

FORD OWNER *and* DEALER

YOUR car usually has to track over some terrible roads and take some pitiless bumps to reach that favorite fishing nook of yours.

The biggest string of fish in the world will not repay you for the discomfort and inconvenience which can be caused by a broken spring or a twisted axle.

But you can insure season after season of motoring comfort by equipping your car with Hassler Shock Absorbers.

The driver's mind is always at ease when he lets his car

Ride on
Hasslers

Robert H. Hassler, Inc.

Indianapolis, U. S. A.

Robert H. Hassler, Ltd., Hamilton, Ont.



April 1924

10th Anniversary Number

20 Cents

NOT CONNECTED WITH THE
FORD MOTOR COMPANY



Tells You When and Where To Lubricate Your Ford



THERE are various colored numerals on the season mileage dials of this Stewart Speedometer, which automatically turn up at regular intervals. For each colored numeral that turns up there are lubrication directions on the chart, hinged below the speedometer, as illustrated above.

For instance, a red numeral turns up every one thousand miles. By referring to the metal chart you will note that opposite the red dot are instructions to "drain oil from crank case" and "add grease to differential."

Burned out or worn out parts are almost always due to lack of lubrication. Save money, and lengthen your car's life by using this Stewart lubrication chart.

\$15.00

Western Price \$15.50

- **ADD OIL TO MOTOR**—Keep level between crank case pick-ups. Use light high grade oil.
- **OIL**—Fill oil cups. Give special attention to commutator.
- **GREASE**—Fill all grease cups including cup on speedometer control arm. Note—To lubricate new style fan bearing, unscrew plug and use heavy fluid oil.
- **OIL**—Apply oil to all bearing surfaces not supplied with oil cups.
- **GREASE**—Fill all grease cups. Grease wheel bearings liberally.
- **OIL**—Drain oil from crank case, following directions in Ford manual.
- **GREASE**—Add grease to differential not more than one-third full.
- **GREASE**—Reduction gears in steering wheel.

The New *Stewart* Windshield Wiper

Here at last! An automatic windshield wiper, electrically operated, independent of the engine, so that "stepping on the gas" has no effect on its powerful, steady sweep. The Stewart cleans the glass thoroughly, with a clock-like regularity *at all times.*

Relieves the driver of the trouble and danger of taking a hand off the wheel to wipe the glass clear, when driving on wet, slippery streets.



\$7.50

Complete

Western Price \$7.75

For your safety and convenience ask your garage-man or accessory dealer to install the electric Stewart Windshield Wiper. Its operation is not a "drag" on the battery and — *you can depend on it.* It is always on the job. *Look for the name Stewart.*

STEWART-WARNER SPEEDOMETER COR'N
CHICAGO, U. S. A.

Stewart
CUSTOMBILT ACCESSORIES
USED ON 9 MILLION CARS



Improved High Pressure Force Feed Oiling System

Throws a Steady Stream of Oil Far in Excess of Climbing Capacity of ANY CAR.

THIS IS ABSOLUTE PROTECTION

Against Burnt Out Bearings, Scored Cylinders, Delay and Big Repair Bills.

Backed With a "Money Back Guarantee."

This photograph with subscribed affidavit shows the Toquet Improved High Pressure Force Feed Oiling System forcing a steady stream of oil at an angle far in excess of the climbing capacity of any car.

No mountain TOO STEEP, no speed too great to prevent the oil lubricating the bearings and front gears. If the engine goes the oil flows, uniformly with the speed of the motor.

You can WATCH THE OIL FLOW in a positive, steady stream just by removing the Breather Cap. You KNOW at a glance that the front bearings are properly lubricated. This is protection and insurance.

Constructed of Bronze and Brass thruout beautifully finished. New High Pressure Magneto Plug, Bronze, interchangeable with Ford Plug. Seamless flexible brass tube easily installed, easily removed. Seamless, Brass, spring tension, Breather Extension. Comes complete. Can be installed in a few minutes. No drilling or mechanical knowledge required.

This Protection against Big Repair Bills only **\$2.50**

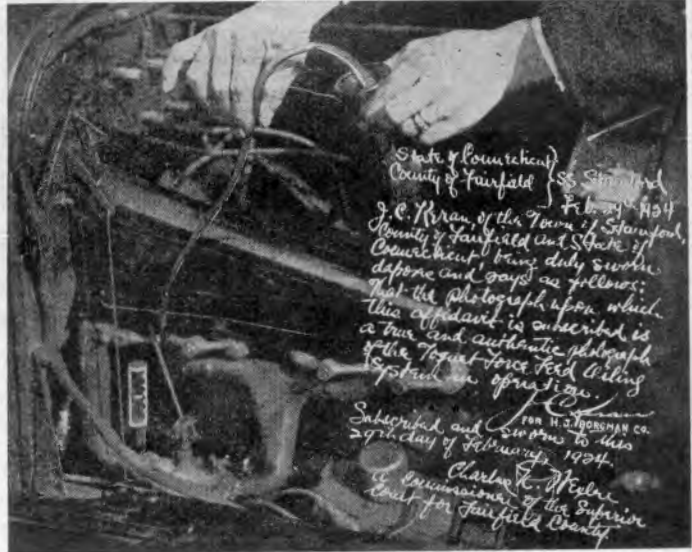
BUY IT TODAY

Sent prepaid upon receipt of remittance and dealer's name if he cannot supply you.

DEALERS—

Write Your Jobber TODAY for the Improved TOQUET High Pressure Force Feed Oiling System.

If he cannot supply you we will ship direct upon receipt of your jobber's name.



STATE OF CONNECTICUT }
COUNTY OF FAIRFIELD } ss. Stamford, February 29th, 1924.

J. C. KIRAN of the Town of Stamford, County of Fairfield and State of Connecticut being duly sworn deposes and says as follows: that the photograph upon which this affidavit is subscribed is a true and authentic photograph of the Toquet Force Feed Oiling System in operation.

J. C. Kieran

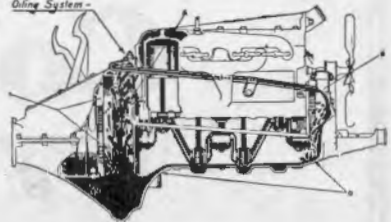
Subscribed and sworn to this 29th day of February, 1924.

Charles K. Weber
A Commissioner of the Superior Court for Fairfield County.

THIS IS THE WAY IT WORKS

The Fly Wheel acts as a paddle wheel and with centrifugal force drives the oil thru the Magneto Plug which is constructed to increase the pressure and control the volume. The oil is forced thru the brass tube to the front of the motor in a steady, positive stream, uniformly with the speed of motor. Oil at this point means absolute protection from lubricating dangers. In no way interferes with Ford Gravity Feed Pipe. Works in conjunction with or independent of it.

Toquet Force Feed Oiling System



THE H. J. BORGMANN COMPANY

Main Sales Offices

STAMFORD, CONN.

*Fahnestock Spring Clip
Binding Posts on Co-
lumbia Ignitor at no
extra cost to you.*



These batteries sell!

NO SHELF-WARMERS, these. Columbia Dry Batteries sell fast. Through the months they pile up nice profits. Look up your own records and you'll be surprised. Quick turnover—easy sales.

"Give me a Columbia Dry Cell," says the customer. Often it's two, three or more. Put Columbias on the counter, in your window, and make sure you have plenty in stock—they'll sell fast.

Things jump when Columbias get on the job. They give real life to bells and buzzers. Engines just can't talk back to their compelling sparks. Sell Columbia Ignitors and Columbia Hot Shots.

Ask your jobber.

Manufactured and guaranteed by

NATIONAL CARBON COMPANY, Inc., New York, San Francisco
Canadian National Carbon Company, Limited. *Factory and Offices: Toronto, Ontario*

Columbia Dry Batteries

—they last longer



TUNG-SOL

THE constantly increasing demand for TUNG-SOL Bulbs is not the result of chance. Car owners as well as manufacturers know that there is a vast difference between TUNG-SOL and the ordinary bulb. It is the care and skill observed in constructing each TUNG-SOL that gives to this bulb superior quality.

Every worthwhile advance in automotive illumination is to be found in TUNG-SOL. The introduction of TUNG-SOL "Fixed-Focus" Bulbs, for use with any of the new patented reflectors, gave to owners a bulb that meets the requirements of the most stringent headlamp laws. In fact *any* TUNG-SOL, for *any* purpose, represents not only quality, but the utmost in value and efficiency.

The Trade Is Requested to Write for Further Information

"Let TUNG-SOL Light the Way"



MINIATURE INCANDESCENT LAMP CORPORATION
Newark, New Jersey

Licensed Under General Electric Company's Incandescent Lamp Patents



A 2-cent stamp and an idea can win you \$50.00

About the easiest money you ever could make. Just write us a letter telling some sales methods that have proved particularly successful in selling Lyon Spring Bumpers. There's a \$50.00 cash prize for the best letter. And prizes for the twenty next best, too.

There's plenty of profit in pushing Lyon sales. Each sale nets

\$200.00 in Cash.
21 Prizes.

Contest closes April
20th, 1924.

Anyone is eligible to
enter.

1st	prize \$50.00
2nd	prize \$25.00
3rd	prize \$15.00
4th to 7th	prize \$10.00
8th to 21st	prize \$ 5.00

Winners' names will be announced in this publication as soon as possible. The judges will be the advertising executives of Metal Stamping Company.

four or five times as much as most accessories. And it's easy to interest customers in Lyon Bumpers. They set the pace in looks, protection and price. That's why

there are over two million in use today.

The Lyon End-fold Parallel Bumper and the Lyon End-Fold De Luxe, two new models, are bound to make Lyons even more popular. They are acknowledged the greatest improvement in bumper appearance and construction since Lyon invented the resilient bumper.

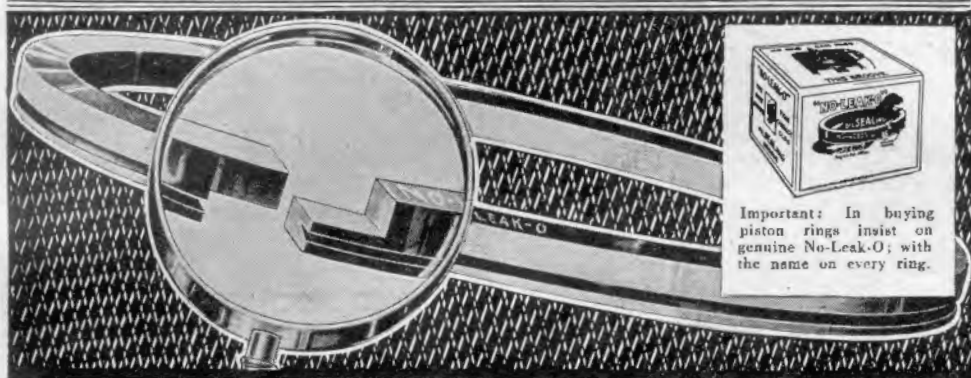
Tell us how you take advantage of Lyon leadership. Tell us what display, what demonstration, what sales argument you've used that has made a prospect into a Lyon purchaser—and a mighty satisfied one at that. Get your prize-winning letter in early. April 20th, 1924, is the last day.

Metal Stamping Company, Dept. 105 Long Island City, N.Y.

Canadian Licensee, B. J. Coghlin Co., Ltd., Montreal

LYON RESILIENT BUMPERS

An Automobile Mechanic Suggested this Advertisement



Important: In buying piston rings insist on genuine No-Leak-O; with the name on every ring.

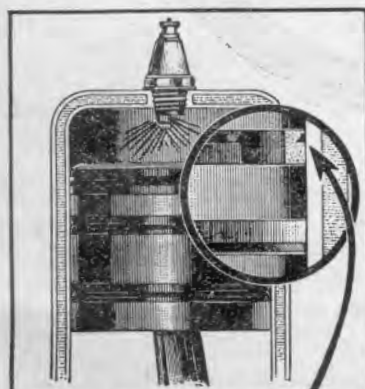
1 satisfied NO-LEAK-O customer sent 10 friends for NO-LEAK-O installation!

"No-Leak-O Rings are certainly business getters, as for instance—one man that was using No-Leak-O Piston Rings sent ten automobile owners to our place of business to have these rings installed. (Name upon request.)

Read the Reasons

1. Individually cast in one piece.
2. Made of finest close-grained tough grey iron.
3. Turned finish for quick seating.
4. Equalized pressure on cylinder walls.
5. The perfect oil seal means perfect combustion.
6. The original patented non-clogging "oilSEALing" groove insures perfect lubrication, prevents leakage due to worn or warped cylinder walls. Not a mere oil scraper.
7. The perfect fit plus the constant oil seal made possible by the angled groove makes it gas and oil tight under all conditions.
8. No-Leak-O service is unexcelled. Prices 35c and up.
9. By reversing the top No-Leak-O ring, with the groove toward the firing chamber, kerosene and unburnt gasoline is kept out of the crank case.
10. Standard replacement ring for ten years.

Copyright 1924, No-Leak-O



No Gas Can Pass this Groove

Write for valuable plain-language literature and booklet, "How to Fit Piston Rings." Absolutely free. Let us tell you how our liberal dealer proposition can increase your profits.

Prices 35c and up

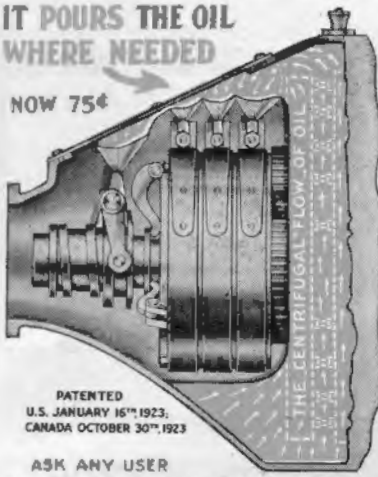
NO-LEAK-O PISTON RING CO.

Dept. 353 Muskegon, Mich.

**NO-LEAK-O
PISTON RINGS**

**IT POURS THE OIL
WHERE NEEDED**

NOW 75¢



ASK ANY USER

PUT ON UNDER THE HAND HOLE PLATE OVER BANDS, IN A FEW MINUTES

No oil can leak out at the gasket. The perfect construction prevents it.

If your dealer cannot supply you send us One Dollar bill, money order or check and an oiler will be mailed to your address prepaid. Also send dealer's name and address.

This oiler has no substitute. Refuse any offered.

Buy an oiler from your dealer for 75c and save the 25c we charge for packing and mailing.

Distributors, Dealers and Fleet Owners—One dozen Oilers in a neat counter display box with circulars sell themselves. Many Ford Agents now install our oiler as part of Ford equipment. A satisfied customer to them means another Ford sold. Order a Display Box with 12 oilers for trial. Liberal Discounts and free sample to trade.

FOUR SPOUT OILER, Inc.

PASSAIC AVENUE and CHAPEL STREET

NEWARK, N. J., U. S. A.

**YOUR FORD TRANSMISSION BANDS
NOW BURN OUT**

Oil Them With a Four Spout Oiler, Keep Them Soft and Pliable, Make Them Last Twice As Long Without a Chatter

Oil the bands and clutch and stop that band friction, then your troubles end. The Centrifugal flow of oil from the Fly Wheel against the Four Spout Oiler pours a steady and positive stream of oil on the Clutch and Bands, and keeps the bands soft and pliable. Elimination of friction means greater power, a smoother running engine and more miles on a gallon of gasoline.

The Four Spout Oiler is guaranteed to stop that band chatter when starting, stopping or backing.

No Special Non-chattering oil required, any good oil will do.

Your Bands now burn out, when oiled they cannot burn and will last over twice as long. A dry and glazed band slides until it gets hot, then it holds with a grab. Oiled bands remain soft and act like new bands.

Standard Ford Bands and a Four Spout Oiler combined cost less than expensive special liners and give better results.

Oiling the clutch positively stops that sudden jerk when changing from low to high irrespective of the speed of the motor when you change and your car will also coast, crank and start easier.

OIL OUT THE BUMPS

with DAHL TIE-BOLT OILERS

No Adjustments No Trouble



**Perfect Spring
Lubrication
Guaranteed**

Enjoy maximum riding comfort and at the same time protect and increase the life of your springs by installing Dahl Tie Bolt Oilers. See your Ford dealer or write us direct.

**For
FORD CARS
and TRUCKS**

The oil is fed through the tie-bolt at the high point of the spring. By gravity it spreads between the leaves to the very ends. Installed in 20 minutes. No lifting or jacking necessary. Properly lubricated springs improve the riding qualities of your Ford. Reduce road vibration. Stop spring squeaks. Increase tire mileage. Lower upkeep cost.

DEALERS:—Your stock should include these fast selling items. See your jobber or write us. A post card brings complete information.

DAHL AUTOMOTIVE MFGRS., Inc.

124-126 Fourth St. N.

Minneapolis, Minn.

"I'M NO SHRINKING VIOLET"

Says Al

"AND NEITHER IS WISOID"



Can you imagine old Al comin' up to me with the above wise crack, after what a time I had convincin' him to try WISOID a while ago? Well, here's the reason.

"Bill," says he, "after I went to three or four garages and accessory stores, tryin' to get me a set of WISOID, like you advised me to, only to have them try to sell me something else; I decided there was a reason, or else that you gave me a lot of 'bunk.' So, I gets on my 'mule,' so to speak, and makes up my mind that not being a 'shrinking violet' I was going to find out if this here WISOID, was.

"So I busts into the next place I comes to, and, right on the wall, big as life, was a WISOID board. Me being of a naturally cautious nature, and wantin' to really find out what the man who sells it thinks of WISOID, I just up and asks him for a set of gaskets for my Ford. And do you know what this gent told me? He says, 'You don't want just Gaskets—what you want is a set of WISOIDs, the gasket material that swells when it comes in contact with oil, gas or water and really stops the leaks in the joints or housings on your Ford. WISOID,' says this gent further, 'will not SHRINK or GO DEAD.'

"That's me," says I, 'and you don't have to sell me a-tall. Wrap me up a set, so I can try out my friend Bill's pet hobby.'

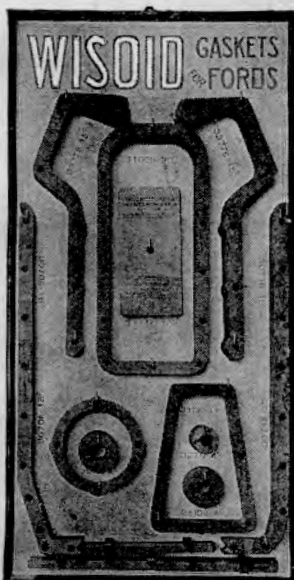
"Well, how'd they turn out?" I asks of Al, "All O. K.?" "I'll says WISOID is O. K., and boy, I'll tell the world you did me a favor, Bill—by puttin' me wise."

If you, like Al, find that your particular garage-man cannot furnish you with WISOID—just tell him he can get a supply from his regular jobber. To avoid any mistakes give him our name to give to his jobber.

Manufactured by

**CONSOLIDATED PACKING
& SUPPLY COMPANY**

25 Barclay Street, New York City.



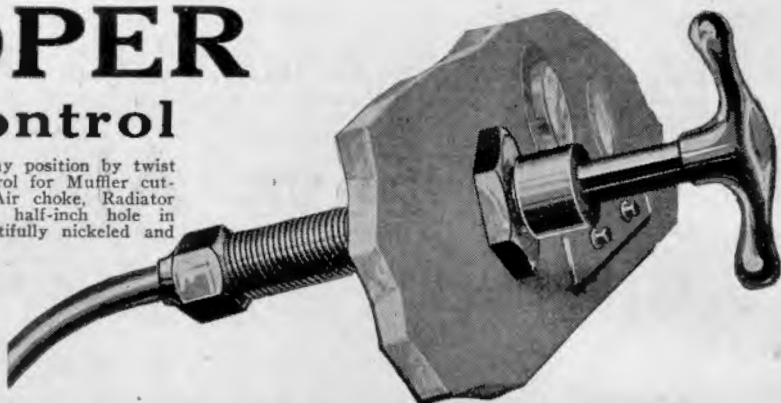
WISOID Display Holder
Displayed by most good Ford
Accessory Dealers. Contains
325 WISOID Gaskets.

WISOID

COOPER

Dash Control

Always handy. Locks in any position by twist of the wrist. The ideal control for Muffler cut-out, Exhaust heater valve, Air choke, Radiator shutter, etc. Requires only half-inch hole in dash. Brass and steel, beautifully nickelled and polished. Price \$2.50 Cooper Jr. Dash Control for Fords Complete with Cooper Special Cut-out for Fords \$3.75.



Dealers: Watch for our half-page ad in Saturday Evening Post. Write your jobber for our proposition. Help Us Supply the Demand for These Popular Items.

Needed On Every Car

The Cooper Cut-out enables you to "listen in" on your motor, keeps your motor properly adjusted. Provides outlet for carbon. Silent when closed. Extra heavy springs, axle and flapper prevent all chattering. Unaffected by mud, water, heat or carbon. Installed easily—no severing or weakening exhaust pipe. Fully guaranteed.

At your dealers, or direct from us. In ordering, give outside diameter of exhaust pipe. Send for circular.

COOPER MANUFACTURING CO.

429 So. First Avenue

Marshalltown, Iowa

Exclusive Sales Representatives

THE FULTON CO., MILWAUKEE, WIS.

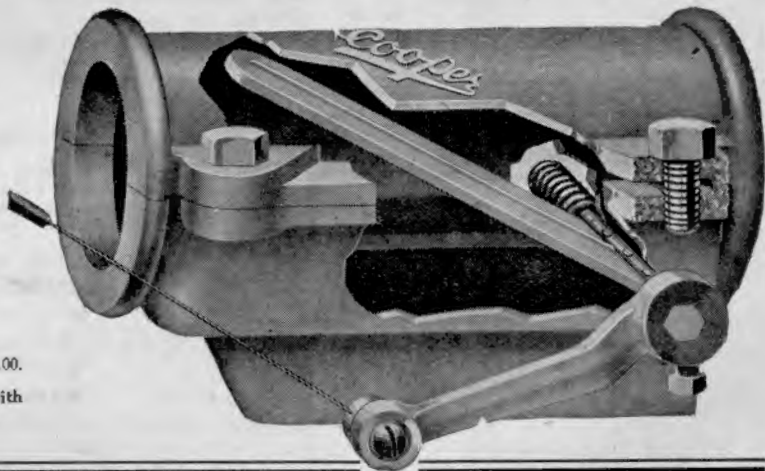
The
Cooper
CUT-OUT

Engine Tester and
Carbon Outlet Valve

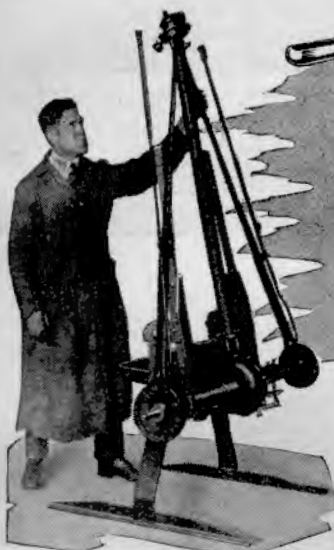
Made For All
Makes of
Cars

Prices. Valve only— $1\frac{1}{2}$
in. \$2.50; $1\frac{3}{4}$, $1\frac{3}{4}$, $1\frac{3}{4}$,
\$3.00; 2, $2\frac{1}{4}$, \$3.50; $2\frac{3}{4}$,
 $2\frac{3}{4}$, $2\frac{3}{4}$, \$4.00; $2\frac{3}{4}$,
 $2\frac{3}{4}$, 3, \$5.00; Chevrolet Special, \$4.00.

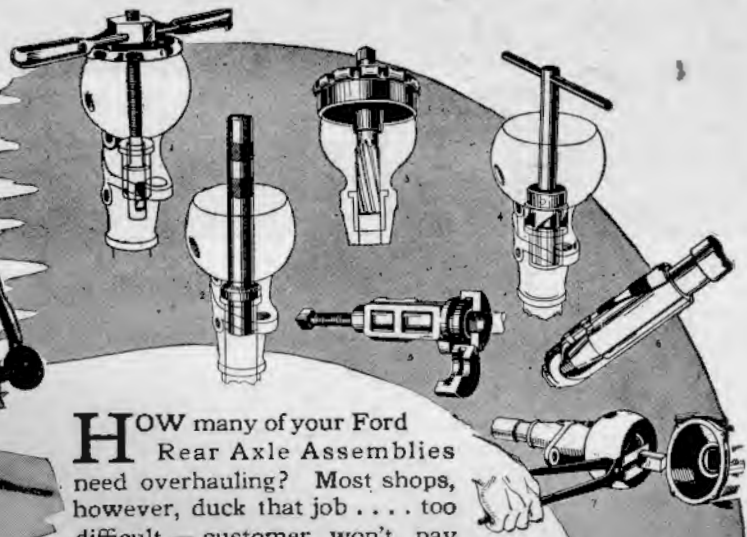
Cooper Special Valve, complete with
"Y" pedal for Fords, \$3.00.



Don't Neglect Your Rear Axle Work



You can wheel your axle assembly right up to Stevens Axle Stand, shown above; fasten it in the chucks of the Stand without lifting; swing it into position for swift, easy work—all a one-man operation. Price \$35. Ask for description.



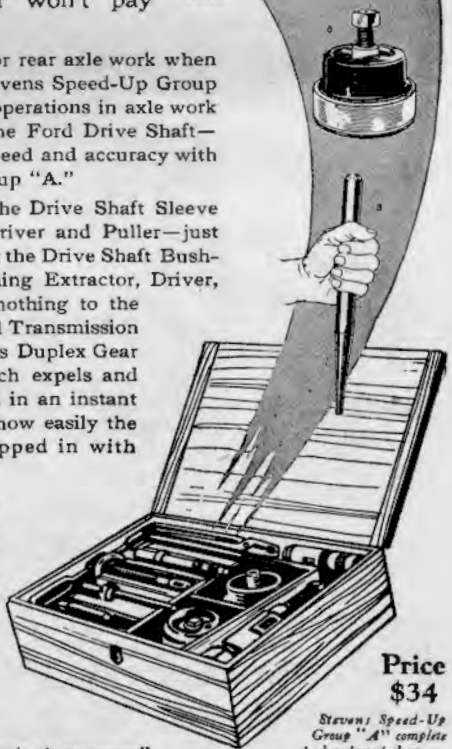
HOW many of your Ford Rear Axle Assemblies need overhauling? Most shops, however, duck that job . . . too difficult—customer won't pay for your time.

But you'll be looking for rear axle work when you are armed with Stevens Speed-Up Group "A." The time-eating operations in axle work—the overhauling of the Ford Drive Shaft—become automatic in speed and accuracy with the special tools in Group "A."

It's a snap to replace the Drive Shaft Sleeve with Stevens Sleeve Driver and Puller—just as easy to replace and fit the Drive Shaft Bushing with Stevens Bushing Extractor, Driver, Reamer and Refacer—nothing to the pulling of the Pinion and Transmission Drive Gear with Stevens Duplex Gear Puller—the Giant Punch expels and inserts the Knuckle Pin in an instant—and at the end, see how easily the Universal Joint is slipped in with Stevens Tongs.

Order this chest of ten special Stevens Speed-Up Tools today. Each cent it costs means dollars of extra profits for you.

Stevens & Co.
375 Broadway, N. Y.



Price \$34

Stevens Speed-Up Group "A" complete in hardwood chest.



Write for Catalog 241 FO It shows you how to make more money on over 110 Ford and Fordson jobs.

"Thru your jobber—his service is economy"





DETROIT Safety

Price
\$2

**Eliminate
Glare**

MAKE YOURS
THE

**Best
Longest
Safest**

HEADLIGHTS
ON THE ROAD



*Attractive
Territory
to Live
Distributors*

**TO DEALERS
SPECIAL TRIAL SELLING ORDER
GUARANTEED SALES**

Motor City Syndicate Date.....19.....
Main Offices: 4490 Cass Avenue, Detroit, Michigan.
Please send me, Parcel Post, Prepaid, Trial Selling Order
of 12 sets of your "Detroit Safety Headlight Devices in as-
sorted sizes for which I enclose herewith remittance of
\$15.00
This order is placed with the distinct understanding that
I may return any number of sets that I cannot sell within
30 days and secure money back at rate of \$1.25 per set.

Name

Street Town

County State

MOTOR CITY
4490 CASS AVENUE



Headlight Devices

T

HIS WONDERFUL NEW DEVICE, although invented before lens laws were written in most state, complies with all state, municipal and county laws and with the law of common sense in every country in the world.

With the ever increasing number of automobiles which travel our highways comes an ever increasing danger. Just think for a moment. If you take a drive this evening, how many cars will you pass—probably a hundred. If your car has glaring, blinding headlights you have endangered the lives of approximately 400 other people and at the same time jeopardized the lives of the occupants of your car one hundred times. You owe it to yourself, your family and the thousands of motorists you meet in a season to make night driving as safe as possible by installing a pair of Detroit Safety Headlight Devices.

The Detroit Safety Headlight Device is simple yet scientifically designed and made. It is low priced and easily and quickly installed by anyone.

The corrugated nickel surface below the bulb reflects the light back against the upper half of the reflector and then all down on the road, not into the eyes of the on-coming motorist. Detroit Safety Headlight Devices give the effect of a dim light, although never dimmed. They cause other motorists to dim out of courtesy. You drive with the "Courtesy of the Road."

The device is made from the highest quality nickel-zinc compound heavily nickel plated and mirror polished. They will not rust or corrode and will last a life time.

Detroit Safety Headlight Devices are used with PLAIN GLASS LENSES, the lowest priced lenses made. The device itself is unbreakable and if a headlight is bumped and broken another lens can be quickly and cheaply installed.

Be safe, not sorry. It is easier and cheaper to prevent accidents. We have received hundreds of testimonial letters from enthusiastic dealers and more than satisfied car owners.

Write
Immediately
for
Attractive
Proposition

SYNDICATE
DETROIT, MICHIGAN

OWNER'S COUPON

Motor City Syndicate Date.....19...

Main Offices: 4490 Cass Avenue, Detroit, Michigan.

Enclosed please find remittance of \$2.00 for which please send me Parcel Post Prepaid one set of Detroit Safety Headlight Devices. This order is placed with the distinct understanding that if after ten days use I am not thoroughly satisfied I may return the devices to you and my money will be refunded.

Name

Street Town.....

County State.....

My Dealers name is.....

NACO

Flawless Cork Gaskets

have met with universal approval on account of their dependable quality, and because they are furnished compactly boxed and clearly labeled for convenience in storing and handling. They can be supplied in all shapes and sizes in general use. They are carried in stock by jobbers throughout the country.

We guarantee "NACO" Gaskets to withstand oil, gasoline and water. They will cushion joints perfectly and give complete satisfaction.

"NACO" Cork Sheets

like those from which "NACO" Gaskets are cut, are supplied in three sizes for those who wish to cut their own gaskets.

"NACO" sheets are made from clean, resilient Spanish cork, carefully granulated to prevent defects and crevices in the compressed sheets. We use a special non-hardening binder.

"NACO" Cork Washers, Discs, Liners, Strips, Packing, etc., are of the same dependable material.

The "NACO" Gasket Display Board

is the most attractive, most compact, lowest priced metal display board on the market. It contains 350 "NACO" Cork Gaskets (listing at \$17) including all Ford shapes. The board is supported by an easel, and has a chain for hanging on the wall. The outlines of the gaskets are marked on the board, with lithographed catalog numbers as a guide in selling and replacement.

If your jobber can't supply you with a "NACO" Display Board, write us today, giving his name. We will tell you how to get one.

Details, Prices and Samples of Our Products will be Furnished on Request.

National Cork Products, Inc.
357-359 Ogden St. Newark, N. J.

LIST
PRICE
(including
board)

\$17⁰⁰



Perfect Steering FOR FORDS



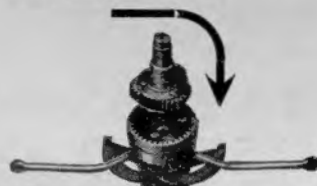
*Tested and approved by
Underwriters' Laboratories*



Installed in Ten Minutes

The simplicity and ease of installation is readily shown by the photograph.

After the steering wheel and cap are removed from the top of the steering post column, the Baker Reduction Gear can be readily inserted as indicated.



The cap and steering wheel are now put back in position.

This installation can be made by anyone while seated in the driver's seat in ten minutes.

The Baker Reduction Gear has made it possible for Ford owners all over the country to experience unthought-of comfort and safety in driving their cars.

By the increased reduction the ease of steering is greatly increased, and you are relieved of that driving fatigue and tense gripping of the wheel which is so apparent and exaggerated on rough roads and long trips.

In addition to transmitting the steering energy downward, the increased reduction likewise serves as a buffer to the jars and jolts of the road as they are transmitted back to the steering wheel. Thus road shock is almost lacking and you enjoy ease and perfect control at all times.

The Baker Reduction Gear is made of hardened steel parts and will outlast the car.

Because of the increased difficulty in steering Fords which are equipped with balloon tires, the Baker Reduction Gear is especially needed.

Order a Baker Reduction Gear today and enjoy absolute confidence in steering.

Retail Price \$5.00

BAKER REDUCTION GEAR COMPANY

10230 WOODWARD AVENUE

DETROIT, MICHIGAN

Gentlemen:

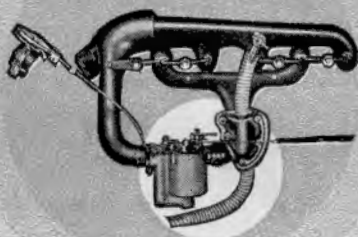
Enclosed is \$5.00 for which please send me sample Baker Reduction Gear. If I am not satisfied with it, I may return it within thirty days and receive my money back.

Please send descriptive literature.....Please send dealer's proposition.....

NAME

ADDRESS

4½ Tons of Stromberg Carburetors



The great demand for the new STROMBERG CARBURETOR with Hot Spot for Ford cars is evidenced by the size of a shipment recently received by Dallas A. Shafer and Co., Inc., of Richmond, Va. This big order filled a 5-ton truck almost to capacity—9000 pounds of these efficient gas savers for Ford owners in Virginia and North Carolina. This was the sixth shipment of five hundred carburetors ordered by this progressive firm during a six month period.

On any car, old or new, the STROMBERG brings about better acceleration—smoother operation—easier starting and a decided saving in fuel.

See your dealer or write direct mentioning name, year and model of your car.



THE STROMBERG MOTOR DEVICES CO.

Dept. 447
64 East 25th Street
Chicago, Ill.

*More than 135 Pas-
senger Car and Truck
Manufacturers use
Stromberg as stand-
ard equipment.*



New STROMBERG Does it!
CARBURETOR



Ford Owners!

Don't Let Your Foot Slip!

Ford pedals get very slick and slippery—so does the sole of your shoe. Some day your foot may slip and then may be serious trouble. Don't let it—but enjoy the security and comfort of Surety Extension Pedal Pads.



SURETY EXTENSION PEDAL PADS

**FREE
TO
DEALERS**

This attractive counter display showing actual Surety Pedal Pads sure sells 'em. Free with 25 sets.



are heavy "non-skid" pads of live, red, molded rubber. Give the feet a sure grip and cushion them so they don't tire. Side extensions widen the pedals and increase the foothold.

Surety Pads go on in five minutes. Just one bolt to tighten. Over half a million Ford owners use them. The original and largest selling pads.

Always packed in the distinctive Grant plaid carton and sold by most Ford dealers and accessory stores. Stop in for a set. If you have trouble getting, send \$1.25 for a set postpaid. Guaranteed to satisfy or your money back.

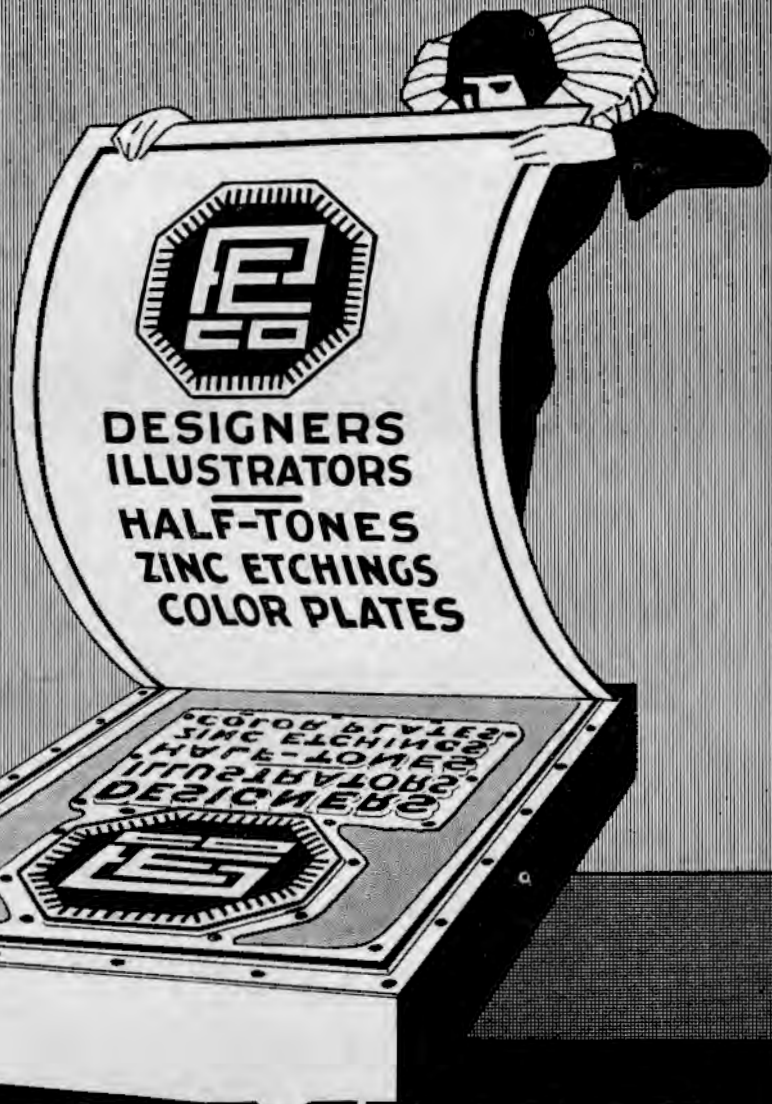
GRANT AUTO APPLIANCE CO.

2415-17 West Fourteenth Street

--

CHICAGO, ILLINOIS

Phone
GRAND
1231



PREMIER ENGRAVING CO.

814 WINNEBAGO ST - MILWAUKEE



Counsel!

DOCTORS give it. And charge for it. Lawyers give it. And charge for. You give it. And, in the end, you charge for it.

Which is only right.

Like other consultants, your opinion is valuable.

Valuable especially when you tell about the PETRY TUNING-UP VALVE.

For you save your customer endless trouble when you tell him how the Petry in his exhaust line enables him to cut out his muffler and so, detect a clogged motor.

You save him valuable time when you tell him how the Petry allows him to quickly blow out his motor with kerosene, or other carbon removers.

You save him dollars and cents when you tell him how the Petry permits him to check up his carburetor adjustment for the most economical consumption of gas.

And then you charge for your counsel.

Not once; but twice: Profit on sale plus cost of installation! (List Price \$3.50 to \$9.00)

Write your jobber for discounts.

N. A. PETRY Co., Inc.
338 No. Randolph St.
Philadelphia, Pa.



THE PETRY UNIVERSAL DASH CONTROL is the only dash control with means for fastening tubing at valve. \$2 00



THE PETRY PEDAL gives ability of operating in one position with easy operation. \$1 25



THE PETRY BUS HEATING SYSTEM offers opportunity to drivers who are cold-blooded!

THE PETRY PUMP is the only pump with spread base allowing full room for operation. Perfect hand fit handle. 17 inch size for Fords \$4 00 (West of Denver. \$4 50)



Petry Products

Reprint of Opening Advertisement—Ford Owner and Dealer
Date of Publication, Apr. 1st, 1924.

JUMBO Power Transmissions for Fords Are LEADERS Again

"They copied all they could follow,
but they couldn't copy my mind;
And I left 'em sweating and stealing,
a year and a half behind."

—KIPLING

Here's WHY

Features That
Make JUMBO Equip-
ment a Real Necessity
in Ford One-Ton Trucks

1. Provides Four [4] speeds FORWARD and Two [2] speeds REVERSE.
2. Cannot be placed or left in NEUTRAL. [Both planetary and emergency brake always effective.
3. Provides a fast and flexible Second Speed and more than **DOUBLES THE PULLING POWER.**
[Gears down High Speed Worm 30.2 to 1]
[" " Low " " 42.5 to 1]
4. Sturdy and oversize in construction. Furnished with complete attaching parts including **TRIPLE STRENGTH DRIVE SHAFT.**
5. Safe and positive in operation. Do not ALTER or INTERFERE with FORD DESIGN.

Maximum Hauling Capacity at Minimum Cost
With The Sheer Brute Power to Overcome
All Obstacles.

**JUMBO
MODEL**
For All Ford
Passenger
Cars. Complete

\$ 67 50



**Ton Truck
Model**

\$ 75 00

**With Complete
Attachments**

**Volume Production
in \$2,000,000 Plant**

Vast manufacturing resources. The best of engineering skill and 18 years experience in building FINE TRANSMISSIONS stand back of the NEW JUMBO.

Only because of these resources and a daily capacity of 500 Transmissions are we able to offer you such a record-breaking price.

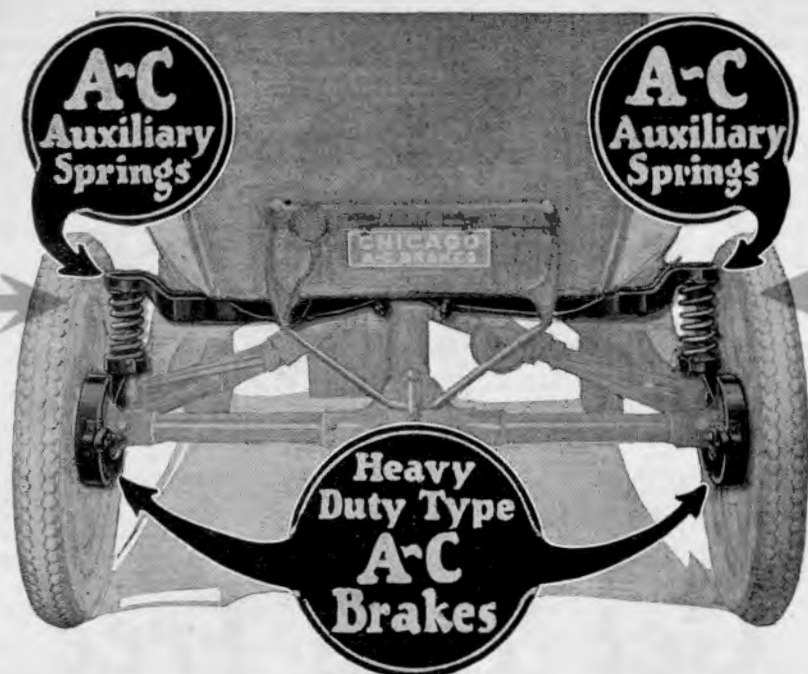


Address:
WHOLESALE SALES DIVISION

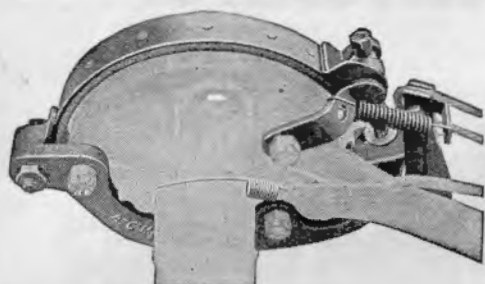
THE PRICE HOLLSTER CO.
ROCKFORD, ILLINOIS

Country-wide Distribution Through Thirty-six (36) of the Country's Largest and Best-Known Jobbers—Write us for name of nearest Distributor and Our Special DEALERS PROPOSITION

(PH-5-2M)



Eliminate All Chance In Braking



Five Models: (1) Emergency. (2) Foot or Service. (3) Foot and Emergency combined. (4) Special drum, large band, cable or steel pull rods, combined foot and emergency. (5) Foot or Service for Ton Trucks.

A-C Brakes for all Ford cars make every stop velvety—smooth, save two-thirds on repair bills, and insure *positive* action minus all chance of transmission brake failure. In use for eight years. Users selling them everywhere. Distributed and serviced in all principal cities of U. S. and foreign countries. Profitable territory still open.

A-C Auxiliary Spring Attachment (not a shock absorber) gives more tire mileage, greater capacity and longer service. Prevents sidesway and tipping—all weight carried on frame and springs. When rear is loaded the weight compresses springs, and load is carried on three springs.



A-C Auxiliary Spring Attachment absorbs road shocks—easier riding loaded or empty—loads up to 1500 pounds carried with perfect safety.

Dealers and Owners:
Write for the complete story of A-C Brakes and A-C Auxiliary Spring Attachment. Get all the facts now.

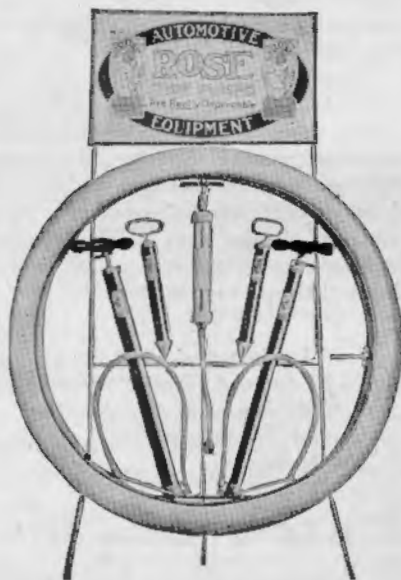
A-C Manufacturing Co., Inc.
2222-26 W. Grand Ave. - Chicago

*Catch the
Attention
and You'll Catch
the Sales*



Get This Free Merchandiser

Put this new sales stimulator to work in your store. It is free. You only pay for the goods it displays. It is our present to you in the interest of better business and bigger profits in 1924. Your jobber is distributing them. Ask him about it.



ROSE

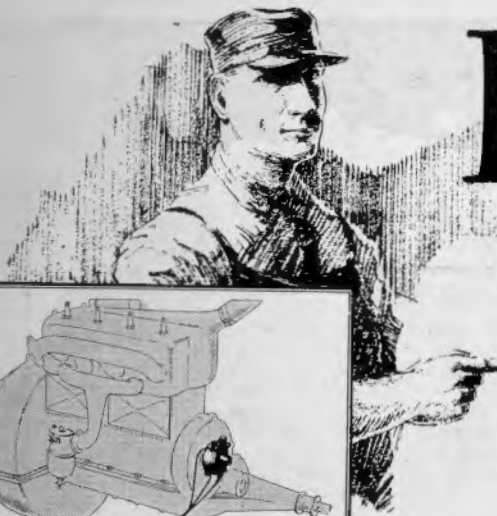
A large majority of dealers over the United States sell Rose Tire Pumps, Grease Guns and High Pressure Lubricators. They are leaders—reliable profit items.

Here is your chance to increase sales. The quickest, easiest way to "ask 'em to buy" is to put goods out where customers can see them and inspect them.

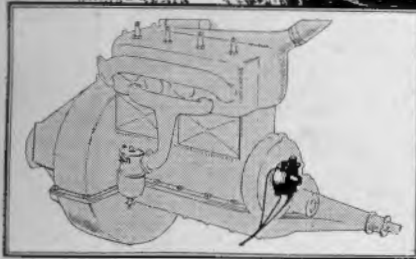
The new Rose Merchandiser is going over big wherever it has been tried. Try one out in your store. Watch it catch sales. Ask your jobber today.

FRANK ROSE MFG. CO.

HASTINGS, NEBR.



If I were selling a timer for Fords and wanted to give Ford owners a run for their money



I'd sell them a timer that needed no oil; that was grease and water proof; and that the owner could forget for ten thousand miles or more. I would sell them a timer that would stand hard service and that everyone could understand. This timer would be on the job 100% whether the cam-shaft wobbled or not.

LIFE TIMERS need no oil. They are giving perfect service all over the country after more than ten thousand miles of hard duty; and end-play or wobble in the cam-shaft has not caused them to stutter once. As a stream of water doesn't short the LIFE TIMER and as the reversible commutator really gives two timers for the price of one, you can understand how we can

Over 100,000 LIFE TIMERS were put in service last year and the growing demand caused us to equip ourselves to handle a much larger volume of business.

We are consequently able to promise prompt shipment to a number of jobbers not at present selling LIFE TIMERS to their trade.

Unconditionally Guarantee Every Life Timer

Sells for \$2.00 east of the Rockies

If you would know more about the LIFE TIMER, use the coupon in the corner. This is one of the most substantial pieces of equipment built for Fords. Write today.

Mechanical Production Company Milwaukee, Wis., U. S. A.



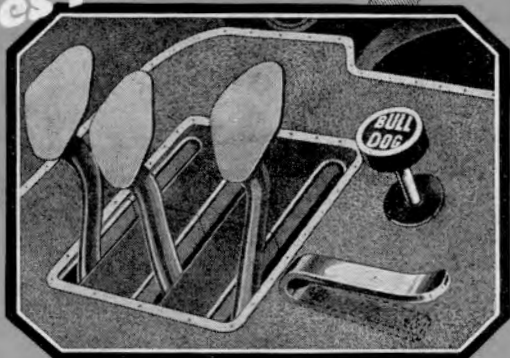
Life Timer for Fords

Guaranteed by the makers Unconditionally

Coupon form with fields for name, address, city, state, and checkboxes for 'I drive a Ford', 'I am a dealer', 'I am a jobber', 'Send literature and sample', 'Send folders and'.

Sweeping

to new sales records



This year again—Bull Dogs are dominating Foot Accelerator Sales. Their broadly advertised name, their known reputation, their convincing record of performance are firmly fixed in the minds of Ford Owners everywhere. When you buy Bull Dogs—from any good jobber—quick, substantial continuous profits are cer-

"Bull Dog"

FOOT ACCELERATOR *for* FORDS

Tell your customers, "Here is the Best Accelerator for Fords." You are safe. Bull Dogs have stood the rigid tests of usage on over a million Fords. They are simple, fine appearing, complete, positive in action and easy to attach. They sell for \$1.50.

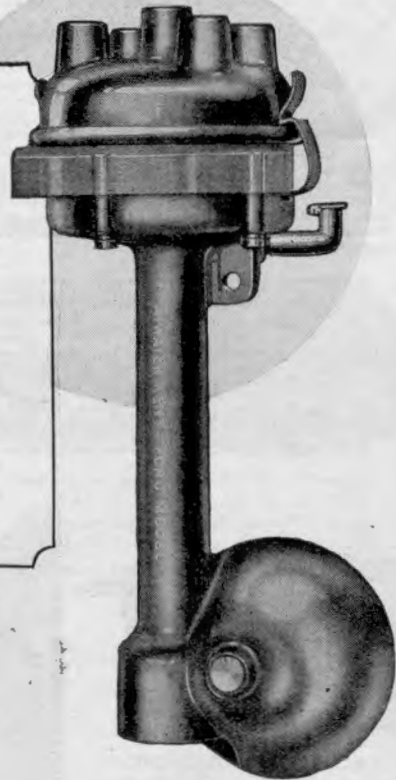
THE W. H. THOMAS MFG. CO.
SPENCER, IOWA

ATWATER KENT

Scientific Ignition

ATWATER KENT Ignition, Type LA, greatly increases the power, flexibility and smooth running of the Ford Engine, and offers to Ford owners every ignition advantage enjoyed on the more expensive cars.

Easily and quickly installed without removing the radiator—In use on more than 100,000 Fords.



TYPE LA FOR THE FORD

Price **\$1080**

Including Cables and Fittings

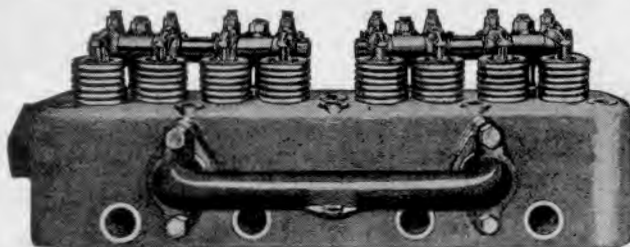
ATWATER KENT MFG. COMPANY
4954 Stenton Ave., Phila., Pa.

Makers of

THE WORLD'S HIGHEST GRADE IGNITION
STARTING AND LIGHTING

Roof 8 Overhead Valve Equipment

For Ford Touring Cars and Trucks
Price \$65



Including Spark Plugs and Wires. Everything Ready to Install.

The Last Word in Power and Motor Efficiency for Standard Service from 8 Valves.

This is a Full Cylinder Head with Eight Valves—Not a Half Cylinder Head with Four Valves.

LIBERTY 8 VALVE RACING HEAD, fastest Eight made with Rocker Arm System.

VICTORY 8, with Single Overhead Camshaft, fastest Eight Valve Head possible to design.

ROOF 16 OVERHEAD VALVE EQUIPMENTS FOR FORD AND DODGE MOTORS

Most powerful cylinder heads ever designed. In service in every state in the Union and forty-five foreign countries. Improved mechanical equipment, including finest rocker arm system ever put on a motor. Sand, mud or the steepest grades are unnoticed by the car owner with Roof valve 16 head. Nearly 100% increase in power for touring car and truck owners and still more power for racing car drivers.

Holders of World's Dirt Track Record from one to five miles, made at Daytona Beach, Fla., and Kalamazoo, Mich. Also world's record for half mile track for seventy-five to one hundred miles made at Funk's Lake Speedway, Winchester, Indiana.

SPEED AND POWER EQUIPMENT

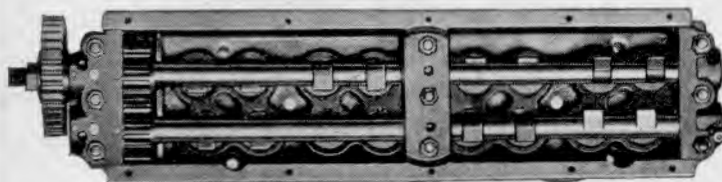
We are the largest manufacturers and distributors of power and speed specialties in the world. Whatever you want ask for it. Headquarters for Magnesium, Triple-lite and Gray Iron pistons and rings, special connecting rods, parts for undersliding chassis, nickel steel racing gears, 3 to 1 and 4 to 1 ratios, racing carburetors, high tension magnetos and other ignition equipment, attachable counterbalances for crankshafts, also high speed camshafts, wire wheels, worm and gear steering gears, four and six forward speed transmissions, special oiling systems, ball bearing safety rear wheel hubs, side radius rods, racing steering knuckles and arms and ball bearings for rear of transmission. Highest quality. Prices far below competition. Racing bodies and Radiators—our own special designs. Get low price body circular.

COUNTERBALANCED CRANKSHAFT—Three Bearing, wanted by every Ford Touring Car Owner. Special Five Large Bearing Crankshaft for Ford Racing Car.

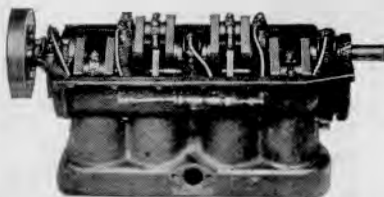
TYPE C NEW MODEL, 16 VALVES, 1 3/4", FOR FORD MOTOR, 4 intake ports—4 exhaust ports—racing rocker arm system—4 large size racing carburetors and Special High Speed Camshaft, complete Equipment one low price for racing only. **SPECIAL TYPE C 2 OVERHEAD CAMSHAFTS WITH FOUR CARBURETORS.** World's Record breaker, fastest ever designed.

FORD TRUCK OWNERS, Our 8 and 16 Valve Heads will double the economic value of your truck. Make your truck a two ton truck instead of a one ton truck.

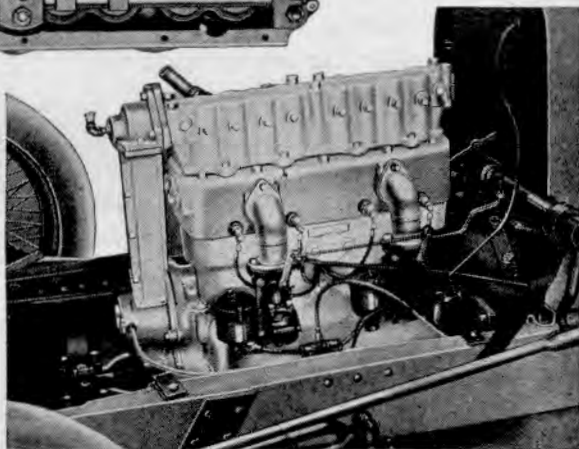
If there is no agent in your territory send for circulars and special proposition to new dealers. It will interest you.



TWO OVERHEAD CAMSHAFTS FOR TYPE C showing operation of camshaft.



FIVE LARGE BEARING CRANKSHAFT—installed in Ford raising motor and also showing hollow crankshaft oil feed to bearings.



ROOF VICTORY EIGHT—Single Overhead Camshaft Cylinder Head with 8 valves. Intake side showing carburetor installation.

LAUREL MOTORS CORPORATION, Anderson, Ind.

Every Ford Owner wants a N-L Oil Gauge

The Better Oil Gauge for Ford Cars

Many dealers are increasing their profits selling the N-L Oil Gauge for Ford Cars. It is easy to install—accurate in operation—beautifully finished. It sells for only \$2.00, giving the dealer a liberal margin of profit. It is one of the most satisfactory Ford accessories yet devised. Any dealer not already handling the N-L Oil Gauge should write for complete information without delay.



FORD OWNERS: The N-L Oil Gauge mounts on the sash where it shows at all times the level of the oil in the crank shaft case. No more crawling under the car. No more worrying whether your bearings will burn out through oil shortage. A \$2.00 investment in an N-L Oil Gauge is the best investment you can make.

DEALERS: There is no reason why every dealer—even the smallest—cannot sell several dozen N-L Oil Gauges every year. They come packed in a business-getting counter display box and fill the need of every Ford owner. The price is right. Write right now for complete details. Putting it off will only mean lost profits.

Enal Manufacturing Co.

107 No. Franklin Street
Syracuse, N. Y.

**SELLS
FOR ONLY
\$2.00**

APCO EQUIPMENT for FORDS



APCO Shock Absorbers
"Rubber Heels for a
Ford." \$25. a set.



APCO Anti-Rattlers
—for fewer adjust-
ments. 35c.

APCO Foot Brake
—for greater secu-
rity and better
control. \$12.50.



APCO Dash Oil Gauge
—a safeguard against a
ruined motor. \$2.50.



APCO Horn
Button No. 9
—at your fing-
er's tip. \$1.



APCO Steering
Column
Brace—
for less vibration.
Black 75c, Pol-
ished \$1.00.



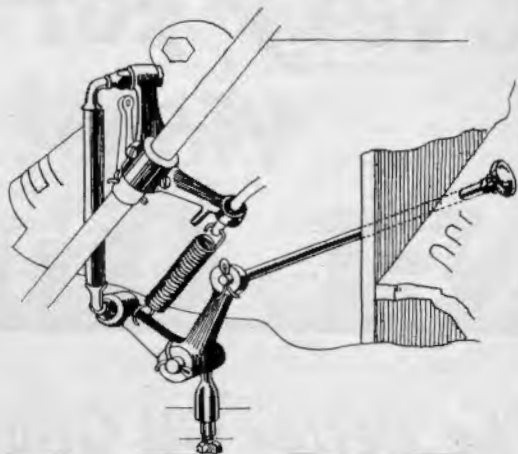
APCO Horn
Button No. 138
—replaces
steering wheel
nut. 50c.

APCO Glass Oil
Gauge Keeps oil
level always in
right. 40c.



APCO Windshield
Cleaner — for an
unobstructed view
ahead. \$5.

APCO Fan Belt
Guide—keeps the
fan belt on the
job. 20c.



APCO WIRELESS Foot Accelerator

A New APCO Product [for Fords!
Still more safety and convenience for
you who drive a Ford.

This new APCO achievement gives a
smooth, flexible control never before
experienced in a Ford. Each moving
part has an easy bearing—the two
major members are ball jointed.

No wires are used. To fit the device to
the engine is practically a matter of
replacing one crank case bolt. No
Ford part is altered.

Packed completely assembled in in-
dividual boxes weighing ten ounces,
\$1.50.

DEALERS: Sell your customers an Accelerator
as good as that on a higher-priced car. That's the
APCO Wireless! Attractive discounts on all APCO
items for you.

Apco Manufacturing Co.

Factory and Main Offices:
Providence, Rhode Island

APCO BRANCHES

Apco Mfg. Co., 180 North Market St., Chicago, Ill.
Apco Mfg. Co., Export Office, 130 W. 42nd St., New York
Apco Mfg. Co., 2005 E. 15th St., Kansas City, Mo.
M. L. Martin, 2006½ Commerce St., Dallas, Texas
Apco Mfg. Co., 224 Peachtree St., Atlanta, Ga.
Canadian Factory, Apco Canadian, Co., Ltd.,
3150 Jeanne Mance St., Montreal, Canada.

new MILWAUKEE TIMER for FORD

(BAKELITE CASE)

A BETTER "Milwaukee" for your Ford car! Now, the Milwaukee Timer has a Bakelite case—the greatest improvement ever added to a standard-type timer.

This famous timer is absolutely "short-proof", for Bakelite is a perfect non-conductor—as well as handsome and durable, oil-proof and water-proof. So this timer, already noted for long life and high efficiency, is now trouble-free until it actually wears out in service. No short-circuits—no mis-firing—no timer troubles.

Improve your Ford with this new Milwaukee—the only roller-brush timer with Bakelite case. For added power, pickup, speed and trouble-proof service, here is the biggest two-dollars'-worth you can buy for your car.

MILWAUKEE MOTOR PRODUCTS, INC.
MILWAUKEE WISCONSIN

(Also manufacturers of the GRIP RACK—the disappearing luggage holder for all cars.)

Bone-dry Egyptian fiber race pressed to a tight fit in the Bakelite case. Remains satin-smooth for thousands of miles.

Fine steel contact points with welded stems. Locked in position. Extra thick throughout for longest life.

Only Bakelite case on a roller-type timer. Makes the Milwaukee absolutely "short-proof". Puts it in a class with high-priced ignition units.

Famous Milwaukee Timer brush assembly. Two bronze castings, fitted and gauged for accurate alignment. Hardened steel roller, finished like a ball bearing.



No increase in price. Retails at

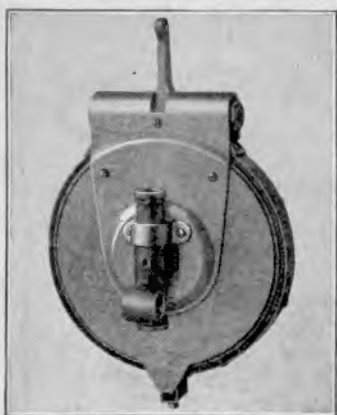
\$2

(\$2.75 in Canada)

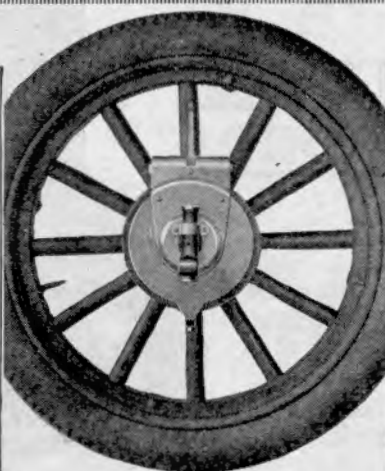


Dealers! Display Cut-out—Free! Three-color Window and Counter display. Holds a Milwaukee Timer from stock. New process—oil colors, extra brilliant, washable. Sent free—postpaid. Write us direct.

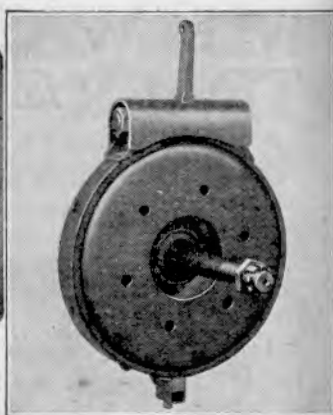
A TODSMITH PRODUCT



Inside view of Todsmith Fore-Wheel Brake Unit, showing regular Ford Spindle which is included in assembly.



Todsmith Fore-Wheel Brake Unit with wheel attached. Control connection permits full flexibility and long life without adjustment.



Outside view of Todsmith Fore-Wheel Brake Unit with wheel removed. All working parts of complete system are protected by housing.

TODSMITH FORE-WHEEL BRAKES FOR FORDS

Provide more than three times Ford service braking surface

Reduce stopping distance at various speeds by an average of 30%. Insure always a gentle, safe stop.

Eliminate hazard of skidding, regardless of road conditions

Brakes function perfectly on all wheels on all angles of turn.

Give added assurance—added comfort—in driving

Interfere in no way with normal operation of car. Operated by foot brake pedal. Front wheels run absolutely free when brakes are disengaged. No unsafe locking of wheels. No excessive dead weight.

Installation requires less than two hours

Price Complete \$37⁵⁰

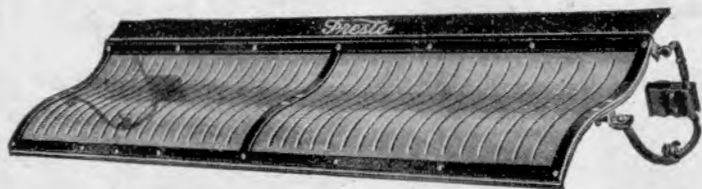
From your dealer or direct

TODSMITH PRODUCTS CO.

544 PENOBSOT BLDG.,

DETROIT, MICHIGAN

Presto Champion STORM and GLARE Visor



The only visor in the world with corrugated panels

protects eyes from blinding light—night or day

The moment you lay eyes on this amazing improved visor you won't rest until you see it on your car. Only the briefest examination convinces that it easily offers much more for the money. Its many new exclusive features put it far beyond the ordinary type visor. For instance, no other visor can offer corrugated panels made of genuine Celluloid. That is why **Presto Champion cannot buckle, sag, or warp.**

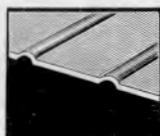
Avoid unnecessary collisions

PRESTO CHAMPION visor is a perfect shield for eyes. Dazzling sunlight or glaring headlights, seen

through this visor, become soft as moonlight. Thus you need never fear temporary blindness that now causes many needless accidents.

PRESTO CHAMPION fits any car

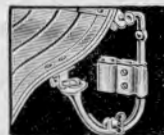
There is a special size Presto Champion visor to fit your car. It comes in two sizes—40 inches at \$7.50 and 44 inches at \$10. Also in 3 colors—green, blue, and jet black. You can attach it yourself, easily and quickly. See this visor at your dealer today. If he cannot supply you, send us your order with his name and we will ship you direct.



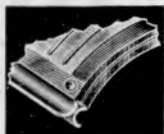
Corrugations in celluloid one inch apart to prevent all sagging, warping and buckling.



Sliding bracket arm provides adjustment for different widths of windshields.



Simplicity of adjustable brackets and universal clamps make attachment easy.



Large rain gutter drains water off to one side.

DEALERS act at once

No doubt you have already had demand for the new improved **Presto Champion Visor**. Cash in on its popularity at once. The biggest value for the money now offered. Sells itself. Many exclusive features. Write at once for catalog 14 for full particulars on Presto Champion and many other excellent items.

METAL SPECIALTIES MFG. CO.

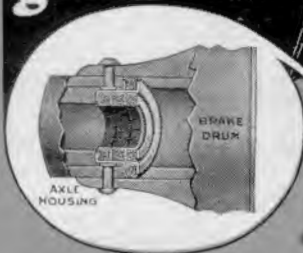
338-352 N. Kedzie Ave. Chicago
Automotive Products

Presto No. 260 Cigar Lighter



Here's a live item you can sell easily. Cadillac, Wills Sainte Claire, Reo and Vello install it at the factory, and now every car owner wants one. Presto cord reaches back seats. Safety fuse. Automatic. Instantaneous. Neat. Attractive. Retail for only \$6.

Stop that grease leak!



INLAND

Grease Retainer for Fords

GREASE LEAKS ARE COSTLY AND OFTEN DANGEROUS.

Stops Leaks Permanently

Many thousands of INLAND Grease Retainers are now in use in Ford cars and in every instance they have proven effective in overcoming this most common and annoying trouble. It is absolutely the best, most reliable and efficient device of its kind on the market—repays its slight cost over and over again in the saving of lubricant and in avoiding the danger of burning out bearings.

Easy to Install

The method of installing INLAND Grease Retainers is simple. Complete directions are printed on each box.

Price, each, for Ford Cars, 75 Cents.

Attractive counter display cartons containing 12 retainers.

INLAND PRODUCTS CO., Manufacturers
Saint Louis U. S. A.



Stop the Rattle Shiver and Shake—

Double the Life of Your Engine—Eliminate Breaks in Transmission and Power Line

TRUSKO —for Fords

TRUSKO is a yoke that supports the back end of the transmission case. Stops side sway and jumping on rough roads. Reduces vibration from engine. Does not interfere with 3 point suspension. Not only makes the engine run smoother, but also makes the whole car ride easier.

Put on in 15 minutes without drilling any holes.

Ford Stores Can Get TRUSKO from their Jobbers or Direct.

TRUSKO DIVISION

BURGESS-NORTON MFG. CO.

123 Richards Street

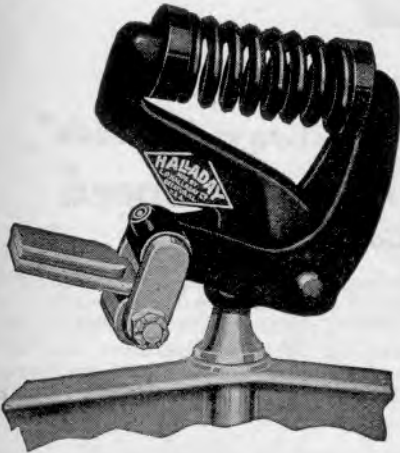
GENEVA, ILL.

At any
Dealers
\$2.00

Ford
Truck
size
\$2.50

HALLADAY

AT LAST! A Spring Cushion



That is **RIGHT**
and **Stays RIGHT**

The **ONLY** Shock Absorber for
Fords Ever Sold Under a Posi-
tive Guarantee to Retain its
Efficiency Under All Conditions

HALLADAY Spring Cushions

are absolutely guaranteed for one year from date of sale to the user against breakage from any cause, or in any manner, or any decrease in the efficiency of operation.

HALLADAY SPRING CUSHIONS

in no manner distort the regular spring by adding strains between the ends and center of the spring, nor do they in any way interfere with the standard spring construction of the Ford car.

Not an untried devise, but the ultimate result of over twelve years of development and perfection of spring cushion construction.

Wear from grit and dirt is reduced to the minimum, by thorough and convenient means of lubrication.

The lever action allows the use of highly sensitive springs with lightning action that absorb the usual road vibration and smooth out the heavy jolts as no other shock absorber ever could.

*Made in Three Weights
To Fit All Ford Models
In Ordering ALWAYS
Specify Model of Car*

All One Price **\$14**
Per Set of Four

Write Your Jobber or Us **TODAY** for Full Details

L. P. HALLADAY CO.

**DECATUR,
ILLINOIS**

"Rocky Mountain" 6 Speed

TRANSMISSIONS FOR FORD CARS AND TRUCKS



Ton Truck Model

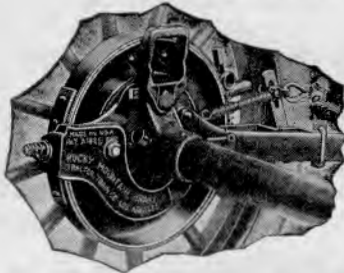
"The Transmission With Gears Always in Mesh"
85% More Power—30% More Speed
Power and Speed Combined

This transmission combines the features of both Power and Speed in one Transmission Gear case, installed at the rear end of the Drive shaft. A decided advantage over all other forms of transmissions. In direct drive the original Ford Speeds remain unchanged. The Power or underdrive ratio gives 85% more power and the Speed or Overdrive ratio will cut down the engine speed 30% or increase the road speed of car or truck. **Rocky Mountain Gears are always in mesh.** It is the latest and last word in adapting the Ford Truck to any road.

"ROCKY MOUNTAIN BRAKES"

COPYRIGHT 1921
TRACTOR TRAIN COMPANY

"The Brake With the Big Double Drum"



This is a real rear wheel contracting service Brake, operated by the regular Ford Brake Pedal (Transmission Band brake is no longer used). For the Passenger Car the large double Drum of pressed steel has 108 square inches Braking area. The Truck Brake is wider and heavier and has 135 square inches active breaking area (the Ford transmission band brake has only 23 square inches). The Ford emergency brakes are operated as usual. R. M. Brakes are powerful, quiet, smooth in action and they **always stop the Car.** Price \$25.00 either Car or Truck Models.

Purchase from your Ford dealer if possible. If he will not supply you, we will ship direct.

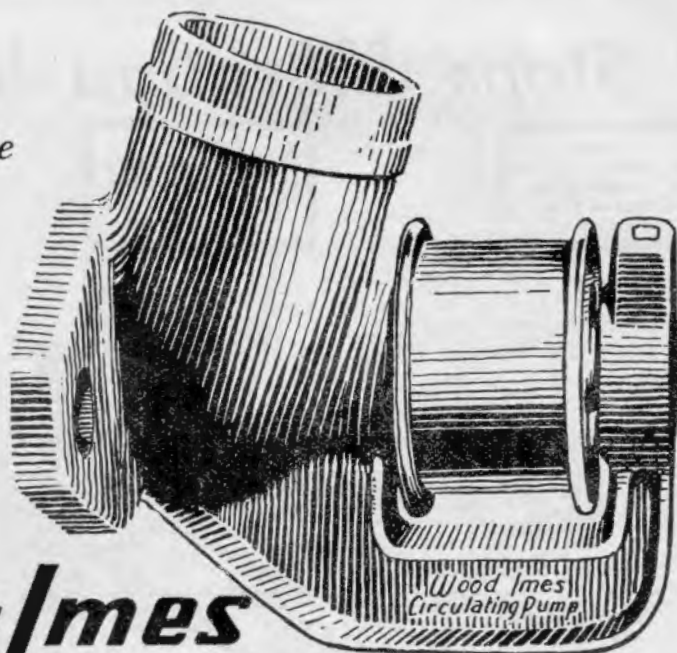
ROCKY MOUNTAIN STEEL PRODUCTS, INC.

Mfrs. of Rocky Mountain Transmission and Rocky Mountain Brakes
 SUCCESSORS TO
 TRACTOR TRAIN COMPANY

1344-46 Wall Street
 Los Angeles, California

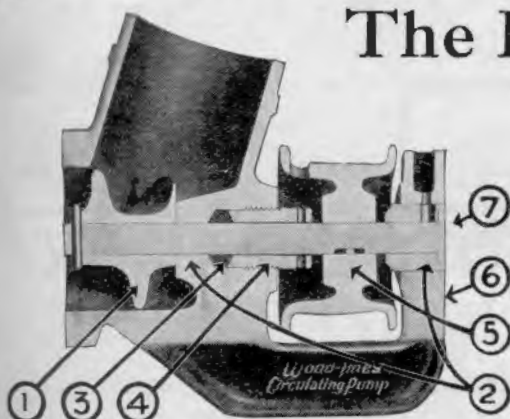
357 Van Ness Avenue
 San Francisco, California

\$5⁰⁰
complete
with Rie Nie
fan belt



Wood-Imes

The Pump that STANDS UP!



1. The THREE bladed screw impeller (same as used on large turbines) does not churn the water but assures positive water thrust. The impeller is pinned to the shaft.

2. The inner bearing is water cooled and lubricated. The graphite packing assists this lubrication. The outboard bearing of nickel babbitt metal has a direct wick-fed lubricating duct—no filling of grease cups. The pulley strain is directed straight down and distributed between TWO bearings.

3. The packing (stuffing) box contains the very best grade of asbestos packing, your insurance against leakage.

4. The packing (stuffing) gland has several thousandths clearance from the impeller shaft and therefore DOES NOT ACT AS A BEARING SURFACE. A hole is provided through the pulley so that you may adjust the packing gland with a nail or punch should it ever become necessary to do so.

5. The pulley is of the split type and so designed as to make it self-aligning with the driving pulley on the motor. A distinct feature.

6. The outboard bearing bracket is an integral part of the pump casting. This means rigidity.

7. The end washer is spun over the end of the impeller shaft and spaces the parts against end play, eliminating the wear on necessary parts as found in other circulating water pumps.

Are you like thousands in the Ford field aware of the necessity of a Circulating Pump but to date unable to obtain one that would really STAND UP?

If this is the case, then Wood-Imes solves your problem.

In the Wood-Imes Water Circulating Pump, we are offering to the Ford field a Pump that contains the same high type of engineering principle and manufacture that characterizes every one of the meritorious items in the Wood-Imes Line of garage and shop equipment.

The outstanding, long life insuring feature of the Wood-Imes Pump is the extra bearing OUTSIDE the pulley. This bearing relieves the torsion strain on the Pump shaft and the inner bearing, greatly increasing the life of the Pump and effectively preventing leakage.

This is but one of the many features of the Wood-Imes Pump. A glance at the sectional view to the left completes the story.

You have tried the rest, now know the best. Write today. Complete information on request.

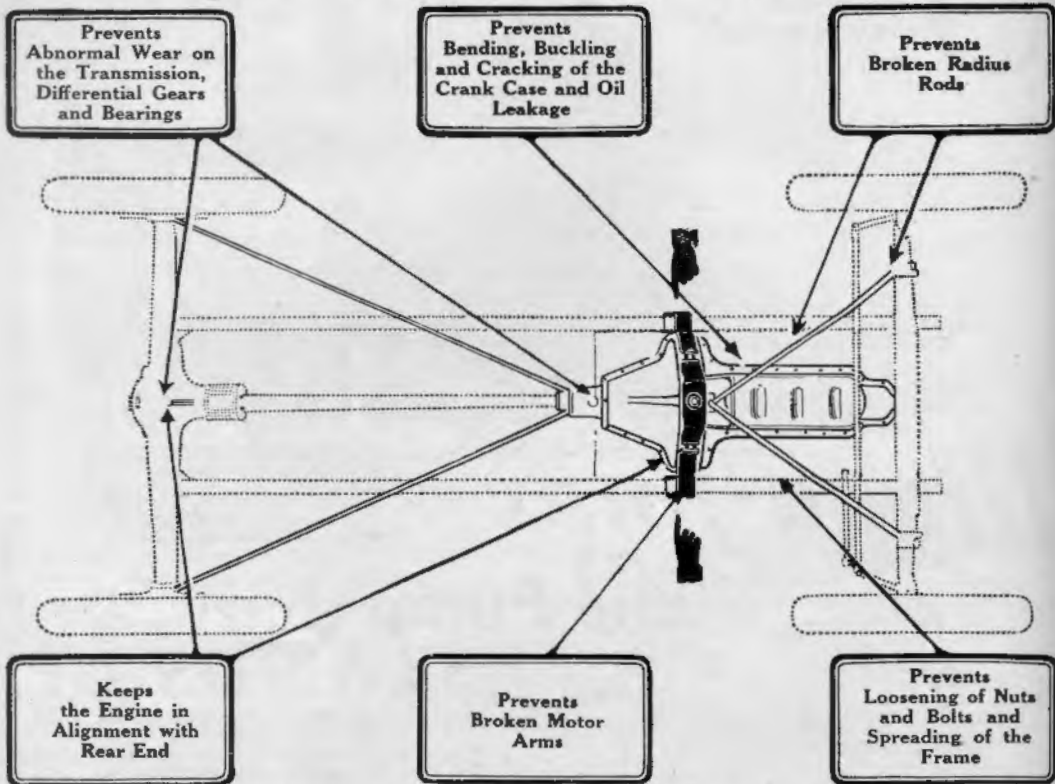
We have a most liberal proposition for live dealers. See your jobber or write us direct giving his name.

411 Johnson St., N.E.

Wood-Imes
 MANUFACTURING COMPANY

Minneapolis, Minn.

It Stops Vibration in a Ford



THE WINDSOR MOTOR SUPPORT AND STABILIZER

Insures Comfort, Pleasure and Safety

Lowers upkeep; lengthens life; keeps a new Ford new and makes an old Ford run like new.

The Windsor Stabilizer Test

Compare your Ford without the Windsor Stabilizer, with your Ford equipped with the Stabilizer and let the test convince you.

1. Run your Ford up hill, throttled way down and note greater power.
2. Jam on brakes going down hill and note absence of chatter.
3. Put in reverse and back up hill and there will be no jerking.
4. Place your hand anywhere on the frame or floorboard—there will be no vibration.

Two sizes: One size for standard Ford cars;
one size for Trucks.

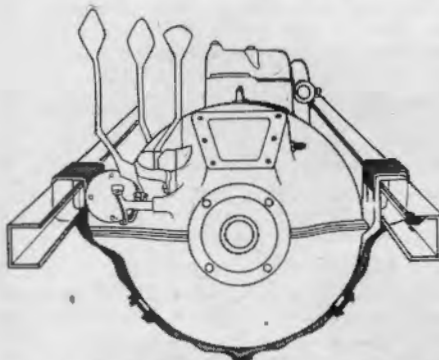
10-DAY TRIAL MONEY-BACK GUARANTEE

Dealers' and Fleet Owners' Discounts on Request.

NATIONAL WINDSOR MOTOR STABILIZER CORPORATION

730 FIFTH AVENUE

NEW YORK CITY



The Windsor Motor Stabilizer is a steel support and truss which fits over the motor arms and around the crank case of a Ford car thereby holding the motor firmly in place and pulling the frames together making the engine and chassis as one unit.



Reg. U. S. Pat. Office

Fabric Specialties for Fords



Presto Seat Covers



Side Curtains With and Without Door Rods



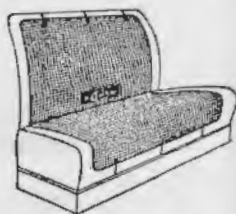
Coverall Seat Covers



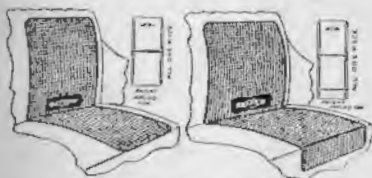
Fibre Door Panels With Pockets



Handy Tool Bag



Matting Seat Covers



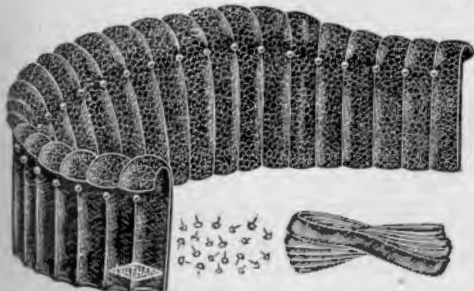
Matting Seat Pads



Re-Upholstery for Seat Cushions



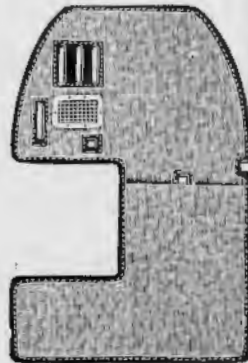
Comfy Crib



Re-Upholstery for Backs



Tire Covers



Floor Mats

Side Curtains



Topping Outfit

A few Nathan specialties. Send for our complete catalog.

Jobbers and Dealers: Write for money making discounts.

NATHAN NOVELTY MANUFACTURING CO.

Dept. F.O., 2157 Prospect Ave., NEW YORK CITY.

Western Representatives: STANDARD MOTOR PARTS CO., 1454 South Michigan Ave., Chicago, Ill.

American Velvet Action Accelerator FOR FORDS

Look for the Demonstrator on Your Dealer's Counter



No
Stock
of
Parts
to
Carry

Novel use of
Rack and Gear
Quadrant Pro-
duces Velvet
Action

Unconditional
Guarantee

Special
Arm
for
Stromberg
Carburetors

Price
\$3⁰⁰

Complete
with
Foot
Rest

This Demonstrator Board given free with initial order of 2 dozen or more. Write nearest office for discounts.

SIX STRONG SELLING POINTS

1. Quickly installed. Attaches to transmission cover. Only two special screws and three cotter pins (furnished).
2. No cables or wires to break.
3. No holes to bore.
4. Carburetor arm is adjustable and does not interfere with valve cage cover.
5. Both hand and foot control can be used independently of each other.
6. Does not connect directly from foot pedal to the carburetor, thus eliminating jerky motor on rough roads.

S. S. McCLELLAND COMPANY, INC.

1926 Broadway,
NEW YORK CITY.

1118 South Michigan Ave.,
CHICAGO, ILL.

\$3 in 30 Seconds



Niagara Recharger

For over three years Niagara Magneto Rechargers have been very profitably and advantageously used by Ford dealers and service stations in all parts of the country. Every owner of a Niagara Recharger is enthusiastic about it.

The magnetism in a Ford magneto seeps out in about ten months to a point where recharging is not only advisable but oftentimes absolutely necessary. Recharging the magneto should be a regular part of the yearly overhauling job and, once done, the owner will want it repeated with each successive overhauling.

Whenever an owner brings in his car and complains that his engine is "not running right somehow" you have a prospect for magneto recharging and a handsome profit from your Niagara Recharger, for when the owner sees the tremendous difference that the recharging effects he will be glad to pay you for the work even though he knows that it required but a very few moments of a man's time.

The great advantage of the Niagara Recharger is that it can be used without in any way disassembling the motor and will operate as efficiently as when used while the engine is being given a thorough overhauling.

The Niagara Recharger is a Tester as well as a Recharger and is so simple and absolutely free from possible disarrangement that your least skillful workman can use it with complete success.

The Niagara Recharger is definitely guaranteed against mechanical or electrical defects. The Niagara Magneto Recharger is completely portable, 12 inches wide by 11 inches high and 12 inches deep. The cabinet is of steel construction, welded and substantially reinforced with steel bands to resist rough usage. Honed slate instrument panel. 15 feet of super-service acid-proof rubber-covered cable extension cord is also provided.

*Ask your jobber to show you
the "Niagara" or write us direct*

Price \$67.50

DECKOP ELECTRIC MANUFACTURING CO.

35 GOODRICH STREET

BUFFALO, NEW YORK.

Always Quickly Ready



Willard

when Charged Bone Dry —and Always a Brand New Battery

The use of Threaded Rubber Insulation now makes it possible to ship Willard Batteries, charged, yet Bone Dry. As no moisture is present, no chemical or electrical action can take place in the Charged Bone Dry Willard. Willard Batteries thus shipped remain charged without deterioration for an indefinite period.

To put one of these new Willards in service it is necessary only to fill the cells with standard battery solution.

Car Builders are finding in this battery a series of advantages that are enjoyed in turn by their distributors and the car-buying public. Without depreciation or charging expense, they can carry sufficient battery stock at their plants to meet peak sales requirements. They can have a battery Bone Dry and charged for every finished car the moment the car leaves the assembly.

Car Dealers profit likewise. Batteries do not have to be removed from the car or sent to the local Service Station for a freshening charge. Less time is consumed in getting cars ready for delivery. If cars are stored there are no battery maintenance charges to be paid.

Car Buyers, too, appreciate the fact that they get a brand new battery.

Battery Men, also, see in Willard Bone Dry, Charged Batteries, lower operation costs of their Service Stations, plus the ability to have always on hand a battery of the type wanted ready for use.

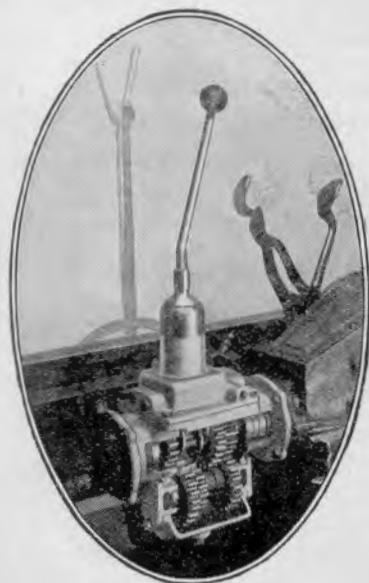
*Only Willard can build and ship this type of battery.
Complete details will be furnished on request.*

WILLARD STORAGE BATTERY COMPANY, CLEVELAND, OHIO
In Canada, Willard Storage Battery Company of Canada, Limited, Toronto

Batteries

Double Your Truck Field and Take An Extra Profit

When You Sell Warford Transmissions You Double
Ford Truck Capacity—And Increase
Your Own Profit



The Ford dealer who sells Warford Auxiliary Transmissions really sells Two-Ton Ford Trucks!

The Warford, with six forward and three reverse speeds, acts *with* the Ford transmission, giving bulldog strength in rough going and speed-wagon pace on good roads.

The Warford equipped Ford has double hauling capacity at a small investment.

There is no better transmission made than the Warford. It is of the approved sliding gear selective type, built expressly for Ford Cars and Trucks.

You can enter the two-ton truck field by selling Warford Transmissions. They are moderately priced, yet give you a good profit.

Ask your nearest Distributor for complete information on the Warford proposition:

Auto Accessory Association
Baltimore, Md.
Continental Body Co., Memphis, Tenn.
Dine-DeWees Co. - Canton, Ohio
Foster-Warford Co. - Auburn, N. Y.
Hall-Warford Co. - Charlotte, N. C.
Houdaille-Polk Co. - Dallas, Texas
E. W. Jay - Vancouver, B. C.
McGee-White Corporation
Minneapolis, Minn.

Motive Parts Corporation
New York City
Motor Specialties Co., Denver, Colo.
Price Auto Service Co., Wichita, Kan.
Sieg Company - Davenport, Iowa
Sieg-Warford Co. - Chicago, Ill.
Transmission Sales Co.
Stockbridge, Mich.
Warford-Eastern Co., Philadelphia, Pa.
Warford-Pacific Co., San Francisco, Cal.

Warford-Sales Co. - Atlanta, Ga.
Warford-Southern Co., Louisville, Ky.
Warford-Western Co., Kansas City, Mo.
Warford Co. of Los Angeles
Los Angeles, Cal.
Woodward Sales Co. - Portland, Ore.
Warford Equipment Co., Seattle, Wash.
George Dietrich - Spokane, Wash.
B. K. Rowand - Phoenix, Ariz.

Warford

AUXILIARY TRANSMISSION

The Warford Corporation • 44 Whitehall St., New York

They increase the riding comfort of any car

No matter what the make or the price of your car may be, BUFFALO Wheels and "balloon" tires will make it a BETTER car—a car that rides easier, drives easier and operates with greater economy.

BUFFALO Wheels, either Wire or Disc, are available in standard sizes as well as in the small diameter sizes—but it is the smaller diameter type that has been designed especially to achieve the original purpose of the "ballooning" of tires.

The BUFFALO mark on a wheel stands for perfection in design, sturdiness in construction and absolute dependability in service.

And the same specialized engineering ability, manufacturing skill and many outstanding mechanical features of Rudge-Whitworth, Houk and House Wire Wheels and BUFFALO Disc Wheels that have led to their adoption as standard equipment in the world's finest cars are embodied in wheels bearing the BUFFALO symbol of superiority.

WIRE WHEEL CORPORATION of AMERICA BUFFALO, N. Y.

Direct Factory Branches:

New York: 835 11th Ave., at 57th St.
San Francisco: 1690 Pine Street

Chicago: 2900 S. Michigan Ave.
Detroit: 433 Leland Street

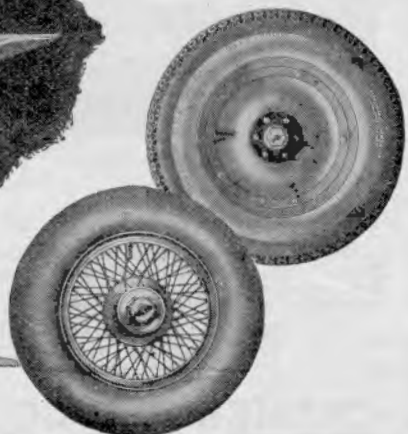
Los Angeles: 1705 S. Hope Street

Service Stations in Leading Cities Throughout the World

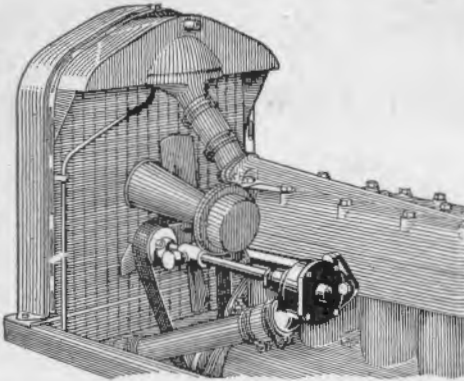
BUFFALO small diameter Wheels also obtainable through the dealers and distributors of the leading tire companies.



for "balloon" tires



It Saves the Motor



**Car Owners Demand
The
MILWAUKEE
CIRCULATING WATER PUMP**

*The Recognized
Standard Water
Circulating Pump*

for Ford Cars and Trucks and Overland Fours

Buy the Standard "Milwaukee" and be sure that you're getting the best.

for Ford or Overland Complete with extra quality belt.

\$8.00
In Far West \$8.50

—and Here's Our Latest—

—a Medium Priced Pump for Fords

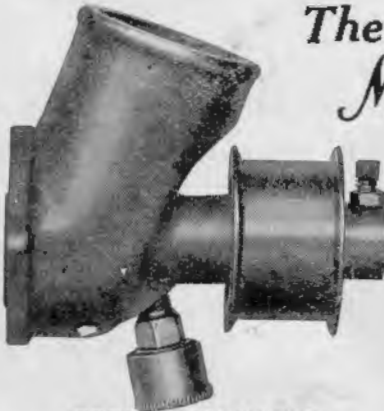
Milwaukee
"550"

Quality consistent with price. Compare it with any other make at higher prices.

It's Blue
\$5.50



The Milwaukee Junior **Outlet Type Pump**



Designed for Ford owners who prefer this type of pump. With such pumps the radiator must be kept full of water at all times. Made entirely of bronze.

Price \$4.00. In Far West \$4.25

**Every Ford Needs this
"MILWAUKEE"
Flanged Pulley
for the Crankshaft**



Keeps the belt on the pulleys and the oil off the belt.

Price \$1.00

FREE TO DEALERS

Ask your jobber to have us send you our Free Circulars imprinted with your name for circularizing your trade. We'll ship them direct to you with his compliments.

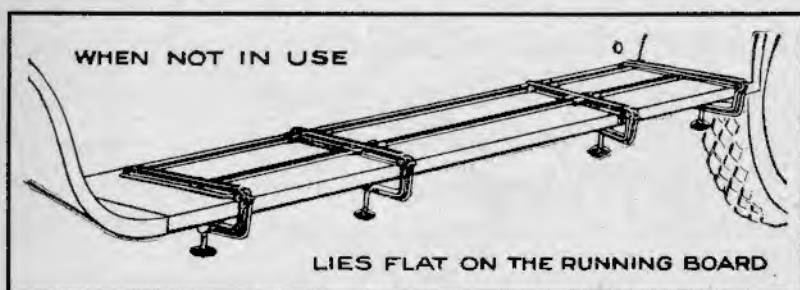
Our Fordson Tractor Pump has Proven a Winner

CRAMER MFG. CO., 387-9 10th St., Milwaukee, Wis.

MARQUETTE

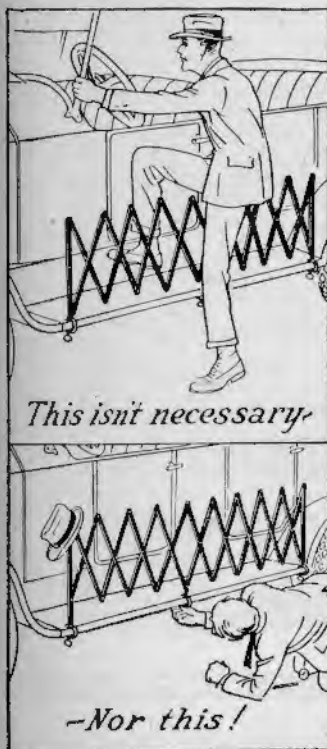
Registered U. S. Patent Office

Luggage Carrier



Folds *Down Flat!*

When Not in Use



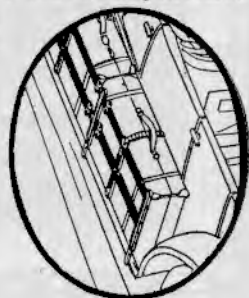
THERE'S no need of climbing over it—no fussing with the clamps to put it out of the way! The Marquette folds right down flat on the running-board when not in use. It thus provides a better footing.

At the moment it is wanted simply lift up to vertical position. Again there's nothing to stick—no bother, no delay.

Protects the car's finish. Straps with steel holders, instantly attached, anchor the luggage against the carrier, prevent bouncing and scratching the car.

Fits any running-board. Two sizes, adjustable in length, 4 and 5 feet long when extended. Durable black enamel finish.

Demonstrate these big features to your customers. The sales are waiting for you!



Marquette Mfg. Co., St. Paul, Minn.

Dear Jim:

You know the Ford gravity gas feed is a fine thing on the level or when the tank is full. But with a low tank and a stiff grade many a good Ford has had to back up a hill to get there at all.

Mac's Gaselevator brings the gas right up over the carburetor where every drop of it will feed on any grade.

And more than that—when the main tank runs dry, the Gaselevator acts as an Emergency Reserve good for seven or eight miles more by simply closing this stop-cock

This shows
one
installed on
a Ford.
Takes about
half an hour.



The retail price is \$7⁵⁰ and that includes every pipe, nut & fitting needed to install it. The company has a proposition the same to all dealers and fair to everybody. I'd like to tell you more about it.

My address is

Mac

MOUNTAIN ACCESSORY COMPANY—
Emporium, Penna., but I am well known here and plain "Mac" will reach me all right.

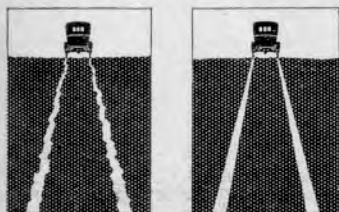
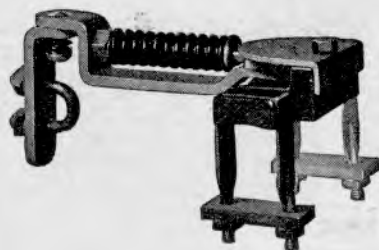
Special
\$3⁷⁵

for a
**BALCRANK
STABILIZER**

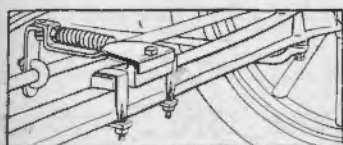
Regular Price \$5.00

Driving Comfort

The BALCRANK Stabilizer checks the shocks and vibrations of the road at their source, steadying the wheels and making light cars as easy to hold to the road as heavier models. Cars equipped with them travel in a straight line instead of leaving a wavy, jerky trail. A steady wheel gives the driver com-



plete control of the car and makes driving safe as well as more pleasant. BALCRANK Stabilizers make light cars easier for men and safer for women to drive. The front of the stabilizer is securely clamped to the front axle and the rear to the tie rod—a simple operation that can be completed in a few minutes. Furnished ready to attach.



To introduce BALCRANK Stabilizers in all parts of the country, and let every owner of a Chevrolet, Ford, Overland or Star know how they really help a small car, we are going to sell 1500 at \$3.75.

As it is impossible to discriminate, the entire lot will be sold to the first 1500 who send in their order.

Read the description given at the left and send in your order today.

Will be shipped postpaid immediately upon receipt of \$3.75 or C. O. D. if so specified in the order.

The Cincinnati Ball Crank Co.
CINCINNATI, OHIO

Makers of lubricating outfits, drag links, etc.

SMILE AT



TRADE MARK

Look for this advertisement
in *THE POST*
April 5th

A Remarkable New Tire Pump

Here's a tire pump that does what a pump ought to do! The Arvin Tire Pump relieves those inevitable and dreaded moments when a flat tire has needlessly spoiled your time, comfort and temper—all for the lack of a pump that would do what it should!

Arvin offers a new standard in pump design and efficiency. Bigger than you'll probably expect—and more powerful! The king of pumps—a veritable air station! Makes a mere accident of tire inflation and quickly sends you on your way—rejoicing!

You can't prevent these emergencies—but you can be ready for them with this big, rock Arvin. When you need air, you need it on the spot—and you want it "quick and easy." That's Arvin!

Arvin agrees to serve you with new ease, comfort and dispatch for 5 long years, or less than 7 weeks a month. Always ready when you need it and where you need it! Take an Arvin away from your dealer today. Be protected!

INDIANAPOLIS PUMP & TUBE CO.

Makers of the "V" Valve
INDIANAPOLIS, INDIANA

ARVIN Tire Pump



Here Is a Pump!

- 1 Big, extra-large handle with extra padding grip.
 - 2 Barrel "high edge," which allows independent check valve at all positions.
 - 3 Heavy-duty hose made of rubber at all points.
 - 4 Built-in grip makes it easy to hold in position.
- ARVIN is a nationally guaranteed product. At All Dealers.

the Arvin Tire Pump is
unconditionally guaranteed
for five years of service!



substantial footgrip
assures steadiness
while pumping ~

FLAT TIRES!



barrel "thigh-high"
—a back-saving
improvement

big handle—
easy to grip

thirty-inch hose reaches
tire valve at any position

PUMP grief is a thing of the past when Arvin gets on the job. Whatta pump! Flat tires regain their running form as if by magic! Little effort—quick results—always ready and unfailing. Get your Arvin now!



Retail price - - - \$4.00

West of Denver \$4.50 In Canada \$6.00

ARVIN Tire Pump



ARVIN ACCELERATOR

for Ford Cars

Assures smooth, steady control over roughest roads. The Arvin does not interfere with removal of foot-boards or floor covering. Equipped with pedestal foot rest. Packed completely assembled in carton, ready to install. Installation unusually simple. Price, complete, only - **\$1.75**

ARVIN COWL VENTILATOR

ARVIN HEATER

Also

- Indianapolis No. 11 Tire Pump
- Indianapolis No. 12 Tire Pump
- Indianapolis No. 14 Tire Pump
- Indianapolis No. 20 Tire Pump

INDIANAPOLIS PUMP & TUBE CO.

Factory and office at Greenwood

Thoroughness



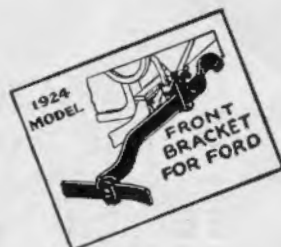
Experience + thoroughness = perfection.
That's the secret of Gemco Bumper quality.

That the Gemco Manufacturing Co. is the world's oldest bumper manufacturer, makes them first in **experience**. **Thoroughness** in manufacture is evidenced by the no less than fourteen distinct and different treatments which underlie and are responsible for the permanently beautiful finish on Gemco Bumpers.

Gemco BUMPERS

*You Can Build Business
and Hold Business with
GEMCO BUMPERS*

Ask your jobber or write us today for dealer proposition and catalog No. 31 showing designs to harmonize with all cars and stay-tight attachments for all models.

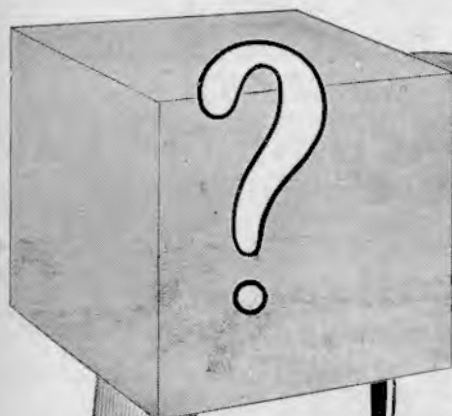


Gemco Mfg. Co.

750 So. Pierce Street,
Milwaukee, Wis.



Would You Buy Piston Rings Without a Name



Of course you wouldn't,

—and yet what difference does a name make unless it is a guarantee of everything you require of piston rings.

For there is as much difference in piston rings as there is difference in the experience, knowledge and manufacturing facilities of piston ring makers.

The 125,000,000 **QUALITY** piston rings that have been put to work during the past 12 years, have, through continued performance, made **QUALITY** Rings most popular with manufacturers, jobbers and dealers.

Any dealer selling **QUALITY** Piston Rings can give his customers ALL the GOOD that can be put into any piston ring at the common sense list price of 25 cents each.



Muskegon, Michigan



The tradename **QUALITY** which is stamped in each ring, was selected as the only word suitable to fully express the actual values in each ring that bears this name.



THE IMPROVED K. R. WILSON

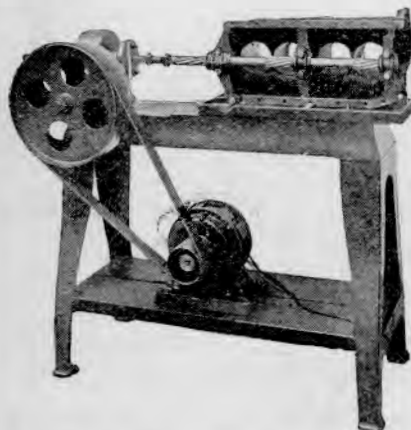
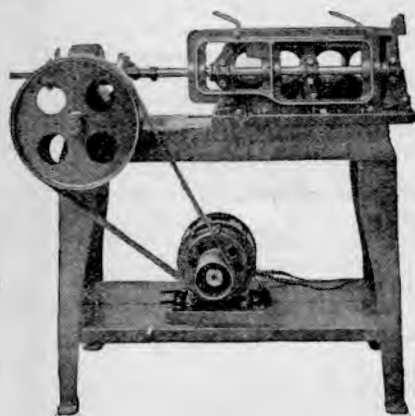
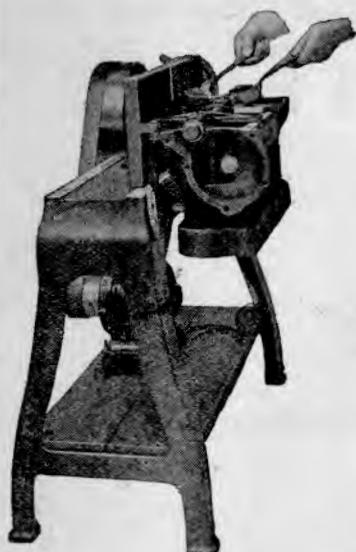
A Shop in Itself

**It Applies Factory Methods
to Repair Shop Practice
1400 IN ACTUAL USE
SINCE 1921**

**ONE MACHINE DOES ALL
OPERATIONS—**

**Rebabbitting Main Bearings
Re-Boring Rough Main Bearings
Align-Reaming Main Bearings
Running-in—"All That's Necessary"**

**A Two-Position Motor Bench
Cylinder Reboring
(Any Oversize)**



The K. R. W. Combination Machine is positively the most wonderful outfit ever produced for RE-MANUFACTURING Ford motors. No other equipment combination can compete with it in the quality of work, nor in the labor cost of doing it, because the Motor block once mounted on this machine is never lifted or carried, fastened or unfastened during all subsequent operations. This wonderful saving of human energy turns losses into dollars, and makes real profits on the savings of labor over the extra cost of doing the work by other methods.

K. R. W. MACHINE APPLIES FACTORY PROCESS

and bores out the Rebabbitted main bearings, and rough main bearing caps simultaneously. The Ford Motor company do it and say it can't be done accurately any other way. This operation is entirely power operated; the machine does the work more accurately than by any other methods known to the trade. The main bearings are then align-reamed to a perfect fit and finish, the same method used by Lincoln, Pierce, Packard and other High Grade Cars.

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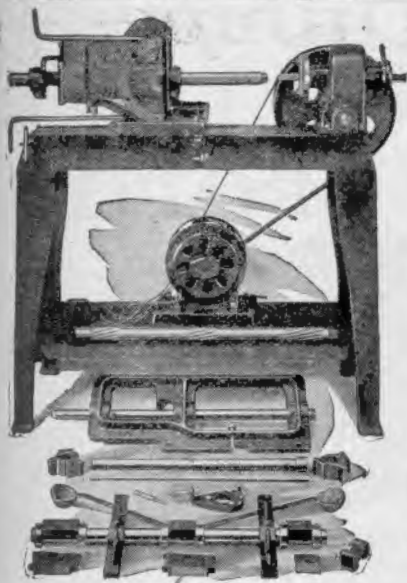
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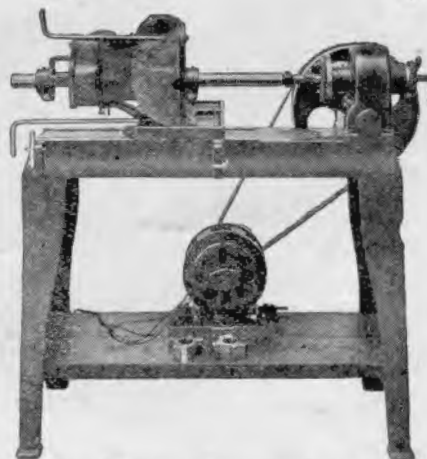
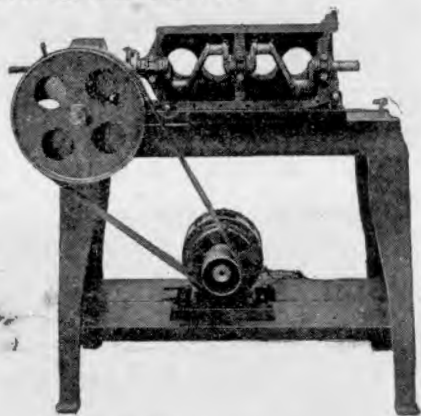


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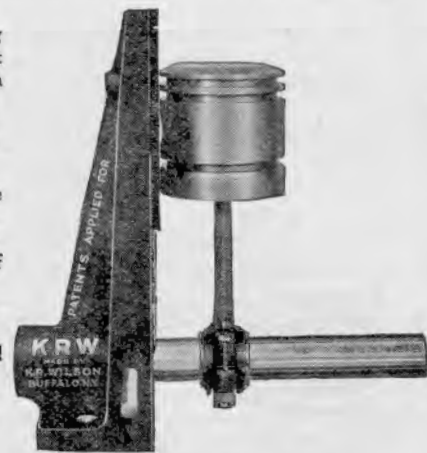
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In Our Tenth Anniversary Issue

WE have endeavored in this our Tenth Anniversary Issue to give to our readers a generous selection of articles which should be of wide interest to the entire Ford field. We believe that you will like the article discussing and illustrating Ford Power Motor Boats.

All of us are interested in the adaptation of Ford power generally, and for this reason we present the article Flying A Ford for Fun, which shows what the powerful little Ford engine can do when adapted to aeroplane uses.

You have shown such keen interest in our articles on the Building of Speedsters that we have gone farther into this subject in the new series known as Power and Speed, which begins with this number. Then there are many other articles that you will want to read for entertainment or instruction.

Our Special Anniversary Section starts on page 81, and in it we have an opportunity to tell you something more about ourselves and the place where FORD OWNER AND DEALER is published, as well as giving you a review of the development of the Ford car during the past ten years. Of course you are interested in the results of the Letter-writing contest, and we are pleased to name the winners in this issue.

The "Industrial Uses" section is again devoted to parks, golf courses, and grounds with much more of interest.

We hope you will enjoy this Tenth Anniversary Issue, and that we, the publishers, and you, the readers will maintain this friendship throughout many more issues to come.

High Efficiency Carburetors

Improved Carburetor and Hot-Spot Manifolds for Better Vaporization of Present Motor Fuels

No. 4.

The Holley Carburetor *Its Care and Adjustment*

THERE are more than 5,000,000 Fords in this country. Assuming that the average Ford is only driven 5,000 miles a year (which is probably low, considering the number of Fords in commercial use) we have a total of 25,000,000,000 miles per year. At 20 miles per gallon, the consumption would be 1,250,000,000 gallons.

At 25 cents per gallon, the total cost is \$312,500,000. While a saving of only 10 per cent would mean saving \$31,250,000 to Ford car owners—which would buy another 100,000 Ford cars!

Millions of gallons of gasoline are being wasted, and millions of Ford engines are running in a choked and inefficient manner because the average driver of a Ford car does not understand the carburetor adjustments as he should. From our own observations of Ford cars passed on the road, we feel certain that more than half, perhaps more than 8 out of 10 are running with the carburetor set for too rich a mixture.

Now too rich a mixture not only wastes gasoline, but also cuts down the power of the engine, causes it to overheat, deposits carbon in the cylinders, and contaminates the oil, thus causing more rapid wear of all bearings and moving parts. Just as overheating means more than wasted food—it means less human efficiency and often sickness.

The purpose of the carburetor is to vaporize the fuel.

The carburetor must also measure and mix the air with the fuel in the right proportions. The proper proportions of air to fuel are approximately in the ratios of from 14-to-one to 17-to-one. This is necessary as fuel will not give a vigorous explosion, unless the vapor is mixed with the oxygen in the air in right proportions to make an explosive mixture for all engine speeds.

Owing to the changes in fuel which have occurred in the last few years, it has been necessary to redesign the carburetors to obtain better re-

sults from present available fuel (which contains more than 50 per cent of kerosene). About the end of 1920, (or was it at the beginning of 1921?) the Ford Holley N. H. carburetor began to be used as factory equipment on Ford cars. As these carburetors were specially designed for present low-grade fuels, they have given much better results than the earlier carburetors.

As there is apparently nothing to wear out, car owners are often reluctant to install new carburetors. But if the Ford is a 1920 or earlier model, we certainly advise the installation of a more modern carburetor. Even if but little wear has occurred, yet the new carburetors are of improved design and can soon save enough fuel to pay for their installation, not to mention the improved engine performance secured through their use.

Carburetor Parts and Purpose

FLOAT CHAMBER OR BOWL: To keep a supply of gasoline at the proper level to feed the spray nozzle. Has the following important parts.

(a) Float, which rises and falls with the gasoline level. This float operates the—

(b) Inlet needle valve, which allows gasoline to enter as the float goes down. When the float rises, the needle shuts off the fuel supply when it has reached its proper level of 1-16 to $\frac{1}{8}$ inch below the top of the spray nozzle.

SPRAY NOZZLE: The gasoline passes from the float chamber to the spray nozzle, where it is drawn out in the form of spray by suction from the engine. The hole in the spray nozzle is drilled with a No. 52 drill. This hole is 1-16 inch long. The lower 1-32 inch is straight, while the upper 1-32 inch is tapered on a 30-degree angle.

NEEDLE VALVE: Is a hand adjustment to regulate the quantity of gasoline passing through the spray nozzle. This is to give proper mixture of gasoline and air, in order that the engine may develop its greatest power. The needle is cut on a 30-degree angle to conform to the angle at

which the nozzle seat is cut. Points are made of Monel metal, which contains about seventy per cent of nickel.

MIXING CHAMBER: Surrounds the spray nozzle where the air and fuel are mixed together in a moving column of air. The perfume atomizer, as formerly found on ladies' dressing tables, was a good illustration of this principle.

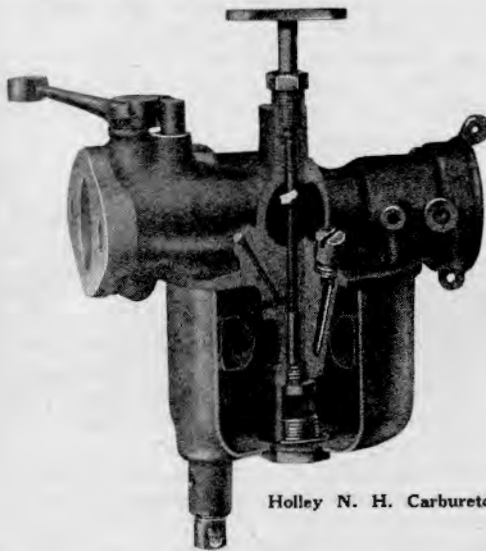


Holley Carburetor

the better vaporization of the fuel.

CHOKE VALVE: On the primary air inlet, assists in priming the engine for easier starting. The normal position for this valve is wide open, being held in this position by a coil spring inside the hub of the lever, with the lower arm of the lever against the stop pin on the mixing chamber. The driver closes this valve while the engine is being cranked. This makes a strong suction on the spray nozzle, and draws through the necessary fuel for easier starting.

STRANGLING TUBE: Is that part where the air passage narrows around the spray nozzle,



Holley N. H. Carburetor

increasing the velocity of the air and the suction on the spray nozzle.

LOW SPEED TUBE: Is inside of the strangling tube, and is used to draw a rich mixture of gas into the cylinders when starting the car and to obtain a richer mixture for slow idling.

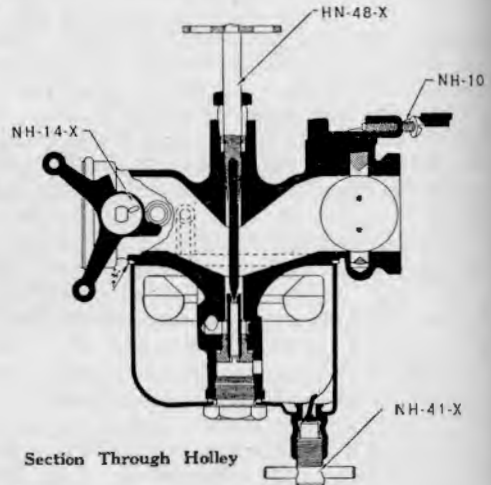
OVERFLOW HOLE: At the bottom of the mixing chamber, lets out the surplus gasoline

after priming, that due to leakage, or any water which may chance to get into the mixing chamber.

THROTTLE VALVE: The butterfly or throttle valve is used to control the quantity of mixture going to the engine. As the throttle is opened, more mixture is admitted to the cylinders, giving stronger explosions and more power. The idling adjustment screw, or throttle stop screw, is a small screw which holds the throttle partly open. It prevents the throttle from closing completely and stalling the engine.

Parts of NH Carburetor

Part No.	Name	Price Each
NH-2-X	Mixer Chamber	\$ 2.50
NH-6-X	Throttle Lever and Rod Assembly .....	.25
NH-10	Throttle Stop Screw .....	.02



Section Through Holley

NH-11	Throttle Stop Clamp Screw .....	.02
NH-12	Throttle Plate .....	.10
NH-13	Throttle Plate Pin .....	.01
NH-14-X	Intake Throttle Lever and Rod Assembly .....	.15
NH-18	Intake Throttle Lever Spring .....	.02
NH-21	Float Valve Seat .....	.10
NH-22	Float Valve Seat Gasket .....	.01
NH-23-X	Float Valve Assembly .....	.20
NH-26-X	Float and Lever Assembly .....	.40
NH-33	Float Lever Pin .....	.01
NH-34	Spray Nozzle .....	.25
NH-37	Float Chamber Gasket .....	.03
NH-38	Mixer Chamber Gasket .....	.03
NH-41-X	Drain Valve Plug and Handle Assembly .....	.10
NH-44	Float Chamber Screw .....	.10
NH-45	Gasoline Inlet Elbow .....	.10
NH-46	Gasoline Inlet Elbow Pack Nut .....	.05
NH-47	Adjusting Needle Clamp Nut .....	.05
NH-48-X	Adjusting Needle Assembly .....	.20
NH-55-X	Float Chamber Assembly .....	.50
NH-56	Spray Nozzle Gasket .....	.02
NH-59	Float Lever Bracket .....	.08
NH-60	Float Lever Bracket Rivet .....	.01

Preparing for Adjusting

See that the engine compression is good.

Make sure that timing is correct and spark is strong.

Make sure that there are no air leaks around intake manifold.

See that a full, clear stream of gasoline flows from the fuel tank to the carburetor.

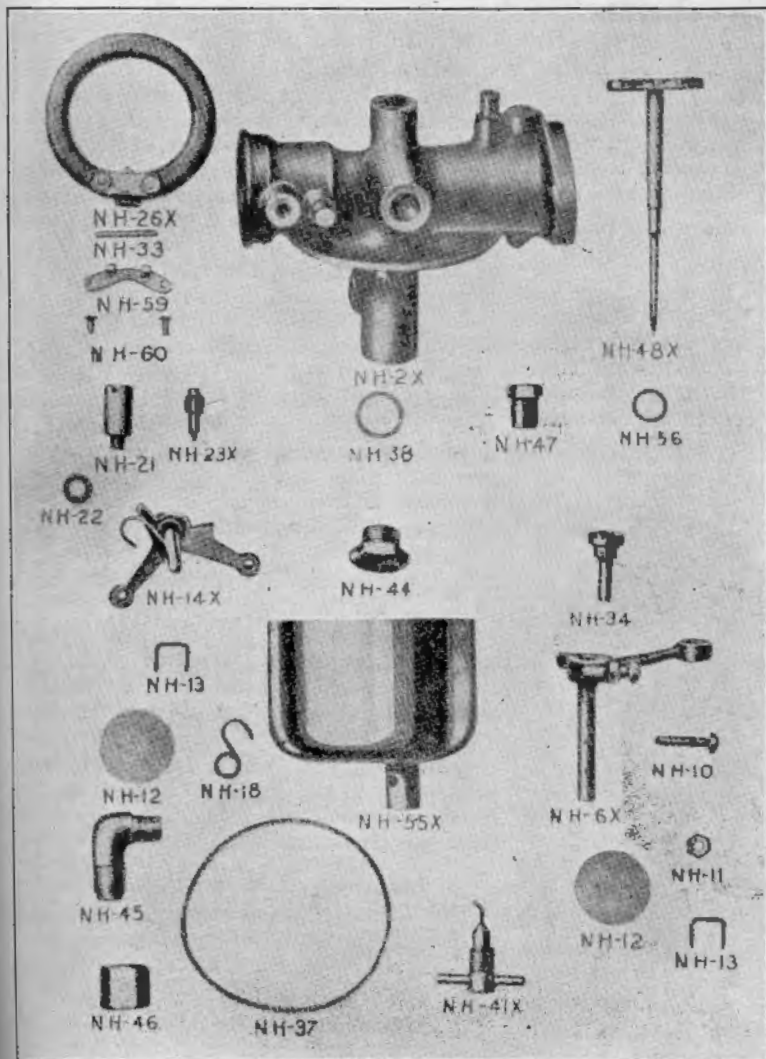
Allow the engine to warm up.

Once properly set, the Holley does not get out of adjustment very easily, yet vibration and wear may alter the adjustment. Compensation is secured automatically, without the use of moving parts, by the distinctive arrangement of the fuel passages with regard to the air passages. The needle valve in the fuel orifice is the only adjustment. And the effect of a change in its setting is manifest over the entire range of engine operation.

The quality of gasoline has been declining steadily for several years, making it increasingly difficult to vaporize. For this reason it is advisable that the carburetor needle setting should be made when the engine is thoroughly warmed up.

To start when the engine is warm, the throttle should be open very little beyond the idling position. The engine will then draw a slightly over-rich priming charge, with usually an immediate start. If it should not start immediately, however, close the strangling shutter (NH-14-X) while the engine is being turned over once or twice, and then release. For power and economical running, the strangling shutter should always be in the wide-open position after the engine has warmed up.

To start when the engine is cold (as in winter weather), open the throttle but very little beyond the idling position. Then close the strangling shutter and keep it closed while the engine is being turned over once or twice. After the engine begins to fire, gradually open the strangling shutter; being careful not to open it too soon as in doing so the flow of fuel is decreased and the engine will stop. While the engine is warming up, it will be necessary to keep the strangling shutter partly closed. But after the engine has warmed up, be sure that the strangling shutter is wide open.



Parts of N. H. Carburetor

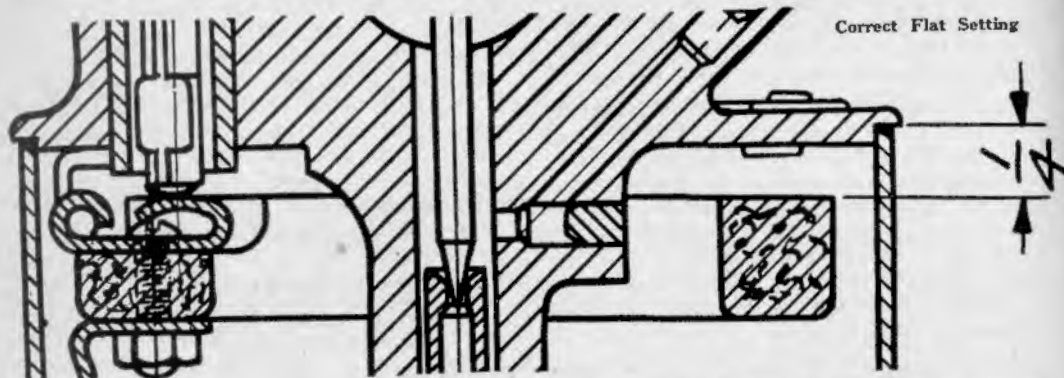
Making the Adjustment

The needle valve (NH-48-X), located on the top and center of the carburetor is the only adjustment. The needle valve usually requires from $\frac{7}{8}$ to $1\frac{1}{8}$ turns from the closed position for average running. However, this may vary somewhat for different engines, and according to the wear of the needle valve and its seat, so in preparing to start, the needle valve should be first turned clock-wise until it can be felt to come into light contact with its seat. The needle valve should then be turned open, in a count-one and one-quarter turns. This position will

give a supply of gasoline sufficient for starting and a little in excess of that required for good operation.

Now crank the engine and, after it has started, allow it to run until it has become thoroughly warmed up. Then make the needle setting. A

hand throttle or accelerator suddenly while the engine is idling. If the engine backfires or pops through the carburetor, increase the gasoline supply very slightly. Repeat this operation, until the engine does not pop or backfire. Study carefully the effect of the gasoline adjustment, as



proper needle setting is one that will give the least fuel, consistent with proper acceleration without missing or back-firing.

Never turn the needle valve down hard against its seat, as this will cut and score both needle valve and seat, and make it impossible to obtain a really good adjustment until the damaged parts are replaced.

To secure a proper setting of the needle (NH-48-X) proceed as follows: With the throttle control lever slightly open, and the spark lever set a little below center, turn the needle clockwise to cut down the gasoline supply, until the engine begins to slow down, miss, or backfire. Then gradually increase the gasoline supply by turning the adjusting needle very slowly counter-

thus better engine performance can be secured.

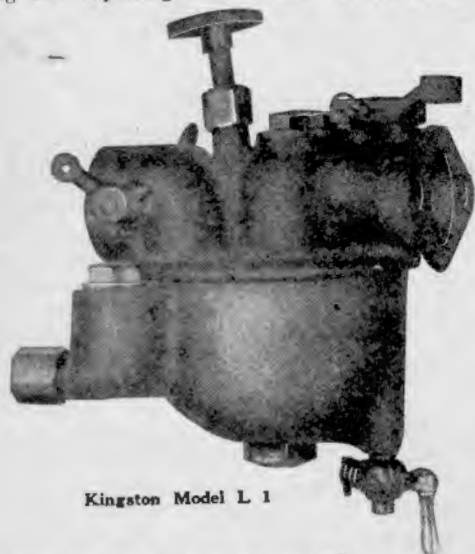
Making idling adjustments. If after the final adjustment is secured, the engine should stop when the spark and throttle are fully retarded; or if the engine should run too fast when the hand throttle is all the way up on the quadrant, an idling adjustment is necessary, as follows: Place hand throttle at top of quadrant. If engine runs too fast, the adjusting screw (NH-10) should be unscrewed to allow the throttle to close more. If the engine runs too slowly or stops, this screw should be turned in, thus keeping the butterfly valve from completely closing.

Occasionally drain the gasoline out of the carburetor by means of the drain valve (NH-41-X). It is put there for that purpose and, if used occasionally, will keep the carburetor free from water and dirt, thereby reducing the possibility of trouble.

Lean mixture. Shown by popping back through carburetor or by weak power. (If exhaust manifold is removed, there will be an almost colorless, blue flame.)

Rich mixture. Indicated by a strong odor of gasoline at the exhaust, by black smoke out of the exhaust pipe, by choked and jerky running engine, and by overheating. (The exhaust will be a reddish, smoky flame.)

Correct mixture. Will be indicated by proper acceleration of the engine at all speeds, and all throttle positions. (The flame from the exhaust ports will be a clear blue.)



Kingston Model L 1

Indications of Wrong Adjustment

The following points indicate an incorrect setting of the needle valve adjustment:
LEAN MIXTURE—

1. Engine hard to start.
2. Engine fires back through carburetor, when throttle is opened quickly.
3. Engine knocks when throttle is quickly

clockwise, until the engine picks up and runs regularly without missing, with the spark lever about half way down on the quadrant.

To determine the final adjustment, open the

opened—this knock being somewhat similar to a carbon or spark knock.

4. Engine will not idle or run evenly.

To correct this condition, turn the adjusting rod counter clockwise, a little at a time. This gives engine more fuel, and it should pick up in speed and run evenly.

RICH MIXTURE—

1. Spark plugs foul quickly.
2. Exhaust gases causes eyes to smart.
3. Black smoke from muffler.
4. Engine operation uneven, choked and sluggish.
5. Difficult for engine to pick up speed.
6. Gasoline mileage low.
7. Muffler explosions.
8. Carbon deposits on pistons and in cylinder head.

To correct this condition, turn the carburetor adjusting rod in a clockwise direction, thus giving the engine less fuel.

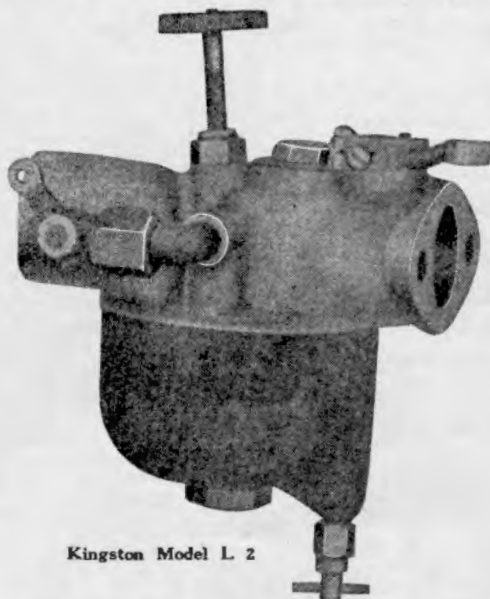
Performance When Correct Adjustment

1. Close throttle, with the spark between half advance and the fully retarded position. The engine should run evenly.
2. Car should run smoothly at from 6 to 7 miles per hour with the throttle lever at the closed position.
3. Drive car a quarter to a half mile at 12 to 13 miles per hour. The engine should run evenly.

5. At all other speeds, the engine should run smoothly with good acceleration.

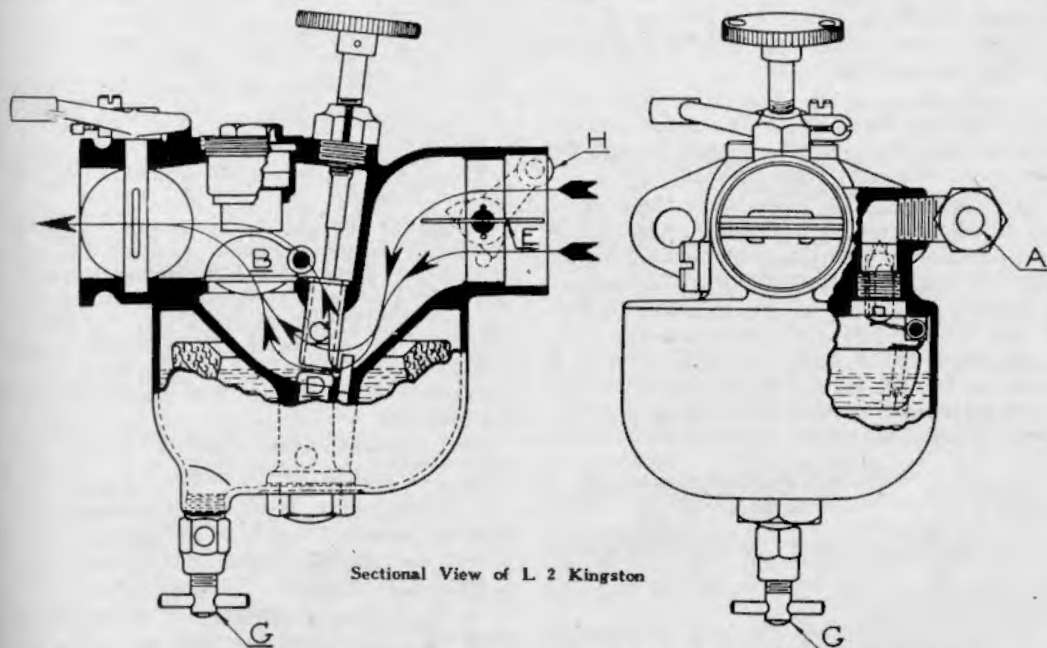
Setting Fuel Level

The fuel level is correctly set when the carburetor comes from the factory. However, if it should be necessary at any time to check up on



Kingston Model L 2

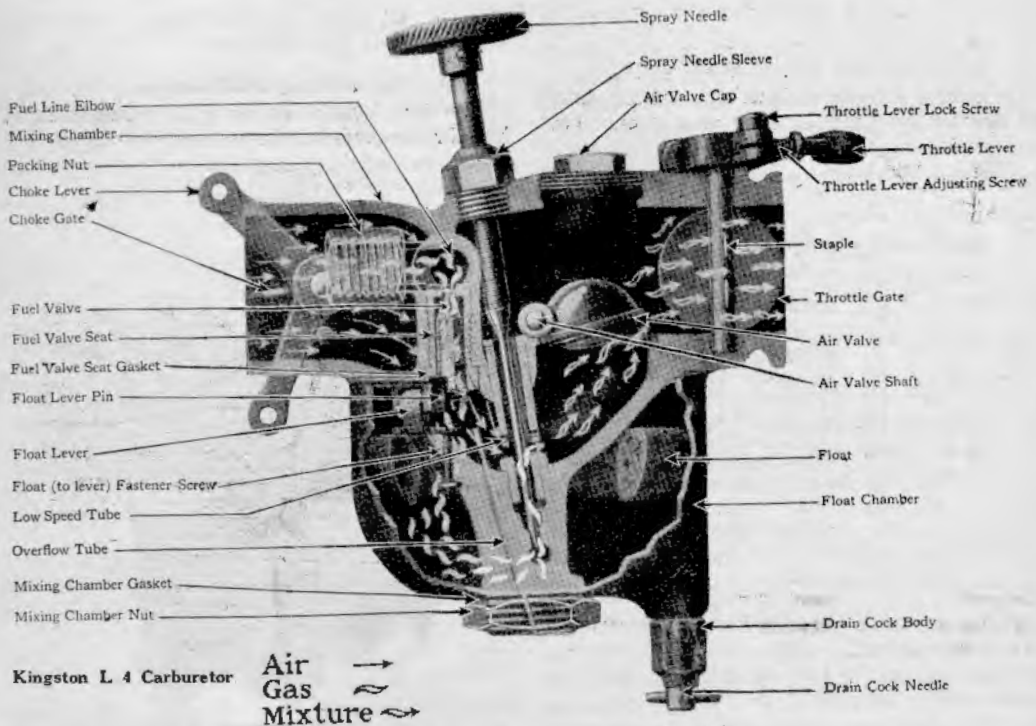
the fuel level, the sketch shows that the distance from the machined edge of the flange of the mixing chamber to the top of the float should



Sectional View of L 2 Kingston

4. With car running 7 to 8 miles per hour, quickly open the throttle wide. The car should accelerate smoothly.

be just 1/4 inch. This 1/4 inch is the distance to the top of the float, and not the distance to the surface of the fuel. When the carburetor is re-



Kingston L. 4 Carburetor

Air →
Gas ~~~~
Mixture ⇄

moved from the engine, this distance is easily checked by turning the carburetor upside down.

To correct the fuel level, the float lever should be bent so that the distance from the upper edge of the float to the machined edge of the mixing chamber is just $\frac{1}{4}$ inch.

Priming the carburetor is used to give more gasoline for starting.

(a) By choke valve. Close the choke valve and crank the engine. The suction draws the gasoline out of the nozzle cup and through the low speed tube into the cylinders.

(b) Dash adjusting lever. Turn the carburetor adjusting lever on dash in a counter-clockwise direction to open the spray nozzle while the engine is being cranked.

Priming is necessary as it enables one to draw a rich mixture into the combustion chambers, making the engine easier to start. Ordinarily cranking, without using the choke valve, will not draw out enough gasoline to make an explosive mixture, unless the engine is already well warmed up.

Back-firing. Through the carburetor may be caused by:

1. Lean mixture, the needle valve being closed too far. Air leak around inlet manifold or gaskets, clogged fuel pipe, dirty strainer, or by water in the carburetor.
2. Leaky intake valve, push rod out of adjustment, or (very rarely) by a broken inlet valve spring.
3. Commutator or timer shorted at one or

more contact segments, or one of the commutator wires being grounded on engine or frame.

Defective Carburetion

(Classified list of carburetor troubles which may be due to:)

1. No gasoline in tank.
2. Valve closed at tank.
3. Clogged fuel strainer in sediment bulb.
4. Clogged fuel pipe.

Indication: engine stops.

Test: Open drain plug on the bottom of carburetor, no drip.

Remedy: Trace out trouble step by step, beginning at the gasoline tank. Clogged fuel pipe or strainer gives this characteristic symptom. Engine stops—but may be started after a minute or so—only to stop again. As this trouble comes on, the engine does not respond readily to the throttle, sometimes popping back at the carburetor. Remove and clean strainer, or clean out fuel pipe.

5. Inlet needle valve worn.
6. Dirt in inlet needle valve.
7. Heavy float (cork float saturated with gasoline. Metal float may be punctured.)
8. Float caught. (Jar it).

Indication: constant drip from carburetor.

Test: Shut off gasoline and drain carburetor. Then close drain plug and open the supply line. If the drip continues, it will be necessary to replace the needle or the float.

9. Water in carburetor.

Indication: Engine misses explosions or stops.

Test: Draw off fuel onto hand. If the gasoline wets the hand, while water is repelled.

Remedy: Draw off all water.

10. Spray needle out of adjustment.

Indication: Rich or lean mixture.

Test: Inspect to see if it has been moved. Change adjustment slightly.

Remedy: Readjust.

11. Leaks around inlet manifold, or joints open. Allows air to enter.

Indication: Engine loses power. Mixture is weak. Sometimes there is a whistling sound.

Test: Squirt oil around joints. Oil will be sucked in at the leaks. Squirt gasoline around joints—engine picks up speed then leak is found. Watch for pin holes in castings.

Remedy: Tighten bolts or replace gaskets.

12. Cold engine: Refuses to start, because gasoline does not vaporize readily when chilled.

Remedy: Fill cooling system with hot water. Warm up the inlet manifold and carburetor with clothes wrung out in very hot water.

Distinguishing Carburetor Trouble

To distinguish carburetor trouble from ignition trouble, remove a couple of spark plugs. Prime the cylinder, replace plugs and see if the engine will run. If the engine will not run, the ignition is at fault. If the engine runs and then stops, the carburetion is at fault.

Very often the manner in which the engine stops is a good indication of the cause of the trouble. If the engine stopped suddenly (as if the switch had been turned off) then ignition trouble is indicated. But if the engine became weaker, missed a few explosions and stopped, then carburetor trouble is indicated. Sometimes back firing (just before stopping) shows a weak mixture and carburetor trouble.

No. 5.

Kingston Ford Carburetors

Factory Equipment on Many Fords

FOR MANY years, Kingston carburetors were standard factory equipment on about half of all the Ford cars manufactured. With so many Ford cars still being sent out with this carburetor as factory equipment, and with over a million Kingston carburetors in use on Ford cars, the care and adjustment of these carburetors will be of interest to many car owners, and to all repairmen.

The question is often asked as to which is the better carburetor—the Kingston or the Holley? The writer has owned two Ford cars for many years, one being fitted with a Kingston carburetor and the other fitted with a Holley carburetor. And we are firmly convinced that splendid results can be obtained from either make!

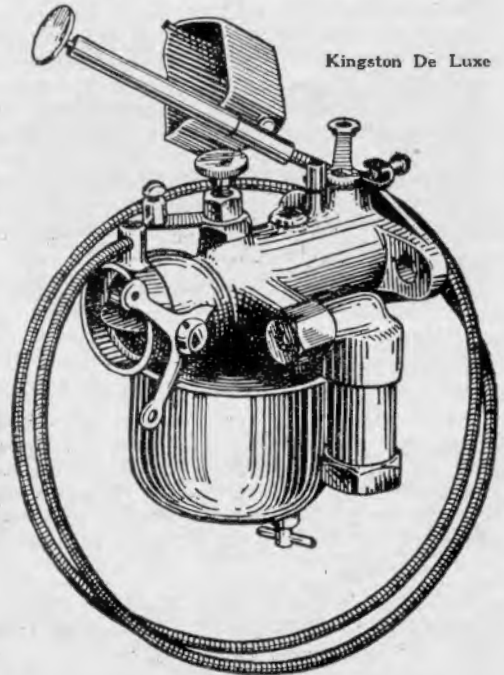
Rather than choose-and-get-into-trouble, we

prefer to refer you to the expurgated edition of "Etiquette in a Turkish Harem" which says: "How happy I could be with either, Were t'other dear charmer away!"

The Kingston Model Y carburetor was used on 1913-14-15 Ford cars. But as gasoline has so changed in recent years that these earlier carburetors are no longer economical of fuel, parts for such carburetors are no longer stocked by many Ford agents. But parts can be obtained from the makers, Byrne, Kingston Co., of Kokomo, Indiana.

The Kingston Model L or L-1 carburetor was used on many 1915 and 1916 Ford cars. And parts for the Model L carburetor are also supplied by the makers.

The Kingston Model L-2 carburetor was used



on 1916 to 1920 Ford cars. Parts for this carburetor are obtainable at any Ford agency.

The present Kingston carburetor is Model L-4 and is used on Ford cars from 1921 to present date.

Description L-1 and L-2 Kingstons

Fuel enters the carburetor from the tank at the connection (A) and is maintained at a constant level (as shown in cut), through the agency of the float.

The pool of gasoline, formed in the base of the tube, will always be present when the engine is not running, and is for the purpose of easier starting. When the engine starts, this pool is quickly lowered to the point of adjustment of needle valve, and continues to feed from this point, until the engine is stopped.

Let us follow the course of the air through the carburetor, until it enters the cylinders as part of a perfect mixture. To correctly appreciate

what occurs in this carburetor, we must follow the course of the air and atomized gasoline throughout its entire range.

When the engine is running slowly, the air valve (B) rests lightly on its seat, allowing no air to pass this point. Consequently, all air must pass through the low speed tube (C). Due to the lower end of this tube being close to spray nozzle, and all the low speed air having to pass this point; the atomized gasoline, drawn from nozzle (D), becomes thoroughly mixed with air in its upward course and is carried in this state to the engine.

To start an engine at any time depends upon getting a combustible mixture into cylinders. That is, proper proportions of air and atomized gasoline, thoroughly mixed.

Difficult starting in cold weather is due the result of two inherent properties of gasoline. It does not vaporize as readily in cold weather as in warm. Also it does not flow through the needle valve adjustment so easily. Consequently, we cannot get as much fuel past the adjustment in cold weather as we can in warm. This is the reason that opening the needle valve slightly makes starting easier and keeps the engine running, when otherwise the engine would have a tendency to stall when the load was thrown on.

In the Kingston carburetor, this extra amount of gasoline for the starting and warming up period can be obtained by opening the needle valve adjustment on the dash, or by the use of the choke throttle (E) placed in the air passage.

When starting with cold engine, this choke throttle can be closed by pulling the choke wire (H) forward. This cuts off nearly all the air supply and produces a very strong suction at the spray nozzle, which causes the gasoline to jet up, and to be carried with the incoming rush of air to the cylinders.

A drain cock (G) is placed at lowest point in bowl or float chamber and should be opened from time to time to drain dirt and water.

Adjusting Model L-1 and L-2

Since repairmen will sometimes have occasion to adjust the earlier Model L carburetors, the method of adjustment will be of interest.

Retard spark fully. Open throttle about five or six notches of quadrant under steering column.

Loosen needle valve binder nut on carburetor, until the needle valve turns easily.

Turn needle valve (with dash adjustment) until it seats lightly. Do not force. Adjust away from seat one complete turn. This will be slightly more than is necessary, but will assist in easy starting.

Start engine, and open or close throttle until the engine runs at a fair rate of speed (not too fast.) Allow engine to run long enough to warm up to service conditions. Now make final adjustment.

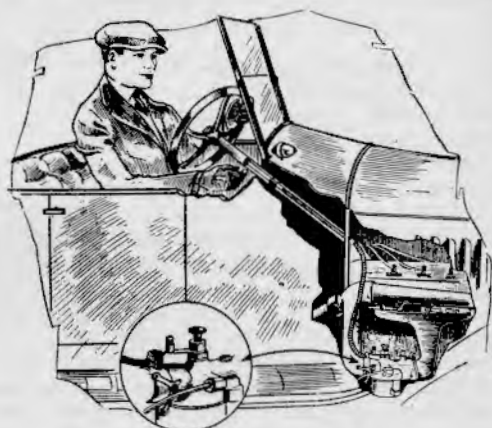
This carburetor has but one adjustment—the needle valve. Close throttle until engine runs

at the desired idling speed. This can be controlled by adjusting the stop screw in throttle lever.

Adjust needle valve towards its seat slowly, until engine begins to lose speed, thus indicating a weak or lean mixture. Now adjust needle valve away from its seat very slowly, until the engine attains its best and most positive speed. This should complete the adjustment. Close throttle until engine runs slowly. Then open throttle rapidly. Engine should respond strongly. Should acceleration seem slightly weak or sluggish, a slight adjustment of the needle valve may be necessary to correct this condition.

With adjustment completed, tighten the binder or clamp nut on the needle valve, until the valve turns under sufficient tension to keep it from losing its adjustment from the vibration of the engine.

Let us now open throttle slowly and see what occurs. The engine now requires a greater volume of mixture. Air valve (B) slowly leaves



Steering Column Adjuster

its seat, permitting a small volume of mixture to pass by. At this point, a change in manner of operation occurs. The low speed tube still continues to deliver a perfect mixture, but is assisted by the air valve opening. The air being drawn by the air valve must pass across the spray nozzle, between it and the low speed tube.

As engine speed is increased up to its maximum, the air valve continues to rise higher and higher, admitting more and more air which, having to pass across the spray nozzle with an ever increasing velocity, becomes thoroughly impregnated with atomized gasoline, producing a perfect mixture through the entire range.

The carburetor owes its success to the construction which makes it possible to thoroughly impregnate all air with atomized gasoline directly at the nozzle, and at the point of highest air velocities. For this reason, it should be possible to throttle down the car to a walking speed, and to accelerate up to 40 miles an hour in 20 seconds,

with every cylinder doing its full share of the work all the time.

Kingston L-4 Model

The fuel level in the Kingston carburetor is maintained by means of the float and inlet valve, in the same manner as described in the article on the Holley carburetor. When the engine is not running, the gasoline rises until it forms a pool in the mixing chamber, submerging the end of the low speed venturi, through which the needle valve extends. There are four holes drilled in this venturi, about $\frac{1}{8}$ inch above the lower end. These holes allow the passage of the air when starting the engine.

When starting, or when running at low speed, the air valve is seated, causing all the gas and air to pass through the low speed venturi. Because of the small cross sectional area of this venturi, sufficient velocity is attained to vaporize the gas. As the speed of the engine is increased, the air valve rises from the seat, allowing the air to pass through the main channel.

At first the mixture that passes through this main channel is very lean, but it mixes with the over-rich mixture from the low speed venturi, delivering the proper mixture to the cylinders. As the speed or load increases, the valve rises higher and higher, until practically all of the mixture passes through the main channel.

Kingston De Lux Model

In addition to the Kingston carburetor that is factory equipment on Ford cars, the makers also furnish the all-brass De Lux model which includes a number of added features. A strainer is fitted with a settling chamber to catch the dirt and water before they have a chance to enter the carburetor. This strainer is conveniently located at the side of the carburetor, so that the bottom of the strainer can be quickly removed for cleaning the screen and draining the collected water.

The steering column control not only makes for easier starting and adjustment, but for greater economy in the use of fuel. The control operates through a flexible cable, in the same manner so successfully used in the familiar Williams accelerator.

This control operates directly in connection with the needle valve, with a pull button placed on the steering column just below the steering wheel. This control affords a full 90-degree operation of the needle valve, either for starting or for extreme road conditions as may be required.

Note: Instructions on the servicing and repairing of both Holley and Kingston carburetors will probably be published in a future issue.

A man who disliked his slow chauffeur
Exclaimed, "Why, you doggoned young lauffeur!
If it wasn't so late,
I would bash in your pate,
And pound you as soft as a sauffeur!"

BY ERMON MILAND PECK.

Fountains and Fords

BY S. OMAR BARKER

THE Ford in the nearby snapshot is not boiling over. Neither has it bursted a blood vessel in its cylinder head as you might suppose. The white spout is beyond the flivver and is in reality a huge artesian well at the edge of a cotton field in southern New Mexico. The car, you notice, has its hood off. That's intentional. I made him take it off out of deference



to the artesian fountain, for artesian water is really the daddy of nearly every one of the hundreds of flivvers in New Mexico's fertile Pecos Valley.

Even though I say this artesian flow is the daddy of the flivvers the connection may not be entirely apparent (kahoom!). It is real none the less. Here's how: Roswell is the mamma city of the Pecos Valley. The Pecos Valley is a rich cotton and fruit valley—so rich in fact that Roswell has more cars per capita than any other town in the U. S. except one. It is rich because it raises cotton, apples, alfalfa, honey, watermelons, chickens and children; it raises them because it has artesian water for irrigation. It makes money on them because it uses flivver trucks for transportation and Fordson fabrications for cultivation; and because it makes money on its produce it can afford to buy more cars than any other town this side of Timbuctou. And so it does, and lo, flivvers lead them all. Fountains father the flivvers and the flivvers like artesian water itself, run on forever, making two tanks of gas grow where one grew before.

It is no use to brag about your car unless you have the kind of car that will back up your brag. Josh Billings said there were two things he liked about the shanghai rooster: he had such a glorious crow, and he had the spurs to back his crow up with.

Even Tombstones say good things about a man when he is down.

The Traffic Officer and the Demon-Driver

BY HARRY IRVING SHUMWAY

ONCE THERE WAS a traffic policeman who had a very mean beat to patrol. He had jurisdiction along a remarkably smooth, fine road for about ten miles. It was a very difficult job to keep speed offenders under control and this officer's motorcycle was kept hot the day long.

He was undoubtedly the politest traffic officer in the world. His manners were charming, his diction perfect and altogether it was a pleasure to meet such a polished, affable fellow. This is perhaps rare as many who travel by motor can say.

He would never stop a car and bawl out of one corner of his mouth: "What d'yuh think this is? A race track? Lemme see your license." No indeed. Cyril, the polite motor officer was always so nice about his work that he received nothing but encomiums from all.

One day his superior officer called him into his quarters. "See here, Cyril, they's a fly guy who is burning up your road every night in a dark, gray baby which must run with lightning. Nobody has been able to catch him. You go out tonight and get him. Better have your gun handy because he's opened up on two of the boys already."

"Good gracious," said Cyril. "What an ill-mannered fellow he must be."

"You said it," rasped the Captain as all captains rasp. "Hop to it. Bring him in dead or alive."

That very night, Cyril, working overtime, spotted the big, gray car coming. Truly, its speed was terrific. Cyril wheeled about and was started in the same direction when the gray flash went by him. He caught a glimpse of a black helmet and black rimmed goggles. Then the race was on.

Cyril had one of the fastest cycles in the world. He opened it up—full tilt. Hnw it roared. The speedometer read 60—then 70—then 80. When a mile of this terrible pace had been reeled-off, Cyril's cycle drew up alongside the dark gray demon. The other driver laughed—and the speedometer jumped to 85.

"Now, really," shouted Cyril to the man. "You know better than to do this sort of thing. Candidly, I am displeased. I beg you will decrease your pace."

For answer the dare-devil driver speeded up a notch and the speedometer read 90.

"I should think you would be ashamed of yourself," hollered Cyril, a little red in the face it

must be confessed. "After the state has given us all so many good roads and everything, you repay it by this unseemly haste."

The strange demon-driver leaned over and yelled at Cyril.

"This is as much my road as it is yours and I don't think it is at all nice for you to yell at me the way you have done. Just to spite you I shall make this car go 95 miles an hour. So there!"

Whereupon he stepped on the throttle right royally and both car and cycle were soon going better than 95 per hour.

How long this terrible race would have gone on nobody knows but suddenly something happened which changed everything. Gates went down across the road about a quarter of a mile ahead and a long freight train began crawling by. Of course there was nothing to do but stop, so both Cyril and the demon-driver halted about a hundred feet from the train.

"You see how utterly futile it was to try eluding me," said Cyril. "My cycle will beat your motor car."

"It will not," retorted the other.

"It will so," replied Cyril. "It will beat anything. But let us not quarrel. Why are you going so rapidly?"

"I am a bootlegger," replied the other. "And I am due with this load of gin at a social gathering. I have promised it."

"I don't believe any such thing," said Cyril.

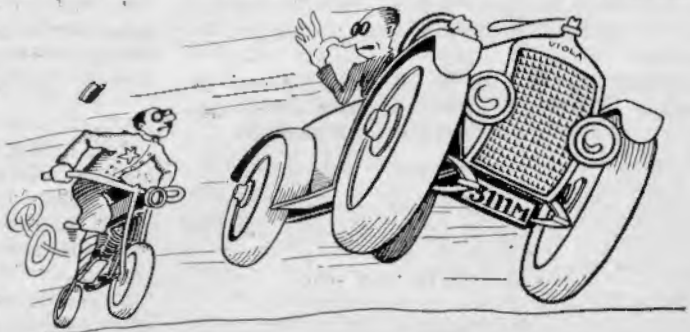
"That is horrid of you to doubt me," said the demon-driver. He fished under the seat and brought out a large bottle. "See that? Gin, real gin."

Cyril gazed in amazement at it. The demon-driver smiled good-humoredly at him.

"If I may be so bold, how much do you earn as a traffic officer?" he asked.

"One hundred and twenty-five dollars per month."

"You are a fine driver. I will give you two hundred a month and five per cent of the profits



if you will come in with me on this game. Really, it is splendid sport."

Cyril's eyes opened wide with astonishment. Then he said, "I will admit that I am somewhat of a gambling fellow. I will take this ribbon from my cuff and cut it in two pieces of unequal length. Then I will place them in my hat, shut my eyes and count one hundred. Then I will pick out one of the pieces of ribbon. If it is the long one, I will go with you. If I draw the shorter one, I will remain faithful to the law."

So saying, he untied a pretty lilac silk ribbon from his cuff and deliberately cut it in two pieces. Then he proceeded as he had said, closing his eyes and beginning to count one hundred. The

freight train was still lumbering on when he began but long before he had counted up to one hundred it had gone. Cyril opened his eyes and found he had drawn the shorter piece of ribbon.

To his amazement the road was deserted. The demon-driver had disappeared. The freight train was rumbling away down the track. Off down the road a dark, gray speck was fast growing smaller. The demon-driver had taken advantage of Cyril while he was counting to one hundred to make good his escape.

Sadly he mounted his cycle and turned back. The incident soured him and from that day he became a silent, taciturn man, speaking not to man, birds or the flowers.



What Could Be Sweeter?

The Ford Sets the Example for the Bees That Keep Busy in this Unique Honey Dispensary

LIVE BEES pursue their hive operations in windows set in the body of a Ford truck used by H. A. Iglemose, a honey salesman and bee-keeper of Wheaton, Illinois.

Mr. Iglemose uses frames taken from an observation hive. These are first placed in glassed holders from which the bees cannot escape. The holders are then fitted into the truck windows where catches hold them in place. Several squares of comb honey also are placed in the holders. The bees endure two days in the truck without difficulty. They are then returned to the hive.

Mr. Iglemose designed and had the body of

his truck built especially to provide for the display of his wares. He added the bees feeling these would attract attention and stimulate sales. Almost everyone, he finds, is interested in watching the insects and many persons who stop out of curiosity to watch the bees often buy a jar of honey before passing on.

He plans eventually to install a honey extracting machine in the interior of the truck and operate it from the rear wheel of the auto. This will permit him to handle this sort of work for farmers and others who do not possess equipment for the extraction of honey from the comb in their hives.

Repairing Ford Radiators Requires Knowledge and Patience

*The Secret of Easy Soldering Is—
Well, Read This Article*

BY GLEN F. STILLWELL

THE aim of this article is to help those who aspire to solder the Ford radiator, and are long on patience but short on knowledge. For it does require some knowledge and not a little patience.

Before draining the water, it is a good plan to ascertain the approximate location of the leak, or leaks. The radiator is then removed from the car. Many mechanics make the mistake of removing the hose and cast iron water connections with the radiator. This is unnecessary, and time may be saved by leaving the latter connected to the block.

It might be well to bear in mind that to properly solder anything, one must have elbow room and, if braces and fins are in your way, remove them. To replace them is the easiest part of your job. Often it is necessary to remove a number of fins to ascertain the exact location of a leak.

A soldering iron, heavy enough to retain heat for some time, should be used. And kept well tinned, and frequently cleaned with sal ammoniac. It is very necessary to have the parts to be soldered perfectly clean, and they should be scraped with a knife or cleaned with emery cloth.

Wire solder is undoubtedly the most convenient for general use. The so-called, acid-core solder forms a combination that is unbeatable. The writer has found that it works very satisfactorily in connection with muriatic acid—the acid being used for cleaning.

The acid should be kept in a stone jar. And if acid core solder is used, a squirt can should be filled with muriatic and can be applied in this manner to parts being soldered, after they have been heated with a torch. If this method is used, it will be found that considerable time may be saved in cleaning parts, as the muriatic acid applied to the hot surface will quickly boil and wash the dirt away.

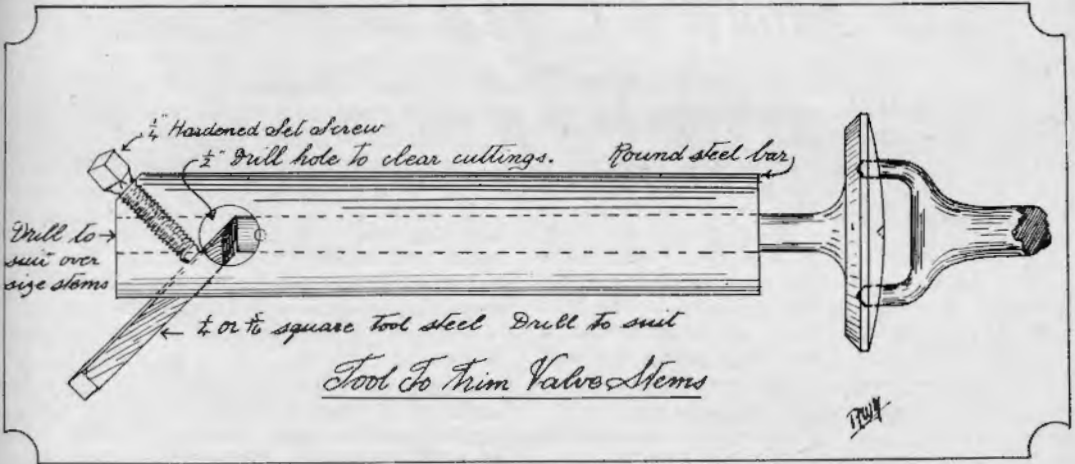
The iron should be held against the work until it is hot, and the solder melted on the iron will flow off and adhere to the parts being soldered. A badly frozen radiator is generally not worth soldering, especially if the workman has to make

out with only a few tools. It requires extra equipment to do this work as it should be done. A cleaning and soldering vat is desirable when a complete overhauling of the radiator is needed. You may begin on a frozen radiator, that shows one or two leaks at the start, and when you have completed the job you will have patched a dozen leaks or so. This is because the heat of



the iron is likely to expand the weakened tubes, and result in unlooked for opening.

The novice who attempts soldering will probably wonder how it is that a man has the patience to do this work, day in and day out. There is but one secret to it. The parts soldered by the professional are scrupulously clean. While the novice attempts the impossible by trying to solder a radiator that has years' of accumulation of dirt and oil on it. Try soldering on a new core or a new part and see how easy it is.



A Ford Valve Fault and How to Remedy It

Throwing Light on a Trouble Which Is Understood by Few Car Owners

BY REX W. YOUNGASH

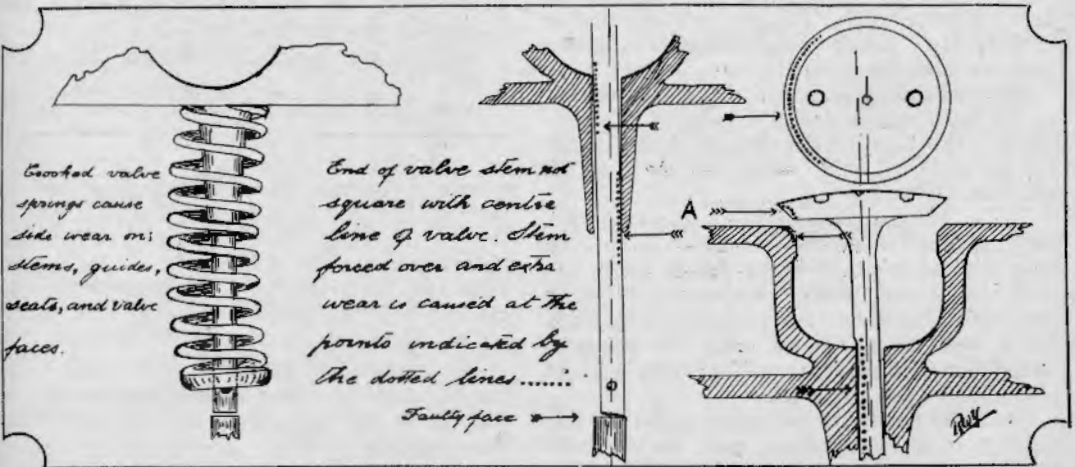
WHEN valves are taken out for grinding they are often found to be worn badly on one side, while the other side shows very much less wear.

Sometimes this is the result of faulty machine work. If so you will find all the seats in the block worn on the same side of the engine. Once this is remedied by re-seating, the fault is gone for all time. But the most common cause in anything but new engines lies at another point and, in this case, it will keep on showing up time after time and because of it the engine will

always be below par in power and smoothness of idling.

The worn side of the valves will have quite a groove in them as shown at "A." The only remedy for this is to turn or grind them in a lathe, or (not so good) to file them in a drill press. If the valves are in poor shape with worn stems and thin heads, new valves should be used.

A sharp re-seating tool should be used to true up the seats, holding it up a little to help it to take the extra metal from the side where it will



The Modern Camel of the Desert

Here Is Another Place Where Nothing
But the Ford Will Do

BY MARY E. WALTER

THE people of this section of the desert of the Great Southwest of the United States (Indio, California) look upon it as the modern desert for its development has been brought all modern science can give to make it blossom and fruit. And as scientific methods

have replaced with occidental cultivation, irrigation and fertilization the primitive agriculture of oriental oases, so has the eastern desert camel been relegated to the discard and the new camel of the western desert been rolled into its place. This is the Ford car.

A Valve Fault

(Continued From Page 63)

have to cut most. To prevent the tool from chattering and spoiling the seat, slip the stem through a hole in the center of a disc of thin wrapping paper and allow the edges to cut their way through the paper. This will call for more pressure to start the cut, but will stop the chatter and give a smooth seat.

Reseating, turning the valves, or new ones and careful grinding in, will remove all the effects but does not remedy the first cause which is; (1) the valve spring is bearing sideways as illustrated, (2) the small face on the lower end of the valve stem is not true with the center line of the valve.

It is not often that you do not find one or more of the valves in a set with the latter fault because they are usually filed to adjust them. They can be filed—if the workman is an artist with a file. But so few can depend on this method that the tool shown is almost indispensable. Its value has been proved in workshop practice and it cannot be used too early in the life of the engine for (whisper this) you will frequently find this fault on new engines. By doing the job early, you save wear on the valve stem guides and the stems themselves.

To use the tool, simply drop the stem into the hole and turn slowly with your grinding tool or by hand, only taking enough off to true up the stem and give the required clearance.

The tool can be made with lathe and hacksaw or the holes can be drilled in a press if care is taken. The hole can be made to suit oversize valves, and will still serve properly for the standard valves.

The cutter is a piece of $\frac{1}{4}$ or 5-16 tool steel, such as is used in lathe tool holders. And should be ground to finish the face as flat as possible.

The valve fault under consideration will cause bad idling and, if two cylinders having the fault follow each other in firing order, the engine is liable to stop when it is running slowly without load.

One more point. In testing an engine for this trouble, or any compression fault, do not make

Around the Salton Sea region, in the upper extension of Imperial Valley, a thriving agricultural region has been developed in the desert where it is as hot as Africa's sands and where similarity to the old world deserts is carried out in the crops produced, especially in dates.

With water from deep wells and crops adapted to the unusual heat and dryness of the place, the community has gone on faster than has been possible for its roads to develop. At present there is a fine paved state highway running down the valley, through Imperial toward the Mexican line. That is about all the road story of this modern desert. Through the cultivated region and out over the virgin wastes ramble trails from farm to farm, among shifting dunes, into wonderfully picturesque canons in the barren hills.

The desert dweller who has travelled these treacherous sands knows by experience that the only reliable camel to "stand up" on the yielding soil; to be trusted off the paved road; to be pulled out when it sinks in hub deep, is the little old Ford. So the prevalence of the Ford in this modern desert, adapted to innumerable uses, has led to its being designated as the camel of the western desert. Much of the picturesque scenery round Salton Sea, as in other parts of the Colorado Desert, would not have been revealed to the sight of many for years to come, but for the Ford, which carries folks quickly where other cars can't go, and animals but laboriously and slowly.

And like the camel the Ford thrives in the desert.

When the blistering heat of summer burns

the test by pulling the crank right over in one movement because this does not allow enough time for any leak to show up. The right way is to rock the crank. That is, to pull each piston up nearly to the top of its stroke and let it back again, repeating this until the pressure in the cylinder will not pull the starting crank down again. Then the piston goes over center.

The number of times that it will do this is the one best test for leaks. In good order it should rock six to ten times, and each cylinder should show the same result!

the sands, the little car loses its shiny complexion; when the fierce winds of spring switch the grape canes heart-breakingly and wither with deadly blast tiny tomato plants, often the Ford parts with its top covering that has weakened through the strain of several desert seasons; and when sand storms screech, burying crops, lashing young plants to death, lacerating human flesh, the faithful car is often polished right down to the "tin."

But this trusty camel rambles right along despite wind and weather and plays its important role of helping push this region on to agricultural prosperity.

And what winds, sand, trails and heat fail to do to spoil "Lizzie's" looks—but not her capabilities—the paucity of garages finishes. This is a lumberless land. The dwellings are inoffensive "California houses," mostly. The garage is the shade of the house or the shelter of the athel hedge. The athel is the shade and the windbreak of the desert, a marvellous tree that grows from cuttings, a foot a month until mature, a boon to the desert dweller and a thing of beauty with its fine feathery foliage. Those who are "fussy" with their Fords and their Fordsans, shif. them daily to the shady side of the hedge. As to rain—it is negligible, but it adds its bit of winter rust to the family camel.

Naturally the desert dweller who is spending his little all on development must count costs and when he has to Ford it on low over miles of soft sand he is happy that his little camel can go eight days without running up a big gasoline bill.

It is in the wake of the desert camel that the arrogance of civilization has come to the primitive desert. Romantic Indians once strode these sands; long, long the desert heat kept at bay their hated enemy, the white man; but he came and with him came the Ford car, and now it is the pride of every Indian who can earn enough, to indulge in some sort of Ford, so Fords in all degrees of decrepitude characterize the Cahuilla reservation. Old Ambrosio, the fire-eater and medicine man of these Indians miraculously eats live coals of fire at the aboriginal fiestas, to appease the spirits. He compounds love notions and he heals the sick—just as his ancestral medicine men have done for centuries. Yet he rides to these primitive ceremonials—not on prancing steed—but in a Ford car all own, it is averred, blase luxurious, modern.

So the Mexicans, the only available labor in this deadly heat, trek from place to place, often in rattlely buggies and pokey nags, from which they rise butterfly like, at the end of onion or cotton season, to wing about in the splendor of

a second hand Ford. On this is heaped bed and bedding, household effects, wife, ten children, goat and dog as they migrate in the wake of progressing crops.

Like the camel of the Orient the camel of the western desert is a muchly burdened creature. The farmer who does things on a small scale must depend on his Ford for many handed help. Late winter and earliest spring vegetables, previous high-priced truck that is expressed to market, is rushed to the train in the family touring car. The whole of many fig crops; boxes of early grapes; mail order cartons of amber dates; tomatoes that come soon after the Mexican crop; grapefruit; turkeys—all are carted on the first leg of their journey to market in the same trusty camel that runs the "folks" ten miles down the boulevard to church on a Sunday or acts as the school bus, week day morning and night.

"What other car would have the courage and the imagination to withstand such neglect, abuse and insult?" said one farmer.

And when prosperity begins to reward the man who has "bucked" the desert, a new auto is the token thereof, but to him the trusty camel can have only one successor—another modern desert camel.

The Big Car's Lament

I WISH I wuz a little Ford
A runnin' right along;
I wouldn't need to wheeze and sigh,
I'd sing a different song.

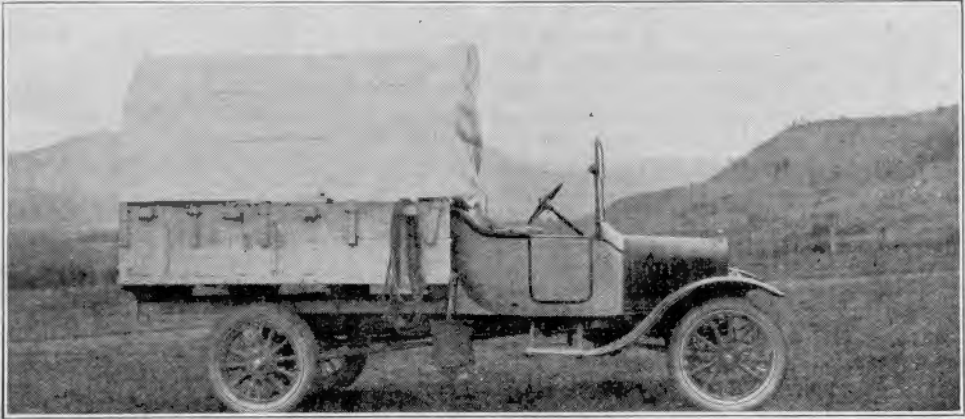
To me the fact of bein'
A big car is a fright;
I don't care if I do look fine,
I never feel quite right.

An' when a Ford goes whizzin' by,
Great tears most always drop;
For where the Ford can go right on,
I'm almost sure to stop.

I stick in mud, I don't like rain,
I can't pull up the hills;
Oh! I could sit here all day long
An' tell you of my ills.

An' so I wish I wuz a Ford,
Then I need never worry,
For they go back and forth each day,
Without such needless flurry.

So just remember when you wish,
To be so big and grand,
It's not the looks that count so much,
As do the pluck and sand.



A Ford "Church Wagon"

The Ford on the Western Ranch

*Car and Truck Bring Many Benefits to
the Former "Wild and Wooley West"*

BY RALPH W. SELKIRK

*Heart-Bar-L-Ranch
Fishtail, Mont.*

I HAVE often said that if we could have but one car it would have to be our Ford truck, but whether I could make good on that statement in case of a show down is a question not entirely settled in my mind. The rest of the family might outvote me. The above thought at least shows what I think of our truck, bought some three years ago and I can truthfully say it has been the most beneficial and satisfying addition we have ever made to our equipment. It even is ahead of our first Ford, bought ten years ago, in its sphere of usefulness.

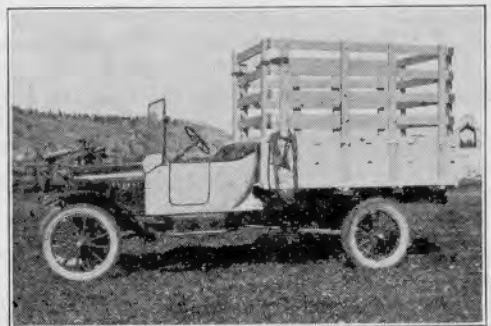
The Ranch is located in the mountains not far from the North East corner of Yellowstone Park and thirty miles from the nearest railroad. Cattle, registered Herefords and Holsteins, hogs and some grain are raised. The hogs and grain beyond our own requirements must be hauled off and supplies in the form of groceries, kerosene, gasoline, salt and coal must be freighted back.

The round trip to the railroad means sixty miles, formerly a two day trip with horses and freight wagon. We now make one trip easily in a day and if necessary two trips can and have been made in a day. A few concrete instances might better illustrate what we gain in time and convenience by using the truck in place of horses.

Last year hogs were contracted to a butcher living about one hundred miles away. These were to be delivered dressed. They were killed late in the afternoon cooled over night, loaded in a truck early the next morning and delivered on board the cars before it became warm. With-

out a truck this would have been impossible as they could not have been hauled during the hot weather with a team. This was repeated every few weeks during the summer.

A bull was bought some time ago from a neighbor living something over a hundred miles away. Before the advent of our truck we would have had two ways of getting him home. First, we could drive him all the way, a matter of five days returning and at least three in going



For Cattle Transportation

after him, or we could have had him driven to the railroad, shipped by freight fifty miles and then driven him thirty miles to the ranch. The expense and time in either case being about the same. As it was we put the stock rack on the truck, started fairly early in the morning and reached our destination about noon. The return



The "Corral" of Fords

trip might have been made that day but we preferred to spend the afternoon in visiting and returned the next morning, leaving about eight and arriving home shortly after dinner. This way Mr. Bull was saved a long walk and we were out only the cost of fifteen gallons of gasoline and a quart of oil.

A new house was built this summer requiring about thirty tons of lumber and hardware. A busy season and rainy weather delayed hauling until the carpenters were about ready to begin work, then the truck made two trips a day until all the material was delivered taking fourteen days to accomplish the job. It would have taken a freight team 56 days to have made the same number of trips.

Hauling is not quite as simple as in a less mountainous and more level country. Situated over one mile high the power of a car is reduced practically ten per cent. The rise in elevation from the railroad to the ranch is over 2000 feet in the thirty miles. The reduction in power, together with the power required to raise the

truck and its load that 2000 feet, make a smaller load necessary than would be handled by the same truck under more favorable conditions. We have recently installed an auxiliary transmission which is a great help in overcoming these natural difficulties and which we would not now be without it. The extra high gear is ideal for traveling over good roads with a light load, and especially on the long down grade to town it makes possible the speed of a passenger car without racing the engine.

The box is of our own construction, made of one and one-half inch pine well bolted and ironed, with a drop-end gate and fitted with sockets into which a stock rack may be dropped and secured without bolts or screws. It easily holds 50 bushels of grain or one and one-half tons of coal. The box is also ironed for wagon bows so that a wagon sheet may be used to cover the entire rig. With the wagon bows and sheet in place it makes an ideal camping or hunting outfit. We recently made a trip up into the mountains where the power of the truck applied at a



View of the Ford-run Ranch

low speed was useful in negotiating the roads, little more than trails, where it was often necessary to ease the truck slowly over boulders or tree trunks and at the same time be ascending a steep pitch or fording a stream. The box is just wide enough for two cots to be made up side by side and long enough for the storage of grub and other equipment at the foot of the cots where it can be conveniently reached by lowering the end gate which also forms a table. With this rig no tent is necessary and the moving of camp is merely to crank up the car and push the pedal.

One other use I've omitted and that is taking the family to social functions which invariably seem to occur when the roads are impassible for a car, due to snow or mud. When we can't get thru any other way we fill the bottom of the truck with rugs and robes, load up with the social devotees and proceed to the dance or whatever it is that requires our attendance. True we don't always go, for we occasionally get snowed in too deeply to get thru even with the truck. As I write, the roads are under four feet of snow and we haven't been off the place for several

weeks and by the looks of the weather it will be several more before we do any traveling, but we do our hauling of supplies when the roads are good in preparation for just such an occasion as this.

I've written so far about the truck but the Ford car, before we had the truck was made to do many things for which it was not intended. With the help of a trailer we hauled many things too bulky to put in the car. It took the place of freight wagon, driving team and saddle horse and does the same on many a ranch today. No more is the hitching rack lined with cow ponies and the livery barn packed with the teams of ranchers come to town for the Saturday afternoon or the evening dance. No more is it necessary to start at four-thirty for the dance at the school house twenty miles away or do we have to dance until day light so as to have light to drive home by. Even the youngest of children now know what a railroad train looks like while little more than a decade ago it was nothing unusual for the children of eight and ten years never to have seen a railroad train.



Ford Car Washing Made Easy

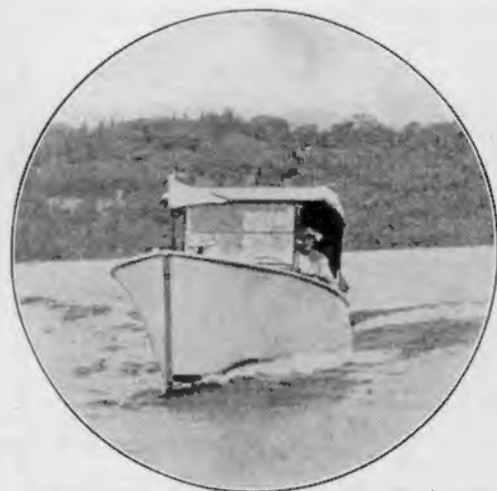
*Why Go to Expense of Having This Job Done Elsewhere
When This Simple Method Is at Hand?*

THIS photograph reminds us of the old story of the Ford car owner who put so many gasoline-saving devices on his car that not only was no gas consumed, but when the saving exceeded 100 per cent, the gasoline accumulated until the car was swamped in its fuel.

We have always rather doubted the authenticity of that story but we cannot doubt this picture. It happens, however, that the fluid is not gasoline, but just plain water.

Now maybe it has nothing to do with the case, but perhaps if the driver of this car in Seattle, Wash., had stuck to this same liquid instead of taking on another cargo at a contraband filling station—(as he *may* have done,) he would not have driven into a street hydrant, smashed it and caused this deluge.

All of which results in a perplexing paradox in which one is advised to stick to water but to avoid water hydrants.



Ford Powered Motor Boats

Fleet Craft, Propelled
by Ford and Fordson
Engines Skim Over
the Water.

BY MURRAY FAHNESTOCK

CONVINCED that the Ford engine could be successfully used in a suitable motor boat, we wrote an article on the use of the Ford as a Marine Engine for the May 1920 issue of our magazine, but found it difficult to obtain pictures to illustrate that pioneer story.

When we published our 9-page article in the May 1922 issue on Ford and Fordson Engines in Marine Use, much more material was available. But the rapid development of the two years has made available more component parts and even complete Ford engined motor-boats, so that the work of adapting a Ford or Fordson engine to marine use is now easy.

The Doryford

If you have had the pleasure of reading Kipling's fine book called *Captains Courageous*, you already know that the Atlantic type of dory, used by the fishermen on the Grand Banks, is one of the most seaworthy of small boats ever developed. It rides the waves like a chip, and yet is reasonably easy to propel.

For those who wish an inexpensive and sturdy boat for hunting or fishing or all around use, which does not require a boat house to protect it from the weather, the modified dory type offers many advantages. The Doryford is twenty feet long, with a beam of five feet six inches and is equipped with a Model T Ford engine with fittings for marine use.

This Ford engine, with the specially constructed hull, gives a speed of 12 miles per hour, which is very good for a boat of this size. The boat is painted rather than varnished and is not so elaborately equipped as the Ford special Ford boats, and so requires less care and attention for its upkeep.

Complete Ford Engined Boat

Owners of Ford cars can now buy completely equipped Ford engined motor-boats, and thus enjoy the same facility of transportation on water that they have long enjoyed ashore. With the Ford engined boat, the owner is already familiar with the mechanism, and does not have to learn a whole flock of new tricks in starting and keeping a marine engine running.

The Gidleyford motor boat is the finished product of professional boat builders, and is sold complete and ready to run. The entire boat has been designed to obtain the best results from the Ford engine and parts, and the result is a harmonious combination of fine performance and beautiful appearance.

It will be noticed that the lowest part of the hull is swept down to just clear the fly wheel housing, and that the engine is installed in a horizontal position so as not to interfere with the lubrication. But since a marine engine works at wide open throttle most of the time, an additional oiling system is also supplied.

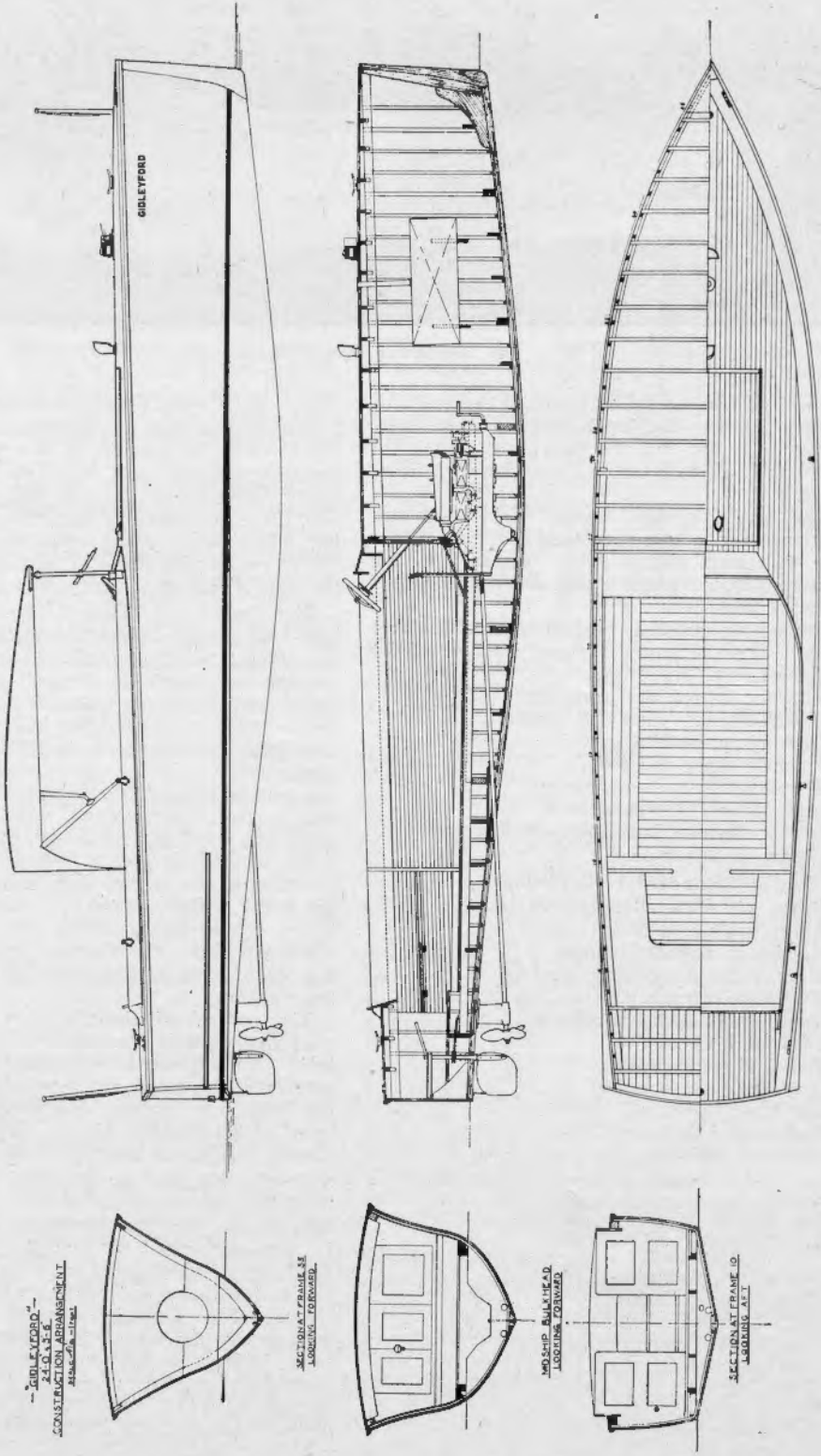
The hull is a combination of the round and Vee-bottom types, with a flare near the bow that deflects the spray away from the boat and keeps the passengers from getting a shower-bath every time the boat cuts through a wave. While more difficult to construct, the flared bow rides the waves well, as the increasing cross section of immersed hull as the wave rises, makes a type of boat that lifts over the waves rather than cuts through them.

The flat stern prevents squatting which causes such a tremendous drag and waste of power with some hulls. Pulling tons of water after the stern of the boat means wasted power. The hull is 24 feet long, which was considered by the builders as a most efficient length for use with the Ford engine. The beam is 5 feet 6 inches.

The frame of the boat is through bolted, so that the boat is easily tightened after being put away for winter. The planking is fitted to



Detailed Drawings of a Ford Engine Motor Boat

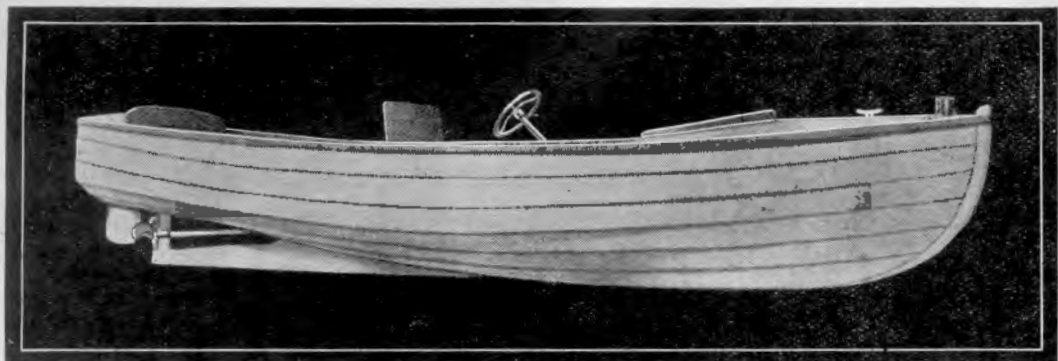


SECTION OF HULL
CONSTRUCTION ARRANGEMENT
LOOKING FORWARD

SECTION AT FRAME 31
LOOKING FORWARD

SECTION AT FRAME 10
LOOKING FORWARD

SECTION AT FRAME 10
LOOKING AFT



The Doryford—a Ford-Engined Boat

frames and fastened with galvanized fittings, with caulked seams to one streak above the water line. Above the water line, the planking is close-fitted inside and out, with cotton thread between plank edges.

The hull is smooth finished inside and out, and painted one coat inside and three coats outside with good marine paint. Decks, covering boards, transom, coaming and interior have four coats of varnish.

Among the materials used in construction are:
Keel, stem, transom, frame, floor frames—white oak.

Ribs—white oak and rock elm.
Clamp streaks—pine and spruce.
Deck beams—white ash.
Planking—pine and cedar.
Transom planking—mahogany.
Plank fastenings—galvanized.
Decks, coaming, bulk heads—mahogany.
Floors—cedar or pine.

Standard Hull Fittings

Brass, nickel-plated water cutter.
Alnm. angle oval deck binding.
Aluminum transom binding.
N. P. piano hinge hatch binding.
Two ventilating hatch lifts.
Two nickel-plated bow chocks.
Two stern chocks.
Bow and stern cleats.
Two flag pole sockets.
Six fener hooks.
One cowled deck vent.
One steel rudder.

Standard Equipment

Auto steering wheel.
One-man khaki auto top.
Two chair cushions.
One stern seat cushion.
Two mooring lines.
Double hinged windshield.
Two wicker launch chairs.
One boat hook.
Three bumpers.
Two flag poles.
Side curtains.
Switches.
Running light.

Power Plant Installation

The builders of the Gidleyford boat have very wisely used the method of mounting the Ford engine in the front part of a Ford chassis frame, rather than directly in the boat. This means that the entire power plant forms a unit assembly, which can be easily removed from the boat for an overhauling, or for safety in storage when the boat is laid up for the winter.

The use of the chassis frame, with its long side bars, makes it easy to support the frame on several widely distributed points; consequently the strains on the hull are greatly reduced, and the chassis frame acts as a back-bone to strengthen and stiffen the hull. Another very considerable advantage is that this frame is accurately drilled for the engine brackets, the steering gear bracket, the dash brackets, and for the hand control lever, so that much time and expense are saved in assembling the parts.

The control is greatly simplified by the installation of the regular Ford steering column in the usual position, with the spark and throttle levers conveniently located under the steering wheel. A drum at the lower end of the steering column actuates the steel cable which controls the rudder.

The control of the clutch is very cleverly worked out, using the regular Ford hand brake lever. Pushing this lever forward allows the regular Ford high-speed clutch to engage, and starts the boat in a forward direction. As the high-speed clutch contains 25 steel discs, it will wear almost indefinitely in light marine use.

To stop the boat, or for backing up, the same hand lever is simply pulled back. And this disengages the high-speed clutch. The lever can be ratchet-retained in neutral position, if desired, or pulled still farther back, thus applying the reverse band and reversing the direction of the propeller. There is an easily adjustable linkage between the reverse pedal arm and the hand brake lever. The foot brake band and the slow-speed band are entirely removed, and the openings in the transmission cover closed with plugs.

As the Ford engine is mounted in a horizontal position, the regular Ford oil feed pump functions as usual. But as the engine is expected to

work fairly hard, an auxiliary oiling system of unusual size is fitted to take extra oil from near the top of the transmission cover and deliver it to the front of the crank case. The easily disconnected coupling, at the middle of this auxiliary oil feed pipe, allows for easy inspection and cleaning.

The Gidleyford thrust bearing is mounted just back of the universal joint. It is fitted with accessible and easily oiled bearings to take care of the end thrust of the propeller, so that none of this end thrust reaches the transmission or crank shaft of the engine.

A marine type of water-circulating pump is mounted on the front end of the crank case, where the low position assures an easy flow of water to pump. From the pump the water flows to the side water inlet of the cylinder block. After cooling the engine, the water passes from the top water outlet of the cylinder head to the water-jacketted exhaust manifold.

The full supply of water flows around the exhaust manifold, and so cools the exhaust gases that the exhaust pipe can be placed under the floor and out through the transom stern without danger of fire. This keeps the hot exhaust pipe out of the way of the passengers and prevents danger of burns. The exhaust pipe is still further cooled and a certain silencing effect obtained by a small pipe which allows some of the cooling water from the water jacket of the manifold to flow directly into the exhaust pipe.

From the water jacket of the exhaust manifold, an outlet pipe controlled by a valve, conducts the water out of the boat. The water-circulating pump is driven by a gear which takes the place usually occupied by the fan drive pulley on the crank shaft. A cover protects these gears.

Among the interesting modifications made by Gidleyford will be noticed the wiggle that has been placed in the starting crank, so that it will clear the bottom of the boat. While a four-cylinder Ford engine can be started with this hand crank, this is only kept as an emergency method, as the regular Ford electric starting and lighting system not only supplies the current for

easy starting, but also for electric lights.

In order that the passengers may not be annoyed by fumes from the breather opening and to save otherwise wasted fuel, an extension is fitted to the breather opening, which also makes it more easy to pour in the oil. This extension breather is connected by a pipe to the hot-air intake of the carburetor, so that the oily fumes from the crank case are drawn through the carburetor and into the cylinders where they help to lubricate the engine. A valve to shut off the flow of the fuel to the carburetor will also be noticed.

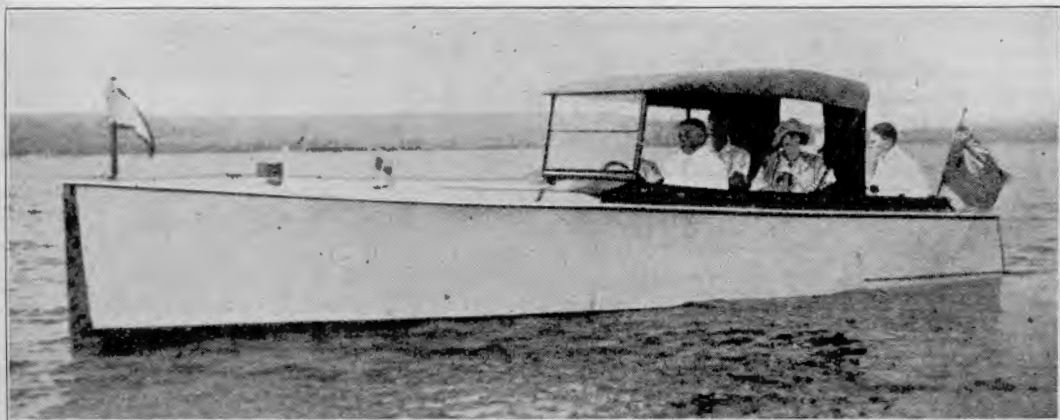
Advantages of Ford Engine

Low first cost. A new Ford engine and transmission can be bought from any Ford Agent and is undoubtedly far the lowest priced engine on the market. But when an old Ford engine is installed in a boat (few new ones are used in boats), then the cost of the engine is trifling. This provides an excellent use for Ford engines from wrecked or worn out chassis.

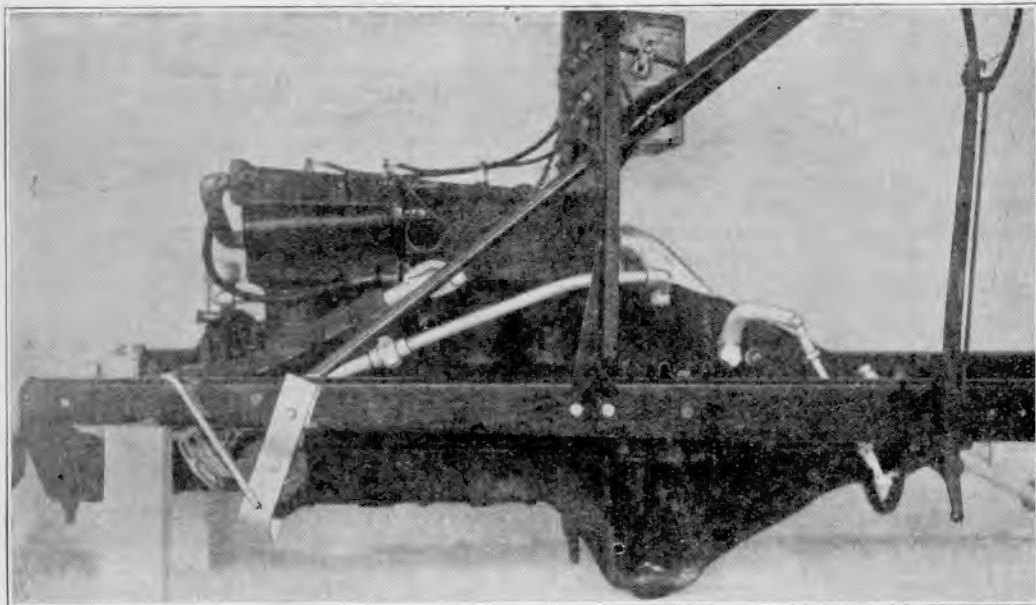
More miles per gallon of fuel. Most marine engines of small size are of the two-cycle valveless type, and are notoriously extravagant in the use of gasoline. A Ford engine should run a boat at a reasonable speed on three quarts of gasoline per hour. At a cruising speed of nine miles per hour, this is 12 miles per gallon of fuel.

Runs more quietly. As the Ford engine has four cylinders, it has far better balance and runs more quietly than the usual moderate priced marine engine, which has but one or two cylinders. When the Ford engine is throttled down so that the engine just turns over, it produces an effect about as near to canoeing as the gasoline engine can come. A Ford engine, being of the four-cycle type, will throttle down far better than the average marine engine.

Fly wheel enclosed. The fly wheel and all moving parts of the Ford engine being enclosed, is conducive of greater safety to the occupants of the boat. The dangers of an exposed fly wheel need no comment, and, as a rule, only the most expensive marine engines have enclosed fly wheels.



Gidleyford Boat All Set to Go



Ford Marine Mounting

Electric starter can be used. Only the more costly marine engines are fitted with electric starters. But the Ford electric starting and lighting system has proven its rugged utility and is inexpensive in first cost and repairs. The dangers of cranking the usual marine engine need no comment. It is too much like twisting a mule's tail.

Lights from Ford magneto. If an older Ford engine is used without an electric starter, then the unique Ford magneto furnishes far better current for ignition than the dry batteries so generally used with marine engines. Also, the Ford magneto furnishes sufficient current to light the running lights, and also for a spot light if desired. Thus eliminating both kerosene lamps and storage battery. As a marine engine runs at about the same speed nearly all the time, the lighting effect is far better than that produced by the headlights on the car.

Clutch and reverse a part of engine. The clutch and reverse are used just the same in a boat as in the car. And the Ford high-speed clutch is a quality clutch that will give almost eternal service in the limited usage of marine service. It is an easy matter to arrange some hook or latch to hold the clutch pedal in the proper position, while stopping or backing the boat.

Replacement Parts Always Available

Parts are always available. Parts of any engine will eventually wear out. And the fact that repair parts are obtainable from any Ford agent means that there is practically no part of the civilized, or even half-civilized, world where spare parts cannot be obtained.

Also, parts are inexpensive. There is no robbery in the prices for repair parts or express charges on parts from the factory. The fact

that the engine is a Ford means that Ford repair service is available for making repairs effectively and at a reasonable cost.

Engine can be replaced in car. For the person who has only a couple of weeks available for the summer cruise, the investment in an expensive marine engine, to remain idle for the other 50 weeks, may seem foolish. But an engine can be borrowed from a Ford car and used in a boat during the vacation two-week cruise and, after the cruise is ended, the engine can be tuned up and returned to the chassis. After a boat is prepared to receive an engine, the time required to make the change over need not exceed four hours. No drilling or altering of engine is necessary.

The boating season is none too long in many sections of the country, and the boat owner who has to send to some out of the way place for worn out engine parts (which may or may not fit when they arrive) is interested in Ford parts which are always, available and, equally important always fit.

Besides the Ford engine, the transmission, and the universal joint, the following Ford parts are frequently used in motor boats. The gasoline tank, the sediment bulb, the fuel lines, the steering wheel, the control rods, the seat cushions, the windshield, and the top.

Water Cooling System

With water, water everywhere, a radiator is certainly not going to be used with any marine engine. But as the top of the Ford cylinder head is at some distance above the water level outside of the boat, some form of pump is going to be necessary.

The water circulating pumps installed on Ford cars, while quite satisfactory for the purpose for which they were intended, will not perform cor-

rectly under the entirely different requirements of motor boat use. One reason being that they are placed too high, and the other being that while car use requires a large volume of water under slight pressure, marine use requires less volume, but the water must be positively lifted a considerable distance.

In order to facilitate the attachment of the proper kind of water circulating pump for marine use, a cast iron water manifold and pump bracket has been designed. A gear type of all bronze Oberdorfer pump is bolted and piped to the manifold, so that installation is very easy.

A flexible coupling connects the pump shaft and the cam shaft extension. One hub of the coupling comes pinned to the pump shaft, and the other hub is easily pinned to the cam shaft extension. A special bracket brings the timer up out of any water which might collect in the lower part of the boat. This timer bracket contains the cam shaft extension which drives the water circulating pump.

As the water circulating pump is of the positive force type, the supply of water varies according to the speed, and automatically suits the work conditions of the engine.

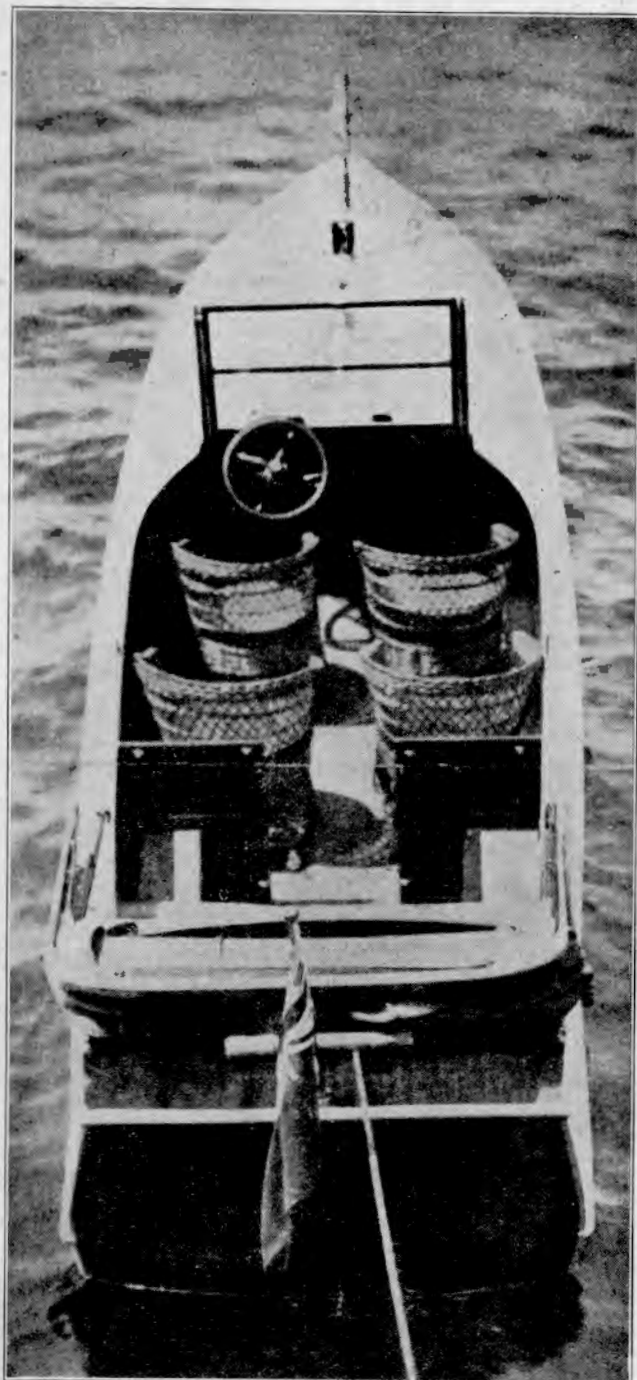
Lubrication of Engine

It was formerly thought necessary to install the engine so that the crank shaft would be approximately level when the boat was under normal headway. But it should be remembered that the Ford engine is regularly oiled when the car is climbing a steep hill, with the engine at a considerable angle from the horizontal.

However, there are many oiling devices which can be used to supply the oil when the engine is installed at an angle. And a straight-line drive, between the crank shaft and the propeller shaft, eliminates waste of power in universal joints.

Suitable oiling devices may take the oil from a special type of magneto contact terminal, and conduct this oil through a pipe outside the crank case to the forward bearings. The centrifugal action of the magnets on the fly wheel throws the oil into a cup that is attached to the magneto terminal, and gravity ensures the flow of the oil to the forward end of the engine.

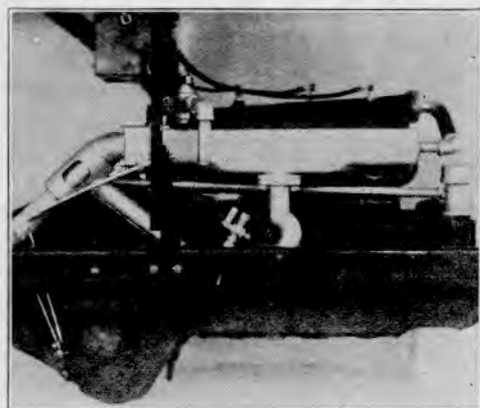
Some boat builders prefer to install the engine level for the sake of appearances, or to eliminate the need for special oiling systems. When this is done and there is an angle between the crank shaft and the propeller shaft, a universal joint is necessary. A double universal joint (made from Fords parts) has proven very satisfactory to many boat builders.



Seating Arrangement

The regular universal joint is attached to the rear of the transmission as usual. Connected to this, by a short square steel bar, is another universal joint made by assembling two female ends and the central ring of a Ford universal joint. The two adjacent forks, connected by the square bar, should be in the same plane.

The purpose of this construction is to eliminate the irregular action of a single universal joint,



Water Jacketed Exhaust

by compensating for it with another universal joint, placed at right angles to the first. In this way, the pulsations of one universal are completely eliminated by the other universal, and the result is a smooth flow of power without any vibration. This also divides in half the angle at which each universal joint works and greatly reduces the power lost in the universals.

If the propeller shaft has an angle of not more than 5 degrees below the horizontal, then a single universal joint will suffice. But where the angle is greater than 5 degrees, then two universal joints connected in tandem are recommended.

A thrust collar and bearing should be installed on the shaft to prevent any thrust pressure from reaching the transmission and crank shaft.

Size of Hull

Experiments have shown that the Ford engine will propel a boat of 30 foot length or less—provided that the boat has smooth, easy lines. It will not propel a short, squatty scow successfully. The hull must have lines that will enable it to slip through the water without overloading the engine. For boats between 30 and 35 foot length, two Ford engines driving twin screws are suggested.

According to some builders of Ford engined motor boats, the best results are obtained with boats 25 feet long by 6 feet beam. The builders of Gidley-Ford recommend 24 feet long by 5 foot 6 inch beam. It is important that the hull should be of modern motor boat design and, preferably, of the so-called Vee-bottom type. Light draught and speedy lines are essentials. Speeds of between eight miles and eighteen miles an hour have been obtained. In general, a speed of fifteen miles an hour is very good. With a

steady, all-day cruising speed of say 10 to 12 miles an hour.

Propeller—a Problem

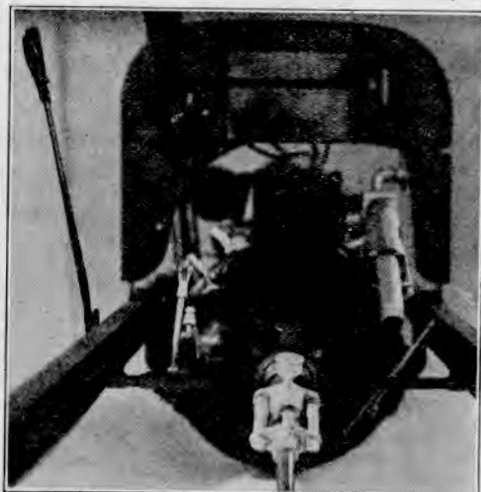
Whether a right or left-hand propeller should be used depends on whether the propeller shaft is attached to rear end of the transmission, or whether the engine is turned around and the fly wheel placed in front. When the propeller shaft is attached to the end of the Ford transmission, then a *left-hand* propeller is used.

From actual experience with many boats, these approximate propeller designs have been suggested by those engaged in the work. These are for speed boats, with modern designs of Vee-bottom hulls.

Length of hull	Diameter	Pitch
18 feet	14 inches	18 inches
20 feet	15 inches	17 inches
22 feet	15 inches	16 inches
25 feet	16 inches	16 inches
30 feet	16 inches	14 inches

When the boat has not been particularly designed for speed, select a propeller listed for a boat from two to five feet longer. For towing, or for heavy boats, where a Ford engine is used because it is the handiest or least expensive, then a 16-inch by 14-inch propeller should be used.

Much of the success of any motor boat depends on the selection of a suitable propeller. Just as choosing a suitable wife may make or mar a man's life. (We are naively assuming that the man chooses—and the woman pays!) As the choice of a wife is influenced by the individual peculiarities of the man, so the choice of a propeller is influenced by many factors of



Thrust Bearing on Shaft

engine performance and hull design.

One of the largest makers of propellers (name and address furnished upon request) issues a four-page questionnaire to be filled out with the answers to questions in regard to engine and hull. Then the propeller makers are ready to give a really intelligent answer as to the size and type

of propeller that will drive the individual boat to best advantage.

When the boat is a very light one and will make from twelve to fifteen miles an hour, a propeller of 20-inch pitch is suggested. For slower boats, the pitch should be proportionately less.

The horse power of the engine is proportionate to the speed the engine attains, up to speeds of 1,000 to 1,500 revolutions per minute. The propeller is more efficient at slower speeds as it simply bores-a-hole in the water at high speeds. But as slowing down the engine reduces the available power, a practical compromise between engine power and propeller efficiency must be made.

Fordson Tractor Engines

While the Ford car engine is a willing little worker—we do not recommend its use for hauling plows! For such an all-day grind, we use the



Ernida at Fifteen Miles

Fordson tractor engine, which was expressly designed for such heavy work. Consequently, the Fordson tractor engine is the logical power plant for cabin cruisers and other heavier boats, where the engine is expected to slug along all day under heavy loads.

When considering the use of the Ford car engine, we mentioned the limitations of the passenger car engine for boat use. But when we consider the use of the Fordson tractor engine, these objections are at once eliminated, as we get a husky brute of an engine that has been designed to stand the hard, continuous grind that an engine gets in a cruising boat.

There is no essential difference between working all day long pulling two plows under a boiling sun, or working wide open throttle driving a propeller through the water. Save that when the Fordson engine is installed in a boat, there is always an adequate supply of clear, cool water through the water jackets, and the engine is not choked up with dust and chaff.

This makes the Fordson particularly suitable for cruisers, where it is the long steady grind that

gets-you-there and brings-you-back. And so we show you a 28-foot cabin cruiser that is suitable for use with the Fordson engine. This particular cruiser was designed for amateur boat builders and either the knock-down frames or the complete hulls may be purchased.



Gear Driven Water Pump

When running in the open air over the water, the wear and tear on engine bearings and pistons will be far less than when plowing through a cloud of dust on the fields or roads. And then the Fordson tractor engine will have a fair chance to show of what splendid materials it is built.

There is a vast amount of difference between the strength of the 1-1/4 inch crank shaft of the Ford car engine, and the heavy, 2-inch crank

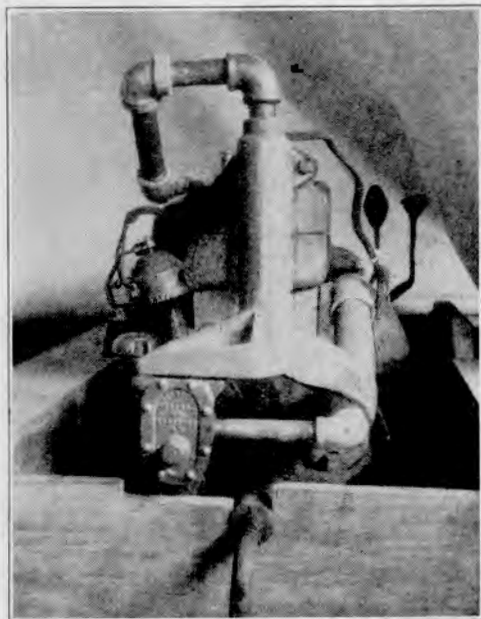


Engine of the Rambler

shaft of the Fordson tractor engine. And yet the Fordson engine is not rated to deliver much more horse power than the Ford car engine. For marine use, the Fordson engine can be expected to develop about 22 brake horse power at 1,000 revolutions.

One of the advantages of the tractor engine is that it develops its full power at a lower speed than that of the Ford car engine. The Fordson engine shows full power at 1,000 revolutions,

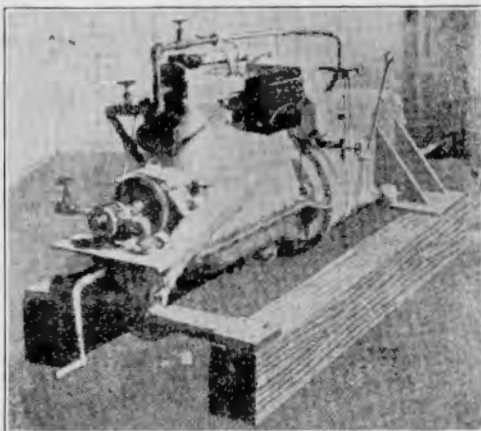
as compared with the 1,500 revolutions per minute or over at which the Ford car engine develops its maximum power. As a result of these considerations, the Fordson engine can reasonably be expected to develop about twice the effective



Hubbell Marine Cooler

push at the propeller that a Ford car engine will show.

Since we need only the tractor engine, we can either buy the complete tractor and resell the wheels and other superfluous parts. Or we can build up the engine from Fordson parts. If we build up the engine, then we should purchase the cylinder block assembly which lists at \$100; and which contains pistons, connecting



Fordson Marine Engine

rods, crank shaft, cam shaft, valves with practically all working parts and bearings already assembled. A rebored cylinder block costs even

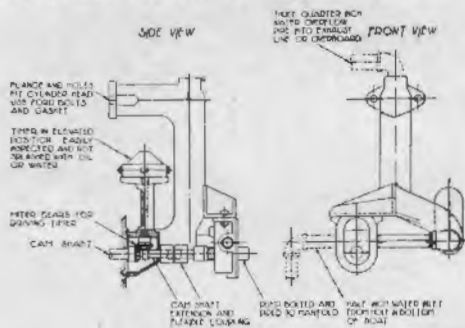
less, and will probably last as long as the average boat.

The Ford transmission can well be omitted, and a marine type of reverse gear used. Thus obtaining equal speeds forward and reverse. A marine reverse gear also includes a clutch, so the usual Ford clutch parts will not be needed. The heavy weight of the Fordson fly wheel is well adapted to marine use and no changes need be made at this point.

Either battery ignition or a high-tension magneto are easily installed on the Fordson tractor engine. While a water circulating pump of the gear type can be mounted on a plate fitted across the lower radiator connection. This water pump can be driven by an extension coupling attached to the front end of the cam shaft, or by a gear mounted on the crankshaft in place of the fan drive pulley.

Owing to the large size of the oil feed pipe of the tractor engine, it will probably provide sufficient lubrication, as this oiling system works nicely on hard work in the fields. Though if desired, an extra oil feed pipe could be added.

In spite of its extra large bearing surfaces and sturdy parts, the Fordson engine is so well de-



Good Water Pump Bracket

signed and built of such splendid materials that it is really not a heavy engine; as compared with the average marine engine of similar power, in which bulk of cast iron is often used instead of the fine steel that is used in the Fordson tractor engine. And so the tractor engine can be used in moderate weight boats to advantage.

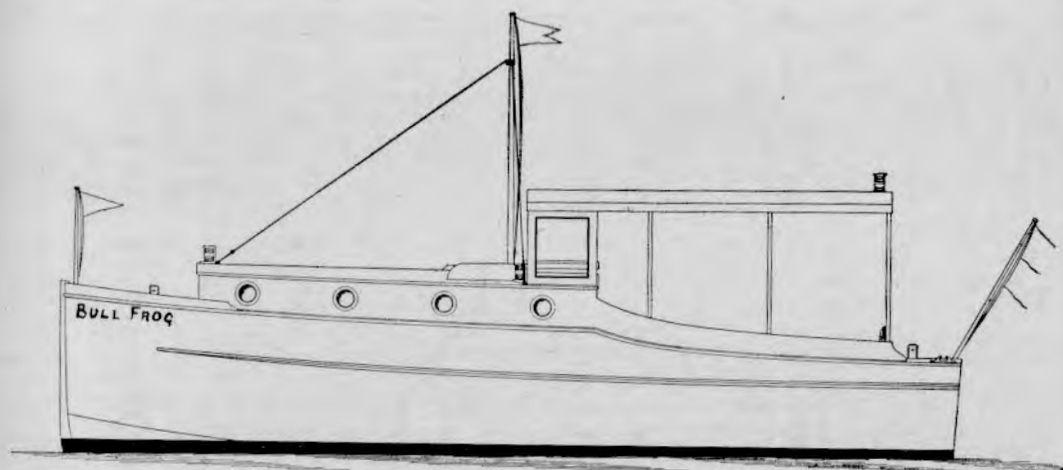
Kerosene As Fuel

One of the attractive features of the use of the Fordson engine in a boat is that both the Fordson engine and its fuel system were expressly designed for the use of kerosene as fuel—and they have proven successful in using it. Some marine engines are claimed to be capable of running on kerosene as fuel—but can they?

Since a crusing engine may run all day, it can burn up considerable fuel between sun-up and sun-down, or say 12 to 15 hours of summer daylight. At two gallons of fuel per hour, the difference between 25 gallons of gasoline at 30 cents, and 25 gallons of kerosene at 20 cents is just \$2.50!

Fordson Marine Fittings

One maker of marine fittings for the Fordson tractor supplies the necessary parts for mounting



Suitable Cruiser for Fordson Engine

the Fordson engine in a boat. These include a cross bar to support the front end of the engine, while two special side plates bolt to the sides of the differential housing, in place of the axle housings.

Instead of using the worm gear, the drive goes straight through. And the propeller shaft is coupled to the end of the usual worm shaft. With this arrangement, three speeds forward and one reverse gear are available, and the reverse is claimed to be more powerful than that of the average marine engine.

While electric lights can be operated from the Ford magneto when the engine is running, a Ford electric generator will have to be driven from the cam shaft or some other arrangement made for charging a storage battery, if the elec-

tric lights are to be available at all times.

One of the advantages of the use of the Fordson engine is that one can use the belt pulley as a *power take off* for the operation of power hoists for use with dredges and other workaday service. Concrete mixers or other devices could be driven by the same engine that propels the boat as required.

According to the makers of these fittings, a boat 38 feet long, 10 feet beam, has been driven at an actual test speed of 10 miles an hour. The speed of the boat was with engine running at 1,000 revolutions per minute, which is the normal speed of the Fordson engine at which it can run indefinitely. Second gear was used, and a Hyde three-bladed, 28 by 30 inch clockwise propeller was used.



My Ford and I

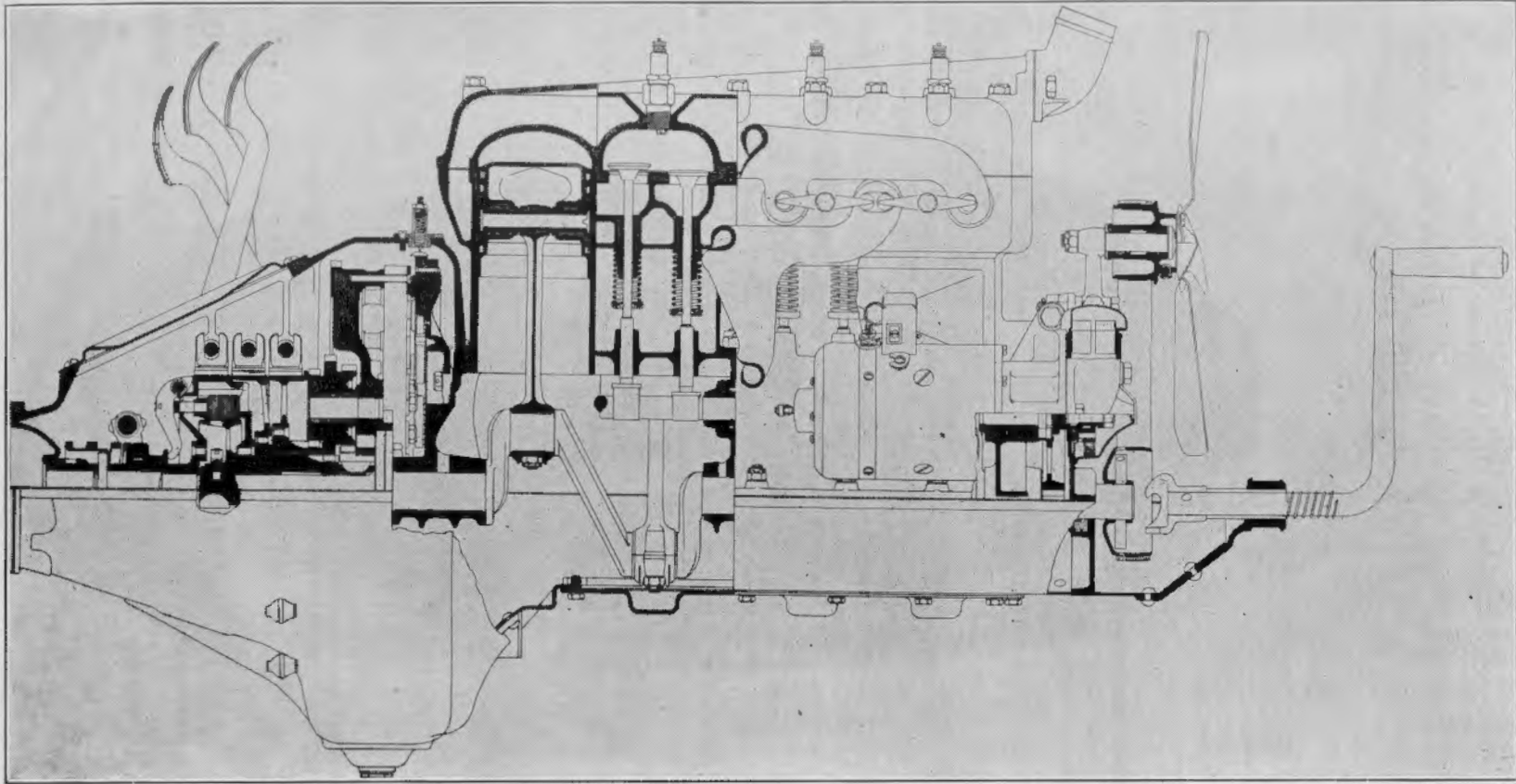
BY IDA M. THOMAS

My Ford and I
Can skim along
On any road—
My Ford is strong.

Though hills are steep
My Ford and I
Can always make
Those hills on high.

We win the race—
Forsooth, we must—
My Ford and I
Take no man's dust.

One scarce can see
Us scooting by,
We go so fast—
My Ford and I.



Sectional View of Engine and Transmission—Showing
Detail of Assembly

Ten Years in the Ford Field

IN looking down the ages ten years is but a fleeting moment. In consideration of achievement, ten years may at times be of as great importance as an age. After all, time is not measured in years so much as by the scale of what is done with those years. "We live in deeds, not in years."

Thus, in the Ford field, the past decade has been most significant. It has recorded the growth in the number of Ford cars from less than a million to over seven millions, with a tremendous development of this great manufacturing enterprise and its network of allied activities. It represents the greatest industrial achievement the world has ever known.

During this eventful period FORD OWNER AND DEALER Magazine has been in the fore-front of Ford activities. It has endeavored to represent the best interests of every man in all branches of the Ford trade and has helped the car owner to best benefit through his purchase. In harmony with Ford policies, it has offered the greatest possible value for the least money to all.

That we have succeeded is proved by the fact that this magazine is read in all parts of the world on this, its tenth birthday, and can claim thousands of loyal readers, many of whom have appeared on our subscription lists year after year.

To this world-wide clientele—this multitude of good friends whom we have faithfully served—we send our greetings at this time, while expressing our gratitude at the response which has met our efforts.

To you, also, we send the message that this tenth milestone does not in any way represent a goal. It is just a mark on the road—a road the greatest length of which still lies ahead. Our ambition is to serve you—and serve you better than ever before—for years to come.

Said Emerson, "We do not count a man's years until he has nothing else to count." We shall not pause, therefore, longer to talk of years that are past. There is much more to count; more work to do.

So, good friends, let us continue on together, in pleasant anticipation of active days to come.

1914



1924

Looking Backward



IN THE heart of a busy city and within a place where usually there vibrates the "hum of industry," I have found the deepest silence and complete solitude. What a crypt our offices become on Saturday afternoon. Out in the shop the battery of Linotype machines stands mute and unmanned; the familiar click and purr from the monotype rooms is stilled; the clacking of the plane and mallet of the "make-up" man is not heard; typewriter desks are closed and I miss the staccato of the keys which, throughout busy days, seems to carry the theme of a business symphony—strange music yet pleasant to the ears of those who have been reared in editorial rooms.

To these offices I have returned intent upon reviewing some business correspondence. Yet I find that it is no longer a place of business. It is rather become a "chamber of reflection". Matters of trade should not intrude into the sanctity of silence here.

So I stroll about meditatively. Where the quiet afternoon sunlight rests on a book-case I note that dust has settled on the shelves and volumes within.—I must call this to the attention of the char-woman.—Dust does not settle in many places around this busy institution.—But this bookcase is not often visited; it is a repository for things of the past, while we are mostly concerned with the present and future. Here are filed the bound volumes of past issues of FORD OWNER AND DEALER magazine. We do not often look backward.—Dust may settle here.—

But with every issue in this row of bound volumes there once was a present and a future.—Let us see.—Here is Volume 1, Number 1, April, 1914. There was some looking forward before this issue was ever printed—and the vision was true. Ten years have passed—and today that little magazine, hardly more than an idea at that time, has grown to several times its original bulk and has found regular readers in all parts of the world.

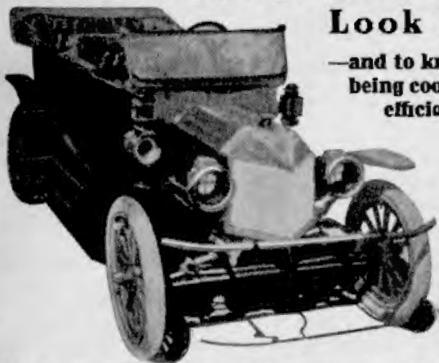
Looking Into Pages of the Past

Perhaps the growth of this magazine is accounted for by the first statement which I find on the first news page of the first issue. I read: "Published for your benefit—with no axes to grind."

"Published for your benefit" was a principle in these first issues when, because the Ford trade field had not developed to a point which it later reached, while an immense army of Ford car owners was growing and seeking more information about this newly popular car, the magazine was called "*The Ford Owner*" and appealed to car owners with a mechanical bent.

Later this principle was applied just as appropriately when the Ford trade became a mighty factor in the field and urged a revision in this publication so that it might include the interests of Ford dealers, service stations, accessory dealers and others connected with the industry.

Wouldn't You Like Your Ford to Look Like This?



—and to know that it is being cooled by the most efficient radiator built.

\$42.00

F. O. B. New York in polished brass finish. German silver Radiators, \$5.00 net extra.

We furnish an extended starting crank without extra charge.

Shipping weight boxed approximately 108 lbs.

Livingston Pointed Front Honeycomb Radiators for Ford Cars

The Livingston Ford type Radiator is a genuine honeycomb radiator and, so far as we know, is the only genuine honeycomb radiator being built and advertised for Ford cars. In other words, the Livingston is the only Ford type radiator in which every bit of metal employed has a direct radiating surface, with air on one side and water on the other side of the cooling surface.

Direct radiation gives the greatest cooling efficiency with the least weight. Pins and other methods of indirect radiation are only partially as efficient. Don't assume, because a radiator shows square air cells from the front, that it is a honeycomb radiator. Look at the water channels and see if all the metal gives direct radiation.

This Ad Which Appeared in Our First Issue Caught the Eye of the "Sensitive" Fordist Who Wanted to Disguise His Car.

It was then that it became "FORD OWNER AND DEALER", and the pioneer and leading publication for the entire Ford trade field.

How quaint some of these pages of ten years ago now look. Even the Ford car itself as pictured in this volume, brings a smile to us in these "Tudor" days. I find an article, "The Year 'Round Car" and through text and illustrations am informed how the Ford car—there was no sedan or coupe then—can be equipped with bodies which result in "A closed car with all the aristocratic appearance that could be desired, and as much comfort as would suit the most fastidious".—Well, in those days our enthusiasm for the good Ford car made us feel that these strange built-on bodies were "class".

Those were the days when self-conscious Ford owners, who were

This One Announced the Emancipation of Women—and Others—From Cranky Cranking. Note the Style of 1914 in the Illustration.



The Boston Starter

has stood the test of time on thousands of

Ford Cars

The most widely and successfully sold starting device ever applied to the

FORD CAR

SOME VALUABLE TERRITORY STILL OPEN
COMMUNICATE WITH US AT ONCE

Automatic Appliance Co.

172 Columbus Ave., BOSTON

1876 Broadway, NEW YORK

A Pullman Diner While Motoring



Eat
in
Your
Car

Going
Along
or
in a
Shady
Spot

Fresh cooked food and drinks, taken from home or obtained on the way, kept steaming hot 24 hours or ice-cold 72 hours.

NX STYLES

\$5.00 to \$50.00

EACH COMPLETE
FOR SIX

Fits in Any Car and Detachable. Illustrated Circular

UNIVERSAL MOTOR CAR COMPANY, Dearborn, Mich.

*Don't Laugh at This One.
It May Represent You of
Ten Years Ago. It was
a New Idea Then and De-
vised to Save Time and
Promote Mileage.*

The Year 'Round Car

How the Ford owner may, by the use of various kinds of equipment, change his Universal Car from the usual touring type to the most completely enclosed one—at expenditures varying with his taste and the degree of luxury desired.

This Page From the First Issue Told of Ways to Achieve Comfort Which Now Is "Built in." The Coming of the Enclosed Models Meant the Eventual Passing of Such Ideas Into the Past.

SUMMER driving, with nothing worse than the wind and dust for the motorist to contend with, requires but little in the way of special equipment. Spring and fall, also, demand but slight concessions from the motorist who would get the benefit of his car during those months. Winter, on the other hand, offers such severities that many motorists are prone to consider the difficulties insurmountable, and consequently we find the October numbers of many motoring magazines filled with articles on laying up the car, putting the car away for the winter, and kindred subjects.

The Universal Car, however, need fear the rigors of winter no more than the obstacles of a summer road. There is no reason for the Ford owner to tie up his car for three or four months, merely because the weather is cold or the roads rough. As for traveling the car is per-

fectly able to make its way, if chain-shod or fitted with good non-skid tires, over almost any kind of snow-bound road. In the big blizzard which isolated Cleveland and the surrounding country a year ago the Ford was most often the first means of communication between the main part of town and the outlying villages, and Fords were making deliveries of groceries and milk in places where the owners of horse-drawn vehicles, despite doubled teams, had to confess defeat.

The usual reason for withdrawing the car from service during the coldest months of the year is not the inability of the car to cope with the added difficulties, but rather the disinclination of the car owner to subject himself to the cold. The Ford, factory equipped with top, wind shield and side curtains, is scarcely well enough outfitted to give the car owner a very warm vehicle for any long drives unless

he so muffles himself in extra wraps that he is uncomfortable—and unpleasant when he arrives at his destination. Though the curtains furnished with the car give adequate protection against the rain and storm, they are so hard to handle, practically requiring the services of some one outside of the car for their proper manipulation, that the average Ford owner would rather tie up his car than bother with the curtains.



A closed car with all the aristocratic appearance that could be desired, and as much comfort as would suit the most fastidious.

a bit thin-skinned about the "flivver" and "Tin Lizzie" epithets (which, after all, was valuable if not complimentary publicity) were willing to have their cars wear disguises. "Wouldn't You Like Your Ford to Look Like This?" asks one advertiser, who, by means of a different style of radiator and other devices changes Ford features.

And starting devices—they were in their heyday Readers were informed that cranking the car was passé. Step on the lever or tug at one and whirr—the engine was started. If you wanted to be real radical you might install an electrical starting and lighting unit.

"Woman and Ford Cross Desert" is the startling headline of an article telling of this pioneer achievement on the American desert. Nowadays the editor has dozens of such accounts come to his desk.

"The Ford is a social asset not to be lightly valued by the man who is fortunate enough to live away from the larger centers of population", claims a statement on another page.

Yes, and there is news here. "John McGraw, manager of the New York Giants, drives a Ford roadster." Another item: "The Ford company averaged 1000 cars a day." Then we learn, "The Ford company has built half a million cars."

Of course, the bulk of the pages is devoted to helpful articles on car repair, on solving troubles, on methods or realizing more economy from the economical car. Then there are notes and articles on the accomplishments of car owners and dealers. Every issue in this volume shows growth in interest and value, yet, in the light of present day publication, how elementary it all seems.

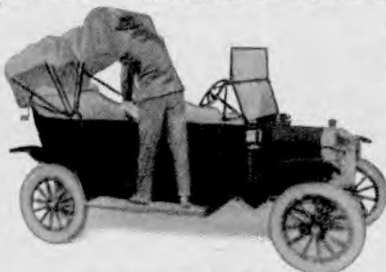
Well, a lot can happen in ten years, as the saying goes. And a lot did happen. And there is an analogy between the car and **FORD OWNER AND DEALER**. With the Ford car the changes have been such improvements as could be made without greatly changing the fundamental points of value of the car.

So with this magazine—the fundamental principles have never changed. "Published for your benefit—no axes to grind," and turning back to the first issue in this volume I find another statement: "Straight before us—you the readers and this your magazine—stretches the road to the desired goal of a successful publication—the confidence and support of its readers. Our car has been carefully oiled, the gasoline tank supplied, the motor is cranked and the car moves on."

A ONE-MAN TOP.

The Perkins-Campbell Co., of Cincinnati, O., make a line of accessories for Ford cars, which includes, among other useful and serviceable devices, a one-man top, and a combined sleeping blanket and lap robe.

The top, which they call the O-M-O-H (which stands for one man, one hand), is well constructed and will add to the appearance of any Ford car. The makers claim that it can



PERKINS-CAMPBELL'S O-M-O-H TOP

be raised with very little effort by one man in ten seconds. This is a big convenience, as you will realize when you think of the number of times you have driven through a shower and gotten wet, rather than go to the trouble of putting up the standard top. The O-M-O-H

*Fortunately We Do Not Need
This Now*

"Moves on" indeed. For ten years it has been on its way. But like many a boasted Ford car, it is now "running better than ever" for, inspired by the response of the great Ford field throughout the world, its drivers still behold a long and useful road ahead.

I well recall the first day I walked into "Daddy" Brownell's office at the Ford Motor Co., Detroit.

"Young man you have a great idea" he said. Follow the ideas of Henry Ford and you must succeed. Give your readers the best magazine you can possibly produce and your readers will multiply and your advertisers will make good."

That visit was a fortunate one for me. I then determined that the adage, "He who serves best profits most" was a mighty safe plan to follow. If it could make Henry Ford the biggest manufacturer of automobiles in the world, it could also make me the biggest publisher of a specialized Ford publication.

And so I have followed "Daddy" Brownell's advice. FORD OWNER AND DEALER has each month produced the best magazine we were capable of printing.

But enough of looking backward. I have said that it is the policy of this house to look ever forward. I have enjoyed my reverie into days gone by. So back onto your shelf, old volume. During the next decade may the great Ford organization thrive, and at the end of that time, may there be ten more volumes added to the nine which now keep you company.

I leave the quiet office, which on Monday morning will buzz with renewed activity—looking forward to the production of bigger and better issues of the pioneer magazine of the Ford field.

W. C. Apple

Publisher of Ford Owner and Dealer

Old Friends

J. B. Hess, of Spring Valley, Ohio writes: "Have taken your magazine since 1915, and like it fine." Nine years is an enduring friendship—can you beat it?"

Started Right and Kept Going

MOSTLY everybody knows the Atwater Kent Manufacturing Company of Philadelphia. We claim them as our good friends, as they have been since the start of this magazine. Here is what they say:

"During the many years that we have advertised our Ignition Systems for Ford cars in FORD OWNER AND DEALER, we have had excellent returns and therefore continue to reserve space therein."

Just Between You and Me



FORD CARS are not the most interesting thing in the world to me—I find you men who own and repair the cars much more interesting. The readers of our magazine are a representative group of all United States (and many foreign countries). I often feel that if I could understand you, I would understand our America.

With all our thousands of readers, each one of you from whom I have received letters has a distinct individuality. That is one feature that makes the selection of reading pages that will interest you so difficult. Almost every mail brings some interesting surprise to liven up the work and make it a pleasure.

But the part that I like best of all is that our readers are so honest and friendly. That is the richest lesson I have learned in my ten years of experience with you. For that I must ever be your debtor, as faith in one's friends is a long start on the road to happiness.

Writing technical articles for you is far more difficult than it might seem. When one uses dimensions in thousandths of an inch, or tells exactly how an operation should be done; then the writer must be altogether right, or the poor writer will be altogether wrong! A writer can play safe by saying "a greater distance"—which does not mean much. But if he says: "At .027 inch," when it should have been .031 inch—then he is altogether wrong.

Since many of you are foremen of repair-shops or expert mechanics, I realize that when I attempt to "Teach grandmother how to suck eggs," I must watch the egg! So far as I can remember, no technical errors have appeared in the magazine which have not been challenged by watchful readers. I am glad that you have done so. Such help enables me to make it right the next time, and I do not wish to live in any Fool's Paradise of undiscovered errors.

Realizing that my work is to be judged by competent (but fortunately friendly) readers, I often write portions of a story over and over again, tearing up one page of copy after another as not being good enough for you. You are entitled to my "very best" in every way—and so I greet you, as from one friend to another!

Cheerfully Yours,

Murray Fahnestock



Then
1914

*Ten Year's Development
of the
Ford Car*

(See Detailed Article Beginning on Page 126)

Now
1924



You Readers Make the Managing Editor's Job Worth While



H. J. LARKIN
Managing Editor

NEARLY every mail brings at least one letter to my desk from some reader who tells us just how well he likes FORD OWNER AND DEALER MAGAZINE. This is a pleasant message, of course, but I often think that the reader gets only half of the enjoyment out of this magazine. The other half comes in being the Managing Editor.

Now please get me right, as they say. I don't want you to think that the M. E. spends his time in driving a Tudor back and forth from a golf course. We all work here and no special favors are shown me. The fact is, most managing editors believe that they do all of the important work around the place. Whether this belief is justified, however, I will not state, since a similar one is held by the office boy—or most any other employee, anywhere.

Still, I maintain that I do work—but it's mighty pleasant work, and that's what counts. To my office comes all of the editorial material that appears in your magazine—and a whole lot that does not appear. There are many more aspiring writers who can't than able ones who do. To the former we try to be nice, anyway.

The Managing Editor must decide just what each issue of the magazine must contain and then he must see to it that all of the material is available. He must find it somewhere and see to it that it is all in type and engravings by press time.

Very often he has to go and get it and that is where the best part of my job lies. I have travelled a good many thousand miles in order to get out the right sort of magazine, but my reward has been greater than is covered in the salary check. The big recompense has been the friendships made throughout the Ford organization.

Up in Minnesota, down in Virginia and at most everywhere else I have met Ford dealers whose friendship and association I value highly. More than that, I have learned from them.

In Detroit I have enjoyed meeting most of the "boys," from Mr. Ford to the little chap who announces your call at Highland Park. I have found all of these men to be of the sort whom you will call up or taxi out to see when you get in their towns, just because they are regular fellows.

Then there are those in the various branches of the game—manufacturers, tractor implement distributors, garage men and others with whom I am always glad to spend as much time as they will allot to me, for I know the visit will be interesting.

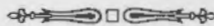
Through correspondence I have made many other acquaintances with contributors, car owners and men in the trade whom I hope to meet personally some time.

I remarked at the start of this article that we receive words of commendation for our work. That is the big point of satisfaction. It is real pleasure to know that I am an active part of a magazine which is serving these friends of mine in good stead and helping them in their work. It is gratifying to know that I may be able in some way to help them in the field in which we both work and it just naturally makes me more determined to do a little more and better work for them.

So I say that my work is also a lot of pleasure. But I must thank you for that fact. Without you—well, come to think of it—without you this job would not exist.

Sincerely yours,

N. James Larkin



Our Editor-in-Chief

ONE of the most interesting events of the day in the editorial department is the arrival of the mail from our readers. One letter will be from Florida, and the next from Maine, then one from England, and one from California. "Age cannot wither or custom stale, their infinite variety!"

One mechanic will wish to know how to make babbitt stick to connecting rod bearings, another will wish information as to the exact diameter of Ford crank shaft, another will wish to know where a trailer axle can be bought. All such letters are read and answered as promptly as possible—though there are times when, in the rush of getting the magazine to press, the answers to individual letters must be delayed.

Some letters request that articles on certain subjects be published, some ask for information that can only be handled in a magazine article, while from other letters we indirectly glean ideas for stories.

Receiving thousands of letters each year, we feel that they are straw-votes, representing the general will of our big boss—Our Subscribers. We realize that the enduring success of a trade magazine is founded solely on the real service it renders to its subscribers. Consequently, while we cannot change our magazine to meet the ideas of each individual subscriber, yet we do our very best to conform to the wishes of the majority. That is why this magazine is dedicated to our readers—who are the real Editor-in-Chief of the FORD OWNER AND DEALER.

What Ten Years of This Magazine Mean in Round Figures

THE auditor of the Trade Press Publishing company rushed into the editorial department.

"I have it," he announced rather excitedly.

"Ah ha," said the editor, "A new Ford timer, or certainly the mechanical solution for chattering or the correct principle in shock-absorbing. When did you join the great army of inventors of devices to improve the Ford car, Arthur?"

"No—it isn't that," said Art, "It's the figures showing just what ten years of publishing FORD OWNER AND DEALER mean."

"Now listen, Arthur," said the editor. "You know this department knows nothing about figures. All we know is that they are mathematical accessories which you and the advertising department use and talk about. We are aesthetic, not mercenary. We create the bills and you fellows pay them."

"For once I am not going to talk about money," said the auditor. "I read in my book of etiquette that one should not converse on subjects with which the listener is not acquainted. I just want to tell you some facts and so that you will be able to understand them, I have some pictures here which will help you follow me. Now here is exhibit A," said the figure wizard, producing the sketch shown herewith.



"This represents the relation between the number of FORD OWNER & DEALER magazines we have issued in ten years as compared with the height of the Woolworth building. If we could form a single pile of these copies, just one on top of the other, the stack would be 35 miles high, or about 235 times the height of the world's highest building. If we laid the magazines flat and end to end, they would reach 1100 miles, or one-third of the way across the continent.

"Now look at Exhibit B. It represents a train $1\frac{1}{2}$ miles in length, or about 150 box cars. Such a train could be necessary to carry the paper which has been used in printing our magazine for ten years. That paper would weigh 5,400,000 lbs.

"If we had the empty cans that once held the ink with which we printed the ten year's issues and strung them together, they would reach from the shores of Long Island out to the 'three mile limit,' " next advised the auditor.



Exhibit B.

"Keep your mind on your business—why talk about pleasure when there is so much work to do," said the editor.

"Well, that dimension is just a coincidence—and again, I am following the advice in my book to talk about what my listener is interested in," continued Arthur. "That ink would weigh 48,000 pounds."

"Now Arthur, you wouldn't kid a poor editor what's trying to do the best he knows how, would you? You aren't handing me a lot of hocus are you?" asked the Ed.

"No, sir," assured the auditor, "those figures do not lie. I have given you conservative estimates, carefully checked. Now this last exhibit shows you and Murray Fahnestock writing articles for the magazine. Then of course there are a number of other contributors. I have figured up the approximate number of words of advice in each separate issue which we have printed for the benefit of the Ford field during ten years of publication."

"Wait," said the editor. "Go easy—I've had a lot of work getting up this anniversary issue. I can't stand a shock."

"Well here's the answer in round numbers," said the auditor showing a sheet of paper covered with figures. "The amount is—325,600,000,000 words."

But the editor had swooned.



Exhibit C.
Giving Wings to Words

Birthday Greetings

Now comes our good friend, G. R. Gilbert of Birmingham, Ala., who says: "Since FORD OWNER AND DEALER was in its infancy I have not missed a copy and always look forward to the next issue with a keen appetite."

Contemplations and Greetings From Our Advertising Director



THEY tell me that it is just a decade ago that FORD OWNER & DEALER first greeted the world and the dates seem to indicate that they are right. To me however, it seems that I have been with the publication but a very brief spell although I distinctly remember going "on the road" with this first number.

In trying to analyze why the time has flown so swiftly I know that it must be because, first, I sincerely love my job; second, I feel that I have truly been of real service to hundreds of manufacturers with the aid of our splendidly equipped organization and last but not least, because this publication, like the Ford car it is devoted to, has made steady progress from year to year. We all like to be associated with a winner and the same thrill that I received winning my first ball game while playing "short" on the school team, comes to me each month as I experience some new accomplishment.

The first issue of FORD OWNER & DEALER Magazine back in 1914 really marked the beginning of a new era in publishing and advertising to the extent that never before had there ever been a publication devoted exclusively to one make of automobile and never before was it possible for manufacturers to bring their message so forcefully before owners and dealers of one make of car. This magazine was truly a specialized class journal. It opened wide the doors to the great Ford market and advertisers walked right in. It was a magazine for Ford car owners, dealers, mechanics, salesmen and those interested in Ford car repairing. They all flocked in as subscribers and I wish you could read some of the letters received this week from individuals who have been reading FORD OWNER & DEALER regularly for ten years.

Great has been the progress of the Ford car, the Ford accessory industry and the FORD OWNER & DEALER Magazine in these short ten years. In 1914 the Ford Motor Co. produced 308,213 Ford cars. There are now approximately seven million Ford cars in operation. The Ford accessory industry has developed to a point where its total volume for the past year aggregated approximately \$125,000,000.

Being the original publication devoted exclusively to the Ford car we very quickly sensed the tremendous amount of good a magazine of this kind could exercise in a field which was destined to be the greatest in the history of the commercial world. Here was an automobile that sooner or later would reach a volume of production that would make possible the existence of a very large number of dealers who could and should equip themselves properly to give the very best kind of service to Ford car owners everywhere. Ford dealers alone, on account of the great number of cars they could and would sell, were in a position to install all kinds of shop equipment and labor-saving devices that would insure maximum service at minimum cost to their customers. What a golden era had dawned for manufacturers of all kinds of accessories and devices,

designed and manufactured exclusively for the Ford car, to increase the efficiency and enhance the comfort of the ever-growing number of Ford car owners!

The whole business, including the Ford car, special equipment for the Ford Truck and Fordson Tractor, Ford accessories and devices and the publishing of our own magazine has been a romance, a real joy and satisfaction, not only to me but to everyone connected with this organization. I had formerly been engaged in advertising work not only with advertising agencies but with large manufacturers, but never was there the interest for me nor the opportunity to help others that has been my good fortune in my present occupation.

There is hardly a day goes by that I do not get a letter from some manufacturer telling me of some remarkable experience he has had as an advertiser in FORD OWNER & DEALER Magazine. You readers are surely somewhat interested in the advertising angle of the publication which you read so carefully each month. One manufacturer of a Ford piston wrote that he had received between 7,000 and 8,000 inquiries, some of them from as far as China, Australia and other parts of the world as a result of three months advertising with us. Another advertiser wrote me that he had received over 500 inquiries from Ford dealers on a digger, a special piece of equipment attached to a Fordson tractor. Still another wrote that he had received approximately 1,000 inquiries from Ford dealers throughout the world on a special body, although he had only been advertising for about three months.

Having been identified with the Ford field in a most intimate manner for the past ten years I have naturally been in a position to aid many new manufacturers about to market something new in the Ford field. I have always endeavored to have the subscriber in mind when conferring with such manufacturers. Did the product have merit? Did it really give the Ford dealer or the car owner something that he did not have before? Was the price reasonable? Would it do all that was claimed for it? I feel, frankly, that this organization has played no small part in the development of the Ford accessory industry and in placing before millions of Ford car owners new devices and products designed for the added efficiency or riding comfort of their cars.

This is the first time in ten years, I believe, that I have had the opportunity to extend my greetings to our thousands of interested readers. I truly congratulate myself and the publication on having such a faithful following as we reach our tenth milestone. I have a lot to learn about the great Ford field and any one of you Ford "fans" can undoubtedly add to the information which I am trying to store up from day to day. I assure you that I drive a Ford Tudor Sedan myself and would not exchange it for anything but a Lincoln.

In conclusion I want to say to subscribers and advertisers alike that it is a keen pleasure to me to take this opportunity to extend personal greetings and good wishes to you all. The whole association is honestly more to me than a mere business relationship. It has been a genuine pleasure to talk and exchange communications with you and I want you all to feel free to take advantage of such information as we have, such service as we are able to render and to ask freely for our co-operation at all times.

Cordially yours,

Chas. E. Goulston

A Visit With Us in Our Home



TEN years ago when the present FORD OWNER AND DEALER Magazine came into existence, the Trade Press Publishing company was well established in the class magazine field, having issued several trade publications for a number of years.

At that time, however, this company was not the institution that it is today; ten years have meant a big development of plant, resources, facilities and personnel. Form a modest little group of offices and a small print-shop, in which only a small part of the mechanical work was handled, has grown a most complete and modern publishing house as well as one of the largest type composition plants in the northwest.

It requires an institution of this size and capability to properly issue a magazine as complete as FORD OWNER AND DEALER and which is circulated throughout the world.

In the following pages we show photographs snapped in the various departments of the Trade Press Publishing company, home of FORD OWNER AND DEALER and, in order that you may better understand the need and functions of these departments, let us here take a "little journey" through the plant, watching the various processes and activities.

The first step in the making of any magazine is the preparation of editorial matter. Into the Editorial department every day comes a mass of correspondence, much of it containing manuscripts—contributions from writers everywhere. These must be read, filed if accepted and returned with a letter if not available.

In the meantime our staff writers are busy writing the many articles which are prepared by ourselves.

About one month and a half before an issue, all the material intended for it is gathered together and prepared for the printer. Illustrations intended for use are carefully marked for the engraver who promptly turns them into plates for printing. The editorial matter is then ready to be sent to the composing room.

Advertising Department Is Busy

During this time the advertising department is kept busy in gathering advertising copy—(that necessary element that pays the bills)—from all parts of the country. Our several district managers make daily calls and send in the copy and plates, if the advertising is prepared by the advertiser.

In many cases the advertising is prepared in our Service department at the home office. In this department are technical men, advertising writers and artists who study the product of the manufacturer and, knowing the Ford market, plan and prepare the proper kind of advertising to bring best results. All art and engraving work is routed through this department.



Here is our "Chief," Mr. Harry A. Apple, president, publisher and editor-in-chief, seated at his desk where he spends most of his time in the work which he best enjoys.

Meet our Vice President and advertising director, Mr. Frederick L. Goulston, who has had much to do with the advertising destinies of many successful manufacturers of Ford equipment.



Left—The business manager must be in touch with all departments. Here is Mr. Paul C. Treviranus, secretary-treasurer and business manager caught at a busy moment at his desk.



This is a corner of the busy Editorial Department which is the clearing house for all material published in each issue of this magazine.



A part of the Service Department where advertising layouts are prepared and much of the worry taken off the advertisers who may not have facilities for preparing their material.

The hundreds of accounts handled by this magazine require capable accountants and modern systems. Both are found in this busy Auditing Department—which is beloved by all for the reason that from this place come the salary checks.





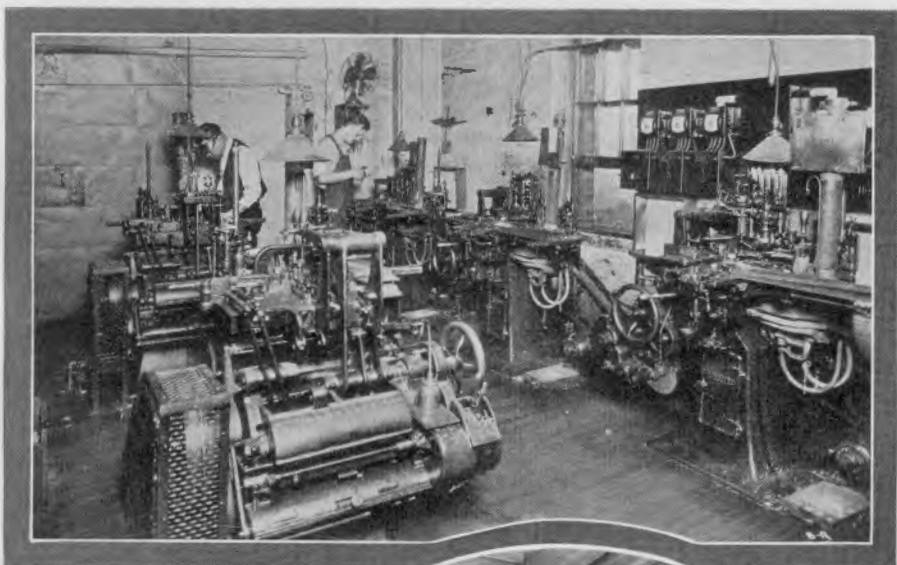
Above is the Circulation Department where hundreds of letters are received from all parts of the world bringing subscriptions to this magazine.



The name of every subscriber is stamped on metal plates and filed in this Addressograph Department which each month addresses all the envelopes which contain the magazines.

Below is the office of the Composing room where all material to be set in type is reviewed and marked for size and arrangement.

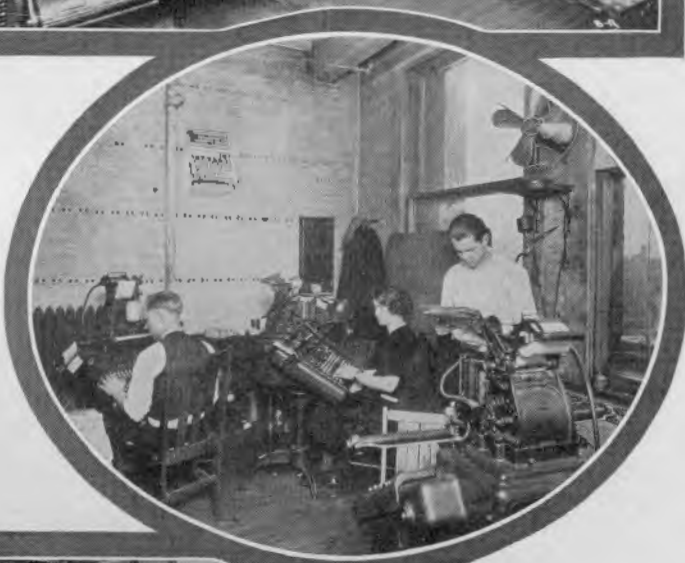




Above is part of the Monotype Casting Room where type is molded and set by intricate and busy machines.

On the Monotype keyboards shown here, patterns are made for the casting machines which automatically set the type as indicated.

Below is a battery of Linotype machines which daily set thousands of lines of type which you later read in this magazine.



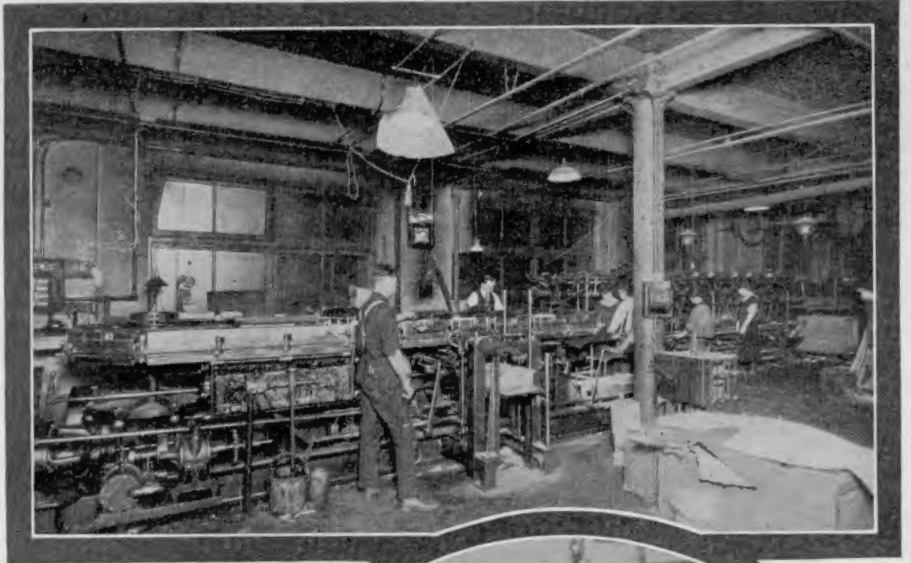


Above is a section of the Make-up Department where type is made up into pages and forms, ready for the press.

"To err is human." That is why we have this department where keen proofreaders carefully scan every line of type that appears in the magazine.

Five times the area shown below is covered by the Press Room where mighty presses are kept busy most of the time in printing this magazine.

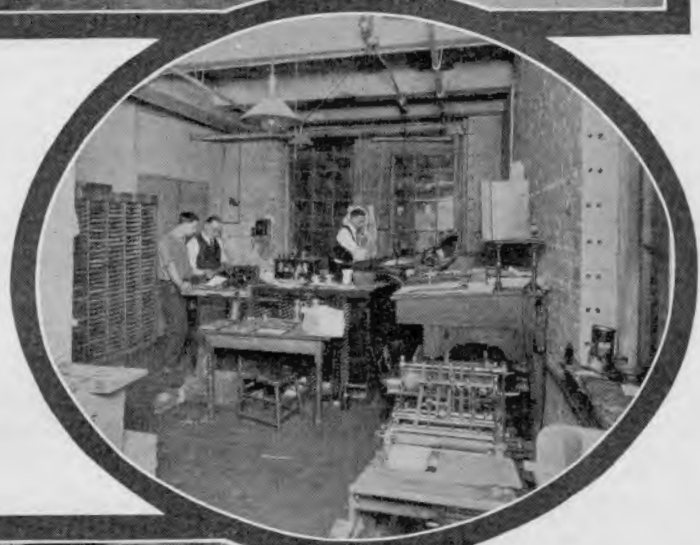




When printed sheets leave the press they are folded and bound on this speedy binding machine shown above.

Here is where office forms and stationery for our own use, as well as proofs for the advertisers, are printed.

Below is a part of the mailing room where speedy young men insert the magazines in the envelopes, pile them into mail bags and load them on trucks which carry them to the Post Office.



Advertising copy also is then prepared for the printer and started on its way through "the shop."

The Composing Room

When copy is received in the composing room it is turned over to the foreman who allots it to either the monotype or the linotype department. Here it is speedily converted into set type on one of the many machines which hum busily all day long, under the hands of skilled operators.

It is then "proved up"—roughly printed on sheets—which are turned over to the Proof department. Here it is carefully read and compared with the original copy by trained and watchful proof-readers. If any errors appear, they are marked and the corrections made, when the proof is again read.

Advertising copy, then in type which has been read for error, is turned over to the "make-up" department where it is made into pages or smaller units according to the size of the advertising. Proofs of these ads are then returned to the advertising department which retains one proof and sends others out to the advertiser for his O. K.

Proofs of the editorial matter, after being read, are returned to the editorial department and are made up into "dummy" pages. By this is meant the pasting on page-size sheets of proofs of reading matter, with engravings, just as it is to appear in the finished magazine. These dummy pages, with similar ones bearing the advertising, are then sent back to the composing room where the complete pages are made up, with the page numbers and dates of the issue inserted and the pages receive the final reading and correcting. The pages are then grouped into units of thirty-two consecutive pages and the corresponding type matter is then made up into a "form" which goes to the press room.

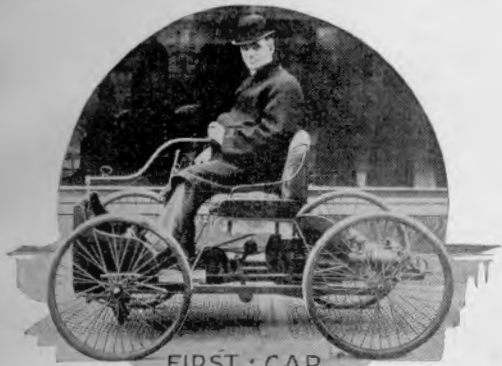
Here the forms are printed on sheets which then go to the folding machine and on to the binding machine which gathers the several forms which make up a complete issue, as well as the cover, and binds the entire issue automatically, after which the cutting machine trims and finishes the magazines.

Addressing and Mailing Departments

In the preparation for the coming issue there has been plenty of activity in the Addressograph department. Here all of the names of subscribers which continually pour into the Circulation department where they are entered and acknowledged, are sent to be stamped on metal plates by special machines. These are indexed with the date of receipt and filed by country or state and city, as well as alphabetically, and placed in metal cabinets.

Prior to the issue, these plates are run through the Addressograph machine and the thousands of envelopes which are to carry the magazines throughout the world are all properly addressed. It is an interesting bit of geography to scan these plates, since they include names of places in some of the most remote parts of the globe. There is hardly a country which does not receive copies of FORD OWNER AND DEALER.

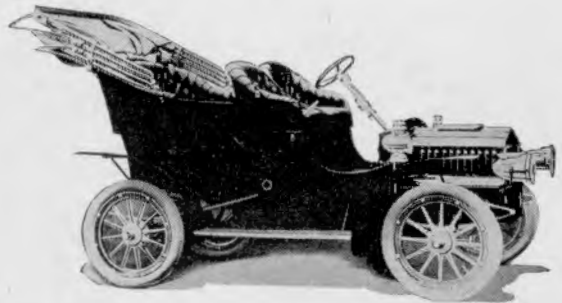
The completed books and magazines and the mailing envelopes arrive together in the mailing department. Here speedy young men promptly insert the thousands of magazines into the envelopes, or pack bundles intended for news-stand sale, and trucks presently carry huge sacks to the postoffice—and FORD OWNER AND DEALER is on its way to its thousands of eager subscribers in the Ford field everywhere.



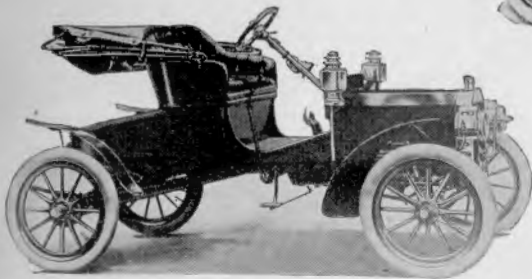
FIRST CAR

Mr. Ford in His First Model

Some Ford Cars of the Past



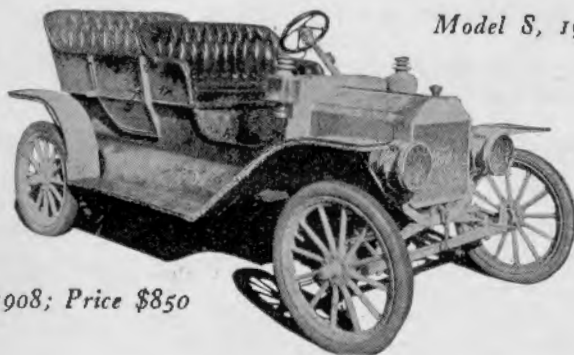
Model F, 1909; Price \$1,000



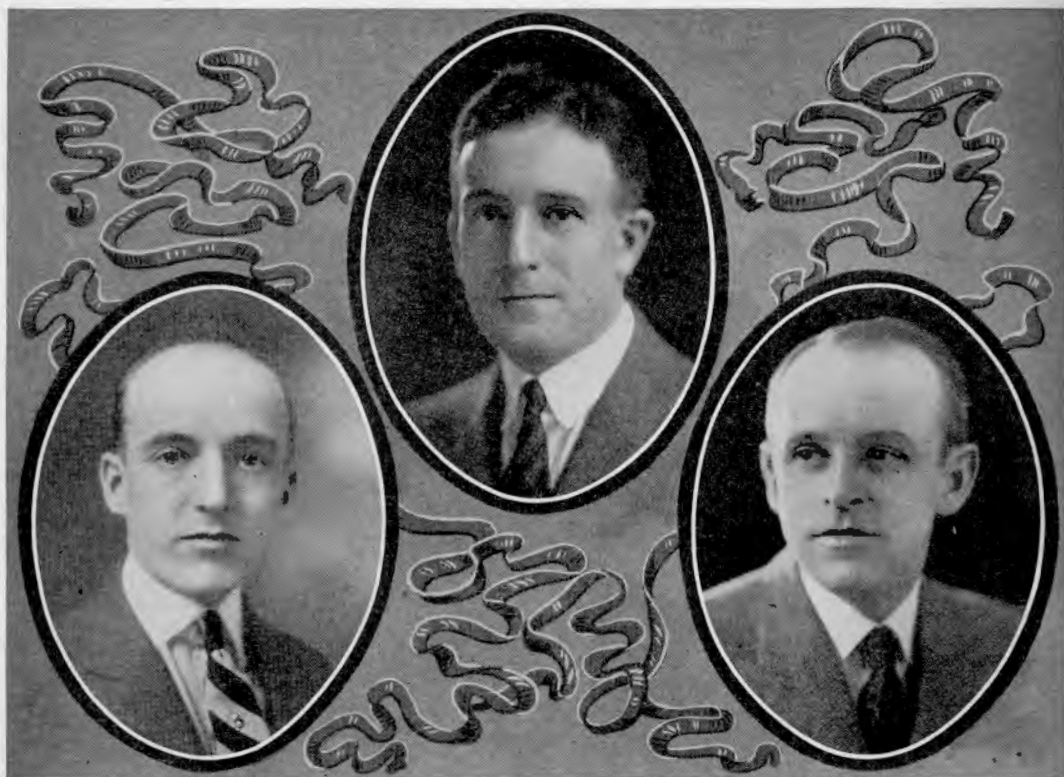
Model N, 1906; Price \$600



Model S, 1906; Price \$750



Model T, 1908; Price \$850



FREDERICK L. GOULSTON
*Vice President and
Advertising Director*

HARRY A. APPLE
*President and
Editor-in-Chief*

PAUL C. TREVIRANUS
*Secretary-Treasurer and
Business Manager*

Pleased to Meet You, Readers!

HERE in these pages the executives of FORD OWNER & DEALER Magazine introduce themselves to you. Most of us have worked with you for years and have had the pleasure of meeting many of you personally. We would like to shake hands with all of you, but since you are numbered in thousands, of course it can't be done. Yet, even now, we feel well acquainted.

HARRY A. APPLE has been associated with advertising and publishing work since his college days and joining this company fourteen years ago is now president, publisher and editor-in-chief. It might be remarked that through years of intimacy with the Ford field, it is probable that there is no one better acquainted with merchandising in this tremendous market.

FREDERICK L. GOULSTON had much diversified advertising experience in eastern markets before he brought himself and plenty of ability westward to join the FORD OWNER & DEALER staff in his present capacity. Under the guidance of Mr. Goulston's department many a manufacturer of Ford equipment has built big success.

PAUL C. TREVIRANUS has always been associated in the executive branches of publication work, and brings to FORD OWNER & DEALER the ability fostered by wide experience. As business manager, all activities of this magazine are familiar to him.

JOHN L. MEYER

Associate Editor, who greets you from the top of this column has had many years of experience in Editorial Departments of leading newspapers and magazines. He is recognized as an expert in magazine make-up and a clever judge or articles for trade magazines.

EDMUND C. KRATSCH

Associate Editor, is an able journalist and speaker, as well as an economist and writer of business articles. He has contributed many enlightening articles to the automotive trade.

CHESTER H. DU CLOE

One of the younger members of the editorial staff, is a product of a leading school of journalism and his ability is reflected in judgment of editorial matter as well as facile writing talent.

HENRY F. THURSTON

Field Editor, has secured interviews with Ford dealers and car owners in all parts of the country and his articles have been read with interest and profit by thousands of readers.

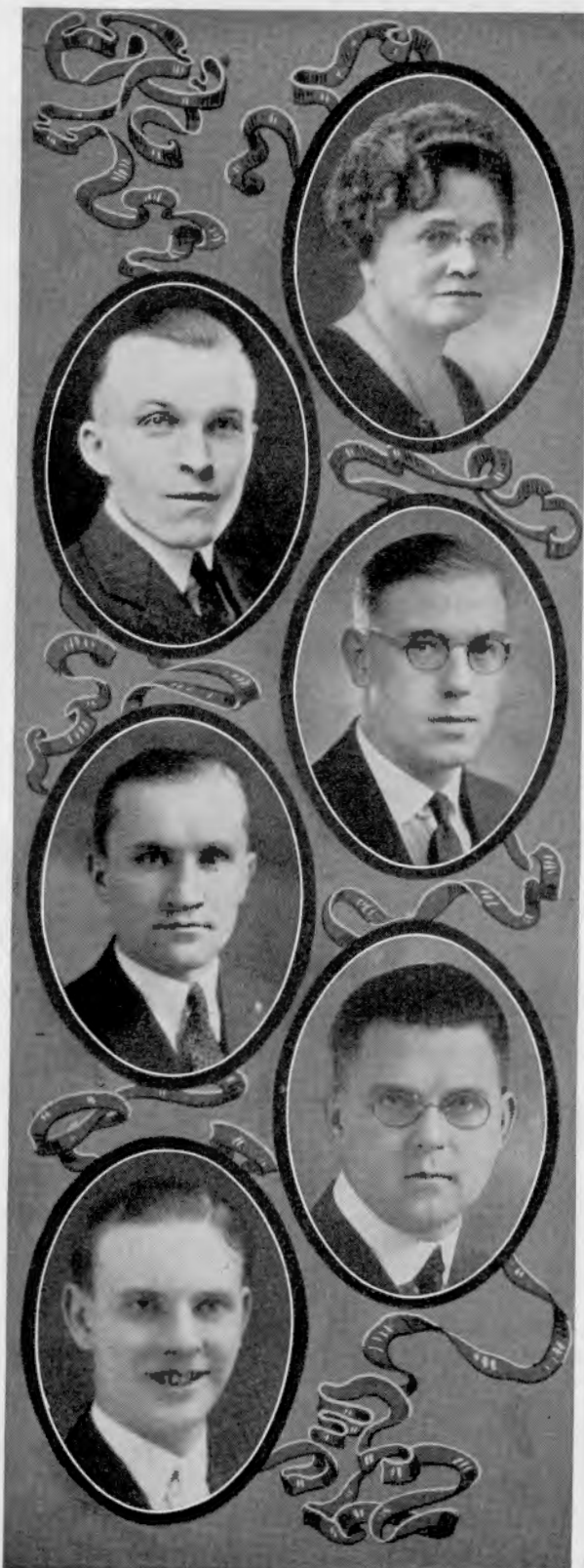
A. L. WARNER

Director of the Service Department, claims versatility through being a capable artist and advertising man. He has also spent a number of years in active merchandizing of automotive products.

GEORGE A. JUST

Manager of the Typographical Department, is nationally recognized as an expert on typography and all mechanical phases of magazine production. He has had wide experience in his field.





MISS BERTHA H. BOETTCHER

Cashier, has been with this magazine since its first issue, and consequently knows its entire story, more especially that touching on its financial phases.

ARTHUR C. ROSSOW

Auditor, presides over the books and finances. His experience has been thorough in many mercantile branches, but his preference is for publishing.

CHARLES I. JOHNSON

Credit Manager, is the man who passes upon the financial standing of advertising accounts, but is pleased to state that most all of those with whom we deal are "good pay."

WINFRED J. BRAUN

Circulation Manager, knows every subscriber by name or at least can easily find the name in his efficient department. If you do not receive your copy regularly just tell Mr. Braun.

C. L. FIRNHABER

Superintendent of the Composing Room, has plenty of work to do every minute during the day. But it happens that he is a most capable manager and so the work is done right up to the minute.

DANIEL A. DEKU

Manager of the Addressograph Department sees to it that every name of every subscriber is carefully plated and filed. Then it is his duty also to supervise the mailing of every issue.

CLAIBORNE M. GARRETT

Our New York representative, is well known on the eastern coast. Mr. Garrett has been with this magazine since his Harvard days, with the exception of a period abroad during war-time. He is an aggressive advertising getter.

DON L. PROUTY

Detroit representative who has had many years of experience in automotive sales and advertising, and is always alert to offer the benefit of this experience to a prospective advertiser in our columns.

EDW. J. KEYS

If you are a manufacturer of automotive devices anywhere near Chicago you have met "Ed" Keys, our representative in that district. Mr. Keys has been on both sides of the fence, being at one time a buyer of advertising and well acquainted with merchandising angles.

M. M. SHURMAN

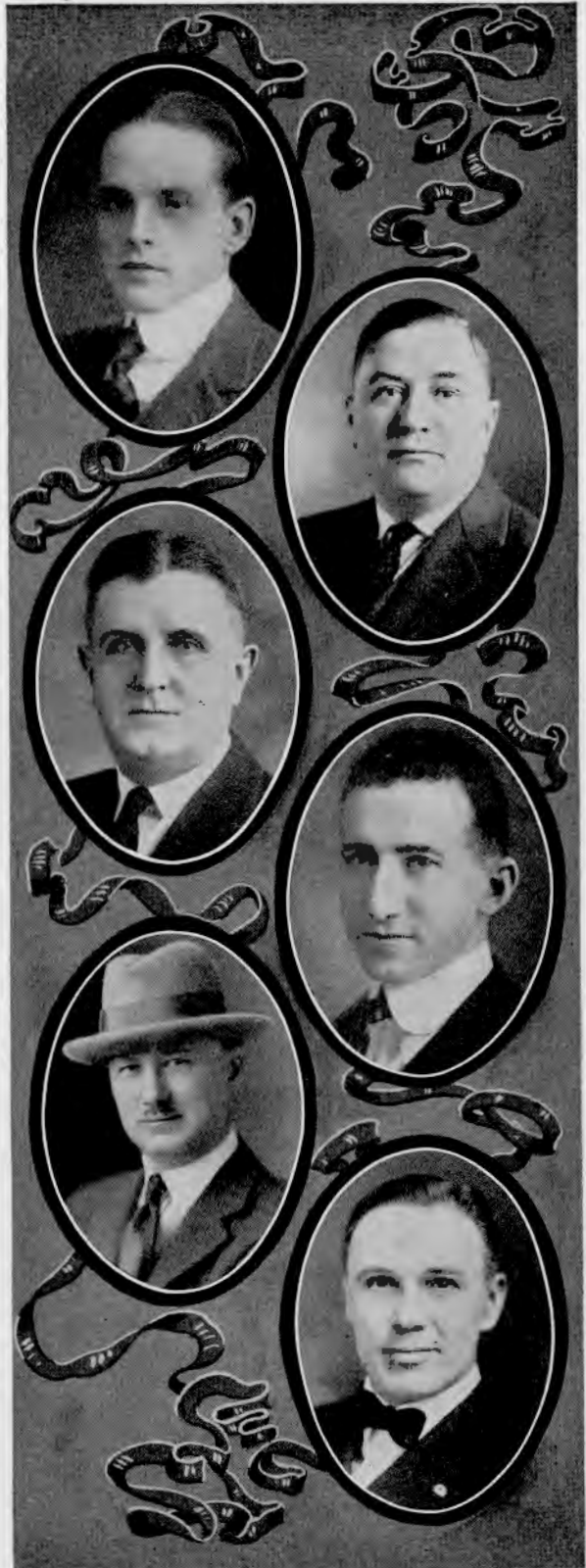
Our St. Louis representative, is from Missouri but he does not ask to be shown quite so much as he is willing to show proofs of the efficiency of this magazine in an advertising way.

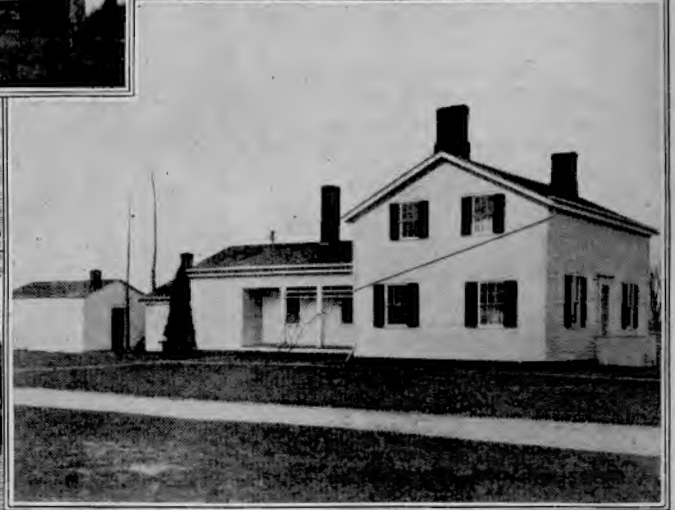
C. M. MINIER

A familiar figure on the Pacific slope from Los Angeles to Seattle, where he vigorously carries the advertising message of this magazine and wins friends for himself and for his publication.

PERCY L. GRAY

Industrial tractor specialist, grew up with the automotive business, but likes best to develop the growing field of the Fordson tractor.





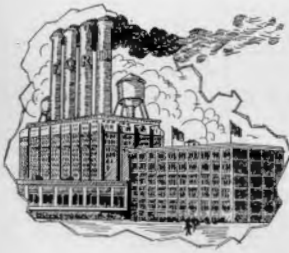
Looking Back Over the Years to Henry Ford's Boyhood Days

HERE are shown the birthplace and boyhood home of Henry Ford and the "little red schoolhouse" where young Ford acquired his first "book learning" and probably indulged in plenty of mischief.

If you tour round Dearborn way, west of Detroit, you will find both of these buildings standing in their original locations and it is very likely that they will remain there for many years to come. Mr. Ford some time ago succeeded in re-furnishing the old homestead with many of the original items of furniture or close copies, and he keeps this shrine to his mother just as it was in her days when she was mistress of the home.

The manufacturer also recently purchased the school-house, but it is not known just what he expects to do with it.

Which place shall we credit with the success which Mr. Ford has won? Without intent to disparage the efficiency of the school, we believe that this remarkable destiny was shaped within the simple farm home—still the closest thing to the heart of the man whom the world calls great.



The Ford Motor Company of Today

TEN YEARS ago people everywhere had begun to talk about Henry Ford and the Ford Motor company. Here was a remarkable man who was doing unheard of things; here was an industry that was growing beyond the greatest commercial dreams of the past. But that both the worthy ambitions of the man and the developments of the industry had reached the summit of possibilities was rather generally believed. No longer was the Ford idea a phantasm; it was a reality, but surely the ultimate had been reached.

Ten years later we find ourselves giving no consideration to the Ford standard of a decade ago. Amazed at the stupendous growth of the industry, we have also ceased to consider limits. Vastly beyond our comprehension has grown this thing, and in its growth we have learned that our guesses as to its eventual limits are worthless.

As the layman mutely accepts and vainly tries to comprehend the universal calculations of the astronomer, so we find ourselves reading facts about Ford—and with only partial realization of what it all means. Volumes would be needed to tell all of these facts of the Ford Motor company of today. In these pages we show in picture some of the plants and places where this industry is found. Here, then, are just some of the facts regarding the greatest industry the world has ever known.

The Highland Park plant of the Ford Motor company covers nearly 305 acres of which 123 acres are under roof. The company has a capacity of 1,800,000 cars and trucks annually. The company operates 34 branches in the United States; 28 of these are assembly plants. There are foreign branches and associated companies located at Buenos Aires, Sao Paulo and Montivedio, South America; Havana, Cuba; Copenhagen, Denmark; Antwerp, Belgium; Manchester, England; Barcelona, Spain; Bordeaux, France; Trieste, Italy and Cork, Ireland. The Ford Motor Company of Canada at Ford, Ontario will produce 100,000 cars in 1924.

Other plants operated as manufacturing units are located at Hamilton, Ohio; Northville, Michigan; Troy, New York and at Flat Rock, Phoenix, Plymouth and Nankin Mills, Michigan.

The immense River Rouge plant near Detroit covers an area of 1200 acres with blast furnaces, foundry, machine shops, body plant, saw mill, coke ovens, cement plant, locomotive repair shop and paper mill.

At Dearborn, Michigan, is the Ford Engineering laboratory and the plant of the Dearborn Publishing company.

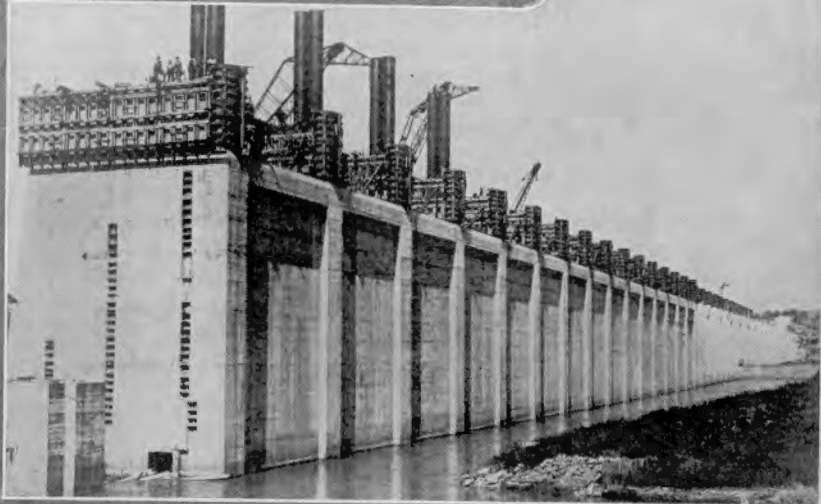


Above—Work at Muscle Shoals—a Coming Ford Enterprise.



New Ford Plant at Hamilton, Ohio

Below—Another View of Shoals Project

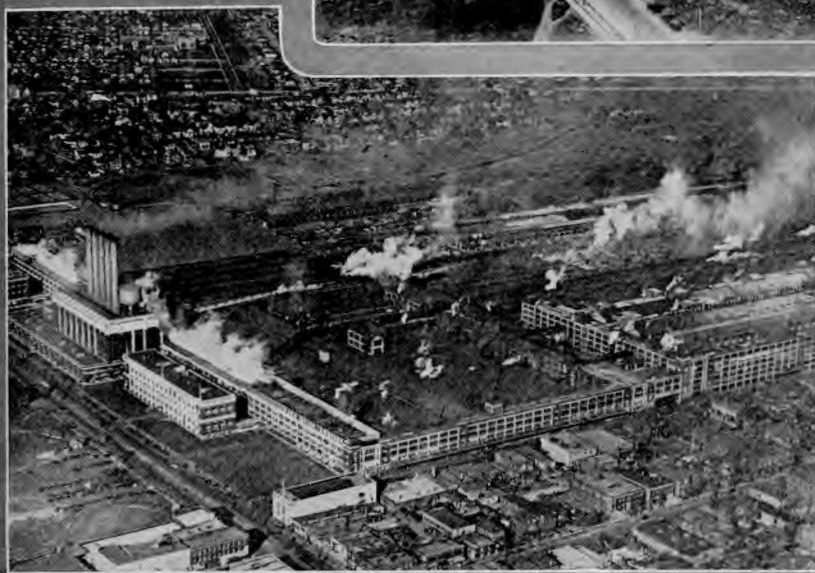




*The River Rouge Plant
Viewed From the Air*

The Lincoln Plant

*Below—Looking Down on
Highland Park.*



There is a glass plant at Glassmere, Pennsylvania, one at Highland Park and one at River Rouge. A saw mill and body plant are located at Iron Mountain, Michigan and the company also owns and operates a 400,000-acre tract of timber and ore land in Northern Michigan.

Coal mines with a reserve of about 600,000,000 tons of coal are operated in Kentucky. The Detroit, Toledo and Ironton and the Detroit and Ironton railroads connect with practically every trans-continental line.

The splendid plant of the Lincoln Motor company has a capacity of 10,500 motor cars yearly. The Henry Ford Trade School in Detroit has about seven hundred students and 43 instructors. The Henry Ford Hospital covers 23 acres, fronting on two boulevards in Detroit and consists of a group of 11 buildings.

There are approximately 157,000 workers employed in Ford industries in the United States, according to recent figures.

An average of 860 carloads of freight are handled every day in and out of the Highland Park and River Rouge plants alone, and it is estimated that on the Ford Motor Company's account 50,000,000 pounds of freight in carload lots are handled every day in the Detroit district.

More than half a million freight cars, one-fifth the freight car ownership in the country, are used annually by the Ford Motor Company's main plants and various branches, according to figures just given out.

The foregoing rather sketchily tells some of the facts regarding the Ford Motor company of today. What shall we record of this mighty industry ten years hence?

Murray Fahnestock Says:

In 1914, I realized the height of my ambition—and bought a Ford roadster.

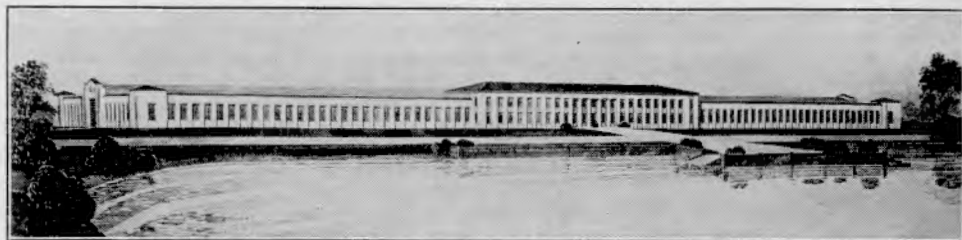
In 1914, my first articles in the FORD OWNER magazine were published.

In 1914, I answered two or more letters a month from you readers. (Ten years have slipped into eternity—and now!)

In 1924, I still enjoy driving my 1915 Ford Sedan.

In 1924, writing for the FORD OWNER magazine has become a hobby.

In 1924, I answer over a hundred, and sometimes over two hundred, letters each month. If you send me more than that, I shall never get to bed at all.



The New Plant of the Dearborn Independent



Flying a Ford for Fun

A Detailed Description of Ford Engined Aeroplanes

BY MURRAY FAHNESTOCK

THE Universal Club of Ford car owners puts the adaptable Ford to many curious uses for fun and utility. And the fun of today often develops into the utility of tomorrow.

We place the Ford engine in a boat—and the crocodile sheds dusty tears of envy as we swirl past him. We mount the Ford engine on a bobble—and scurry over the snow to the tune of Jingle Bells, played in double time.

We attach a belt pulley to the front end of the engine—and the engine churns the butter or shucks the corn under a brazen sun. We chuck the same engine onto a little truck, and use it for shoving cars of earth down deep in the dank depths of a grimy mine. On land or sea, or in the caverns under the earth, the Ford pursues the even chugging of its way.

We use the Ford car for joy rides—and for funerals. For business or for pleasure. Or for business-with-pleasure, is the mission of the Ford. Some of us like speed cars, and some wish for super speed, as shown by the interest that has been taken in our series of Secrets of Speed articles.

But some of our readers wish to shake the dust of Old Earth entirely from their wheels. And for such members of the Sky-Rocket Club, "the sky's the limit." For them, this article is written.

If we sail forth on the wings of the morning—we may be in our graves by noon. Thus putting variety into the middle of a Perfect Day! To go up like a rocket—for one crowded hour of glorious life—even though we should come down like a stick! What sport could equal this?

Wasn't it Icarus, whose father Daedalus made him into the first flying machine—fastening birds' feathers to his shoulders with wax? But Icarus

LONG ago certain Ford car owners often did aerial experimentation with their cars—but usually it was not intentional. These instances were recorded in ditch jumping and climbing of telegraph poles. But now the driver may turn the prow of the Ford skyward and gaily sail into the blue. Yet whether or not you seek to fly, you will find this article of interest. Mayhap a great new field for Fording is revealed herein.

flew so high the sun melted the wax—and Icarus fell into a part of the blue Aegean Sea which has ever since been known as the Icarian Sea.

Icarus had the bright idea—but the workmanship was faulty. Had he used Royal Glue, we might even now be yelling "Swat the flyer," rather than "Swat the fly." This emphasizes the fact that extra care in both workmanship and materials must be used by those who would fly high.

The next stage in the evolution of the aeroplane was about a thousand years ago, when Charlemagne was the big works in Europe, and Haroun-al-Raschid was Calif of Bagdad. And when the stories of the Arabian Nights were being told as "have you heard the latest?" in naughty stories.

The most fantastic of all the stories originated by the imaginative Arabs was the story of the Magic Carpet, on which one had only to sit and wish, to fly through space from one destination to the other. The little Arabian boys and girls must have been pop-eyed with wonder at the thought of such carefree transportation, instead of the weary plodding over hot and dragging sands. But what was in those days but a flight-of-fancy now seems to be on the verge of realization.

The Arabs of those days were only able to use their imaginations for getting away from the unpleasant realities of life into the semi-dreams of fancy. But the mechanical progress which has been made during a thousand years allows us to translate the Magic Carpet from a flight-of-fancy into the Ford-engined aeroplane, all ready to flip.

For aviation use the engine must be, above all, reliable. For the sudden stoppage of the engine may result in a forced landing or disastrous des-

BOSCH

The Bosch Ignition System for Fords is already half sold to most of your customers through the big Bosch National Advertising Campaign and through its reputation for service. Demonstrate the Bosch Ignition System to a few of them. You'll not only make sales, but you'll make salesmen, and in a short time you'll have a steady, growing, profitable business with little effort on your part.

The Bosch Ignition System for Fords (type 600) is a complete high quality ignition system, which has been designed, tested and built by the makers of the world famous Bosch Magneto.

It is easy to sell, easy to install and is a wonderful trade builder.

Write today for sample fitting C. O. D. and full particulars about the new sales plan.

Ignition & System



for
FORDS





TYPE
600
\$12.75

<p>SHOCK ABSORBER</p>	<p>SPARK PLUGS</p>	<p>ELECTRIC Windshield Wiper</p>
<p>PRICES per PAIR Fords \$10.00 Medium Cars \$15.00 Heavy Cars, and Trucks \$20.00</p>	<p>PRICES FORD SIZE 75c REGULAR \$1.00 SIZES</p>	<p>\$9.50</p>

AMERICAN BOSCH MAGNETO CORPORATION

Main Office and Works: Springfield, Mass.

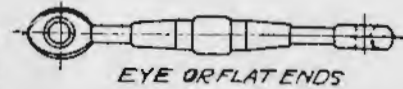
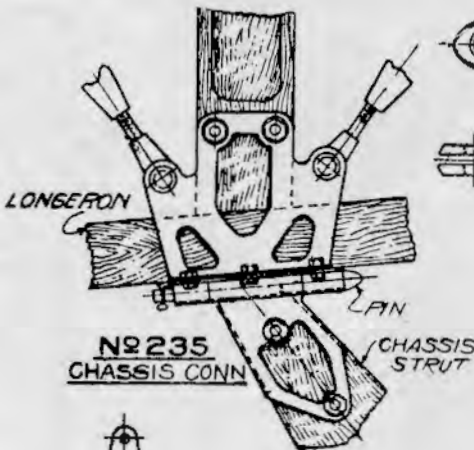
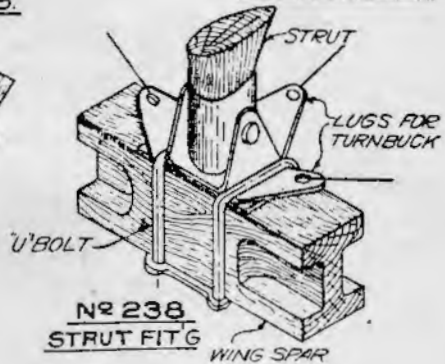
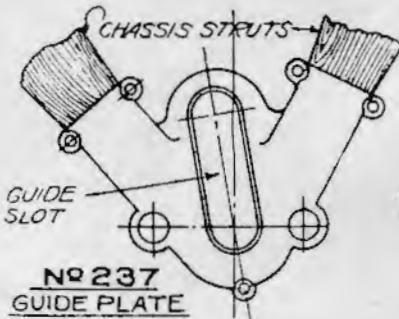
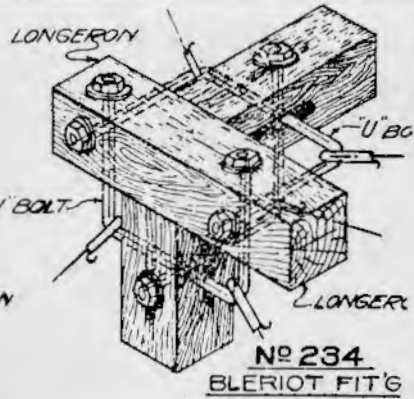
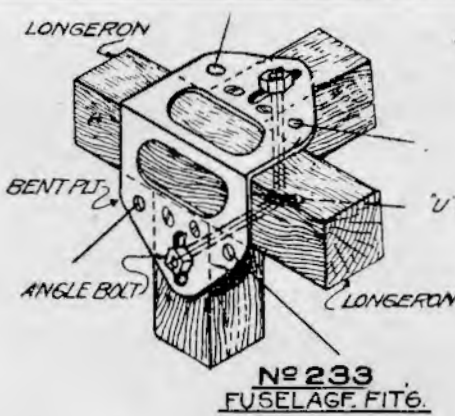
Branches:

New York

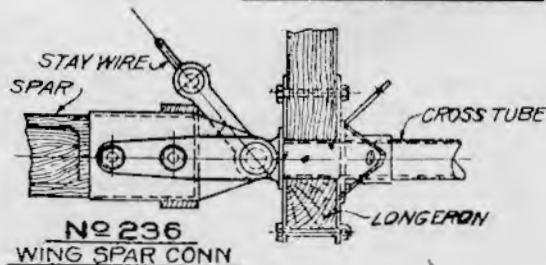
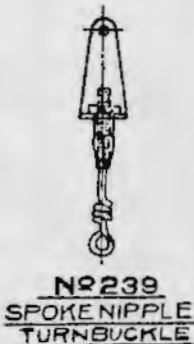
Chicago

Detroit

San Francisco



NOTE!
IN ORDERING GIVE EXACT
SIZE AND SHAPE OF BARS
TO BE CONNECTED, AND
GIVE ALL ANGLES. THE
BLERIOT TAKES THREE
"U" BOLTS PER JOINT.



Sniff the Hint of Spring in the Air?

Lucky is he whose work keeps him and his Ford out in the open—pushing her into low to make this grade, or coasting lazily down that long hill.

But whether you are out on business or out on a lark, you will wonder how you ever managed in the years before to get along without the new RYD-E-Z trunk, so neatly fitted on its special rack at the rear—built to fit all Ford models.

RYD-E-Z Trunk and Rack.

Dustproof and waterproof, the RYD-E-Z trunk answers the question of where and how the salesman will carry his bags and samplecases. It solves the problem of where to pack the picnic lunch and the kids' bathing suits—handy to put things in and handy to get things out.

And for madam—dressed in her best and making afternoon calls, the RYD-E-Z trunk adds that final touch of elegance and beauty to her sedan.

Order from your dealer or from us direct.

Agents write for full information on special introductory proposition. Reduced price for sample outfit. Dept. A.

The **RYD-E-Z**
SPRING COMPANY

Cleves (*Cincinnati*) Ohio

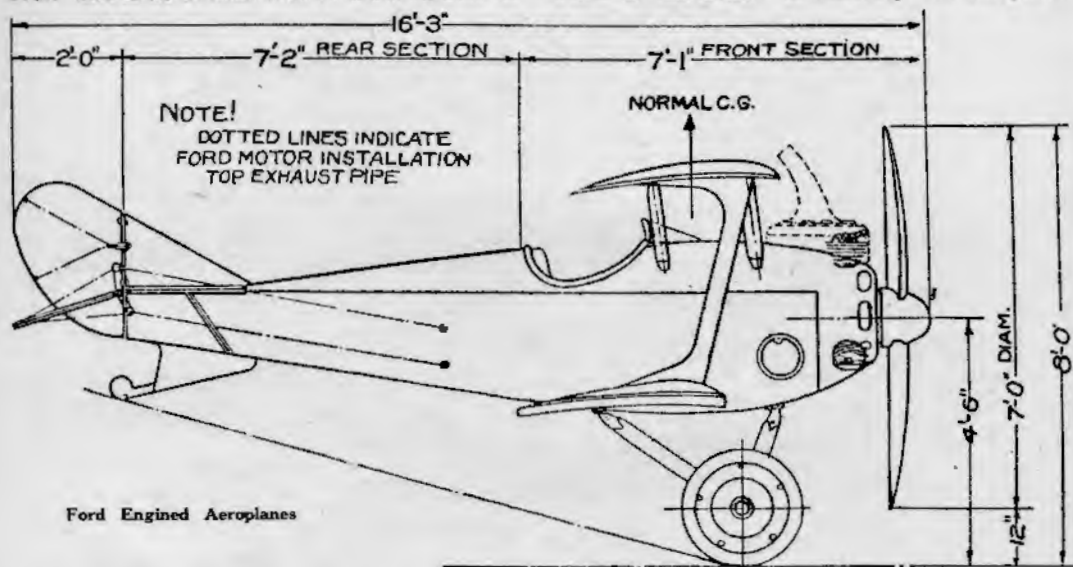
New York Branch—
254 West 54th Street

cent of the aeroplane. Then what could be more natural than to select the reliable Ford engine for this work?

While aviation engines are generally of large size and great power, this has been due to the craving for speeds of 250 miles an hour and over. Let us be content with 60 miles an hour or

suitable for aeroplane use. Since the propeller is mounted directly on the end of the crank shaft or driven by chain from the crank shaft, no clutches or transmission are necessary. And the transmission parts should be removed.

In order to reduce the pound-per-horse-power, which is the factor of efficiency for aeroplane



Ford Engined Aeroplanes

so, for which the power of the Ford engine is sufficient. Remember that the Wright brothers made flying history, and made many flights with engines of less than 40 horse power.

The success of the so-called flying flivvers, or small engined aeroplanes, in crossing the English Channel, and in making flights of considerable distance, has proven that a powerful engine is not essential for fun in flying, especially in fair weather. Eventually, flyabout Fords may be as numerous in the air as runabout Fords are on the roads.

You Don't Have To

The writer is greatly thrilled by stories of Artic cold and privation—especially when such stories can be read in front of a cozy fire with something to eat within easy reach. In like manner, we believe that many of our readers will enjoy reading the story of how Ford engined aeroplanes have been built by men who have "went and done it."

We do not suppose for a moment that the majority of Ford car owners who read this story will hasten to extract the engines from their cars to build an aeroplane. The building of a Ford aeroplane involves the expenditure of considerable time, and some money. But the car owner who understands the Ford engined aeroplane will have a better knowledge of how to drive and repair Ford cars to best advantage.

Lighter but Greater Power

It is not to be expected that the Ford engine and transmission without alterations, would be

use; we can cut down the weight to some extent by the elimination of superfluous parts. But we can make far greater gains by increasing engine speed and horse power.

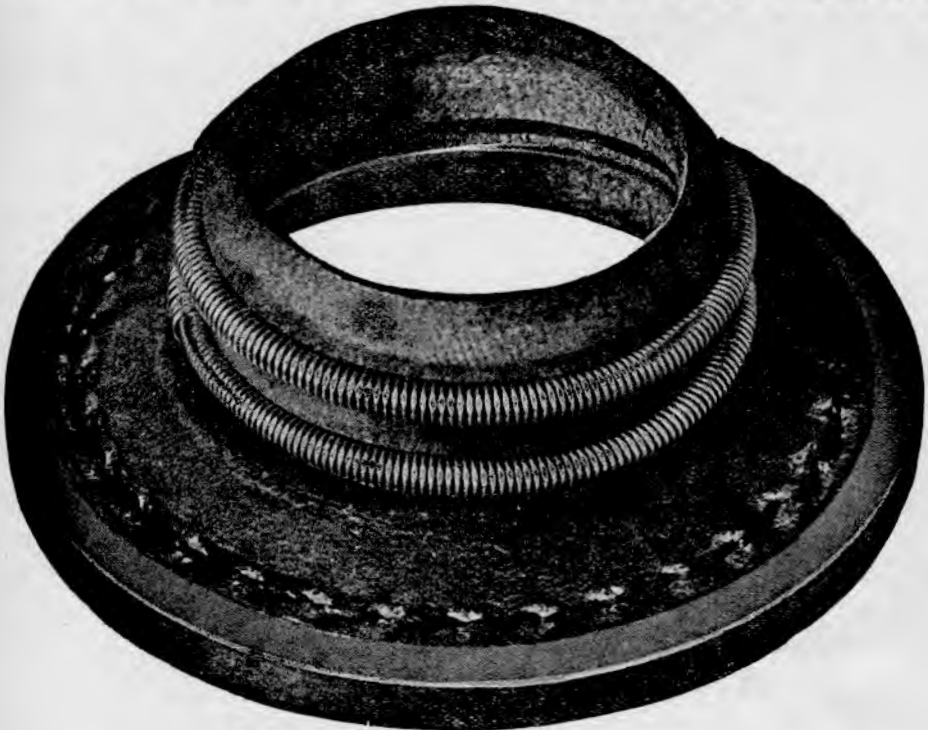
To reduce engine weight, we can use Dow metal pistons, fabric timing gears, cut down the weight of the flywheel, etc. The crank shaft may be drilled for lubrication and, while the counter balanced fly wheel crank shaft is heavier, the increase in weight will be more than paid for by the smoother running balance and greater speed obtained.

To increase the engine power, it is necessary to get more gas into the cylinders, which means to get it in and out again quickly. One of the overhead valve cylinder heads is the logical answer to this problem. But if the expense deters, then much may be gained by the use of larger valves such as Fordson tractor valves. Dodge car valves, or Hudson valves. See our Secrets of Speed stories.

In order to open and close the valves at the proper time for high speed use, a high-speed cam shaft is desirable for the Ford engined aeroplane. The fact that a high-speed cam shaft does not perform so well at slow idling speeds is no deterrent for aeroplane use, as the aeroplane engine is run with wide open throttle at all times.

To increase engine speed and reliability, it is necessary to reduce vibration by the use of such lighter parts as Dow metal pistons, lightened connecting rods, and counter balanced crank shaft. Connecting rods and pistons should be carefully

C & M OIL RETAINERS



Patented April 1, 1913—Jan. 9, 1917—Jan. 14, 1917
 "Made of Leather :- Therefore Leak Proof"
 C & M TRADE MARK
 PATENTED

C & M PRODUCTS
 — FOR FORD CARS and TRUCKS —

① **C&M STEEL SHIM**
For the Axle Shaft Taper
PAT. MAR. 12-1919

② **C&M BEARING PULLER**
PAT. JULY 15, 1919

③ **C&M CAP PULLER**
Removes Dust Caps
PAT. JAN. 14-1919

④ **C&M WHEEL PULLER**
— PAT. JULY 15, 1919 —
ALSO MADE FOR FORD TRUCKS

⑤ **C&M LINER CLAMP**
ALSO MADE FOR FORD TRUCKS

⑥ **C&M OIL RETAINER**
PAT. APR. 1-1913 — JAN. 9-1917
ALSO MADE FOR FORD TRUCKS

⑦ **C&M APPLICATION TOOL**
For Oil Retainer Installation
ALSO MADE FOR FORD TRUCKS

⑧ **C&M SLEEVE EXTRACTOR**
PAT. JUNE 28-17
ALSO MADE FOR FORD TRUCKS

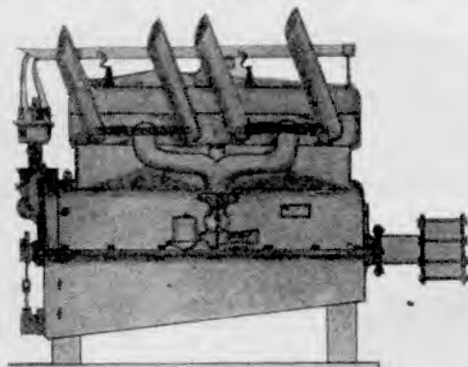
⑨ **C&M DUMMY AXLE**
Used With the Sleeve Extractor

FORD REPAIRMEN AND AGENTS—WRITE TO US OR YOUR JOBBER
Cantrell-Miller Manufacturing Co., Inc. 1248-1254 Larkin Street
 San Francisco, Calif.

balanced until all are of the same weight within the limit of $\frac{1}{8}$ ounce. Increasing the efficiency of the lubricating system and the fitting of a water circulating pump for better cooling will be necessary for running at high speeds with wide open throttle.

The Kansas Cyclone

Ford cars are often said to fly over the roads. But it is seldom that they reach the heights of sustained flights over the fields and forests. However, in 1917, a Ford engine was fitted with a propeller, (thus stirring up a little cyclone of its



R. C. J. Aviation Engine

own) and installed in a 800 pound Curtiss type biplane, with which many flights of ten minutes' duration were made.

The ingenious builder of this aeroplane not only made the changes in engine construction, but also learned to fly the aeroplane without instructions. A 140-pound passenger has been carried for several hundred yards, at 10 to 15 feet above the ground. Though of course any Ford engined aeroplane should be considered as a strictly one-man machine.

The total weight of the cut-down engine is but 202 pounds, yet it is claimed by the builder that this engine gave 50 horse power on brake test at 2,400 revolutions per minute. However, 25 brake horse power would seem more reasonable at this speed. Running free, speeds up to 4,800 revs. are claimed, which shows what speeds can be obtained from the Ford engine with the proper mechanical changes. A standard Ford engine weighs 343 pounds.

The propeller is mounted to a counter shaft which runs in ball bearings, these ball bearings being fitted in a bracket attached to the cylinder head. The counter shaft is driven by a heavy type of motorcycle roller chain, and the ratio between the sprocket wheels is such that the propeller runs at its most efficient speed, which is one-half that of the engine.

The fly wheel has been machined down to a weight of eleven pounds, which is sufficient for the high speeds at which this engine runs. The propeller has considerable fly-wheel effect, and thus tends to steady the engine. A water circulating pump is driven by belt from the counter

shaft and is needed to prevent overheating when the engine is developing extra power.

A Bosch high-tension magneto is driven by chain from the front end of the crank shaft. But there are now on the market brackets which can be used to drive the magneto from the cam shaft thus giving a neat, enclosed drive. The more accurately timed spark of the high tension magneto gives better power and speed. And much weight is eliminated by the removal of the Ford magneto coil assembly and magnets.

Lynite aluminum pistons were used in this 1917 engine, together with lighter connecting rods. A high-speed cam shaft operated the larger valves, and the size of the valve ports was also increased and a special manifold fitted.

Jennings Flew Them

R. C. Jennings has been building aeroplane parts for many years. His first successful machine to fly (with a Ford engine) was a tractor bi-plane, which was tested in the fall of 1910. This machine was improved and flown for three successive years.

Then came the war. And throughout the period of the war, Jennings made aeroplane parts for the British government. After the war was over, at the time when we visited the Jennings shops, work on the manufacture of parts for Ford engined aeroplanes had been resumed.

The single-seater, training type of biplane is recommended for those who wish to learn to fly, and do not wish to invest too much money. It is not so fast as some other types, but is much safer and easier to learn to fly. And it can be easily repaired if injured. Owing to its light weight and small size (having a span of only 28 feet), the machine is very easy to house.

Aside from the engine, an aeroplane is a comparatively simple machine, and can be built in a shed or basement where there is a space about 16 feet long. There is no brazing or welding to do, and if one can handle wood working tools, the work is easily done.

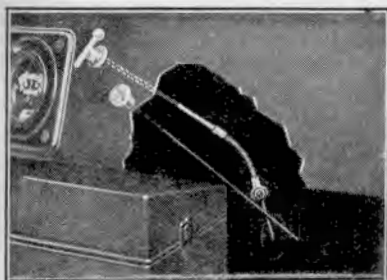
It was interesting to watch the manufacture of the fittings in the Jennings shops. And particularly interesting to notice the high quality of steel that is used for aeroplane parts. No chances can be taken with brittle steel, which might fracture on short notice. And Jennings showed us the quality of the steel by hammering the steel plates over double, and practically tying the steel strips into knots—yet without any signs of fracture in the tortured metal.

Either the completed aeroplanes, the parts in knock down form and ready for assembly, or the separate parts and blue prints can be supplied.

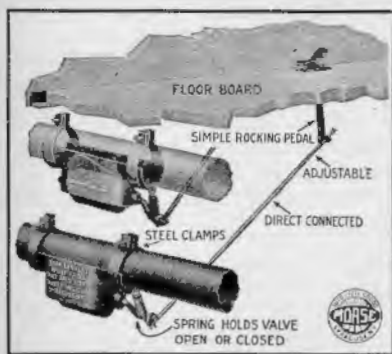
Some Specifications

Wing Span	28' 0"
Chord	4' 0"
Gap between wings	4' 3"
Stagger of wings	8"
Area	206 sq. ft.

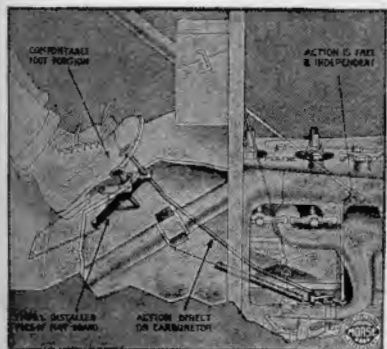
FORD DEALERS



MORSE NEEDLE VALVE CONTROL \$100



SNAP EXHAUST RELIEF VALVE \$150



SNAP FOOT ACCELERATOR \$150

Who desire to merchandise popular and quick selling accessories which will prove most pleasing to their customers should investigate

MORSE PRODUCTS

Each one is mechanically correct in design and of a standard of quality and workmanship which assures most satisfactory service.

MORSE NEEDLE VALVE CONTROL

Enables you to easily adjust your carburetor without bending down under the cowl. With this facility at your finger tips you can readily change gas mixture to conform to the weather—road—or—load conditions. Higher motor efficiency—less gas and carbon. Installed in a jiffy. Attractive dealers display easel in colors with every box of 12. Price One Dollar.

SNAP EXHAUST RELIEF VALVE (Cutout)

Gives greatest possible relief to your motor (through big 3½-inch opening) from muffler back pressure when occasion demands full power.

Permits you to hear clearly every pulsation of your motor in testing to detect trouble.

Snaps open or closed at a touch of your foot without the use of cables, chains, pulleys or wires. Saw only a v-shaped hole in exhaust pipe when installing.

Price One Dollar and a Half.

SNAP FOOT ACCELERATOR

Provides perfect foot throttle control from slow in traffic to wide open. The pedal rod runs direct from foot to carburetor throttle in the exact line of applied pressure. A substantial stabilizing bracket attached to transmission cover plate affords the necessary support to give a steady, positive, sensitive and easy response to touch of foot. Complete with comfortable foot rest.

One Dollar and a Half.

MORSE MFG. CO., INC.

340 W. Fayette St.

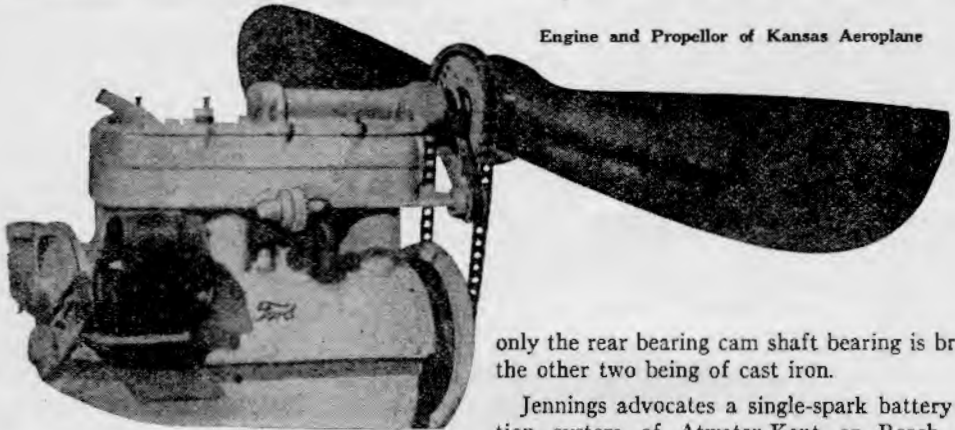
Syracuse, N. Y.

Speed, minimum	37 m. p. h.
Speed, maximum	74 m. p. h.
Climb	6500 ft. in 10 minutes
Weight loaded	580 lbs.
Useful load	240 lbs.
Wt. per h. p.	16.5 lbs.
Wt. per sq. ft.	4.28 lbs.
Duration	4 hours
Ford engine	35-40 horse power

crank case eliminating the oil fouling of plugs and the waste of oil through the exhaust pipes.

The connecting rods are of the web type, of one-half Ford weight. They are machined all over and then balanced with each other.

The crank shaft is machined all over and then balanced. The cam shaft is fitted in special bearings, all three of which are Non-Gran Bearing Bronze—while in the standard Ford engine



Engine and Propeller of Kansas Aeroplane

R. C. J. Engine Changes

In its natural condition, the Ford engine is too heavy for aeroplane use. After four years' of experimenting, Jennings has reduced the weight of the Ford engine by 100 pounds, without reducing its strength. Jennings claims a maximum of 35 horse power, at engine speeds of 1650 R. P. M., the same speed at which the average Ford engine shows only 18 to 20 horse power.

Among the secrets of speed which enable this engine to deliver so much more power with so much less weight, are light-weight pistons, and racing type of light-weight connecting rods. A racing or high-speed type of cam shaft increases the valve lift and changes the valve timing to develop more power at high speeds.

With the racing valve timing, a special carburetor of larger size is used. The cylinders are rebored to larger size, and the lower surface of the cylinder head is planed off, to increase the compression and the maximum power.

When rebuilding a Ford engine into a R. C. J. aviation engine, Jennings machines the cylinder block all over—and then enamels it. This not only reduces weight and allows an accurate inspection to be made for flaws and incipient cracks, but eliminates all chances of oil leakage, making a perfectly clean engine.

The cylinder block is then rebored to $3\frac{7}{8}$ inch, which considerably increases the power. The pistons which are much lighter than regular Ford pistons, are equipped with special piston rings; and are drilled for return of oil to

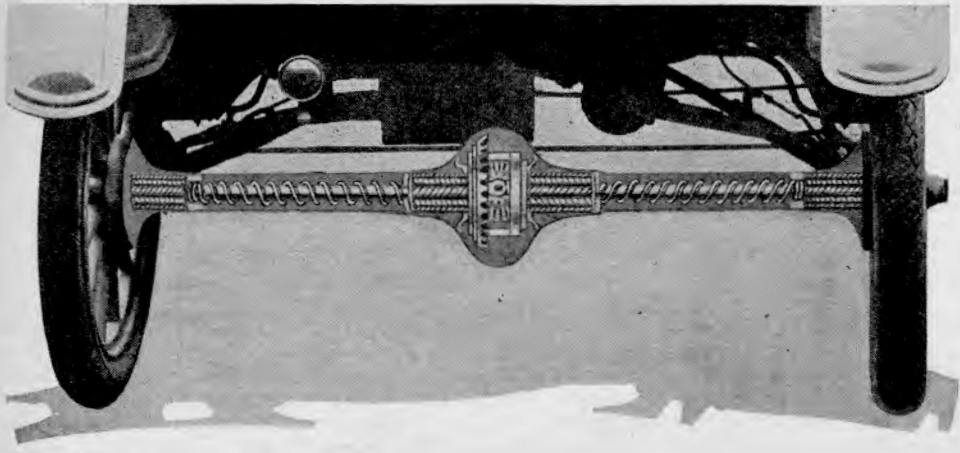
only the rear bearing cam shaft bearing is bronze, the other two being of cast iron.

Jennings advocates a single-spark battery ignition system of Atwater-Kent or Bosch type. One advantage of the system being that, after the engine has been run for a while and is warmed up, the engine can be restarted nine out of ten times from the seat of the aeroplane by simply closing the switch.

A Master carburetor of $1\frac{1}{4}$ inch size is used. The oil pan or crank case lower half is of cast aluminum, plentifully webbed, and machined all over. The oiling system is mechanical and supplies oil to all cylinders, to gears and bearings. The valves are adjustable, and securely attached to the valve springs, so that they cannot come loose in spite of the high speed of the engine.

The propeller hub is attached to the crank shaft before the engine is assembled and machined perfectly true. This propeller hub is of cast steel and is furnished with propeller bolts and face plates. When the propeller is mounted directly on the crank shaft, a special ball-bearing thrust bearing is supplied to take the end thrust of the propeller.

Sometimes the builder prefers to mount the propeller on the countershaft, with a two-to-one reduction from engine to propeller. A roller chain drive is then used. When a roller chain drive is used (chain is of roller type), a fly wheel must be placed on the crank shaft to equalize the power impulses of the crank shaft. The Ford fly wheel is far too heavy, so Jennings uses a small fly wheel which has over 80 per cent of the weight concentrated at the rim, where the weight belongs.



Grease Retainers

That Stop the Grease and Keep It Stopped
For Ford Rear Axles

What Dealers Say About Woodworth Grease Retainer

I have used your retainers and have just ordered another lot from my jobber. They are the only thing I ever used that will stop the grease from leaking out and keep it stopped.

ROY KING, Kingsville, O.

We have used these retainers for a long time and find they are the only thing we can stop the grease with.

H. LYON & SON,
Alpine, N. Y.

We have used your grease retainers for some time and find there is nothing just as good.

A. A. SALES CO.,
Assumption, Ill.

I have used these retainers for a long time and have got very good results from them.

M. S. EBERSOLE, York, Pa.
We have used and sold these retainers and find them to give entire satisfaction.

W. M. FULTON,
Burggettstown, Pa.

We find these retainers to be the only thing that will stop all the oil and continue to hold.

PLAIN CITY AUTO CO.,
Plain City, Ohio.

THE WOODWORTH Oil and Grease Retainers for Ford rear axles consist of two steel wire springs, one wound right hand and one left hand. These are slipped over the axle shafts inside the casings. One end of the spring fits tight on the shaft, the rest of the spring is larger so that it touches the bottom of the casing.

After the oil once begins to work out of the differential case of the Ford car and get in around the axles, washers placed at the outer ends last but a very short time before they wear loose enough to allow the oil to get through.

The oil works out only when the car is running for there is enough slant in the axle casings to carry it back to the differential when the car is standing still. With Woodworth Retainers the revolving of the axles continually pushes the grease back and as there is nothing to wear out (made of oil-tempered spring steel) they last as long as the car.

Very easy to install.

Made in two sizes, the regular size fits the Ford and Chevrolet 490 cars, the large size at the same price is made for Ford ton truck.

Packed a pair in a carton with full instructions for installing.

Price 50c per pair. To dealers four pairs for \$1.50 or twelve pairs for \$4.00, delivered with advertising matter parcel post prepaid.

We are looking for distributors who can carry stocks and supply the dealers in their territory.

Woodworth Specialties Co.

SOLE MANUFACTURERS
Binghamton, N. Y.

As I Saw the Past Ten Years In the Ford Field

A Review of the Ford Field During a Busy Decade

By J. S. JENNINGS, JR.
Of Jennings Engineering Co., Detroit

THE remarkable thing about the present Ford car from a mechanical standpoint is its striking similarity to the Ford car of ten years ago. There have been minor changes here and there, each one a decided improvement, but fundamentally the chassis is the same as the original model T.

Coupled with the amazing increase in the use of Ford cars of all types, there could be no better evidence of the soundness of the Ford principles of design. The widespread sales and service organization of the Ford Motor Co. has doubtless been a big factor in the commercial exploitation of the Ford product, but that organization would never have been called into being but for the essential worth of the model T chassis.

This lack of fundamental changes in the Ford chassis cannot be ascribed to any undue hesitancy on the part of the Ford Motor Co. in the adoption of new ideas of proved merit. The early use of the worm gear drive in the Ford truck and the Fordson tractor, and the many new features of design embodied in the latter, offer the best of evidence to the contrary.

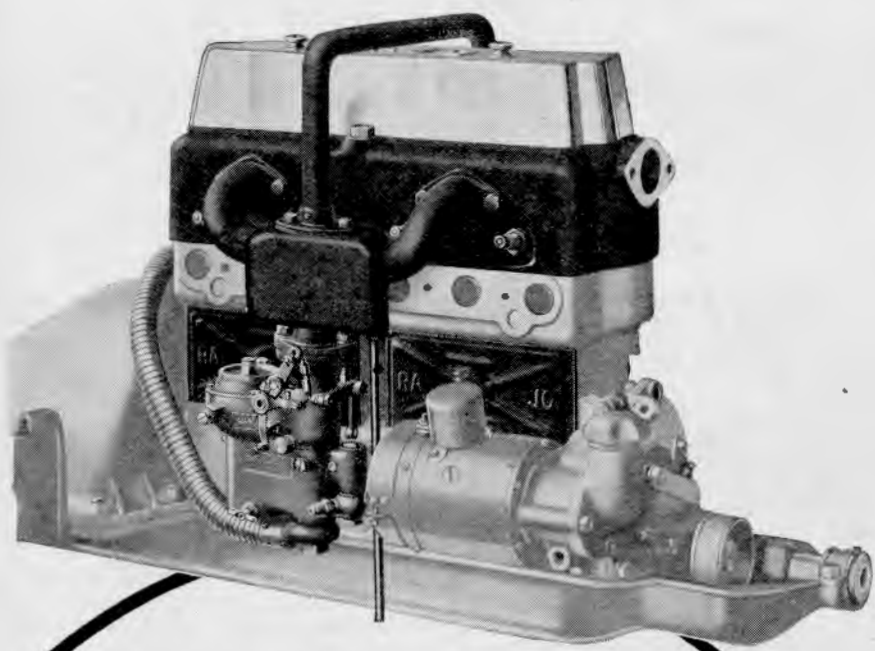
In this connection the writer can speak from personal experience, as he and his associates, in presenting to the Ford engineering department what was at the time a brand new idea, encountered a keen interest and a spirit of ready co-operation in determining the real worth of the principle involved. Once convinced of the soundness of the vacuum principle in engine governing, they were not slow in making provision for mounting our governor on the tractor. Thus it may be said that the Ford Motor Co. has been ahead of the field in recognition of a new principle. And as the large scale production of Fordson tractors provided the stimulus for the work of development of our device, it seems altogether fitting to mention it in connection with Ford developments.

The addition of a starting and lighting system has been the most radical development in connection with the Ford car. A comparison of the present system with the cumbersome contrivances offered the trade in the early stages of starter development affords a good example of the extremely rapid improvement in design which has characterized this phase of the automotive industry.

When the Fordson Tractor was introduced it was really revolutionary in design. The combination of all the main units, including even the radiator, in a rigid structural unit with three point suspension, was the outstanding feature. Worthy of special note also was the worm gear drive, the simple air-washer system and the successful application of the method of utilizing kerosene as fuel. The reduction of all parts to the lowest terms of simplicity and the ingenious way in which many parts were made to serve a double purpose made it possible to produce a high grade piece of mechanism at an astonishingly low price.

It is in production methods and in rigid standardization that the greatest developments have taken place. Owing to the tremendous scale of Ford production, no part is too small to justify special machinery for production in large quantities. Few people who have not been closely associated with large scale production work, realize the exacting requirements of the progressive assembly method which is in universal use in the Ford factories. There is no time for tinkering with parts that do not fit, and the most complete and rigid system of inspection at all stages of work is an absolute essential. Thus, large scale production, which in the minds of some has been associated with careless and haphazard methods, in reality is a factor in producing the highest class of workmanship. The lengths to which the Ford Motor Co., has been willing to go to secure uniformity of parts is well illustrated by their recent acquirement of the properties and methods of the Johansen Gauge Co., which has become world famous in the production of gauges of almost unbelievable accuracy. The knowledge possessed by the Johansen organization of the art of producing perfectly finished metal surfaces to exact limits will, undoubtedly, be of tremendous advantage when applied to Ford production, as finely finished surfaces will result in diminished friction and wear.

So small a thing as a commutator roller, serves as a fine example of the highly specialized machine tool development. The battery of machines, carbonizing and heat-treating furnaces, automatic grinders and burnishing machines would be a revelation to a manufacturer of ten years ago, and the precision with which thousands of these parts are daily produced by almost entirely auto-



The Model "B" Rajo Valve-in-Head will give you more speed than you ever dreamed of getting with a standard Ford! It will jump to 50 miles per hour in two city blocks! It will average better than 20 miles to the gallon! — — The Model "B" provides its owner with the most powerful car on the road and to the man who sells it, it provides a three-way profit. Whether you own a garage or just drive a Ford you owe it to yourself to get all the facts about the three models of the Rajo Valve-in-Head. *SS SS SS SS SS*

RAJO MOTOR CO., 1355 Racine St., RACINE, WIS.



Reviewing Ten Year's of Ford Car Development



BY MURRAY FAHNESTOCK



WHILE after seven years, a man may still fit the same suit of clothes, doctors say that no part of the original man remains—that even his bones and the enamel of his teeth have been replaced in that time. Such are the changes wrought by Time over the years. And while a 1924 Ford occupies about the same amount of space on the road as the 1914 model there has been constant change and evolution in the details of the component parts of the Ford car.

But just as the man of thirty is apt to show the same general character and personality as he did when he was twenty, so the Ford cars of today include the same sound fundamentals of design and construction that made the earlier Fords so successful—it is only the component parts that have been improved.

The pioneer Fords of 1914—with their shiny brass radiators and lamps, their bright cherry red dash boards and flip fenders—were far more

As I Saw the Past Ten Years

(Continued From Page 124)

matic methods would surprise the advocates of hand fitting as productive of the highest class of workmanship.

Little need be said regarding developments in body design, as the public is generally familiar with all the present models. A very clear idea of the greater diversity of models can be gained, however, by going back to nineteen hundred and fourteen. At that time the Ford Company produced no closed bodies except the now obsolete taxi-cab. The sedan body was then only in preparation. Virtually the only models sold were the touring car and the roadster. No commercial chassis was offered and there was no one ton truck nor any tractor. Commercial cars were produced by altering runabouts and trucks were made after a fashion by adding to the rear end of the Ford chassis certain abominations which naturally went out of existence with the advent of the present one ton truck. Since that time the Ford agent has become, by comparison, a merchandiser in a field ten times as wide.

picturesque than the business-like Fords of today. Just as the cow-boys of the movies were more picturesque than the business men who now manage our western cities.

When the Ford was a luxury (though it may be hard to think of the earlier Ford as a luxury), it was considered the height of elegance to carry as much polished brass as adorns a brass band. In those days, cars were not used for business in all sorts of weather, but were primarily for the Sunday afternoon or an evening spin in pleasant weather, and so brass could be kept shiny.

The beautiful radiator had brassy sides, and the square cornered appearance of a baby Rolls-Royce. On either side glared the big, brassy head lamps, which used acetylene gas from a carbide gas generator mounted on the left-hand running board. Anyone who could keep that acetylene gas generator from generating smells in the daytime and make it generate gas at night, immediately qualified as manager for the gas works of a large city.

The bulb horn was of brass and, when the horn worked (as it sometimes did) its plaintiff "Honk, honk" always reminded us of the blue goose who, when she heard the Ford horn said "There is that fresh Mr. Gander again. I just won't turn to look at him!"

One of the reasons why these earlier Fords were lighter than present models is the fact that the smaller fenders of the 1914 Fords were also made of thinner steel and not nearly so well braced. In those days, if a fender lasted less than six months, the owner got a new fender gratis—because the factory well knew that the fenders were not so good. The fenders simply broke away at the four rivets, where the fender support irons were attached to the thin flat surface of the fenders.

When the new streamline fenders were made, the curved shape of the fenders not only stiffened and strengthened the fenders, but the braces to which the fender support irons were rivetted were more scientifically designed and so that trouble has been completely eliminated. The new fenders also protect the car much better against mud and water splash, and so the car requires less frequent cleaning.

The brass trimmed oil lamps looked like carriage lamps and would sometimes stay lit when

CROSLLEY

THE LARGEST MANUFACTURER OF RADIO RECEIVERS IN THE WORLD

The SIGNAL FIRE of TODAY

PIONEERS of the old west were amazed to see how quickly the Indians learned of their presence.

The advance of a wagon train was known days ahead. Even a lone trader was known long before he arrived in the Indian camp.

Eventually the pioneers learned that the savages had a highly perfected signal code. From mountains top the signal fire blazed its message at night, or by day sent up its smoke in columns, straight, pink-white smoke, black smoke—it carried a story far and wide.

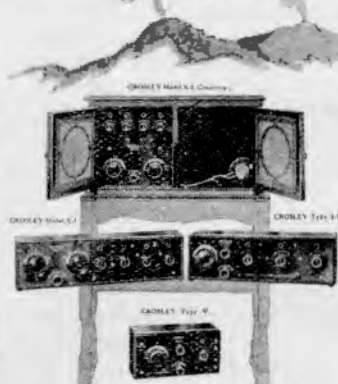
Now are the signal fires. Radioed are the tribes. Today the Westerner in remote places receives his message by Radio—the modern Signal Fire.

The Croslley Radio Corporation
Cincinnati, Ohio



CROSLLEY

Better-Cost Less
Radio Products



A CROSLLEY RECEIVER FOR EVERYONE

CROSLLEY TYPE N. FIVE DIAL
A new line representative of the best made in America...
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452 ALFRED STREET

CINCINNATI, OHIO

the car was at rest. To call them "The Lights That Failed" was flattery. Car owners often called those "Sons of Darkness" much worse names than that.

It is interesting to note the number of places on these early Ford cars at which brass bolts and nuts were used, in order that such parts should not rust together, when subjected to the action of the weather. The hold down nuts of the radiator studs, the bolts and nuts of the windshield and many other places, were of solid brass. During the war, when brass and copper were needed for munitions, the use of so much brass and copper was found to be an unnecessary refinement.

The tiny hoods of the 1914 Fords were of solid aluminum, and one can distinguish a 1914 Ford from a 1915 Ford by the fact that the 1914 Fords did not have any slots or louvres in the sides of the hood, while the 1915 Fords have slots or louvres. One can distinguish a 1914 Ford from the 1913 model by the fact that the 1914 Ford has a small cowl or drop front on the front fender, while the 1913 Ford fenders are straight.

There is a big difference in appearance between the ungainly top and windshield of the 1914 Ford, and the neat one-man top and slanting windshield now used. Not only is the slanting windshield neater in appearance, but it is far more convenient for ventilation and rain-vision than the earlier models, which had only two practical positions—either all the way up, or all the way down. Note the funny braces from the windshield hinges to the radiator studs, which look as if they pushed the front end of the car along.

The present touring car tops are of the so-called one-man type, which are not only easier to put up or down; but have the great advantage that the bow, coming down at the sides of the front seat, is eliminated. Thus the top is made neater in appearance and the bows do not interfere with access to the car.

In 1914, the majority of drivers kept the top folded down most of the time and, consequently, a "top cover" was part of the regular factory equipment of every open Ford car. Now top covers are so seldom used that they are no longer supplied as factory equipment.

Front Axle Changes

We consider the biggest front axle improvement to be the change from the adjustable ball bearings to the bearings of the roller type. Unless frequently adjusted, the ball bearings were unreliable and apt to give trouble by breakage of parts. When these ball bearings went to pieces, the hub was apt to cut and score the spindle, and perhaps let the front of the car down on the road. Few car owners realize that the \$5.00 or more that these roller bearings cost adds much greater value to the car. This is only one of the points where extra value has been put into the Ford at a lower price.

The second big change in the front axle system

is in the new style front radius rods which, owing to their attachment below the axle and heavier material, give much better bracing and hold the front axle much more securely in alignment. The fastening of the front radius rods to the lower ends of the spring perches by means of tapered nuts gives a wedging effect that makes it possible to keep the radius rods tight. This prevents the hammering which might otherwise result in crystallization of the steel and broken parts.

The front wheel hubs have been extended to strengthen the hubs at the outer ends and prevent the loosening of the hubs on the outer races of the roller bearings.

One of the "luxuries" of 1914 was fitting a Ford with demountable rims and big 30 by 3½ inch tires on the front wheels. Now demountable rims, with the same size tires on all four wheels, are in almost universal use. While the shoe-string 3-inch tires are but seldom seen on the front wheels.

Changes in Steering Gear

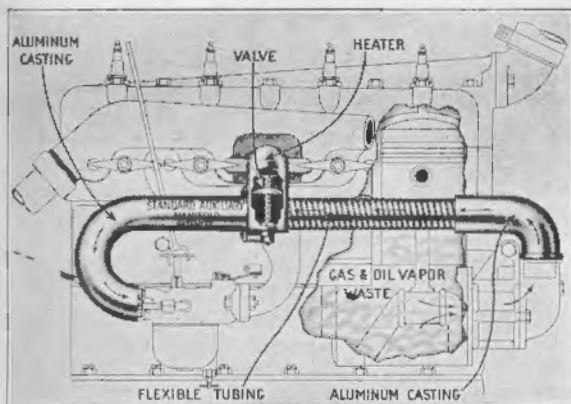
The steering wheel has been increased to sixteen inch diameter. And the larger wheel makes steering and driving in general more easy, more positive and more comfortable. The rim of the steering wheel is now made of a special material, which retains its neat appearance much better than the enamel used on the 1914 Fords.

Some owners of earlier Ford cars used to be afraid that the steering gear connecting rod would go "over center" and lock, but the possibility of this trouble has been eliminated by extending one of the pins on which the steering gear pinions operate. This pin fits in a slot which limits the travel of steering wheel between those positions in which the front wheel spindles strike the front axle yokes. While the full steering wheel motion is available, the stop prevents the straining or buckling of the steering gear connecting rod after the front wheels have reached the reasonable limit of their turning motion.

On 1914 Fords, the ball to which the steering gear connecting rod was attached was made an integral part of the spindle arm connecting rod. Consequently, when wear of this ball occurred it was necessary to replace the entire spindle arm connecting rod. But the design has since been improved so that the spindle yoke ball is replaceable. This also eliminates the use of the bolt previously used to hold the yoke to the spindle rod.

Early Ford cars did not have any provision for license plate brackets, but neat brackets for both front and rear license plates have now been made factory equipment on Ford cars and the car owner is saved the money formerly spent for license plate brackets.

The crankcase front end bearing has been greatly improved so that only two nuts are required to hold the front spring to the front cross member of the chassis frame. By this plan, the middle of the spring (which is weakened by the



We can prove that—

- it will stop oil dilution
- it will do away with carbon
- it will lubricate valves and top piston rings
- it will preheat all air for the motor
- it will give better seating valves
- it will eliminate back pressure
- it will save 50% on oil
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the real solution for oil dilution—

Ford Owners! Cut out the bugaboo of oil dilution and leakage in your cars. You know that—

—oil is diluted by gas escaping past the pistons into the crank case.

—much oil is lost through the crankcase leakage.

The Standard Auxiliary Manifold takes care of all this.

It draws the unburned gas out of the crank case and carries it back to the carburetor.

It stops all leaks by creating a partial vacuum in the crank case.

It properly lubricates the motor even though the oil line is clogged and gives it a new lease on life.

No installation expense as it is put on in 3 minutes. No holes to bore—nothing removed except the stove. Guaranteed for the life of the car.

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We will ship a Standard Auxiliary Manifold to any reader of the Ford Owner & Dealer subject to return if it is not entirely satisfactory. Just pin a \$5.00 bill or money order to this ad and send it in with complete shipping address plainly written.

If you would be willing to run your Ford without it after 30 days use, take it off and ship it back. We will return your money and refund the transportation charges.

*Or if you want further information write today
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tie bolt holes) is more tightly lamped, and breakage of springs at this point is reduced. Also, more length of spring is made available for easier action.

Many Rear Axle Changes

The vital rear axle system has been changed in almost every detail during the last ten years. It is well that this has been done, for a much stronger rear axle system is needed for the Ford Sedans and Coupes with their additional weight. In 1915, the Ford rear axle housings were made much stronger and heavier, and now do not give trouble with broken housings or loose rivets.

One of the weak points of 1914 Fords was the ring or drive gear of the rear axle. The corners used to chip off the gear teeth. Then these broken off chips would lodge between the gears and bang!—would go the gears. Several changes were made in the design of the ring gear. First, the outer corners were machined off at a 45-degree angle. Finally, the outer corners were rounded and a better grade of steel and heat treatment was used—and the gears have given comparatively little trouble ever since.

The writer well remembers one Ford dealer who was appointed a Ford agent in 1914. In accordance to custom, he was asked to order a stock of parts in proportion to his territory. His order read "\$250. worth of rear axle ring gears. And \$750. worth of universal joints!" After receiving this witty jolt, the Ford Motor Company improved the ring gears and the universal joints. Universal joint trouble is seldom experienced now, except on cars whose owners entirely neglect the lubrication of the hard working universal joint.

Another part of the 1914 Fords that has been greatly improved is the rear radius rods. These used to give frequent trouble by the breaking of the threaded front ends. With the improved quality of these rods (which are now made in a different manner), little trouble of this sort will be experienced particularly if the nuts holding the front end of the radius rods to the universal joint housing are kept tight.

The differential pinions used to have bronze bushings, where they fitted on the differential spider. But Ford engineers found that by simply enlarging the spider shafts, the pinions could be mounted directly on the spider; and that the larger bearing, even though of steel to steel, would give longer wear.

The drive shaft thrust bearing (the ball bearing) has been changed and improved. While the drive shaft roller bearing, instead of running in a removable steel sleeve, now fits directly into the machined forging, which also acts as the drive shaft roller bearing housing. This forging is much stronger than the old malleable iron casting that sometimes cracked or broke.

The new design running board brackets are of channel section and in one piece, extending

completely across the chassis. This not only reduces the number of parts to be kept tight, but gives both fenders and running boards and fenders greater rigidity and freedom from vibration, without adding to the weight.

The dash board is now attached to the side members of the chassis frame with pressed steel brackets of increased size and better design. These brackets hold the dash much more firmly to the chassis frame than the old style forgings as previously used. The new brackets are not only cheaper but they are much better, and tend to prevent rattles at this point.

The earlier Ford mufflers consisted of a series of tin cans wrapped with asbestos. When the engine back-fired—away went the muffler, tin cans, asbestos and all. The present Ford muffler is of pressed steel design, and is far lighter and stronger than the earlier mufflers with their cast iron ends.

Being mounted directly on the exhaust pipe, a very compact, light and rigid construction is obtained. And there is far less chance of rattle than with the old design.

The new muffler has been approved by the engineers of the Fire Insurance Underwriters, which means that it is free from the possibility of breakage, leaks, or other fire hazards.

The exhaust pipe has also been changed, and now has an upward sweep where it passes over the hand brake control shaft. In the 1914 Fords, there was very little clearance between the exhaust pipe and the controller shaft and, as soon as the exhaust pipe got the least bit loose, there was a tinkling sound like distant cow bells, from this point.

Numerous Engine Improvements

To the Man-in-the-Moon, this old earth appears about the same in 1924 as it did in 1914. But we know what a welter of changes have occurred and that—whether for better or for worse—the world will never be the same again. To the casual observer the present Ford engine looks much like the 1914 model—but the readers of this magazine are familiar with the many changes that have been made.

Beginning with the cylinder block, one of the chief improvements in the Ford engine is the better finish and polish of the cylinder walls, so that the engine more quickly attains full power and holds its power for a longer time. Of course the new cylinder blocks are arranged for the addition of the generator of the electric starting system.

Instead of using two separate valve chambers and valve chamber covers, the two valve chambers have been merged into one and, due to the fact that two studs now hold one cover, the cover can be more securely bolted in place and there is less oil leakage.

The cylinder head was slightly changed in 1915 to give more compression space. In 1917, the

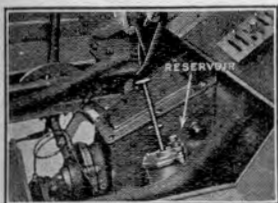
Bowen Chassis Lubricator

FOR  FORDS

*A single pressure on
the lubricator button
oils
every chassis bearing*



The lubricator button is conveniently located in front of the driver's seat. The reservoir is installed under the floor boards immediately below the lubricator button.



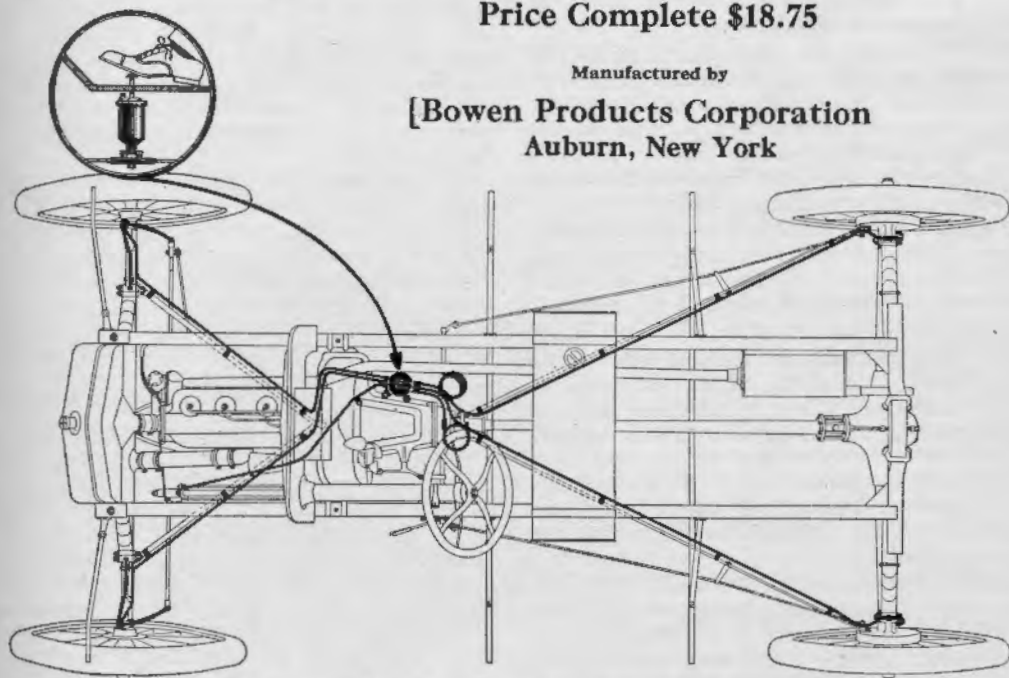
The Bowen Chassis Lubricator makes it possible, for the first time, to properly lubricate the Ford Car. It eliminates the guess work as well as the disagreeable features of either grease cup or grease gun lubricating methods.

A foot pressure on the lubricator button, accomplishes in a fraction of a minute all that hard, dirty work that formerly required from one to three hours. It delivers a measured quantity of oil to each bearing, providing proper lubrication, thereby cutting upkeep to a minimum and prolonging the life of the car.

Price Complete \$18.75

Manufactured by

**[Bowen Products Corporation
Auburn, New York**



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present "high-type" of cylinder head, with much greater water jacket space and differently shaped combustion chamber, was adopted. Ford engineers made many experiments before they decided on the present shape of combustion chamber as being best adapted to the Ford. The high type cylinder head requires long cylinder head bolts, and so they too were changed in 1917.

The pressed steel crank case was first made wider and stronger in the nose at the forward end. Then a down-turned ridge, along the outside edge of the crank case, was added. This ridge acts as a reinforcement and adds greatly to the strength of the crank case.

Moving Parts Are Vital

Light moving parts are essential to smoothness of operation and reduction of wear. And the important moving parts are much lighter—yet equally strong—than they were in the 1914 Ford engine. When the piston ring embraces the piston and says "You are not the same as you used to be!", the piston slaps back "Neither are you!" And both are telling the truth.

One of the brightest ideas of the Ford engineers was the invention of the so-called "tapered" piston ring which is .002 inch (about the thickness of a human hair) thicker at the bottom than at the top. One advantage of this wedge shape is that the narrow bottom edge soon wears into good contact with the cylinder walls and holds the compression. Another advantage is that these piston rings tend to slide over the oil on the upward stroke and scrape the oil down on the downward stroke. As a result, this ratchet action tends to prevent the accumulation of excess oil in the combustion chambers.

In 1920, an entirely new design of piston was developed and, while the material is cast iron, the weight has been reduced about $\frac{1}{2}$ pound for each piston, with a resulting increase in the speed and smoothness of the engine. In 1923, the Ford piston was again improved by cutting a bevel at the lower edge of the bottom piston ring groove. This bevel is cut on a 20-degree angle, is $\frac{3}{64}$ inch deep and forms an oil pocket which collects excess oil and returns it to the crank case on the down stroke of the piston.

In the latter part of 1920, Ford cars began to be fitted with the new style of light weight connecting rod which is six or seven ounces lighter than the old style rod. Since the connecting rods are among the most swiftly moving parts of an engine, this change has had an important effect in improving the performance of the Ford engine. If you have a 1914 Ford, we strongly advise the installation of the new light weight pistons and connecting rods.

While the crank shaft still has as many bends as a snake with a broken back, yet there have been several changes made in the crank shaft to make it wear better. One of these is the lapping or polishing of the bearings in the direction in which they run. Consequently, the steel shaft

will not wear the babbitt bearings so rapidly. Also, after being straightened, Ford crank shafts are now put in static balance.

In 1919 an important improvement was made in the timing gears, by changing from the straight spur gears to the present type of spiral gears, with the teeth cut at a slant or angle. The gradual engagement of the spiral gear teeth gives a smoother action, and results in much less noise from the timing gears. And timing gear "howl" does not give nearly as much trouble as it did.

Perhaps the Ford planetary transmission is the assembly that has been subject to fewest changes—yet several important changes have been made in this part. For instance, the triple gear assemblies were formerly composed of three separate spur gears, rivetted together. After hard usage, the rivets would sometimes work loose. Then it was an awful job to disassemble the transmission to tighten the rivets. This trouble has been completely eliminated by the present design in which all three spur gears of each triple gear assembly are cut from a single block of steel.

Another trouble that was sometimes encountered on earlier Fords was the dropping down of the high speed clutch discs between the brake drum and the clutch disc drum, due to wear of the old style transmission distance plate No. 3330. Since that part gave trouble, the Ford engineers eliminated it by changing the design of the brake drum, and thus making the distance plate unnecessary.

When drivers allow the car to coast down long hills with the high speed clutch disengaged and the engine stopped, then the end thrust of the high speed clutch spring is taken up between the brake drum and the clutch disc drum. In the earlier Ford models, there was a wide flange on the end of the brake drum bushing to take care of this end thrust. But this flange used to wear and, when worn, would allow too much end-play in the transmission.

In 1920, the Ford engineers overcame this trouble and improved the planetary transmission by fitting three steel thrust washers between the clutch disc drum and the brake drum. These three steel washers will stand much more severe service than the bronze flange. However, it is not advisable to coast with the engine stopped for, when the fly wheel stops, there is no circulation of oil over the discs. And any bearing that is not lubricated will soon wear or burn out.

In the 1914 Fords, the transmission covers were of aluminum and, while they sometimes cracked, they were about 20 pounds lighter than the iron covers now used. While the iron covers are stronger they are also heavier. But when the Ford Motor Company secures Muscle Shoals and a supply of aluminum, it is possible that these covers may again be made of that material.

Radiator Re-designed

One of the biggest improvements in Ford cars was the change from the dinky little brass

Up with the record breakers

Spurt of Brow, Navy Pilot, Greatest Speed Ever Made by Man; N

GOES 274.2 M
OF NAVY GREAT
FLIGHT RECORD

Air Speed Record Smashed 3 Times In 2 Hours in New Rivalry

266 Miles an H

CURTIS AEROPLANE & MOTOR COMPANY, INC.
14 HAIL STREET
BUFFALO, N. Y.

On September 28, 1923, at Oyster Bay, N. Y., you first saw a new plane respectively in the world for the moment. International Distance flying was done by this plane. The plane averaged 274.2 miles an hour over the 212 mile course, making this the fastest speed ever for the distance.

On October 6, 1923, at St. Louis, Mo., you saw a new record for the distance. The plane averaged 266 miles an hour over the 150 mile course, making this the fastest speed ever for the distance.

This is the third consecutive year that all these records have been set by the Splitdorf Magneto. The reason for this is that the Splitdorf Magneto is the only one that is built to last. It is built to last because it is built to last. It is built to last because it is built to last.

Very truly yours,
The President

AND you too, Mr. Ford Owner, can be "up with the record breakers."

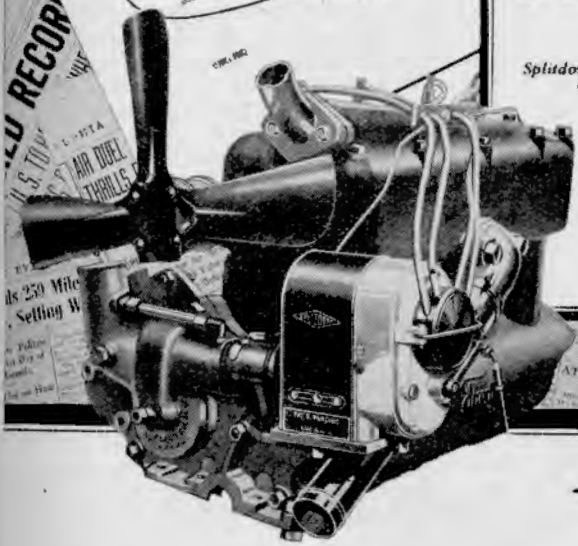
For the same principle of magneto construction that makes the world's records possible are available for Ford cars in the Splitdorf Gear Driven Magneto specially designed for installation on Fords, that never fails to give:

- The easiest possible starting at lowest cranking speeds;
- A hot, fat, sizzling, never-failing spark that just CONSUMES the mixture and minimizes carbon deposit; and
- Absolute protection against oil, dust, grease and the natural accumulations found with the best kept motors.

SPLITDORF ELECTRICAL CO.
Dept. F--392 High Street
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Splitdorf Magneto installed on Ford Engine

Splitdorf Green Jacket Spark Plug designed especially for Ford Engine. Extra length of shell eliminates trouble due to excessive oil in cylinders. Insist on this special type.



bound radiator of the 1914 and 1915 Fords to the streamline radiators used on the 1917 and later models. The increase in size of the radiator greatly increased the cooling capacity of the radiator. Fitting the radiator with a separate shell (1914 radiators were of one-piece construction with sides soldered in place) made a stronger radiator and one that is easier to repair.

Just recently, the Ford radiators have again been altered and the 1924 Ford radiator is now even higher, which not only improves the cooling efficiency but gives a higher hood and a better appearance to the car.

The splash pan below the radiator, and the side wings to the front fenders, not only improve the appearance of the car, but tend to scoop in the air and direct it through the radiator, thus giving better cooling. Also, the splash pan protects the radiator from mud and dirt, so that it will cool more effectively.

The radiator is now mounted upon springs, whereby it is afforded a limited amount of flexibility, thus preventing the bending or twisting of the chassis frame from straining the radiator and causing leaks. This increases the life of the radiator, prevents radiator breakage from frame weaving, and relieves the radiator of many sudden shocks and much vibration.

Instead of the four separate blades rivetted to a central casting, the Ford fan has been improved by being cut from a single piece of sheet metal, thus making a stronger fan. The lubrication of the fan has been made much easier by the large oil reservoir. This keeps the bronze bushings well lubricated and reduces wear and rattle.

The life of the fan belt has been greatly increased by the use of larger pulleys, which prevent slippage and wear of the belt. Also, the larger pulleys allow the belt to pull the fan with less strain, and do not bend the belt at such a sharp angle, thus reducing internal friction in the belt fabric. The longer belts now used contain more material and have more "give" to them, and so wear longer.

The Fuel System

In 1914 Ford cars, there was a 10-gallon round fuel tank under the front seat. In order to lower the seat cushions of the touring cars and roadsters, the elliptical tanks were adopted. While these elliptical tanks are considerably more expensive to manufacture, this shows that the Ford Motor Company does not hesitate at expense, if a real improvement can be effected.

Not better engines, but better fuel, is the real reason why some of the 1914 Fords seemed to have such powerful engines. In 1914, gasoline really was all gasoline even though it only cost about 12 cents a gallon! Such gasoline would evaporate quickly, and also clean and dry. This old style gasoline produced so little carbon that it was only necessary to remove carbon every 5,000 miles or so, and high compression could be used.

Present available fuel contains at least 50 per cent of kerosene oil and the Ford engine has had to be modified to a certain extent to use this relatively bum fuel. It is interesting to notice that a much more effective hot air stove is used on the latest Ford carburetors than on the earlier models.

On 1914 Ford cars, either a Kingston Model Y carburetor or a Holley Model H carburetor was used. Both of these carburetors were good carburetors for their time, and for 1914 fuels. But as fuel changed, it was necessary to change the carburetors so that the mixed kerosene-gasoline fuels of 1924 could be vaporized to better advantage. The present Holley NH carburetor, or the improved Kingston carburetor are great improvements over the carburetors used on early Ford cars. If your 1914 Ford has one of the earlier carburetors, you will be well repaid by changing over to a carburetor of present design, which is better adapted to cope with the poor quality of fuel now available.

Ignition Improvements

One of the greatest ignition improvements is the fact that the storage battery of the electric starter supplies a fine hot spark for easier starting, and also acts as a stand-by in case that trouble should develop in the Ford magneto. If your car does not have an electric starter, then we strongly recommend that you carry one of the compact dry cell assemblies for easier starting and as a get-you-home source of current for the ignition system.

Owners of earlier Ford cars used to have lots of trouble in rainy weather with water getting down between the coil box and the dash, and putting the ignition system out of business. This water used to have the same effect on a Ford's ambition as a snow ball down the neck of a bob-haired girl.

A dash weather trough is now used which catches any water from severe rains which works under the hood at the dash. The trough carries the water off to either side, eliminating danger of shorts, hand starting or irregular firing due to possible water short on the coil terminals or dash wiring.

As previously mentioned, 1914 Fords were equipped with head lights burning acetylene gas. But as these gas lights were such an awful nuisance, the change to electric head lamps (operated from the Ford magneto) was made in 1915. It is interesting to note that the doors of these earlier electric head lamps had brass rims.

When the electric head lamps were added as factory equipment, the magnets of the Ford magneto were changed from the $\frac{5}{8}$ inch to the $\frac{3}{4}$ inch size, in order to supply the extra current required for the head lights. Also, the windings of the magneto coil assembly were changed from the round bobbins to the oval type, thus making a much more powerful Ford magneto.

Now that the Ford magneto is only used for

Philbrin Gearless Ignition for Ford Cars

Here is the final design in clean installation combined with the advanced Philbrin Ignition System. The Gearless Distributor screws directly on the Ford cam shaft giving a rigid drive without the backlash or trouble of the gears used in other Systems. There is no lag in Philbrin timing. You get a very fast spark on the instant it is required. Power leaps up while gas consumption drops and your starting troubles are over. Installation is easy. About one hour with only a screw driver and wrench does the trick. The radiator need not be removed.



Contact Maker and Distributor \$13⁵⁰

The Philbrin Ignition System is like no other on the market. It is a highly designed and fully patented System, giving an intense, crashing spark at all speeds which literally tears the gas to pieces. This gives instantaneous flame propagation with great power and acceleration. It explodes a leaner mixture with a big saving in gasoline and leaves practically no carbon deposits because of the clean combustion. For starting in cold weather the Philbrin is remarkable and thoroughly appreciated by Ford owners. Our illustrated folder describes this System fully.

Special Wiring \$2.00; High Duty Coil \$7.00. Complete Philbrin equipment \$22.50 Tax Paid. Shipping weight 6 lbs. Any good coil can be used with the Philbrin Distributor but without our guarantee.

10,000 Mile Guarantee

With our 30-day money-back offer safeguards the Ford owner who would like to try real ignition results.

The open circuit type of ignition as used by Philbrin requires about one eighth of the current usually employed. It will run equally well on six dry cells or on a battery so low that you can not blow the horn. This low current consumption and quick starting means a big saving in battery current. You will be more than delighted with the new action of your Ford when Philbrin has been installed. We will gladly send you illustrated folder upon request.

Distributors and Dealers are finding additional profits in Philbrin sales. Write us for territory.

Philbrin Corporation, 511 S. Broad St., Kennett Square, Pa.

The Highest Grade Ignition in the World

ignition (on starter Fords) the magneto has ample current for the ignition system even when the magnets are comparatively weak. Another change in the magneto coil assembly was to round out the corners, between the coil bobbins and the frame of the magneto coil assembly, so that metallic filings would not collect so easily at these points and cut through the insulation and short or ground the magneto.

About the middle of 1914, a great improvement was made in the Ford ignition system when the old style wood coil boxes (as used on the earlier Ford cars) were replaced with the present type of metal coil box. While the metal box is both neater and less expensive than the hard wood boxes previously used, the big difference is in the coil units.

The coil units of earlier Ford cars had genuine platinum points which, even in those days of comparatively cheap platinum, cost about \$1.00 each, as compared with the 10 cents each now charged for coil points. Even though our 1924 dollar will only buy about half as much in many things—the improvement in coil points means that we can buy ten times as many for a dollar!

The present tungsten coil points are harder and far superior in performance to the platinum points. And require much less frequent replacement and adjustment.

The ignition lock on the 1914 Fords could be easily turned with a nail. While the present ignition locks do not afford absolute protection, the Ford car certainly has a far better lock now than it did in 1914.

The wiring system of the Ford car has been completely re-designed, making it practically proof against short circuits and fire. The new design has been approved by the Fire Insurance Underwriters, and all Ford cars equipped with the new wiring system obtain the remarkably low fire insurance rate of 55 cents per \$100.00 valuation. Insurance on Ford cars equipped with the earlier type of wiring is double this amount.

The wires are now of 16 gauge or heavier, insuring freedom from breakage and greater mechanical strength. All wires are protected by black glazed cotton looms, giving strength and good appearance. Special loom extension on commutator wires, and fibre insulators on commutator case, protect this once weak part where the wires sometimes gave trouble.

Of course, the biggest improvement in the Ford car has been the addition of the electric starting and lighting system, which has made it possible for even women to drive cars. Even those drivers who had a good Armstrong starter often suffered from broken arms or dislocated shoulders, so the electric starter may safely be said to be one of the most effective safety devices ever invented.

One of the great indirect benefits of the electric starting system is that it makes available an adequate supply of current for electric lights, even when the engine is not running. This makes

it unnecessary to clean, fill and trim three pesky oil lamps, which gave lots of trouble on the earlier Ford cars.

We now have diffusing or anti-glare lens as a part of the regular equipment of every Ford car at no additional cost. While in 1914, such lenses were hardly imagined by the most enthusiastic drivers. The double filament bulb is a great convenience and saves the weight and bother of a set of side lamps.

Counting the Cost

During the early part of 1914, the Ford touring car sold for \$600. and the runabout for \$525. These prices were later reduced and on August 1, 1914, the touring car sold for \$490. and the roadster at \$440.00. At that time, the Ford Motor Company announced that "If more than 300,000 cars were sold during the year beginning August 1, 1914, each purchaser would receive a refund of from \$25 to \$50."

While few people took the announcement seriously (as 300,000 was a remarkable number of cars for those days, and only 221,000 had been sold the year before), yet it is a fact that the Ford Motor Company did sell over 300,000 cars that year. And refunded more than \$15,000,000. to car owners! The writer of this article was one of those who received an unexpected check for \$50.00.

Compare the \$600 and \$525 prices of 1914, with the \$295 and \$265 for the touring and roadster models at the present time. The prices have just about been cut in half! Also, as the buying power of the dollar has been reduced at least 50 per cent, you can now buy at least THREE TIMES AS MUCH FORD NOW AS IN 1914!

The Little Old Ford

SELL our Ford? Well I guess not!
The fenders may be bent I know.
Some bolts are lost. It needs a top
But let me tell you it can go.

What if the clutch does sometimes balk,
Or if the bearings do rebel.
It rattles some I don't deny.
But when it runs it goes like—well,

Tom Jones with his big Packard car
Don't very often get ahead.
Last week we walked to town, I know,
For something in it had gone dead.

But laws! Jim fixed the battery.
A hub cap also he has bought.
We'll hang a lantern on behind.
Sell our Ford? Well, I guess NOT.

By Edna Smith DeRan.

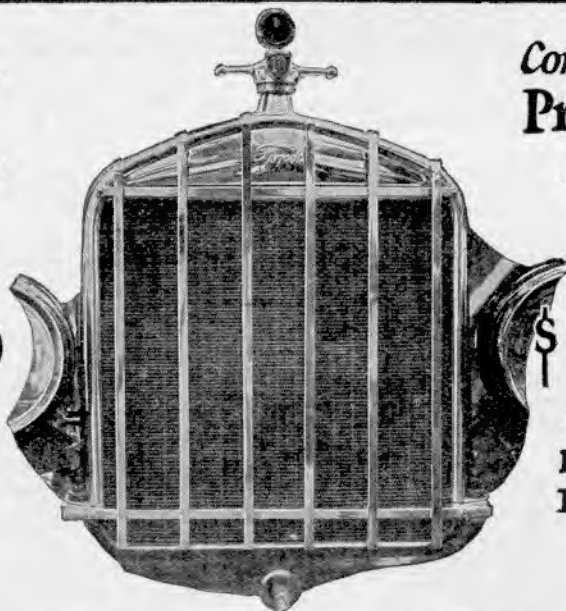
MERCURY *Nickelēd* RADIATOR SHELL

1924 MODEL

*Complete with
Protecting
Rods*

\$ **12.50**

F.O.B.
LOS ANGELES



\$ **14.**

EAST OF
DENVER

Make Your Ford *Distinctive*

-- give it that custom-built look that will make it "stand out" -- different, distinctive, "classy"! A Mercury shell will enhance the appearance of your Ford more than any other accessory.

The Mercury shell is a genuine Ford part that has been sealed with a special solution to prevent rust. Covered with duplex copper, and heavily nickel plated, replacing the regular black Japan shell. Protecting rods are made of half inch brass tubing, bevel at top and heavily nickel plated, attached to shell with horizontal spacers top and bottom. All shells wrapped in tissue paper and packed in heavy individual cartons for shipping.

We Can Also Supply Shells for Previous Ford Models

If Your Dealer Can't Supply You

USE THE COUPON 

Dealers & Jobbers: -- if you are not already stocked, do it now. "Cash in" on the remarkable sales Mercury shells are enjoying.

Write or wire for our proposition.

PULLIAM & PULLIAM

1232 So. Grand Ave.

Los Angeles, Calif.

Gentlemen:

Enclosed find { *Check* / *Money Order* } for which send me 1

1 Ford Nickelēd Shell Parcel Post prepaid.

Pulliam & Pulliam

Manufacturers & Distributors  of Automobile Equipment.

1232 S. Grand Ave.

Los Angeles

FOD 1

Power and Speed

The Overhead Cam Shaft and Five Bearing Crank Shaft For Greater Engine Efficiency

BY ROBERT M. ROOF

Chief Engineer, Laurel Motors Corp.

EVEN at touring car speeds, when the Ford engine is only running at 1000 revolutions per minute, the light and whippy Ford crank shaft is so springy that vibration is noticeable. That is why counter balanced crank shafts secure a noticeable improvement in the smoothness of the average Ford engine.

But if we speed up the engine to 3,000 or 4,000 revolutions for racing car use, then we find that a crank shaft of the usual Ford size design does not have sufficient stiffness to resist the centrifugal forces, and power is wasted in vibration. When we remember that centrifugal force increases as the square of the speed, then we realize that the force is sixteen times as great at 4,000 revolutions as at the usual 25-mile speed with 1,000 revolutions.

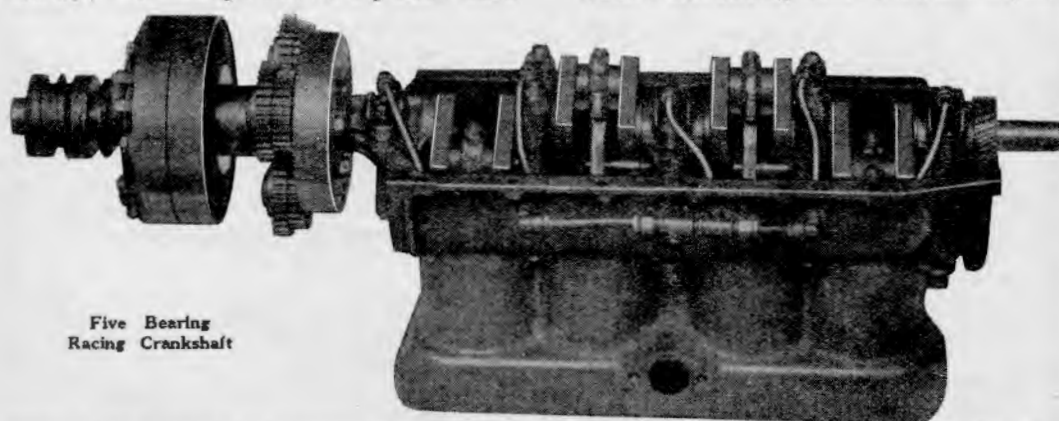
One way of obtaining greater stiffness in the crank shaft is to increase the size of the crank shaft itself. Another way is to fit two extra bearings, thus making a five-bearing crank shaft.

greatly increase the stiffness of the crank shaft.

We have found by experience that a crank shaft with five-bearings greatly reduces the vibration in a four cylinder engine, for the reason that the distance between the supporting bearings has been reduced just one-half. And the least bearing at these intermediate points will keep the tremor from starting—and if you do not allow the tremors to start, then there will never be any vibration.

Another advantage of the five-bearing crank shaft is that the crank cheeks are in a straight line. This eliminates any chance for parabola, as we discovered when the new crank shaft was tested out on the Precision type of crank shaft balancing machine. The crank shaft can be balanced for all speeds on this machine and, according to tests made, there is no critical point after the crank shaft is properly balanced.

When a five-bearing crank shaft is used, the



Five Bearing
Racing Crankshaft

While a third way is to combine the two, thus obtaining maximum strength and stiffness.

Owing to the one-piece construction of the upper half of the crank case, and cylinders and their water jackets; the Ford cylinder block casting is very strong and rigid. And, if we use a sufficient number of bearings to tie the crank shaft to this rigid cylinder block, we can thus

two auxiliary main bearings are secured to the cylinder block by shouldered studs. The ends of the studs can just be seen between the first and second and the third and fourth cylinders.

Recesses are cut in these auxiliary bearings so that the hold down studs secure these bearings to the cylinder block independently of the bearing caps. Consequently, the bearing caps can be re-



no harm done!

No car is safe from the other fellow

—unless it has rear protection

Every Ford Owner appreciates the protection and security that a good rear bumper provides. That's why over one hundred thousand Fords are now equipped with the

And it solidly braces and supports the rear fenders, corrects loose play, dropping and stops rattles.

"T" steel construction; finished in black baked enamel or heavy nickel plate.

MARQUETTE

Registered U. S. Pat. Office

Fender Brace and Bumper for Ford Cars

This strong, neat bumper wards off all damaging blows. It gives full rear protection for half the usual price!

- List Prices for Coupe, Roadster and Touring
- No. 10 Black Baked Enamel Finish.....\$4.50
 - No. 20 Heavy Nickel Finish.....\$6.25

- List Prices for Fordor and Tudor Sedan
- No. 30 Black Baked Enamel Finish.....\$4.75
 - No. 40 Heavy Nickel Finish.....\$6.50

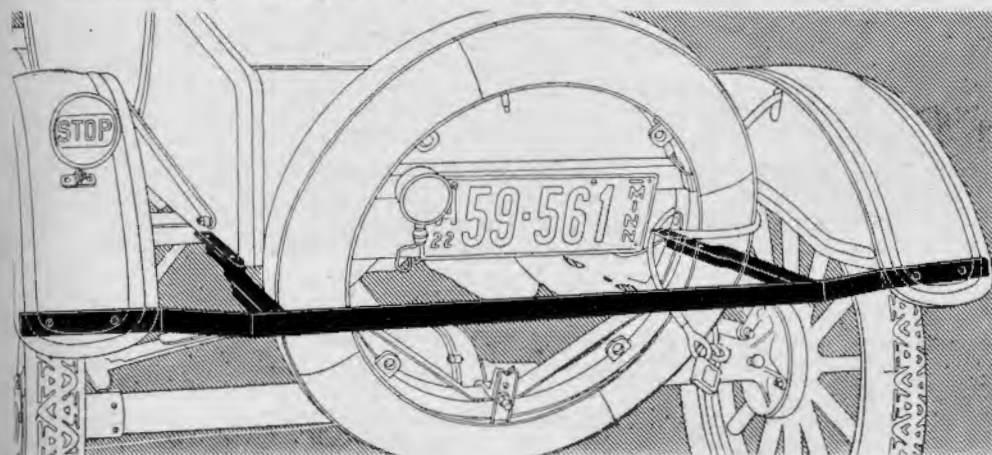
Installation Extra

Pacific Coast Prices Slightly Higher

Ask Any Ford Dealer

MARQUETTE MFG. CO. St. Paul, Minn.

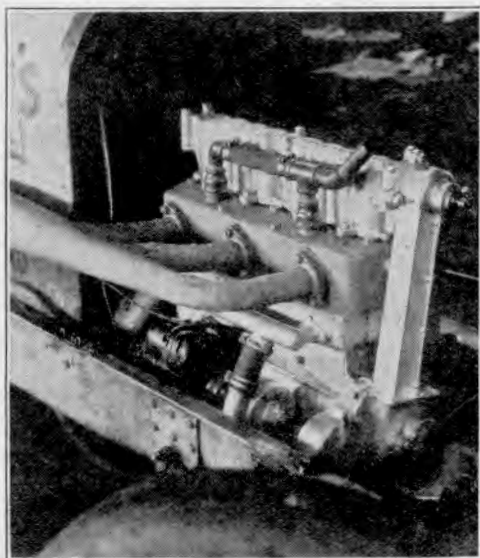
DEALERS—Ask your jobber about our interesting offer.



moved for refitting without disturbing the alignment of the bearings.

The five-bearing crank shaft is machined from a bar of solid stock. The main bearings are $1\frac{3}{8}$ inch in diameter, and the crank pins are $1\frac{1}{8}$ inch diameter; as compared with the $1\frac{1}{4}$ inch diameter, for both main and connecting rod bearings, of the regular Ford crank shaft.

The crank shaft is hollow drilled, and the oil



Silent Chain Driven Cam Shaft

is distributed to the crank pin bearings from the auxiliary bearings by oil ducts leading from the auxiliary main bearings to the crank pins. The arrangement of the direct oil feed to each main bearing is clearly shown in the cut.

The total bearing friction of the five-bearing crank shaft is less than that of a three-bearing crank shaft, for the reason that the two extra bearings prevent crank shaft deflection and bending, which is one of the chief causes of bearing friction and wear. A round, true shaft spinning

and have proven very successful. The view of the five-bearing crank shaft is also interesting in that it shows the cut down fly wheel that is of sufficient size for use on a racing Ford engine. For racing use, the reverse drum, with its additional friction and drag, has been removed. This leaves the slow speed drum for starting the car and the brake drum for stopping it.

The Victory Eight

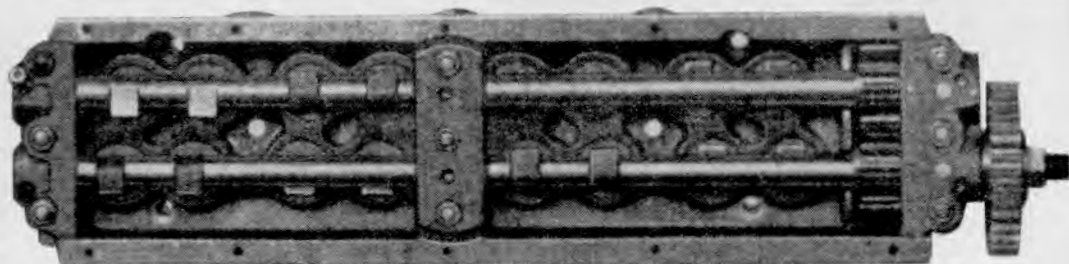
The Liberty aviation engine, the engine of the Wills-St. Claire, and other notable engines have been distinguished by their power and speed, obtained in part from the overhead location of the cam shaft. And now we have Ford racing engines, of both 8-valve and 16-valve overhead type, fitted with overhead cam shafts.

One of the features of the overhead cam shaft is that the action from cam to valve is short and direct. Thus eliminating push rods, rocker arms and other comparatively heavy parts whose weight and inertia tend to retard the action of the valves at very high speeds.

In order to drive the cam shaft, a silent chain drive (of the type used on the Lincoln, Packard, Cadillac, and other high grade cars) is used. As such cars have used the silent chain for driving the cam shaft for many years, the reliability of the chain drive is now well established. While the illustration shows a sheet metal housing for the cam shaft, the patterns are being changed, and the chain housing will hereafter be an aluminum casting.

In testing out the Victory Eight, tachometer readings of the engine running without load showed speeds of between 6,000 and 6,500 revolutions per minute. Some of those who watched the tests were so startled by such high speeds that they thought the engine might blow up!

On a cement road, the engine has maintained an engine speed of 4,200 revolutions per minute for six miles, with the car travelling most of the time at 100 miles an hour or over. The tach-



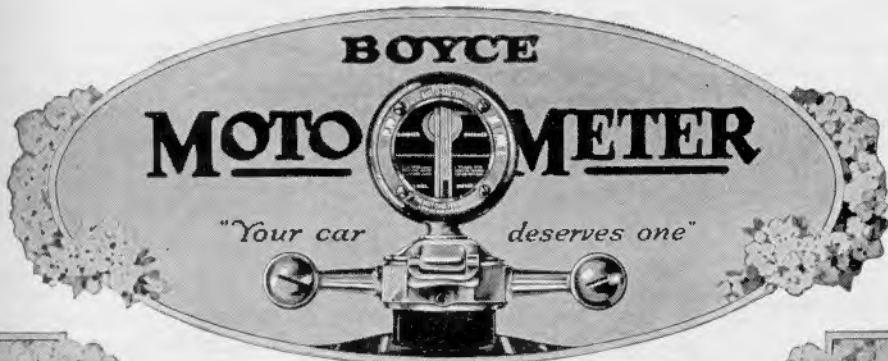
Dual Cam Shafts Actuate Doubled Valves

ometer was attached to the rear end of the overhead cam shaft.

The sprocket which drives the silent chain is mounted in the position usually occupied by the Ford timer. Consequently, the silent chain runs at but one-half of the crank shaft speed, which is

in bearings has but little friction. It is only when unbalanced forces distort the shaft that the bent shaft tries to wobble in its bearings and so causes friction.

The five bearing crank shafts have been thoroughly tested out in racing during the past year



Boyce Moto-Meter Month of May—

THE greatest merchandising campaign ever used in the automotive equipment business. This gigantic—smashing advertising and selling effort is all arranged to benefit the dealers of the country first.

You must profit before any benefit can reach us

Fifteen leading national magazines with over 10,000,000 circulation (including four May issues of The Saturday Evening Post) together with a billboard campaign covering all the main highways from the Atlantic to the Pacific and from the Gulf to Canada, will impress the consumer.

YOU CAN MAKE YOUR STORE A PART OF THIS WHOLE CAMPAIGN by displaying, as soon as it arrives, the beautiful six color lithographed window display as shown on this page.

This is in itself a strong invitation to every car owner to come into your store and buy automotive equipment—not only Boyce Moto-Meters, but other staple articles as well.

Place your orders with your jobber as far ahead as possible, to avoid delays in delivery.

The MOTO-METER COMPANY, INC.
Long Island City, N. Y.

THE MOTO-METER COMPANY OF CANADA, Hamilton, Ontario
Manufacturers of Industrial Thermometers and Boyce Moto-Meters exclusively

BOYCE MOTO-METER

"Your Car Deserves One"

BOYCE MOTO-METER

There is no other automobile accessory that gives such supreme service, for so long a time, at so little cost, as the Boyce Moto-Meter.

Remember, there is a Boyce Moto-Meter for every car—from a Ford to a Rolls Royce.

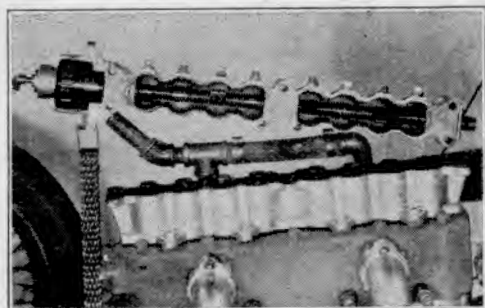
Your Car Deserves One

MOTORING NECESSITIES

- BOYCE MOTO-METER
- SCHLACH
- LOCKING CAPS
- LOGGAGE CARRIERS
- TIRE CHAINS
- FLASHLIGHTS
- SPARK PLUGS
- STOP LIGHTS
- COAR LIGHTERS
- BUMPERS
- TIRE GAUGES
- HORNS
- WINDSHIELD WIPERS
- REAR VIEW MIRRORS

important in such a high-speed engine as this.

The overhead cam shaft is provided with an outboard bearing for the upper chain sprocket which is lubricated by Alemite oilers. A pressure feed oil pump of the gear type is mounted



Victory Eight Carburetor Side

on the extension of the lower cam shaft. The cam shaft is easily removed, and regular Ford cam shaft bearings are used in the upper cam shaft housing.

The overhead cam shaft has the fast timing, with the roll top cams giving a very fast valve action. We have found that we could reduce the valve lift, and still get the same revolutions and acceleration. While holding the throttle open at 4,200 revs. under load, the writer feels that, if there were two of the 2-inch carburetors, the revolutions would have gone still higher, as the engine could be heard calling for gas.

In connection with these cylinder heads, we have tried to secure perfect water circulation. And the large water pump of the centrifugal type will be noticed at the side of the cylinder block in the position usually occupied by the Ford electric generator. A high-tension magneto is driven by an extension of the water pump shaft, and the cables to the spark plugs are neatly carried through the opening between the second and third cylinders.

A gear type of pressure feed oil pump is attached to the front end of the regular cam shaft, as an engine which runs at such speeds certainly needs pressure feed oiling to the bearings. This oil pump also serves as an out-board bearing for the lower chain sprocket shaft.

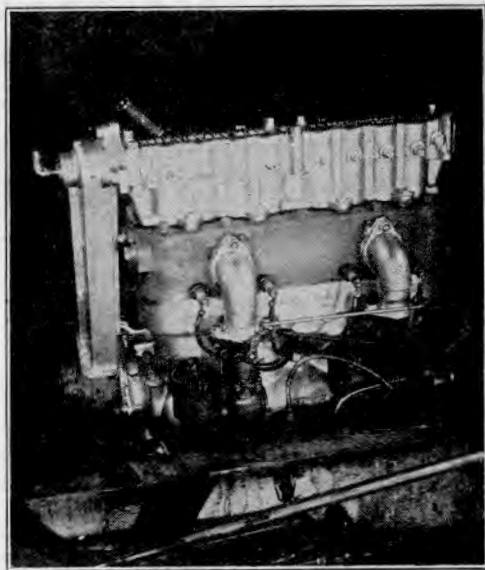
The front cover plate, on which the oil pump is mounted, is machined with a male and a female recess, so that the alignment between these parts will always be perfect.

The overhead cams act directly on the plungers or tappets which work in guides directly over the valve stems and valve springs. Any side wiping action of the cams is taken care of in these tappet guides, and only direct push is transmitted to the valves. Due to the absence of side thrust on the valve stems, the wear of the valve guides is greatly reduced, and this tends to prevent air leaks around the valve stems and uneven running at slow speeds.

The Roof type C engine can now be supplied with a double overhead cam shaft, one cam shaft operating all the doubled exhaust valves, while the other cam shaft operates the doubled inlet valves for the four cylinders. With this sixteen valve head, all valves are of the 1¾ inch size. And the four valves per cylinder certainly allow a very free flow of gas, and great speed and power.

With the double overhead cam shaft, the writer has used this on an engine fitted with a five-bearing crank shaft. With four Miller carburetors and long air induction pipe, we are frank to say that we never drove a car as fast as this outfit. When the lines of the road commence to cross, and when one's cheeks are pressed in on one's face—then one is surely travelling.

The two cam shafts are geared together so that only one silent chain is necessary to operate the



Victory Eight Camshaft

two cam shafts. And the chain drive only operates the two cam shafts, while on Lincolns and other 8-cylinder cars, the silent chain operates two cam shafts, water pumps, etc.

Unlike the Good Old Times

*AT Bunker Hill and Brandywine
And often on the sea
Our fathers fought with courage fine
To make our country free.*

*And victory was what they'd planned
For liberty and life,
Since far and wide throughout the land
Were Freedom's comforts rife.*

*But O what changes fall in line
As decades onward fare!*

*For now we have to see a sign
To know we'll get "free air!"*

By Ermon Miland Peck

Ford Repair Book FREE

Every Ford Owner or Ford Driver should own a copy of this valuable book—in fact carry it with him at all times.



This interesting little book — true to its name "Ford Care and Home Repair" contains illustrated information on various methods of Ford car repairing.

It also contains a complete Ford Motor Trouble Chart covering all parts of the car outlining Ford Car troubles common to every driver and giving remedies for each. This chart alone will save you much time, trouble and cost.

Free With a Year's Subscription

For a limited time we are offering a copy of Ford Care and Home Repair FREE with a year's subscription to FORD OWNER AND DEALER Magazine at the regular price of \$1.50 a year. If you are now a subscriber, this also applies to your renewal.

You will need FORD OWNER AND DEALER during the coming year. It will be bigger and better than ever. Subscribe now and get your FREE copy of Ford Care and Home Repair.

Send This Coupon Today

FORD OWNER AND DEALER,
129-135 Michigan St.,
Milwaukee, Wis.

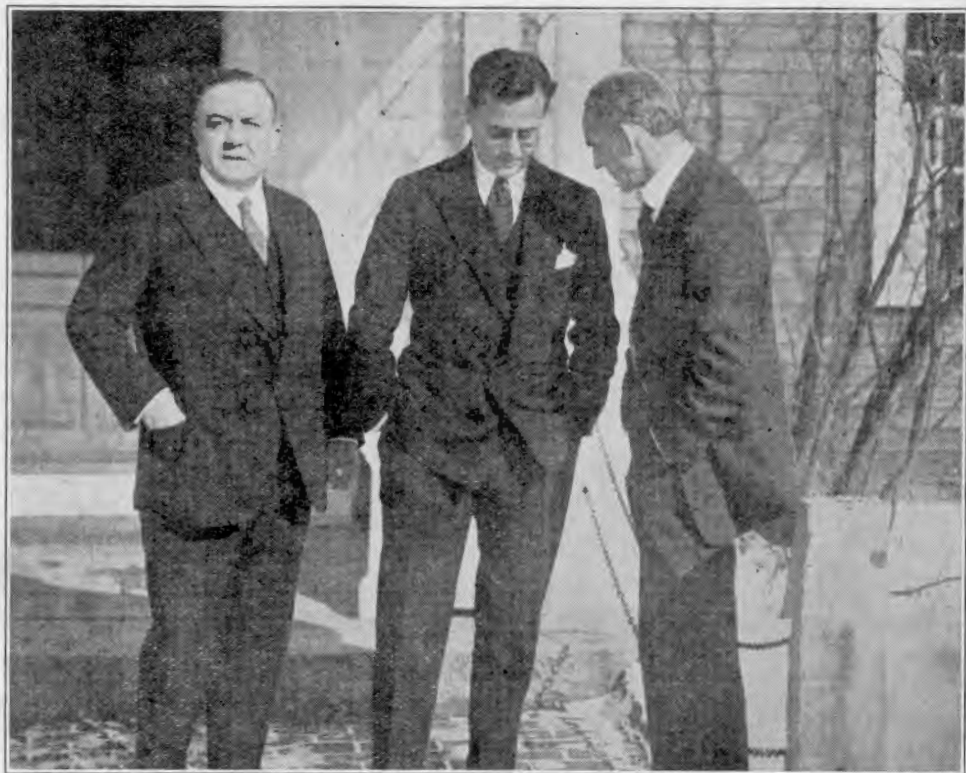
For the enclosed \$1.50 (M. O. Check Currency) please send me FORD OWNER AND DEALER Magazine for one year and send me (postage prepaid) the Repair Book Free.

Name.....

Address or R. F. D.....

City..... State.....

I am a (car owner) — (Garageman) — (Car Dealer) — (Accessory Dealer).



Mr. Ford Visits With His Eastern Officials

It Would Take Fifty-Seven Years to Interview All Who Want to Talk With Him—So He Goes Visiting Instead

A NIMBLE statistician probably could prove that in this country there are a couple of million persons who are confident that they have a personal message for Mr. Ford. In each case it is a message which its bearer is sure Mr. Ford should hear, whether it be advice on conducting his business, ways to spend his money to best advantage, or the story of some new invention of a gimcrack for the Ford car which, in the interests of humanity should be adopted as standard equipment.

The same figure specialist could inform you that if Mr. Ford were to grant each of these persons a five-minute interview and work at it throughout eight hours each day, it would take him 57 years, 28 days, 2 hours and 40 minutes to complete the interviews at the end of which time there would be another batch of persons with their messages.

Mr. Ford is too courteous to expect anyone to wait in his office that long for an interview, so he does not attempt it. Unquestionably he would like to talk to everyone, but it just can't be done, as the figures prove. Besides this, Mr. Ford likes to get a little time to visit around with the boys in his own organization. There is nothing he enjoys better than just "talking things over" with his lieutenants.

Recently Mr. Ford evaded a cordon of would-be interviewers and took a trip to South Sudbury, Mass., where he inspected the "Wayside Inn," historic tavern which he purchased. On his visit he was accompanied by Gaston Plaintiff, eastern representative, and Dutee Flynn, Rhode Island representative of the Ford Motor company. Here we see them having a pleasant little chat at the door of the Inn. Mr. Plaintiff at the left, Mr. Flynn, center, and—but you recognize him.

Industrial and Farm Uses of Ford Power Units

No. 12.

Golf Courses—Parks—Grounds

Miscellaneous Uses

MOST Ford dealers and tractor implement distributors have already decided to make this the biggest Fordson year in history. But it is one thing to make such a decision and quite another to carry it to fulfillment. Not that there is any obstruction to this course; the public wants Fordsons. Nevertheless, not all dealers are doing all that they might to push tractor use.

We have often urged the planning of tractor selling. Let us be specific in the matter of some seasonable sales.

We suggest that every dealer who reads this—and who has not already begun his campaign—start today to have his tractor salesman call on the local park board, officials of every country club and the purchasing department of every cemetery.

Have him make appointments for demonstrations, if necessary. Have him tell each of these groups just what Fordsons can mean. Have him *sell* a Fordson—or start negotiations.

The time is right. Some sort of equipment is going to be used presently to do the work required in these places. For the benefit of all concerned—see to it that Fordsons will be chosen.

Do it now.





Figures Prove Fordson Works on Golf Grounds

*Equipment Gets Work Done and
Saves Money on Big Job*

IN CHICAGO, the Mid-City Golf and Amusement Company is constructing a hundred-acre golf ground in a part of the city that has long been used as a dumping ground for the waste of the city. Before it was used for this purpose it was a brick yard, as the soil was a heavy clay suitable for manufacturer into bricks. So, great excavations were dug, thirty and forty feet deep. When this area was taken over as a dumping ground, every thing was dumped into it, including bed springs, wash boilers, garbage cans, iron hoops, wire netting, bricks, mortar, and every conceivable form of debris that a great city can produce. It took years to fill all the cavities and make mounds grow where depressions had been. This was the condition when the Mid-City Golf and Amusement Company determined to make an amusement place out of it.

It was seen that the plowing of this area would present more than usual obstacles, as the plows would have to cut through a mass of tough rubbish. The work was in the hands of Langford & Moreau, landscape engineers and golf architects of Chicago. This company has had a great deal of experience in using Fordsons in the clearing of other areas for golf grounds and determined to buy some Fordsons of its own. So it purchased three Fordsons and hired a fourth. Three of these were at work on the grounds when the Field Editor of *Ford Owner & Dealer* visited the locality.

The plows had been used with great success—an Oliver number 7 and a Deere number 40, each being a two-bottom plow. Two Deere disc harrows were also in use. Speaking to the writer, of the work of the Oliver plow, L. W. Shanesy, president of the Lloyd-Shanesy Motor Company, Ford dealers that had furnished two of the tractors and the Oliver plow, said, "We are much pleased at the way the Oliver plow has stood the strain of this excessively heavy plowing; we are servicing the plow and the only thing we have had to furnish in the way of a repair was a coulter wheel."

Harold T. Pease, chief engineer of the company, said, "Both the Deere and Oliver are 14-inch plows and are thus able to do the largest possible amount of work even in this very difficult plowing. We are also using a road grader with the Fordsons for leveling the ground.

We find that we can use Fordsons much economically in this work than we can use horses. Here is about the way it figures out: using some teams and are paying \$12 a day for a team and driver. We can operate a Fordson for \$15 a day, and it does the work of four teams. The four teams would cost us \$48 a day.

"The estimate of \$15 a day for the Fordson is a very liberal one, being made up as follows: driver, \$6.25 a day; kerosene and lubrication, \$2.50 per day; depreciation, or repairs, \$2.50 a day. I think the repairs should be considered as forming a part of the depreciation item, and are made necessary by the depreciation. This makes a total of only \$10.75 a day. But to be liberal and make an offset for every thing, So I add the \$4.25, to cover such items as insurance. Also, there is a loss of time of

Some of the best landscape gardeners may be found in cemetery work. They are looking for the most practical and economical ways to keep the grounds in good condition. Here is a field of prospects for all Ford dealers who should urge Ford power as best and most inexpensive.

driver when the machine is laid up for repair for any other reason, when the wages of driver have to be paid. So I think \$15 a day is fair.

"For the past month we have kept a record with each tractor, and we intend to continue to do so. We have owned the Fordsons for only six weeks, which explains why we have not done this before. For the month past, we have used, on the average, daily, one half gallon of gasoline and 13½ gallons of kerosene. We use four quarts of heavy oil per machine per day, in addition to draining off the old oil on a week, at which time we use two gallons for refilling.

"In this work we use kerosene, because it is cheaper. It is true that gasoline would give more power. But kerosene will drive the wheels right into the ground and provides all the power we can use. It would be a waste to produce an increased power.



Detroit's Patrician Neighborhood Decides on the Fordson

Grosse Pointe Golfers Know How to Keep the Course Right

WHEN you acquire a million or so of dollars in the city of Detroit, the traditional thing is to move to Grosse Pointe. That section is the recognized patrician residence district.

It follows that there just must be a country club—and there is a very good one. It is well patronized by many who know what a golf course should be and insist on having it just that way. At the same time, among its members are many practical businessmen, a number of whom have been brought up in the motor busi-

ness and are well acquainted with mechanical values.

So it is not surprising that when the committee on upkeep was considering ways and means of keeping the course in good condition, the reliable and economical Fordson was one of the first things thought of. Next, representatives of the Peter J. Platte Motor Sales, Ford dealers, hopped in with plenty of evidence of the value of the Fordson and soon a sale was made.

Here we see the Fordson with a mower keeping the course in perfect shape—and, as usual, doing the work at a saving over any other method.

This Ford Dealer Places Many Tractors on Golf Courses

Providing Right Equipment Builds More Business

AMONG the Ford dealers who have seen the sales opportunity for Fordsons and equipment which is offered through golf courses and grounds is the Shoreen Motor company, live and up-to-date dealers of Evanston, Illinois.

In the work of selling, a good deal of attention is being given just now to the selling of trucks and tractors. The agency has within a year sold 20 trucks and cars to the municipality, many of the trucks being equipped with dump

bodies. Most of the tractors sold have gone to golf links, either for construction work or for mowing and keeping the fields in order.

In this connection, Mr. E. R. Aldrich, tractor specialist said, "With the tractor we are also handling the Baker Backfiller. Here is the way I sold one tractor and equipment: I went to a golf course where they had a lot of open ditch to fill up. It was 12 inches wide and 3½ feet deep. With the tractor and backfiller I filled

This Dealer Places Many Tractors

(Continued from Page 147)

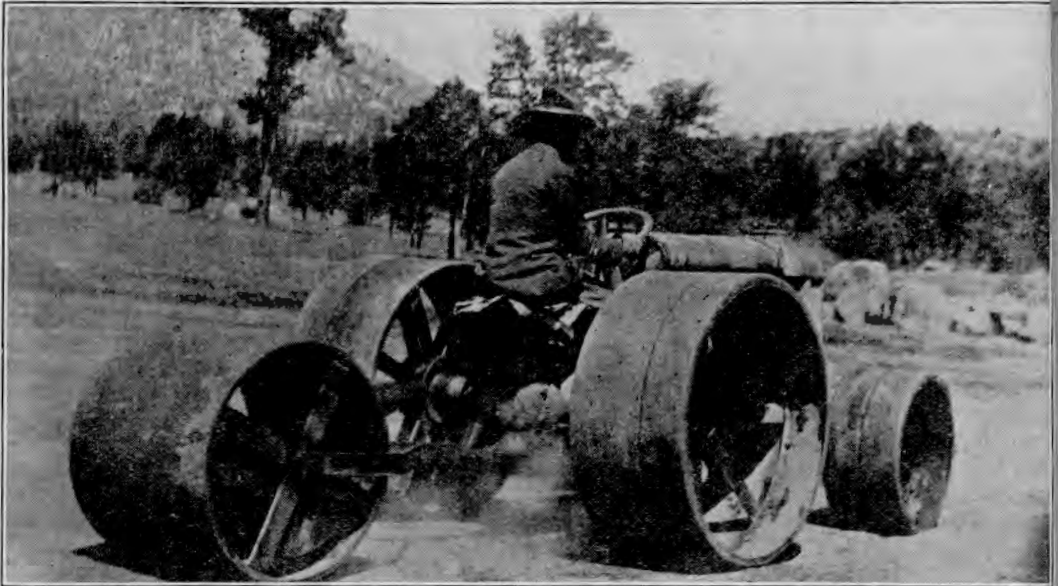
in 50 feet in six minutes. On the strength of that operation, it took me only 15 minutes to make the sale of the tractor and equipment. It is now doing the same work, with one man, that four horses and six men were doing previously. The tractor driver only is needed, the back-filler working automatically.

"The importance of such a combination is seen in the large amount of backfilling that has to be done in any of these big operations. On the golf course in question, the contractor had 80,000 feet of ditch for tile and 36,000 feet for water.

"I made another demonstration out in the country. There was much old grass stubble and alfalfa. The horse mower was used on it,

but it continually clogged. We put a tractor in with a Roderick Lean Cutmore Mower, and did the work easily.

"Out in the forest preserve, there was being created a Community Golf Course. One old pasture of about 30 acres was included. That had some good sod but also many ant hills and small mounds. We lowered the knife till it was within about an inch of the ground. Then we went on with the tractor and cut off smooth all those projections. That saved plowing and re-seeding the whole. We seeded only on the spot that were cut off and so saved a whole year in the process of making the course. For this work we simply used a tractor with wide-rimmed wheels, with no cleats or pegs."



Down in Arizona They Use Fordsons for Better Golf Courses

Proving That the West, Once Wild, Is Tamed and Improved

How times change! It really is not so long ago that, down in Arizona, proper "stance" didn't mean a thing to the natives. They were more interested in ability in the quick draw of a .44 than on a pretty drive and instead of golf balls fleeing through the air, lead pellets whizzed.

But now, where once rampaged some wild cow-puncher astride his mustang, we find the peaceful tractor operator on his Fordson mount

and many parts of the former wild and woolly are now converted into golf courses.

The introduction of golf courses marks the advancement of civilization. The appearance of the Fordson reveals the growth of modern efficiency. We vote for the modern idea; one is apt to live better and longer.

So here we show the present Arizona—with a Fordson keeping one of its many golf grounds in excellent trim.

Patented Dec. 6, 1921

All Rights

Reserved

*It Stands
the Gaff*



When You Sell a Wehr Grader

When you sell anything, including a Wehr Grader, there are several things you want to be sure of. First: the financial responsibility and integrity of the manufacturer. Second: you want to be assured of the engineering experience and ability of the manufacturer's engineering staff. Third: the manufacturer must have an unquestioned reputation for square and business-like dealing.

Then you must be completely convinced that the machine is designed after the best engineering practice and principles covering the class of work it is to do. And finally you want to know that the machine is built on specifications providing a large factor of safety on the most difficult work it will be called upon to do. In a few words you want to sell a Wehr Grader on the basis of its being able to "Stand the Gaff" in road building and maintenance.

The Wehr Company wants every Fordson dealer to be assured of its financial responsibility and integrity and of the experience and ability of its engineering staff on road grading equipment. To that end we invite thorough investigation.

Furthermore, the Wehr Company wants every Fordson dealer to be assured of the

ability of the Wehr One-Man Power Grader to perform accordingly to the statements made in our advertising and descriptive literature.

Wehr Distributors in every section of the United States and Canada are in position to sell Wehr Graders purely on their merits, their ability to back up our claims for them in demonstrations.

You already know Fordson ability to deliver steady power. You are proud to sell the Fordson. Here then is a new way for you to sell them, a new market sure and safe.

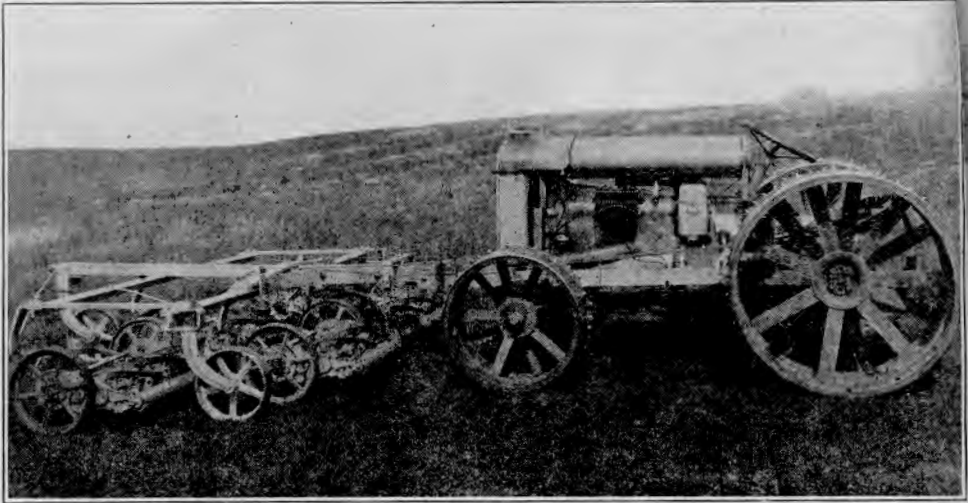
There's a Wehr distributor near you. Ask us to have him tell you the complete Wehr story. Let us tell you how we help you sell Wehr Graders.

Wehr Company, Milwaukee, Wis.

Distributors in All Sections of the United States

Canadian Distributors

Canadian Oliver Chilled Plow Works, Toronto & Winnipeg



Rarin' to Go— and Hard At It

Wisconsin Golf Course Keeps This Fordson Profitably Busy

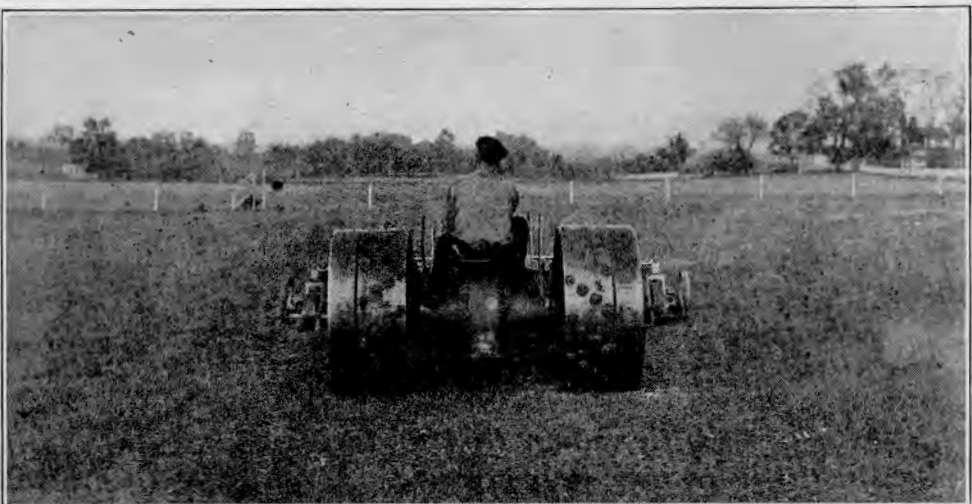
Above is a "still life" picture of a Fordson, equipped with a lawn mower for the golf course. Although standing alone and motionless, with mowers raised, it seems almost eager to get under way and do things. That is true with a Fordson most any time you look at it. The power is there, ready for the touch of the operator to start it accomplishing things.

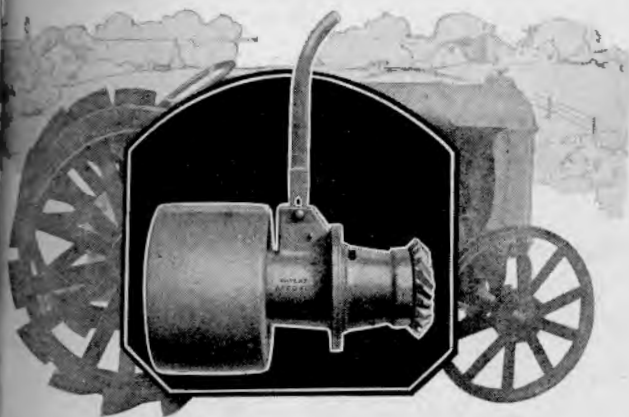
The other picture reveals that the operator has arrived. He has mounted and given lever to the formerly dormant power. The Fordson has jumped into it; the mowers start to whirl

and wide swaths are soon trimmed through the long grass.

The golfers on this Wisconsin course will find the links in just the proper condition for a good game. At the eighteenth hole they will thank the Fordson for a good score.

In industry, quite as much as in the golf game many are thanking the Fordson for bigger scores. How much more this will be true when tractors are installed in all of the places where they should be carrying out their work of economy.





Get Set Now for Your Biggest Spring!

SO INSISTENT is the spring demand for Smith Units that sales for the first three months of this year far exceeded our highest expectations. From coast to coast our distributors are demanding immediate shipment. That's why we say "get set now."

Order at once from your nearest distributor. He can supply you **now** with Smith Units. Don't wait until the season is at its height—for even modern production facilities, when precision workmanship is essential, have their limitations—and we don't want you or your customers to be disappointed.

Inner Gear Always in Mesh

The spiral bevel gear of the sturdy Smith Unit is always in mesh with internal gear of the Fordson itself. No possibility of damage to tractor. Clutching or de-clutching the Smith Unit means merely sliding the splined sleeve in and out, so it unites or disunites the two halves of the shaft.



DALLMANN MACHINE & MFG. CO.

912 Winnebago St., Dept. F-4, Milwaukee, Wisconsin

SMITH UNIT
PULLEY-CLUTCH
for Fordsons

Sold only through Authorized Fordson Dealers

Order from these SMITH UNIT

Distributors:

- SEATTLE, WASHINGTON,
Northwest Appliances, Inc.,
1117 Valley St.
- PORTLAND, OREGON,
Northwest Appliances, Inc
- SAN FRANCISCO, CALIF.,
O. R. Peterson Co.,
12th and Mission Sts.
- LOS ANGELES, CALIF.,
O. R. Peterson Co.,
1112 Santa Fe Ave
- DALLAS, TEXAS,
Moline George Co.,
Market and Pacific
- HOUSTON, TEXAS,
Moline George Co.
- AMARILLO, TEXAS,
Moline George Co.
- NEW ORLEANS, LA.,
Moline George Co.
- CROWLEY, LA.,
Moline George Co.
- TULSA, OKLA.,
Ryan Equipment Co.
- OKLAHOMA CITY, OKLA.,
Ryan Equipment Co.
- OMAHA, NEBR.,
Badger Body Mfg. Co.
- DES MOINES, IOWA,
Badger Body Mfg. Co.
- KANSAS CITY, MO.,
Badger Body Mfg. Co.
- MINNEAPOLIS, MINN.,
Badger Body Mfg. Co.
- FARGO, N. DAK.,
Badger Body Mfg. Co.
- FOND DU LAC, WIS.,
T. W. Meikeljohn Co.
- MILWAUKEE, WIS.,
T. W. Meikeljohn Co.,
433 Prospect Ave.
- CHICAGO, ILL.,
Dealers Equipment Co.,
3942 Federal St.
- DEARBORN, MICH.,
William Ford
- ST. LOUIS, MO.,
Monarch Equipment Co.,
4235 Duncan Ave.
- INDIANAPOLIS, IND.,
Dealers Supply Co.,
1327 E. Washington St.
- CINCINNATI, OHIO,
Dealers Supply Co.,
663 Lincoln Ave.
- COLUMBUS, OHIO,
Dealers Supply Co.,
395 Buckingham St.
- LOUISVILLE, KY.,
Monarch Auto Co.,
Broadway at Brook
- NASHVILLE, TENN.,
Monarch Auto Co.
- YOUNGSTOWN, OHIO,
H. R. Hooper Co.
- CHESTER, PA.,
Gash-Stull Co.,
9th and Sprout Sts.
- KEARNEY, N. J.,
Gash-Stull Co.
- WORCESTER, MASS.,
New England Implement Co.
22 Garden St.
- RICHMOND, VA.,
Universal Motor Co.
1012 West Broad St.
- CHARLOTTE, N. C.,
Universal Motor Co.
- ATLANTA, GA.,
Universal Motor Co.
- JACKSONVILLE, FLA.,
Universal Motor Co.
- BUFFALO, N. Y.,
W. B. May, Inc.
- COPENHAGEN, DENMARK,
F. Buelow & Co.,
Toldbodvej 6



Part of "Tree Fleet" in Front of Ford Dealer Office

Ford Power Needed in Tree Culture and Landscape Work

Tree Experts Are Able to Keep Parks and Grounds Beautiful With Ford Help

*"I think that I shall never see
A poem beautiful as a tree"—*

So wrote Joyce Kilmer in the familiar verse, with which we are all inclined to agree. Certain it is that the charm of parks, grounds and golf-courses is found, not so much in the rolling landscape, as in the decorative result of trees. Without trees most landscapes would be monotonous prairies.

On the other hand, trees are only beautiful if they are alive and healthy and in order to remain this way they sometimes have to put up a fight against conditions that are not propitious,

as well as a host of insect pests and parasites.

To help the trees in their fight, the Davey Tree Expert Co., of Kent, Ohio, has been organized and is doing a good work in providing all the attention that trees need, including pruning, trimming and spraying with antiseptic chemicals.

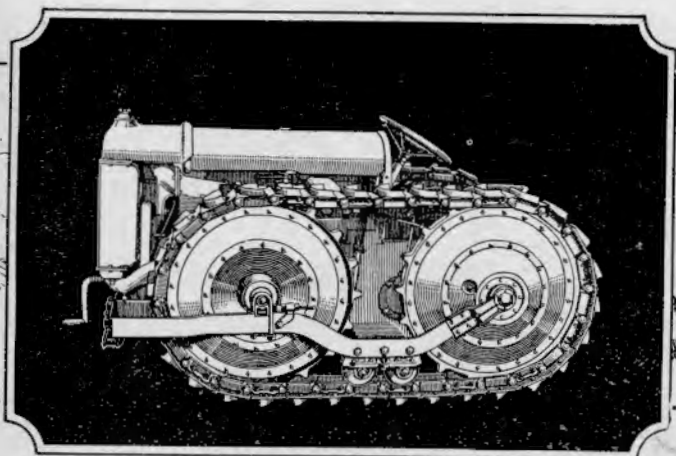
But, while helping the trees, the Davey company itself needed the best kind of help to cover its territory and get its work done with the greatest efficiency and the least cost. What do they do?

Adopted Ford power, of course.

You who know the Ford, need not ask if



View of Davey Special Outfit



How to Sell More Fordsons— and Make More Profit Per Sale

Selling Fordsons should be the easiest tractor selling job any dealer could wish for. If a customer is in the market for a light-weight, general-purpose tractor, the Fordson fills the bill from every standpoint.

And if the customer is in the market for a "crawler" type tractor—one that is to be used under conditions where wheel-type tractors can't operate successfully—you can still sell him a Fordson simply by equipping this tractor with a set of **Johnson TRACKPULLS!** And you make an extra profit on the sale—a profit on the TRACKPULL as well as on the Fordson itself.

The Johnson TRACKPULL is an exceptionally high-grade machine shop job that conforms to the general mechanical excellence of the Fordson tractor. This attachment converts the Fordson into a very efficient "muley" type two-ton crawler of practically 14 H. P. drawbar capacity, with independent clutch control, permitting square turning under load without throwing strain on differential.

Make the extra Fordson sales the TRACKPULL makes possible. And make the extra profit on every sale that this attachment represents. Get all the facts regarding our dealer proposition. Write—**today**—on your firm letterhead.

A. C. JOHNSON PRODUCTS COMPANY

DEPT. A-4, RACINE, WIS., U. S. A.



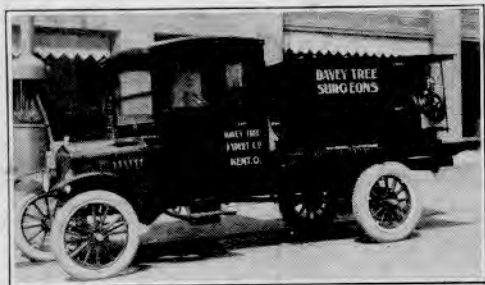


“Easy,” Says the Driver of This Digging Fordson

Device Digs Up Load and Dumps It Into Truck

A CERTAIN successful man when asked what principles were the best to follow in order to win answered with the brief advice: “Dig!”

proved successful; you *know* that it did. But for further conviction we quote Mr. Hugo E. Birker of the Davey company who says: “At the present time we have four power outfits mounted on Ford speed trucks which have proved effi-



One of the Davey Fords at Work

cient in every respect. With this type of equipment, we find it possible to make good time between spraying operations, thus cutting down the overhead due to lost time between jobs.”

The Fordson tractor had won considerable success before it did much literal digging but, judging from this illustration, it is ready to do plenty of digging in order to maintain its place if that is necessary.

The outfit shown is saving money for a St. Louis contractor. The shovel is lowered into the ground, the tractor driven ahead a few feet thereby filling the shovel. By means of the hoist drum on the side the load is then easily lifted into the waiting truck. A quarter-yard is lifted at one time.

This device is known as the Dig-a-Load, which would appear to be a very appropriate name. Thus hooked up with reliable Fordson power it is claimed that it does the work for which it is intended—as usual, quicker and better.

Golfing has come to stay and grow. More golf grounds must be laid out. The Fordson is a welcome power unit for this work. But don't forget the courses already being used. Remember that such as do not use Fordsons, should use them. Sell them.

Wood-dumped loads Build good roads

WHATEVER the type of roads built—concrete, gravel, macadam or asphalt—dump trucks play a big part in the work from start to finish; and to a surprising degree, the final cost of the job is determined by the dependability of the dump truck.

More and more the Ford truck is being used in this work, both because of its speed and its low cost; and this emphasized the need for a quick-acting, sturdy dump body, low in cost, to make, with the Ford, an efficient road building unit.



This need is best met by the Wood Self-Dumper. This all steel body, operated by gravity, is built in the same plant, by the same organization, and to the same high standing as the dumping bodies, used on heavier trucks in connection with the Wood-Detroit Hydraulic Hoists, which for 15 years have dominated this field.

In many fleets, on hundreds of Fords, these bodies are providing efficient, dependable service at a surprisingly low cost.

Price
Complete

\$140

F.O.B. Detroit
Tax Extra

WOOD HYDRAULIC HOIST & BODY COMPANY

World's Largest Builders of Dumping Equipment for Trucks

7950 Riopelle Street

Detroit, Michigan



Fordson Hauling Three Trailers Over Very Rough Ground at Mount Olive Cemetery, Chicago. Frequently the three trailers are heavily loaded. Charles A. Palm, assistant to the superintendent, standing, and William A. Veach, driver.

Live Equipment Is Profitable in Cemetery

*Fordson Does Any Work It Is
Put to and Wins Approval*

AT Mount Olive Cemetery, near the junction of Irving Park Boulevard and Naragansett Street, Chicago, a Fordson is in use doing a large variety of work. Recently, the Field Editor of *Ford Owner & Dealer* had the pleasure of observing some of the performances of this tractor under the guidance of its operator, Mr. William A. Veach, who is not only an expert in handling the machine but who is also an enthusiast as to the work the Fordson does.

In inspecting the work of the tractor, the writer was accompanied by Charles A. Palm, assistant to the superintendent, Norman Michelson. Mr. Palm was formerly an automobile mechanic and did the first work with the Fordson in the cemetery. He was exceedingly enthusiastic regarding the machine, saying, "One of my pleasures, when I ran it, was to see what it would do under all kinds of trying circumstances. I liked to ride over hilly ground and through mud holes, just to see it climb out of the places into which I got it. It always easily surmounted its difficulties. This outfit is working every day.

We use the mud-hooks on the rims, as it often has muddy and soft places over which it must travel."

Mr. William A. Veach is not only the driver but he is also a practical mechanic and does all the repair work, even to overhauling, except such work as requires the use of lathes. The tractor is equipped with a Burpee-Johnson sea fixture, which, Mr. Veach declares, is a great comfort to him, as he sometimes runs at a speed of 20 miles an hour. It is also provided with Wehr brakes. Said he, "The wheels are loaded with sand, to give us more traction power. I think we have about 500 pounds of sand in them. That is a great help in a wet day on a slippery pavement and reduces the possibility of skidding.

"As we do a good deal of concrete work, we have a concrete mixer which is drawn by the Fordson. We have three dump carts especially adjusted to go with the Fordson. They were made by the Peter Schuttler Wagon Company of Chicago. We have several arrangements that are our own idea. This applies also to the hitch

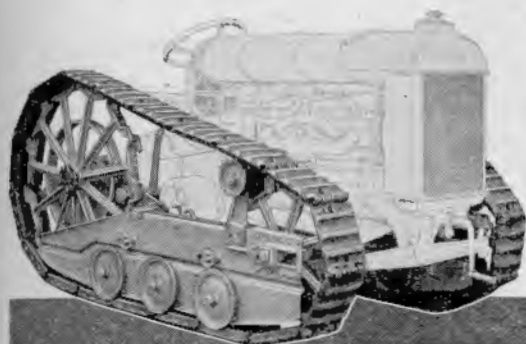


Sell More Fordsons Make a Double Profit

Get your share of the big, ever-increasing special market for 2-ton Crawler tractors. Convert the Fordsons into the lowest priced, most economical, full powered 2-ton Crawler tractor in the field merely by equipping them with Trackson Full-Crawlers. That gives you a double profit, one profit on your Fordson, and another big profit on Trackson Full-Crawler, sold together as one unit. It will help you sell Fordsons **easier** and **faster** because Trackson Full-Crawlers give Fordsons full pull of a husky 2-ton tractor, and takes your Fordsons where wheels can't go, on any ground in any weather.

This combination opens up a new market for Fordsons in heavy duty work; such as, contracting, lumber and industrial fields where ordinary wheels won't serve. Every sale means a satisfied customer. Make it a point, now, to sell the low-priced Trackson Full-Crawler Fordson and let your customer **save the difference**.

With a Trackson comes assured traction everywhere. More than 1000 square inches of ground contact. That's why it pulls and goes on any ground in any weather. Full working Fordson clearance; no special tricky clutches; no gear reduction; no changes in differential. And there are many other interesting points about the Trackson. Write for them.



Trackson

Full-Crawler

for Fordsons

Don't fail to write. Information you receive will lead to more Fordson sales and profits.

The Full-Crawler Company

Dept. of Geo. H. Smith Steel Casting Co.
502 Clinton Street, Milwaukee, Wis.

Inventors and manufacturers have placed equipment on the market to help the Fordson best use its wonderful power. It is an economic duty to get this equipment distributed and sold as quickly as possible. All work done without this machinery, where it could be used to advantage, is time and money lost for all concerned.



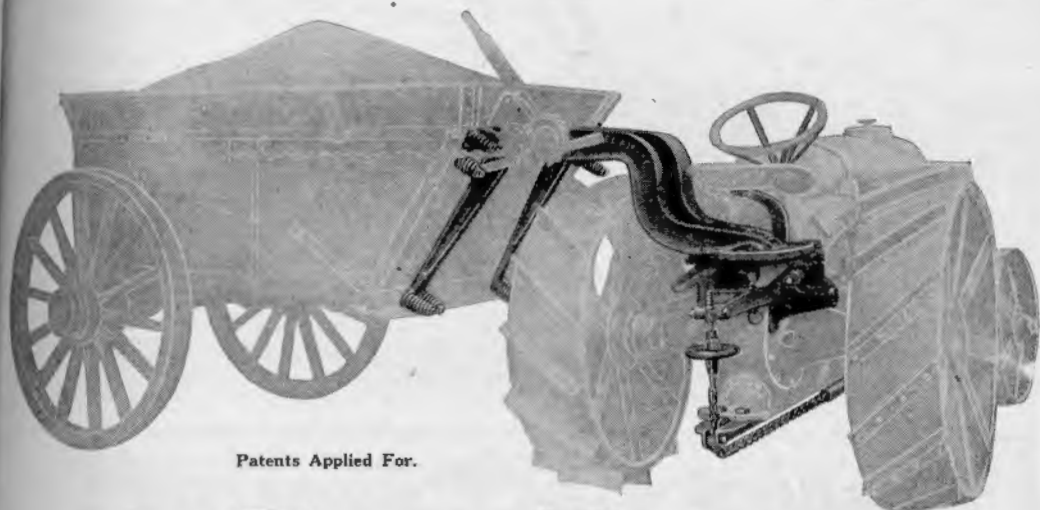
Fordson Operating With Single Dump Cart Under the Trees of Mount Olive Cemetery, Chicago. Note the extension cleats combined with rubber tires on the drive wheels of the Fordson. Man standing is Charles A. Palm, assistant to the superintendent; operator of the Fordson is William A. Veach

and to each other. We went around to the other cemeteries where they are using Fordsons and observed just what they were doing and the good and bad points, as we considered them, of their methods. As a result, we devised a rather high hitch, as that facilitates dumping. At the same time it makes it more possible for the machine to rear up in climbing a steep place under certain conditions. But that is not a thing that worries me, as I simply release the clutch

by which we attach the dump carts to the tractor if I think an accident possible. We have never had an accident of any kind, but with a high hitch, I do not believe a greenhorn should be allowed to run the tractor. I have climbed some rough places with three loaded trailers behind me, and sometimes I have had the tractor pointing very high up in the air. We also have a trailer we made over from a government red cross wagon, and we have our own special hitch for that. On a good road I can haul the three trailers loaded at a speed of 15 miles an hour. One reason for that is that the wheels of the carts all turn on roller bearings."

Ford dealers who have sold Fordsons and equipment to country clubs, parks and cemeteries found that it was not particularly difficult to close the deals. For after all, if you can show anyone how to save work, time and money and can offer people the means to accomplish this—they want that means and will buy.

Observing an outfit consisting of a man, a horse, and dump cart at work, Mr. Palm remarked, "Before getting the Fordson we used to have four outfits of that kind at work here, while now we have only two. That saves the cost of two horses and two men, as an offset to the cost of maintaining the tractor and driver."



Patents Applied For.

The **TRAIL-IT HITCH**

The TRAIL-IT hitch makes it possible for you to motorize your horse-drawn equipment at a small investment thereby reducing your haulage costs 50%.

The TRAIL-IT hitch affords perfect steering control because the **BALANCE SPRING** regulates the pressure of the front wheels against the ground. This correct distribution of weight results in maximum pulling power for all conditions.

Because of its peculiar construction the TRAIL-IT hitch makes right angle turning practical. TRAIL-IT trailer beams are furnished for any make of semi-trailer. The Fordson or Ford or Ford truck can be used interchangeably and the semi-trailers can be connected or dis-connected in less than two minutes.

TRAIL-IT can be adapted to any type of hauling problem.

DEALERS: Here is an opportunity for you to sell Fordsons, to replace horses. On short hauls and where conditions are impossible for trucks TRAIL-IT makes it possible for you to show the purchaser how he can operate a Fordson and semi-trailer to replace three or more teams at a decided saving in investment and operating costs.

A Post Card Brings Complete Information

This TRAIL-IT equipped Fordson converted a sprinkler into a semi-trailer, replaced three teams, did better sprinkling, and saved \$366.00 a month.



TRAIL-IT COMPANY

1611 CENTRAL AVENUE

MINNEAPOLIS, MINNESOTA

Advice of Henry Ford Followed in Tractor Selling

"Watch the Tractor," Said Its Manufacturer— We Did and Won Success

BY CLYDE FORD

Editor's Note: One of the best-known Ford dealers in the state of Michigan is Clyde M. Ford of Dearborn. He is a cousin of Henry Ford, but does not rely upon any prestige which this fact may furnish to help him in his business building. He is a "go-getting" type of dealer and has had particular success in tractor selling. We have asked Mr. Ford to outline some of the reasons for his success for our Anniversary Issue. Here is his interesting answer.

AT VARIOUS times I have been asked what methods I have used to win success in the selling of Fordson tractors. Such questions, no doubt, were inspired by the fact that I have a record, I believe, of having placed more Fordsons than has any other dealer in Michigan,



Clyde Ford

and this in a community where farm land—the first leading field of sales—was fast being changed into subdivisions and building up.

First, I will credit my early acquaintance with the tractor. Being situated in Dearborn, I saw the Fordson tractor from the first experimental stages down to the present model. Such first-hand knowledge of this remarkable power plant, plus the observance of its development, was naturally an advantage.

I followed it in the fields while it was being tested; in fact, I saw it turn the first furrow, my father holding the plow.

With my father the Fordson was a subject of daily conversation while we were waiting for the time when the tractor would come into practical use. One day while watching the first experimental jobs at work, Henry Ford, who was present, said upon leaving, "Watch the tractor."

Coming from Henry Ford, such a casual remark had a significance considerably beyond the mere words. It revealed his faith in this product and suggested a prophecy, to those who were acquainted with his manner of speaking. Surely all of the potentialities which he saw in this power unit are now being realized and brought forth. I wonder if it is not indeed exceeding the scope of utility which even those of us who knew it first had allotted to it.

At any rate, I followed the suggestion of Henry Ford. Since that time I have been watching the Fordson closely. So I probably had somewhat of an advantage in being thoroughly sold on the job years before it actually reached the market. When it did finally appear on the market, I was ready for it.

Having been through the early days of the Model T work, I knew that it would require a lot of service and educational work to put the tractor over and make it stay. Service has sold tractors and made them stay sold.

When we sold a tractor we made it a point to see that the owner was thoroughly instructed in its use; not only in the use of the tractor itself, but also in the use of all implements, more especially the plow, in agricultural installations.

I have had with me a tractor man who learned his stuff on the Ford farms during the experimental days; a young man of good mechanical ability and full of determination, who, when he set out to show Mr. Farmer how to operate, he meant it, and let the farmer know it too, which naturally led to good results.



Trailers That Track

The illustration is an action photograph of a Fordson tractor pulling fourteen 2-ton automotive trailers. At the time the photograph was taken the Fordson and this train was traveling at the rate of about 7 miles per hour and you will note was making a reverse curve. We call your special attention to the fact that each trailer follows directly in the path of the one ahead, conclusive proof that Automotive trailers do track.

We also wish to call to your attention the Fordson tractor pulling these trailers. This tractor is equipped with our special tow hook which takes the place of the regular tail piece. Each trailer is also equipped with a similar hook making it possible to couple any number of trailers into a train.

We manufacture a complete line of Automotive industrial trailers consisting of 144 models covering every service to which an industrial trailer can be applied. These trailers are built of standardized units which makes possible their remarkably low price. Write for catalog prices and complete information.

Automotive Trailer Corporation

Factory and Main Office:

Springfield, Illinois

Dealers and Distributors All Over the World.

Outside of a few call-backs, when the tractor was placed on a farm I never carried an elaborate follow-up system; personally I did not believe in it. If the farmer was instructed properly and followed for a few times to see that he got under way all right, he was given to understand that when he wanted anything, if he would call "Dearborn 50" he would get it.

Right here I want to say that this is the big thing which has made me successful in selling tractors. I backed up instruction to the minute, at times disrupting some of my other service when the demand became too heavy for my regular tractor service to take care of it. The big thing was, when they called for service they had the confidence of knowing they would get it.

Today my former tractor selling field is almost all taken up with the outgrowth of the city of Detroit. However, where an agricultural field may disappear, an industrial area usually opens. It then becomes a matter of working these new prospects while applying the same fundamental selling principles. In either case the tractor may be depended upon to do its share if given the proper backing.

The tractor business has given me a great deal of pleasure. Part of this pleasure is realized in knowing that I took a hand in pioneering it. It is interesting now to note the development of the Fordson in the industrial market; already the equipment for industrial use is an industry in itself.

If I may say it here, it also gives me pleasure to tell that I sold the first industrial tractor—being the first one equipped with rubber tired wheels and retailed by a dealer. I also held the first tractor-trailer demonstration. I am not saying this in a manner of boastfulness, but rather to point that my interest in the Fordson has been sustained from the first—because in the days of its infancy I saw what the Fordson should someday mean to the world.

There are still many fields to pioneer and put over the top and what I have done any dealer can do. From my own experience I would draw three primary qualifications for the dealer who really wants to realize in Fordson selling the success which can be won. These qualifications are:

First—He must believe in the tractor as a great institution; an Ideal of Henry Ford's—not as a means of just making more profit for himself, but as a means of helping humanity.

Second—He must be sold on the fact that the Fordson can do anything.

Third—He must back up the Fordson with service.

Fordson Floats Are Prize Winners!

THE tournament of Roses at Pasadena, held each year, has become world famous as the greatest pageant of its kind. Hundreds of motor vehicles make up the parade, and all floral decorations must be the finest of fresh cut flowers,

Directs City Work From Ford Car

THE city of Gary, Indiana, has three Ford runabouts for its street department, each car attractively lettered showing its official status. The commissioner of streets however does not use one of these lettered cars. He has a Ford car of his own and it is unlettered. To the Field Editor of FORD OWNER AND DEALER, he said: "I have made an innovation in my office in the way of keeping tab every day of where the various crews are working. I can look at a report on my desk any morning and know just where the various squads of workers are to be. I consider it my duty to keep watch and see that the men are doing the work they are paid for.

"I go about in an unmarked Ford. There are so many Fords about that the men cannot possibly guess in which car I may be. So I can watch them without being recognized myself. As I often speak to them from my unheralded car, they know I may be in any Ford car that comes along."

no artificial substitutes being permitted. Huge frames are built over the vehicles, in many cases completely concealing the motive power. It is a striking tribute to the versatile Fordson that for the past two years it has propelled the leading floats to victory in the Tournament parade!

This year, the float entered by the City of Glendale won first prize in the division devoted to municipal entries, while Grand Sweepstakes Prize was also awarded to this float for being the best entry in the entire parade.

The float, which was of huge dimensions, was rightly titled "Fairyland." From a bower of ferns at one end, a tinkling waterfall played, while at its feet an old witch watched a cauldron of flowers, and two little "fairies" perched on toadstools of blossoms.

Many floats were entered in the Elk's Division, and here again the Fordson won first honors. Lodges from many Southern California cities had splendid exhibits, but it remained for the Glendale Elks to carry away first prize with a magnificent entry.

In each case, the Fordson was equipped with W. & K. Rubber Tired Wheels, distributed in California by the O. R. Peterson Company. The Fordsons were the property of the City of Glendale, and were purchased through the Ford dealer at that point, Jesse E. Smith Company, who has been active in developing industrial uses for the Fordson in that locality.

Several other floats in the Tournament parade were also mounted on Fordsons, notably two entries by the City of Pasadena, Water and Power Departments.

The Fordson is particularly adapted in use in such parades, through its flexibility and the fact that it can be driven at very low speed indefinitely without over-heating.

Heil-Ford

Bodies for Work in Parks—
Cemeteries—Golf Courses—
Country Clubs—Municipalities

36 cu. ft. Hand Hoist Dump Body

Like those used by the exclusive Blue Mound Country Club of Milwaukee in maintaining their Golf Links. 36 cu. ft. capacity; Double acting tail gate; Extra sides can be added. Underneath Hand Hoist with 55° dumping angle. Complete, with "U" bolts ready for mounting. Weight 850 pounds. Price f. o. b. Milwaukee \$125.00. Add 5% Gov't Tax.



Covered Garbage Dump Body

Seven of this type just put in service at Washington, D. C. Four steel covers, two at rear and one on each side. All seams in body are electrically welded to make it absolutely water-tight. No tail gate required. Duck-tail end or sump for holding liquids. Heil Underneath Hand Hoist gives a 70° dumping angle on this job. This unit can be furnished without covers.



500 Gal. Street Sprinkler

Sprinkles four city blocks. Complete unit includes nozzles, controls, man-hole, piping, hose, except hydrant connection. "U" bolts furnished for attaching to chassis. Just the thing for Parks, Cemeteries, and small municipalities.



Bulletin No. 133, just off the press, profusely illustrated, two-color broadside, will be sent to you immediately at your request. It contains complete information, specifications and prices on Gravity Bodies for road work, Coal Bodies, Compartment Truck Tanks, etc.

THE HEIL CO.

1130-50 Montana Avenue,
Factory Branches

Milwaukee, Wisconsin
Philadelphia and Chicago

Two Essential MotoreX SALES KIT

OUTSIDE
SIZE
9 $\frac{3}{4}$ "x13 $\frac{1}{2}$ "

INSIDE
SIZE
9x12"



GENUINE COW-HIDE
FINISHED IN GLOSSY MAHOGANY

Indispensable for Ford Sales Work

Every Ford Salesman needs a carrying case in which he can keep all his selling ammunition, orderly arranged.

The Sales Kit is a "Custom-built" case for this purpose, made up at quantity production cost.

STURDY CONSTRUCTION—LONG WEAR

The top is re-inforced with a steel rod running from end to end. The handle is riveted clear through the steel rod. All seams are sewed with a special lock stitch. A heavily nickel plated three position lock of pleasing design gives security to the contents.

Finest material and workmanship produces a case that is the equal of the finest made.

Special Pocket for Prospect Cards

The pocket for prospect cards pictured in the circle is an exceptionally handy feature. It is fitted with four index guides for 4x6 inch cards. These guides have permanent celluloid tabs, marked: "Prospect," "Canvass," "Owner Follow-up" and "File."

The salesman can lay-out his work each morning and systematize his efforts with business-like methods.

IF, UPON EXAMINATION, A SALES KIT FAILS TO COME UP TO YOUR EXPECTATIONS RETURN IT AND WE WILL REFUND YOUR MONEY

Creators of **Fordex** Products

SALES EQUIPMENT COMPANY

5981-A Woodward Ave., Detroit, Mich.

DONT STUFF YOUR POCKETS

The convenient arrangement and business-like appearance of the "Motorex" Sales Kit makes it ideal for the Ford salesman.

Inside, there are four 9x12 inch pockets, a pencil loop and pencil, and a pocket for business cards. The pocket on the outside for prospect cards pictured below, is another dandy feature.

Each case is equipped with two correspondence folders, a pencil, a copy of "Fordex" Ford Facts—the vest pocket edition of "Fordex"—and the four index guides for the prospect card pocket.

Gold Imprinted FREE

When ordering in lots of six or more, Sales Kits will be imprinted in gold with the name of the Firm or Salesman, without any extra charge.

PRICE **\$7.50** Postage Paid



NOTE THE
GRADUATED
POCKETS

Selling Helps

FordeX SALES and SERVICE DATA

Another Edition (The 7th) Now Ready

The Seventh Edition of "Fordex" Sales and Service Data, just off the press, is the most complete sales book ever published.

Nothing has ever been attempted that can compare with this latest "Fordex" as a "selling-aid" to Ford Dealers and Salesmen.

All the good features that sold previous editions in excess to 50,000 copies have been incorporated in this latest book. But it has been vastly improved and brought up-to-the-minute.

Nothing has been overlooked that would increase its usefulness in Ford sales work.

New Features

Graphic chart showing growth in the use of Fordson tractors in U. S. since 1921.

Comparative chart of truck and commercial car registration by makes.

Price comparison of touring cars based on F. O. B. factory prices of January 1924.

Two-passenger coupe comparative price chart as of January 1924.

Eight photographic views of the Lincoln cars, reproduced in sepia on India tint stock.

Four views of the Ton truck chassis with the new steel cab and body.



The Same Coat-Pocket Size

PRICE
\$3.50
Postage Paid

"Up-to-the-Minute" in Every Detail

There is no stale or useless information in the new "Fordex." Complete motor numbers of Ford and Lincoln cars and Fordson tractors up to March 1924. Latest figures on Lincoln production. Detailed mechanical and material specifications of the ton truck steel body.

All improvements in Ford, Lincoln and Fordson products are summarized for reference use.

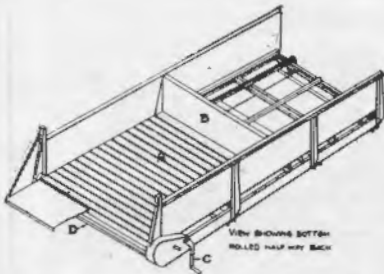
The above are only a few of the many improvements which help to make "Fordex" Sales and Service Data an absolute essential in the selling and servicing of Ford Products.

OVER 50,000 COPIES OF "FORDEX" SALES AND SERVICE DATA NOW IN USE.

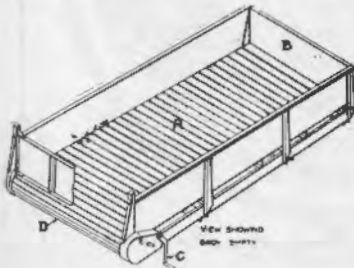
Enclosed find \$_____ please sendpostage paid
 copies of the 7th edition Fordex at \$3.50 each.
SALES EQUIPMENT COMPANY
 5981-A Woodward Ave., Detroit, Mich.
 Name _____
 Address _____
 City _____ State _____



Save The Difference Load and Unload Mechanically



The bottom of the body consists of a rolling steel apron "A" which rolls back around drum at "D" and returns under the body.



Bulkhead "B" is mounted and braced to rolling apron, moving back and forth with it. Drum is revolved by Crank "C." Two reductions of speed are provided.

Here's the biggest savings on hauling yet. Think of it—a rolling all steel truck floor that loads and unloads mechanically. And it does it faster. Besides it allows one man to do the work of two with considerably less effort. These savings are all conspicuous in the **Labride Roll-out Truck Body**. It permits you to use a Ford truck for heavier duty and **save the difference**.

With its all steel rolling floor, the **Labride Truck Body** readily lends itself to efficient and profitable service for all purposes. It is built for heavy duty. Material dealers can use it handily for every kind of hauling. It eliminates climbing over the load and lifting heavy cement blocks, bags, brick, ice, tile, sod, etc. Simply **roll them on and off**. The only device on the market that can be mounted and operated on trailers.

Write in today for detailed information and our catalog. Ford dealers ask us for our special dealer arrangement. Let us tell you how you can make a double profit on your Ford Truck Sales.

Lakeside Bridge and Steel Co.

602 Villard Ave.,

North Milwaukee, Wis.

Send in this coupon

Gentlemen:—

Without obligation send me more information and prices regarding Labride Roll-out Truck Bodies.

Name

Address

City State

I am interested in dealer arrangement.

Labride
ROLL-OUT FLOOR

Strand

"Chosen by the Majority!" **Governor**

A Demonstration Sells It!

THOUSANDS of Fordson owners are using the Strand—and selling their neighbors on it! This reliable, unfailing governor has proved itself worthy of the Fordson—by insuring a uniform speed under any load, by its mechanically perfect operation and its long, trouble-free service.

Sell the best! Folks never regret buying quality. Every Strand user means another booster for your entire line. Start with a case of six. Write us today or ask your Fordson Accessory Distributor.

Northwest Mfg. Company

2320 Riverside Avenue

Minneapolis, Minn.

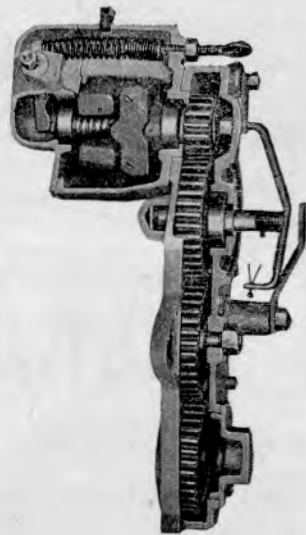
Distributed by:

OLIVER CHILLED PLOW WORKS:

Atlanta	Little Rock	Moline	Jacksonville
Dallas	Memphis	New Orleans	Kansas City
Denver	Minneapolis	Nashville	Oklahoma City
	Omaha	Sioux Falls	St. Louis

Connelly Machinery Co., Billings, Mont.
 East Side Lumber Co., Idaho Falls, Idaho.
 Gash-Stull Co., Chester, Pa.
 T. W. Meikeljohn & Co., Fond du Lac and Milwaukee, Wis.
 Mitchell, Lewis & Staver Co., Portland, Seattle, Spokane.
 New England Implement Co., Worcester, Mass.
 Monarch Auto Co., Louisville, Ky.; Nashville, Tenn.
 O. R. Peterson Co., Los Angeles and San Francisco, Calif.
 Universal Motor Co., Richmond, Va., and Charlotte, N. C.

European Distributor:
 Alfred Dugdale, Ltd., 65 Conduit St., London, Eng.



Exclusive Features

- Mechanically driven at crankshaft speed.
- Retains the original timing of the engine.
- Straight spur gears.
- Oversize ball bearings.
- No damage from back-firing.
- Dust-tight aluminum housing.

*Sold Only by
 Authorized
 Ford Dealers*



Piling Up More Proof of Plus Power With Fordsons

15,000 Feet of Lumber Is the Daily
Average Job of This Outfit

IT is generally agreed that standing timber may have several uses, but that as building material it is quite useless until it has been cut and converted into lumber. For this we have saw mills.

But just as there was practical need for portable typewriters, such as this article is being written upon, so there was need of saw mills which did not need to be built in one place, there to stay and whither the timber must be brought. So a smaller mill was built and run—with steam power and a whole lot of trouble and cost.

Then came the Fordson.

Shown here is just another example of the practicability of the Fordson-operated saw mill. The picture was taken in the woods near Chat-

tanooga, Tenn. The outfit is achieving the daily average of from twelve to fifteen thousand feet of lumber, or about four-hundred and fifty cross ties, with fuel consumption of twenty gallons.

Several other mills of this type, which happens to be the Corley, are in operation in that section. One of these is owned by Mr. Don Harris, Chickamauga, Ga., and is operated by Mr. Brock, age 69. Mr. Brock has used all manner of power in wood cutting, but says that he would not trade the present outfit for any two outfits he has ever used in the past. One reason for this endorsement is the fact that this mill has been in operation for about a year, during which time there has been no expense for upkeep, although an average of about fifteen thousand feet of lumber is being sawed each day.

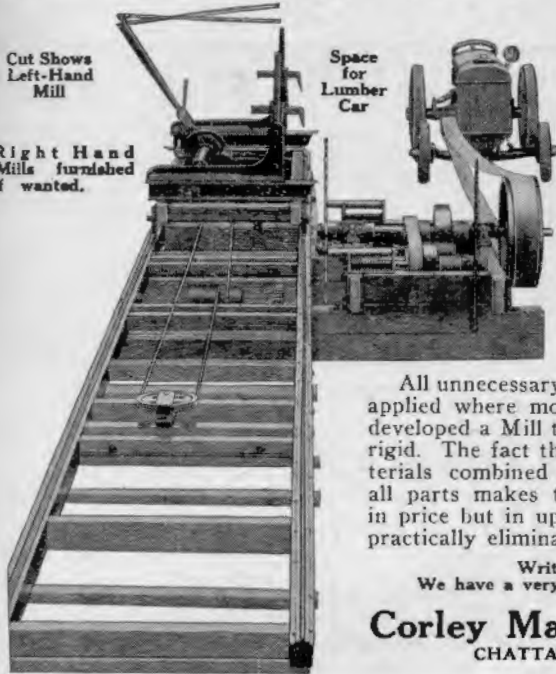
All of the hauling problems of many contractors are left to fleets of Fords equipped with appropriate bodies. The reason is simple enough: Faster transportation at less cost.

THE CORLEY STANDARDIZED SAW MILL

Cut Shows
Left-Hand
Mill

Right Hand
Mills furnished
if wanted.

Space
for
Lumber
Car



THE CORLEY Saw Mill completely disproves the general idea formerly held by the old Saw Mill men that "Nothing but steam will operate a Saw Mill." The capacity of the Mill depends on the man operating it. Two men in fair sized timber can cut from 4,000 to 5,000 feet of lumber or 100 to 150 cross ties per day using Fordson power. This can be increased by additional help.

All unnecessary parts are eliminated and the strength applied where most needed. In this manner we have developed a Mill that is light and at the same time very rigid. The fact that we use only the highest grade materials combined with a complete standardization of all parts makes the Corley Mill economical not only in price but in upkeep as well. Friction and vibration practically eliminated.

Write for complete specifications.
We have a very attractive proposition for Ford dealers.

Corley Manufacturing Company
CHATTANOOGA, TENNESSEE, U. S. A.

ADAMSON LOCOMOTIVE

Attachment for Fordson Tractor



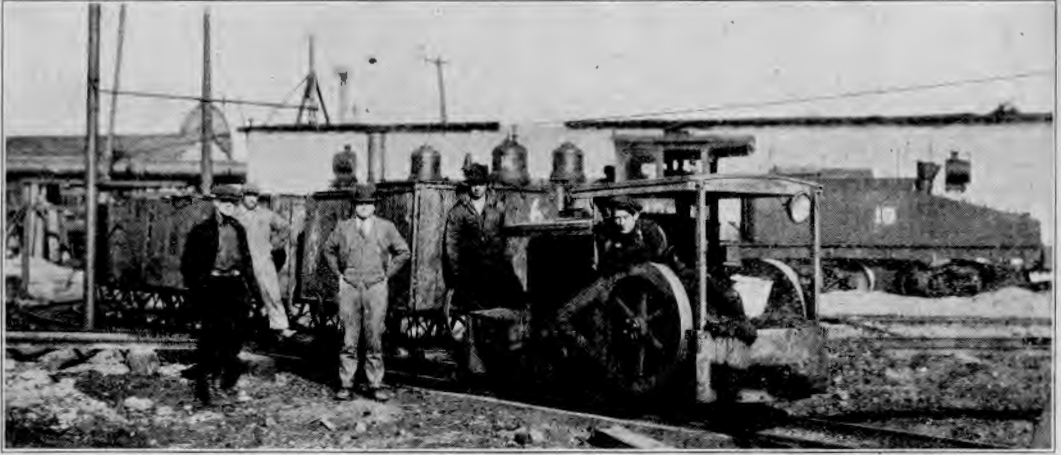
Texas Oil Co., Riverside, Texas

Has proven satisfactory in many different industries over thirty-eight states and countries.

ATTACHMENT ONLY \$700.00

LOCOMOTIVE \$1125.00 F. O. B. FACTORY

ADAMSON MOTOR CO., Birmingham, Ala., U. S. A.



Fordson as Locomotive Pays Real Dividends

Another Branch of Industry Profits Through Ford Saving

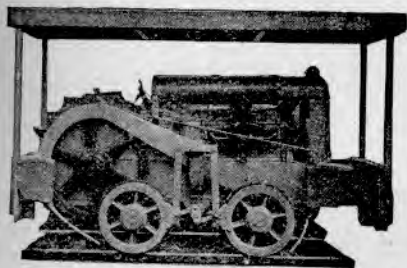
A GROWING and profitable field for Fordson activity is found in the use of this power unit as a locomotive. In this connection it has proved out in many cases. Herewith we show some installations which, as usual, have resulted in satisfaction and saving all around.

Photograph Number 1 shows a locomotive with Fordson tractor power unit handling shale at the operation of the Clarion Fire Brick Co., St. Charles, Pa. This firm have employed Brookville locomotives, Ford driven, since 1918, the original locomotive replacing five mules and a

corresponding number of drivers. During 1922, due to increased tonnage, their original light locomotive was replaced with heavy type equipped with Fordson tractor power unit. During 1923 locomotive was in service 300 days, handling 75 tons fire clay over three quarters of a mile of track on gas consumption of $5\frac{1}{2}$ gals and a quart oil. During this period cost for upkeep was one new Fordson timer. Since replacing mule haulage with locomotive equipment back in 1918 the Clarion Fire Brick Co. have nnt been held up one day for raw material at plant.



BROOKVILLE GAS LOCOMOTIVES



FORDSON TRACTOR POWER UNIT

Positively intact, with the exception of Fordson wheels and front axle assembly. Not an experiment, but a **finished** product. A standard gas locomotive as to every detail plus all the advantages of local Fordson Service secured through the use of Fordson Unit. Four-wheel-drive, 20-in. drive wheels, 36½-in. wheel base, high grade spring journals under all drive wheels. A satisfactory working speed in reverse as well as forward. Furnished from 6500 Lbs. weight up to 6 tons. All gauges 24-in. to 56½-in.

FORD TON TRUCK POWER UNIT

We offer a product made possible by six years of actual experience. Our standard locomotive takes the entire Truck driving mechanism, plus Brookville auxiliary reverse which gives standard high and low drive in reverse as well as forward. Weight from 2 to 2½ tons, four wheel drive, 30-in. wheel base. All gauges 18-in. to 56½-in.

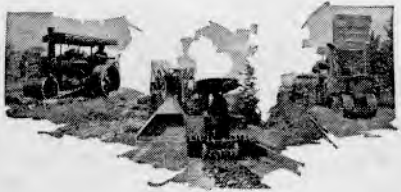
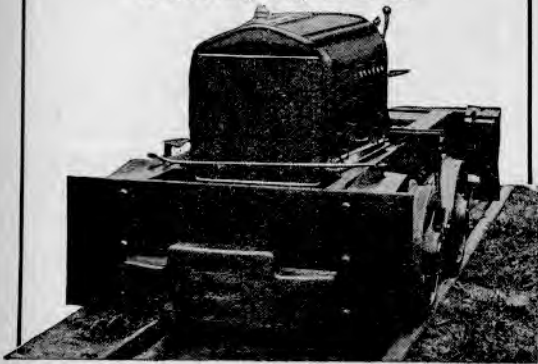
SPECIAL

All types of rail equipment suitable for the Ton Truck Unit, or Model T, for passenger, light freight or express service. Thru the use of Brookville auxiliary transmission standard high and low drive is available in reverse work as well as forward.

Sold as far as possible thru
Authorized Ford Agencies

BROOKVILLE TRUCK & TRACTOR COMPANY

Brookville, Pa., U. S. A.



Save on the Subgrade With an Austin Pup

THE AUSTIN PUP was literally "made-to-order" for subgrade work, and many of the country's most progressive contractors are numbered among its most enthusiastic boosters. These photographs of an Illinois State Road job show how the planing blade and scarifier, and finally the roller, will turn a hard, rutted subgrade into a smooth, true, compact one; will do it quickly, easily and inexpensively; and, finally, will save the material that otherwise is wasted in filling irregularities and the ruts left by the trucks.

A special catalog tells all about this three to five ton, one-man machine that does anything and everything that an elaborate outfit costing five times as much to purchase and operate will do. We would like a chance to prove to you that you really cannot afford to be without at least one Austin Pup.

The Austin-Western Road Machinery Company

Factories and Home Office, Chicago

Branches in all Principal Cities



Photograph number 2 was taken showing the operation of W. A. Keys, Brockwayville, Pa., using a locomotive with Fordson power unit, hauling coal. We quote from recent letter received from Mr. Keys:

"In regard to locomotive purchased during 1922, will say that I am more than satisfied with it. I was hauling coal with teams before I purchased the locomotive and it was costing me 80c per ton to haul it, and even then I was having quite a time to keep the coal out of the way of the miners, having eight or ten teams doing the hauling. Since installing the locomotive I have one of my neighbor boys running the machine, doing the hauling for 15 cents per ton, with one man helping him. They are making good wages as they can haul 200 tons a day. The cost for gas and oil is about 1½ cents per ton. The tramroad is 3300 Ft. long with a 5%

grade so the tractor has paid for itself two or three times over since purchased."

Photograph Number 3 shows the installation of a locomotive, with Fordson power unit, operated by Charcoal Iron Co., Manistique, Mich. This outfit was sold the Charcoal Co. by the Peoples Auto & Tractor Co., local Fordson Dealers of Manistique.

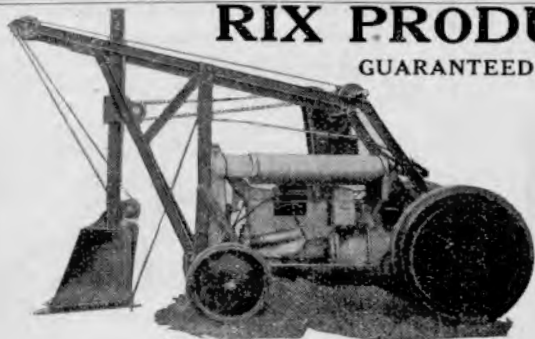
Locomotive in question handles 30" gauge rail trucks, loaded with charcoal buggies, and is in operation 24 hours per day. Formerly trolley type electric equipment was employed, and machine was installed to test out in comparison with electric locomotive. Results obtained have been extremely satisfactory, both as to efficiency, and cost for operation compared with electricity.

In each of the above mentioned installation the Brookville Locomotive was used.

"Before I started selling Fordsons I thought it was going to be a tough job. Now I'm convinced that industry was waiting for them. The market is ready—all I have to do is to supply the need intelligently," said a Fordson salesman recently.

RIX PRODUCTS CO.

GUARANTEED FORDSON EQUIPMENT



The Rix Digger

See our two-page ad in the January issue and our page ads in the February and March issues of FORD OWNER & DEALER.

FACTORY

HOME of MIXERMOBILE
955 - 30th St., Milwaukee, Wis.



The NEW IDEA SPREADER

Twenty-five years of making, advertising and selling—coupled with faithful, honest service—have made the name NEW IDEA stand for "A BETTER SPREADER" in the minds of millions of farmers. It needs no introduction in your territory.

For Team or Tractor

Place the 1924 model NEW IDEA SPREADER on your floor without delay. Its manifold improvements, sturdy construction and the new low price will win instant interest and approval from your customers. A post card will bring full details.

THE NEW IDEA SPREADER CO.
COLDWATER, OHIO.



ABINGDON BODIES

Over fifty-eight years successful experience in the manufacture of quality bodies back Abingdon products.

Abingdon bodies contain only the best of sound well seasoned lumber. They are built by, and under the supervision of master craftsmen who take pride in their work. Many of our employees have been working in the Abingdon plant continuously for twenty years or more.

The illustration shows our outfit No. 4014. This is but one of the many bodies which go to make up the Abingdon line.

Because Abingdon quality bodies sell at a price which compares favorably with the so-called cheap production lines it will pay you as a dealer to write for our complete list of Abingdon bodies together with our discounts and sales plan.

ABINGDON MFG. CORP.
ABINGDON ILLINOIS



Howell's Clutch Lock and Brake Lever

Pictured here locks the clutch in active position and is instantly released by a touch of the hand. No Fordson owner will be without it when they see a demonstration.

Sold ONLY Through Authorized Ford Dealers

Retails at
\$3.50

Can be Operated From Any Position

For belt work it is easy to reach. Makes cranking easy as it holds pulley and load disengaged, acting as a friction clutch. Easy to install—no holes to drill.

WRITE TODAY
For Dealer Discounts and Descriptive Folder



Grant Motor Co.

Distributors St. Joseph, Mo.

KROHN KOMPENSATOR

THE COMPENSATING DIFFERENTIAL



THE KROHN COMPENSATING DIFFERENTIAL furnishes the car, truck or tractor in which it is installed POSITIVE PULLING POWER to either or both rear wheels under loose, slippery or heavy tractive conditions.

KROHN KOMPENSATOR EXPERIENCE

In 1922 with less snow and not so much mud, and without KROHN KOMPENSATORS installed in our fleet of Model T Ford delivery cars we were compelled to pull our cars out a good many times.

The past year with more snow and worse roads but with our fleet equipped with KROHN KOMPENSATORS we have not towed one car.

(Name of this user on request)
This concern now has thirteen in service.

Dealers Write for Prices Etc.

H. McFARLANE & CO.

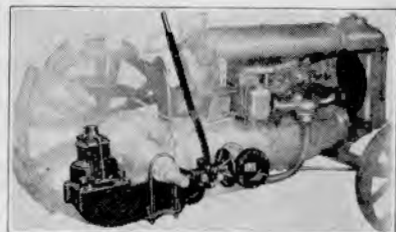
322 S. Green Street,
Chicago, Ill.



Transporting



Dumping



Power Clutch

MIAMI - FORDSON ONE MAN POWER SCRAPER

**One Unit Will Replace FOUR
TEAMS and SIX MEN**

The Miami-Fordson One Man Scraper is exactly what its name implies. It is a three-quarter yard scraper that is loaded, transported and dumped by one man without leaving the Tractor seat. Does not require any strength or exertion to operate.

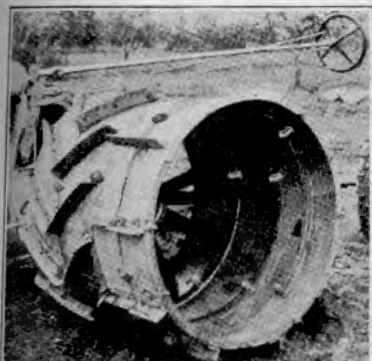
This Scraper is especially valuable for grading roads, for real estate development, for building dams or levees, for stripping operations and many other similar projects.

Its tremendous saving of man and team power can not be overlooked even on the smallest job. The largest contractors use them in fleets.

Write us now for complete information and our liberal **TRIAL OFFER**. Be ready with this equipment for your spring business.

The Miami Trailer-Scraper Co.

Troy, Ohio, U. S. A.



EXTENSION RIMS ON OR OFF IN 15 MINUTES!

On to stay on—more securely than when bolted—until you want to remove them. Then off they come with ease.

That's the whole story when you use

DEARBORN EXTENSION RIM CLAMPS

Pounding of rims—drilling drudgery—adjusting—bolting and all the other griefs of the old method are done away with. You add and take off traction as required and the only tool you need is a wrench.

\$2.50 for set of four—\$5.00 for set of eight
F. O. B. Dearborn

Dozens of dollars saved in time and effort.

DEALERS: You KNOW they sell fast. Get prices—or better, get your order in right now and take a chance on us treating you right. It's safe play. Equipment Distributors carry them in stock.

Dearborn Tractor Appliance Co.

DEARBORN

Dept. A.

MICHIGAN

Regarding Rim Clamps

In a previous issue we had reference to the Dearborn Extension Rim Clamps in which we may not have made it clear how the bolts are adjusted.

The manner of attaching extension rims with these clamps is very simple and can be accomplished with but little effort by anyone. The bolts are placed from the bottom upward, together with a lock washer which holds each clamp perfectly rigid at all times.

The entire operation of putting on extension rims through the use of these clamps requires only fifteen minutes and removal is just as easy, although while the rims are on, they are there to stay securely until it is desired to remove them. These devices are made by the Dearborn Tractor Appliance Co., Dearborn, Mich.

Next Month
The Fordson for
DOCKS, WHARVES,
DEPOTS

An Easy Way to Sell Used Fords At a Profit



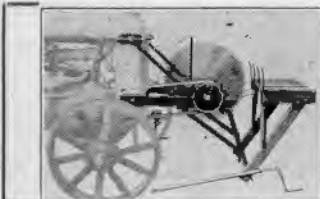
The best place to sell a used car is where it will receive hard, rough service right from the start. And the best way to sell used Fords—both trucks and touring cars—is to equip them with Mixer-mobile attachments. Every contractor is a likely prospect. Mounted on the Ford chassis and powered by the Ford motor, this remarkable concrete mixer pays for itself in a short time through its saving of time and labor.

Whether as extra equipment for new or used Fords, there is a good profit in selling Mixer-mobile. Write for all the facts. Use your firm letterhead.

MILWAUKEE CONCRETE MIXER CO.
Dept. H-4, MILWAUKEE, WIS.

MIXERMOBILE

"It Follows the Work"



STOVER No. 57 SAW-FRAME

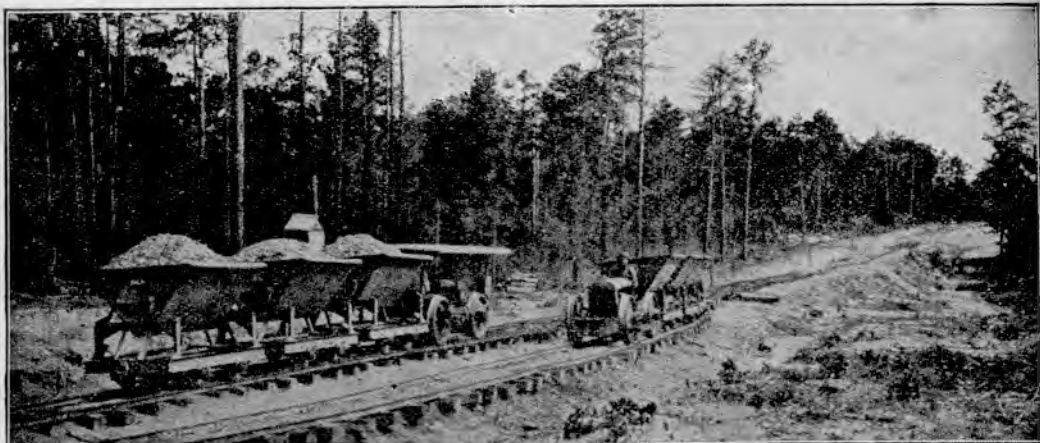
For Use With Fordson Tractors

Most sturdy, compact and easily attached frame on the market. Steel braces carry all strain. You now take saw to wood—not the wood to the saw.

No Holes to Drill—No Bolts to Remove

Saw-Frame is carried on 4 castings. Can be assembled and attached in 10 minutes. Write for descriptive circular.

STOVER MFG. & ENGINE CO., 77 Lake St., Freeport, Ill.



Saving Money With the Fordson Locomotive

Equipment Used in Texas Paid for Itself and Keeps on Paying

RECENTLY we asked the Adamson Motor company, Ford dealers at Birmingham, Alabama, to furnish us with facts regarding an installation of the Adamson Locomotive attachment for Fordson tractors which they market.

The information was promptly forthcoming but in such volume that we were permitted to take our choice, since it seems that these attach-

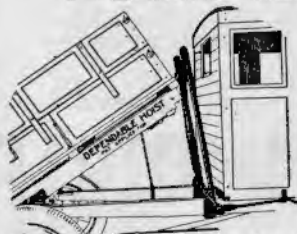
ments are saving money in dozens of places and among such a diversity of industries as lumber yards, stone quarries, coal yards, and, in fact, wherever there is need for hauling over rails.

Above we picture an installation at the Texas Oil company, Riverside Texas, where this equipment is maintaining the Fordson standard of doing a lot of work in less time and at less cost. After promptly paying for itself, the outfit then proceeded to pay dividends and is continuing to do so.

Raw clay is hauled to the mill in two-ton dump cars, three cars to a train owing to heavy grades. Fordson tractors are used for this purpose being transformed into locomotives by means of Adamson attachments, which give them a speed of fifteen miles an hour in high and makes them practically unshailable in low.

One of these units has regularly made a round trip in an hour, but the normal operating schedule is seven trips per day. At the plant the cars are hauled into the raw clay storage shed by steam hoist installed at the upper end of the inclined stock trestle.

A DUMP TRUCK



\$27

Just put a Dependable Hoist on your truck.

It will immediately convert your old fashioned plain body truck into a modern dump body truck.

Easily and quickly installed. Ford price \$27.00. Other models at proportional prices. Write for details—give make of truck. Dealers ask for proposition.

DEPENDABLE MFG. CO., 804 E. Main St., Streater, Ill.



Carburetor Adjuster For Ford Cars
Price \$1.00

THE REX LINE of Ford Equipment

Can be purchased from all Ford Dealers and Accessory Stores

Adjustable Extension Handle For Ford Cars
Price \$2.50



Spring is here. Why not be prepared with the little thing that will add pleasure and comfort to your driving by selecting one or all of our useful devices? Don't wait until the last minute until you are going to start your season's driving. "Do it Now." It costs no more today than a month later.



Carburetor Air Control For Ford Cars
Price 50c

A **REX Extension Handle** fitted to your Ford brake lever will add pleasure to your driving and might save a bad accident. Only Costs \$2.50.

A **REX Carburetor Adjuster** fitted to your instrument board will help you to adjust your carburetor quickly and save gas. Only Costs \$1.00.



Handy Wrench For Ford Cars
Price 35c

A **REX Choke Attachment** will help you to start your engine and save your battery. Only Costs 35c.

A **REX Handy Combination Wrench** will remove your spark plug quickly and fit most of the nuts and bolts. Only Costs 50c.

A **REX Handy Cigar and Cigarette Lighter** will save you from fumbling in your pocket for a match and running the chance of dropping sparks on your clothing or robes. The ash tray prevents sparks and ashes from falling on the floor of the car and burning up the carpet or setting fire to the car. Only Costs \$2.00.



REX Electric Cigar Lighter For all cars
Price \$2.00

A **REX Handy Dimmer** fits on the steering column within easy reach of your finger tips and makes dimming easy, and if you dim on a narrow dangerous road, the other fellow will dim and perhaps save a bad smashup. Only Costs \$1.50.

IMPORTANT: Remember there are no holes to drill, the only tools necessary are a screw driver or small wrench. You can attach in a few moments yourself.

• Manufactured by

Ajax Auto Parts Co.

Sole Distributors

REX ACCESSORY SALES

415 Lake Avenue

Racine, Wisconsin



Handy Dimmer For All Cars
Price \$1.50

Sold through jobbers and dealers. If they cannot supply, order direct from us. We pay parcel post.

Greetings, Old Timer!

TEN YEARS ago when *FORD OWNER AND DEALER* was making its bow to the Ford world, there appeared in its pages an advertisement of a shock-absorber manufactured by Robert H. Hassler, Inc., of Indianapolis, Indiana. It was a modest quarter page.



Today the Hassler company occupies advertising space on the front cover of this magazine. Since the first small advertisement, this company has been a constant and growing advertiser.

Today, also, the products of this company are known throughout the world and an immense business has grown from a small beginning.

Robert H. Hassler, president and general manager of the company has been prominently identified with the engineering profession for more than thirty years, during which time he has been an active part of some of America's largest corporations.

When the Hassler company was asked for an expression for inclusion in our Anniversary Number they responded, "Use your own initiative in the matter. It will have our entire approval."

Thank You,—Glad You Like Us

AMONG the bouquets and congratulatory messages sent to us on the occasion of the Tenth Anniversary was the following from the president of the Kuempel Company, Guttenberg, Iowa, originators of the "life-size" idea in patterns for car body building:

"Mr. Goulston I want to congratulate you on the 10th anniversary of the magazine you helped to build. I am glad to see it and yourself prosper and as it ages may it be likened unto old wine—real pre-Volstead stuff—which I think it will. Ten years don't seem very long, but I can well remember the first issues—each of the 120 which I have followed. You have helped my game grow too. You know I got my idea on "Red-i-Kut" patterns for converting Fords into sport cars in 1916 and today over 11,000 Kuempel Sport cars are on the roads in every clime. In fact the sun never sets on the jobs and the happiness they have brought builders—which is what I am selling anyway.

"It has been a fight—and still is and I'm enjoying every minute of it. Why just last month an ad in *FORD OWNER AND DEALER* brought me an \$85.00 order from Bolonga, Italy. Say I'm glad for the F. O. & D. and your good self at the advertising helm. I hope the next ten years will see equal or greater growth for your magazine."



Equips Fords Neatly for Luggage-Carrying

Thousands of Ford owners are adopting this new-style, **disappearing** carry-all—because it combines good looks with neatness and all-season utility.

Carrying luggage on tours or week-end jaunts; sport equipment or picnic supplies; salesmen's sample cases; shopping bundles—this neat-folding holder makes the left running board useful; gives you and your passengers more room and comfort.

Dealers

You should have a GRIP RACK Sale-Maker. A steel running board on angle-steel legs, with a GRIP RACK bolted in place. Free! Ask your jobber, or write us.

You'll like the GRIP RACK—its convenience, its appearance. Ask your dealer about it, or write us for handsome descriptive Booklet "J."

Milwaukee Motor Products, Inc.
Milwaukee, Wisconsin

Insist on the genuine—the only GRIP RACK is the MILWAUKEE. Look for the brass name-plate.

Ford size retails at \$5⁰⁰



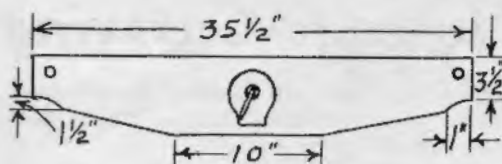
M I L W A U K E E
GRIP RACK



A department wherein you may express your mechanical ideas
Send us rough sketch and description of any repair hint that would be of assistance to Ford owners
If acceptable, we will pay \$1 for same

Makes Instrument Board

FORD roadsters and touring cars, of 1917 to 1921 models, may be improved in appearance and convenience by the installation of an instrument board cut from inch dressed board,



which may be given any desired finish, or covered with top material.

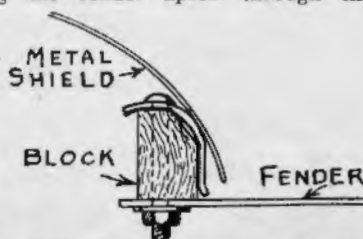
The board is cut to dimensions shown in the sketch, with 3-16 inch holes drilled in the corners. As car bodies sometimes vary slightly, a card-board pattern may be first cut to size, if preferred. The regular ignition switch is removed from the coil box and mounted on the new instrument board. The bottom of the coil box is reversed and three holes are drilled in the back of the box to allow the longer wires to pass up between the dash and coil box. These wires should be 14 inches long. A dash light, a carburetor adjuster, and other devices can be conveniently mounted on this board.

J. E. CHAPMAN,
ELLISTON, KY.

Preventing Fender Rattles

To prevent front fender rattles, round one edge of each of two 2 by 4 inch wood blocks, and cover top and one side of blocks with pieces of rubber cut from a discarded inner tube. Bore two holes in each block and attach to fender on inside of the metal shield. Be careful that the holes in the fender are so placed that the block will be drawn tightly against the inside curved surface of the shield. This will give the effect of one-piece construction, and prevent the usual rattles at this point.

The rear fenders may be made more rigid by bolting the fender apron through the body.



Loosen the upholstery on the sides at the bottom. Bore a hole through apron and body side. Use a large washer on the outside and a piece of one inch strap iron about six inches long, on the inside of the body panel. By keeping the brackets properly tightened on the fender irons, it will be found that these methods will hold the fenders rigidly.

H. C. PATTERSON,
CUMBERLAND, MD.

Keeps Out Water

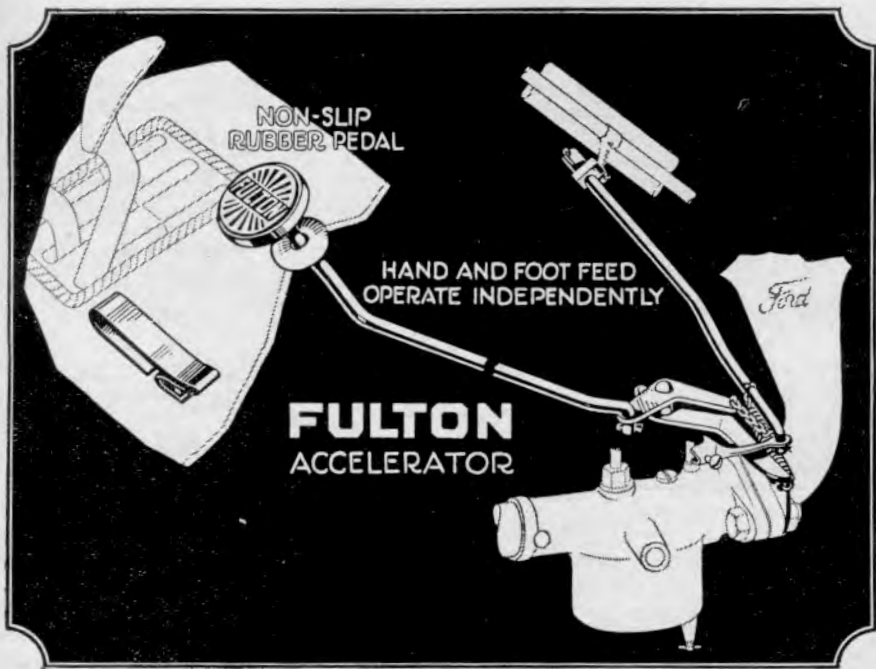
WATER often enters through the hole for the valve in the demountable rim. This water may cause rust and make the tube stick to the rim which may ruin the tube.

To prevent the ingress of water and sand, cut a piece of rubber about two inches square from a discarded inner tube. With a paper or leather

punch, cut a 3/8 inch hole in the center. With the tube in the casing, and ready to put on the rim, slip this small piece of rubber over the valve stem, and push it up as far as the beads. Then put the casing on the rim, being sure that the small piece stays between the beads and the rim.

L. JORDAN,

LOS ANGELES, CALIF.



Don't Drive Without This Better Accelerator



The **AERMORE**

Exhaust Horn
Sets new standard of signalling efficiency. Quick installation — durable — dependable. Price \$7.00 to \$14.00. Ford Size \$7.00.

Here it is—the Fulton—the very accelerator you've been waiting for. Gives positive foot control, an even flow of power under all driving conditions; can't work loose or jam; saves gas and power, and gives real satisfaction every moment in use.

This better accelerator is made to Fulton Standards of finest quality materials, fully nicked. It is equipped with a non-slip, rubber foot pedal, and an improved foot rest.

Installed on the right hand side of the motor 4½ inches or more from the foot brake. There is no interference with pedal pads and magneto post. Easy to install. Fully guaranteed. **Price complete only \$1.50.**

See your Dealer. If he does not carry the Fulton, send your order to us direct. We guarantee your satisfaction.

Dealers. These accessories are nationally advertised. Ask your jobber for the Fulton proposition. We are also exclusive sales representatives for Cooper Cut-outs and Kokomo Wind Shield Wings and Mirrors.

THE **FULTON** CO.

742-75th Ave., Milwaukee, Wis.

Automotive Equipment

Pace Setters of Quality

Hand Warmer With Heater

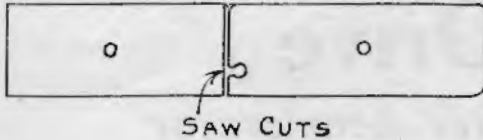
WHEN a car warmer of the type fitted over the exhaust manifold is used, this affords a supply of heated air which can be used to keep the hands of the driver warm, even in an open car. A funnel shaped tube of closely woven duck is tied at the small end around the opening of the hot air duct.

The upper end of the tube widens out in the form of a funnel, and is provided with a draw string by which it is kept in place over the steering wheel. The bag must be considerably larger than the wheel to permit easy movement of the hands. Two holes are cut in the upper surface of the bag to admit the hands.

DALE R. VAN HORN,
WALTON, NEBR.

Cuts Valve Covers

THE one-piece valve chamber covers, used on 1923 and later Ford engines, are somewhat difficult to remove and replace betwixt-and-between the generator, the manifolds and the carburetor. But if these one-piece covers are sawed



in half, and then slotted, close to the carburetor pull rod hole, the removal and replacement of the covers is easy. It has been my experience that very little oil escapes from covers cut in this manner.

C. H. SHARPE,
PHILADELPHIA, PA.

Quiets Timing Gears

When an engine has been overhauled and the main bearings tightened, this brings the crank shaft closer to the cam shaft and, if new timing gears are installed, the new gears will be "crowded" together and will howl. Of course, the theoretical method is to rebabbit the main bearings and refit them, but sometimes this is a waste of time.

But, if the ends of the teeth of both large and small gears are filed off slightly (this need not be more than the thickness of a sheet of paper) this will cause the gears to run more quietly than when meshed too deeply.

The small or crank shaft gear may be set up tightly against the cylinder block, if one takes care. This will help to avoid en-play of crank shaft and hard starting. If a tight fit when cold, the crank shaft will expand forward and make a free fit when warm.

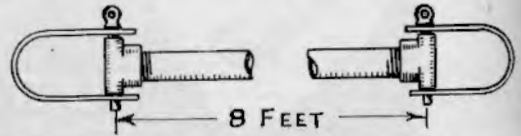
If the flange on the crank shaft keeps the gear from fitting against the cylinder block,

the shaft may be cut down with a hack saw or with a file, to allow the gear to go farther. The gear can be fastened so as not to slip off forwards with prick punch marks in the shaft.

L. L. ROMERSHEUSER,
WHITE, NEBR.

Towing Pole

WHEN a car requires towing, the brakes are often out of order, and so a rigid towing pole, which allows the front car to control the

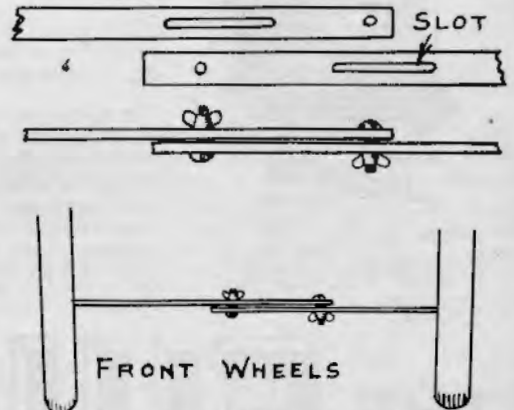


movement of the rear car, is of practical utility to the garageman. Iron gas pipe, of 1 1/4 inch diameter, and about 8 feet long, is threaded at both ends. Onto these threaded ends are screwed tee-connections for 3/4 inch pipe. A pair of clevises can be purchased at a hardware store for about 25 cents each. And the pins of the clevises are a fair fit through the tee-connections.

MILES HOUSER,
MUNCIE, IND.

Front Wheel Alignment

As front wheel alignment is an important factor in easier steering, and reducing tire wear, it is important to check the alignment. This is easily done by means of two yard-sticks and a couple of stove bolts. Cut slots and holes in each stick, as shown in sketch, and bolt the two sticks loosely together.



Place an end of each stick against the inside rims of the front wheels at axle height, and tighten bolts. The gauge is now applied to the rims towards the rear of the car, and the difference, or toe-in, is easily read on the scales of the yard sticks. This should be from 3-16 to 1/4 inch.

FOYE E. ILES,
FREDERICKTOWN, OHIO

You can now buy the famous Rush Timer Roller for \$1.00

At this new low price, you'll feel economical when you buy one—and the results of its use will save you many times its cost. Besides you will get more out of your motor—quicker starting, more power and better gas mileage—with no bothersome timer oiling.

Get one today—see for yourself the truth of these statements. Your satisfaction is guaranteed.

Rush DUAL-CONTACT Timer



Line Contact
Wipe Contact

RUSH Timer Roller

The Dual contact feature insures a positive, rolling, wiping contact between roller and track. There is never an interruption in the spark during the period of contact. Guaranteed to prevent the timer track from corrugating or wearing rough. Price, \$1.00.

Rush Timer Case with Detachable Fibre Ring.
The Rush Timer is made in three parts—for better service and greater economy. Each one is made of the best materials and may be bought separately or complete. Roller assembly, \$1.00. Timer case and fibre contact ring, \$1.50; extra replacement ring, \$1.00; complete, \$2.50. Satisfaction guaranteed or money refunded.

Manufacturers of

**Rush Adjustable Emergency Brake Shoes
FOR FORDS**

DEALERS—Order now for immediate delivery.

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NO trial and guess work when you handle the job with Starrett Tools. Clean, accurate fits—right the first time. Two generations of skilled machinists have found that Starrett Tools produce more accurate work, in less time and at a lower cost. And they're easy to buy. Ask at any good hardware store for Starrett Micrometers, Cylinder Gages, Combination Squares, Dial Test Indicators and other fine precision tools built for motor servicing.

Write for Catalog No. 22 "LG" and the Supplement describing the new Starrett Tools.

THE L. S. STARRETT CO.

The World's Greatest Toolmakers
Manufacturers of Hacksaws Unexcelled
ATHOL, MASS.

Starrett Thickness Gage No. 71 for the Automobile Trade contains best possible combination of leaves for auto work. Protected from kinking by folding neatly in metal case. Leaves easily replaced. Case has eyelet so that gage can be carried in a ring or hung from hook. Invaluable when setting or adjusting Coils, Breaker Points, Spark Plugs, Valve Tappets, Checking Shim Thicknesses, Cylinder Wear, End Play in Crankshaft, Tightness of Spring Shackles, etc., etc.

6267

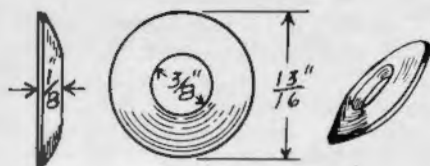


The Puzzle Corner

Special Anniversary Puzzle

While the magazine is celebrating its Tenth Anniversary, the Puzzle Department wants to celebrate its first birthday. One of our readers tripped up our Technical Editor on a part of the Ford starter—and that's how the puzzle department originated.

Two more of our readers have sent in crowned steel washers, about 13-16 inch outside diameter and of $\frac{3}{8}$ inch bore. These washers are $\frac{1}{8}$ inch thick at the middle, and taper to a thin outside edge. One garageman said that such a washer fell from the valve side of an engine he was



IS THIS A FORD PART?

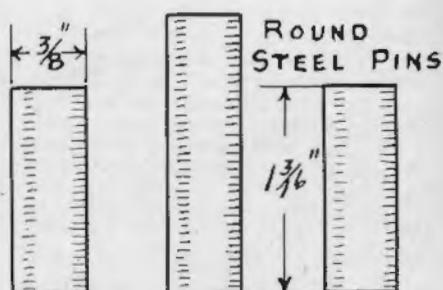
overhauling, when he turned the engine over on the bench. Another mechanic, who sent in a similar washer, said that he thought it came from the cylinder head. Neither could find the part of the engine it came from—and neither could we. Can you? We will pay an award of \$1.00 for the FIRST correct answer to this particular puzzler.

Some of our readers have been enclosing small parts as their suggested ideas for the puzzle department. We have been keeping these parts in an envelope and, on a recent trip to Detroit, thought Mr. Henry Ford might be interested in them. He was.

It is a wise daughter that knows her own mother in these days of beauty parlors. But it was a wise Henry who knew his own Ford, for it did not take Mr. Ford long to tell to which part of the Ford car each of our little puzzlers belonged. However, when it came to the cone-shaped washer, Mr. Ford wasn't sure, but he said—(we'll tell you after you tell us!)

than the other two. Did you get that? And do you know the reason for making the pin longer?

We do not pay for correct answers to puzzles. And while we shall not publish the names of



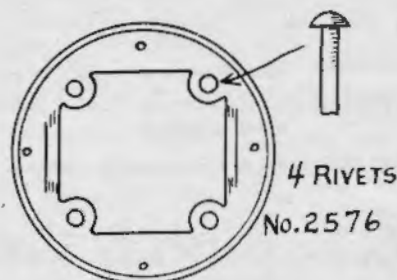
THE THREE TWINS WHO-ARE-THEY?

those sending in correct answers, those who care to send in answers may do so.

The award of \$1.00 for suggesting this puzzle goes to M. P. Blackman, Bluffton, Mo., while Edw. H. Ritner, Harrisburg, Pa., gets honorable mention for having suggested the same idea.

Answer to March Puzzle

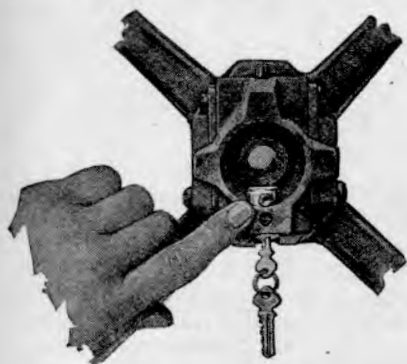
The four round head iron rivets, as shown in the March issue, which are $\frac{1}{4}$ inch in diameter and $1\frac{1}{8}$ inch long, are listed in the Ford booklet as part No. 2576, universal joint ring rivets.



Sometimes these rivets, which hold the universal joint together, work loose. Then it is better to pay 5 cents for a set of four new rivets, rather than to attempt to tighten the old rivets, as tightening old rivets seldom makes a lasting job.

THESSE three round steel pins will prove a puzzler to some of our readers, owing to the fact that one pin is shown as longer than the other two. On 1920 and earlier Ford cars, all three pins were of 1 3-16 inch length. On 1921 and later Fords, one of the pins really is longer

There has never been any need to change the original FOX *rigid* locking principle



The first FOX LOCK made, five years ago, and the latest model now being packed for shipment employ **precisely** the same locking principle.

Refinements have been made from time to time, improving the appearance, convenience and durability of the FOX LOCK—alloy steels, scientifically heat-treated have increased its strength—but the **rigid** locking principle has never been altered in the slightest detail.

Tests of all kinds—above all, the tests made by hundreds of thousands of Ford drivers on their own cars—have conclusively proved that there is no better method of locking the Ford car than the FOX locking principle.

When you sell a FOX LOCK, you are not experimenting at the possible expense of your customer; you are giving him a lock proved by test and use the best protection against

theft ever devised for the Ford car. And your profit is just as large as on a less reliable lock, while the cost to him is no greater.

Write today for complete details.

FOX

AUTOMOTIVE PRODUCTS CORP.
4660 North 18th Street, Philadelphia, Pa.

STOP THIS



WITH
NEVERWEAR
AUTO TOP
PROTECTORS

“They make the top outlast the car”

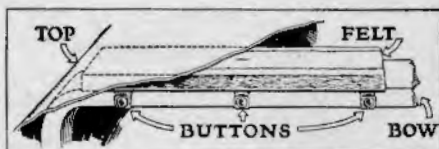
Motorists everywhere are buying this simple yet ingenious article.

It is a strip of felt pad strapped on to the cross bow by means of elastics and snap fasteners.

This soft, springy cushion prevents the flapping top from wearing itself out against the top bows.

The sharp edges of the bows cannot eat through the top fabric.

LIST PRICE, \$1.50 a pair, in an individual carton.



For All Old and New Cars

Ask your accessory dealer or write us direct.

Manufactured by
AUTO TOP PROTECTOR CO.
INCORPORATED

Box 1036, Thomaston, Alabama.

Here Are the Winners in the Letter Writing Contest

Hundreds of Letters Pour in From All Points

BY THE CONTEST EDITOR

WELL, friends, my big job is ended. "Friends" is right, for I never knew we had so many; "big job" is also right, for I have been some busy since the announcement of our Letter Writing Contest in reading bushels of letters which came from all parts of the country and abroad.

There were so many cracking good letters that I was almost up a tree in arriving at even an opinion before all of the letters were in. Then the entire bunch was put up to our editorial board, which acted as judges. At the end of a week we had finally selected what we believed were the letters entitled to the prizes.

Besides the prize winners, it was suggested that we also publish an "honorable mention" list. This was not practical, since every letter sent to

us was worthy of such mention. I have conducted a number of contests, but I really never read a finer set of letters, nor ones which seemed to be written in such sincerity.

In behalf of FORD OWNER & DEALER Magazine I want to thank our hundreds of friends for their interest. Each letter written was carefully read and appreciated and it is our only regret that each and every one of you who entered this contest could not have won first prize. There was not a poor letter in the entire lot and we highly appreciate your splendid response.

But I know you are not half so interested in reading my remarks as you are to learn who won the prizes. So, with a hearty hand-shake to the winners and all the rest of you—here is the decision of the judges:

Subject:

"What Ford Owner and Dealer Magazine Has Meant to Me"

FIRST PRIZE—\$50

W. H. McCullough,
203 24th Avenue South,
Seattle, Wash.

SECOND PRIZES—\$25 EACH

Herman Brenneman,
Uniontown Garage,
Uniontown, Ohio.

L. M. White,
Colony,
Kansas.

THIRD PRIZES—\$10

G. K. Murray,
1420 Ninth St.,
Des Moines, Ia.

Vic C. Wallin,
Grand View Motor Inc.
Grand View, Wis.

A. E. Frampton,
4210 Iroquois Ave.,
Erie, Penn.

FOURTH PRIZES—\$5

Anthony Ciuffreda,
Strobel Motor Co., Inc.,
1425 Irving St., N. W.
Washington, D. C.

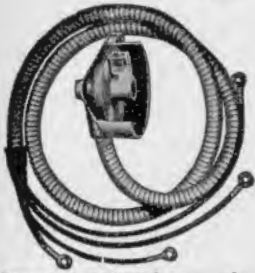
H. P. Van Wagner,
21 Nassau St.,
Atlanta, Ga.

John C. Key,
Route 2,
Brent, Alabama.

Ralph Hunter,
Camp Point, Ill.

R. R. Hayes,
Hills and Dales,
Dayton, Ohio.

The Fastest Selling Quality Timer for Ford Cars



Built on a different and better principle of Ford ignition, the Turner outsells all timers of its class. It is the best timer to sell because it gives the most satisfaction to the customer. Oil-proof, grease-proof, water-proof. Requires NO oiling.

Increases power, lessens plug fouling, gives an instant start, saves gas, stops motor "kicking."
Price complete, \$3.75.

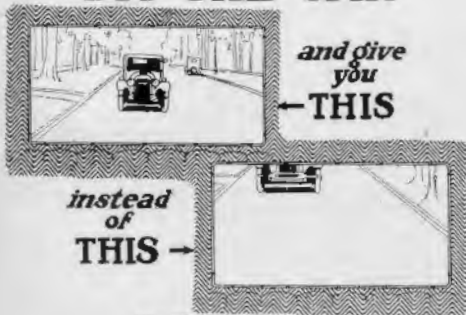
TURNER MANUFACTURING CO.
Dept. A KOKOMO, INDIANA

TURNER

2MI
TIMER

KALES *findview* Mirrors

FIT THE CAR



and give you
— THIS

instead of
THIS —

Full View Behind
See Back as far as you see Ahead
Kales Brackets
Do The Trick

Kales Stamping Company

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If Your Ford is either Truck or Taxicab

You Will Save Money

by equipping the

TRUCK with a

**Dreadnaught
Indestructible
HUB ODOMETER**

An absolute check-up on gasoline, oil, tire usage and expense — *by the mile*. Strong enough to be collision-proof — attached just like a hub cap — accurate and unfailing in registering every traveled mile.

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Get Our Interesting Dealer Proposition

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A business-getter from the minute it's attached. Gets you every penny your mileage earns and inspires confidence on the part of your patrons who are assured by the ATCO of an honest fare.



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ODOMETER and ATCO TAXI-
METER yours for the asking,
without obligation.*

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DAYTON, OHIO

New York Office: 22 West 61 Street

Successors to AMERICAN TAXIMETER CO.

FIFTH PRIZES—\$1

H. M. Wyckoff, Jordan, N. Y.	Francis W. Golden, Roxbury Crossing, Mass.	O. E. Parsons, Wauwatosa, Wis.
L. S. Upshow, 404 Linwood Ave., East Point, Ga.	E. L. Hamilton, 1548 Forsythe St., Beaumont, Tex.	
J. G. Wilson, Box 155, Weedville, Pa.	Vernon Potter, Giddings Auto Co., Paw Paw, Mich.	C. Faust, 126 Fifth Ave., Moline, Ill.
James McIntosh, 1016 Central Ave., Hot Springs, Ark.	Roy W. Allen, M. D., Tower City, No. Dak.	

Subject:

"What the Ford Car Has Meant to Me"

FIRST PRIZE—\$50

Marshall W. Overton,
217 N. Franklin St.,
Watkins, N. Y.

SECOND PRIZE—\$25

Edgar I. Syverud, Dagmar, Montana.	Victor Simpson, Langevin Block, Ottawa, Canada.
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THIRD PRIZE—\$10

Charles F. Innis, 606 Lincoln Highway, East, Coatesville, Pa.	N. C. Cathie, Lancaster Bldg., Calgary, Alberta, Canada.	G. Robert Jernberg, 499 Lake Ave., Worcester, Mass.
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FOURTH PRIZE—\$5

Wilbur Van Scoyoc, 643 Washington Ave., Tyronne, Pa.	Rev. M. G. Dickinson, Louisa St. & Mc Kee Place, Pittsburgh, Pa.	H. Schofield, Royds St., Milnrow, England.
E. F. Carter, 825 Woodford St., Missoula, Mont.	S. P. Watson, 59 High St., Metuchen, N. J.	

FIFTH PRIZE—\$1

Harry P. Hinks, 515 Kelly Ave., Wilkesburg, Pa.	Vincent E. Gorman, 546 Passaic Ave., Nutley, N. J.	Delia G. Bennett, Box 502, Sanford, Me.
H. M. Moulton, R. F. D. 2, Box 7, Framingham, Mass.	Russell H. Campbell, 124 Tuxedo Ave., Highland Park, Mich.	
Miss Ann E. Russell, Mora, New Mexico.	Fred H. Hanger, Great Bend, Kansas.	Mrs. John W. Payne, Golden City, Mo.
Willy Brunnich, 558 Delaware Ave., Milwaukee, Wis.	G. R. Gilbert, 412 N. 19th St., Birmingham, Ala.	



Brass Where Brass Belongs—PERFEX

Brass or bronze wherever water comes in contact with metal is a distinctive feature of Perflex construction. The core is made of one-piece bronze units, following the famous scientific and patented Perflex design. Both the top and bottom tanks are one-piece seamless brass. Copper rivets are used throughout. There is nothing to rust or corrode. The reinforcement of the bottom tank described below is typical of Perflex construction. There are many other exclusive patented features which make Perflex Radiators a time and money saving investment.

Ask your dealer, or write, for circular which gives full details.

Reinforced Lower Tank

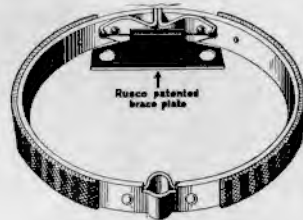


The lower tanks on the new Perflex Radiator are fitted at the bottom corners with 20-gauge brass reinforcements which are riveted with stout copper rivets sealed and protected by being sweat soldered in place. To this reinforced tank section is fastened the improved Perflex suspension bracket as illustrated. This holds the radiator steady but protects it from strains due to the twisting of the frame.

RACINE RADIATOR COMPANY
 RACINE WISCONSIN

Canadian Office
 316 Kennedy Building
 Winnipeg, Canada

PERFEX
 THE PERFECT RADIATOR



Brakes You Can Trust

Put them on your Ford at our risk

ALWAYS sure of your hand-brake. That means something in the way of comfort and confidence when you are driving, doesn't it? No one wants to feel that he is to blame when there is an accident.

Dependable Brakes

ARE the best insurance against accident. Rusco Steel Emergency Brakes will stop your Ford when you want them to. The bands are of tough, cold-rolled steel. The patented brace-plate makes the braking pressure absolutely even. They are lined with Rusco Brake Lining (the kind that is used as standard equipment on Packard Cars).

Thirty days' Trial

SEND the attached coupon with \$2.75 to the Russell Manufacturing Company, Dept. F. 2 Middletown, Conn., and we will send you a complete set of Rusco Steel Emergency Brakes. Or if you prefer, you can pay the postman \$2.75 plus the postage charges. Put these brakes on your own Ford (you can install them yourself) and try them for thirty days. Then if you are not satisfied, return them to us, and we will refund your money.

THE RUSSELL MANUFACTURING CO.
 Dept. F. 2 Middletown, Conn.

Please send me a set of Rusco Steel Emergency Brakes. I enclose \$2.75. I will pay the postman \$2.75 plus postage. (Cross out words not needed.)

Name

Address

Post Office

WHAT- WHY- HOW-



WHEREIN
YOUR QUESTIONS
ARE ANSWERED

Conducted by
Murray
Fahnestock

AGREES—AND—DISAGREES

In the July 1923 issue, you mentioned that enough attention was seldom given to seeing that the crank case was straight. About two years ago, we found that we could get much nicer running engines if we straightened the crank case of every engine that we overhauled—particularly if the engine was two or three years old, or had seen much rough usage.

About a year ago, I wrote you about an engine that was very quiet—but had no pep. I read the article by the Ford factory expert, on page 88 of the August 1923 issue, on valve timing while I was camping in Western Arizona. When I got home, I retimed the valves by piston travel, and it was "like adding another cylinder to the engine."

I certainly enjoy the articles in the magazine, even if I do not agree with everything that I read in it.

Your experiences with straightening of crank cases giving smoother running engines is interesting corroboration of our article on Crank Case Alignments.

And the method of timing the valves by piston travel, which gave such good results on your car, is now neatly done by K. R. Wilson's valve timing device.

We are glad that you enjoy the articles in the magazine. We do not expect our readers to agree with everything in it. It is the function of a magazine to present ideas and to stimulate thought—rather than to present final decisions in a trade that is still progressing rapidly. Like pioneers spreading across the Western plains, we shall necessarily make mistakes and errors. That is why we need the help of those pioneering in Ford mechanics in making the magazine better.

FORD AND BUICK VALVES

In the September 1922 issue, you published an article naming many Ford parts which could be used interchangeably in other-than-Ford-car makes of cars. And requested us to tell you of any other interchangeable parts that we discovered.

In overhauling a 1917 Buick Light Four, some of the valves had badly worn stems and burned heads. But I found that Ford valves fitted perfectly! The Buick valves have slots in the stems, and flat keys or cotters. While the Ford valve pin hole corresponds so nearly with the lower end of the slot in the Buick valve stem that no change is necessary.

The flat key has considerably greater shearing strength than the round pin used in the Ford valve, so the Ford valve pin would seem more apt to shear off and allow the valve to drop down in the Buick cylinder, where the effects might be disastrous. In the case of a Ford car, with valves in the side, the shearing off of the valve pin would merely put the valve out of action, but would not cause other damage.

When installing Ford valves in Buick cars, we would suggest that the strength of the valve spring used on the Buick be compared with the Ford spring. Both springs being compressed to the length they occupy when the valves are fully open. If the valve springs have the same tension, then it would seem that the Ford pin could be safely used, as it is spring tension that is the chief factor in shearing pins.

USES GRAPHITE SUCCESSFULLY

I have literally saved a Ford from the junk pile with graphite, because of a refusal to limber or free up when new. This motor has had five teaspoons of motor graphite (finest grade) mixed into a quart of oil, every time the oil has been changed. The car has now made about 4,000 miles and the bearings, and especially the cylinder walls are in perfect condition.

Have built a Ford racer, and graphite was used in it successfully. Being a grease hound for the last 12 years, I have used graphite on every kind of job imaginable, except of course for electrical units.

Graphite will not kill a Ford magneto, neither will it injure any part of a Ford engine, unless used to excess, or a wrong grade.

Much can be said for and against the use of graphite. No doubt it can be used to great advantage. Also, when not properly used it can give lots of trouble. That's where the difference of opinion arises.

We have warned against the use of graphite in the average Ford engine, because many car owners would simply dump the graphite into the crankcase, to clog up the oil feed pipe and short-circuit the magneto.

FINDS ELUSIVE KNOCK

On page 162 of your June 1923 issue, I notice that you answered a question in regard to engine knocks. But two heads are better than one, and you might be interested in this.

Bought a 1914 Ford in 1920. It had, as you know, an engine knock. So I put in new rings, oversize and light-weight pistons, piston pins and bushings—but still the knock. Then a new set of connecting rods and a new crank shaft—but still the knock. Also new cam shaft, cam shaft bearings, tappets and new valves—but still the knock. Then a new cylinder head and gasket (1921 head). Last, but not least, a new cylinder block. And there I had a new engine perfect—but still the knock.

I then tore down the engine and placed three thin washers (costing 15 cents) between the low speed and brake drum in the transmission and, Presto!—the knock was gone!

The later Fords are thus assembled, for I have a new 1922 and the three washers are in the same place, but when these washers get worn, there is end-play and a knock follows.

Your letter proves that two heads are better than one—and we are always glad to receive such helpful letters from our friends, Mr. Shaw. When the man on the job has such trouble locating an engine knock, it is not always easy for us to guess the correct location of the knock from afar.

About 1920, new Ford cars began to have a different kind of driven gear sleeve bushing, using a straight bushing and three washers, instead of the flanged bushing previously used. But the Ford Motor Company states that there should be some clearance or end-play in the transmission, and suggests .015 to .027 inch clearance after assembling. This clearance may be checked by sliding the brake drum back and forth on the shaft. The transmission of a 1914 Ford is probably so badly worn by this time that it is necessary to run it with less than usual clearance to avoid knocks.

HASTINGS

**REAL GLASS WINDOWS GIVE
Protection From Wind and Snow
For Fords 1923 and Later**

You can buy sets of two windows consisting of the well known Hastings frames with glass and fasteners. Replaces celluloid. Is easier to see through, better looking, and more permanent.



**Look for the Name on the Frame
For 1922 and Previous Fords**



The sets of three windows have been sold and used by hundreds of thousands of owners of 1922 and previous Ford models. Get the best windows by making sure the name Hastings is stamped on the frame.

Most Widely Sold and Used

Hastings windows fit perfectly, bind the fabric without cutting. They are neat, orderly looking, clear glass windows, handled by most all good accessory dealers



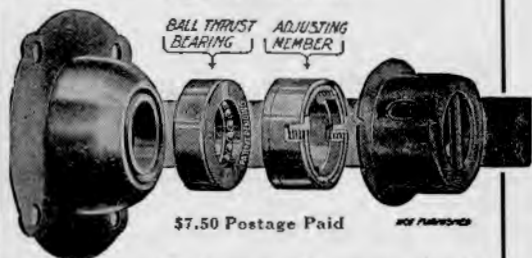
**HASTINGS MANUFACTURING CO.
HASTINGS, MICHIGAN.**

Makers of Automotive Necessities.

Makes Smooth Running Fords

Adjusto THRUST BEARING

PAT. PENDING-



\$7.50 Postage Paid

**Takes end lpay out of
Crankshaft and Transmission
AND KEEPS IT OUT!**

Takes jerk out of Clutch and Chatter out of Bands

Saves the expense of Overhauling
and Rebushing Transmission

Easy To Install, Without Removing Motor

Order now from

DURHAM ADJUSTO BEARING CO.

9325-B Grand River Ave., Detroit, Mich.



**It's So Simple—
Your Boy Can Do It**

To make a permanent repair merely clamp a Shaler Patch-&Heat Unit over the puncture, cut or tear and light the solid fuel it contains. Exactly enough heat is generated to vulcanize the rubber. After five minutes take off the pan and throw it away. That's all. The tube is ready to use. Anyone can do it anywhere. No gasoline, no cement—no danger of burning the tubes.

SHALER 5-Minute Vulcanizer

Costs only \$1.50

Slightly higher in Canada
and Far West

Complete outfit includes nickel plated vulcanizer and 12 Patch-&-Heat Units—in a small package, ready for instant use. Wherever auto accessories are sold you can buy the Shaler. Get one for your Ford automobile today.

C. A. SHALER CO.

2602 Fourth St., Waupun, Wis.



DOWN TO THOUSANDTHS

What is proper clearance for the Ford magneto?

What clearance should be used for the coil points?

What clearance for spark plug gaps?

Can the valve tappets be adjusted to say .018 to .022 inch with successful performance on rebored Fords? Or should they be the same as standard Fords?

The gap between magnet clamps and poles of the magneto coil assembly should be .030 inch. There is a tolerance of from .025 inch to .040 inch, but .030 inch gives best results. It is safer to have a little more gap at the bottom or unsupported part of the magneto coil assembly, as this part vibrates at times. New cars are set with .020 inch at the top or bolted part, and with a clearance of .030 inch at the bottom.

Coil points should separate a trifle less than 1-32 inch, or say .028 to .030 inch.

Spark plug points may be set at 1-32 inch or .031 inch. Valve timing for both new and rebored Ford engines is the same. In both cases, better performance will be secured by adjusting the valves to open and close at the correct time in regard to piston position. Then use valve tappet clearance as it may happen to be. If the less accurate method of timing by tappet clearance is used, then from .018 to .022 inch is about correct, for passenger car use. With slightly more clearance allowed for trucks.

SMOOTH AND FAST

Wish to make a touring car engine run smoothly, and give a little more speed than average engine with less vibration, but not for racing. Are the Laurel counter balanced crank shafts balanced for both standing and running balance?

How would a counter balanced crank shaft work a counter balanced fly wheel, as described in January 1923 issue? Do these counter balanced fly wheels necessitate the removal of the starter ring gear?

Your idea for making a Ford engine run more smoothly for a touring car is a good one, and will give more speed and less vibration. In one sense, the Laurel counter balanced crankshafts are balanced for both standing and running balance, in that they are DESIGNED to have a running balance.

Yes, we think that a counter balanced crank shaft should work very nicely with a counter balanced fly wheel.

WISH-BONE UPSIDE DOWN

Wish to thank you for your suggestion of using 4-to-one gears in my Ford Sedan for hilly districts. I find these gears to be a wonderful improvement.

Would suggest that you drop a word of warning to owners who are replacing front radius rods. Tell them to put them in right side up, and why. I was unfortunate enough to drive for two years with these rods upside-down, because I was not told that there was any difference. Always wondered why car steered so badly on turns, and narrowly escaped accidents several times.

The rear wheels, viewed from behind, look knock-kneed, with the middle of the axle housings sagged so that there is a good fraction of an inch difference between the distances, as measured at the tops and bottoms of the wheels. Have seen many Fords like this, but none as bad as mine. It was not better after a complete rear axle overhaul.

My 1922 Ford runs smoothly and starts easily, but some times skips when pulling slowly uphill on high gear, with wide open throttle. Could this be timer, coil adjustment or spark plug gap?

On page 38 of our April 1923 issue, we showed the tapered nuts and countersunk holes in front radius rods which make it certain when the front radius rods are correctly installed. But it is possible that some of those who are having front wheel WABBLE or hard steering may find that, as you suggest, the front radius rods are turned upside down.

Since the rear wheels are closer together at the top than at the bottom (they should be almost vertical—though there will always be some slight deflection due to bending of the axle shafts and play in bearings) it seems certain that the axle housings are bent or sprung. If this is not corrected, you may have trouble with axle shaft breakage. Some skilled repairmen can straighten sprung axle housings on a lathe. But if not, it will be necessary to install new housings. You might install rear axle truss rods, to hold axle housings straighter until the next time the rear axle system is overhauled.

We believe that too wide a gap in one of the spark plugs or a defective spark plug porcelain is causing the skip.

A Ten Year Friendship

WE NOTE your statement that the L. P. Halladay Co. advertising appeared in your first issue 10 years ago. While we could not have told this ourselves without going back through the records, we are not at all surprised, as Halladay shock absorbers have held an important place in the Automobile Industry since some years previous to the birth of FORD OWNER AND DEALER.

"During that time we have made many changes in our shock-absorbing devices, the result of constant and untiring study of the problems of spring suspension. Our shock absorbers have not always been especially for or limited to use on Ford cars but whenever we have marketed a shock absorber of that character, you will find that they have been advertised in your publication.

"As you are entering into the second decade of your high position in the field of automobile publications, we are just getting well under way with the marketing of our latest shock absorbing device, the Halladay Spring Cushion for Ford cars, and feel that we can "swap" congratulations on a constant improvement in the results of our efforts.

"We are glad to say that we feel that FORD OWNER AND DEALER has always been good and is getting better, and are very sure in our conclusions based on careful tests that our new Halladay Spring Cushion is staying right with you in progress and evolution. Here's hoping your 10th Anniversary may be only the beginning of a number of similar anniversaries."

From the L. P. Halladay Co.



Titanic No. 102

Guaranteed Forever Against Center Breakage

The TITANIC Hump Center is our guarantee and your protection. TITANICS have no weakening center bolt hole.

That is why we guarantee them never to break at the center.

TITANIC alloy steel, correctly heated, means greater strength and greater durability.

TITANIC'S better performance means greatest satisfaction, greatest profit.

TITANIC SPRINGS

TUTHILL SPRING CO., 760 Polk St., Chicago, Ill.

Builders of Quality Springs for Over Forty-Four Years.

Quick, Easy Profits for Garagemen!



\$2 Profit for Only 30 Minutes' Time
With This Front Axle Reclaimer!

The new sensation among garagemen! Big, quick profit-maker! Reclaim front axle with this **Safety Center Reamer**. Every job means a satisfied customer and \$2.00 profit for you. Any one of your helpers can do the complete job in 30 minutes. When the front wheels "wobble" use the **Center Reamer** on the axle. Supply the spindle-bolts with a set of Lock Nuts and Washers. Makes front wheels true forever. Better than new axle.

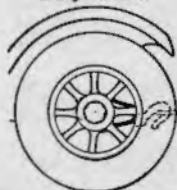
More business and bigger profits for you! Make more money on your helper's labor. Less than four repair jobs pays for complete set. Don't delay. Be the first in your territory. **Center Reamer** complete with nuts and washers to equip six cars sent postpaid to you for \$7.50. Send today!

Save Time, Work, Money With This SAFETY "NO-JERK" TOW LINE

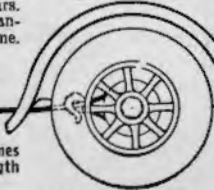
Easy to Sell

No more jerking cars, stripping gears or springing frame and axle when towing crippled cars. Ends danger of damaging customers' cars. Takes bumps out of roughest road. Saves time, trouble, expense. Cannot come unhooked when slack. Your customers will want one. Quick profits for you in every sale.

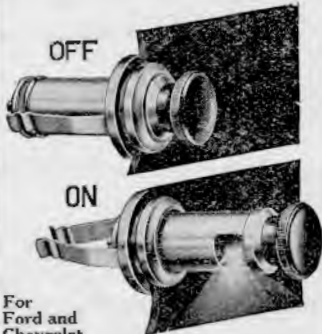
Quick Profits



Easy to handle. Flexible—fits any tool box. Worth many times actual cost. Sent prepaid—\$4.95 complete with full 12-foot length of low line. Assembly only, \$3.75. Send today!



SAFETY MANUFACTURING CO. 1814 Walnut St. KANSAS CITY, MO.



For Ford and Chevrolet

Introducing The BELL Dash Lamp

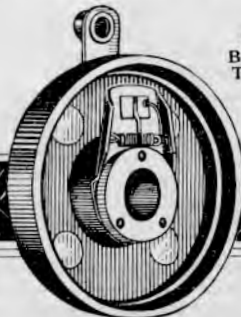
Otto Bell now offers Ford and Chevrolet owners a brand-new dash lamp. Push it in to switch it off; pull it out when you want light. Here's a dash lamp that's out of sight and out of the way when not in use. Nothing shows but a polished Bakelite knob and a nickelled ring. Nothing to catch or break. No half-hidden switches. Sturdy, simple and durable.

Ask your jobber about this new arrival, or write us direct for prices and descriptive matter.

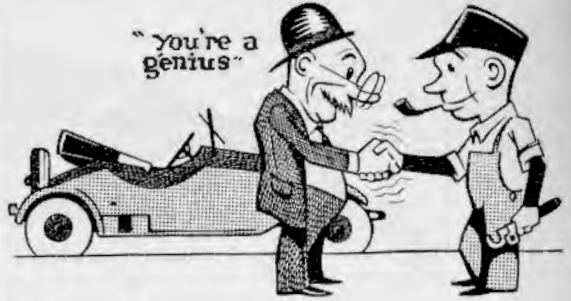
When you're selling a BELL Dash Lamp, don't forget to show your customer the famous molded Bakelite

BELL Timer

Sold by leading jobbers.
BELL MFG. COMPANY
 17 Elkins St., Boston 27, Mass.



The BELL Timer



Brush satisfaction is up to you

Use only Columbia Pyramid Automotive Brushes —they last longer

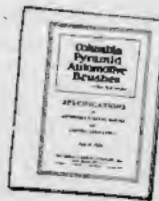
COLUMBIA Pyramid Automotive Brushes reduce electrical troubles to a minimum because each is designed for the particular unit to which it is to be applied. There is a right Columbia Pyramid Brush for every use on every car now running.

Columbia Pyramid Automotive Brushes are made in all sizes, shapes and connections to fit every motor, generator and horn,

and are sold in convenient individual packages and in assortments containing the brushes most needed in the average service station.

free!

This book enables you to choose the right brush for every motor car.



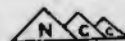
Buy only Columbia Pyramid Brushes and let the satisfaction they give safeguard your reputation among motorists.

Buy them through your own jobber.

National Carbon Company, Inc.
 New York, N. Y. San Francisco, Cal.

Canadian National Carbon Co., Limited
 Factory and Offices: Toronto, Ontario

Columbia Pyramid Automotive Brushes
 — they last longer



LAMP SERVICE

That's US!

Lamps and Parts

of Every

Conceivable Type—

In Stock

Ready to Ship You

**VARIETY
PRICE**

DISPATCH—

Headlights, Cowl, Dash, Pillar, Side, Dome, Step, Corner, Search and Spotlights, in Gas, Oil or Electric—in a Profession That Overlooks Nothing—

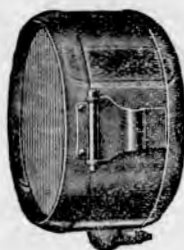
*"THE LINE THAT'S RIGHT
FOR LIGHT AT NIGHT."*

Superior Lamp Mfg. Co.

New York City
150 W. 52nd St.

Newark, N. J.
38 Branford Place

"In Business Since 1902"



STOP your Ford fenders from flapping! Prevent nerve-racking squeaks and eliminate costly replacements by installing "Fend-R-Braces" on your Ford car or truck. Installed in five minutes with bare hands. No tools required—no holes to drill! Just snap "Fend-R-Braces" on your Ford and tighten the turnbuckle. You can always keep them tight with this turnbuckle. "Fend-R-Braces" fit any Ford model, either car or truck—and in addition to bracing the fenders they greatly strengthen the running boards. Guaranteed against defects in the material and workmanship.

If your dealer can't supply you, send direct to us. We will make shipment—via C.O.D. Parcels Post—the same day order is received. You take no chance!



Price per set, for front and rear, \$2 post paid and tax free! (Add 25c west of Denver. In Canada, add 75c and send cash with order.)

Dealers we have a money-making proposition—you must act now! Territory is being snapped up—Wire!

Tractor-Train Co. of Ind., Connersville, Ind.



Any Light for Illumination
AUTO-PAS for Safety

No other light possesses the wide range of night driving securities provided by



(Made in California)

No other light so quickly and dominantly gets the right of way, for its three-way light rays are always recognized and obeyed. Installed on the left running board, the green light of *Auto-Pas* prevents side-swiping and collision, while the red light behind and the white light on the road, shows exact safety clearance to passing cars.

\$7.50

provides this protection.

Mail your check to

J.F. BUTTS 207-E Alaska Commercial Bldg., San Francisco, Calif.

DEALERS: Write for full particulars and literature. "The Light that says Safe Here." Regardless of what you are handling, it will pay you to investigate "Auto-Pas Safety Light."



**Manufacturers,
Distributors,
Sales Representatives,
Agents**

**List Your Organization
With Our Service Department Gratis**

Many Accessory Manufacturers who use this publication, are seeking connections with sales agents in every section of the country. Our representatives will gladly tell them about you if you will furnish us with the information necessary to do so intelligently.

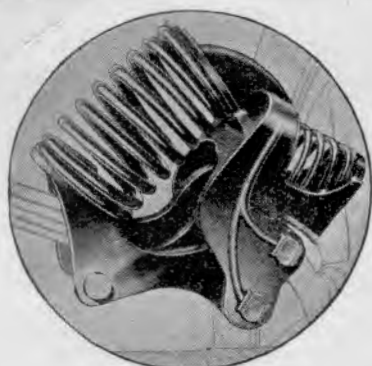
Advise us as to the territory you cover, class of trade you sell, how you handle the accounts and men you travel.

WRITE

Sales Service Department

Ford Owner and Dealer

MILWAUKEE, WIS.



DISCO Double Snubs

FOR
FORD CARS

DISCO DOUBLE SNUBS ARE
A COMBINATION OF BOTH
A HIGH - GRADE SHOCK
ABSORBER AND SNUBBER

STUDY the picture and it will be seen that the snubs take the place of the regular Ford Shackle and the car springs hang in the same position as they did before—neither raising or lowering the body of the car.

They perform a double duty. Don't be satisfied with only a shock absorber or only a snubber. Sell Disco Double Snubs, install them on your customers' cars and let them enjoy the real comforts of floating along over rough roads.

\$20.00 per set of
four snubs.

*In ordering please state if snubs are for
Ford Touring, Sedan, Roadster or Coupe.*

AGENTS

We want aggressive agents who will sell these snubs. Comfort and economy in the snubs is so apparent that your prospects will readily buy.

Installation is easily accomplished. Not necessary to remove wheels, reverse perches, or drill holes.

We know what you can do with Disco Double Snubs. You can take advantage of this proposition and make money. Write now for our special terms to active agents.

DISCO ELECTRIC MANUFACTURING CO.
Dept. A.D., 2100 Howard St., DETROIT, MICH.

Fill in for selling proposition

DISCO ELECTRIC MANUFACTURING CO.
Dept. F.O., 2100 Howard Street, Detroit, Mich.

Territory desired

Name

Street

City State

They Ring the Cash Register

GIVE a minute's attention NOW to these Eclipse products. Each has downright superior merit—each is a fast seller and a **real profit earner**. They move right off the counter—there's not a shelf-sticker in the bunch.

Eclipse ~~DK~~-Less

"The Renewable Timer that Outlasts the Ford"

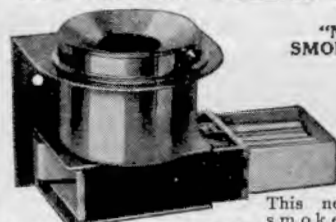


Your own test is all that we ask for the Eclipse. Here is a timer that by sheer outstanding performance has earned tremendous growing preference from tens-of-thousands of dealers and drivers. After rigid comparison of performance and service costs, it has been adopted as **standard equipment** on hundreds of

large commercial Ford fleets. It is built **mechanically** right—no oiling—dry-wipe contact action—no bumpy hill-and-valley wear—**renewable** contact points.

Try it out for yourself. Send for one and for our exclusive service station proposition. Put the Eclipse on the stubbornest Ford you know—and note results.

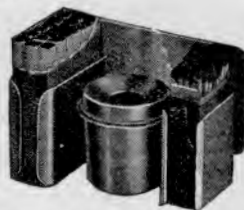
THE FASTEST DOLLAR SELLER— THE "NIFTY" SMOKE TRAY



This newest Eclipse smoke tray is as handsome and useful as its enormously-successful older brother. Heavily nickel-plated on brass. Dealers have pronounced this a tremendous seller. Retail for only a dollar.

Eclipse Auto Smoke Tray

Will continue to be the choice of the man who wants something bigger and more complete than the smaller model. Brings cigarettes, matches and ash receiver within easy reach from the wheel. A good-profit, fast-moving item at \$1.50.



Perfected Carry-All Auto-Step—

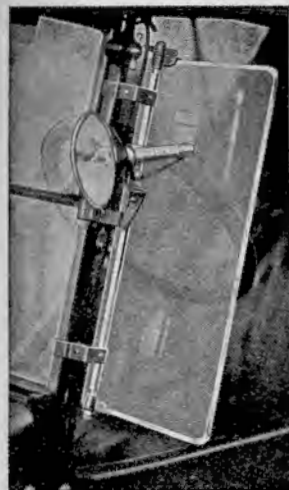
Offers salable features not duplicated or approached in any other product. Instantly convertible from a handsome step into a substantial, practical, rattle-proof luggage carrier. Has every feature of a fine step and a good carrier. Each pair is adjustable from 40-in. to 64-in. Retail at a price that removes sales resistance and gives you a fine margin. Get the details.

Dealers and Jobbers! Write at once for full particulars and discounts.

Eclipse Timer Mfg. Co.
2909 Meinecke Ave. Milwaukee, Wis.

A Special New Type for Fords STERLING WINDSHIELD WINGS

Custom Built



Here—at last—is a handsome, practical, sturdy "wing" especially designed and built for FORDS—a price that has never been rivalled.

Nothing "dresses up" a car so much as STERLING Wings. Nor does anything offer so much driving comfort. STERLING Wings fit perfectly and are backed by five year GUARANTEE against defect or breakage.

Dealers: Write us at once for our extremely attractive proposition. Prepare NOW for the big Spring demand.

Per Pair

\$1250

(Retail Price)

STERLING MOTOR PRODUCTS COMPANY

11-21 N. Ionia Ave. Grand Rapids, Mich.

Half an Hour of Your Time and Your Ford Transmission Is Relined



The only replacement lining that provides a quick method for relining your FORD transmission, without necessitating changes in construction of the Ford in order to install. Made in one-piece. Smooth acting and efficient as an air brake.

Any Ford Owner
Can Install the Quikon

Practically no mechanical experience is necessary. Requires no accessories. Slips on in a jiffy through the transmission cover hole.

Ask your dealer or garageman for the Quikon one-piece lining. If he does not carry it in stock, send his name and order from us.

Price \$3.50

Dealers and Jobbers: Write for our interesting proposition.

Harrison Auto Products Corporation

822 Hamilton St. Harrison, N. J.

"CHICAGO" TRANSMISSION

Auxillary Selective Type

FOR FORD TRUCKS & CARS

When attached to the standard Ford Transmission gives SIX FORWARD SPEEDS and THREE REVERSE.

UNDERDRIVE—DOUBLES THE POWER

OVERDRIVE—30% MORE SPEED

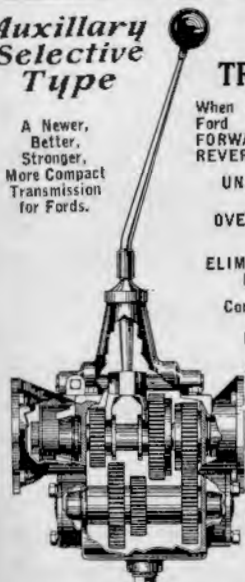
ELIMINATES 80% USE OF PLANETARY BANDS

Complete IN ONE UNIT SUPER-STRENGTH PROPELLER SHAFT

ANY GARAGEMAN OR OWNER CAN INSTALL WITHOUT SPECIAL TOOLS.

TWO TON PERFORMANCE AT ONE TON FORD COST.

LIVE DEALERS WANTED



CHICAGO TRANSMISSION CO.

332 So. Michigan Blvd., Chicago, Ill.

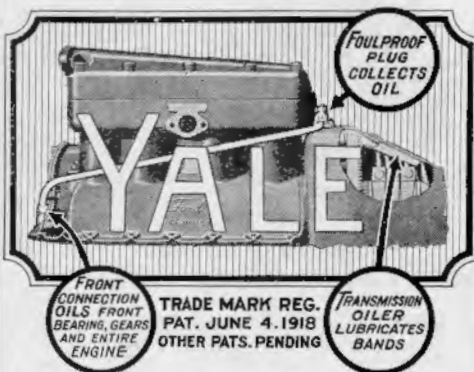
Quikon
ONE PIECE
TRANSMISSION LINING
for Fords

Makes Oil in a Ford Run Up Hill!

When going up hill no oil reaches the front end of the Ford engine! Scored cylinders, burned out bearings and a big repair bill may stagger your pocketbook unless you install a—

Yale Oiling System List, Complete, \$3.50

LIBERAL Discount to DEALERS



Guaranteed to oil engine and transmission perfectly, regardless of SPEED or GRADE—Stops all chatter and grab and makes bands last 2 to 4 times longer—No foul magneto post—no clogged oil line—more oil at high speed and ends all your oiling troubles.

DEALERS! Sell it on every new car. It saves you untold grief. Thousands of FORD dealers have already sold over 100,000 at a good profit.

Write for dealers' proposition and let us send sample for inspection and test.

ROLAND and KOCH,

Manufacturers

533 I. W. Hellman Bldg., Los Angeles, Cal.

Or write to—

3221 Harney St., Omaha, Neb.

A. C. BRAKE CO.,

2739 Locust St., St. Louis, Mo.

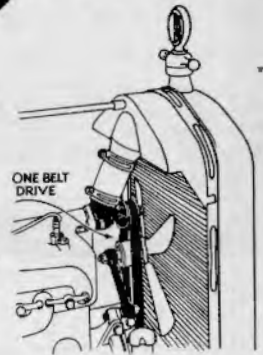
Distributor East of Miss. River

THE WACO COMPANY

117-19-21 So. 3rd St., Harrisburg, Pa.

Oberdorfer Pumps for Fords

\$4



Easy to Install

THE OBERDORFER ONE BELT DRIVE WATER PUMP for Fords comes complete and ready for easy installation. Fifteen minutes will do the job. The centrifugal pump assures a steady circulation of water that prevents freezing in winter and overheating in summer.

All wearing parts are of bronze, tightly packed to prevent leaking. Bushings are of phosphor bronze. The housing is of aluminum. A grease cup insures proper lubrication.

The Ford arm is replaced by a forged steel fan support arm, which is furnished allowing one belt to operate both the pump and fan. A new fan belt is furnished, one inch wide, of genuine leather, pebble grain and water proof.

Demand Oberdorfer Pumps. Order from your jobber now. If he cannot supply you write to us, giving jobber's name. Canadian price, \$6.50 to the trade.

M. L. Oberdorfer Brass Co.

128 Thompson Road,

Syracuse, N. Y.

IRON OUT THE ROAD

WITH

FOUR-DEES

FOUR-DEES SHOCK ABSORBERS

We insure any Ford equipped with FOUR-DEES SHOCK ABSORBERS against broken springs, regardless of load or road conditions.

THIS GUARANTEE is in addition to a year's guarantee against defective material or workmanship, and our standing offer to refund full purchase price to anyone who is not fully satisfied within 30 days trial.

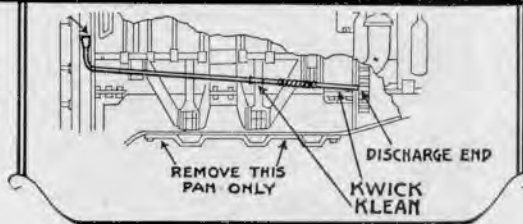
Details on Request

AUTO-EEZ MFG. CO.
Incorporated
Houston Texas

Kwick-Klean Oil Line Sections

Practical Economy

For Ford Cars



SAVE MONEY

SAVE MOTOR

DON'T WAIT FOR TROUBLE—HEAD IT OFF!

Install a Kwick-Klean Oil Line Section in your Ford
DO IT YOURSELF IT FIFTEEN MINUTES

or have your garage man install it when cleaning your pipe line—he will do this without additional cost—why?—because instead of a three hours job he can clean and install a Kwick-Klean in fifteen minutes and make a bigger profit.

After Kwick-Klean is once installed you can clean a clogged line in a few minutes in your own garage or on the road if necessary.

SAVE WORRY

SAVE TIME

RETAIL PRICE \$1.00

Sold Exclusively through Recognized Jobbers

1731 WAZEE STREET

BROADWAY ELECTRICAL WORKS

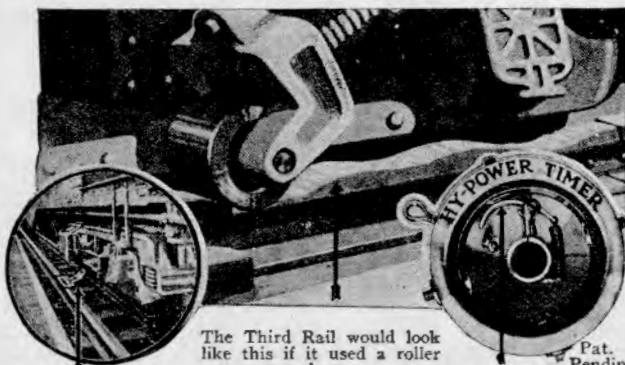
DENVER COLORADO

MANUFACTURERS OF DEITZ TOP-HOLDERS FOR FORDS ALSO DEITZ WINDOW SILENCERS FOR ENCLOSED CARS

HY-POWER TIMER

"THE TIMER OF NO REGRETS"

For Ford Cars, Trucks and Fordson Tractors



This is the way it looks with the Sliding Shoe

The Third Rail would look like this if it used a roller shoe.

List Price, \$1.00

The same principle of Sliding Shoe in Hy-Power Timer

Pat. Pending

The illustration herewith tells the story. The sliding shoe feature of the Hy-Power Timer overcomes the worn camshaft bearings and continues to make perfect contact. It gives 100% service and satisfaction.

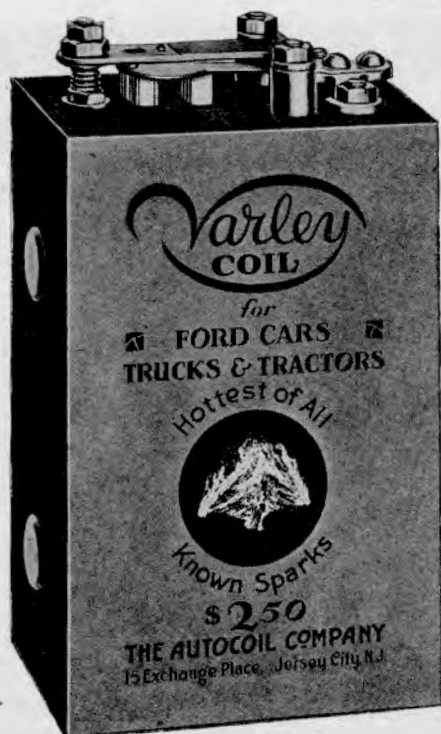
The Hy-Power Timer gets the best performance possible out of the Ford motor, and outlasts four roller type timers. It gives pep and snap to lazy motors, will take hills on high, get all the power the engine can develop, and with less gasoline, too. The Hy-Power Timer will give a smooth, flexible flow of power, a properly timed, full powered, perfect spark.

HY-POWER MFG. CORP., Dept. F., Mt. Vernon, N. Y.

SUCCESSORS TO BENFORD AUTO PRODUCTS CO., INC.

DEALERS: A sample dozen order from your jobber will sell quickly. Order today.

FORD OWNER: Ask your dealer for a Hy-Power Timer. If he does not carry it in stock, send us \$1.00 with the dealer's name, and we will ship you direct a Hy-Power Timer, postpaid.





The Grif-Ho Non-Glare Dash Light

ILLUMINATES YOUR INSTRUMENTS WITHOUT TIRESOME BACK GLARE

A fast-selling accessory which is easily installed in a few moments. The annoying and even dangerous back-glare of the ordinary light is eliminated by means of a novel revolving shutter. With shutter in normal position (slightly open) the instrument panel is well illuminated. To read watch or map, find tools or inspect battery, just snap the shutter wide open. Attached to dash by invisible mounting with two small bolts. Handsomely finished in polished nickel and ebony black enamel.

Retail Price \$1.25

Dealers, write your jobber or us for complete information and discounts.

GRIFFITH-HOPE COMPANY
MILWAUKEE, WISCONSIN

For SAFE DRIVING in MUD, SNOW or ICE

Reichert's Emergency Tire Chains

No jacks or tools are required to install them. You merely place the malleable clamp on the spoke, then slip the chain over the tire and hook the snap in the loop.

CHEAP SAFETY INSURANCE

A set of four chains (packed in a neat bag) is sufficient to pull any car or truck out of mud, sand or snow.

The ease with which they are attached make them an absolute necessity. You can't afford to be without them this winter.

- Size 1 — For Ford car only.....Set of 4, \$3.20
- Size 1½ — For 3 and 3½-inch tires.....Set of 4, 3.50
- Size 2 — For 4 and 4½-inch tires.....Set of 4, 4.00
- Size 3 — For 5 and 5½-inch tires.....Set of 4, 5.00
- No. 221 — For Ford trucks with solid tires. Set of 12 units. Price per set, \$12.00.
- No. 222 — For Ford trucks or others with 4 or 4½-inch pneumatic tires. Set of 12 units. Price per set, \$14.00.

Order From Your Jobber or Direct.

IMPERIAL BIT & SNAP CO.

Dept. J. RACINE, WIS.



BREDAR'S BALL SHIM \$ ONLY 1.10

You Can Install It in 10 Minutes and you have saved many dollars worth of expensive repairs and quick depreciation on your Ford.

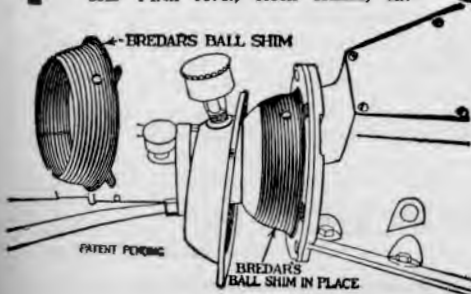
Stop that "Jump" and "Chatter"

in the rear wheels when starting and stopping. Takes all the excess play out of the ball joint and gives smooth, easy operation and economical long life.

If your dealer hasn't Bredar Ball Shim order direct from us now—you'll find the \$1.10 the best investment you've made—we pay the postage.

Jobbers and Dealers should get attractive facts—discounts. Write today.

Nic Bredar's Son Mfg. Co.
2529 Fifth Ave., Rock Island, Ill.



PREVENT Cold Weather TIRE CHANGES WITH NATIONAL TIRE FILLER



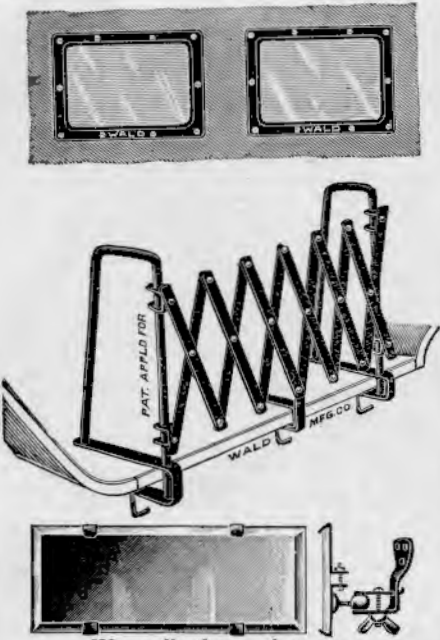
No more getting out in the cold to change tires when you use NATIONALS — they CAN'T puncture or blowout! And you can get 20 to 25 thousand miles from each, many having given 4 to 5 years' good service. Cut your own tire bills and make big money selling NATIONALS to others. Over 300,000 satisfied users; 12 years' proven success. Some good territory open. You make a good profit on every sale. Write us now.

Agents wanted in every territory. Write us now.

National Rubber Filler Co.,
222 College St., Midlothian, Texas.
Please send me your dealer-agent's proposition.....send me your direct prices on National Tirefillers.....

Name _____
Address _____

MAIL THIS NOW



We sell them cheaper.
Dealers and Jobbers, write us for prices.

WALD MFG. CO.
P. O. Box 619, MAYSVILLE, KY.

"C&D" CLAMP-ON "C&D" STEERING WHEEL BRACE FOR FORD CARS



Fits All Models

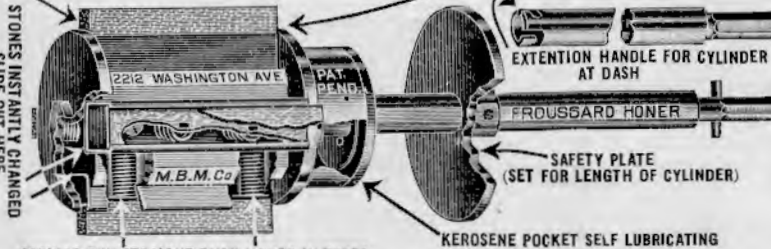
Ford puts them on his cars now, why not make your old car new by putting a C. & D. STEERING WHEEL BRACE on? No holes to drill, put on in two minutes; made of steel in black enamel finish. Send \$1.00 and we'll send one to you or \$6.00 per dozen F. O. B. Cleveland, cash with order.

Side-Line Salesmen Wanted.

The C&D Mfg. Co.

2456 Prospect Avenue
CLEVELAND, OHIO, U. S. A.

REAL CARBORUNDUM STONES FINE MEDIUM OR COARSE STONES SELF ALIGNING



STONES INSTANTLY CHANGED SLIDE OUT HERE

SPRINGS RUN STRAIGHT THRU HONER IN TUBES ASSURING EQUAL HONING PRESSURE

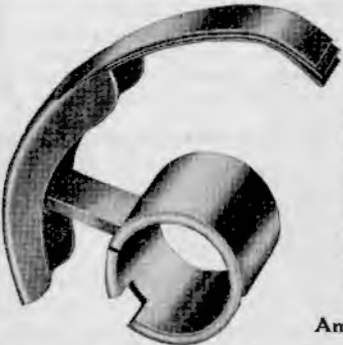
MULTIPLE BORING MACHINE COMPANY, INC.
St. Louis, Missouri.
Distributors or Salesmen wanted.

SELF CENTERING SELF ADJUSTING SELF LUBRICATING

Renews cylinders without removing Motor Tapered or heat scored cylinders trued up. A wonderful time and money saver for a reduced investment. Lapping time reduced 90%. Special price \$25.00.

We also manufacture
Froussard Cylinder Boring Machines.
Froussard Piston Aligners.
Froussard Cylinder Honer.
Multiple Tire Pumps & Can't-Leak Piston Rings.

STATE REPRESENTATIVES
W. O. Tranhagen; Alameda, Calif., California Representative.
Harner & McIntire Co.; Ottumwa, Iowa., Iowa Representatives.
Other States Open. Automobile Supply Houses and Agents wanted. Liberal Commission.



THE GOEBEL TIMING BRUSH

DEALERS—Write on Your Letterhead for Free Sample and Attractive Sales Proposition.

The flexible brush of this timing device insures absolute evenness of firing, producing a fat spark, always at exactly the right moment, keeping spark-plugs clean and saving gas. Easy, smooth riding—no jerks or jumps. Thousands of satisfied users. Liberal profit; attractively packed in display carton; plenty of advertising help. Advertised in "Saturday Evening Post." Send for your free sample today!

THE BALTIMORE ENGINEERING CO.
American Building Baltimore, Maryland



One of the many bargains

Fidelity Spark Plugs

45c

Guaranteed for the Life of Your Car



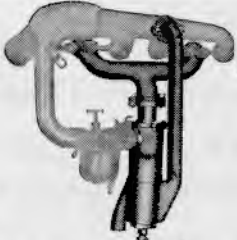
THE dealer who displays this sign— whoever he is— wherever you find him, has the advantage of a huge buying power—which he passes on to you in lower prices.

He is one of 38,000 other dealers drawing his supplies from "NEMCO," one of the world's greatest reservoirs of automobile accessories. Everything you want or need, for truck or car— *Certified Quality Automobile Accessories*—and at low prices.

Big Nemco Bargain Book—FREE!
 Know the lowest prices before you buy—use the big "Nemco Bargain Book" as your guide, it shows and prices thousands of accessories. You can get this book, free, from any dealer displaying the Nemco sign—or we will send it direct to you.

Speedster Bodies \$26.20 and up

NEMCO CHICAGO U. S. A.
 849-51-53-55 Washington Boulevard

PRICE \$14.50

For FORDS

Pat. Nov. 21, '22
 Other Pat. Pend.

Hill's ALL FUEL VAPORIZER vaporizes all the fuel all the time. This result is obtained by the peculiar patented construction of the ALL FUEL VAPORIZER. The wet mixture leaving the carburetor is subjected to a severe centrifugal action which throws all of the unvaporized portion of the fuel against a differentially heated wall. The liquid flows downward in a film meeting the heat conducted upward from that part of the Vaporizer which is heated by the exhaust.

This heated part contains a reservoir in which the unvaporized portion of the fuel collects when the engine is first started. As the exhaust begins to circulate this liquid is evaporated automatically giving a richer mixture for the cold engine. After the Vaporizer is properly warmed up the fuel is evaporated where first separated from the air. The reservoir is automatically emptied if for any reason the engine fails to start—for every start the Vaporizer is dry.

No LIQUID can reach the engine at any time even when starting cold with full choke. NO CRANK CASE DILUTION.

No burned out bearings from thin oil. 30% more mileage per gallon. 90% less carbon. No fouled spark plugs.

Uses regular Ford Carburetor. Same carburetor adjustment used winter and summer. Easily applied.

SENT C. O. D. Parcel post. Mailing weight 13 lbs.

WM. H. HILL, 415 Wells Ave., Canton, Ohio.
 Manufacturers of other cars licensed.

—NOW'S THE TIME FOR—

FERNALDS
 The Small Priced Handy Helps That Make Motoring More Enjoyable

Steer-Aids—Take the vibration from steering rod. Save tires and bushings. Make driving easy for Fords and other light cars. Sell for 50c pair.

Little B-R-A-T-S—End brake rod rattles on 90% of all cars. Set of 4 for 50c.

CasaRs—Steering Arm Shock Absorbers and Anti-Rattlers. Take up road jolts. 50c retail.

Nifty Radiator Caps—Add to the appearance of the car. Easy to unscrew. Sell for 50c.

Fernald Stop Light—Combination parking light and signal, automatically controlled by special dust and rust proof switch. Beautifully finished in enamel and nickel. Retail at \$2.50.

Motorists—If your dealer can't supply you, we will.

DEALERS—The spring motoring season is opening up. Be prepared to put extra dollars in your cash drawer by pushing Fernalds.

Order from your Jobber or write for Catalogue

Fernald Mfg. Co.
 Dept. F., North East Pa.

Hi-Ju

"The Light for a Mite"

COPYRIGHT 1924 BY HI-JU SALES CO.

\$1.50



Hi-Ju is the newest, simplest, most durable lighter that money can buy; guaranteed to last longer and give better service than any other lighter at any price. The wonderful Hi-Ju heating element tells the story. Can be installed on any car in five minutes. Get one at any good dealers or remit direct to us. We send Hi-Ju post paid anywhere in U. S. on receipt of price. Money back if you want it. Descriptive folder free.

Dealers: Hi-Ju sells on sight. Demand already tremendous. Write now for attractive discounts.

HI-JU SALES COMPANY

931 N. Summit St.,

Toledo, Ohio



PAT. MAR. 2, 1916, FEB. 20, 1918

Spectacular Achievements

are everyday performances with Pressure Proof Piston Rings. Witness the epoch-making oil-economy run made in November by a stock 1924 Franklin sedan, Pressure-Proof equipped.

1184 miles on less than $\frac{3}{4}$ quart of oil—5992 miles to the gallon.

Special Contract Prices to service stations and garages who will carry Pressure Proof Rings in stock for local requirements.

PRESSURE PROOF PISTON RING CO.
107 Massachusetts Avenue Boston, Mass.
PRESSURE PROOF RINGS, LTD., Sherbrooke, Quebec



\$5

for all FORD Cars

A sturdy, well-built Motorhorn with a tone that travels. Ask your nearest dealer for a demonstration of the Schwarze Motorhorn for Fords. Equipped with the new Ford Universal Bracket—easily installed—fitting all Fords.

Jobbers and Dealers: Get the sales plan, increase your profits selling the Schwarze Motorhorn line.

SCHWARZE ELECTRIC CO., Adrian, Mich.

SCHWARZE

M o t o r h o r n s

MORGAN

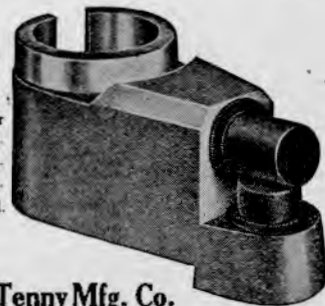
Double Contact Timer Rotor

"The Timer that Times all the time"

Fits into the regular Ford timer-shell and delivers thousands of miles of perfect timer satisfaction. On tests the MORGAN has shown as much as 40,000 miles road service, and still going good.

Price \$1.50

Built for service. If your jobber or dealer cannot supply, sent direct, post-paid.



Morgan-Tenny Mfg. Co.
SHERMAN, CALIF.

PROTECTOMOTOR

REG. U. S. PAT. OFF.

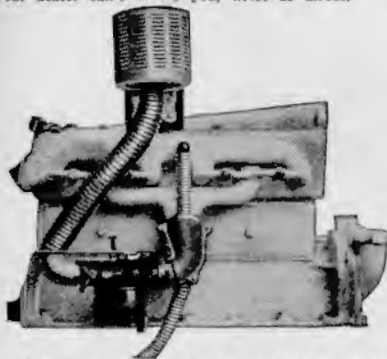
Perfect Positive Protection

Give Your Ford Longer Life

By eliminating ALL dust, sand and grit from the air that goes into the engine, the engine will run 3 to 5 times as long without valve grinding or carbon removing. The engine will run 50,000 miles and upwards without need of overhauling.

Protectomotor Hot Spot will do away with all cold weather engine troubles and give your Ford the pep of the highest priced cars.

If your dealer can't supply you, write us direct.



STAYNEW FILTER CORPORATION
ROCHESTER, NEW YORK

Branches:—No. 403 Real Estate Exchange Bldg., Detroit, Mich. No. 1926 Broadway, New York City. 222 Hinshaw Bldg., Oakland, Cal.

Give Your Customers Battery Service, too—

Quick battery recharging service is a distinct asset to every garage. The Marshall System of constant potential charging will add dollars to your profits that are now going elsewhere. A customer can leave his car during the day for repairs and have his battery charged at the same time. No rental battery necessary and you make friends by reason of the additional service.

The Marshall System charges batteries in 8 hours or less. It operates day and night continuously, without attention, under the guidance of the exclusive Marshall Voltage Regulator, "the brains of the Marshall System."

The Marshall System is now used by both Exide and Willard in their own branch stations. Write for further information to

MARSHALL ELECTRIC COMPANY
3225 Locust Blvd. ST. LOUIS, MO.

Marshall System

"Better, faster charging at less cost!"

If You Want Real Closed Car Comforts in Your New Touring or Roadster When Ordering Ask for

"Q. D." QUICK DE-TACHABLE DOOR-OPENING CURTAINS

NOT MERELY A CURTAIN WITH A ROD BUT A REAL CUSTOM MADE JOB.

They last the life of the car and offer a comfort that is unsurpassed in any higher priced cars.

Curtains and handles go on and off quickly, no screws, or holes to drill and no eyelets or fasteners to change.

Made from Reg. Ford Cur. tains, New or used, Per door **\$2.50**

With our Curtains, exactly like Ford, but door-opening Per Door **\$4.50**

INCLUDING DOOR-HANDLES You don't have to buy a complete set as our Curtains match up and conform with Regular Ford Product.

Q. D. CURTAIN CO.
3583 W. 25th St., Cleveland, Ohio.

We have them for the old 1916-22 models.



TOP RE-COVERS

WITH BACK CURTAINS Made from 32 oz. Heavy Drill Ford "Kantleak" Rubber

One Man or Old Style

Touring Car\$8.00
Roadster 7.00

Tacks and binding included. Further information, Dealers' and Jobbers' proposition sent on request.

A Dime a Door to Get Rid of Rattles

A rattling automobile door is annoying. Any driver would pay a good price to eliminate rattles but a dime a door does the trick if invested in Hastings Dor-Ratl-Chasers. One below the bottom hinge of each door keeps the door snug and free from rattles. Most good dealers can supply you.

Note to Dealers:—If your jobber does not handle Dor-Ratl-Chasers write to us for name of nearest jobber.



Hastings Mfg. Co., Hastings, Mich.



You'll find them on your dealer's counter on display cards like this.



This is the way Hastings Dor-Ratl-Chasers look installed.

A High Tension Magneto Will Stop All Your Ignition Troubles

Make starting easy even in the coldest winter weather.
Save more gas and give your engine full power at all times



Fits on in place of Ford timing gear cover.

THE COLUMBO FORD MAGNETO ATTACHMENT FITS ALL FORD MOTORS

Can be used with any standard high tension right hand magneto.

Complete with all parts including switch, cables and special adjustable fan adapter.
Needs only a wrench to install.

Write for complete information.

APOLLO MAGNETO CORPORATION
73 GRAND STREET, KINGSTON, N. Y.



TORIT ACETYLENE TORCH NO. 13

Whether the job is lead burning, battery sealing, fender straightening, radiator soldering or loosening a rusty or corroded nut, the Torit No. 13 Torch is always ready at a second's notice to serve you, and the price is wonderfully low. It is handy for soldering tinware, babbiting, joining light tubing, aluminum soldering, soldering electrical connections, etc.

USES ACETYLENE ONLY

A splendid use for discarded auto acetylene tanks. Many owners make the Torit No. 13 pay for itself in a single day. Torch with 4 different tips, soldering copper, 5 ft. tubing and connection for auto acetylene tank. **\$7.50**

In U. S. **\$7.50**
\$10.00 in Canada.
Order from your jobber or
ST. PAUL WELDING & MFG. CO.
170 W. Third Street ST. PAUL, MINN.

DUPLIX TIMER ROLLER!

improves ignition.

"Efficient as any expensive timer"

Makes rough worn timer shells work like new

Why not get your money's worth out of every Ford shell?

Read this unconditional Guarantee

Put a Duplex Timer Roller into any old Ford Timer Shell - use it for a month and if for any reason you think it does not give you a smoother fitting - easier starting and more flexible motor - We will gladly refund your money

Price 75¢

The Duplex has patent features not found in any other kind timer. Its double flanges (illustrated) make a positive wedge contact on both sides of the track that improves with use. The grooves minimize firing resistance and make it possible to use either gear as a set.

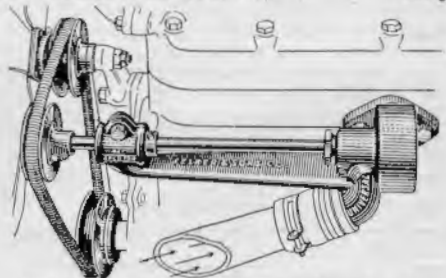
Special Dealers and Jobbers Prices - Responsible Distributors Wanted

Duplex Timer Mfg. Co., 500 Alhambra St., Seattle, Wash.

The UNIVERSAL PUMP for FORD CARS AND TRUCKS

Water Circulating

with Round Belt Running in "V" Pulleys



Can Not Slip or Run Off at Any Speed

The PUMP that is better than any flat-belt design—and worth the price, too. We also make Flat Belt drive pump which must be ordered specially, if desired.

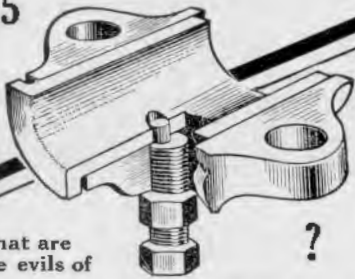
ROUND BELT Type, complete with "V" shape cast aluminum pulleys for crank-shaft, fan and pump. List **\$10.00**

FLAT BELT Type, complete with flanged pulley and flat belt. List **6.50**

To the first LOCAL DEALER (or user) of either type, write us for our Introductory Offer.

Sold by THE JOBBING TRADE.
FELKER & SONS CO. Manf. and Sole Distributors
1832 Univ. Ave. St. Paul, Minn.

\$3.75



What are the evils of

?

CRANKSHAFT END PLAY

One of the many evils of Ford crankshaft endplay is causing the high-speed clutch to drag. This makes the motor hard to turn over, placing an extra load on the battery and resulting in frequent recharges.

HOW TO CORRECT IT—

You can stop end-play easily and quickly with the C-A ADJUSTABLE BEARING. Don't "pull" the motor. Simply drop the oil pan. It will permanently stop hard starting, poor lights, knocking and other troubles due to end-play.

ADJUSTABLE BEARING CO., INC.

Dept. 400

Brazil, Indiana



ADJUSTABLE CENTER BEARING CAP

End Play Shim for Ford Crankshaft



Sooner or later all Ford motors will have Crankshaft end play allowing the magnets to drop away from the coil, this causes hard starting and poor ignition, poor ignition causes loss of power, poor ignition is the cause of many scored cylinders because the spark being weak does not burn all the gas, the unburned gas is continually passing by the piston rings, cutting the lubricating oil, it quickly thins the lubricating oil in the crank case and causes no end of motor trouble.

Save yourself all this trouble by installing this End Thrust Collar, save several hours of mechanic's time which means several dollars, use the old cap which is already fitted to the old worn crankshaft better than you can possibly scrape it, give your customer a better job than if you burn in a new cap. If you use a new cap it is a trifle longer than the babbitt in the block, consequently you have only half an end thrust bearing; by using the end thrust COLLAR all the play is taken up at the front end of the rear bearing cap, this leaves a full end thrust at the rear end where all the thrust comes when the car is operating on the road.

Notice the wide wearing surface on the collar. Notice the deep flange on crankshaft where the collar is used. No experience necessary, anyone can file the end of bearing cap until the shim drops into place. Can be fitted in fifteen minutes. It has been thoroughly tested and we guarantee it to stand up and give real service and satisfaction.

If your jobber does not handle them write us, or our sales representative. Selling price, single Shim by mail postpaid 75c. List per dozen \$8.40. Liberal discount to jobbers and dealers.

THE OESTERN CO., MANUFACTURERS

1900 White Street

DUBUQUE, IOWA

Sales Representative,

J. WADSWORTH STAFF, 332 S. Mich. Blvd., Chicago, Ill.



YOU CAN ALWAYS BE SURE OF RESULTS WITH

GENUINE APEX INNERINGS (INSIDE PISTON RINGS)

Your dealer or garageman will tell you what hundreds of thousands of happy car owners know already—that there is only one genuine "Innering", the "APEX," that is absolutely guaranteed to—and does

STOP OIL PUMPING without REBORING

—and they stop piston slap, fouled plugs, vibration and reduce gas and oil consumption to a very minimum while power, flexibility and economy return as in the days when "she" was new.

Retail Price 20c each up to 3/4" wide or 5" diam. Larger 35c. Ready shaped and sized for instant installation in all standard and "over" size ring grooves.

Dealers—Jobbers: Get profitable facts now. Thousands have developed a wonderful business.

THOMSON MFG. CO.

Peoria

Dept. A

Illinois

Insist on the Thomson Guarantee Tag. It is your protection—as to quality and performance.



EASY-FILL CAP AND GAUGE

Most convenient filler cap ever made.



Fits all models of Ford Gasoline Tanks.

Retails for \$1.50

Takes the place of the regular cap and once screwed on need never be taken off.

Gasket under hinged cover makes it absolutely leak-proof and cover lays flat on the tank when open—it is unbreakable.

Gauge Rod is permanently held in the cap and can not fall out. Gauge is made of clock spring steel and can be bent double without breaking.

Bold figures are etched on gauge and can not come off.

If desired, when filling tank gauge rod can be held down out of the way of hose nozzle by just raising the wire clip that locks the cover.

Worth many times its cost in time saved and convenience it affords. Sells on sight.

Each one packed complete in a separate carton.

Dealers trial order: Send \$1.00 with order on your own letter head and we will send cap and counter display outfit.

You lose money every day you wait—Act NOW.

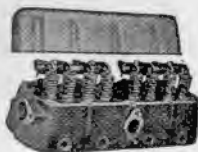
Satisfaction guaranteed or money refunded.

EASY-FILL CAP COMPANY

933 Lawrence Ave.,

Chicago, Ill.

"How to Build a Fronty Ford"



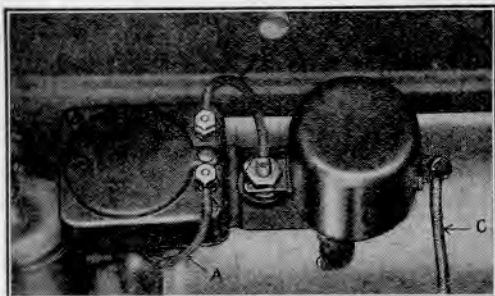
Get this book, "How to Build a Fronty-Ford," and build your own racer. Full instructions are given by Arthur Chevrolet, one of America's greatest race car designers. The book sells for only \$2.00 and is given free with orders of \$50.00 or more. The Frontenac Cylinder Head installed on your Ford will give it more speed, greater flexibility and added power. It reduces gasoline consumption, decreases vibration and eliminates over-heating.

FRONTENAC

CYLINDER HEAD

Write for free catalog price list.

Chevrolet Bros. Mfg. Co., 412 W. 10th St., Indianapolis



THE DOMAN

Battery Charging Regulator

FOR FORD CARS

Insures full charging
Prevents over charging
Saves gasoline
Saves trouble

PRICE
Six Dollars
Post Paid

A Ford Car fitted with this regulator has a better and more efficient electrical system than any other car not so fitted. No accessory can be had that will give greater return both in actual money saving and general satisfaction in use.

Bulletin on Request.

The Doman Mfg. Corp.

10 Water Street, Elbridge, N. Y.

Simplex Transmission

For Ford Cars and Trucks

More Power—26 to 1 in Low in Our New Type "CT"
It will pull like everything

This transmission has three speeds forward and one reverse and replaces the regular Ford transmission, drums, bands and all. The low gear is lower than the Ford, therefore more power, third or high is the same as the Ford high and second is halfway between. It is ruggedly built with oversize alloy steel gears. Multiple disc clutch. Foot brake on jack. Installation easy. No cutting or machining.

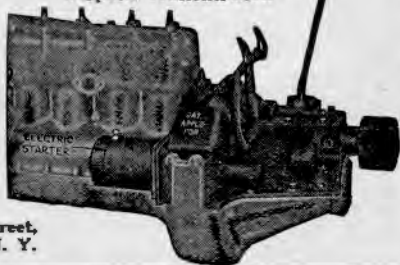
Write today for other interesting details.

E. D. & A. F. CRONK, Inc.

136 Hotel Street,
UTICA, N. Y.

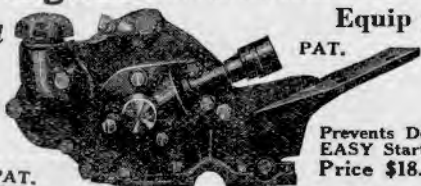
Three-Speed
Sliding Gear
Type

3-Speed Transmission



Magneto Attachments for All Ford Models

Model
-B-



Prevents Delays.
EASY Starting.
Price \$18.00

Equip your Ford with our dependable High
Tension Magneto Attachment

PAT.



Model
-C-

Saves 35% in Gas
Magnetos sold separately.

Manufactured by

HParkin Magneto Co.

325-27 N. Fifteenth Street, Philadelphia. Pa.

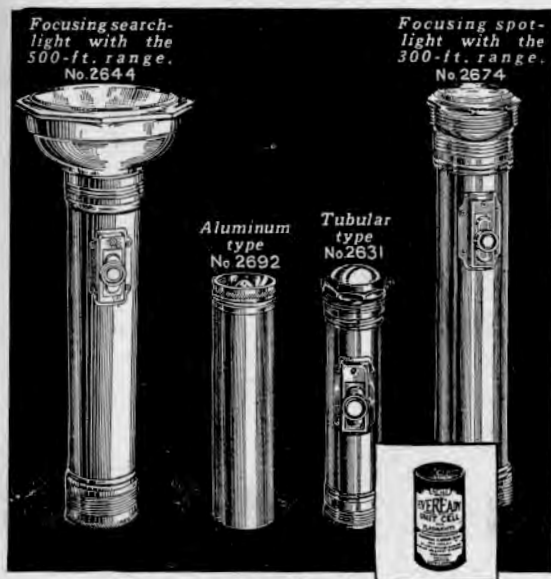


PAT.

Model A
Price \$15.00

Price \$18.00

22 fine flashlights—new features



TWENTY-TWO fine flashlights in the four general types illustrated at left. Newly designed cases. New features. New reasons for selling the *perfect portable light for every purpose and purse*. There's the new safety-locking switch that cannot be turned on by accident. Then there's the octagonal lens ring—better looking, easier to screw on and off. Prevents rolling.

The new ribbon-pattern fibre cases are practical, good-looking water-proof, warp-resisting. Eveready standard features are retained, of course. No change in prices—65 cents to \$4.50 retail, complete with battery—anywhere in the U. S. A. NOW—sell the new line! Ask your jobber.

EVEREADY FLASHLIGHTS & BATTERIES

—they last longer

EVEREADY UNIT CELLS, in 2 sizes, fit and improve all makes of flashlights.

Manufactured and guaranteed by
NATIONAL CARBON COMPANY, Inc., New York—San Francisco.
Canadian National Carbon Co., Limited, Toronto, Ontario.

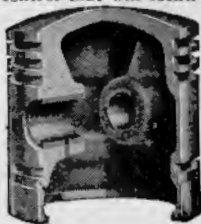
Profit by Giving Real Motor Service

The service man who can take down a motor in bad condition and fit it up to perform as well as new is bound to build his business—to satisfy his old customers and get new ones.

But the fellow who can turn a motor back to the owner with more power, more speed and more pep than it had when new is certainly going to make a reputation. You can do it with DOWMETAL Pistons. You can eliminate vibration periods. You can insure a saving of gas and oil. You can save wear on bearings—and reduce repair expense.

You can put into a motor a velvety smoothness of operation and an ease of control that will identify your shop as a progressive and competent service organization able to do with DOWMETAL Pistons what the ordinary service station cannot do without them.

Use DOWMETAL Pistons for the service they will give to your customers and for the good they will do your business.



THE DOW CHEMICAL COMPANY
MIDLAND, MICH., U. S. A.



TIME IS MONEY

Save as much of it as you can, by speeding up your service work with the

4-S Handy Jack

Especially designed for Ford service. The speediest, handiest Ford service jack on the market. Simply wheel under front or rear axle, pull handle down and the Ford is up ready to work on. Lifts 3000 lbs., weighs 30 lbs., is 68" long,—height adjustable from 11" to 18".

One Ford Distributor

in Milwaukee is using 40 of them and wouldn't part with them at any price. One in Cleveland ordered a sample and wired for 10 more half an hour after he got it.

Order Yours Today.
Money-Back-If-Not-Satisfied.

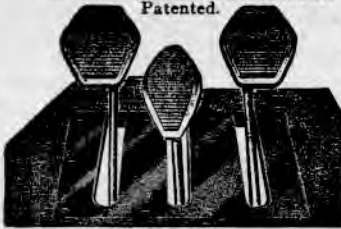
J. B. Lindl Mfg. Co.
1227 - 12th St., Milwaukee
320 Market St., San Francisco
365 Broadway, New York
DEALERS WANTED



\$8.50 EACH — 3 FOR \$25.00

"Perfection" Auto Pedal Pads

They insure your foot staying on the pedal no matter how slippery. Big D. X. "FORD" EXTENSION Patented. sturdy grips made of high grade, deeply corrugated rubber. Stand by you in the greatest emergency — that's what they are made for.

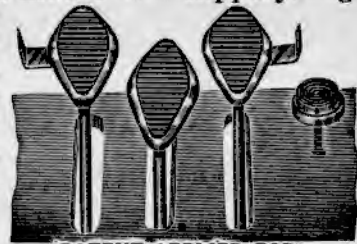


Patented

\$1.25 per Set of 3

Any owner can install "Perfection" Pedal Pads himself in but a few minutes—no bolts—no drilling—simply bend the prongs and they are on for good.

FORD CAR OWNERS: If you cannot buy from your dealers remit to us. Prices listed single sets include postage.



PATENT APPLIED FOR

\$1.00 SEE THE NEW D HOOK PADS

DEALERS: Show your customers how easy Perfection Pedal Pads are to install. Let them try a set and know the driving comfort they never thought was possible. You too, will be agreeably surprised to find nearly every such demonstration results in a sale of a complete set.

WRITE FOR DETAILS



Patented Dec. 21, 1915

Regular Ford D Model
\$1.00 per set of three

MANUFACTURED EXCLUSIVELY BY

THE AUTO PEDAL PAD CO., INC. 318-20 West 52nd Street
NEW YORK CITY, N. Y.

We are the only firm making Pedal Pads for all cars. If interested write for particulars. Write in for new dealers proposition and do not fail to secure one of our new handsome display Ford boards.

A Better Job Now!

Why take small pay from uncertain jobs? Why be buffeted around from this to that, not knowing whether you will have a job tomorrow or not? You can change all that. Learn the auto repair business. Have a job at good pay wherever you go. Later have an independent business of your own. If you are mechanically inclined, a few weeks training at Detroit can start you to real success.

Be a Trained Man—Successful!

Over 14,500,000 autos need constant service. 70 million tires, millions of batteries, electrical systems to be kept going. Welding to be done. There are amazing opportunities for men who start now. Fit yourself to win one of the good jobs or to start a business of your own.

Come to Detroit—the Auto Center

Get first hand knowledge and training (by factory-approved methods) at the Michigan State Automobile School. Hudson says, "Best school in America." Other auto leaders say the same. Learn on latest equipment, under expert instructors.

Grasp This Opportunity

Act at once. Find out what we can do for you. Write today for School Catalog and personal letter answering your questions. Say whether you want to start your training at home or at our school in Detroit.

A. G. Zeller
President



Michigan State Automobile School
Box 3042, 3043 Woodward Avenue, Detroit, Michigan

Get the FACTS—Write TODAY



The Great TOURING SUCCESS

For camping, hunting or fishing trips and for general touring, the new

Moon Bros. TRAVELER

Body for Fords meets every demand. Quickly converted into full size bed.

Write for free folder and dealer's proposition.
CHAMPION BODY CO., St. Louis, Mo.
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Commodore

Our 1924 models set new standards of beauty, design and finish. ABC body frames are made of selected white ash. Body panels, hoods, etc., are made of heavy, three-passenger automobile body metal, which forms up perfectly and takes a smooth, beautiful finish. Write today for catalog of these and other models.

AUTOMOTIVE BODY CO.

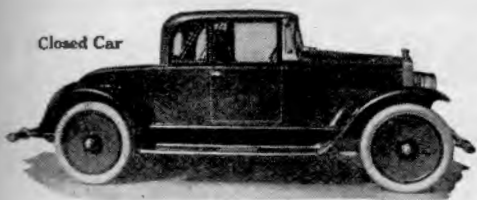
40 N. WELLS ST.
Chicago, Ill.
Dept. F.



ABC Racing Body

ABC BODIES for Fords SELL ON SIGHT

Closed Car



Shifting



BUILD A
DE LUXE BODY
ON YOUR FORD

Blue Prints and Photo-
graphs with detailed
instructions.

One Dollar Per Set



Open Car

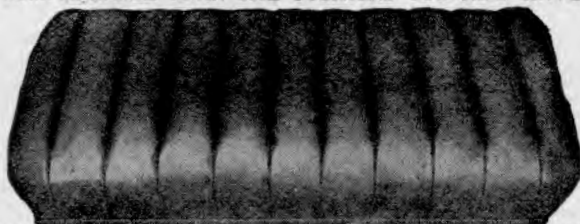
B. B. ELLERBECK
42 South 9th East St.
Salt Lake City, Utah.

TAKE SOLID COMFORT IN YOUR FORD

WE WILL SEND YOU A CUSHION THAT WILL MAKE YOUR CAR RIDE 100% MORE COMFORTABLE THAN THE CUSHIONS YOU NOW HAVE.

Or We Will
Pay Your
MONEY
BACK

We Cover With
Leather, Imitation
or Cloth to
Match
Upholstering.



We Fit Any
Make of
Car Made,
Regardless of
Size, Year,
Make or
Price.

WE SELL DIRECT AT MANUFACTURER'S PRICE. WRITE FOR ILLUSTRATIONS AND PRICE.
YOU WILL SAVE 100% OVER WHAT YOUR LOCAL DEALER WILL CHARGE.
AMERICAN CUSHION & SPRING CO., KALAMAZOO, MICH.



Floating Plunger Wheel Puller

Starts a "Frozen" or "Stuck" wheel instantly. Strike the plunger, turn the screw, strike again and the wheel comes off without injury to hub threads, spokes or axle.



Wheel pullers made of Heavy Certified Malleable Iron, the plunger made of Chrome Nickel Steel. STRONG, DURABLE and SERVICEABLE.

\$1.50

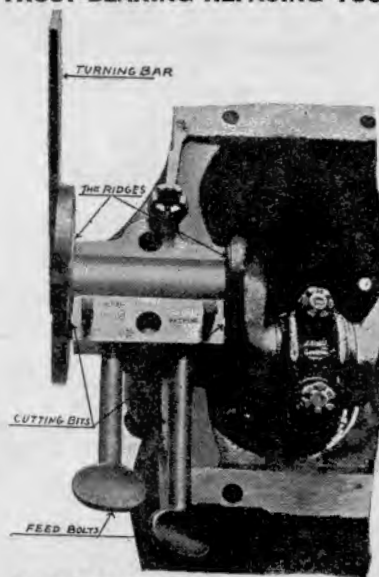
There is a Mosco Wheel Puller for over 300 models of cars.

F. C. HERSEE COMPANY

Manufacturers

Brighton — Mass.

MECHANICS! ATTENTION!
TRUST-BEARING REFACING TOOL



SAVES YOU TIME AND MONEY!

Cuts Ridge off Thrust Block as complete and smooth as a lathe with a few revolutions of the crankshaft, insuring first class work and satisfied customers.

If your Dealer can't supply you order direct.

Sold on Money Back Guarantee!

Attractive Proposition for Dealers and Jobbers
PENCE AND BAHR TOOL CO.
SPRING VALLEY, WIS.

HOW AN OHIO DEALER DOES IT



"I bought a dozen Anthony's—on the say-so of my jobber's salesman—up to that time I'd carried only common, cheap, leaky valve pumps. Well, I've been selling Anthony's ever since, push 'em—talk 'em. They win friends for my store.

I wait on pump customers myself—always show 'em an Anthony and a cheaper pump side by side. I tell 'em to hold their finger over the hose opening and bear down on the handle—to do this with each pump. (Generally, they drive the handle all the way down on the cheaper pump because there is no compression.) Then I tell 'em the Anthony will pump more air per stroke—and is guaranteed to be as good a year hence as it is today—that by paying a little additional, they're buying high grade insurance against all pump troubles.

"It's because I sell pump insurance as embodeid in the Anthony that I have made many new customers who come in and ask for a pump like I sold their neighbor. And I make a real profit on each pump, too."

DEALERS—Write for detailed facts and figures about the Anthony.

THE ANTHONY CO., Long Island City, N. Y.

ANTHONY TIRE PUMP

ALL IN ONE!

Approved in Massachusetts.
Conforms with state lighting regulations.



Stop signal lens furnished in green or red

Price Complete \$5.00 Only
\$6.00 West & Rocky Mts.

STOP SIGNAL — TAIL LAMP LICENSE HOLDER — All In One.

Just what you've been looking for—a combination stop, tail lamp and license bracket—compact and sturdy. No need to clutter up rear of your car. Unequaled in beauty and safety. Special design ELIMINATES COMPLETELY ONE SOCKET AND PLUG.

Frame and bracket plate made of heavy steel in baked black enamel. Lamp front of brass in nickel satin finish; semaphore lens for tail light. Interior finished in white porcelain enamel. Shipped complete with trouble-proof switch, accessories and instructions for quick installation. Fits any Ford Car. Ask your dealer.

DEALERS:

Your jobber will quote you, or write direct. Splendid profits. Nothing to equal it at \$5.00. Will not gather dust on your shelves. Send for our splendid new catalog 12c.

Chicago Electric Mfg. Company

2801 S. Halsted St., CHICAGO, ILL.

DRIVE THIS Beautiful Raceabout

Instead of your Old Ford

Choice of FOUR COLORS: Fiat or Bullet Nose Radiator Shell
Send for 1924 Free Catalogue of new auto Bodies, Accessories, and Speed Power Equipment. Direct from Factory



AMERICAN TOP AND BODY CO., Water Street, DELPHI, IND.

DUNN COUNTERBALANCES



Act as close-up flywheels, and practically eliminate vibration, regardless of engine speed. Annual loss between power impulses and give "Fours" the flexibility of "Sixes." Kill destructive vibration, and not only cut your repair bills in two, but double the life of your engine.

Prices: Ford, Chevrolet, Overland 4—\$5.95; Dodge—\$7.50.
Order Today. MONEY BACK GUARANTEE.
Note—Liberal discount to dealers and Jobbers.

Dunn Manufacturing Co.
Clarinda Iowa, U.S.A.
Box 204

Stanley TRANSMISSION LINING

\$1.00 or \$2.25? You have your bands relined. The service charge is \$5.00. When a \$1.00 lining is all worn out, Stanley lining is only one-third to one-half through. Is it cheaper to pay \$6.00 for lining and service twice, or \$7.25 once.

Thousands of owners who keep records of costs, are buying Stanley lining.

Insist upon the genuine Scotch Lining



Per set (rivets included) \$2.25

Double to triple service guaranteed. At good dealers—or write us.

TRADE INQUIRIES INVITED

STANLEY BELTING CORP.
13 No. Jefferson St., Chicago, Ill.
Stanley Belting Corp., 318 Broadway, New York



In addition to our line of thrust bearings for Fords, Bantam replacement bearings are made in sizes to fit all makes of cars, trucks and tractors.

It is not uncommon to find that by replacing the two plain washers in the Ford rear axle with Bantam Thrust Ball Bearings F-40 it is possible to enjoy 20,000 or more miles of driving completely free of rear axle trouble.

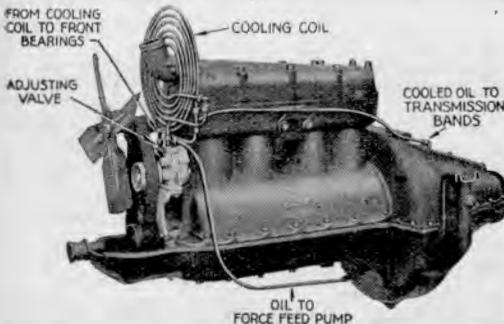
Not only this, but the F-40 by cutting down friction gives your Ford more power to the rear wheel enabling you to climb better, coast faster and farther and use less gasoline.

Bantam F-40 is a real high class bearing. Heat treated collars, ground raceways, 40 high grade steel balls, solid bronze retainer. Jobbers and dealers everywhere carry F-40 in stock. If you cannot obtain it from your trade connection write us direct.

BANTAM BALL BEARING CO.

BANTAM

CONN.



Kramer OIL KOOLER

No more thinned out oil and consequent burned out bearings, "frozen" pistons or scored cylinders on your Ford car or truck.

Low Priced—Easily Installed

Kramer OIL KOOLER is a force feed oiling system that not only forces oil to every point of necessary motor lubrication and to transmission bands but cools it while in circulation.

Stop heavy repair bills. See your dealer today about this wonderful device that costs so little and accomplishes so much; or write us direct for facts and price.

PEORIA MACHINE SHOP

Manufacturers

805 Franklin St. Motor Dept. Peoria, Ill.



Every Ford Owner Should Have This Book

301 PAGES

ONLY \$1

Everything you want to know about an automobile is explained in this I. C. S. AUTOMOBILE HANDBOOK. The most complete book of its kind ever printed.

Invaluable to the driver or owner who wishes to take care of his own car. Contains practical information on automobile troubles and describes the remedies in plain, simple language that anyone can understand.

Just slip a dollar into an envelope—fill in the coupon and mail, and this I. C. S. Automobile Handbook will come to you by return mail.

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I enclose One Dollar. Please send me—post-paid—the 301-page I. C. S. Automobile Handbook.

Name.....

Address.....

DAYTON DIMMER



Obey the State Law yet enjoy the safety of perfect driving light.

The Dayton Dimmer is the only device which really makes this possible.

The Dayton Dimmer is a switch in which are combined the features of an ordinary contact switch with the principles of a Rheostat. With the Dayton Dimmer it is possible to adjust your dimmed lights to a point of safe driving light without glare and by pressing the button on top of the dimmer, dim your lights to this point instantly.

You owe it to your family and others who ride in your car to install a Dayton Dimmer. See your Ford dealer or service mechanic today or write us direct giving their names.

Dealers: It will pay you to investigate the merits of this quick selling, safety insuring headlight device. Delay means lost profit. A post card brings complete information, discounts and sales literature. Price, \$3.00.

DAYTON DIMMER MFG. COMPANY
DAYTON, OHIO.

MAKE YOUR FORD INTO THIS SPORT CAR—SAVE \$50 to \$150 WITH Red-Kut Life-Size Patterns \$9.99

Famous **Red-Kut** life-size patterns and picture instructions show you sure-fit how you can easily convert your Ford into this Fast, Snappy, Sport Car as thousands have done, with easily obtained materials. No need to lay up the car. **LOOK AT WILFRED ENO'S PAL—** Eno says, "Total material cost with steel and paint for my Pal only \$17.51. It took me just 3 Sundays to build it and I sure am proud to hear them say, 'He built that snappy sport car.' I never cut any steel or did any woodwork before but now can't go wrong with Kuempel patterns." (Overland City) St. Louis, Mo.



SPECIAL OFFER Easy-to-Understand Instructions and **Delivered**

on "All Weather Pal"—Life size patterns for each part of the "Pal" body so you can't go wrong. Picture instructions, conical disk wheel pattern and pressed Steel straining rear: Go-Sum Windshield patterns with stormproof feature and AirWay Cowli (instrument board controlled) Ventilator patterns with instructions, Jiffy Top patterns with storm and fly curtain patterns—easily made—fold and slides into the body—makes your "Pal" warm and comfy. All complete and delivered for \$9.99 if you order at once. Think of it, with this outfit you can make your Ford into this "All Weather Pal" and be the talk of the community. "Pal" set of "R.K.O." steel for all sheet steel parts of the body and disks for the wheels—Good 22 gauge stuff—shipped from warehouse stock near you only \$9.95; extreme south and west \$11.95. "Pal" body patterns only with pressed metal tail delivered \$6.40.

Garagemen make big money converting Fords into classy Kuempel Sportsters Order now while we can make good delivery, and really enjoy the wonderful spring days in your "Pal." Keen, Classy, Up-to-the-minute. You can build it. Over 11,000 in use. Don't hesitate. "Swing Lo" Underling Irons, no frame cutting kind, only \$7.00. Send to come for new manual of other distinctive sport body patterns from \$3.50 up—"R.K.O." Steel, "Swing-Lo" Irons, "Quick-Get-Away Gears," "Jiffy" Tops and "Gossum" Windshields. Order Now.

KUEMPEL COMPANY
Founded 1916 72 1/2 Kuempel Bldg., Guttenberg, Iowa

"Have finished my 'Pal'. It's some jazz boat. I go where a goat can't go where others fall I go on. I can run thru mud on high where there can't go on low. Here is a picture. I am so proud, I am called the 'Ace' of Fords for I skip by them all, just like a rabbit." Cal Fortune, Columbia, Ky.

"The red-blooded young man who loves a car that will get up and go, a car low and rakish in line and snappy in appointments picks the "Pal". With its easy riding 35 inch seat and sweeping line it's a ten strike—bar none."

SPORT BODIES for FORD and CHEV. 490 at \$34.50 UP



We are manufacturers and our quantity production enables us to quote exceptionally low prices. Our unique shipping methods save you 75% in FREIGHT CHARGES. Send at once for free particulars on the famous CENTRAL line of Bodies.

Under-slung Parts **\$6.75** Per Set

OUR BOOK: "HOW TO BUILD A FORD RACER" sent anywhere on receipt of 25c in cash or stamps. WRITE US TODAY!

Life-size paper patterns—you can build this classy body at a very small cost **\$8.00** Per Set

CENTRAL AUTO SUPPLY CO., Dept. 123, Louisville, Ky.

Ford Mileage Increased 50% Per Gal. of Gas for \$1.00



Whirling Mist After Passing Through **"MISTY MIXER"** Any One Can Install It No Holes to Drill

Gas Leaving Carburetor in Siniel Drops Never Heats Fuel Pat. No. 463774

THE MISTY MIXER is guaranteed to save 100 times its cost. Use it a year, if not satisfied we will refund your money.

With each MISTY MIXER we will give one of our Aluminum Transmission Band Oilers free if you say "saw your ad in Ford Owner and Dealer."

THE TWO FOR \$1.00 CASH; C. O. D. \$1.15

BUSINESS REVIVING CO., Oblong, Ill.

Just Say (we'll back you)

"I WANT Milwaukee GEARS"

Differential Gears that "STAND THE STRAIN" for FORD and CHEVROLET Cars

Will fit all Touring Cars, Roadsters, Coupes and Trucks

FOR FORD: Standard Ratio—Straight Tooth or Spiral Tooth and CHEVROLET: **SPECIAL RATIO**

3 to 1—2 3/4 to 1 for Speed
3 1/4 to 1 (Highway) for Speed and Power
4 to 1 and 4.2 to 1 for Power
Walter Non-Skid Differential.

FOR MAXWELL: Standard Ratio (Straight Tooth).

Sold Through Dealers and Jobbers Only

Mfg. by **MILWAUKEE FORGE & MACHINE CO. MILWAUKEE WISCONSIN**

Perfect Workmanship Guaranteed Easily Installed



MADE—FIT—WORK RIGHT
Used all over the world.
Over 100,000 in use.

THE AMERICAN TIMER

The Timer you have been looking for, because

Built like a Dynamo
Easy Starting
Electrically Perfect
Fully Guaranteed

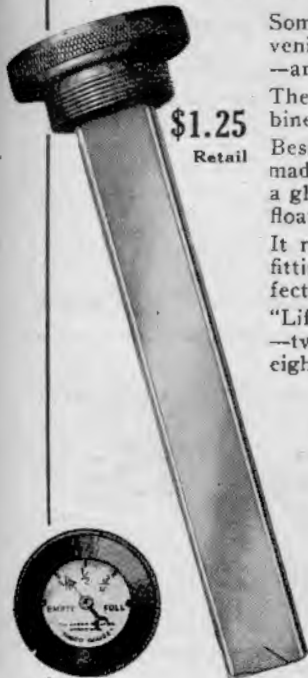
Price \$3.50

Over 100,000 satisfied users on the Pacific Coast.
Choice Territory Open for Distributors
Factory Distributors

American Distributing Company
1211 West Sixth Street — Los Angeles, Calif.
Manufactured by
American Mechanical Works, manufacturers of guaranteed products.



What are Ford Owners Looking for in a Gas Gauge



\$1.25
Retail

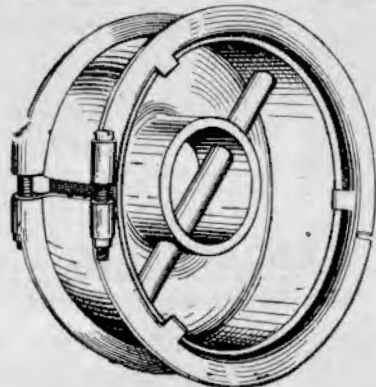
Something simple—convenient—easy to install—and priced very low. The Tasco Gauge combines all these features. Besides—it is sturdily made—dial protected by a glass top and the cork float by a metal guard. It replaces the old cap, fitting the threads perfectly. "Lift the seat and look—two moves instead of eight."

Owners—ask your dealer! Dealers—ask your jobber! Jobbers—ask us! Carries a long profit—quick turnover.

THE AKRON SELLE CO.
AKRON, OHIO

No. 43 Sta-Rite Fan Pulley Rim

A Flanged Rim for Late Model Ford Fan Pulleys.



Retail Price, 50c

The Sta-Rite Fan Pulley Rim eliminates the possibility of the fan belt running off the pulley due to slipping of the belt when the engine is started. It is easily installed by anyone, simply loosen up the screws and slip the flange over the regular Ford pulley until the projections on the rim are flush with the front faces of the pulley, then tighten up the two screws on the rim and replace the belt.

Banner Accessory Manufacturing Co.
2629 - 23 La Salle Street
ST. LOUIS, MO.

We Offer and Recommend

McINTIRE FORD TRANSMISSION TOOL SET

Holds all thirteen variable parts of transmission and cover in proper position for quick, easy assembly. \$4.50 per set Complete.

"TOGLTONGS" for holding and guiding Ford universal when assembling. Only device for the purpose having jaw blades formed to contour of ball cap—and cornerwise grip on square shank. \$1.50 per pair.

FORD MANIFOLD PACK NUT CLAMP

Prevents pack nut from loosening. Packed in neat dozen cartons for dealers. List 35c each.

H. G. STRAIN SALES SYSTEM

552 Polk Street San Francisco, Calif.

RUSTED SPRINGS SOON SNAP

They are costly, and a nuisance to replace.

NO MORE BROKEN SPRINGS!!!

Slip on, easily, quickly, **WITHOUT DRILLING**, a set of 4 foolproof automatic spring oilers.

4 cost you only \$2.25 prepaid.

They clean out rust, keep it out, thoroughly lubricate the spring leaves, giving 100% service. Solidly and substantially built. They're beauties.

MAKE DRIVING A PLEASURE

Send for a set today. We are the sole owners and makers of this patented spring lubricator which has found so much favor with car owners.

AUTOMATIC SPRING OILER CO.

9 Humphrey Street, East Elmhurst, N. Y.
Distributors will find this a quick profitable seller.

MODEL 26 FRONT END TYPE

ALL ROLLER BEARINGS

POSITIVE LOCK

Woodward & Rowe, Manufacturers

WOODWARD FOUR FORWARD SPEEDS FOR FORDS

No. 1 Underdrive for Power

CARS AND TRUCKS

No. 2 Overdrive for Speed

BUILT THE BEST AND SELLS FOR LESS

TRANSMISSION ONLY, ANY TYPE \$65.00. Connections extra, CARS \$10.00—TRUCKS \$20.00

WOODWARD SALES CO., Chicago Distributors

Warehouse, 1116 N. Central Park Ave., Chicago, Ill. — Office, 1116 N. Central Park Ave., Chicago, Ill.
Exclusive Territory to Dealers. Special Agents Wanted. Easy Work. Good Profit.

*Do Unto Others as Though You
Were the Others.*



A Nut's a Nut

—and, as such, can be just as stubborn on a Ford as on any other car.

MOSSBERG

CHROME MANGANESE STEEL
FORD CAR WRENCHES

are built with just that idea in mind.

Their mettle is in their metal—tough, strong chrome manganese steel that stands the hardest kind of strain without cracking or bending.

—and unlike ordinary Ford car wrenches, Mossberg car wrenches for Fords are forged in one piece, making the sockets wholly proof against twisting off or peering out.

There are 22 different types of Mossberg Ford Wrenches—not a nut on the car that one of them doesn't fit.

You will usually find them all on one display stand at the dealers, with a chart showing which one you need for any special job, together with the price—the moderate price.



MOSSBERG

CHROME MANGANESE STEEL
WRENCHES & TOOLS

Frank Mossberg Co.

Attleboro, Mass., U. S. A.

BRANCH OFFICES

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Seattle, Wash., 214 Maritime Bldg.

Montreal, Quebec, Office 21, Mount Royal Hotel

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Thousands of satisfied users are praising the merits of our battery. Big production, low overhead and sales costs allow us to make a quality battery at 50% lower price to you. Written 2-Yr. Ironclad Guarantee is your protection. Compare these prices. 5% discount for cash with order.

AUTO BATTERIES		RADIO BATTERIES	
6 Volt 11 plate	\$12.25	6 Volt 60 Amp.	\$ 8.50
6 Volt 13 plate	14.00	6 Volt 80 Amp.	10.00
12 Volt 7 plate	17.00	6 Volt 100 Amp.	12.50
		6 Volt 120 Amp.	14.50
		6 Volt 140 Amp.	16.00

SEND NO MONEY. Shipment made C. O. D. Express same day order is received. Examine battery, read 2-Yr. Guarantee before you pay a penny. Act now. Order Today.

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A Real Steering Gear

For Ford Cars
and Trucks

Insures Safety
Comfort
Pleasure

Can't
Lock

Write
for Our
Agency
Plan

Order
Sample Now

Opportunity for
Salesmen Calling on
Repair and Garagemen

ONLY
\$16⁵⁰

C.P.C. Balanced Pressure Steering Gears

H. G. DIEFENDORF

THE RECORDING DEVICES CO.
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THE AV-A-CO VALVE ACTION FOR FORD MOTORS
INCREASES THE VALVE LIFE WHICH MEANS—MORE POWER—MORE SPEED—SMOOTHERNESS
AND GREAT ECONOMY—EASY TO GETTING—ANY ONE CAN INSTALL—BETTER AND VERY
MUCH CHEAPER THAN OVERHEAD VALVES—NO EXCESSIVE STRAIN ON CAM SHAFT
BEARING—NO SPECIAL OILATION—NO SYSTEM AIR CARBURETING NEEDED
THE PERFORMANCE OF AV-A-CO VALVE ACTION IN TRAFFIC IS WONDERFUL
FOR PLEASURE CAR AND TRUCK—IF YOU BELIEVE IN DIRECT
AUXILIARY VALVE ACTION COMPANY
ATTN: MAIN OFFICE
FITZBURGH, MASS.

PRICE \$15.00

EXPORT ONLY Yale Oiling System

Used in every country of the world where Ford cars are sold. Not a replacement part. Ford distributors and agents, ask for free samples.

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156 Fifth Avenue, New York City
Cable Address TURNASEMOS

ELIMINATES motor troubles

New!



Transmission Oiler just added
A Boon to Ford Owners
A Gold Mine for Dealers
W. O. THOMPSON MFG. CO.
PASADENA 330 MOUNTAIN VIEW ST. CALIFORNIA

LOSE TIME



ALL-WEATHER ENCLOSURE FOR FORDS, CHEVROLETS, OVERLANDS and STARS
Provides perfect protection and clear vision. Light weight, yet strong and durable. Free from springs, weights, levers, or other mechanical devices. Nothing to rattle or get out of order. Easily installed. Low-priced.

DEALERS: This represents opportunity for you. Write.
THE LONGDIN-BRUGGER COMPANY
(Established 1898) Fond du Lac, Wisconsin.

Thank You Jobbers and Dealers

Patented Throttle and Spark Extension Levers



We heartily thank the scores of jobbers and dealers who have shown such a splendid spirit of fairness and co-operation by recognizing the Patented

Safe-T Throttle and Spark Extension Levers as the original product of a man who has worked hard to perfect an article of universal need. We invite others to write for prices, etc.

SAFE-T AUTO ACCESSORIES CO.,
700 So. Crawford Ave., Chicago, Ill.

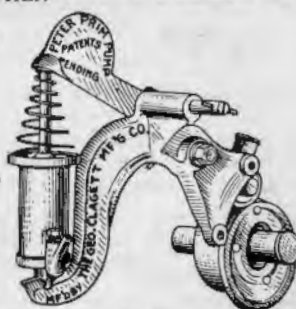
FREE AIR WHERE AND WHEN YOU NEED IT

PETER PRIM POWER TIRE PUMPS FOR FORDS

\$7.50 PREPAID

Your money back if not thoroughly pleased after ten days' trial. Send for Literature.

AGENTS WANTED
GEORGE CLAGETT MFG. CO., Marlboro, Maryland.



OUT WHERE THE RUTS BEGIN ANCHOR AUTO BULBS



Find the Smooth Stretches Ordinary lamps will serve on brilliantly lighted boulevards, but it takes a quality bulb to point the way along a bad stretch of road. Anchor Auto Bulbs give a pure white light, are not effected by rough going or severe shocks. To avoid lighting troubles, ask your dealer for—

ANCHOR AUTO BULBS

ANCHOR ELECTRIC COMPANY

557 W. Jackson Blvd. Chicago, Illinois

VICTORY MOTOR SUPPORT

Keeps the motor steady. Repairs broken crank case arms, and if installed in time prevents this trouble.

PRICE
\$2.50

Let us send you our catalog showing Lifters for attaching hoist to front and rear of Ford without scratching, and other shop necessities. We will also tell you name of jobber near you handling same.

SIMONSEN IRON WORKS
Dept. 3, Sioux Rapids, Iowa.



Water Circulating Pumps for Ford cars and Trucks

NIMS PUMP COMPANY

Stockton, California Philadelphia, Pennsylvania

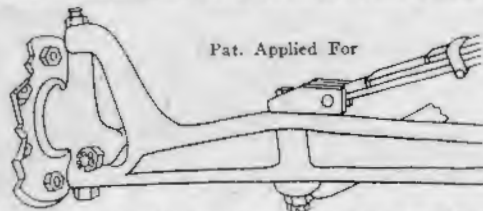
Speedway Bodies

New 1924 Models Write for Catalog



Morton & Brett Indianapolis, Indiana.

SEBOLT SPRING SUSPENSION FOR FORDS



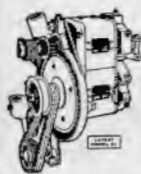
Pat. Applied For

Anchoring right end of spring makes your Ford steer like any other car, comes out of ruts, car tracks etc., and with absolutely no side sway. No shock absorbers needed. No moving parts, installed in 15 minutes.

Price \$3.00

SEBOLT ENGINEERING COMPANY
2018 Bonnycastle Ave., Louisville, Ky.

Heinze-Springfield Starters



Genuine—Latest Improved Type—
Fits Any Model Ford Car

Price includes Ammeter, Dash and Tail Lights, Lock and high-grade Battery of standard make. A quick, sure start and bright steady lights all the time. Light and starter buttons on dash. Installation simple. Everything complete. As efficient in winter as in the summer months. **LIMITED supply at this head-rock figure.** Order today from this ad—or write for further details.

\$49.75

THE SERVICE PRODUCTS CO.
Springfield, Ohio Dept. C.

REMINGTON AUXILIARY



An Emergency Gasoline Supply automatically ready for emergencies.

Mounts over carburetor—will feed on any hill.

Price \$5.00 at Ford Dealers

REMINGTON AUTOMOTIVE CORP.
17 West 60th Street, New York City

BUILD SPORTMAN'S IDEAL FORD DELUXE

With
Fordspeed
Body—6
Models

Mount One on your
Ford \$29.00 up



Underlung Fixtures

8 & 16 Overhead Valves

FORDSPEED BODIES OFFER CLASS—QUALITY—VARIETY AT REASONABLE PRICES, completely assembled and finished in attractive sport colors—all ready to mount on chassis. Free catalog. **L. N. FORD SPEED & POWER EQUIPMENT MFRS.,** 250 West 54th St., New York, 2nd floor

\$10 a DAY



to one man in each county. Starting big campaign selling **COFFIELD TIRE PROTECTORS.** Prevent punctures, blowouts, stone bruises and fabric breaks. Double tire mileage. Pay for themselves on first tire; used over and over again. Pure live rubber; no metal, no fabric, no friction. Easily applied, no cement or tools required. Nothing else like them. Three-year guarantee. Earnest, reliable men

MAKE \$45 TO \$75 a WEEK

Every car owner a prospect. Laundries, bus lines, etc., place big orders. Big demand at new low prices. No capital required. We help you start. Territory going fast. Write **THE COFFIELD TIRE PROTECTOR CO.** 627 Court St. Dayton, Ohio

FORDS—34 Miles
on Gallon of Gasoline
Starts Easy at Zero



We guarantee all other cars nearly double present mileage, power and flexibility, make hills on high formerly difficult on low. Models for any car, truck, tractor, marine or stationary engine. Makes old cars better than new. See wonderful mileage guarantees for other cars.

Ford..... 34ml.	Reo..... 24ml.	Chevrolet..... 32ml.
Buick 4..... 30ml.	Chalmers... 23ml.	Maxwell(25)... 30ml.
Buick 6..... 24ml.	Olds 6..... 23ml.	Nash 6..... 23ml.
Hudson..... 20ml.	Paige 6..... 20ml.	Lincoln 8..... 17ml.
Hupp..... 25ml.	Oakland 6... 24ml.	Stbkr Lt. 6... 23ml.
Dodge..... 23ml.	Overland 4... 32ml.	Cole 8..... 17ml.

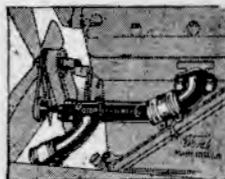
If your car is not mentioned here send name and model for particulars and our guarantee on it. **AGENTS WANTED.**

SENT ON 30 DAY'S FREE TRIAL

You can drive any car in heaviest traffic without shifting gears. Starts off on high in any weather without priming or heating—no jerking or choking. No more foul spark plugs or carbon in cylinders. No leaking of gas into crank case. Try it 30 days on our guarantee of money back if not entirely satisfied. No strings to our guarantee. **YOU ARE THE JUDGE.** Anyone who can handle a wrench can attach it. No boring of new holes or changing of operating mechanisms. Write today.

AIR-FRICTION CARBURETOR CO.
670 Raymond Bldg. Dayton, Ohio, U. S. A.

CONSTANT CIRCULATION
Prevents your motor from overheating.
Maintains even motor temperature.



The MECO Water Pump

Keeps the water circulating at all motor speeds and under all conditions. Retail price only \$5.00—covered by saving in repair bills.

Dealers and Jobbers, write for information.
MOTOR EFFICIENCY CO. 816 N. Illinois St. Indianapolis, Ind.

The WONDER SPARK PLUG

Positively Fires Through Oil Under Compression
3/8" Ford Size \$1.00
3/16" All Other Cars \$1.25



Sideline Salesmen Wanted: Attractive proposition for whole or part time.

Use a full set and watch your motor take on renewed life and power. Ask your dealer or repairman. If he cannot supply you, write us direct.

FREE TEST OFFER!

Dealers and Repairmen write on your business letterhead for full details of this liberal offer.

WONDER SPARK PLUG CO.
1531 Pine St., ST. LOUIS, MO.

Saves You 50%

2-Year Unconditional Guarantee

SILVER-S BATTERY

with genuine **AHLELL NEVERLEAK** solid rubber case Half price on this non-leakable Guaranteed Superior Quality Storage Battery. One-piece indestructible case can't leak, rot, spill or injure rugs or clothing. Read these prices.

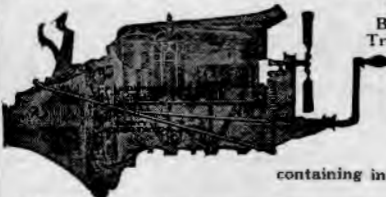
5% Discount for Cash in Full with Order

AUTO PRICES		RADIO PRICES	
6-V. 11 Plate, . . .	\$13.00	6-V. 100 Amps. . .	\$13.50
6-V. 13 Plate, . . .	15.00	6-V. 120 Amps. . .	15.50
12-V. 7 Plate, . . .	18.00	6-V. 140 Amps. . .	17.00

Read our 2 year unconditional Guarantee before you pay a cent. Battery shipped C. O. D. express subject to your approval. Send name and address and state wanted TODAY.
SILVER-S BATTERY CO., 201 E. Ontario St., Dept. 56 Chicago

SAFETY OILING SYSTEM

What Every Ford Owner Needs and Wants



Eliminates Bearing and Transmission Trouble

\$5.75

Packed in box containing instructions.

Write for our dealer proposition which includes four-color counter display absolutely free to you.

THE MOTOR RIM MFRS. CO.
 1625 East 24th Street CLEVELAND, OHIO

Drives Your Ford Where You Could Not Go Before!

Direct Power to Both Rear Wheels 100% Traction
The "WALTER" NON-SKID DIFFERENTIAL

Used by—
 Milkman
 Farmer
 Grocer
 Expressman
 Butcher
 Doctor
 and
 The Man
 Who Gets There

A proved Mechanism transmitting equal power to Both Rear Wheels. Pulls you through any Sand, Snow, Mud, etc. Complete control of your car.

Special Price **\$14.80** Net
 (30-day Guarantee or Money Back)

Write for Particulars

MILWAUKEE FORGE & MACHINE CO., Milwaukee, Wis.

SEND for the INTERNATIONAL CATALOG

Our net price list. Full line of auto bodies and accessories for Fords at Wholesale Prices. Save big money on bodies by buying direct from factory.



FORD FORD—PRICES FROM \$27.85 UP. Factory to Consumer direct—Pay only one profit.

INTERNATIONAL BODY WORKS
 914 W. Ohio Street Dept. 5 Chicago, Ill.

WHOLESALE PRICES

SEND FOR OUR BIG FREE BARGAIN BOOK of the best Auto Supplies made! You'd be surprised if you knew our sources and names of manufacturers.



EVERYTHING

Special made Bodies—Tires—Tubes—Batteries—Spotlights—Bumpers—Tools, etc. This book exactly illustrates in colors thousands of bargains—whatever you need or want in Equipment. Every article backed by our Legal Binding Guarantee of absolute satisfaction. Thousands of pleased customers everywhere. Get on the inside of this Price-Saving business. Postal card or letter brings this book—FREE! Be sure to ask for Book Special B.

BODIES \$20.95 AND UP

NEW YORK AUTO & RADIO SUPPLY CO.
 Washington at Peoria Street Chicago, Illinois

AUTO SUPPLIES

FORD VALVE SPRINGS

are lifted quickly and easily with the **K-D Parallel Jaw Valve Spring Lifter** without removing carburetor and manifold.

Replaces valves as easily as it removes them and leaves both hands free to work.

Rust proof pressed steel. If your jobber doesn't carry K-D's step softly—you may wake him!



Write us about it

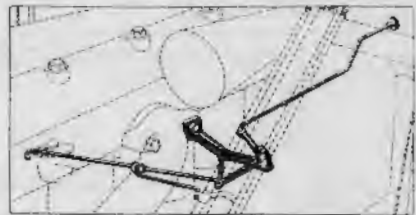
K-D MANUFACTURING COMPANY
 LANCASTER, PENNA.

A POST CARD WILL BRING YOU FULL DETAILS ABOUT THE WONDERFUL

New AIR CONTROL

MPC Pneumatic Accelerator for Fords

MOTOR PRODUCTS CORP. DETROIT, MICHIGAN



Heineke's "Ever Ready" Accelerator for Ford Cars

The construction and high grade material used, the instant and positive operation make this accelerator superior to any other on the market. Has a comfortable designed foot rest.

Send \$1.35 and we will send you this accelerator—prepaid.

Attractive prices to dealers and garage men. Write at once for information.

NATIONAL AUTO ACCESSORIES MFG. CO.
 1117 South 5th Street, Springfield, Ill.

CLASSIFIED ADVERTISEMENTS

Advertisements inserted under this classification for 7c per word; name and address must be counted; no order for less than \$1.50. Cash must accompany order. Advertising copy due by the 10th of the month preceding date of issue. Write for Classified rates on twelve-time contracts. This gets big results.

Ford Racer, Underslung, 16 Valve, 4 Speed Transmission,

Racing Carburetor, High Tension Magneto, Outside Exhaust, Special Camshaft, Oiling System, Wire Wheels, other extras, Cost \$1275. Will sacrifice \$475 Cash. Track prize winner, biggest bargain ever offered. F. H. Ford Speed & Power Equipment Mfrs., 250 West 54th St., New York. 2nd floor.

Ford Dealer: Send for catalog, Kiernan's Camp Carrier that converts into any kind of a tent frame. Write today. W. C. Kiernan & Co., Whitewater, Wis.

Paying Business, Refinishing old automobiles like new—Modern approved methods—manufacture automobile specialties, supplies. We teach you how at home. Demand unlimited. Start your own business. **Autofinishers—F. O., Sheboygan, Wis.**

Patents—Trademarks—Write for free Guide Books and "Record of Invention Blank" before disclosing inventions. Send model or sketch of your invention for examination and instructions without charge. Terms reasonable. **Victor J. Evans & Co., 627 Ninth, Washington, D. C.**

FORD MAGNETOS RECHARGED IN FIVE MINUTES without removing any parts from car, Secret exposed. Any one can do it with materials that you already have. Nothing extra to buy. You can either use your battery or city lighting current. Fully charged magneto removes cause of ignition troubles, gives easy starting, brighter lights, more power, saves gas. This is no fake, Mr. Ford owner. It will do all that an expensive recharger does and then some. Tests field coils, burns out grounds, and recharges with the best. Complete simple instructions and wiring diagram \$1 prepaid. **The Auto Electrician, Box 261, Middletown, N. Y.**

\$50 a week evenings. I made it. Mail order business. Booklet for stamp tells how. Sample and plan 25c. Free 12 articles worth \$3. **Alfo Scott, Cohoes, N. Y.**

100% More light for magneto lighted Fords—1915 to 1924 models. Handy switch that fits on the steering wheel and attached in five minutes. Floods the road with light on the darkest night. Agents wanted in every community. Regular \$3.50 switch complete ready to attach sent on receipt of \$1.75 to introduce. Guaranteed. **Sunlight System Co., Box 304, Chicago, Ill.**

BARGAIN IN PISTONS FOR FORDS

Having received a large stock of high grade Pistons for Fords (no seconds), they are offered at the following attractive prices:

Plain Ground Piston with high grade bronze bushings **.05**
Ground Piston with drilled oil groove and bronze bushings **.75**

Following sizes are in stock:

STD	.005	.015	.025	.033	
.0025	.010	.020	.031		Semi-finished

These pistons are guaranteed to be lightweight, to have uniform walls, and to be straight and true to size marked.

P. O. Box 309, Hammond, Ind.

YALE RESERVE GAS TANK

FOR FORDS AND CHEVROLETS—

Live agents wanted, 100% profit. Sells retail \$1.00. 8 inch tank soldered to filler cap fits inside regular tank and fills from splash. Reserve supply instantly available in handy form for priming, filling vacuum or emergency run to gas station. Absolutely new. Write now. **Frank R. Pritchard, 271 Annandale Blvd., Los Angeles, Calif.**

18,000 miles in 18 months without draining crank case. **HILL'S ALL FUEL VAPORIZER, Page 203.**

Ford Rideasy—You are taking no chance to send in your name and get the facts on the Ford Rideasy proposition found in another column.

Safety First—Equip your Ford with Bosc Emergency Brakes (Patented). **F. J. Bosc, Galeton, Pa.**

Motorists—Never-Fail Carbon Solvent saves time and money. Removes carbon from motors instantly without labor. Wonderful results. Costs only a few cents. Sample and valuable information mailed free. Write **Charles Davis, Box 202, Rutland, Mass.**

We tailor top and seat recoverings, for all cars. Prices range \$5.20 to \$20. Delivered at your door. Easy to apply. You drive 100 tacks and save \$25. Samples free. **Equipment Company, 1113 So. Main St., Los Angeles, Calif.**

Be sure you install one of my front license holders on your Ford. No more rattle or bent plates. Parcel post in United States 75 cents. **Jos. R. Carter, 416 Hinton St., Petersburg, Va.**

"INVENTORS"—Don't LOSE YOUR rights to patent protection. Send for blank form "Evidence of Conception" to be signed and witnessed and information bulletin in "How to establish your rights." Both are free and very desirable to proper patent procedure. **LANCASTER & ALLWINE, 238 Ouray Bldg., Washington, D. C.**

BIG MONEY AND FAST SALES—Every owner buys Gold initials for his auto. You charge \$1.50; make \$1.35. Ten orders daily easy. Write for particulars and free sample. **American Monogram Co., Dept. 216 East Orange, N. J.**

Paint attractive signs and show cards with letter patterns. If interested send stamp for samples. **John F. Rahn, E 2433 Greenview Ave., Chicago.**

Lightning strange battery compound. Charges discharged batteries instantly. Eliminates old method entirely. Gallon free to agents. **Lightning Co., St. Paul, Minn.**

Salesmen calling on dealers, garages, service stations can make \$40 and up weekly, extra, selling business—building advertising specialty. Vest pocket proposition. Low prices, liberal commission. Just the line for you. Write today. **National Bank Supply Company, 226 Lafayette St., New York City.**

Do it now—Look here Ford agency dealers. Cheapest and best result getter in the Ford advertising business for you. Absolutely cheap and good. Many using it now and getting desired results. Write **W. K. Keithley, Syracuse, Nebraska, for particulars.**

Ford RideasY—Don't fail to read the **Ford RideasY** proposition in another column and send in your name.

MONKEY GLANDS

Good as the name; one dollar per set; easily put on. Satisfaction guaranteed. Agents wanted. **Monkey Gland Co., Harborview Pl., Bridgeport, Conn.**

FORD SPORT CAR

fans don't fail to see "Red-1-Kut" ad page 214.

"FILL FULL OF GREASE AND FORGET IT." ANDERSON MASTER TIMER.

Dual wipe contact, gives more power, easier starting, greater mileage per gas mile. **TEN TO TWENTY-SEVEN THOUSAND MILES.** Obtained before replacing parts at small cost. **PRICE 2 DOLLARS AGENTS WANTED ANDERSON AND MILLER HYDE PARK, MASS.**

WANTED

Distributors and Salesmen to sell **PIN INSERTERS** and **REMOVERS** for Ford Valves; liberal profits. Tool saves times on every valve grinding job and welcomed by all repairmen. **BALCOM MFG. COMPANY, Stamford, Conn.**

DOOR OPEN Curtains. Latest thing for Fords. Complete set 3-door opening, 34-Oz. material. Touring \$9.95. Roadster \$6.50 Postpaid. Ford One-Man Tops. Top re-covers for any car. Fit and quality guaranteed. Buy direct and save money. **WALRIKE RUBBER COMPANY, Springfield, Ohio.**

—STOP VIBRATION—

VI-BRACES—a simple device that supports and holds the Ford Motor rigid. All that is needed is a wrench and 3 minutes to install them. Sent mailed on money-back guarantee, \$1.75 postpaid. Pay postman on delivery. The results are surprising. **VI-BRACE MFG. CO., 421-12th Ave., Milwaukee, Wis.**

GENUINE TOWNSAN VALVE ADJUSTERS

Successfully used for ten years. Accurately takes up wear on each valve, insuring maximum efficiency of Ford motors. Send \$1. for complete set of eight. Money back if unsatisfactory. **Chadborn Sales Co., 2725 Emerson Ave. So., Minneapolis, Minn.**

For Sale—Buy our famous couch dogs to watch your car in safety. Puppies well bred and marked. Write for prices. **John T. Donner, Chillicothe, Ohio.**

Salesmen Wanted. Side line or entire time. State generals in each state. No samples. Pleasant dignified work. All the big ones approve. Big commissions paid each week. Just paid one man \$180.00 for four days effort. If you now sell hardware, auto accessories or kindred lines, this proposition will help increase your sales. Give references. Act quickly. **Corey & McKenzie Co., Service Department, Omaha, Nebr.**

One—Miller Carburetor—Ford.
Two—Zenith Carburetors 1 1/4 inch—Ford.
One—Eight Valve Rajo Head complete—Ford.
One—Four Valve Rajo Head complete—Ford.
These parts are slightly used. No reasonable offer refused. **Ullman and Hauser, 617 West 129th St., New York City.**

Racing Bodies and Accessories—Send at once for particulars and quotations on our line of bodies and speed accessories. **Central Auto Supply Company, Dept. 1230 Louisville, Ky.**

Salesmen wanted to sell Bosc Emergency Brakes. (Patented). **F. J. Bosc, Galeton, Pa.**

FORD RideasY \$10.00

Flat-Volute-Spring (only) Chatter-Shock-Killer. Don't send any money—send your name and address as a Ford owner, and we will mail you full information how you can prove, or disprove—what we say at your own home, also how you can get the agent's discount and bonus. You own a Ford to ride in. Now, why not make it to ride as good, or better, than the big several thousand dollar price cars? We are taking the chatter and rebound out of such cars as the Buick, Jewett, REO, Hudson, Oakland, Olds, Maxwell, and a long list of that class of cars, and withal the FORD. We are out to give the Ford Owner the **SQUARE DEAL**, and if we do not take out the chatter, shocks and rebound, bobbing up in front, and so on, then we won't take any Ford Owners' Money. Give us your name and address and see our hand. Reference, **Peninsular State Bank of Highland Park, Detroit. Auto RideasY Co., 223 Grand Ave. W, Detroit, Mich.**

SALESMEN WANTED CHICAGO MANUFACTURER

Wants two or three good salesmen, full time or side line, now calling on or who are acquainted with electric, hardware and auto accessory dealers and jobbers and others who sell electric lamps or auto accessories, to sell the **GRIP-O-LITE**, a portable gripping lamp for the home, and the **KLASP-TITE**, a utility lamp for the automobile, the radio, the motor boat, the camp, and all battery and other low voltage lighting circuits. Both items new—but old enough to have demonstrated that they are live, keen sellers—and that they repeat splendidly. Even as a side-line, they are worth \$50 to \$75 per week to an aggressive salesman. Liberal commissions, territory assignment and full protection guaranteed. State territory you are now covering, lines now handling, references and experience, whether interested in both lamps or which. Address,

A. B. STEWART & COMPANY
219 W. Huron Street,
Chicago, Illinois

Everybody make your own Hand Cleaner. Cheapest and best. Not gritty. Send 25 cents (coin) for formula. **H. F. Gaines, R. No. 1, Poultney, Vermont.**

AUTOMOTIVE PATENTS

Engineer-Attorney Specializing in Power and Automotive Inventions.

M. P. LAUGHLIN

48 East 41st St. New York

Hadco Auto Semi-Steel Stock Boxes and cabinets and auto bin markers will save you time and money in your auto shop. Send for catalog and samples and free booklets; "How to Simplify the Work in the Auto Stock Room," "How to Label Auto Stock Bins," and "How to Build Your Own Stock Bins." **Haddon Bin Label Co., Dept. F, Haddon Heights, N. J.**

NEW LIVE WIRE SPECIALTY GET A JAD

Perfect Spark Plug Cleaner..... \$.40
For all Autoists
Ford Safety Footboard Holders..... \$.50
All Goods Guaranteed
Salesmen Wanted
Auto Holder Co., Glen Falls, N. Y.

A Loud Speaker Cutout speaks for itself. Clear exhaust—no sticking—easily installed. Ford size \$2.00. Dealers wanted. Loud Spenser Mfg. Co., 5000 University Ave., Indianapolis, Ind.

"TRICK" VALVE ADJUSTER FITS ALL GAS
 Absolutely new. Nothing anywhere so good.
ONLY ONE-PIECE VALVE ADJUSTER MADE
 Quickly Installed by Owner
SAVES EXPENSE AVOIDS REPAIR BILLS
 Takes Up Wear Stops Noise
THE "TRICK" THAT CURES THE CLICK
 12 Complete Adjusters 50 cents. Order now.
"TRICK" MANUFACTURING COMPANY
 2 Albee Building WASHINGTON, D. C.

BOATS THAT GO

AND KEEP ON GOING ARE PROPELLED BY
 GENUINE Ford Automobile engines equipped
 with THE HUBBELL MARINE COOLER
 ("Fixes a Ford For a Ferry")

Rich men like this scheme because it keeps going.
 Others like it because of:—

- (1) Low first cost. Use discarded engine.
- (2) More miles per gallon of gasoline.
- (3) Quiet running, conversation enjoyed.
- (4) Flywheel enclosed. SAFETY FIRST.
- (5) Lights from engine, no kerosene.
- (6) Clutch and reverse, part of engine.
- (7) Ford self starter can be used.
- (8) Repairs quickly and cheaply made.
- (9) Put engine back in car at season's end.

Send for NEW booklet and ASK QUESTIONS.
 Agents are wanted in waterside towns **Harry
 Rider, 206A Commercial Bldg., Norwalk, Conn.**

DISTRIBUTORS WANTED

Responsible, high grade producers calling on
 Ford Dealers and Agencies. Refer to our display
 advertisement on page 25. The N-L oil
 gauge is a fast selling repeater because it is
 dependable, attractive and low priced. We give
 our Distributors valuable sales and advertising
 assistance. Write for our proposition and outline
 your qualifications. **ENAL MFG. CO., 107
 N. Franklin St., Syracuse, N. Y.**

MONEY IN FORD SUPPLIES CUT-RATE PRICES

One man each county to take orders for
 "Everything Good for Ford Car." Over 800
 standard, staple supplies each best of its kind,
 in everyday demand, everywhere. Big profits.
 Direct advertising plan which gets the business.
 Can be handled during spare time if you
 wish. Permanent contract. Address Box 1077,
 Chicago, Ill.

BODIES Snappy, well-built special bodies for
 WITH Fords. Speed—Comfort—Style.
PEP REED SERVICE, Box 1, Aurora,
 Ill.

AUTO ACCESSORY AND RADIO MANUFACTURERS AND DISTRIBUTORS

Do you want to demonstrate and display our
 product? Also appoint agents and salesmen and
 do a large retail business on Madison St., Chicago,
 where thousands pass daily? Demonstration
 and office space can be had very reasonable
 in Manufacturer's and Distributor's Exhibition
 room. We can accommodate a few more so
 hurry before all the space is taken. Apply
**Manager, Manufacturer's and Exhibitor's Arcade,
 513 West Madison St., Chicago.**

Ford Motors rebuilt. Write for prices. Also
 lightweight Ford pistons. Acme Cylinder
 Grinding Co., Rome, N. Y.

FOR SALE—Special Ford Racing Car, brand new.
 Equipped with latest type Rajo racing head,
 double ignition, two carburetors. Special parts
 used throughout. This car is guaranteed to go
 100 M. P. H. **H. J. Skelly, 414 Wisconsin Ave.,
 Oak Park, Ill.**

ACT QUICK

Salesman & Agts.—Territory closing out fast.
 Big money to live wire hustlers. Improved invention,
 biggest repeater. See our ad, page 1.
 Write today. Dept. S.—**H. J. Borgmann Co.,
 Stamford, Conn.**

Patent for sale or royalty. Reserve supply
 valve for gasoline tanks. Not a tank, simply a
 fuel proof valve. For information write **Mr.
 Fred Jensen, 163 Michigan St., Rochester, N. Y.**

Vaporizes all the fuel all the time and does it
 right. **HILL'S ALL FUEL VAPORIZER, Page 203.**

**Two-Door Ford Sedan Owners sleep on your
 car cushions.** Most comfortable and practical
 bed devised. (Not a canvas spreader bed).
 Weight 7 pounds. Carried under seat when not
 in use. Bed set up is 4 ft. x 6 ft. Does not
 injure or mar car. Outfit consists of light wood
 cushion supports, 24 in.; flexible spreader and all
 regular cushions of car. Set up in 2 minutes.
 Installed by anyone. Money-back guarantee.
 Postpaid \$5.00. (East of Rockies \$5.50) including
 instructions. **Milligan & Chrey, Bremerton,
 Wash.**

Reliable Magneto Recharger, A. C. Direct,
 Delco Plants \$55.00. Terms given. Adjustable
 gasoline sign \$5.00. Magneto speed tester \$8.00.
 A. C. V. Non-speed Magneto bench tester \$3.00.
 Glass closed flame intensifier. Also open type.
 Low price to street demonstrators, fairs, carnivals.
 Samples free. Distributors wanted.
Reliable Mfg. Co., Utica, N. Y.

Build your own and save 75% of the cost.
 Okay two door sport Coupe and Roadsters
 (speedster type). Send dime for blue printed
 design and specifications. **M. Meyler, R. No. 10,
 Kalamazoo, Mich.**

**Agents, Salesmen—Sell New Thermostatic
 Automatic Carburetor Control Attachment for
 Fords.** Big profits, full or part time. Burns
 95% air. Doubles mileage. Attached in 2 minutes.
 No drilling. Does automatically exactly
 what Ford Manual says you can do by hand.
 Cadillac now using Thermostatic Carburetor
 Control under Blanche license Write today.
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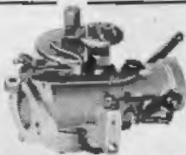
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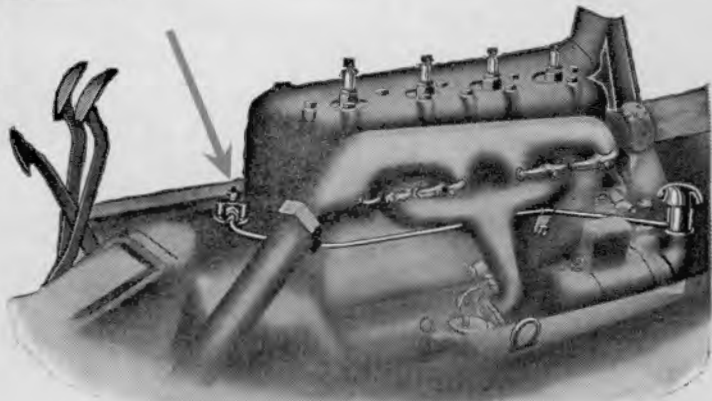
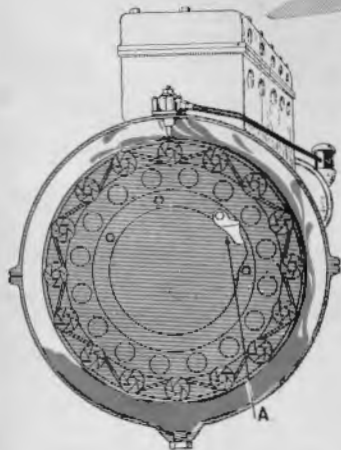
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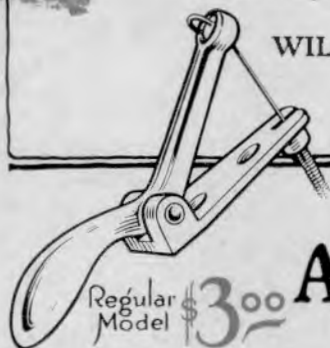
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