

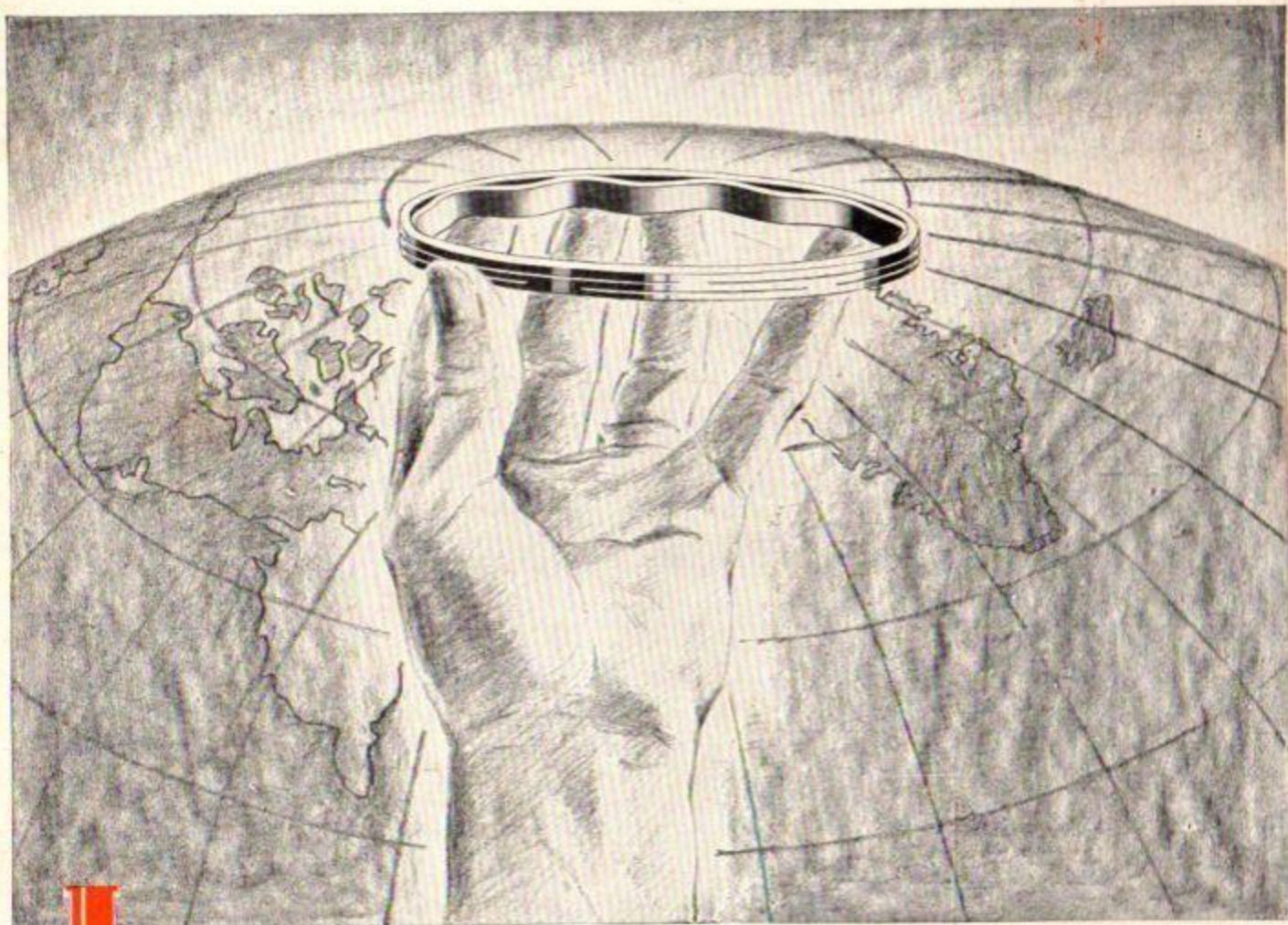
AUTOMOBILE DIGEST

... *Serving the Service Field* ...



THANKSGIVING

November 25¢



Is SIMPLEX the highest-priced ring in the WORLD?

It is well known that the Simplex ring is made of the finest materials obtainable—it is well known that the patented over-width feature cannot be found in any other one-piece ring under the sun—

But these are not the reasons why car owners gladly pay more for Simplex rings—

They pay more because they know that no other ring can equal the performance of the Simplex ring—and because they know that no other ring can save them the far greater cost of honing, grinding or boring cylinders and installing new pistons.

And good service men everywhere know that Simplex is the one positive cure for the 3 BAD HABITS (com-

pression-loss, oil-pumping and piston-slap)—they know that Simplex jobs eliminate those costly “come backs” and give them a quick profit turnover.



The Simplex Piston Ring is the only one-piece ring that is made “over-width”—actually wider than the ring groove it goes into. Its slotted construction permits it to be compressed into the groove, where it expands up and down, sealing the top and bottom of the groove against oil pumping, compression loss and piston slap. (This up and down expansion is patented.)

Yes, Simplex costs more money than an ordinary ring—but it saves many times its cost for the car owner, makes more profit for you and gives far greater service in the motor—No ring that does less can command so high a price.

Write today for your copy of the new Simplex Facts Book.

**THE SIMPLEX PISTON RING CO.
OF AMERICA, Inc.**

1967 East 66th Street, CLEVELAND, OHIO

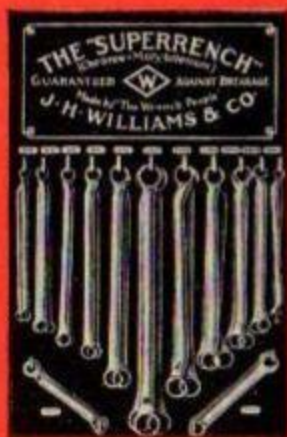
THE CURE FOR THE 3 BAD HABITS

SIMPLEX
PISTON RINGS
LENGTHEN THE LIFE OF YOUR MOTOR

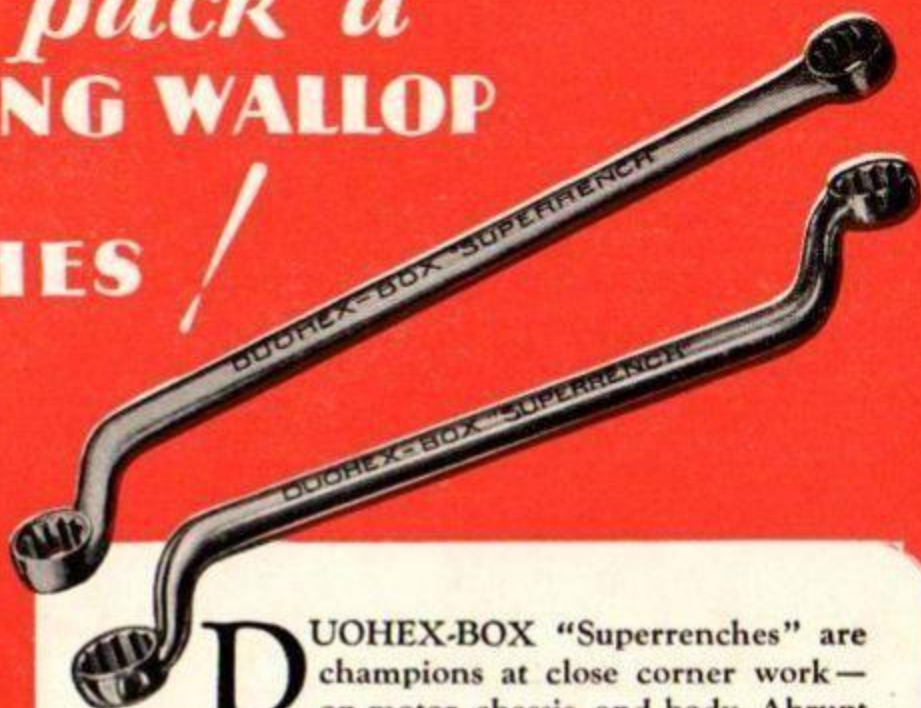
They pack a WINNING WALLOP in the CLINCHES



There are five Sets (3 illustrated above) packed in strong metal box, with handle: black enamel finish.



Display Board MB-2, 15 x 24", carries dealers' handy stock of 3 each, 14 different wrenches. The board is free to dealers purchasing the wrenches it displays.



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The Double Offset pattern—with a different size opening in each head—turns nuts completely with a swing of 30°, less than 1/10 of a full circle. The Single Offset pattern—with the same opening in both heads—works readily in an arc as small as 15°.

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"SUPERRENCH"
(Chrome-Molybdenum)



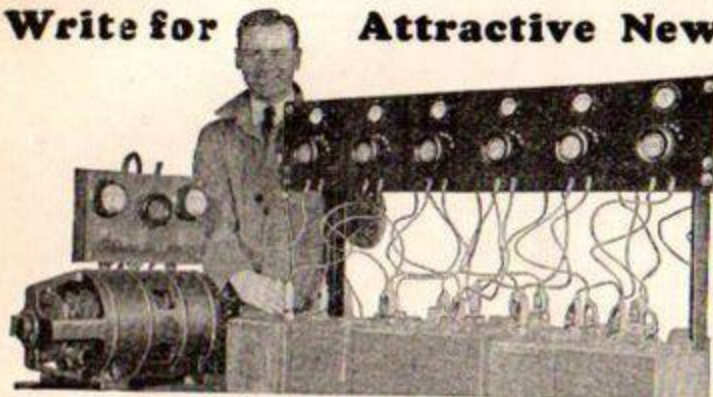
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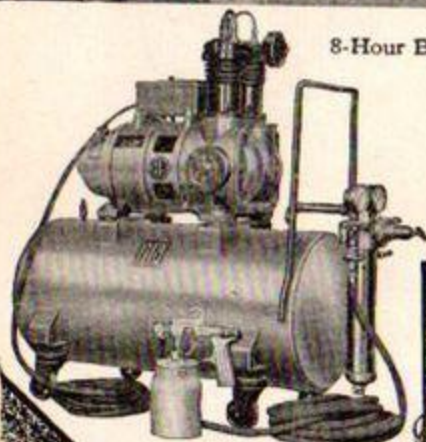
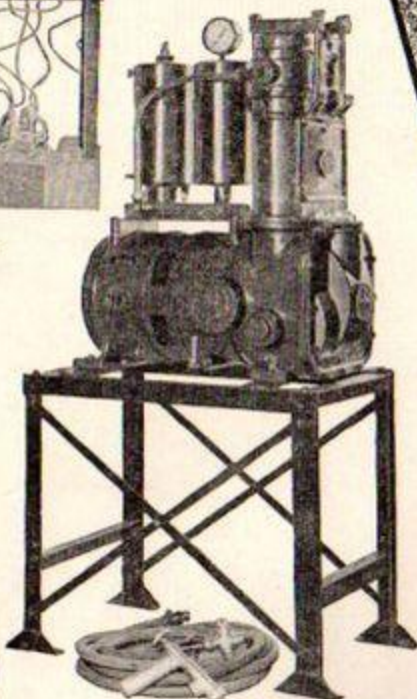
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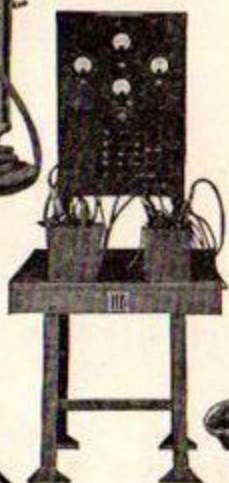


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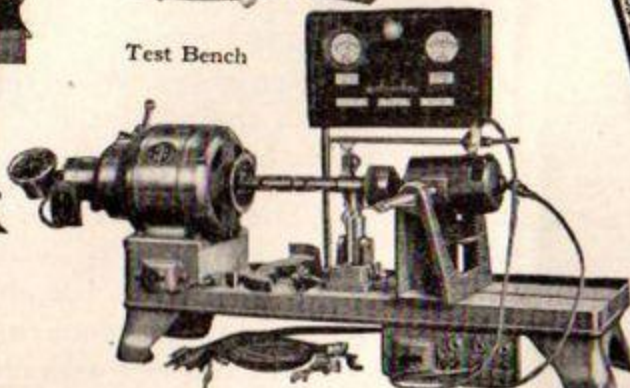
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Let the Largest Builder of Shop Equipment—Bring You More Profit

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AUTOMOBILE DIGEST

CINCINNATI

Serving the Service Field

Vol. XVII

NOVEMBER, 1929

No. 11

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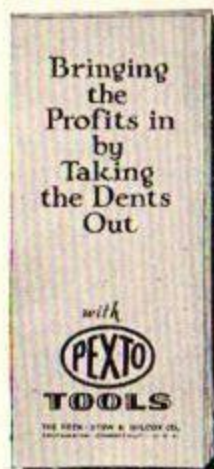
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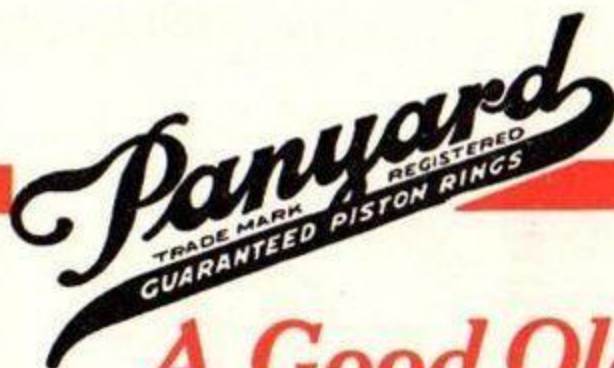
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and name of nearest jobber.*

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AMPERE, NEW JERSEY

P E D E R S E N
Oiljak

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A Good Old Name A Great New Meaning

[[IMPORTANT NEWS to EVERY MAN Who Buys or Sells PISTON RINGS!]]

NEVER in all its history has the good name "Panyard" symbolized such quality as now—now backed by greater facilities, greater resources, greater distribution and a greater servicing organization than ever before. No other source offers you or your customer such perfect protection behind each piston ring.

In this new phase of Panyard development "quality" applies its tremendous appeal upon a thoroughly competitive basis in so far as price and service are concerned. The Panyard market is no longer "thin" or exclusive, even though the Panyard quality remains exclusively Panyard.

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If you use rings for any purpose or are interested in any way in the sale of piston rings you should get the latest facts concerning modern "Panyards" and the modern Panyard policy. Write or wire your request to

THE PANYARD PISTON RING COMPANY

MUSKEGON, MICHIGAN

Successors to

The Panyard Machine & Manufacturing Company

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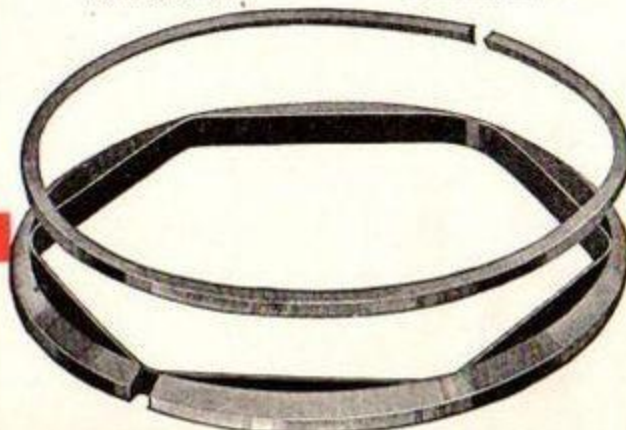
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thousand!*

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AUTOMOBILE DIGEST

Serving the Service Field

22 E. Twelfth Street, - - Cincinnati

ESTABLISHED 1913

A VIATION



DEMANDS MORE TRAINED MEN



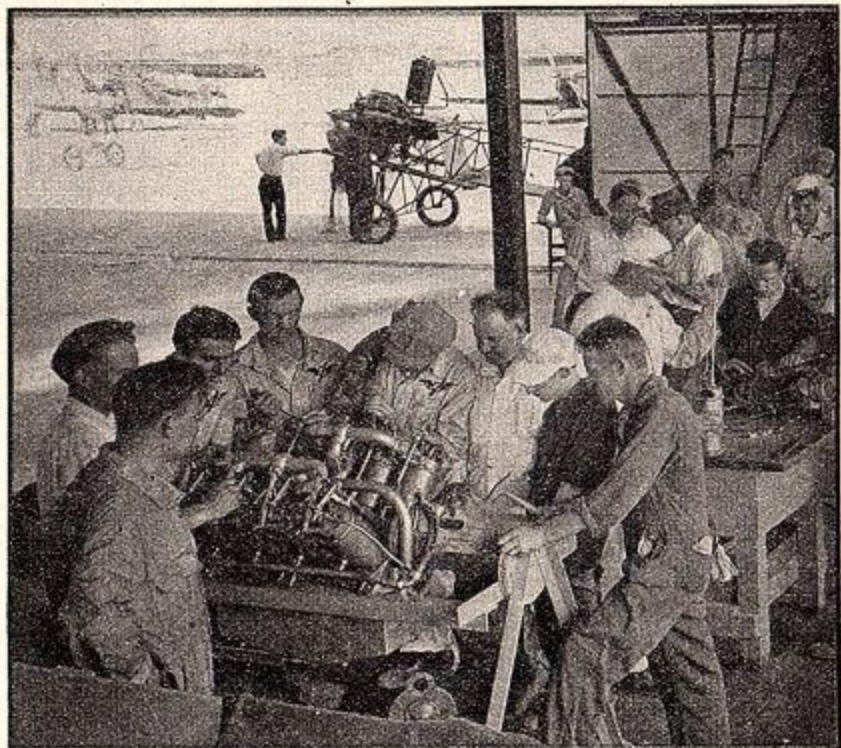
PARKS training will assure your success « « « «

RIGHT now—today—there are literally thousands of unfilled jobs—big-paying jobs, too—in the fascinating aviation industry, awaiting men with the right training!

The supply of skilled, thoroughly trained airplane and engine mechanics is pitifully smaller than the demand. Here's opportunity for you. Here's a ready-made chance to step into the most profitable and attractive type of job.

But—you must be trained before you "cash in." Your success will depend directly upon the *kind* and *thoroughness* of your training. Parks Air College (the largest civilian aviation school in the world) is better equipped than any other institution to give you exactly the training you need.

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You will graduate from the Airplane and Engine Mechanics School fully equipped to command a big-salaried job. Parks graduates are in great and constant demand—because aviation executives know that Parks training is the finest, most thorough of its kind. Many Parks graduates are headed toward even bigger things, for their training and ability have qualified them for executive positions in transport companies, as airport managers, and so on. Money-making possibilities for Parks-trained men are limitless.

Sign and send the coupon today and we will send you our handsomely illustrated catalog and full information.

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Room 1162 634 North Grand Avenue
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PARKS AIR COLLEGE, Room 1162
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Rebore and Grinder

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Sensational 30% Price Reduction on this Key Machine

Boring
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Grinding
Head



2 Machines in 1

STOP LOSING MONEY on jobbed out "rebores" or on "comebacks" caused by "good enough" tools. A Simplicity Portable Cylinder Reborer and Grinder will do the job better, quicker, and cheaper than any machine on the market. No stones to replace... for the Simplicity is not a hone. No "still out-of-round" complaints... for the Simplicity centers, bores, and grinds *factory perfect* at exact right angles to the block face, uninfluenced by the cylinders' walls. Furthermore, the Simplicity is automatic, and will do the job in or out of the chassis while you attend to other work. Backed by our free Business Building Plan, the Simplicity has doubled the trade of countless shops, almost over night.

Sold on Easy Terms. Pays for itself as you pay.

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Port Washington, Wis.

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Coupon

Simplicity

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THE MOST COMPLETE REBUILDING LINE
in the United States

SIMPLICITY MANUFACTURING COMPANY,
4911 Spring St., Port Washington, Wis.

☐ Please acquaint me with your Free Plan for selling the service of my particular shop.

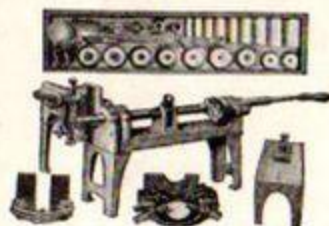
☐ Please mail full information on your.....

☐ Please demonstrate same free at my shop.

Name..... Address.....

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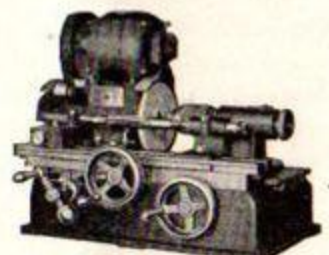
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Connecting Rod Babbitting and
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Power or Hand Operated



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General Purpose Grinder

2 in 1 Crank Pin Tool
Valve Seat Replacement Tool
Connecting Rod and Piston Aligner
Reseating Cutters and Pilots
Valve Face Grinder
Bench Grinder

AUTOMOBILE DIGEST

CINCINNATI, OHIO

for Dealers, Garage Owners & Service Mechanics

Volume XVII

NOVEMBER, 1929

Number 11



Miffs That Last

By RAY F. KUNS



MANY an owner is patronizing a certain garage in preference to others just as good—and going out of his way to do it—simply because he likes the owner, or the man in charge of service. The one thing he likes most about this fellow is the personal interest he takes and the way he tries to see that a customer gets the most in satisfaction and service from his car.

In going over your list of customers who have fallen away, make an analysis to determine how many of these have ceased giving you their business because of what they considered slights on the part of help. It is surprising how expensive an even unintentional miff can be. Too often repairmen are apt to size up a customer by the way he is dressed and make a grievous error through this influence.

The best way to guard against customers becoming dissatisfied is to train carefully all those who come in contact with the trade. There is no better investment, nor way in which time and money can be spent with greater returns, than in sales training. Life insurance is sold in the volume it is because the life insurance companies have realized the value of sales training. The poorest salesmanship is usually to be found in retail stores and such places of business as repair shops.

The average mechanic is not ordinarily a good salesman. If he was he would probably be earning more money selling than he is making as a mechanic. The

reason why a really good salesman can earn so much is because there are so few really good salesmen. And the reason why there are so few good salesmen is because so few firms make any serious effort to train them.

Any garage man would consider it a crazy notion to take a young fellow with hardly any practical experience and set him to work on a job requiring an expert. That young fellow must be taught, he must be trained, he must acquire the necessary skill and have sufficient experience before he can be entrusted with a job requiring the services of an expert.

Yet fellows without the least training in handling the trade are allowed to answer telephone calls, talk with customers and do other selling. It is obvious that this is one reason why it costs so much to do business, why it is so hard to hold customers and why business as a whole is constantly paying for miffs that last.

It costs real money to get new customers. They are far too valuable to lose. It is not easy to figure out just what the loss of a customer means in dollars and cents because that loss has such far-reaching effects. However, it is obvious that the cost is so much as to make it worth a great deal to take every possible precaution against miffs which can so easily occur. Selling the job and keeping customer goodwill is a job for the experienced repairman with a pleasant disposition and a good understanding of human nature.

2. Check levers 4, 8 and 8a to see that they are against the stops 9 and 18 when the brakes are in a released position.

Caution. It is not ordinarily necessary to adjust screw 3 as this is set at the factory to hold equalizer 5 parallel to the cross shaft and it ought not be necessary to change it.

3. In order to remove all slack in the pedal movement the pedal should be set $\frac{3}{16}$ -inch from the toe-board by adjusting screw 23, with rod 7 disconnected. Next set the front wheels straight ahead and adjust the rods 10 so that levers 19 set approximately $1\frac{1}{4}$ -inch forward of a perpendicular center line. Next adjust cables 11 so as to remove all slack. Next adjust the rods 12; then rods 7. When adjusting rods 7, 10 and 12 and cables 11, care must be used not to pull levers from their stops. When all these adjustments are properly made the pedal lever will be $\frac{3}{16}$ -inch below the floor board, as shown in the figure.

4. Place all four wheels on jacks or blocks.

5. Proceed to loosen nuts 2 until lock washers are free. This will allow the centralizer to center cam.

6. Back up the nuts 1 until each wheel drags hard, or until it is just possible to turn the wheels a complete revolution by hand.

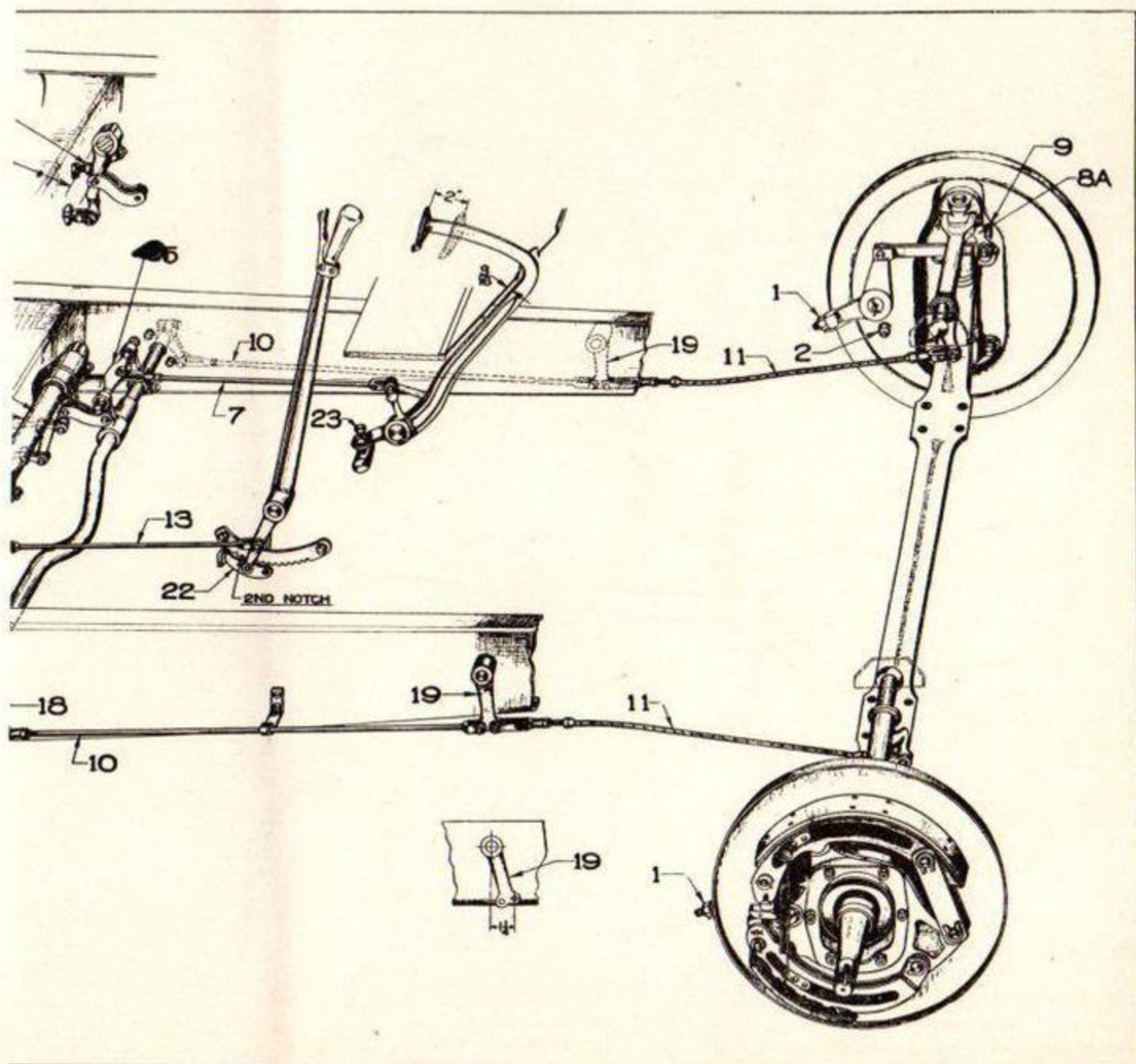
7. Tighten nuts 2 to lock centralizer in correct position.

8. Now back off the nuts 1, fourteen flaps ($2\frac{1}{3}$ turns) which should give sufficient clearance to free each wheel. This is equivalent to approximately 2-inch pedal travel. Note this on the pedal. In case new linings have been applied, a slight drag is permissible for this initial adjustment. After backing off nuts 1 it will be necessary to apply the brakes firmly to properly seat nuts 1 against lever 8.

Caution. It will be necessary to check the spring locks to make certain they will hold nuts 1 from vibrating off.

9. Before dropping the car from the jacks, apply

(Continued on page 58)



Trade Associations Assemble for *Repairman's Ultimate Good*

*M. E. A. and N. S. P. A. Annual Conventions of Manufacturers and
Jobbers Held This Month to Be Rich With Good
Ideas and Practical Discussions*



Shop equipment exhibit at the 1928 M. E. A. Show

THE Motor & Equipment Association holds its eleventh annual show and convention at the Coliseum in Chicago, November 4th to the 9th. The following week, or November 11th to 16th, at Convention Hall, Detroit, the National Standard Parts Association stages its annual show.

Both associations are nationally known as doing a tremendous piece of educational work, much of it of a pioneering nature and, like all pioneering work, a lot of digging is necessary before pay-dirt is located. A recent movement on the part of the M. E. A. was the creation of the slogan, "Care Will Save Your Car," which they have made available to the entire industry. Members of the association and jobber salesmen are promoting the use of the slogan by dealers and service stations, which, it is believed, will be a great factor in the furtherance of the idea of "preventive service."

The photographs accompanying this article were made at the model service department set-ups, complete in every detail and shown in actual operation at last year's M. E. A. and N. S. P. A. Shows. These exhibits, along with the several hundred staged by manufacturer members, were highly valuable to every jobber attending, presenting an opportunity of seeing, in one collection, what manufacturers have to offer

the trade. No phase of the association's work, however, is of greater importance than the bringing together of jobbers and manufacturers from every section of the country for practical discussions on distribution, the problems existing in automotive maintenance and the exchange of ideas. This, in the final count, reverts to the maintenance man who does the actual service work, as the ultimate benefactor.

In considering automobile servicing problems of this day, with their infinite ramifications, the success or failure of the tremendous program of this group of earnest

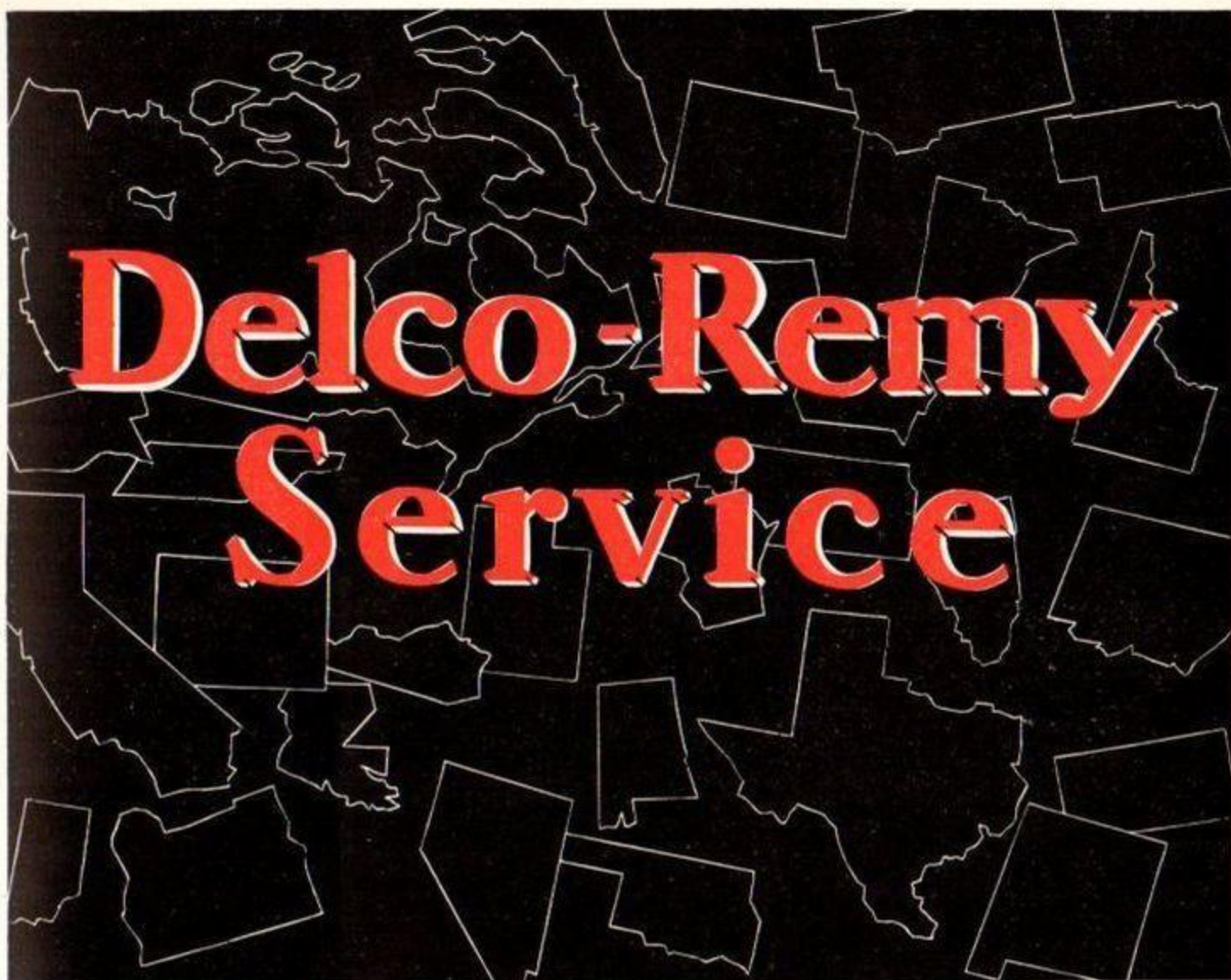
engineers depends not so much upon the motors they service as the MEN who service them. Both parts and equipment have been developed to a fine point. The unknown quantity, the X in the case, is the man who takes the parts and equipment and does the job. He is the man who brings the plans to fruition or destruction.

A tow chain once broken may be tied together with

(Continued on page 62)



*Mechanical Service Department model set-up exhibited at the
1928 N. S. P. A. Show*



everywhere . . .
immediately available



United Motors Service is the official field service organization for Delco-Remy and Klaxon, with 27 Direct Branches and more than 1000 Authorized Electrical Service Stations. Look for the familiar orange-and-black sign. Directory of Branches and Authorized Service Stations mailed on request.

Parts Depots, Direct Branches and Authorized Electrical Service Stations of United Motors Service—the official field service organization for Delco-Remy electrical products — are located in cities and towns throughout the United States and Canada. This wide representation makes it possible for car dealers *everywhere* to use genuine Delco-Remy service parts and to provide their customers with *authorized* Delco-Remy Service.

DELCO-REMY CORPORATION
ANDERSON, INDIANA

Say "I saw it in the AUTOMOBILE DIGEST" and you'll get a ready response

Some Helps ON HEADLIGHTING

Standard Sizes of Lamps—Lamp Manufacture and Use—Car Lighting Systems—Adjusting Lamps—and Trouble Shooting

By R. E. CARLSON



Fig. 1. The eleven lamps displayed in the upper row service 90% of the cars

standard lamps many other special types are made, the most commonly used of which is the 32-21 candlepower lamp for depressible beam headlighting. This lamp is sometimes used in place of Mazda lamp No. 1110, which is a 21-candlepower lamp.

Lamp Manufacture

Incandescent lamps today are made in special factories and by production methods carefully controlled, resulting in a precision product. The automatic and semi-automatic machines used in winding the tungsten wire into a coil as well as the machines used for seal-

"MY lights seem dim" or "My lights must be glaring the way people shout at me—what can you do about it?" These and other questions sometimes perplex the service man. Space will not permit a complete discussion here, but the principal points in car lighting service will be covered.

Standard Lamps

Fig. 1 shows a lamp panel displaying the standard types of lamps used on present day motor cars. This photograph as well as the others used in this article, was taken in the Automotive Room of the new Westinghouse Lighting Institute, Grand Central Palace, New York City, which is devoted entirely to demonstrating better lighting. Due to an intensive simplification program carried on by the lamp and car companies, some eleven lamps now service 90 per cent of the cars. As a result of this standardization, the motorist today pays only 60 per cent of what he paid in 1920 for automobile type lamps.

Table 1 contains general information covering the eleven lamps commonly used. In addition to these

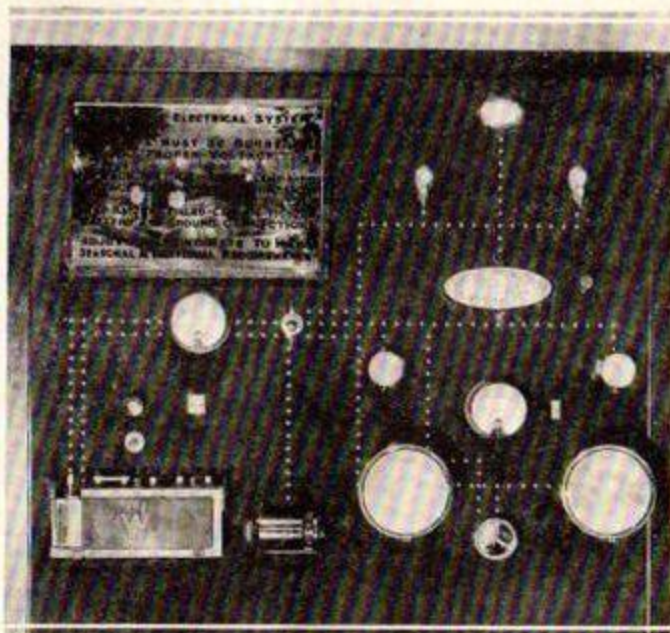


Fig. 2. This animated panel demonstrates the operation of the car lighting system

ing in the bulb and basing are fascinating to watch and almost human in action. A vast amount of research work by skilled laboratory personnel is being carried on continually to improve the quality and maintain a high-grade product. Practically all automotive lamps are of the gas-filled type which gives greater light output for a given current consumption and reduces bulb blackening throughout the life of the lamp.

Lamp Use

The headlamps on new cars generally use the two filament type of lamp shown as Mazda lamp No. 1110 in the table. This is the 21-21-candlepower lamp or in some cases the 21-32-candlepower lamp is used. The auxiliary lamps such as auxiliary head, cowl and rear generally take Mazda lamp No. 63 which is of 3-candlepower. For signal purposes a 15 or a 21-candlepower lamp is used. For interior lighting some cars use a 6-candlepower lamp, although a 15-candlepower lamp is recommended because it gives much better results. Instrument boards require either 3 or 6-candlepower lamps. These two lamps are made in the same size bulb so that they are interchangeable.

Car Lighting System

Fig. 2 shows a panel in the Lighting Institute arranged to explain and demonstrate the lighting system on a motor car. This system consists of a generator generally of the third brush type, a storage battery, ammeter, suitable switching equipment and necessary wiring. When the car is parked current flows from the battery through the ammeter and to the parking lights and tail lamp. The parking lamps may be either 3-candlepower auxiliary lamps in the main headlamps or cowl lamps. When the engine is running the current travels from the generator up to the ammeter and there branches, part of it going to the ignition and lamps and part going to the storage battery. The lamp circuit and the battery circuit branching from the ammeter are in parallel. The common return is through the car frame. Anything which happens in the battery circuit to raise or lower the voltage has a corresponding effect on the voltage in the lamp circuit. Lamps give normal life and normal light output only when operated at the proper voltage so that it is essential that the electrical system be kept in proper adjustment

to maintain suitable voltage at the lamp sockets. High voltage which means short lamp life results generally from one of three things:

- A—Too high charging rate.
- B—Loose connections in the generator, battery to ground circuit.
- C—Insufficient water in the battery.

The charging rate of the generator is controlled by adjusting the third brush. Moving this brush in the direction of rotation increases the charging rate, and moving it in the other direction decreases the charging rate. If the ground connection from the battery to the frame is corroded or makes poor contact, this increases the voltage in this circuit and consequently the circuit supplying current to the lamps. When the ground connection is entirely disconnected the gen-

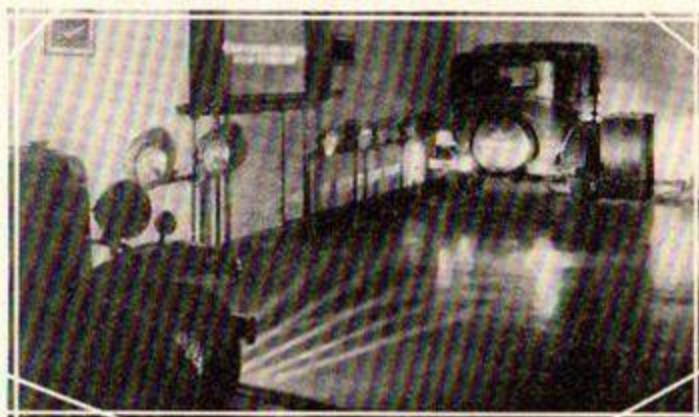


Fig. 3. These headlights are properly adjusted. Notice that the beam is well concentrated and strikes below the top of fenders on car ahead.

erator acts substantially as a straight shunt wound machine, the voltage rising at once and burning out lamps and field fuse.

Adjusting Lamps

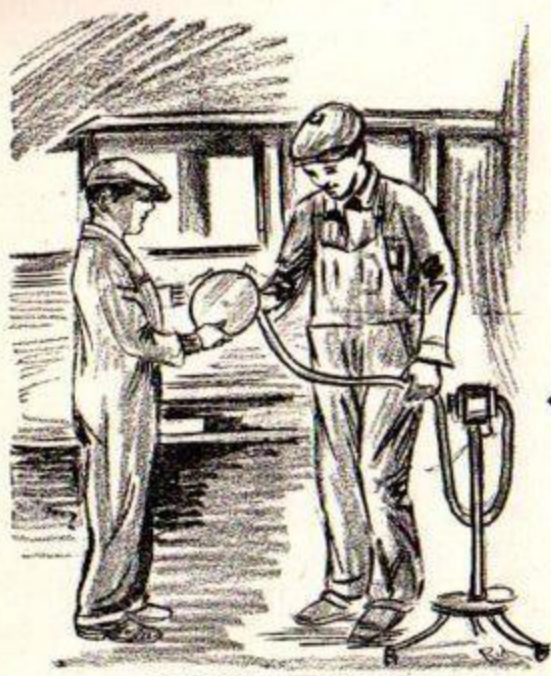
Dim lights may be caused by dirty reflectors or lenses or by too low a voltage at the lamp. In adjusting driving lamps the first step is to place the equipment in good condition. If the reflectors are tarnished they should be cleaned with a preparation of lamp black and

(Continued on page 30)

DATA ON ELEVEN LAMPS THAT SERVICE 90% OF THE CARS

Mazda Lamp No.	Service	Circuit Volts	Rated Candlepower	Bulb Diameter Inches	Base		Maximum Overall Length Inches
					S. C.—Single Contact	D. C.—Double Contact	
61	Auto., rear and inst. lp.	3-4	*2	3/4	S. C.		1 1/16
63	Auto., rear, inst. side, step, aux. hd. lp.	6-8	3	3/4	S. C.		1 1/16
64	Auto., rear, inst. side, step, aux. hd. lp.	6-8	3	3/4		D. C.	1 1/16
67	Auto., rear, inst. side, step, aux. hd. lp.	12-16	3	3/4	S. C.		1 1/16
81	Auto., dome and panel lp.	6-8	6	3/4	S. C.		1 1/16
87	Auto., signal and backing lp.	6-8	15	1	S. C.		2
1110	Auto., head lp. depressible beam	6-8	21 } 21 }	1 1/4		D. C.	2 3/8
1129	Auto., head and spot lp.	6-8	21	1 1/4	S. C.		2 3/8
1133	Auto., head and spot lp.	6-8	32	1 1/4	S. C.		2 3/8
1141	Auto., head and spot lp.	12-16	21	1 1/4	S. C.		2 3/8
1158	Auto. hd. lp. for Ford cars wired for 2 fil. lp.	6-8	21 } *2 }	1 1/4		D. C.	2 3/8

* Nominal.



THE TOUCH-UP JOB

PART TWO OF "REFINISHING AUTOMOBILES"

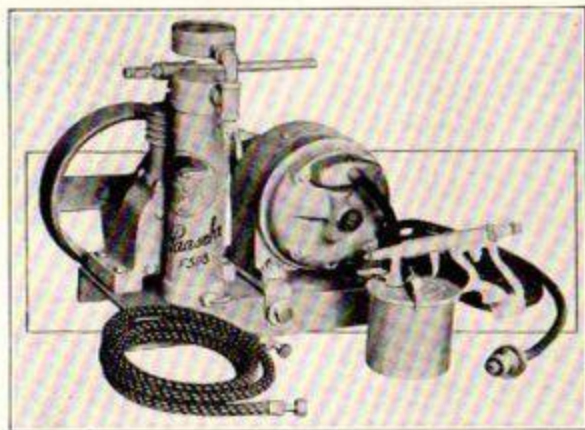
BY RAY. E. KUNS

SINCE the used car dealer sells his merchandise very largely on looks, and since there are relatively large numbers of cars with their finishes in fair condition finding their way into the used car dealers' stocks, quite a business of retouching has been developed. Another condition which has resulted in building the touch-up business to great volume is the fact that traffic conditions are more and more congested and almost every car on the highways will come to greater or lesser grief within any one twelvemonth and need to have some of the surface restored if the job is to be kept looking its best and if the surface is to be protected.

With the lacquers it is much easier and more practical to match colors than with the older paints or color

anteeing certain good results when his materials are used with thinners or lacquer reducers of his own production or recommendation. Another manufacturer may use different solvent specifications and blends, which are likewise good. But the two products may not mix well.

Colors of almost any shade may be matched by mixing the shades of one manufacturer and the job in need



The smaller paint outfits require only to be plugged in and a little space on the bench and they are "on the job"



Such a portable painting outfit has distinct advantages

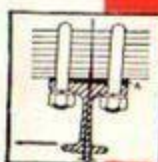
of touch-up work or the refinishing of a hood, a cowl or a newly repaired fender or panel may be readily accomplished. If the job is properly handled it goes to the customer or onto the sales floor with much of the appearance of the new car in its show room.

While the requirements for a satisfactory touch-up job are all of those required for a complete refinishing job, if any of the work is down to the metal, this article will deal with the technique of touching-up only. Later articles will deal with the problem of getting the job cleaned down to the metal and the new paint surface built up. It is a recognized fact that many shops go in for the touch-up work while they would not undertake the complete repaint job. Instructions given in this articles are rather meagre, in so far as the real process of preparing the work and applying the enamel is concerned, but it must be remembered that the space available is limited, and to cover the field properly would require many pages. On the other hand the first article

varnishes. As long as the lacquers used for mixing, when seeking a color, are all from the same factory it is not difficult to secure the desired shade. However, best recommendations are against mixing the several colors produced by different manufacturers since the solvents may vary in the several items, and any attempt to mix them would give poor results. In this connection it must be remembered that each manufacturer is guar-

THIS SHIM ENDS SHIMMY

WANDERING
WEAVING
HARD STEERING



Simply drive the Shim between the axle and spring to change the tilt or caster of the axle. Done in five minutes.



TIRE SCUFFING
PITTING
CUPPING
GOUGING

AND THE BEAR AXLE GAUGE SHOWS HOW!

THE CAUSE IS IN THE AXLE

Wrong caster or tilt of the axle causes most cases of shimmy. The Bear Axle Gauge checks caster in five minutes without removing either axle or wheels. Also shows bent or twisted axles and discovers hundreds of dollars of repair jobs every month.



PUT AN END TO GUESS WORK

Only by finding the cause and aligning cars accurately can you correct steering and tire trouble. Most alignment troubles originate in the axle—if the axle is out of line, it is impossible to line up wheels. You need the Bear Axle Gauge in your shop—the basic tool of all alignment service.

BEAR SYSTEM OF ALIGNMENT

Send the Coupon

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DETAILS ABOUT
THE BEAR
ALIGNMENT
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CORRECTS EVERY FORM OF MISALIGNMENT BY FINDING AND CORRECTING THE CAUSE. ACCURATE TOOLS AND GAUGES CHECK EVERY ALIGNMENT ANGLE AND FIND EVERY POSSIBLE SOURCE OF TROUBLE. THE BEAR SYSTEM OF WHEEL AND AXLE ALIGNMENT IS USED AND RECOMMENDED BY ALL LEADING AUTOMOBILE AND TIRE MANUFACTURERS IN THE COUNTRY BECAUSE IT IS THE ONLY METHOD THAT RETURNS THE CAR TO MANUFACTURERS' SPECIFICATIONS

BEAR MANUFACTURING COMPANY,
Dept. 411, Rock Island, Illinois.
Gentlemen: Send me without obligation full information about the Bear System of Wheel and Axle Alignment, Bear Tools and Gauges, and your new Home Study Course in Alignment.
Name
Address
City
State

recommended a number of helps in mastering the technique of the job and suggested books and other ready helps. Nor should the would-be painter fail to make use of his jobber and paint salesman. These men are anxious to have him succeed and should, if called on, be willing to come out and help "hold a clinic" on the job. So it must be remembered that the following suggestions are rather a "skeleton" of the procedure.

The most usual failures of lacquers are due to three causes. The first is accidental injury, which may be mere scratches or whole panels requiring handling. The next is the fading of the original color and failure of



With the portion to be refinished properly prepared, a good refinisher can do a "like-new" job in short order

the lacquer due to heat, evidenced around the hood, cowl and deck, where the sun rays hit the job directly. The third is the result of continuous polishing and leaves the color thin with the metal exposed. Still another and fourth cause is failure due to chipping or peeling. This is because the original metal

was not cleaned properly, the metal rusted, or the undercoats of the job were not of proper grade or properly applied.

Touching Up the Scratches

Scratches or abrasions in the enamel or lacquer may be through the color coats only. In this case the first thing to do is to use some very fine sandpaper of the so-called "wet" or waterproof type and carefully sand down all edges of the scratch. That is the edges of the color are tapered off or "feathered out" so that no edge of the color shows. The next step is to use the spray or touch up gun and run on successive coats of matched color to build up the surface to its original thickness and hue.

In case the scratch or injury is through the color and the undercoats as well, then it will be necessary to sand down the injury until all irregularities are removed and a portion of the metal exposed. If any displacement of the metal has occurred as in the case of dents or dings, then, of course, the repairs of the metal are first made and the process of preparing for the paint follows the repairs.

After the sanding has been completed, then it will be necessary to give the metal a coat of metal primer. Next, and after the primer coat is thoroughly dry, comes one or more coats of surfacer, and when these are dry and sanded down to a hard, smooth surface the color coats of the lacquer are applied.

In some cases deep scratches are filled with a paint

October Automobile Digest carried part one of this series and took up the merchandising and business side of re-finishing. This article deals with the technique of the touch-up job and future installments will cover the problems of getting the job cleaned down to the metal and the new paint surface built up.

or lacquer glaze run in with the putty knife and treated with a coat of surfacer, which is then sanded before the color coats are applied.

Touching Up the Repaired Panel or Fender

This is really a repaint job. The same care which is necessary for building up a lacquer or enamel job from the metal must be followed. Briefly the usual practice is about as follows: The metal is worked out as smooth



Modern equipment is made for ease of operation and speedy work. Guns have a pistol grip and the paint cups are readily refilled.

as possible by the repairman and all dents or dings are either hammered out, shrunk out or filled with solder.

Clean the surface to be refinished most carefully. Oil,

wax, grease or dirt are fatal to the new finish. Likewise any rust particles. Use benzol to go over the surface and follow this with high test gasoline.

The first coat to be applied is the metal filler, which is used as a bonding agent to hold succeeding coats to the metal. The next step is to use paint or lacquer glaze or putty to fill out the irregular places and build them up. This glaze is applied with the painters' glazing or putty knife. A little practice will allow the surface to be built up over the irregularities which may have resulted from the accident or from the repair methods, such as welding, in a smooth fashion. When the glaze or putty has hardened it is sanded down with a fairly coarse grade of sandpaper and then finished off smooth with a finer grade.

Unless there are marked irregularities the glazing is not resorted to, but the several coats of surfacer which follow the metal filler are depended on to fill out the surface and give a body on which to work with the sandpaper when working down to a true surface. The beginner should always keep in mind the fact that it is impossible to get a good finishing job with a poor under body. Lacquer does not build up a body as readily as the older forms of paint. On the other hand, if the under surface is smooth the enamel color will require little work to bring out the luster and finish.

When the new panel is dry and has been sanded smooth with the No. 180 grit or water proof paper the workman prepares it for the color by dusting it off with the painter's duster. The surrounding surfaces are protected from the color to be applied by means of a covering or paper shield pasted in position over the surfaces

(Continued on page 36)

THE PRESTIGE

THAT COMES FROM

GOOD MERCHANDISE

1929 has proved to be one of the most exacting years in automobile history. The public has been more critical of values . . . has demanded more for its automobile dollar . . . has insisted on having nothing short of the highest quality at the lowest possible price.

In such a year as this Chrysler Motors products invariably show to their best advantage. And Chrysler Motors dealers reap the benefits.

Chrysler Motors dealers have never had inferior merchandise to sell. They have never had to live anything down.

The more critical the public has been in its comparisons the greater values

Chrysler Motors products have proved themselves to be by every comparison.

Thus, dealers affiliated with every division of Chrysler Motors have had a decided advantage . . . have strengthened their position in public approval . . . have added to their reputations for offering outstanding merchandise.

And Chrysler Motors dealers—the merchants who sell Chrysler, Dodge, De Soto and Plymouth cars, Fargo commercial vehicles and Dodge Brothers Trucks, Buses and Motor Coaches—can approach the future without misgivings—certain that they will add to their prestige and entrench themselves more strongly in public approval.



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Chrysler Motors Products Include:

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For efficient brake service

Raybestos

BRAKE SERVICE EQUIPMENT

1375



WITH this complete brake service equipment, the serviceman has everything necessary for brake service work.

Equipment Includes

Raybestos Brake Tester,
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Raybestos No. 4 Combination drilling and countersinking machine, riveter, rack for rivets and stock of rivets.

Raybestos C & G Super Wheel Puller with complete set of 24 adapters.

Raybestos Drum Lathe.

Trues inside or outside of drum without removing drum from wheel or removing or deflating tires. For passenger cars or with truck attachments.

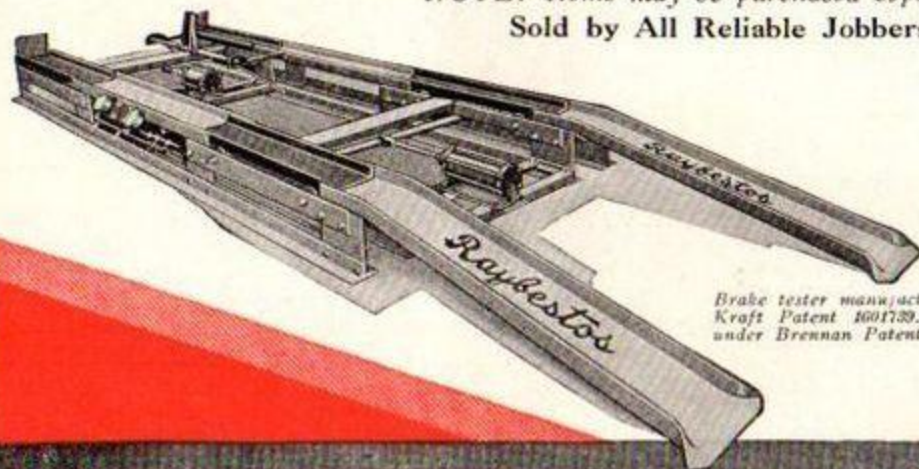
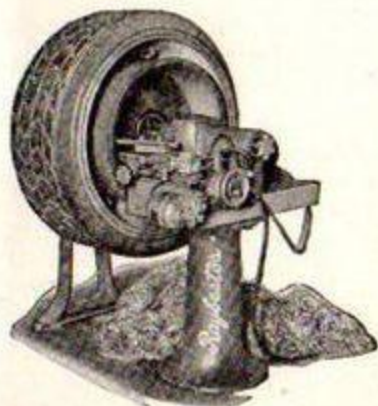
Raybestos Brake Lining (molded or woven) and stock of merchandising helps.

Extra Equipment if Desired

Raybestos Air Jacks and Pneumatic Pedal Depressor to be used in conjunction with brake tester may be obtained if desired. Raybestos Air Jacks \$125. Pneumatic Pedal Depressor \$30.

NOTE: Items may be purchased separately.

Sold by All Reliable Jobbers



Brake tester manufactured under Kraft Patent 1601739. Licensed under Brennan Patent 128470.

For every type
of brake

Raybestos

BRAKE LININGS

THE Raybestos line includes every essential type of lining for every automotive brake. With this *one* line it is possible to meet all replacement requirements. Here is the outstanding leader of the industry—a *quality* lining with generous profits for jobber and serviceman.

Raybestos Woven Linings: Silver Edge for passenger cars and light trucks and Gold Edge for heavy duty.

Raybestos Molded in Rolls: A semi-flexible molded lining in 50-ft. continuous rolls. Possesses long life, uniform thickness.

Raybestos Molded Segments: Each segment molded for a particular model of brake in accordance with manufacturers' specifications.

Hycoc Hydraulic Compressed: Particularly adapted for heavy duty. Ground on one side to permit immediate seating.

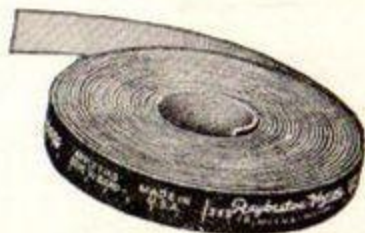
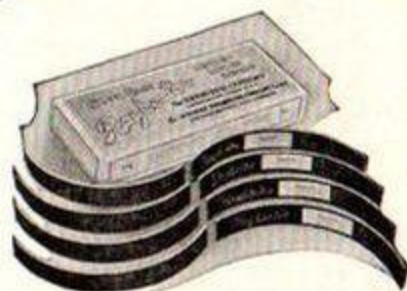
Brake Linings for Ford and Chevrolet

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THE RAYBESTOS DIVISION
of
RAYBESTOS-MANHATTAN, Inc.
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Clutch Facings—Fan Belts—Car Washing Hose—Hose for Filling Radiators—Air Hose—Windshield Wiper Hose—Welding Hose—Generator Tubing—Hand Pump Tubing—Car Mats.



On the Air "THE RAYBESTOS TWINs"

Every Friday at
6:30 P.M. (Eastern
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Over WEA, New
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*Prepare your
direct - mail
early and name auto-
motive gifts in price
groups*

MANY automobile dealer establishments, garages, service stations, etc., did the best Christmas business ever last year. More of these automotive merchants will do even a greater business this year, and those who get the major share of this easy patronage will be the ones who plan early to attract the attention of Christmas shoppers and who keep hard after this trade right up to Christmas eve.

There are many tricks in getting the holiday business. Let's look, then, at some of the ways which proved so successful last year and how these enterprising individuals will go after a bigger share of Christmas trade this year. In this way the reader may glean some worth-while ideas and suggestions for his own profit.

First of all it is well to realize that *everything* offered for sale by the automobile dealer, automobile retail store, garage, filling station, etc., is appropriate for use as a Christmas present. This includes such things as gasoline and oil books, repair work, paint jobs, sets of spark plugs, tires and inner tubes, accessories of all kinds, used cars, robes—everything offered for sale in any automotive establishment anywhere in America.

This means, then, that the only thing necessary in order to promote the sale of all automotive items at Christmas time is to display them and advertise them

Get After Christmas

By FRANK H. WILLIAMS

in such a way as to make the public realize their value for Christmas giving and to sell them in such a way that folks will feel perfectly satisfied with the articles for holiday use. This, in turn, means a hammering away on the matter with newspaper advertising, direct-mail advertising, extra attractive window displays, special store illumination and decorations, Christmas sales tables and so on.

Also it means something that some establishments overlook and which may be at the bottom

of the reason why they don't do so well at Christmas time—namely, that to make items attractive to Christmas shoppers and thus increase the sale of the goods, they must be packaged in a Christmassy, appealing, snappy manner. Otherwise people simply won't buy them.

Christmas-time may be said to be the gay package time of the year. To most people the packages in which their presents go to recipients are just about as important as the gifts themselves. Many people will walk a mile to get a



Garage merchandise orders have a wide appeal. For gas, repairs or accessories



Christmas tree display employed by a California "Super" last year. It was illuminated all night and proved a splendid business-getter

Patronage Early

widely sold article at some one special store simply because that store has the reputation of doing up Christmas gifts in the "most wonderful" packages of any store in town. Bright, attractive, gay packages are the very essence of Christmas in these modern times and the automotive concern which packages its items

accordingly for those folks who buy them for Christmas giving, is sitting pretty and is bound to get a major share of the Christmas business.

Since this is the case it becomes evident that those automotive concerns who pound hard in their advertising on the fact that they package gifts in especially appropriate and attractive

ways for Christmas giving, will attract the most attention. And many automotive concerns find it a splendid proposition to use special window displays for the showing of the packages, wrapping papers, twines and ribbons they use in doing up articles which are bought for Christmas giving.



The Christmas packing is half the sale

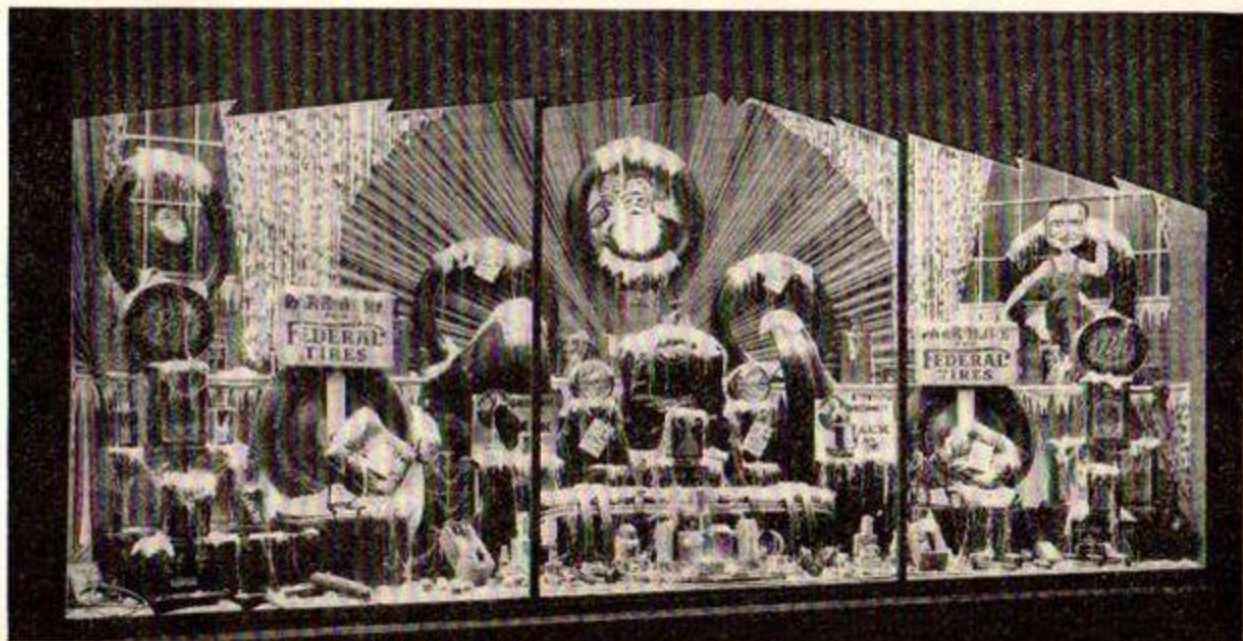


Open-table displays are inviting

Extremely important, too, in getting plenty of Christmas business is the proposition of making the automotive establishment look like a Christmas store. One of the biggest joys of Christmas shopping to the average person consists in visiting stores which are wonderfully decorated and illuminated for the Christmas season. That's why the department stores go in for tremendously elaborate holiday decorations and get such huge throngs of people into their establishments at this time of the year. That's why, too, some diminutive little stores which go in for fascinating Christmas packages and really remarkable Christmas illumination, get such a splendid volume of Christmas trade.

It isn't hard to give a Christmas air to the automotive establishment nor is it necessary to spend much

Like the department store gift window at Christmas time, this accessory dealer's window has sufficient variety and "atmosphere" to make the shopper stop and buy



Here's
the

New "U X" MODEL

Wet or Dry, the



HALL has always recommended wet honing and still does in spite of speed claims of dry honing propagandists. In this new Model UX, HALL makes honing possible at greater speed than any wet or dry hone you ever saw, and insures a polished, glass-smooth finish. And should you choose to use it for dry honing, this new HALL model offers greater speed and finer finish than any so-called dry Hone on the market today.

One Tool Handles All Jobs

This new HALL model comes complete, ready to handle any cylinder diameter from $2\frac{3}{4}$ to $4\frac{1}{2}$. No extras to buy.

Half-inch Drill Swings It

Solid and sturdy in construction, yet light enough to operate perfectly with any good $\frac{1}{2}$ -inch Drill.

Costs Less to Buy; Less to Operate

A precision-built tool, lower in first cost than any other tool approaching it in efficiency. Long wearing HALL stones and fibre blocks cost less to buy and use. These facts, plus its greater speed, mean more profit per job. Tool complete in metal box, at its advertised price.

Micrometer Set; Two Stones Two Fibre Blocks

Equipped with the HALL Micrometer Set which eliminates the guess-work and insures speed and accuracy with no danger of going too far oversize in any cylinder.

Tool is fitted with two HALL stones and two special fibre blocks which wear equally with stones. Tool comes complete with roughing and finishing stones and fibre blocks.

Universal Range

HALL HONE

Fastest Hone You Ever Saw

WHEN Better Hones Are Built, HALL Will Build Them! That has been proven again and again . . . in early HALL models . . . later in the HALL Model X Hone which outsold all other hones combined, and now in this new UX HALL Hone in which is incorporated the successful design of the Model X, plus increased range and greater speed than offered by any other Cylinder Hone or Grinder.



Companion to the Model X Hone

The Model UX does not replace the Model X, the world's fastest selling Hone but is the companion to it. Model X is made in three ranges and is strictly for wet honing. It has long 6-inch stones and insures the finest possible finish. **\$39⁷⁵**

Ask Your Jobber or Write for Circular

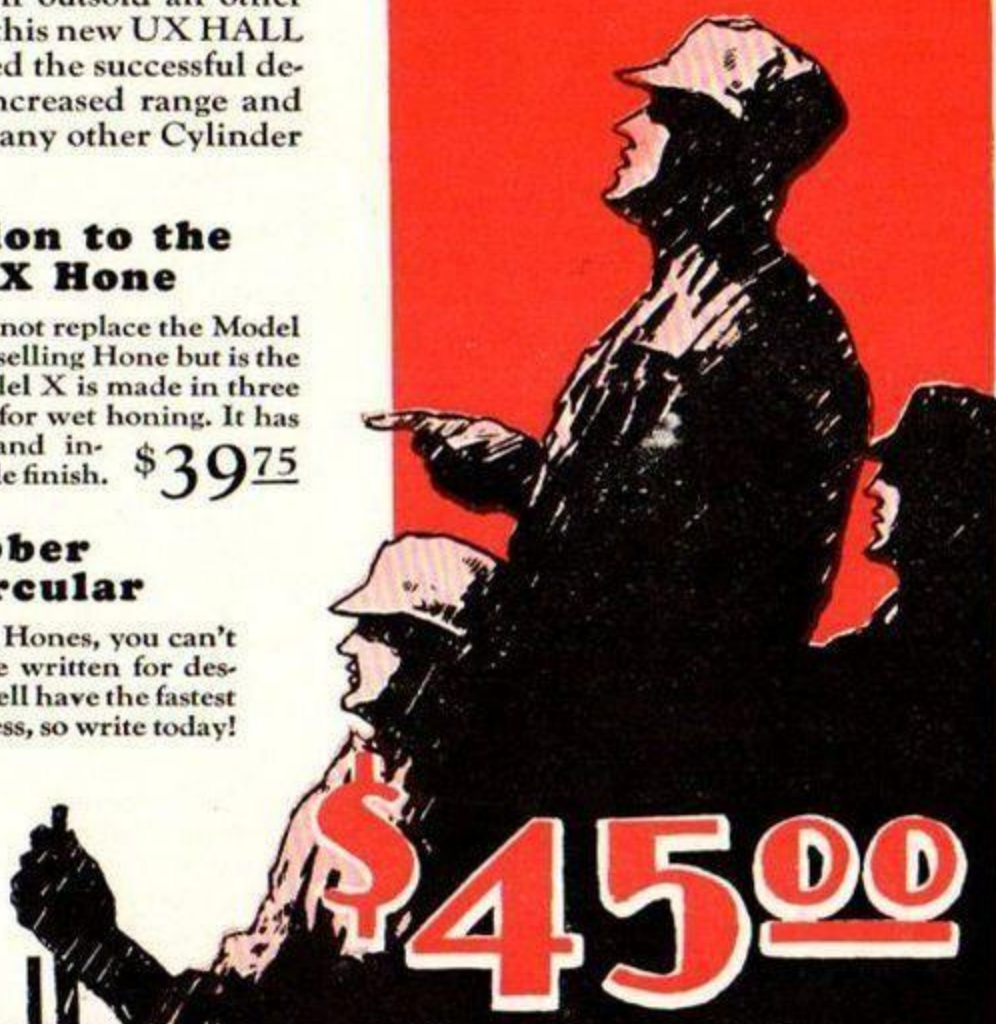
If your jobber hasn't these HALL Hones, you can't afford to buy a Hone till you have written for descriptive literature. You might as well have the fastest and best, especially when it costs less, so write today!

THE HALL MANUFACTURING CO.

1650 Woodland Ave.

TOLEDO, OHIO

In Canada: The Hall Gear & Machine Co., Ltd.
Toronto, Ontario



Complete with waste-receiver set \$52⁵⁰

Operates Wet or Dry

As the Mercury DROPS Profitable Sales JUMP!

ENGINITE will rid radiator and cooling system of rust, scale and corrosion.

Why not help your customers to complete the job? And at great profit to YOU! Tell 'em why

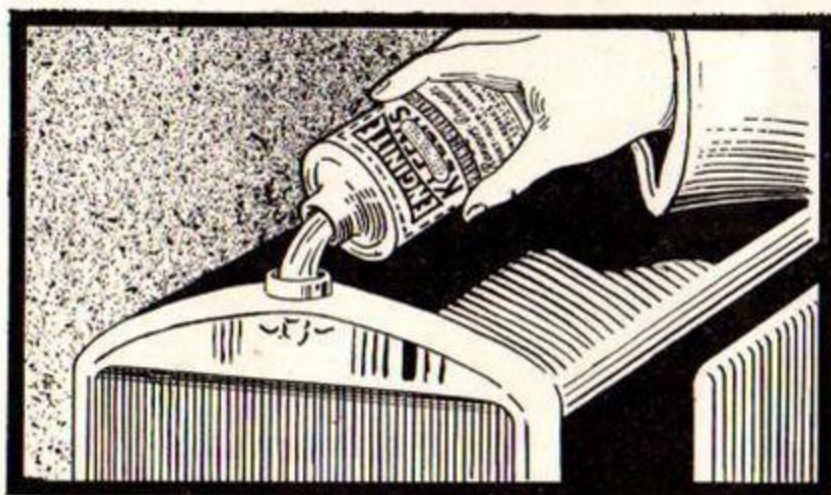
they should clean out the clogged water system—get rid of the power-consuming engine-heating, water-boiling rust, corrosion and scale. It's done in a jiffy with

ENGINITE

THE WONDER FLUID

Reg. U. S. Patent Office

Worldwide Distribution



Here's what harmless, non-inflammable Enginite does: Dissolves all rust, scale and corrosion deposits that are in the radiator and water jackets and keeps the whole circulation system clean as a whistle. A sweet-purring power-plant, more zip, heaps of energy, every ounce of fuel doing duty—no more cracked engine blocks, premature boiling over; just clean, engine-pepping

water flowing without obstruction through the cooling system.

Tell your customers that ENGINITE positively keeps the water system at the proper temperature winter and summer. It prevents overheating and promotes general motor efficiency. \$1 can good for four treatments, or 4,000 miles. Ask for the can with the green top.

Anti-freeze preparations will only give 100% efficiency when rust, scale and corrosion is first removed with Enginite.

Enginite may be used with or without anti-freeze preparations.

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119 West 41st Street, New York, N. Y.

- ☐ Send me dealer's proposition on your attractive display box of 12 cans or send \$7.29 for trial dozen order prepaid.
- ☐ I enclose \$1.00 (25c extra west of Rockies and Canada). Send me 4000-mile trial can of Enginite.

Name
Address
City State

Other Suggestions for ENGINITE

Removes Rust, Scale, Corrosion from Domestic Hot Water and Steam Heated Systems, Boilers, Tanks, Etc.

Go Into Business for Yourself. Apply for an Exclusive County or State Franchise. A Very Attractive Proposition is Offered Responsible Applicants. Sales Field Includes Service Stations, Garages, Hardware and Accessory Stores, Plumbing and Heating Contractors.

TIMESAVER

Lapping and Grinding Compounds

Offers Garages More MONEY-MAKING OPPORTUNITIES

These nationally known concerns pay a higher price (quite a bit) for Timesaver than for other abrasives because it saves them time, labor and money—and because no other abrasive on earth will do what Timesaver will do for them. Profit by their experience.

Buick Motor Car Company
Cadillac Motor Car Company
Chevrolet Motor Car Company
Chrysler Corporation
Hupp Motor Car Corporation
Oakland Motor Car Company
Saginaw Steering Gear Division
(General Motors Corporation)
A. O. Smith Corporation
General Motors Export Company
American Nokol Corporation
Austin Manufacturing Company
Brunswick-Balke-Collender Company
Chicago Great Western R. R. Company
Chicago Surface Lines
Chicago Motor Coach Company
Chicago, North Shore and Milwaukee R. R. Company
Chicago Rivet and Machine Company
Commercial Solvents Company
Continental Can Company
C. & N. W. Railway Company
Cooke Seal Ring Company
Fairbanks, Morse & Company
Marshall Field & Company
Foote Bros. Gear and Machinery Co.
Hartford Special Machinery Company
W. A. Jones Foundry and Machinery Co.
Link-Belt Company
Moline Tool Company



TIMESAVER Cannot Imbed in Metal...

Timesaver allows you to lap worms and sectors with off-center high spots without removing the steering gear from the car. One of the country's largest automobile manufacturers is now doing it.

Here is an excerpt from the instructions recently issued to its dealers by the automobile manufacturer mentioned:

"We have been experimenting with this compound for some time, and the results have been very successful . . . in many cases avoiding the necessity for replacing the worm and sector."

"Do not substitute any other abrasive," the company instructed, adding:

"Timesaver has special properties in that it loses its abrasive character after a few minutes of lapping."

"It is this characteristic that makes it possible to use it in the steering gear without danger of continued grinding action."

"Although Timesaver is expensive, the labor saved and the results secured will more than offset the cost."

As a matter of fact that you can prove to yourself, Timesaver actually costs less than ready-mixed abrasive compounds. **TIMESAVER IS SOLD IN DRY POWDER FORM ONLY.** Mix 1½ ounces of Timesaver with oil and you have at least **FOUR OUNCES** of abrasive compound.

Investigate! Get booklet . . . giving you dozens of money-making suggestions and ideas, and complete instructions for cashing in on them. Write for this booklet at once . . . today!

Abrasive Engineering Laboratories, Inc.
117 N. Jefferson St., Dept. C-4 Chicago, Ill.

ABRASIVE ENGINEERING LABORATORIES, Inc.
117 North Jefferson Street, Dept. C-4
Chicago, Illinois

Gentlemen:

Please mail me booklet, which contains dozens of money-making suggestions and ideas for garage repair shops . . . and complete instructions for cashing in on them.

Name

St. No.

Town State

My Jobber is

NOTE: If you want to try Timesaver at once, send check, money order or dollar bill for a 1½-oz. can of Timesaver . . . stating whether for use on hard or soft metals.

HELPS ON HEADLIGHTING

(Continued from page 15)

alcohol. If too badly tarnished or rusted, replace the reflectors by new ones or have old ones resilvered. The wiring should be checked to make sure that the plug at the back of the headlamp makes good contact and is not corroded, and that the circuit fuse is in good condition. Lenses should be cleaned and properly placed in the reflector with the name of the lens at the top of the lamp. Gaskets should be removed if broken to prevent the entrance of moisture or dirt. Work on one lamp at a time, having the other covered. First focus the lamp by means of the screw at the rear of the housing to give the form of beam and then move the entire headlamp backward or forward to aim this beam so that the top is about parallel with the road surface. In case of doubt, consult instructions pertaining to headlamp adjustment which are contained in the car instruction book.

Fig. 3 shows a properly adjusted beam and you will note that the top does not rise higher than the fenders on the car ahead. This means that the light is thrown down onto the road where it is useful and is not thrown



Fig. 4. A new type of testing photometer's widely used in the State of Washington

above the horizontal where it is a source of glare and annoyance to oncoming drivers. Where sufficient adjusting business is obtained to warrant the expenditure, an adjusting station can be set up consisting of a track on the floor or a painted mark at right angles to a wall or white screen about 25 feet away. A suitable adjusting screen can be made of a piece of composition board 4 feet high by 8 feet long, mounted on a frame so that it will stand of its own accord 25 feet in front of the car being adjusted.

Fig. 4 shows the latest type of adjusting screen which is widely used in the State of Wisconsin, which is a photometer, indicating the intensity of the light in different parts of the beam.

Most states have definite requirements in the law or have regulations issued by the Commissioner of Motor Vehicles pertaining to the adjustment of headlamps upon motor cars. Many states have officially appointed headlight adjusting stations and issue complete regulations governing the procedure in these stations. In general, the car is placed 25 feet in front of

the wall or screen on a level ground. The lamps are focused and then aimed so that the beam will not rise above horizontal.

Trouble Shooting

For dim lights inspect the wiring, particularly the plug at the rear of the headlamp. Also examine the reflectors to see that they are clean. Also see that the charging rate is properly set and that the battery has sufficient water in it.

When lamps do not give satisfactory life this is an indication that the voltage is too high which may be caused by too high a charging rate, no water in the battery or loose connections. The required charging rate varies on different cars and for different drivers. In the case of a doctor who makes frequent starts and stops a higher charging rate is required than for a driver who drives at high speed through the country on long trips.

In general, a higher charging rate is required in winter than in summer.

Loose connections in the generator, ammeter, battery ground system are sometimes hard to find but whenever excessive voltage is indicated, this trouble can, in practically all cases, be eliminated by checking and rechecking this part of the electrical circuit.

Spotlight and auxiliary driving lights should be inspected to make sure that they are firmly attached to the car and are in good operating condition. Interior lighting can be improved through the use of larger candlepower lamps and for all dome units we recommend using at least 15-candlepower lamps.

Incandescent lamps are tested and retested in the factory before they are sent out to the customer and whether or not they give satisfactory service in actual use depends on the condition of the car lighting system. The car manufacturers have made great improvements in the wiring in the last few years so that complaints are growing less and as a rule the complaints are of the type which can be easily remedied by the service station. Headlight glare can also be greatly minimized through proper adjustment of the headlights. This not only makes conditions on the road better for other users, but greatly improves the road light and makes for the safety of the car driver.

FREE SERVICE TO EXHIBITORS

The Service Booth of AUTOMOBILE DIGEST was such a pronounced success at the M. E. A. and N. S. P. A. Shows last year that a similar service will be repeated this year.

For the many and sundry items which you might be in need of—from mucilage to a hatchet—call on us at

Booth 144, M. E. A. Show, Chicago
Booth 248, N. S. P. A. Show, Detroit

"We must be serving to be happy"

Like a great river, which starts as a rivulet and grows in size as it progresses, the public's demand for eight cylinder automobiles is increasing each month. The figures below tell their own story—a 94% increase in eights above \$1000, a loss of 18% for sixes in the same price field. Today,

Studebaker is the world's largest producer of eight cylinder cars. But in addition to three great lines of eights (\$1185 to \$2350) Studebaker also supplies its dealers with three lines of sixes (\$860 to \$1475). Fortify your business today, as well as for the future, by investigating the Studebaker franchise.

New Car Registrations

STATES	Percentage of increase or decrease first 7 months of 1929 Compared With Same Period in 1928	
	Sixes Over \$1000	Eights Over \$1000
Alabama	.1—	99.+
Arizona	3.—	503.+
Arkansas	16.—	19.+
California	*	*
Colorado	16.—	105.+
Connecticut	19.—	105.+
Delaware	25.—	52.+
Dist. of Col.	*	*
Florida	33.—	33.+
Georgia	35.—	46.+
Idaho	28.—	85.+
Illinois	12.—	110.+
Indiana	13.—	145.+
Iowa	27.—	127.+
Kansas	*	*
Kentucky	19.—	139.+
Louisiana	19.—	45.+
Maine	20.—	94.+
Maryland	17.—	86.+
Massachusetts	18.—	102.+
Michigan	17.—	88.+
Minnesota	15.—	156.+
Mississippi	21.—	54.—
Missouri	16.—	76.+
Montana	9.—	161.+
Nebraska	25.—	100.+
Nevada	38.+	138.+
New Hampshire	21.—	51.+
New Jersey	*	*
New Mexico	2.+	107.+
New York	18.—	86.+
North Carolina	27.—	65.+
North Dakota	18.—	121.+
Ohio	18.—	81.+
Oklahoma	*	*
Oregon	11.—	92.+
Pennsylvania	20.—	89.+
Rhode Island	12.—	138.+
South Carolina	27.—	94.+
South Dakota	14.—	176.+
Tennessee	12.—	106.+
Texas	20.—	60.+
Utah	15.—	191.+
Vermont	5.—	185.+
Virginia	15.—	81.+
Washington	12.—	251.+
West Virginia	16.—	64.+
Wisconsin	*	*
Wyoming	16.—	51.+
Average 43 States	18.—	94.+

* Registration figures (at least for 1928) not available according to Engine Model.

The Studebaker Corporation
of America

Dept. 91, South Bend, Indiana

The Studebaker Corporation of Canada, Ltd.
Walkerville, Ontario

MARVEL MYSTERY OIL

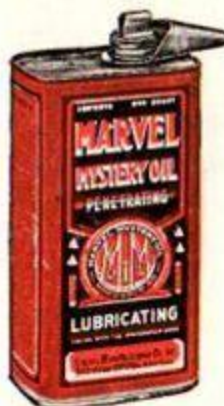
YOUR OWN GOOD "JUDGMENT"

is what we have faith in and it has not been misplaced. Marvel Mystery Oil is sold in every state in the Union and has the O. K. of the largest airports, factories, railroads, automobile service stations, in fact wherever Marvel Mystery Oil has been introduced it has established a firm hold and made friends.



IN COLD
Flows at -70°F

IN HEAT
Lubricates at $+700^{\circ}\text{F}$



MARVEL MYSTERY OIL, a clear, light, lubricating oil, will blend quickly with any oil, grease, or lubricating compounds, keeping them from becoming solid when cold and lending to them Marvel Mystery Oil's own high lubricating value.

MARVEL MYSTERY OIL frees sticking motor valves and is the ideal lubricant for all types of upper-motor lubricators or oilers.

(**FREE** ask for chart and learn about
MARVEL MYSTERY OIL)

Sold Thru the Jobbing Trade

EMEROL MFG. CO.,

242 West 69 St., New York, N. Y.



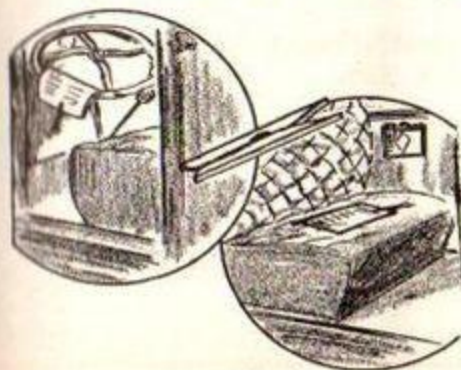
GET A CLOTHESPIN! By GEORGE N. KRAMER

THE problem of choosing just the right type of service chart, especially for use in the super-station, has troubled many. This applies not only to the size and shape of the sheet, but also to the quality of paper used. If it is too light, the wind blows it away and it cannot be slipped under the windshield wiper; if it is too heavy, it is too bulky to handle in the office records.

The long sheet, about 4½ by 11 inches, on 20-lb. white bond paper, with the services listed down a single column, is found by many to be the best all-around kind to use. In the first place, the size cuts out exactly, as the printer will tell you; and if you asked for a 11½ or 4½ length or width, there would be an extra charge because of waste in cutting the paper. An inexpensive 20-lb. weight is strong enough to withstand the handling at the various departments and is not too bulky for the office files. Again, done up in pads of 100, or 50 if duplicates are used, they are handy for the salesman to carry around with him, and the single column entry is pleasing to the eye and not as confusing as where the double column is employed.

Whether duplicates are used or only claim checks given, the sheets must be numbered. If the claim check system is employed, the perforated stub, which must be numbered the same as the sheet, should be no less than an inch and a quarter wide; otherwise it is too narrow and the customer might lose it or have trouble finding it in his pocket. Many have tried the heavier paper, some using what would correspond to the texture in a government post card, but this did not give satisfaction, even though it provided a claim check that was better to handle. In the first place, the buff color

was an objection because the writing did not stand out well on it; secondly, it was too bulky for office records; and it made too large a pad for the salesman to carry about conveniently. If this weight



(Continued on page 38)

NO NAME SUPER SERVICE STATION

999 South Uptown Avenue

No. 13131

Someplace, California

Date..... Salesman.....

Patron

Address

Car.....Type.....License No.....

WASHING

POLISHING

Nickel

Top dressing

CLEANING

Motor

Chassis

LUBRICATION

Springs

Clutch

Snubbers

Universal lbs. at

Differential lbs. at

Transmission lbs. at

Oil—kind qts. at

Flushing oil qts. at

Misc. qts. at

BRAKES—Adjusted

Relined

Wheel alignment

Miscellaneous

TIRES

Tubes

Repairs

IGNITION—Automotive

Battery—new—rebuilt

Battery repair

MISCELLANEOUS

Gasoline

Accessories

General repairing

Total

CLAIM CHECK

NO NAME SUPER SERVICE STATION

999 South Uptown Avenue

Someplace, California

No. 13131

Saleman.....

Questions & Answers

By THE TROUBLE MAN

Repaired Battery Will Not Hold Charge

Q. I sometimes have the experience of having a battery in which new positive plates have been installed, which will not hold its charge as long as other batteries, repaired for similar defects. Is there any explanation to be offered for this result?—H. R. L., Grand Rapids.

A. In charging a battery in which new positive plates have been installed, an important feature is to take into consideration the condition of the negative plates. One of the requisites is that the new plates be fully charged, and this may take considerable time. In the case you mention of

positive and negative plates and give assurance that both sets of plates in a cell are fully charged. The cadmium readings can be made regularly throughout the charging operation. If you are not familiar with this test, the method of making it is illustrated. A pair of steel prods are used and a stick of chemically pure cadmium is used which is threaded at right angles to one of the steel prods. The prods are attached to large handles and the cadmium protected by a rubber button on the end of the stick so that the metal does not touch the plates. The meter should be calibrated to 0.3 volts to the left of zero and 2.7 volts to the right. The cadmium stick should always be placed in a solution of sulphuric acid before using so that there is a slight formation of cadmium sulphate on the stick, otherwise this sulphate would form after some readings have been taken and an unreliable record would be obtained.

Servicing the Bulb Type Battery Charger

Q. H. M. Garage, Toledo, Ohio, who inquires regarding the servicing of the bulb type battery charger, will find the following information on troubles which may arise of value.

A. We believe your question can best be answered by giving you reports on a few service calls, cases when jobbers had reported serious trouble; type or make of the charger had nothing to do with the troubles reported:

Case 1—Wire connector at top of bulb loose, causing arc at this point, fusing wire and connector together burning out bulb; installed new bulb, tightened connection—job O. K.

Case 2—Connected charger to one battery, worked O. K. Traced connectors in line of twelve batteries, found broken wire between fourth and fifth battery; rubber insulation was not broken, so break was not noticed—charger O. K.

Case 3—Customer only getting 6 amps. from a 15-amp. charger with twelve batteries on line. He had charger 150' from meter and was using No. 18 wire from meter to charger. Relocated his bench about 30' from meter, used No. 10 wire from meter to charger; this corrected trouble.

Case 4—This customer has a lot of old batteries from a large used car dealer (you know what they are), sorted out three or four that were past charging, cleaned terminal posts on balance, added a spoonful of acid to each battery, brought them up

O. K., but charging rate was naturally lower.

Case 5—This is a fleet, owner only charges one or two batteries at a time, generally set his charger up two notches and it would charge at 6 amps., now has to turn it up four to six notches, then a little later blows fuse. His bulb is four months old. Turned his charger up four or five notches and bulb would continue at 6 amps. after it was started; simply an old bulb that takes more juice to start, but when started is O. K.

Case 6—Fuse blown on this job; put in new fuse, everything is O. K. Owner claims charger never operated over 6 amps.; started same at 10 a. m., then drove to —. When I returned at 7 p. m., found the charger operating at 8 amps, with 10 batteries. Owner is O. K., but his night man is a high-powered baby.

Case 7—This customer needs a good battery tester, has no way of testing a battery before putting on line. Claims battery manufacturers should make the positive post square so he could tell them apart (you know the rest of his story). Some of the battery manufacturers should see him, he has a lot of ideas—nothing wrong with charger.

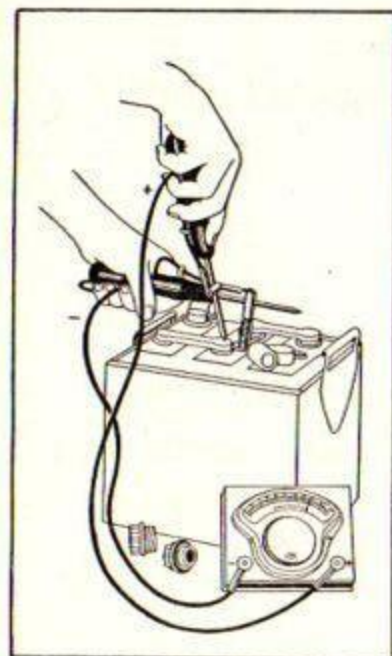
Case 8—This customer has a defective bulb, an air-breaker. He put in new bulb, but had not changed fuse—evidently blew fuse while trying to get defective bulb working; put in new fuse with his new bulb—everything O. K.

Case 9—Trouble here caused by a defective wall socket. This boy knows his stuff, had tried everything he should try. What fooled him was the socket would make contact part of the time and would then wait. Installed new socket and corrected trouble.

Nickel-Plated Tubing

Q. Where can I get a nickel-plated tubular railing to be installed around the edges of a cutaway body of an old touring car being made into a garage service car? The tubular trimming comprises lengths of nickel pipe bent to suit the purpose and fitted in nickel-plated posts of some six or eight inches in height?—P. C. G., McComb, Ohio.

A. We know of no firm handling such special railing, but you can have it made to measure by the H. J. Hunger Brass Co., Cleveland, O., manufacturers of plumbers' brass goods. Send them full dimensions and they can make up such nickel-plated railing to suit any design.



replacing the positive plates, the negative plates are very apt to be in a sulphated condition. The duration of the charge given the battery may put the new positive plates in good condition, but the negative plates may not have been changed to pure spongy lead as they should be normally when a battery is fully charged. Prolonging the charge will usually accomplish the desired results. The battery may be put through a cycle of charge and discharge.

Battery makers and many battery repair shops are not in agreement as to the value of the cadmium test, as the results are very often misleading under certain conditions due to lack of experience. However, in this case the cadmium test will offer a means of judging the condition of both

PURON

METAL MASTER APPARATUS

Possesses

Simplicity in design
Safety in operation
Sturdiness of construction

Provides

Dependable performance
Economy in operation
Apparatus for every need and

Proceeds

with increased facilities
to continually serve present
and future users as it has
for seventeen years.



"National Distribution"

Home Office, Denver, Colorado

Ask the Jobber Nearest You

UCC

DIVISION OF OXWELD ACETYLENE CO.

SEATTLE, WASH. PORTLAND, OREGON SAN FRANCISCO, CALIF. LOS ANGELES, CALIF.
SALT LAKE CITY, UTAH KANSAS CITY, MO., CHICAGO, ILL. DETROIT, MICH.
CLEVELAND, OHIO NEW YORK, N. Y.

The advertiser will thank you for mentioning the AUTOMOBILE DIGEST

THE TOUCH-UP JOB

(Continued from page 18)

to be protected. This method is also used when applying the metal primer and the surfacer if the spray gun is used for that work. There is now an adhesive shielding tape on the market especially designed for this purpose. It is readily removed and has the advantage of not pulling any of the color along with the tape.

When applying the color it is usually necessary to have this thinned or reduced about 50% with the reducer recommended by the enamel manufacturer. The flat spray is usually used for panel work and the motions are forth and back just as in brushing out paint. Allow for some lap of the spray, about one-half, so as to secure even coats. Hold the gun from six to nine inches from the work. The coat should be wet and flow together so as to give a smooth coat and not too much the "orange peel" or "egg shell" look or appearance.

When the first coat has dried, usually in about one hour, the second coat is applied, this time across the direction of movement of the first coat. Continue with successive coats until the proper color has been secured to match the rest of the job and then rub out or polish the work.

Refinishing the "Thin" Panel

As suggested above this condition results from excessive polishing. When it comes to refinishing the problem is one requiring considerable judgment on the part of the painter. If the metal shows through in spots, doubtless the best thing would be to remove the old lacquer to the metal and build up. The danger lies in the effects of the polish which has been used. If an attempt is made to build up the job without removing the old paint it is possible that some of the polish may

remain in the old finish and affect the new finish. The body, which has been polished with wax, is very difficult to refinish, especially if there are any cracks into which the wax has settled. The new paint, when applied over any oily or waxed surface, will not hold.

When cleaning the panels, which have been polished thin, use soap and water first and then follow this with high test gasoline. If wax has been used as a polish, wash the job with turpentine and then follow with the

With its interchangeable discs and buffers, the portable sanding machine is indispensable

gasoline. Finally sand the job with the 180 grit sandpaper and wipe it clean. Use turpentine with the waterproof sandpaper, and when the job is smooth it may be built up as need indicates and as described above.

Refinishing the "Burned" Hood or Deck

It is doubtful whether it is worth while to try to refinish the burned job without removing the old finish. The fact is that the old job has lost its luster and finish

because the finish has been dried out until it is lifeless. The best plan is to get down to the metal and then build it up from the ground. If the new finish is built over the old it is likely that the dried-out undercoats will sap the solvent and life from the new coats and the new work will quickly lose its luster.

Rubbing the Refinished Work

This is accomplished by means of special rubbing compounds or by means of 300 to 400 grit sandpaper. The sandpaper to be used is the waterproof sandpaper, and in some cases the work is made much easier if the special sanding lubricant or fluid recommended by the sandpaper manufacturer is used. Rubbing with the sandpaper may be accomplished by hand or by means of one of the many polishing and rubbing machines now universally used. Naturally the latter method will save much time and is recommended for the larger repairs or panels. The polish which is possible to secure is dependent on the smoothness or "levelness" of the surface. The irregularities of the lacquer pigment or color are sanded off, leaving a true even surface, which can then be brought to a high polish.

Polishing the Refinished Work

After the sanding is complete, and this may all be done after the final coat or a little after each coat, many refinishers like to spray on a coat of clear lacquer reducer. Then, after this is thoroughly dried, preferably overnight, they make use of some of the polishing compounds, for bringing out a luster or gloss. Some of these compounds work on the principle of furnishing a wax base which is polished by the rubbing action of the cheese cloth or other soft material. Others work on the plan of polishing the lacquer and bringing out its gloss through the heat generated by the friction of the polishing action. Naturally the machine makes for speed and ease in this latter operation. The best polish and the one most lasting is the one secured by polishing the lacquer, since this leaves every particle of the polished surface free of any oil or wax which might start to collect dirt and destroy the luster.

Make Use of Power

It is hard to get a man to walk two blocks these days. He depends on gasoline or electricity to haul him. So it has come to be in our paint shops. There are some operations which can only be done by hand. With reference to these, as the common expression has it, "it is just too bad." But fortunately much of the drudgery of lacquer refinishing is assigned to the power machinery. Compressed air applies the primer, filler and surfacer coats, and finally the color. The sanding machines will do the sanding and the rubbing, necessary for smoothness and gloss. Hydraulic jacks and overhead conveying equipment will move the jobs about.

One thing the machinery will not do. It will not do the thinking or ring the cash register. That is fortunate. Most people get more thrill out of using their wits to accomplish the desired end than out of working any other part of their anatomy. Many readers of AUTO-



© E. G. C. 1929

SUMMER or winter, spring or fall, Ethyl will improve the performance of any car.

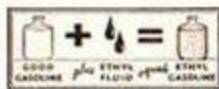
Cold weather with its snow and slush, heavy mud and wet sand, calls for the added power which Ethyl Gasoline delivers. The better control which Ethyl means under all driving conditions breeds that confidence which contributes so much to comfortable, pleasant and safer motoring.

Ethyl does this because it is gasoline *plus*. To good gasoline

has been added Ethyl anti-knock fluid. It turns any gasoline into better gasoline and makes *any* car, whatever its type or age, give a better performance.

Start riding with Ethyl today. Let it remove the hardship from your winter driving. It is sold at pumps bearing the Ethyl emblem.

Ethyl Gasoline Corporation, 25 Broadway, New York City; 56 Church St., Toronto, Can.; 36 Queen Anne's Gate, London, England.



ETHYL GASOLINE

Help us to give you a better paper by mentioning the AUTOMOBILE DIGEST

NEW Service Shop Micrometer No. 54



*One micrometer
instead of four.*

The new Brown & Sharpe Micrometer Caliper No. 54 is just what you need in your shop for measurements from 0 to 4", by thousandths of an inch. With this one tool you can measure pistons, crankshaft bearings and pins, wrist pins, camshaft bearings—practically all automotive parts requiring close measurement. It is a tool that will pay for itself many times over in your shop.

*Ask your dealer to show you
this new tool or write to us
for a descriptive circular.
Brown & Sharpe Mfg.
Co., Providence, R. I.*



BROWN & SHARPE TOOLS

"World's Standard of Accuracy"

MOBILE DIGEST will think this refinishing proposition through to a profitable FINISH this season.

NEXT MONTH: Methods of Getting Down
to the Metal.

If you are interested in a complete list of lacquer manufacturers, as well as refinishing equipment makers, you can secure it from AUTOMOBILE DIGEST, Service Department, 22 E. 12th St., Cincinnati, O. It's free—and was prepared for your convenience and help.

GET A CLOTHESPIN!

(Continued from page 33)

would be in white material, the price would be unnecessarily large.

The duplicate system, except in special cases, is both cumbersome and troublesome. Where a second record is not required, the single sheet system simplifies book-keeping. The salesman checks the services requested and fills in the prices of the flat rate charges, leaving the others to be entered at the various departments. If a duplicate is handed to the customer, he frequently thinks the prices filled in constitute the entire bill; or he may come back wondering what this or that might be. In the single-sheet, claim-check system, he brings back the numbered check and presents it at the window. The salesman gets the completed sheet from his car and shows it to the customer, explaining whatever might be not clear to him. The bill is paid, the sheet checked in the office and filed away in order, where it may be found at any time a question arises on that particular job.

The arrangement of the services offered should be orderly and detailed, each distinct department separated from the others by heavy black lines. The foregoing is found to be a good pattern.

But where does the clothespin come in? That was principally to arouse curiosity so our article would be read. But it does have, like the old-fashioned hairpin, a usefulness, in connection with the service sheets just described. Every service station management has had some trouble keeping the sheet with the car on its trip about the lot, whether the paper was heavy or light. By using the long sheet, it is an easy matter to loop it on the wheel of the car, fastening the two ends with a spring or clip type of clothespin which is both inexpensive and practical. It does not rust, like steel spring paper clips which are sometimes used, and is easier to handle. Even when, for some reason, the sheet cannot remain attached to the wheel, it can be fastened to the clothespin and thrown on the seat without fear of the wind blowing it away.

By all means, get a clothespin!

New Oversize Cup by Orange Roller Bearing Co.

A NEW cup for tapered roller bearings, which makes it unnecessary to build up and rebore hubs when making replacements, has recently been developed by the Orange Roller Bearing Co., Orange, N. J.

The inside of the cup is standard, for taking "Orange" or other standard makes of cones, while the outer circumference is made oversize. The new cups are made in a complete range of sizes to cover every automotive requirement.

Here's the way to MATCH those pesky COLORS!

AFTER a fender-bumping bee, or face-lifting a Lizzie—how in heck are you going to touch up the old lacquer?

It's a cinch when the color's black, but nowadays it's often a pale robin's egg blue! And you've got to match it. Maybe you've seen an owner who got a cardinal red dab of paint where he needed burnt umber?

Here's the way. Egyptian—one of the oldest and largest makers of lacquer—has a *method* of matching—a method that *works*. Not just a formula, or a lot of paint to sell. We've got a way of getting the thing done—rapidly and right.

First: two books. You need to study them. Matching lacquers is nobody's cinch. But if you *do* study them, you'll *know how*.

Second: a wall chart for quick reference on the job.

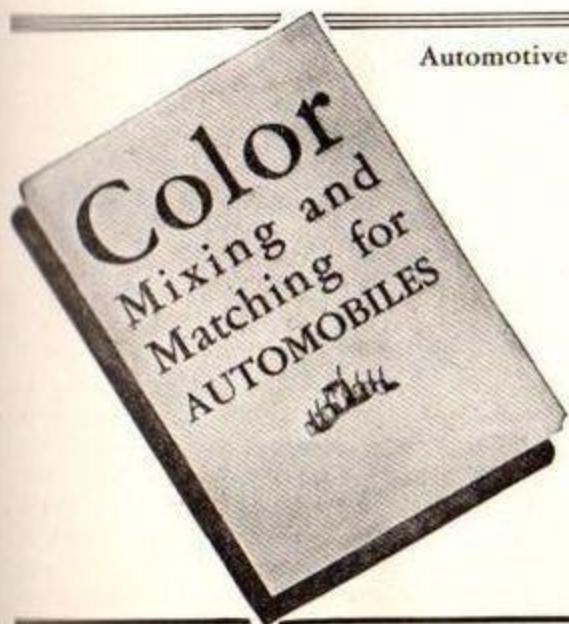
Third: a series of color-chips—we call it the "prismatic color deck", to help you find the *nearest* color to the one you're matching. In other words, you *start* right.

Fourth: an assortment of tinting lacquers with which you can really match any color. You don't need to buy anything extra (except to replace material as you use it). It's all the very finest lacquer on the market. Egyptian has that reputation, and you'll find we've won it fairly. And this tinting assortment (with books, chart, colordeck,



strainers, mixing paddle, testing chips and caps free) sells for only \$22.25!

Order from your jobber—or, if he can't supply you, direct from us. The coupon below is handy. Send for the free books, anyway!



Automotive Distributors' Division. The Egyptian Lacquer Manufacturing Co.
90 West Street, New York City

Please send me, without obligation:

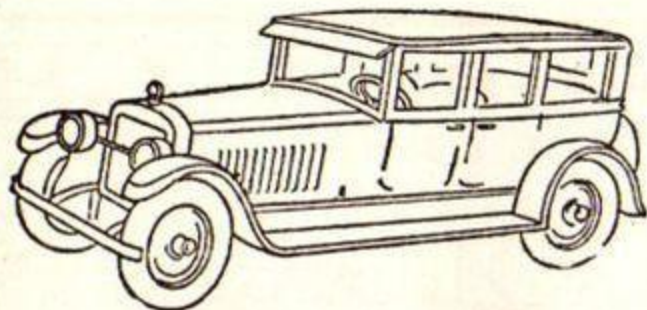
- FREE ☐ "Color-Mixing and Matching for Automobiles"—the only book of its kind ever published—telling you exactly *what* to do, and *how*.
- FREE ☐ "Transportation Finishing Facts"—how to use lacquers, how to prepare the surface, how to spray, how to add thinners, etc. Complete and essential information.
- \$22.25 ☐ Send me your assortment of tinting colors complete, with all free aids to mixing and matching colors.

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Don't miss a word of our free shipment offer. We ship without receiving one penny. Repair any auto fault, learn how now. You can do it easily in this new simple way. These five big automobile books are the most interesting, the most practical books we have ever published on automobile construction, operation, and repairs. Brimful of facts, photographs, and explanations so easy to understand that anyone can learn how to repair auto faults in almost no time. Over 2,000 pages full of diagrams, data sheets, and everything else needed to make anyone an authority on automobiles. Whether you want to qualify as garage owner, auto repair expert or merely wish to know how to keep your own car 100% efficient, you will recognize the amazing value of these five big books, especially on our

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A very liberal plan of distribution brings these books to you for examination without one cent of payment to us. We don't ask a cent of you, but ship the books **FREE**. Look them over. Read them as much as you want to, note the splendid photographs and drawings, and then if you decide you want them, send only \$2.00 and then \$3.00 a month until only \$24.80 is paid. That is all. Nothing more to pay us. There is no further obligation.

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Yes, we include a certificate of membership in the American Technical Society, which entitles you to free consultation for one year on any subject relating to automobile engineering. We have over a million dollars of resources enabling us to get co-operation of the largest automobile manufacturers and dealers who have furnished us plans and photographs. You can write or wire any time for special information. Answers will be sent promptly without cost.

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There are no strings to this offer—it means just what it says. Send name and address on the coupon and all of the five big books will be sent you. Remember, one fact alone may save you an expensive repair or help you to a better job.

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Drexel Ave. at 88th St., Chicago, Ill.

I would like to look at the five big auto books—send them on your free offer. I will pay the few cents delivery charges. If I like them I will send you \$2 when I have had the books fifteen days, and then \$3 a month until the special low price of only \$24.80 is paid. Otherwise I will return the books at your expense. You are to include, without charge, free consulting membership certificate in the American Technical Society.

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COUPON**

The advertiser will thank you for mentioning the AUTOMOBILE DIGEST

As We See It

Service Sells Cars

ONE district of a factory distributing system was showing no profits in any department. New car sales were poor. The car was gaining a bad name. Disatisfaction with the product was the rule, not the usual exception. When a new distributor went into the territory, which was the worst the factory had, everything looked bad. After spending some time on the job he came to the conclusion that the trouble was entirely with the service end of the agency. Analyzing further he came to the conclusion that the trouble could only be cured by educating the service men. He set about educating these men and to this end borrowed all the equipment he could and then bought, out of his own pocket, the equipment he could not get otherwise.

When the men knew how and practiced what they knew, the owners of the product in the district began to evince satisfaction in their possessions and told their neighbors about the new era and the pride they took in their cars. From the worst district in the nation, this district came to be the best. Now that dealer and distributor spends all his time preaching the gospel of "service" to the men who service his cars.

Factory Schools

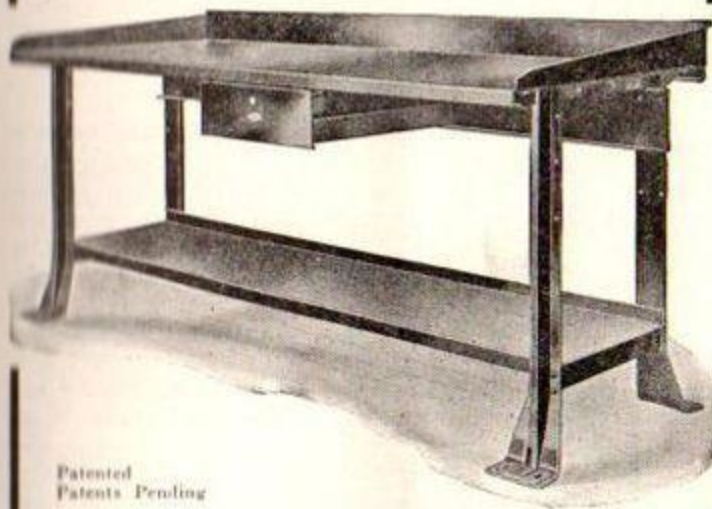
THE man who made the success with the dealer agency because he educated the service men at his own expense, won the esteem of the factory to the extent of their putting him and his school on the road. Now this factory has a school at the home plant; in fact, has had one for a long time. It is now sending a branch school overseas and it is going to have four traveling schools at home in America. Yet we have men—service men, foremen, shop superintendents, salesmen, dealers, and distributors, as well as the factory men themselves, declaring that it is not worth while to spend money and time learning how to service cars. Was there ever a greater fallacy?

A Voice of Thanks

THANKSGIVING is the most human of all holidays. Each one of us has much in common, for we all have great cause to thank that Power which guides the destiny of man for the many good things the year has brought.

We are thankful for the great number of new friends AUTOMOBILE DIGEST has made during the past year and the compliment that comes with the retaining of old friends. We are thankful to be of service to that great army of men who have joined hands in the maintenance of America's motor cars, and hope that the future will fulfill the present's promise to you of continued prosperity.

To-Day It Must Be Steel



Patented
Patents Pending

"HALLOWELL" STEEL WORK BENCH

Yes, it's getting to be steel more and more—in all walks of life.

It's because wood splinters, cracks, warps, gets wobbly, absorbs oil, is hard to keep decently clean and burns. Steel won't do any of these things.

And the "HALLOWELL" Steel Work-Bench is a fine example of modern steel construction—strong, rigid, and wobble-proof—wears as only steel can wear.

Then it's easy to clean that broad one-piece steel top without a crack and without a splinter, and so hard and close that oil never soaks in.

And we carry 1368 different sizes and combinations of "HALLOWELL" Bench Equipment in stock for immediate shipment.

*Just Write for
Full Information in Bulletin 386*

"HALLOWELL" Service Station Equipment of Steel is featured in the Manuals of Oakland-Pontiac, Hudson-Essex, Buick, Chevrolet, Graham-Paige, Willys-Overland and Studebaker.

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A PERFECT REPAIR FOR THAT BURST WATER JACKET



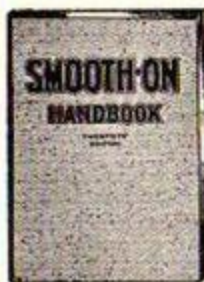
This engine, on a 2½-ton truck, froze and burst in two places. Taking down, welding and reassembling at a cost of \$150.00, would have taken time and given no better results than produced in a few minutes with Smooth-On, and at an expense of \$1.00.

No disassembling and no heat!

- Simple crack.** Force Smooth-On No. 1 into the crack and give it a few minutes to metallize.
- Long crack.** Put the Smooth-On under a metal plate, held with cap screws.
- Piece broken out.** Fit the piece back with Smooth-On in the break, and bind with metal straps.
- Holes or thin spots.** Cut weak metal away, bevel back, fit with manhole plate, and force the Smooth-On in tight with screw. To make an extra neat job, cut off outer end of screw.

These methods will make a perfect, permanent water and heat-proof repair on most any jacket break, without taking down, without heating and distorting and without requiring cylinder regrinding.

Use Smooth-On also for stopping all water, oil, gasoline or exhaust gas leaks and for tight hold at screw threads.



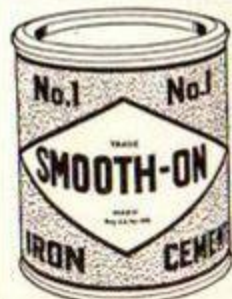
Be ready for the emergency by getting Smooth-On No. 1 in 1-lb. or 5-lb. can or 25 or 100-lb. keg from your nearest dealer, or if necessary, from us direct.

This BOOK FREE

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Twentieth Edition—136 pages of data—193 diagrams, pictures and practical hints on at least 200 different uses for Smooth-On. Every progressive engineer should have this book—get your copy now.

Do it with SMOOTH-ON



SMOOTH-ON MFG. CO.
Dept. 2, 570 Communipaw Ave.
Jersey City, N. J.

Please send copy of the SMOOTH-ON Handbook, Twentieth Edition.

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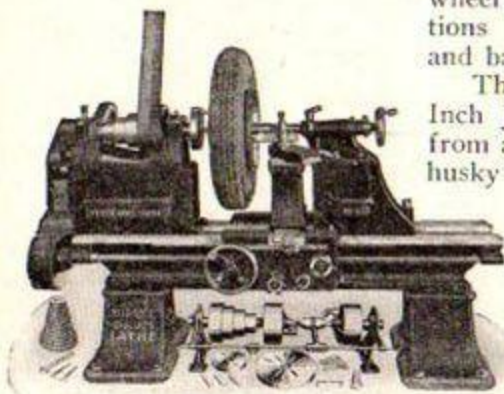
NEW! Shop Equipment

Replacement Parts and Accessories



New South Bend Lathes

AMONG new machines to be exhibited at the M. E. A. show, are several New Model South Bend Lathes. All will be back-gear screw-cutting machines representative of the 96 sizes and types in the South Bend line. The brake drum lathe, illustrated, will be demonstrated on a typical brake drum truing job, and on other wheel servicing operations such as testing and balancing.



The New Model 9-Inch Junior, operating from a light socket but husky enough to do most of the average service station's machine work, will be used for demonstrating the lathe method of valve re-

facing, commutator truing, bushing making, and other such jobs. An 11-Inch South Bend Lathe will be fitted with a recently introduced connecting rod boring attachment that is accurate, easy to operate, and speedy.

For those who miss the show, free bulletins on each of the machines exhibited are obtainable from the South Bend Lathe Works, 548 E. Madison St., South Bend, Ind.

New "Superrench" Assortments

J. H. WILLIAMS & CO., Buffalo, N. Y., who recently introduced the "Superrench" Duo-hex-Box Wrenches in both single and double offset patterns, now announce five assortments of these wrenches for mechanics and service men, who will appreciate them for use on connecting rods, main bearings, base, cylinder heads, spring clips and other places where clearance is limited.

One Set consists of the single offset pattern, two Sets of the double offset pattern, and two Sets of both single and double offset patterns. All are forged from chrome molybdenum steel, heat-treated and chrome-plated over nickel, finished bright. Guaranteed by the makers against breakage. In Sets, their convenience and adaptability will be at once apparent to all who have need for such tools. Details and prices may be obtained from J. H. Williams & Co.



New Condenser Tester for Automotive Electrical Service

AUTOMOTIVE electrical service stations and service managers of car agencies will be interested in the new King Type CT-3 Condenser Tester recently placed on the market by The Electric Heat Control Co., 5903 Carnegie Ave., Cleveland, O. This device was brought out to meet the demand for a means of testing and measuring capacities of small condensers such as used in auto ignition and radio. It not only measures capacity, but the voltage and current is such that it shows up weak insulation and breaks down defective condensers, for, it is pointed out, 110 or 220 volts, in a great many cases, will not show up even a shorted condenser. Condensers can be tested and measured without removing from car or radio set, and the



King Tester is a handy measuring device for resistance units, also circuit tester, used the same as a lamp or meter in series. The manufacturers will be glad to send DIGEST readers literature and prices.

New, Free Book on Reamers

THIS new Keystone booklet deals not only with the care and operation of reamers, but with taps, dies and drills as well. Simple, concise and practical, a copy should be in every mechanic's hands. It can be, too, for the Keystone Reamer & Tool Co., Millersburg, Pa., manufacturers of Keystone "tools that do the job right" are offering to send it free to any service man writing for a copy. The book contains useful information on sharpening reamers, taps and drills, as well as a reaming trouble chart and other helpful data. Illustrations make the explanation easy to understand and follow. Get your free copy. (Keystone tools will be exhibited at the N. S. P. A. show.)



ATKINS SILVER STEEL SAWS

If you want to cut the cost of making repairs it will be worth your while to investigate Atkins SILVER STEEL Hack Saw Blades and Frames.



No. 4



No. 10



No. 11

Write to headquarters at Indianapolis for book *Saws in the Shop*, containing many helpful suggestions for cutting metal.

CLIP AND MAIL NOW!
SEND ONLY 30c FOR SAMPLE BLADE FOR HAND FRAME
Send FREE BOOK

E. C. ATKINS & CO.
Dept. M, INDIANAPOLIS, IND.

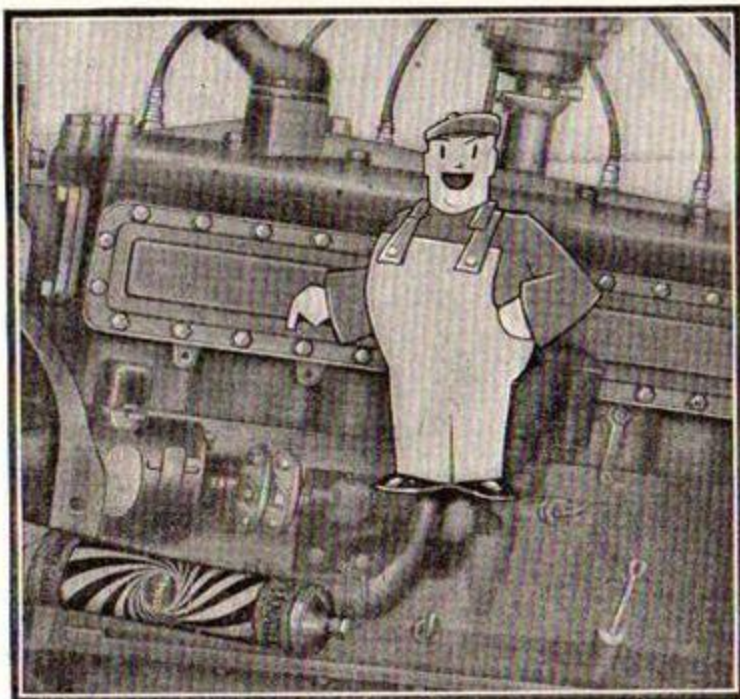
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valve plates made leakproof

When bolting valve plates in place make them leakproof with a thin layer of Form-A-Gasket over old or new gasket.

Any union becomes *permanently tight* — and leakproof to gasoline, gasoline vapor, kerosene, oil, grease, water and compression — when assembled with Form-A-Gasket, yet *comes apart almost at a touch* when unbolted for overhauling.

8 oz. Tube (Mechanic's Size) \$1, sent direct if your jobber can't supply you.
Permatex Company, Inc., Sheepshead Bay, N. Y.



you may as well work without tools as work without

FORM-A-GASKET

REG. U. S. PAT. OFF.

by PERMATEX, Sheepshead Bay, N. Y.

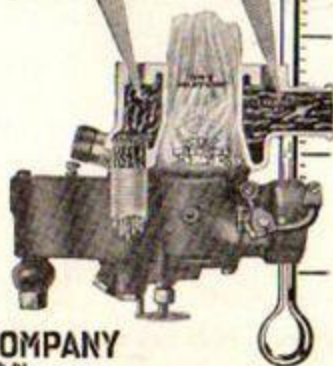
Cold Weather Driving and MARVEL Carburetion WITH AUTOMATIC HEAT CONTROL

AGAIN comes the time of year when Marvel Carburetion holds forth that *Particular* appeal of automatic heat control applied directly at the throttle.

This patented principle of hot exhaust gases brought directly to the spot where it is needed puts Marvel in a class by itself in cold weather performance.

Never has there been a carburetor more saleable.

Marvel Carburetors are standard equipment on Buick, Nash, Oakland, Pontiac, Hudson, Essex, Marquette.



MARVEL CARBURETOR COMPANY
FLINT — MICHIGAN

Big Year in Denatured Alcohol Ahead

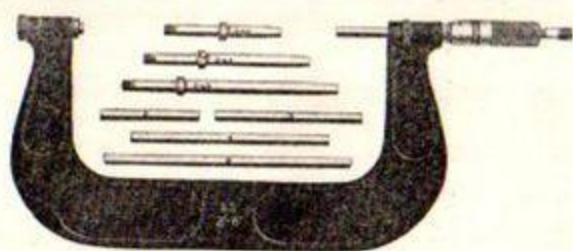
AS soon as the weatherman forecasts a cold wave coming, motorists make a bee-line for anti-freeze protection. Every dealer should plan now to get his share of this business and The Industrial Alcohol Institute, Inc., is working hand in hand with its dealers to assure them a big year in anti-freeze profits. Signs, window trims, radiator protection charts, "Alco-Testers," even motion picture reels for showing in theatres, meetings, etc., are provided. Illustrated here is the Alco-Tester.



a simple, accurate instrument that the attendant uses to tell the freezing point of radiator solutions, a service that pleases customers and sells two gallons of denatured alcohol instead of one. The Alcohol Institute is making these testers to dealers at a nominal price. Send your inquiry direct to AUTOMOBILE DIGEST, Cincinnati, Ohio—we'll see that the interesting literature is sent you at once, without fail.

Especially for Measuring Pistons

BROWN & SHARPE Micrometer Caliper No. 55 is a precision tool especially designed for measuring pistons in motor service work. Its broad range of measurement, from 2 inches to 6 inches, by thousandths of an inch, covers all pistons ordinarily used. This range of measurement is obtained by the four anvils furnished



with the micrometer, which are easily and quickly changed and held positively in place by a knurled nut. (Note the illustration.)

You will appreciate the economy of the investment in such a serviceable tool which practically takes the place of a set of three or four micrometers. Its special design for automotive service work makes the B. & S. No. 55 micrometer an important tool for your kit. Write Brown & Sharpe Mfg. Co., Providence, R. I., mentioning AUTOMOBILE DIGEST.

Imperial Welding Equipment and Tube Cutter Improved

IMPERIAL Welding and Cutting Equipment is now manufactured entirely in chromium finish, materially enhancing the attractiveness of these welding torches and regulators and in turn adding to the pride the worker has for his tools. Furthermore, as is well known, this chromium finish is very durable and extends the period of usefulness of the equipment. Imperial welding equipment is well known in the trade for its durability, speed and efficiency.



Get a quick answer—mention AUTOMOBILE DIGEST

Takes the place of a dozen wrenches and pliers

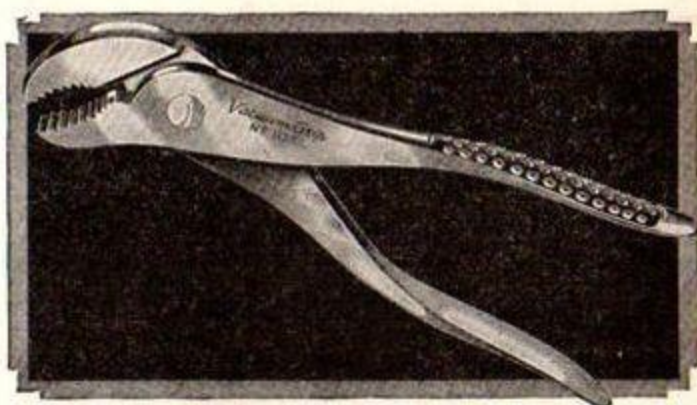
USEFUL in a hundred ways. Equally effective for rods, pipes, fittings, square or hex nuts, spark plugs, battery terminals, cotter pins, etc.

Adjusts itself to work of any shape as readily as the human hand and fingers. Deeply milled Stillson-angle teeth can't let go, once they have a hold on any object.

The 45° angle nose gets into the hard-to-reach places with ease. Has adjustable joint for work up to $\frac{7}{8}$ in. diameter. Full-fashioned non-slip Vacuum Grip handles.

If your dealer can't supply you, write to us direct. We pay parcel post.

FORGED STEEL PRODUCTS CO.
Newport, Penna.



Vacuum Grip Angle Nose Grippers
No. 107, Length 7 in. Price \$2.00

The greatest pair of grippers ever offered to the automotive mechanic. Unequalled for strength and durability. Hammer forged from special Silico-Molybdenum alloy tool steel, hardened and tempered thru and thru—NOT CASE HARDENED (surface hardened) open hearth steel, like ordinary pliers.

Vacuum Grip Pliers

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Built *UP* to a Standard-
Not *DOWN* to a Price

NICKEL, BRASS,
COPPER, SILVER,
GOLD, ETC.

Now! Do Your Own Electric Nickel Plating

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ONLY

\$6.50
Plus Postage

SAVE MONEY, TIME, AND INCONVENIENCE
No Experience Required

Anyone with ordinary intelligence can do it. There is no necessity for sending out those Headlights, Headlight Reflectors, Radiator Shells, Bumpers, Door Handles, Hub Caps, etc. RECONDITION, REPAIR, RETOUCH, OR PLATE NEW WORK. Do it instantly at any time without removing the parts to be plated. Electrically Deposit Nickel, Brass, Copper, Silver, etc. Do your own Electro-Plating in your Home, Garage, Office, or Place of Business, with the



ALADDIN PORTABLE ELECTRO-PLATER

Simple and Economical to operate. Not a toy, but a practical Electro-Plating Outfit with which Perfect and Durable Work can be done. Positively Guaranteed to do as we claim. Build up a Profitable Aladdin Electro-Plating Business of your Own. This offers wonderful ECONOMY to users and BIG MONEY-MAKING possibilities to AGENTS and DEALERS. Thousands in Service since 1924. Write for our FREE Booklet, Testimonials, and 30-Day Trial Offer Today. Agents and Dealers wanted everywhere.

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THE INDIANAPOLIS HEAD

FOR SPEED—POWER—MILES PER GALLON

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to MORTON & BRETT, Indianapolis, Ind.

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We Make Everything for Racing and Sport Cars
SPEED EQUIPMENT FOR RACING

Overhead Valves for Dodge, Ford, Maxwell, Chrysler, Chevrolet.
Racing Bodies, Radiators, Speedway Bodies, Wire Wheels,
Crankshafts, Axle Shafts, Special Race Cars.

We Make 2 to 1 Rocker Arms for the Chevrolet for More Speed and Power
THE NEW INDIANAPOLIS BODY—Latest Design to Fit Your Ford



DEAL DIRECT WITH THE ENGINEERS AND MANUFACTURERS



"Better than anything they have ever used"

THE parts cleaning tank in one southern garage was not giving satisfactory results. Changing from one cleaning compound to another failed to improve matters until an Oakite material was tried.

Now, after a short soak in a solution of this Oakite material, even the dirtiest parts are cleaned to the metal, without hand scraping or scrubbing. So quickly and thoroughly does this vigorous cleaner work that it is "better than anything they have ever used," according to the garage superintendent.

You, too, can have this kind of cleaning in your repair shop. Write for helpful Oakite booklets. Or, ask to have our nearby Service Man call. No obligation.

Oakite Service Men, cleaning specialists, are located in the leading industrial centers of the U. S. and Canada.

Manufactured only by
OAKITE PRODUCTS, INC., 26E Thames St., NEW YORK, N. Y.

OAKITE

TRADE MARK REG. U. S. PAT. OFF.

Industrial Cleaning Materials and Methods

Help us to give you a better paper by mentioning the AUTOMOBILE DIGEST

Another product to be exhibited at the M. E. A. show is the Imperial copper tube cutter, which is now made with reamer. A reaming blade adds to the usefulness of this tube cutter, which makes a straight, clean right angle cut quickly, leaving no burrs or chips to clog the line. The cutting wheel, as it cuts, turns down a small amount of metal at the edge which provides extra strength for flaring. Sometimes the tube edges are a little rough or jagged before being flared, which unevenness, the makers point out, can be easily smoothed off by the use of the reamer, adding further efficiency and convenience. Address The Imperial Brass Mfg. Co., 569 S. Racine Ave., Chicago, Ill., for literature.



A Business-Builder

A REFLEX battery charger and one corner of your shop is all that is necessary to establish a profitable battery charging department and 24-hour dependable battery service will bring customers in to build business for other departments. The Reflex illustrated is of 1 to

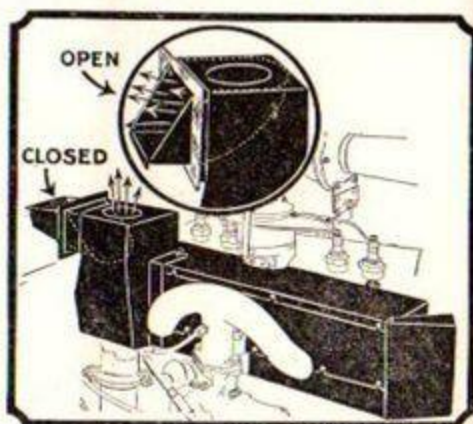


15 battery capacity, sold on a money-back guarantee. It charges in 24 hours without attention, and there is no up-keep with the exception of current, which is small (the makers stating the Reflex charges batteries in series for less than 6 cents apiece). It

is quiet in operation, built for years of service and so constructed that it cannot overcharge or discharge. Literature giving the details of Reflex chargers in sizes best adaptable to various needs, terms, and explaining how to operate a battery charging service, will gladly be sent DIGEST readers upon request to The Reflex Spark Plug Co., 10808 Berea Rd., Cleveland, Ohio.

New Ford A Heater

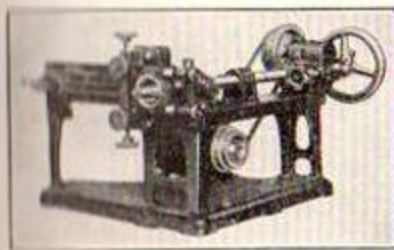
WHEN the Dunn Mfg. Co. set about providing dealers with a satisfactory heater to sell Model A Ford owners they set down three requisites, which were, first, heat, plenty of it, where it is needed, and when wanted. Two, simplicity of installation and operation, and third, low cost if possible. They claim that every requirement has been answered in the "Prestoe" shown here, which has a capacity of seven inches, with no obstructions. Even the control damper was designed so that when open the air blast would not be impeded in the slightest degree. When the



damper is closed the heat escapes through the top of the casing hood. As to installation, the makers state it almost falls in place. The price is small, and the product guaranteed by the Dunn Mfg. Co., Box 68, Clarinda, Iowa.

Reduces Costs on Bearing Fitting Jobs

HAND boring and facing of connecting rod bearings is entirely eliminated by the Simplicity Power Drive Babbitting and Boring Machine, the new labor-saving addition to the Simplicity line of motor rebuilding equipment. Bearing service work is thus put on a production basis that effects a saving for the customer as well as increased profits for the shop owner. Further-



more, the makers state, smoother bearings are assured because of the constant boring speed of the power drive. A micrometer set fly cutter establishes accuracy and uniformity of bearings, and instant-

aneous stopping and starting of the machine is controlled by a special clutch. The machine has three boring speeds, ranging from 70 to 115 r. p. m. The Simplicity line of rebuilding equipment is manufactured by the Simplicity Mfg. Co., 3911 Spring St., Port Washington, Wis., to whom our readers should write.

Meets Modern Lubricating Problems

THE fast development of automobile, aeroplane and marine motors has brought about a condition where ordinary oils will not take care of all lubricating problems. Marvel Mystery Oil solves many of these difficulties. It is also used to assist heavier oils in their work and overcome the shortcomings of light oils. For example, it is claimed that one quart of this especially blended oil to each five of crankcase oil will eliminate danger of seizure and scoring of new or re-conditioned motors and enable all motors to start easy in the coldest weather. The illustration shows the new quart size with the special funnel spout.



Marvel Mystery Oil can be successfully used for overhead oilers and upper motor lubricators. Among other claims made for it is its ability to lubricate over a long period of time without gumming, resist emulsion, lubricate under extreme heat,

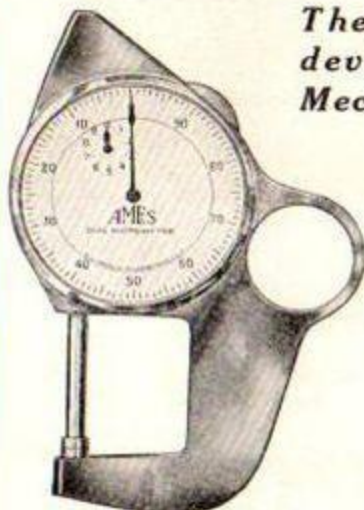
quickly remove rust, corrosion and gum and penetrate quickly. In addition to literature, readers addressing the Emerol Mfg. Co., 242 W. 69th St., New York City, will be sent a large, handy oiling chart free.

"Powerfield" Battery Manufacturers Expand

THE Advance Battery Mfg. Co., Louisville, Ky., have recently built an addition to their factory which doubles its capacity. The leader of the Advance line is their "Powerfield" brand, claimed to be of the highest quality construction and materials, and selling to the consumer at a moderate price with a two-and-one-half-year guarantee. The manufacturers state their new building is a monument to the success of the company's policy of rigid adherence to quality.

Watch for the new Ames "Dial Mike"

The handiest tool yet devised for the Motor Mechanic.



instant measuring
extreme accuracy
quick conversion
impersonal reading
adjustable
1-inch capacity
lasts a lifetime

Send for complete information or see it at the shows

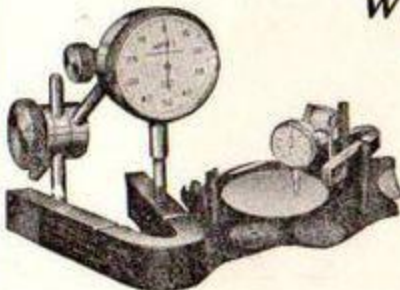
Ames Cylinder Gauge With Setting Tool Handle

Tests all cylinders for straightness and roundness. Accurately measures taper and out-of-round. Compares sizes of cylinders in motors.



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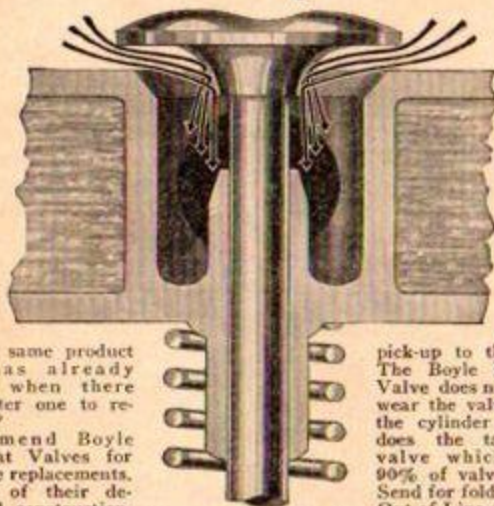
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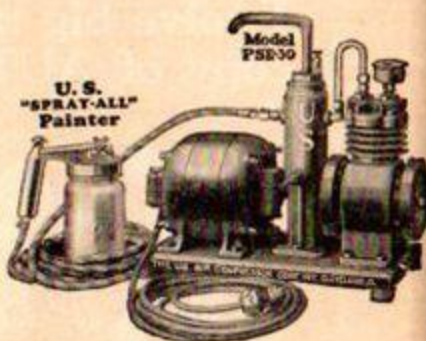
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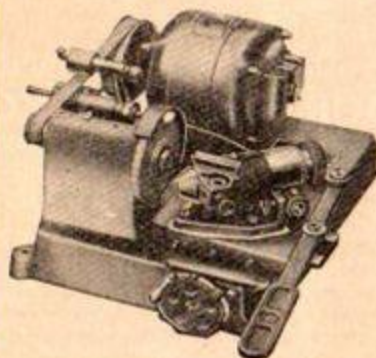
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Van Norman Valve Refacer

THE new Van Norman Model "G" Valve Refacer is a real precision tool, accurate to within .001-inch, with a capacity up to 1/2-inch, including Model A Ford valves, it is claimed. It is equipped with the Van Norman split-double grip collet, ball bearing wheel head and



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The Model "G" may be seen in the Van Norman display of tools for motor maintenance at the M. E. A. show, or full information may be had on writing the Van Norman Machine Tool Co., Springfield, Mass., referring to this item.

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SUPER Service, Master Service and Tire Stations will find a highly valuable educational merchandising exhibit at the Vesta Battery Corp. Booth No. 26, at the National Tire Dealers' Association Convention, Chicago, November 11-14.

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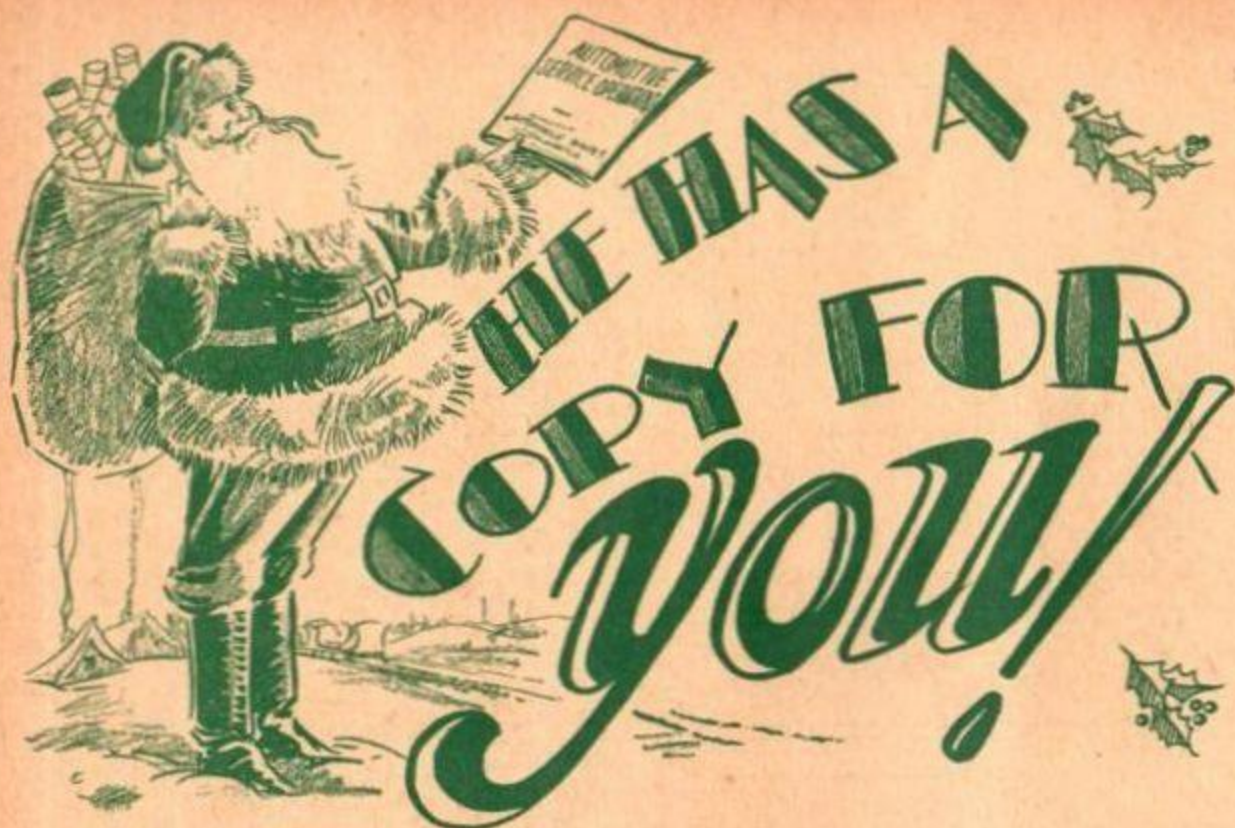
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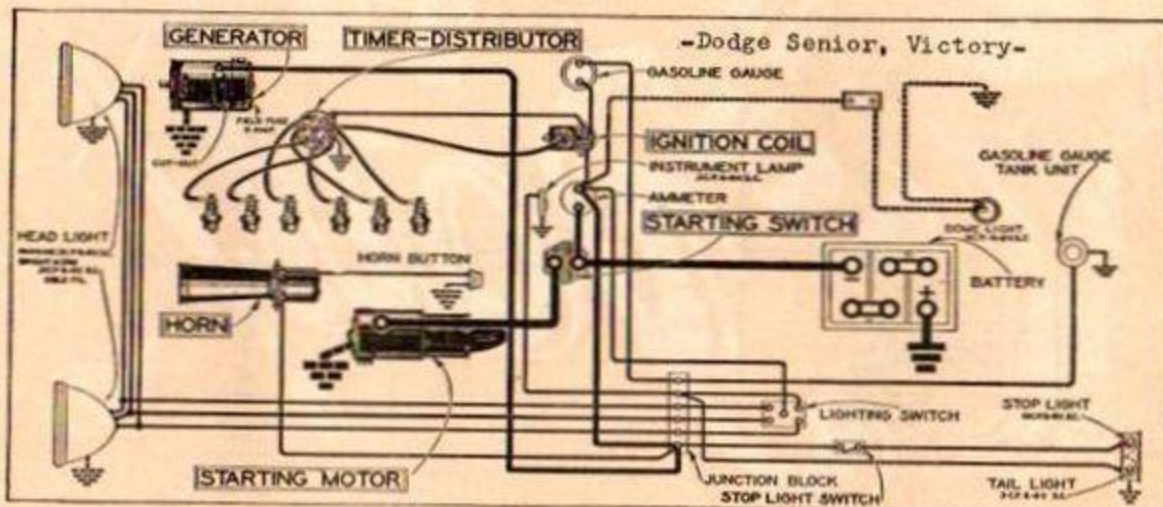


DODGE SENIOR SIX, 1928

NOVEMBER, 1929

Courtesy North East Electric Corp.

No. 39-A



TEST DATA

STARTING MOTOR

No Load—120 amps, 5.6 volts, 1700 r.p.m.
Lock Torque—16 ft. lbs., 550 amps, 3.1 volts.
Brush Tension—3 lbs.

GENERATOR

Rotation—Clockwise, viewed from front end.
Speed—1,166 times engine speed.
Regulation—Third Brush.
Brush Tension—12-16 oz.
Lubrication—A few drops of oil every 2000 miles.
Max. Cold Output—17.5 amps, 1400 r.p.m. at 8.0 volts.
Fuse—6 amps. in generator field circuit.

CUT OUT

Closes—6.75 volts.

Opens—5.75-6.0 volts.

Contact Gap—.020"-.025".

TIMER-DISTRIBUTOR

Rotation—Clockwise.

Contact points provided in duplicate.

Manual Advance—20°.

Automatic Advance—20° starts to operate at 400 r.p.m. Maximum automatic at 2200 r.p.m.

FIRING ORDER 1-5-3-6-2-4

Contact Point Adjustment—.020".

Timing Ignition—Advance the spark. Place No. 1 piston on compression stroke. Check the flywheel marking "I. G. N." It should be in line with the indicator in the peep hole provided below the starting motor on left side of the engine.

TOLERANCES, CLEARANCES AND SPECIFICATIONS

Dodge Senior Six, 1928

- Bore $3\frac{1}{2}$; stroke $4\frac{1}{2}$; S. A. E. rating 27.34.
- Valve spring tension, 50 pounds closed.
- Valve lifter clearance, .004 to .006 hot.
- Exhaust valve closes 6° after top dead center.
- Inlet valve opens 0° after top dead center.
- Inlet valve closes 48° after bottom dead center.
- Exhaust valve opens 50° before bottom dead center.
- Flywheel marks are D. C. 1 & 6; Ex. Cl. 1 & 6. Ign. 1 & 6.
- Front drive, chain.
- Chain adjustment, yes. How made, manual.
- Firing order—1-5-3-6-2-4.
- Piston pin. How fitted, S. A. Clearance, "thumb push" fit.
- Piston clearance. Ring lands, .030 top; .020-2&3, .050-1&5. Skirt, .0025.
- Piston ring end clearance. Top, .005 min.; Center, .005; Bottom, .004 to .018.
- Connecting rod bearing. Type, babbitt rod. Clearance, .0015. How fitted, S. A.
- Main bearings. Type, interchangeable. Clearance, .001 to .0035.
- Crankshaft end clearance. Minimum, .004. Maximum, .006. How adjusted, shims.
- Oil capacity in quarts, 7. Grade of oil by S. A. E. No., medium.
- Cooling system. Type, pump. Capacity, $4\frac{1}{2}$ gal.
- Water pump shaft packing. Size ring, $\frac{5}{8} \times 1\frac{1}{4} \times \frac{1}{4}$.
- Front axle. Toe in, $\frac{1}{4}$. Camber, $2\frac{1}{2}$ °. Caster, 2°-40°.
- Clutch pedal to floor board clearance, with clutch engaged, 7.
- Rear axle. Ring and pinion clearance, .007.
- Brakes. Type, hydraulic 4-wheel. Clearance of band, top, .006; bottom, .012. Front lining size, $15\frac{1}{2} \times 1\frac{1}{4} \times \frac{3}{16}$; rear, $11\frac{3}{4} \times 1\frac{1}{4} \times \frac{3}{16}$. Lining brand, Johns-Manville moulded.
- Tire size, 31x6. Pressure, 35 lbs.

AUTOMOBILE DIGEST

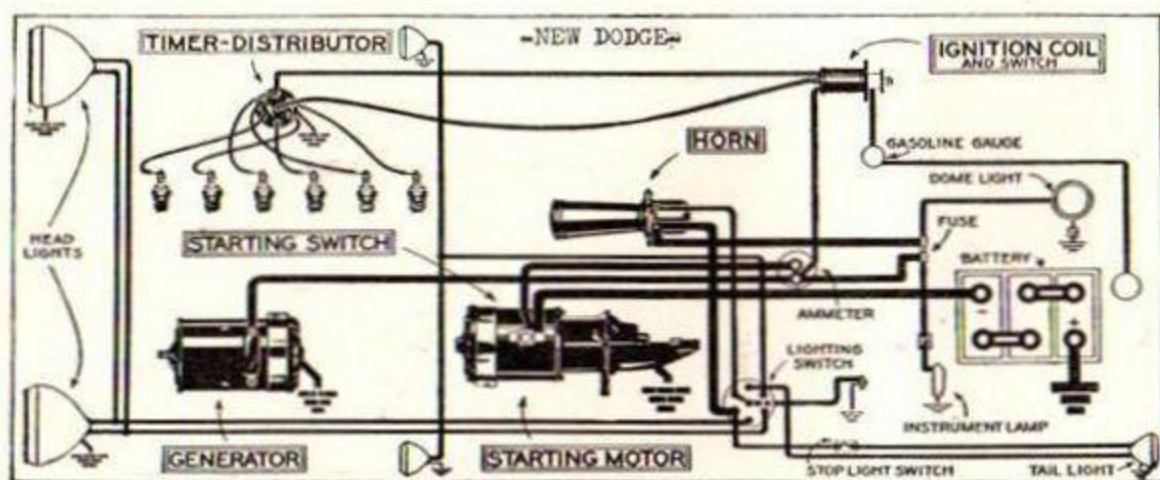
WIRING DIAGRAM AND SERVICE INFORMATION

NEW DODGE SIX, 1929

NOVEMBER, 1929

Courtesy North East Electric Corp.

No. 40-A



TEST DATA

STARTING MOTOR—6494

Rotation—Clockwise, viewing drive end.

No Load—120 amps., 5.6 volts, 1700 r.p.m.

Lock Torque—13½ ft. lbs., 3.2 volts, 550 amps.

Brush Tension—3 lbs.

Bearings and Lubrication—Requires no lubrication, armature supported by oil-less type bearings.

Starting Switch—20900.

GENERATOR—6530

Third Brush Regulated

Rotation—Clockwise, viewing drive end.

Max. Hot Output—14.75 amps., 8 volts, 2100 r.p.m.

Max. Cold Output—19 amps., 8 volts, 2000 r.p.m.

Brush Tension—12-16 oz.

Bearings and Lubrication—Ballbearing at drive end and graphite bronze bushings at commutator end.

Place few drops medium oil to oiler at drive end every 2000 miles and about ½ tsp. oil at commutator end.

TIMER-DISTRIBUTOR—10845

Rotation—Clockwise, viewing distributor rotor.

Contact Opening—.020".

Manual Advance—35° eng.

Automatic Advance—600 eng. r.p.m. Max. 2200 r.p.m.

Bearings and Lubrication—Turn grease cup full turn every 500 miles and replenish grease when necessary. Place few drops oil to felt pad in hollow breaker cam shaft, thin coating of grease to sides of breaker cam shaft every 2000 miles.

TOLERANCES, CLEARANCES AND SPECIFICATIONS

New Dodge Six, 1929

1. Bore 3½; stroke 3½; S. A. E. rating 27.34.
2. Valve spring tension, 42 pounds at 2½ inches.
3. Valve lifter clearance, .004 to .006 hot.
4. Exhaust valve closes 6° after top dead center.
5. Inlet valve opens 0° after top dead center.
6. Inlet valve closes 48° after bottom dead center.
7. Exhaust valve opens 50° before bottom dead center.
8. Flywheel marks are C-16-I.
9. Front drive, chain.
10. Chain adjustment, no.
11. Firing Order—1-5-3-6-2-4.
12. Piston pin. How fitted, selective assembly. Clearance, thumb push fit.
13. Piston clearances. Ring lands: top, .000; 2&3—.020; 4&5—.050. Skirt, .002.
14. Piston rings, end clearances. Top, .005; center, .005; bottom, .001.
15. Connecting rod bearings. Type, babbitt rod. Clearance, .0015. How fitted, ream.
16. Main bearings. Type, interchangeable. Clearance, .002.
17. Crankshaft end clearance. Minimum, .004. Maximum, .006. How adjusted, shim.
18. Oil capacity in quarts, 6. Grade of oil, medium.
19. Cooling system. Type, pump. Capacity, 4 gal.
20. Water pump shaft packing. Size rings, .615x1½x¾ long.
21. Front axle. Toe in, ¼. Camber, 2¼°. Caster, 2½°.
22. Clutch pedal to floor board clearance, with clutch engaged, 5¼.
23. Rear axle. Ring and pinion clearance, .007.
24. Brakes. Type, hydraulic. Clearance of band: top, .008; bottom, .006; front top, .008; front bottom, .006; internal shoe, yes. Lining size, 13½x1½x¾ (two per wheel). Lining brand, Johns-Manville No. 106-S.
25. Tire size, 5.50x19. Pressure, 35 lbs. F. & R. normal; 40 lbs. front (fast country driving).

AUTOMOBILE DIGEST

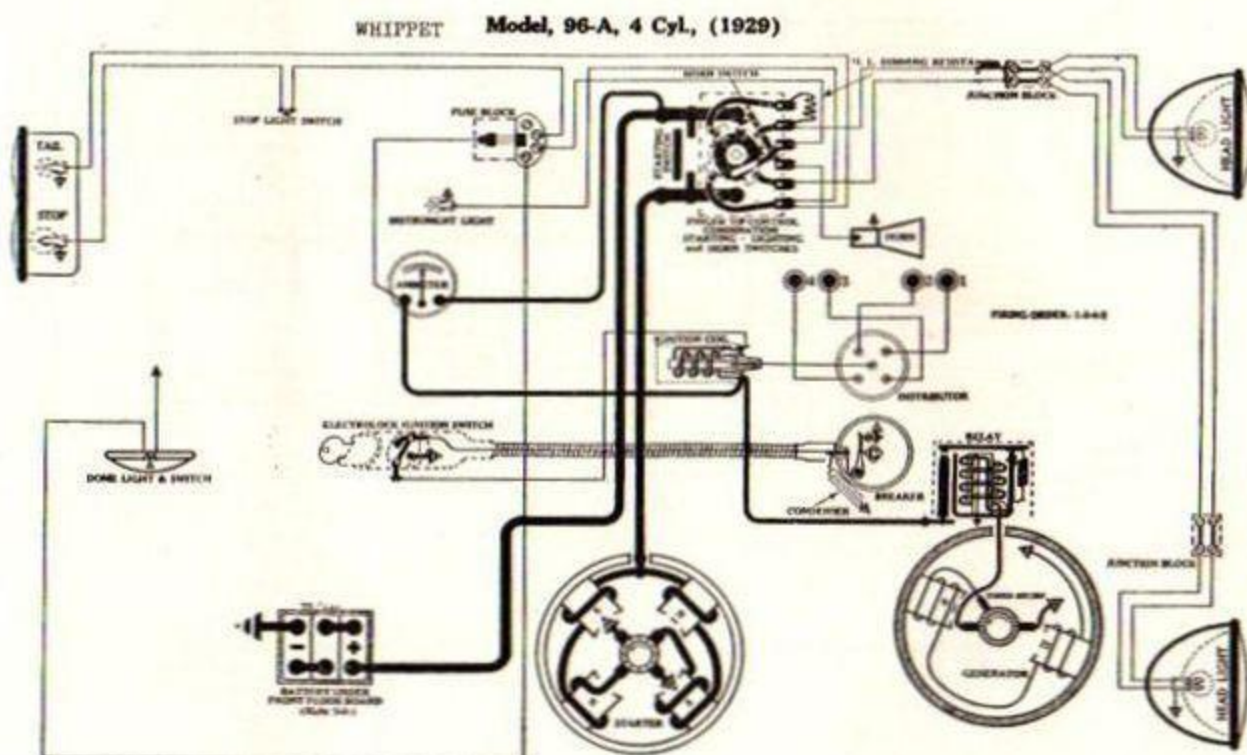
WIRING DIAGRAM AND SERVICE INFORMATION

WHIPPET, MODEL 96-A, 4-CYL., 1929

NOVEMBER, 1929

Courtesy Standard Eng. & Pub. Co., Belmont, Mass.

No. 41-A



TEST DATA

STARTER

Rotation, L. H., Com. End. Auto-Lite, MZ-4001

Connection to Engine—Bendix drive.

Running Free—60 amps. at 5.5 volts.

Cranking Engine—180 amps. at 5.2 volts, 200 r.p.m.

Lock Torque—10 ft. lbs., 490 amps., 3.6 volts.

Brush Spring Tension—20 to 24 oz. on each.

Starting Switch—Located foot of steering column. Operated by pulling up on horn button.

GENERATOR

Rotation, L. H., Com. End. Auto-Lite, GAL-4116

Performance Data—Gen. cold.

Amps.	R.P.M.	Volts	Amps.	R.P.M.	Volts
0	650	6.5	10	1075	7.3
2	720	6.6	14	1340	7.7
5	850	7	16	1800	8

Motoring Freely—5-5½ amps. at 6 volts.

Max. Stall Current—16-19 amps. at 6 volts.

Field Test—4.7 amps. at 6 volts across field coils in series.

Field Fuse—(None).

Brush Spring Tension—20 to 24 oz. on each.

Third Brush Adjustment—Loosen cover band.

IGNITION

Rotation, R. H., Top View. Auto-Lite, IGB-4020-A

NOTE: This unit is of the full automatic type; however, the spark may be retarded for starting, and on heavy grades, by pulling out on spark knob.

Breaker—Contact separation .020 to .024 in.

Contact Spring Tension—18-20 oz.

Timing—1—Locate T. D. C. 2—Locate rotor. 3—Set spark.

Spark Plugs—¾" semi-aircraft (AC type Y); gap .025 in.

Firing Order—1-3-4-2.

Manual Retard—14 degrees (on flywheel).

Automatic Advance—24 degrees (on flywheel).

Eng. R.P.M.	Degrees Advance (on flywheel)	Dist. R.P.M.	Degrees Advance (on cam)
800	0-1	400	0-5
1200	2	600	1
2400	14	1200	7
3000	20	1500	10
3400	24	1700	12

Coil—Auto-Lite, IG-4063.

Ignition Switch—"Electrolock," type 9-A.

RELAY

Auto-Lite, CB-4014

Closes—7-7.5 volts.

Opens—½-2½ amps. discharge.

Contact Gap—.025-.035 in.

Core Gap—.010-.030 in., contacts closed.

LIGHTING

Switch—Briggs & Stratton 40941.

Location—Foot of steering column. This unit is a combination starting switch, lighting switch, and horn switch, all being controlled by horn button on steering wheel.

Fuses—Single 20 amp. fuse mounted on block under engine hood (left side).

Lamps—Head—1110 (Bifocal); instrument—63; dome—63; stop and tail (single socket)—1158.

NOTE: This is the old style Ford headlight bulb with two filaments; make sure the 3 C. P. filament burns for tail light.

BATTERY

U. S. L., 3-CVX-5X-6A, 6 volts, Negative Terminal Grounded

Starting Capacity—96 amps. for 20 minutes.

Lighting Capacity—5 amps. for 17 hours.

Box—Length, 9½; width, 7; height, 9¼ in.

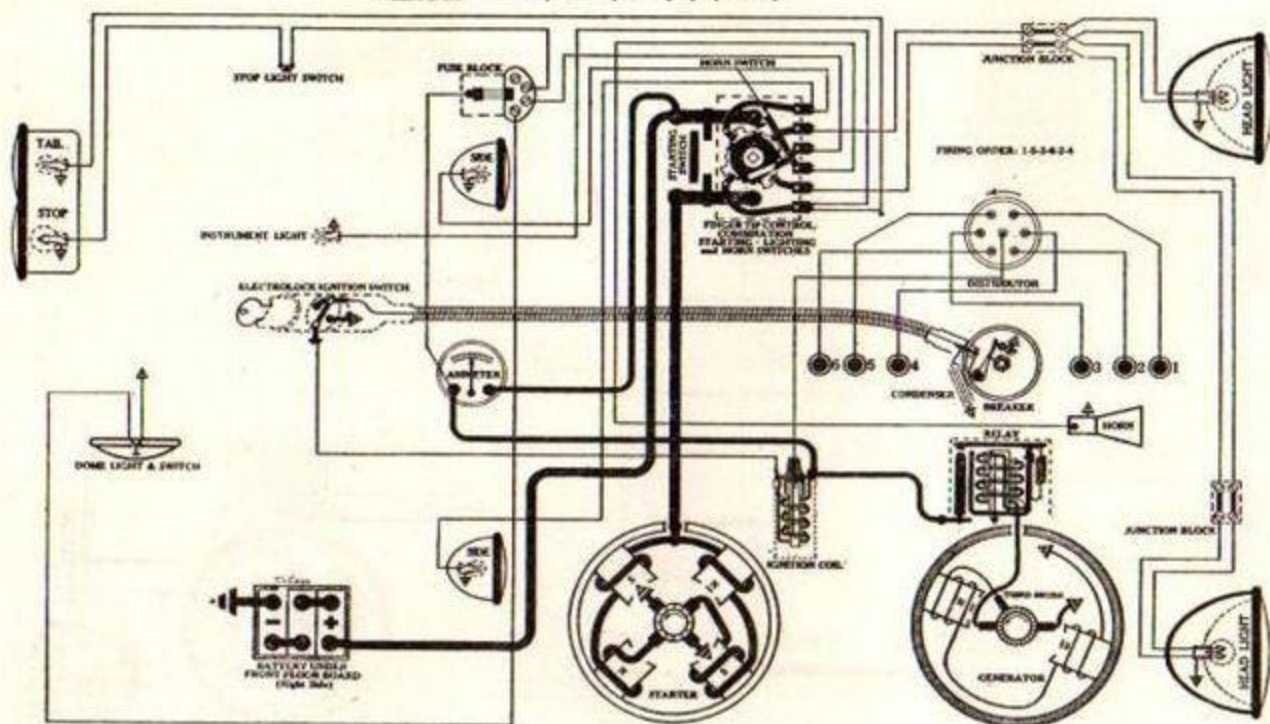
WHIPPET, MODEL 98-A, 6-CYL., 1929

NOVEMBER, 1929

Courtesy Standard Eng. & Pub. Co., Belmont, Mass.

No. 42-A

WHIPPET Model, 98-A, 6 Cyl., (1929)



TEST DATA

STARTER

Rotation, L. H., Com. End. Auto-Lite, MZ-4011

Connection to Engine—Bendix drive.

Running Free—60 amps. at 5.5 volts.

Cranking Engine—180 amps. at 5.2 volts, 200 r.p.m.

Lock Torque—10 ft. lbs., 490 amps., 3.6 volts.

Brush Spring Tension—20 to 24 oz. on each.

Starting Switch—Located foot of steering column. Operated by pulling up on horn button.

GENERATOR

Rotation, L. H., Com. End. Auto-Lite GAL-4106

Performance Data—Gen. Cold.

Amps.	R.P.M.	Volts	Amps.	R.P.M.	Volts
0.....	650.....	6.5	10.....	1075.....	7.3
2.....	720.....	6.6	14.....	1340.....	7.7
5.....	850.....	7.	16.....	1800.....	8.

Motoring Freely—5-5½ amps. at 6 volts.

Max. Stall Current—16-19 amps. at 6 volts.

Field Test—4.7 amps. at 6 volts across field coils in series.

Field Fuse—(None).

Brush Spring Tension—20 to 24 oz. on each.

Third Brush Adjustment—Loosen cover band.

IGNITION

Rotation, L. H., Top View. Auto-Lite, IGB-4021

NOTE: This unit is of the full automatic type; however, the spark may be retarded for starting, and on heavy grades, by pulling out on spark knob.

Breaker—Contact separation .020 to .024 inch.

Contact Spring Tension—18-20 oz.

Timing—1—Locate T. D. C. 2—Locate rotor. 3—Set spark.

Spark Plugs—¾" long (AC type Z); gap .025 inch.

Firing Order—1-5-3-6-2-4.

Manual Retard—14° (on flywheel).

Automatic Advance—24° (on flywheel).

Eng. R.P.M.	Degrees Advance (on flywheel)	Dist. R.P.M.	Degrees Advance (on cam)
800.....	0-1.....	400.....	0-5
1200.....	4.....	600.....	2
2400.....	16.....	1200.....	8
2800.....	20.....	1400.....	10
3200.....	24.....	1600.....	12

Coil—Auto-Lite, IG-4065.

Ignition Switch—"Electrolock," Type 9-A.

RELAY

Auto-Lite, CB-4014

Closes—7-7.5 volts.

Opens—½-2½ amps. discharge.

Contact Gap—.025-.035 inch.

Core Gap—.010-.030 inch, contacts closed.

LIGHTING

Switch—Briggs & Stratton 40941.

Location—Foot of steering column. This unit is a combination starting switch, lighting switch, and horn switch, all being controlled by horn button on steering wheel.

Fuses—Single 20 amp. fuse mounted on block under engine hood (left side).

Lamps—Head—1110 (bifocal); instrument—63; dome—63; stop and tail (single socket)—1158.

NOTE: This is the old style Ford headlight bulb with two filaments; make sure the 3 C. P. filament burns for tail light.

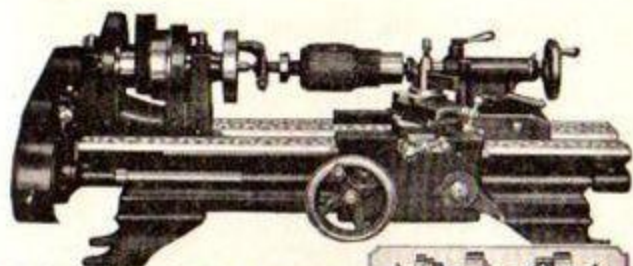
BATTERY

U. S. L., 3-CVX-5X-6A, 6 Volts. Negative Terminal Grounded

Starting Capacity—96 amps. for 20 minutes.

Lighting Capacity—5 amps. for 17 hours.

Box—Length, 9½; width, 7; height, 9¼ inches.



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Lathe with equipment as **\$163**
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George, the Lava Soap Man

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grocery store. But if you want to try it at our expense, mail this
coupon.

Procter & Gamble, Dept. AG 1129
Cincinnati, Ohio

George: I want a free sample cake of your Lava Soap.

Name
Street
City State

It's a Money Maker on Repair Jobs

Now is the time for recon-
ditioning of cars—Save time
and money with the **HOWSER
FILES-IT GLAZE BREAKER**—
a tool whose speed and flex-
ibility on every job is an asset
to all shops. A few of its
many features are: no re-
sharpening, elimination of
assortment of reamer sizes,
self-adjusting to valve guide
and so forth.

*If your Jobber Can't Supply
You—Write Direct*

*The Coupon Below is for
Your Convenience*



Model "A"
15 Degree sta-
tionary type, ad-
justable to all
sizes. \$3.25

Model "B"
Has adjustable
angle feature
and is adjust-
able to all sizes.
\$4.25.

Model "C"
Combination
Model "A" and
Universal Joint
Speeder Wrench
— making one
complete unit.
\$5.00

Model "D"
Combination
Model "B" and
Universal Joint
Speeder Wrench
— making one
complete unit.
\$6.00

The B & H Mfg. Co., Indianapolis, Ind.

B & H MANUFACTURING CO.,
Indianapolis, Ind.

Send at once Model A ☐
Model C ☐

Model B ☐
Model D ☐

Check enclosed ☐

Ship C. O. D. ☐

Name

Address

City State

Free Reference Books

Refinishing Motor Vehicles

"Transportation Finishing Facts" and "Color Mixing and Matching for Automobiles," are two booklets published by the Egyptian Lacquer people, chock-full of facts for the spray man. Starting with the cleaning of the surface, this first-named booklet gives the detailed procedure of how to obtain a perfect finish. The booklet on color mixing and matching is invaluable, and in it are sample chips sprayed with actual material to show true colors. A. H. Greener, 116 W. 39th St., New York City, will see that interested readers receive copies of these valuable booklets free and post-paid.

Building a Brake Service Business

Literature published by The Raybestos Div. of Raybestos-Manhattan, Inc., Bridgeport, Conn., outlines an attractive plan of how you can establish a brake service business. This company furnishes not only the complete brake service station equipment, but offers such dealer helps as folders, signs, form letters, advertising copy, brake service bulletins, clutch data, brake lining data, price lists and other helps which bring owners into the shop. In short, the literature shows how you can develop permanent and profitable brake service business at minimum trouble and expense. Write for it.

Lathe Bulletin No. 9

The South Bend Lathe Works, 548 E. Madison St., South Bend, Ind., has just issued a two-color fully-illustrated bulletin describing their New Model 9-Inch Lathe. Owing to a wide choice of kind of drive, legs, length of bed, and other features of design, this back-gear, screw-cutting precision lathe is available in over fifty styles, each of which is specified and priced in the new bulletin. A section is devoted to construction, manufacture, and inspection; some of the varied uses of the 9-Inch Lathe are shown; and practical attachments for adapting it to milling, keyway cutting, and grinding are also described and priced. Of especial interest to the service shop mechanic is the fact that a lathe of this size is said to do all but the heaviest of his machine work. A free post-paid copy will be mailed to anyone requesting it.

Care and Use of Reamers

New, free Keystone booklet dealing with care and operation of reamers, taps, dies and drills. Contains information on sharpening reamers, taps and drills, a chart of common reaming troubles and their causes, help on the use and abuse of these tools. Get your free copy from the Keystone Reamer & Tool Co., Millersburg, Pa., makers of Keystone "tools that do the job right."

Equipment for Auto Shops

If you're interested in refinishing, write the R. G. Haskins Co., 4649 W. Fulton St., Chicago, Ill., for interesting literature on portable shaft machinery. Tells how to turn out better work in shorter time, reduce overhead and bring in more business.

Babbitting and Boring Machine

Literature giving details of the new Simplicity power drive babbittting and boring machine, telling how by means of greater speed and lower cost it puts bearing service work on a profitable production basis. Write for it to Simplicity Mfg. Co., 4910 Spring St., Port Washington, Wis.

Tools for Motor Maintenance

Van Norman, Stanley and Stanley—Atha tools for motor maintenance are pictured and described in this loose-leaf catalog, printed on heavy paper. The Van Norman line includes piston turning and grinding machines; reamer grinding machines; piston and con rod reaming machines; valve refacers; valve seat aligners and reseating cutters; rotary carbon cleaning brushes, wire wheel brushes and other accessories; body repair kit with Van Norman Angle Drive for removing paint, sanding and polishing in refinishing work, etc.

The Stanley line includes portable electric drills, drill stands and attachments. The Stanley-Atha line of quality tools for automotive mechanics, such as fender and body bumping tools, hand chisels, punches, bars and practical tool sets and vises is also covered. Your request to AUTOMOBILE DIGEST, Cincinnati, O., on your letterhead, will bring a free copy.

THE literature reviewed in these columns contains information of definite value to every garageman and service mechanic. Your request for a free copy of any booklet places you under no obligation. The manufacturers are glad to disseminate this data to the trade, and we are glad to keep our readers posted.

Welding and Cutting Equipment

A 56-page, heavy paper catalogue listing, illustrating, and describing every needed piece of oxy-acetylene equipment for welding, cutting, brazing, lead burning, heating, decarbonizing. The welding torch is a money-maker and garagemen should have this authentic book. Technical Publicity Dept., Oxweld-Acetylene Co., 205 E. 42nd St., New York City, will send it to our readers free.

Wheel and Axle Alignment

A manual valuable to anyone doing wheel and axle alignment, either occasionally or regularly. Numerous cuts illustrate the instructive test. Bear Mfg. Co., Rock Island, Ill., will send it to readers on request.

Modern Automobile Finishing Methods

A 32-page book on the subject, by The Sherwin-Williams Co., each page carrying information on modern finishing methods of vital importance to everyone engaged in or considering the doing of this profitable work. From the preparation of the metal to the stripping; from color to the merchandising of the service, this book is instructive and to the point. AUTOMOBILE DIGEST, Cincinnati, O., will have a free copy sent you.

Your Air Compressor

The Curtis Pneumatic Machinery Co., publishes literature on the air compressor, illustrating and describing various types to meet different needs. The paint shop must have adequate, reliable compressor units to do good and profitable work. Send your request to AUTOMOBILE DIGEST, Cincinnati, O.

Portable Electric Tools

A handsome book of 24 pages, known as Catalog No. 2, brought out by the Millers Falls Co., enumerates some interesting facts concerning portable electric tools and describes Millers Falls electric drills, hole saws, electric sanders and polishers for lacquer work, electric hammers, screw drivers and grinders and wire wheel brushes. Request the Free Literature Dept. of AUTOMOBILE DIGEST, Cincinnati, O., for your copy.

Ratio Gears

Garagemen are shown how the installation of special ratio gears does an expensive job of adding power and speed to the Model T Ford. Milwaukee Forge & Machine Co., Milwaukee, Wis., will send without obligation.

Better Cleaning in the Garage

Showing new and better ways of cleaning, in a 32-page book. How to clean auto parts, remove grease from floors, wash wiping cloths, wash autos and strip paint, at low cost. Oakite Products, Inc., 26E Thames St., New York City, are the people to write.

Automobile Lifts

Literature describing a rapid and economical means of raising automobiles for complete service, repairs or washing. Address the Automobile Rotary Lift Co., Memphis, Tenn., for literature, which will be sent free.

Motor Reconditioning

Complete story of a new method of doing motor reconditioning with piston rings of patented design. Shows how guaranteed work is turned out and the results speedily accomplished. An interesting dealer opportunity is also explained. The Simplex Piston Ring Co. of America, Inc., 1932 E. 66th St., Cleveland, Ohio, will fill your request without obligation.

About Glaze Breakers

This is the story of how the Howser Files-It Glaze Breaker is used on the valve seat with an ordinary speed wrench to remove the glaze and carbon preparatory to using the finishing reamer. It requires no reshaping, saves reamers and keeps them sharp and the small cost of the device is quickly repaid. Write The B. & H. Mfg. Co., Indianapolis, Ind.

"Yankee" Tool Book

New catalog of 45 pages, well illustrated, printed on enamel stock, lists "Yankee" tools, of North Bros. Mfg. Co., that save the mechanic time and labor and help him work more efficiently. Because they are good tools, they are a pleasure to use, and a copy of this catalog will interest all tool lovers. Address your request to Automobile Digest, 22 E. 12th St., Cincinnati, O.

Dent Removing Profits

Describing a complete line of tools designed especially for the removal of both fender and body dents. Illustrated descriptive matter shows their application and the proper way of handling the work. Ask for Circular AD of The Peck, Stow & Wilcox Co., Center St., Southington, Conn. It's free.

Steel Work Benches

Any garageman can step up the efficiency of his shop with modern steel work benches and tables at a surprisingly low cost. This catalogue No. 386 shows the latest in design and helps in selecting steel benches or bench legs best suited to your needs. Gladly sent readers by the Standard Pressed Steel Co., Box 527, Jenkintown, Pa.

What You Should Know About Honing

New literature has just been published by The Hall Mfg. Co., 1650 Woodland Ave., Toledo, Ohio, giving some important dope on hones and honing and how to get more of this work. It covers also the Half Hone, Honing Stand, Waste Receiver and Floor Base. Copies may be had without obligation.

Book Catalog

Describing automotive books written by authorities on every phase of auto repairing. Whether mechanic, expert or apprentice, these books will help you, and they are easily understood. American Technical Society, Dept. A-564, Drexel Ave. and 58th St., Chicago, Ill., will fill your request without obligation.

Keeping the Car's Finish

Circulars on a new wax auto polish made in ten different colors add life and renew the original color of the car. Also describes a cleaner which quickly removes stains and blemishes from the finish. Sent by The American Polish Co., 220 No. Desplains St., Chicago, Ill.

Abrasives and What They Should Do

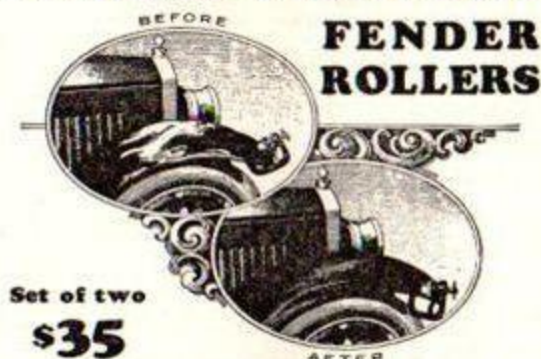
Literature giving interesting facts concerning lapping and bearing compounds, showing how Timesaver Compound produces perfect velvet-finish surfaces that retain the oil film. Sample also sent free to repairmen. Address Abrasive Engineering Labs., Inc., Dept. C, 117 N. Jefferson St., Chicago, Ill.

Capacity Chart

An accurate capacity chart showing gasoline, oil, transmission, differential and radiator capacities of all passenger cars, has been published by S. F. Bowser & Co., Inc., and is being distributed free of charge to filling stations, garages, etc., desiring copies. Send direct to Automobile Digest, 22 E. 12th St., Cincinnati, O., for your copy.

Garage Equipment Index

This is a directory of manufacturers of shop equipment, arranged alphabetically by products, published and distributed free to readers by AUTOMOBILE DIGEST, Service Department, Cincinnati, O. The Index acts as a handy reference and a quick method of securing information from the manufacturers.

STILES-HERMAN

Set of two
\$35

**Remove Fender Dents
Quicker and Easier**

Don't just "bang away" and trust to luck... Remove dents scientifically and profitably with a set of HERMAN FENDER ROLLERS.

There is a Small Roller for removing dents from the edges, and a Large Roller for taking out dents from the top or crown of any kind of fender... Two Rollers sold as one unit, not separately, \$35.00.

With the purchase of our new Combination Body and Fender Tool at \$15.00 you have all the fender equipment you need for only \$50.00.

Write for descriptive literature and free manual.

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OUT OF DENTS

STILES-HERMAN MANUFACTURING COMPANY
1710 Russell Blvd., St. Louis, Missouri

Two of the

Time-Saver

Patented Tools Mechanics Need

Complete line of patented tools that cut work and time in half.

ART
Valve-Lock
TOOL



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For removing and installing valve locks. Double-duty; one end for pin styles; other end for yokes (or horseshoe) style locks. Needed also for its uncanny facility for reaching into inaccessible places, picking up parts, loosening screws, bolts, etc. You'll bless it

ART
Piston-Ring Groove
CLEANER



Saves time, work—increases profit per job. Recommended by leading Piston Ring and Car makers. Fits sizes: 1/8-in., 5/16-in., 3/8-in., 1/2-in. by simple adjustment. Don't delay making the job easier for yourself, better serving your trade.

\$1.25

Southern Representative

F. B. KEITH

808 Walton Bldg., Atlanta, Ga.

Order from Your
Nearest Jobber

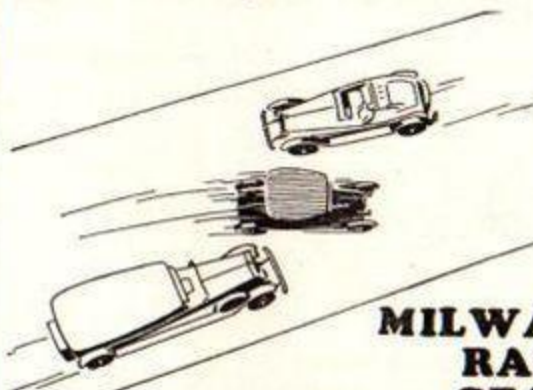
FREE

Fill out and send to The Art Tool Mfg. Co., 326 Lakeside Ave. W., Cleveland, Ohio, for folder describing complete line of Time-saver tools.

Name

Address

Extra Speed in a Pinch



MILWAUKEE RATIO GEARS

3 1/4 to 1 (39-12) 3 to 1 (39-13)

WHY trail along in the rear with slow standard Ford Gears when you might just as well be out in front? 500,000 Model "T" owners have answered this question by installing Milwaukee Ratio Gears.

Just think! 56 miles per hour in a Ford... your own Model "T" Ford. Same engine, same transmission and same car throughout... just a simple change of ring and pinion gears in the rear axle. Any garage or service station will be glad to install a set of Milwaukee Ratio Gears at a very low cost.

MILWAUKEE FORGE & MACHINE CO.
MILWAUKEE, WISCONSIN

An Amazing Offer!



The New Model

REFLEX
BATTERY CHARGER
Direct to You

At a Special Price on Easy Terms

YOU need only a very few dollars to install this latest, improved Reflex Battery Charger. No other such profitable business can be started with so small an investment. Actually it pays for itself out of profits it has made. Our monthly installment plan makes it extremely easy to put in this highly profitable department without any financial planning. Start a battery charging service immediately—don't delay! Now is the beginning of the battery charging season.

Money Back Guarantee

You take absolutely no risk. Satisfaction is guaranteed or your money will be returned. No upkeep except current. No wear out. Protected against discharge or overcharge. Built to last a life time and it works 24 hours a day.

MAIL COUPON... Today... for Details

Write today for literature describing how easily the Reflex Battery Charger can be installed, both mechanically and financially—and how it will start a new, steady stream of profits. Turn an idle corner of your shop into a veritable gold mine.

THE REFLEX SPARK PLUG CO.

10808 Berea Road, Cleveland, Ohio

Gentlemen:—Without obligation, send me complete details on the specially priced Reflex Battery Charger, explaining how I can operate a battery charging service on a big, profit-paying basis.

Name

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HASKINS

EQUIPMENT

in operation at Mack's Auto Paint Shop, Los Angeles, Calif., on Norma Talmadge's Rolls-Royce.

The rapidly revolving HASKINS polisher enables the workman to finish the work in surprisingly quick time, and the result is a high-luster polish that would be hard to equal by any other method.

By increasing output not only does Haskins Equipment solve the problem of cutting costs—but it also assures a brilliant, lasting finish that speaks eloquently of competent help and efficient shop practice.

There is a Haskins to meet your requirements, whatever they are. As a first step—write for complete descriptive literature.

R.G. HASKINS COMPANY

Portable Flexible Shaft Machinery

4649 WEST FULTON STREET, CHICAGO, ILL.
Branch Offices in Principal Cities

MAIL TODAY
R. G. Haskins Co., 4649 W. Fulton St., Chicago, Ill.

Please mail information on Haskins Equipment for Auto Shops.

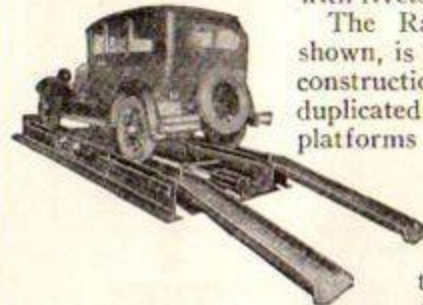
Name

Address

City..... State.....

Complete Brake Service Station Equipment

EVERYTHING necessary to establish a modern brake service station or department—from rivets to brake tester; even down to folders, circular letters, advertisements and signs, is contained in the Raybestos line of brake service equipment. Anyone contemplating the establishing of a profitable brake service shop, or increasing business through brake service should get the details of the Raybestos plan and lay-out from The Raybestos Div., Raybestos-Manhattan, Inc., Bridgeport, Conn. The equipment consists of Raybestos brake tester, drum lathe, wheel puller, brake relining machine with rivets, and Raybestos lining.



The Raybestos brake tester, shown, is efficient and rugged in construction. Road conditions are duplicated exactly on the sliding platforms of the tester, giving a

perfect reading of the brakes. The

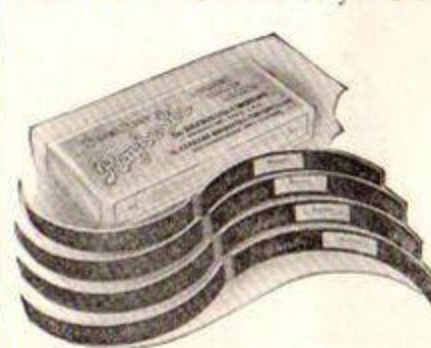
tester may be operated from one position

and does not require a pit. The reading

is registered on special dials on the left side of the tester, and electric lights tell the story to the operator at a glance.

The Rayco brake relining machine is a moderate priced locating, drilling, countersinking and riveting machine. Its noiseless gears running in oil, the ball thrust bearing which takes the pressure of the spindle, and many other mechanical features make this an outstanding item in its price class. The machine comes complete with riveting tools of nicked steel and a stock of rivets, and like all other pieces in the Raybestos line may be purchased separately.

Raybestos Silver Edge Molded Segments, also shown, are molded for a specific make of car and brake, enabling the service man to use a special Raybestos segment in perfect accord with the manufacturer's specifications. This new method has advantages at once apparent to the brake repairman, in turning out jobs that are right, in less time, pleasing customers and increasing profits on the flat rate basis. Raybestos woven lining, for use on brakes designed for woven lining, is well known to the trade and is the result of years of experience in manufacturing a lining that resists wear, is as effective in wet as in dry weather, and throughout a quality product. Another Raybestos lining is Hycoc molder in rolls, a new feature in internal brake lining. It is a semi-flexible



molded lining and comes in 50-ft. continuous rolls. At a moderate investment, Raybestos makes available all



Ever-Tite Reaction Bolts

Installed on connecting rod bearings ends all knocks for the life of the motor—even on out-of-round crankshafts. Automatic feature keeps bearings snug and true, eliminating take-up or tightening and costly regrinding or replacement. Easily installed—Guaranteed for 50,000 miles. Set of 8 for Ford "T" or Chevrolet 25-28 \$3.75 prepaid; also made for all cars, trucks and tractors.

Ever-Tite Universal Hose Clamp

New—different—no nuts to tighten—no bolts to work loose—no threads to strip—no studs to break. Rust-proof—fit any size—self-locking—quickly attached or detached without tools. Box of six, 40c.



Ever-Tite products are fully guaranteed—your money refunded if not satisfied.

Ever-Tite Center Bearing Cap

Automatically rids Fords and Chevrolets of motor ills caused by crankshaft end-play—makes starting easier. Quickly and easily installed—no special tools needed. Ford set \$2.75; Chevrolet set \$3.00.



Ever-Tite Bolt Company

4750 Sheridan Road, Chicago, Ill.

For Every Reaming Need

There's a Genuine Critchley
or a C & T
Spiral Aligning Reamer
to SPEED the Work

You can do a better job of reaming with them; they shear clean, cut better, clean and true without chatter, yet cost no more. Write for Catalog D. See for yourself how completely these famous tools satisfy the reaming requirements of mechanics the world over.

"Jobber Salesman"

Critchley and C & T Aligning Reamers are of tungsten steel, oil hardened, designed and built on soundest engineering principles, durable, dependable and fully guaranteed.

Write today for Complete Catalog "D"

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Largest exclusive manufacturers of reamers in the world.

Factory: Portsmouth, N. H.

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Canadian Distributors: F. Bacon Company, Ltd., Montreal, Quebec.



HOTEL FORT SHELBY

Lafayette and First
DETROIT

22 Floors
900 Rooms

—all with Servidors

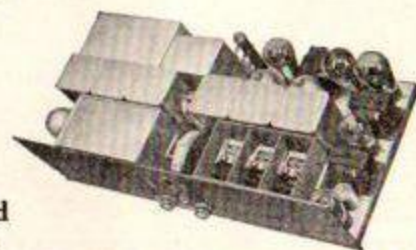


WHETHER your choice be one of the many very comfortable rooms at \$2.50, \$3 or \$4, or an especially large room or suite overlooking the city, river and Canadian shore, you will here enjoy a special sense of value.

Convenient to all downtown; principal shops almost at the door. Garage in connection; cars delivered without special service charge. Excellent facilities for conventions.

J. E. FRAWLEY, Managing Director.

EASY to BUILD and SELL The World's Finest Screen-Grid BAND-FILTER RADIO



9 Tubes
Six Tuned
Circuits

Choice
of 9
Beautiful
Cabinets



The
BLACKSTONE

The ideal receiver for custom-building—ideal because the results cannot be duplicated—because of simple assembly from completely-wired and factory-tested units—because of unlimited choice of cabinets and speakers—because of freedom from service problems.

Nine tubes, including automatic voltage regulator. Six tuned circuits. Exclusive Band-Filter tuning. Three-stage Screen-Grid amplifier. Power detector. Push-pull '45 audio. Phonograph connection. World-wide range. Superb tone.

The 48-page "HiQ-30" Manual tells how to make money building and selling this amazing receiver. Brimful of other valuable radio data. Send 25c for it today. Address Dept. AD11.

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Custom-Built
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HAMMARLUND-ROBERTS, Inc. 424-438 W 33rd St. NEW YORK, N.Y.

Imperial Primer

Starts Cars
Instantly
in Coldest
Weather

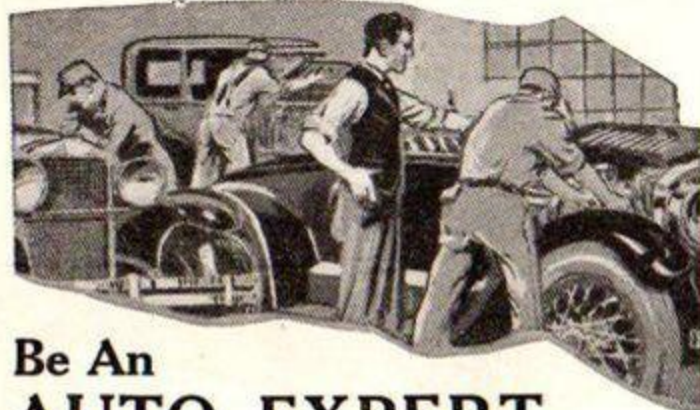


Quickly Installed

All makes of cars now start instantly in coldest weather when equipped with the Imperial Primer. This easily installed device throws a rich spray of vaporized FIREABLE gasoline into the intake manifold, thus enabling the engine to be started on the first turn-over no matter how low the temperature. The Imperial Primer is simple to install and pays a very worth-while profit to dealers. The No. 58-D Outfit is for all cars except Fords while the No. 59-D Outfit fits all models of Ford Cars. Order from your jobber.



The Imperial Brass Manufacturing Co.
569 So. Racine Ave., Chicago, Ill.



Be An AUTO EXPERT

Don't be satisfied with a mechanic's job and pay. Clip coupon for my FREE Book. Learn why it's easier for trained men—REAL, Electrical and Mechanical Auto EXPERTS to make big money than for average auto men to get average pay. It's training that makes the difference, not just years of experience.

I TRAIN YOU AT HOME

No need to quit your job to take "JOB-WAY" Training. Get my FREE book and learn how Dillard, a 14-year experienced auto man, jumped from \$3 to \$10 and \$20 a day after just 5 months of training, the same training which has brought big raises in pay, promo-

tion, and quick success in business of their own to my students. Many had no previous auto experience and very little schooling.

CLIP COUPON RIGHT NOW

Get my FREE Book with all the facts and details of my big offer to ambitious men. Read my money-back agreement. Learn about my Employment and Consultation Service, free to my students. Act today!

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Send me your FREE Book giving all the facts about your training and proof that it can raise my pay—also details of your big offer. No obligation to me.

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Town State
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Compare with Costliest Sets!

America's big old, reliable Radio Factory springs its 10th anniversary sensation! Latest 1-dial, Perfected Screen Grid, Push-Pull, Super Dynamic Electric AC and newest battery sets of finest construction, costliest features—at astounding low factory prices. Compare with radios at 2 to 4 times the price—unless Miraco is MORE SELECTIVE, RICHER, CLEARER, TONED and gets MORE DISTANCE. Don't buy it! Do! Lighted thousands report programs from Coast to Coast, Canada, Cuba, Mexico, with magnificent clear, cathedral tone. 1 year guarantee. Choice of beautiful consoles with dynamic speakers. Insure satisfaction, save lots of money—deal direct with a big, old maker of fine radios—10th successful year. Write and be convinced!

Screen Grid
\$49.88

BATTERY
MODEL
\$29.50

Send postal or coupon
for Amazing Special
Offer. No Obligation.

USER-AGENTS!
Exclusive Territory.
Big Money. Write!



Free

NAME
ADDRESS

MIDWEST RADIO CORP.
President & Vice Sales—first year
591-SN Miraco Bldg., Cincinnati, Ohio
Send amazing special wholesale price offer.
Interested in exclusive territory prop'n.

The advertiser will thank you for mentioning the AUTOMOBILE DIGEST

essentials for brake service business. This equipment will be exhibited at the M. E. A. and N. S. P. A. Shows, and readers are invited to address the factory direct for full particulars, mentioning the DIGEST.

Save Time Installing Piston Pins

IN installing piston pins I find I can save a great deal of time by not screwing the piston or the rod in the vise when I want to remove or replace the pin.

Instead I get a rod or long thin punch that will fit inside the pin and I fasten this in the vise so that most of it projects to the right or left of the vise jaws. I get hold of the connecting rod, piston and piston pin assembly and slip it over this rod that I have clamped in the vise. That is, the rod goes through the piston pin. Get the idea? Then it is a simple matter to remove the piston pin clamp screw because the piston can't turn on you, and you can have all your clamp screws removed or replaced while the other fellow is clamping and unclamping the vise.

But the best thing about this idea is that it prevents a twisted connecting rod. If you clamp a connecting rod in the vise while you are removing the piston pin clamp screw you are apt to spring the connecting rod with the pressure applied to the wrench. Rods have often been sprung in this manner and mechanics have spent many long hours looking for the "elusive knock."
—Chevrolet Garage, O.

The second half of "Servicing the Chevrolet Six Cylinder Chassis" will appear in the December issue of AUTOMOBILE DIGEST.

BUICK BRAKE ADJUSTMENTS

(Continued from page 11)

the brakes slightly with a pedal jack to determine whether right and left wheels have the same traction. If not, slack off the adjusting nut 1 on the tight wheel to balance it against the opposite wheel.

Important Note. The brake linkage is so designed and arranged to give proper distribution of braking effort between the front and rear wheels. This relation cannot be changed by varying the adjustments of nuts 1. It is only possible to balance the rear wheels against each other and the front wheels against each other.

Buick Hand Brake Adjustments

Operation No. 149

In order to secure an economical brake service the factory has provided adjustments on the hand brake rigging so as to give an equalization between the rear wheels and thus secure the same braking efficiency from each one. When adjusting, proceed as follows:

1. Check the levers 21, making sure they set against stops 20 and that there is no slack in rods 13 and 14. Rod 13 is set in the lower hole of the cross shaft lever to give maximum ease of operation.

2. Set the hand brake lever pawl 22 in the second notch of the ratchet with the rear wheels off the floor. This is equivalent to the fourth notch when the brakes are applied with the car moving.

3. Adjust nuts 15 until both rear wheels have a

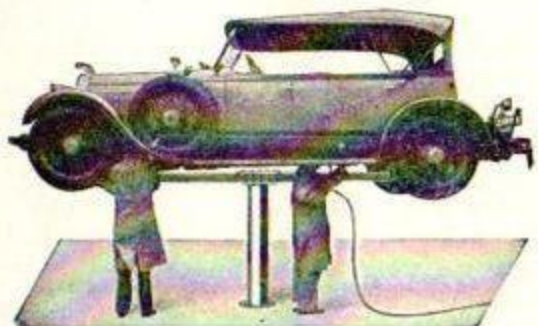
FINISH THE JOB ON ROTARY LIFT

FOLLOW up every washing and service job with a good grease job on the whole car. It will ride easier, the motor run smoother and quieter and squeaks and rattles will disappear. Give your customers a complete job on Rotary Lift—it means an extra profit for you.

Rotary Lift is the oldest and most widely used rotating automobile lift made. It is in use in every state in the Union, in Canada and in many other foreign countries. Rotary Lift's operation is unaffected by temperature or climate—it always works summer or winter whether installed inside or outside.

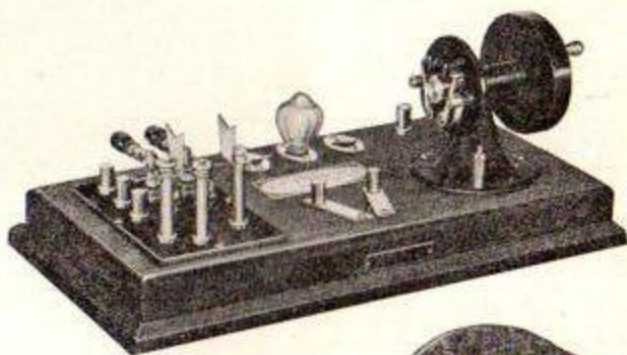
Finish the next job on Rotary Lift, the original rotating automobile lift.

Automobile Rotary Lift Co.
MEMPHIS, TENN.



Model 94—\$250 at Factory

THE SLIFER METHOD



For testing High-speed coils and condensers uses the fastest test breaker ever built.



Simplified in design—extremely accurate and easy to operate

*Write for interesting booklet
or ask your jobber's salesman.*

W. J. SLIFER & CO.
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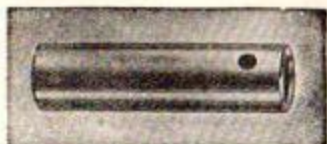
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Welding Aluminum Castings Without Preheating

Operation No. 150

Experienced aluminum welders sometimes dispense with the usual preheating process and handle rather complicated jobs entirely with local preheating, using an oil burner for the purpose. A typical job is described here, and the description may be used as a guide when handling similar work.

1. Form a steel plate to fit the inside of the job, in this case a lid 56 inches in diameter and $\frac{3}{4}$ -inch thick,



(Photo and process courtesy "Oxy-Acetylene Tips," Oxyweld-Acetylene Co.)

from a rotary bottling machine, which showed a crack from one edge about 20 inches inward, toward the center.

2. The steel plate is clamped to it along the crack.

3. Fasten the casting to a flat surface and align the two sides of the break at the open end by means of a steel strap clamped in position.

4. Vee the opening carefully.

5. Heat the entire length of the break with the oil burner, to a moderate temperature.

6. Start the welding at the inner end of the break with the preheater, heating the aluminum thoroughly a few inches ahead of the weld.

7. Use a puddling rod and a cast aluminum flux in order to secure a sound weld. The puddling rod is used to remove the oxide from the surface of the molten metal and to work the new metal added into form.

8. Continue to play the preheater ahead of the weld, along the crack. This keeps the crack opened up to the limit of expansion.

9. As the weld is completed for sections of the break they may be covered with asbestos paper to prevent rapid cooling. It is best to select a place for the work which will be free from draughts of cool air.

10. The job shown was completed in 90 minutes and required very little refinishing.

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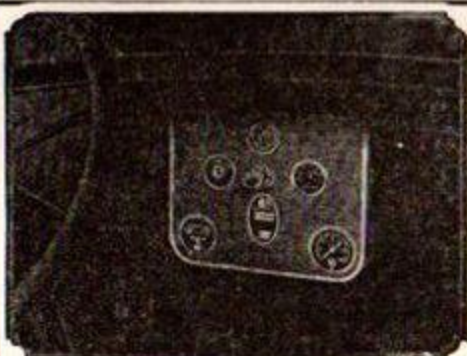
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(Continued from page 12)

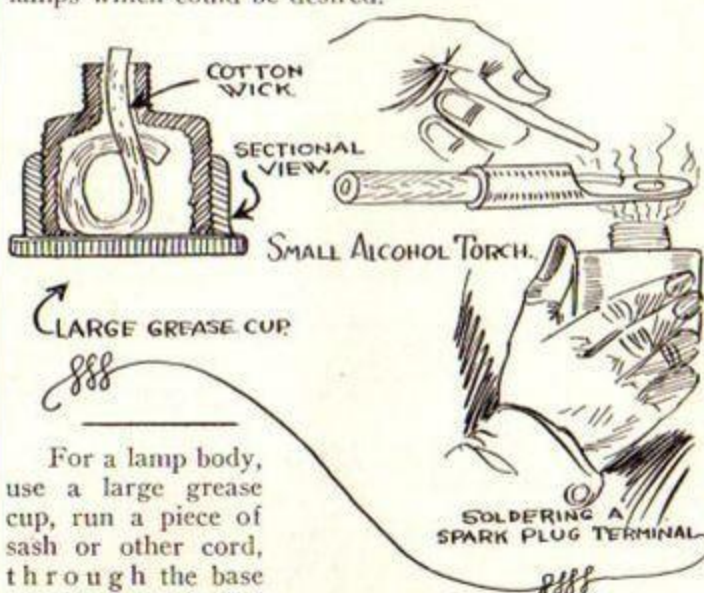
hay wire, but as a tow chain it is no better than hay wire. Figuratively speaking, if the service man does not have help a "hay wire" job may result. It is the job of the jobber, then, to weld in the link of service that assistance which makes the service chain one hundred per cent strong.

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Before me, a Notary Public in and for the State and county aforesaid, personally appeared Ray F. Kuns, who, having been duly sworn according to law, deposes and says that he is the Editor of the AUTOMOBILE DIGEST and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management, etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business manager are:

Publisher—Edward Rosenthal.....Cincinnati, O.
Editor—Ray F. Kuns.....Cincinnati, O.
Managing Editor—N. R. Meyer.....Cincinnati, O.
Business Manager—L. A. Thelen.....Cincinnati, O.

2. That the owners are:
Edward Rosenthal.....Cincinnati, O.

3. That the known bondholders, mortgagees, and other security holders owning or holding 1 per cent or more of total amount of bonds, mortgages, or other securities are—None.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any—contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in the cases where the stockholders or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner, and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

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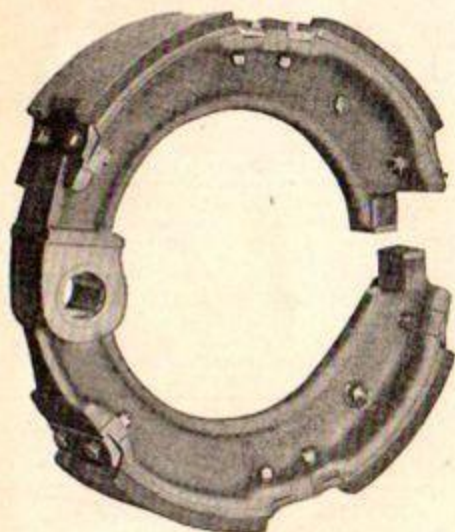
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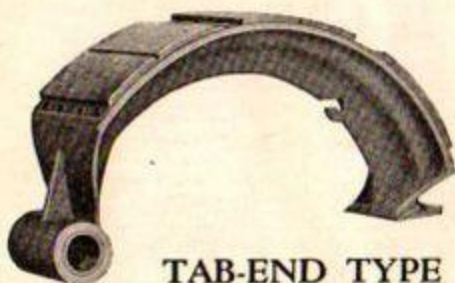
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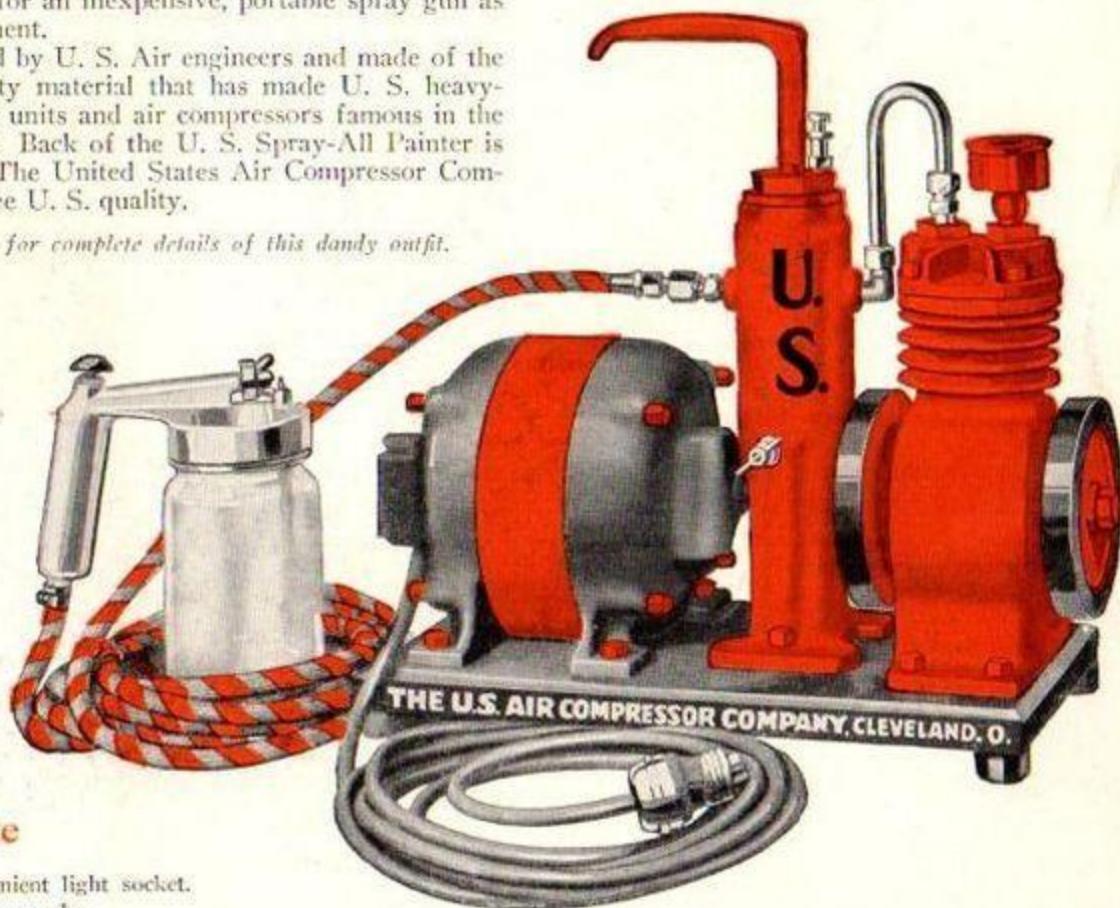
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