THE HORSELESS AGE

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# Brakes on Hills.

## Energy Absorbed by Brakes in Descending Long, Steep Grades, and Amount of Braking Surface Provided in Standard Cars During Recent Years.

By F. E. Watts.

Motor car parts are quite often designed to resist the stresses met with under average conditions of operation, rather than the extremes which really try the metal of a car and determine its worth and lasting qualities. Thus the braking systems of most cars, while suitable for ordinary roads, are not the best possible for operating in very hilly districts, as around Cincinnati and Pittsburg, for instance.

As was stated in the first instalment of this article, the total area of braking surface required should probably be determined by extreme conditions of grades that are likely to be met with and the drum temperature we are willing to allow. In this connection working conditions may probably be best illustrated by calculating an actual example.

Let us assume that a car which weighs, with full passenger load, 3,500 pounds, is about to descend a 20 per cent. grade 10,000 feet long. By a 20 per cent. grade we mean, of course, one with a vertical rise of 20 feet for every 100 feet of horizontal distance. Its angle with the horizontal is then the angle whose tangent is 0.2000, or approximately 11 degrees 19 minutes. The length of the hill, which we have assumed as 10,000 feet, multiplied by the sine of 11 degrees 19 minutes will give the vertical drop.

$$\text{Sine } 11^\circ\ 19' = 0.19623$$

So the height of the hill is:

$$10{,}000 \times 0.19623 = 1{,}962.3 \text{ feet.}$$

When a car is at the top of a hill, because of its greater distance from the centre of the earth, it possesses potential energy equal to its weight multiplied by the vertical drop. In the case we have assumed the energy loss in descending the grade would be:

$$3{,}500 \times 1{,}962.3 = 6{,}868{,}050 \text{ foot pounds.}$$

This energy may be expended in several different ways, according to how the car descends. If it could roll down the hill without friction from the road or mechanism all the energy would be used in overcoming air resistance during a descent of rapidly increasing speed and an extremely long coast on the level. Under ordinary practical conditions, however, even without brakes applied, parts of this force would be expended in overcoming friction of the mechanism and friction of the tires on the road, the rest in air resistance as before. This friction and air resistance act as brakes in themselves, and if they are not great enough to balance the downward force of the grade the car will descend with constantly increasing speed but more slowly than under the ideal conditions of no friction. Their action then is simply to decrease the apparent grade of the hill, making it seem longer and less steep.

We will assume that such a retarding force is applied by the brakes that the car goes down the hill at some uniform rate; that the car approaches the hill at the same rate it descends and that it continues along the level after the descent at the same speed. Under such conditions the brakes do not absorb any of the energy of motion (kinetic energy) of the car. Their work consists in absorbing part of the potential energy lost by the car and converting it into heat, which they must radiate fast enough so that the contact surfaces will not get hot enough to burn.

First let us assume the constant speed is 10 miles per hour. The traction resistance, if the road is good, will probably be about 25 pounds per thousand; this would give a total traction resistance of:

$$25 \times 3.5 = 87.5 \text{ lbs.}$$

Air resistance is given by the formula:

$$R = V.\ A. \times .00017.$$

Where R is the resistance in pounds.

V = velocity in feet per second, and A = the cross section area of the car, in square feet.

$V = 14.67$.

A may equal about 15.

Which gives $R = (14.67)^2 \times 15 \times .0017 = 5.4$ lbs.

Total resistance = 87.5 + 5.4 = 92.9 lbs.

At a speed of, say, 25 miles per hour the air resistance becomes of more importance, for it would equal:

$R^2 = (36.75)^1 \times 15 \times .0017 = 34.4$ lbs.

The total resistance would then be = 87.5 + 34.4 = 121.9 lbs.

These resistances are in pounds and are overcome through a distance of 10,000 feet. So the energy losses in foot pounds for the two speeds are

Loss at 10 m. p. h. = 92.9 × 10,000 = 929,000 foot pounds.

Loss at 25 m. p. h. = 121.9 × 10,000 = 1,219,000 foot pounds.

If we substract these losses from the total energy loss in descending the hill we shall have the energy absorbed by the brakes in each case.

At 10 m. p. h. this is

$$6{,}868{,}050 - 929{,}000 = 5{,}939{,}050.$$

and at 25 m. p. h.

$$6{,}868{,}050 - 1{,}219{,}000 = 5{,}649{,}050.$$

The time of descent is:

At 10 p. m. h., 10,000 ÷ 14.67 = 682 seconds.

At 25 m. p. h., 10,000 ÷ 36.75 = 272 seconds.

So the energy absorbed by the brakes per second is:

At 10 m. p. h., 5,939,050 ÷ 682 = 8,710 foot pounds.

At 25 m. p. h., 5,649,050 ÷ 272 = 20,750 foot pounds.

It would appear at first sight as though much greater braking surface would be needed in the second case than in the first, but it must be remembered that this energy is turned to heat, and that the rate at

which the drums will dissipate heat depends largely upon the speed with which air passes over them.

Experiments prove that the rate of cooling varies with the speed of air currents, about as shown by the curve of Fig. 1. The maximum cooling effect is reached at speeds which vary with the excess of temperature of the body above that of the surrounding air, amount of eddy currents, etc.

For such temperature rise as we may allow in brakes, say 100° C., 180° Fahr.), this limiting speed is probably about 80 feet per second. At the lower speeds the cooling effect varies roughly as the speed.

Taking the cooling effects found by scientific experimenters and translating them from decrease of temperature of the substance cooled into foot pounds, which process is of little interest in this article, we find a cooling rate, under favorable conditions, for a speed of ten miles per hour and temperature increase of 180° Fahr. above the atmosphere, of 1.5 foot pounds per second for each square inch of cooling surface.

The required braking surface then would be:

$8710 \div 1.5 = 5840$ sq. in., for 10 M. P. H.

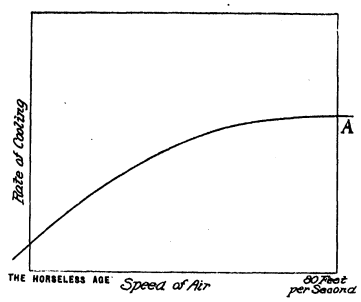



FIG. 1.

And

$$\frac{20750}{1.5 \times 2.5} = 5540 \text{ sq. in., for 25 M. P. H.}$$

This is the area which would be required to maintain the temperature limits we have assumed. As these areas are much too large to be obtained with ordinary brake designs it is evident that for such severe use brakes must either be water, oil or air cooled by some method which either provides increased radiating surface or means for renewing the cooling liquid. Or else the braking surfaces must be made of materials which will stand a high degree of heat, without serious loss of strength or frictional qualities. The foregoing conclusions would appear to favor the use of metal to metal brakes with provisions for water cooling.

AVERAGE BRAKING SURFACE PROVIDED.

Tables of average braking surface have appeared several times in these columns, and indicate that the amount provided is constantly increasing.

In 1906 the average American car had 133 square inches of surface for 23 horse power and 1,800 pounds weight. The average foreign car had 290 square inches for 36 horse power and 2,100 pounds weight.

Upon 1907 cars the braking surfaces were found to average as follows:

FOREIGN CARS.

| | Foot | Hand | Total | Car Weight |
|---|---|---|---|---|
| Brake area in sq. in.... | 103.8 | 213.6 | 317.4 | 2943 |
| Car pounds per sq. in.. | 28.1 | 13.7 | 9.2 | |

AMERICAN CARS.

| | Foot | Hand | Total | Car Weight |
|---|---|---|---|---|
| Brake area in sq. in.... | 103.1 | 161.6 | 264.7 | 2745 |
| Car pounds per sq. in.. | 28.6 | 16.9 | 10.3 | |

More recent designs show some increase over these figures, and while I have no averages worth giving of late designs I believe the total braking surface would be one square inch for between eight and nine pounds of car weight.

# Motors for Aerial Navigation—IV.

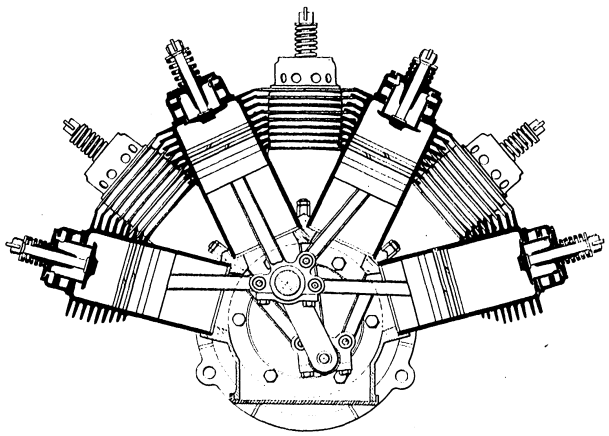
THE R. E. P. ENGINE.

This engine is of particular interest on account of the fact that it is designed and manufactured by M. Robert Esnault Pelterie, who is both a gifted engineer and an enthusiastic aviator.

This motor can be obtained in three different sizes, corresponding to 25, 35 and 45 horse power output. With the exception of the latter size, an uneven number of cylinders is adopted, acting upon the usual two-throw crank-shaft with cranks at 180°. A reference to the adjoining diagrams will explain better than words the arrangement and grouping of the cylinders. It must be pointed out that on the smallest engine only five cylinders are employed, but their arrangement is essentially similar to that of the 35 horse power motor shown by the diagrams.

Only one piston for each set of cylinders has a connecting rod, the big end of which encloses the crank-pin. The other connecting rods have forked ends, working on pins provided for this purpose on the lower end of the main connecting rod. At first sight this arrangement appears somewhat unmechanical. However, it is quite easy to see that this is not the case. The pins that engage at the forked end of the auxiliary connecting rods fit, at its central portion, into the body of the principal connecting rod, and the two symmetrical projecting ends are, therefore, in a very convenient position to withstand both the bending and sheering stresses to which they are subjected during the explosion stroke. When it is remembered that with the bore employed the maximum value of the force acting upon the pins cannot be more than two tons, it becomes evident that a pin of ½ or ⅝ of an inch in diameter will do the work with an ample margin of safety. The specific pressure at this connection will certainly reach very high values. This, however, only affects the friction between the working parts. On the other hand, the amount of energy absorbed by friction is proportional to the pressure and to the way the latter travels in the unit of time. This travel is obviously reduced when the diameter is diminished, and this will compensate to a certain extent for the increase in specific pressure. The valves which are of the combined type, are placed in the cylinder head. They are actuated by a rocking lever, which is operated by a vertical rod.

A very valuable peculiarity of the radial disposition of the cylinders consists in the possibility of adopting a single cam-disc for the operation of all the valves. The mathematical demonstration of this principle is not within the scope of this paper, but I will give the results for the engines of the type now in discussion. The cam-disc which is to operate all the valves of a motor with an uneven number of N cylinders must turn in a direction opposite to



SECTIONAL VIEW OF R. E. P. MOTOR.

that of the main shaft, and at a speed N-1 times smaller than that of the engine. The disc must also be provided with N-1 cams, equally spaced round the periphery of the former.

On the R. E. P. motor the exhaust is discharged through the holes of a concentric chamber which surmounts the cylinder, and which also serves as anchorage for the fulcrum pin of the rocking arm already referred to.

This engine is obviously intended to be mounted at the front of the machine just behind the propeller. The cooling is therefore insured without the provision of a special engine fan.

It is evident that the designer of this motor has made a special study of eliminating superfluous weight. This is clearly shown by the following data, which refer to the 35 horse power engine illustrated by the diagrams:

| | |
|---|---|
| Weight of an auxiliary connecting-rod | 3 ozs. |
| Weight of the complete connecting-rod set | 2.5 lbs. |
| Weight of a complete piston | 1.2 lbs. |
| Weight of the crank-shaft | 5.1 lbs. |
| Weight of the crank-chamber | 11.4 lbs. |

Appended are both the total and the specific weights of the different types of R. E. P. engines:

5 cylinder, 20-25 horse power, weighs complete 114 lbs., or 4.5 lbs. per horse power.
7 cylinder, 30-35 horse power, weighs complete 150 lbs., or 4.3 lbs. per horse power.
10 cylinder, 40-45 horse power, weighs complete 220 lbs., or 4.8 lbs. per horse power.

### THE ANZANI ENGINE.

Considerable attention has been drawn to these motors on account of the successes attained by the Blériot aeroplane.

The engine fitted to the Blériot machine of cross-channel fame was fitted with a 25-30 horse power motor, having cylinders 105 by 130 mm., and running at 1,600 revolutions per minute.

The following table gives the different sizes and weights of the Anzani motors:

| H. P. | Size of cylinders | Revolutions | Weight in Kgs. |
|---|---|---|---|
| 10-12 | 85 x 85 | 1,800 | 35 |
| 12-15 | 85 x 100 | 1,800 | 38 |
| 25-30 | 105 x 130 | 1,600 | 66 |
| 35-40 | 120 x 130 | 1,500 | 80 |
| 45-50 | 135 x 140 | 1,400 | 105 |

All the above motors have three cylinders, and are arranged for air cooling, but can also be supplied with water-jackets to the cylinders.

Air-cooling appears to be satisfactory, provided the speed of the aeroplane is 45 miles per hour or thereabouts.

### MOTORS INCLUDED IN CLASS C.

The principle of revolving the cylinders round the crank-shaft suggests itself naturally when the absence of fly-wheel and efficient cooling are desirable.

On account of the equality of action and re-action the principle stated above can, theoretically at least, be realized with every reciprocating engine, provided the revolving mass be properly balanced and the cylinders be suitably fed. The Gnome engine can very properly be taken as a typical example of a motor built on these lines.

It is quite obvious that suitable lubrication and feeding are more difficult to attain on revolving cylinders than on stationary ones. On the other hand experience has shown that it is quite possible to dispense with the flywheel, and to efficiently cool an engine built on the usual lines. Therefore it is very doubtful whether any practical advantage can be derived from the use of a motor with revolving cylinders.

However, if the possibilities of the revolving cylinder arrangement be further investigated, it will be found that this design can be realized in a much simpler manner than is usually the case. A good example of a really scientifically-designed revolving cylinder engine is the Burlat motor, to which I shall refer again later on.

### THE GNOME ENGINE.

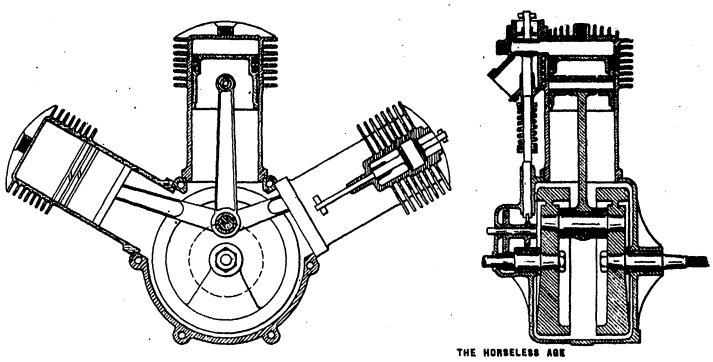
This engine is the design of M. Laurent-Seguin, and it is manufactured by the Gauthier Company.

There are seven cylinders, each one of which with its radiator fins is machined out of a solid bar of steel. The lower end of the cylinders fit in corresponding holes on the crank-chamber, and project a short distance on the inside of the latter. This projection is provided with a groove, and a split locking-ring inserted in this groove completes the attachment of the cylinders to the crank case.

The hollow fixed crank-shaft has a single throw, to which only one connecting rod is attached. The remaining connecting rods work on pins let through the big end of the main connecting rod already referred to.

The explosive mixture is led from the carburetor through the hollow shaft into the crank-case, whence it is admitted into the cylinders by means of an automatic inlet valve placed in the head of the piston. The exhaust valves are on the cylinder head.

A drip feed lubricator is provided, which delivers the oil into the centre of the crank case, whence the lubricant is distributed to the cylinders by centrifugal force.




SECTIONAL VIEW OF ANZANI MOTOR.

Double ignition is provided by high-tension magneto and storage battery.

This engine also entered the test for aerial motors already referred to, and appended are the official results for the motor just described.

Cylinders—110 mm. bore x 120 mm. stroke.

| | |
|---|---|
| Duration of the test | 2¼ hours. |
| Mean speed | 1,200 revs. |
| Mean output in horse power | 35 horse power. |
| Fuel consumption per horse power and hour | .8 lb. |
| Oil consumption per horse power and hour | .04 lb. |
| Total weight of engine complete | 180 lbs. |
| Specific weight | 5.1 lbs. |

*(To be concluded.)*

## Book Review.

Luftfahrzeugbau—Konstruction von Luftschiffen und Flugmaschinen. By Dr. Fritz Huth. Second Edition. Published by M. Krayn, Berlin, W. In paper covers, 7.50 marks; in boards, 8.70.

Dr. Huth took upon himself the task of compiling a work that might serve as a guide to the constructor of aeroplanes and other aerial vehicles, and that his book met with a favorable reception is shown by the fact that the first edition was sold out inside of a year. The second edition contains considerable new matter and has been thoroughly brought up to date. The book contains 332 7x10 inch pages and includes 341 illustrations and tables. After an introduction giving an abbreviated history of human flight, the author takes up flying machines or dirigible balloons, to which subject about 70 pages are devoted. The systematic manner in which the subject is handled may be judged from the following sub-division: Filling gases, the bag, stability, steering, calculations, constructional details, piloting and newer constructions. The main portion of the book deals with the aeroplane. The laws of air reaction are discussed at length with the aid of diagrams and mathematical formulæ. The closing chapters are devoted to the construction of aeronautic motors and of complete aeroplanes.

In Germany it is forbidden by law to test factory cars on the public highway.

# Four-Cylinder Crank Shaft Design.

## Derivation of Practical Formulæ for Dimensioning Crank Shafts for Motor Car Engines, from Data Obtained from Actual Modern Engines—Modern Practice Provides for Increased Strength.

By P. M. Heldt.

The writer about five years ago, shortly after the four cylinder motor had become the accepted type for touring cars, collected data for a large number of four cylinder crank shafts and evolved formulæ for dimensioning such shafts, determining the constants from the data gathered. These formulæ, I believe, have been used to quite an extent as a guide in the design of crank shafts. It was suggested recently that in the intervening period practice in this branch of motor car engineering had changed considerably, that crank shafts were now made more liberal than formerly, and that consequently the constants in the formulæ were incorrect. In order to test this assertion and to devise new, up to date constants if necessary, I collected data for a considerable number of crank shafts used on recent models, drawings of which are shown herewith.

As in the previous analysis of crank shaft design, the explosion pressure has been assumed to be four times the gauge compression pressure. It is found at once that there has been an appreciable reduction since 1905 in the average compression pressure carried, which at that time was 80 pounds per square inch. This will account largely, though not entirely, for the changes in the formulæ constants.

The first part of the crank shaft to investigate is the crank pin. The projected bearing surface of the pin should evidently be proportional to the total explosion pressure on the piston head, this pressure being directly transmitted to the pin. It is found that in the crank shafts with three main bearings the average pressure on the crank pin bearing is 962 pounds per square inch, as compared with 1,186 pounds in 1905.

The bearing surface depends, of course, both upon the length and the diameter of the crank pin. We may assume that length and diameter of pin are proportional. This is not strictly correct, since with a stronger material the ratio of length to diameter can safely be made greater, but since nearly all of the cranks are made of material of practically the same strength it would not be possible to derive from the data gathered any dependable information as to how this ratio should vary with the tensile strength of the material. This ratio $e/d$ varies between the limits 1.06 and 1.88, and its average value is 1.35. Five years ago the corresponding figure was 1.63, showing that now crank pins are made relatively shorter so as to increase the strength of the crank shafts.

Calling the crank pin diameter $d$, the length $l = 1.35\ d$, and the projected area of the crank pin bearing $a = 1.35\ d^2$.

If we denote the total pressure on the piston head at the moment of explosion by P, then

$$a = \frac{P}{962} = 1.35\ d^2$$

$$d^2 = \frac{P}{1.35 \times 962}$$

$$d = \sqrt{\frac{P}{1300}}$$

It must be remembered that in calculating P it is assumed that the explosion pressure is four times the compression pressure.

Taking up next the main bearings of three bearings, four cylinder crank shafts, it is found that in the majority of cases the main bearing is of the same diameter as the crank pin bearing. In some instances the main bearing diameter is one-eighth inch and even one-quarter inch larger than the pin bearing diameter, and in one or two cases the rear bearing is of greater diameter than the others, the reason for this being that this journal, in addition to transmitting the power of the motor, has to carry the weight of the flywheel. The main journals act as shafts whose torsional strengths depend upon the cube of the diameter. The torsion is a function of the total pressure on the piston head P, and the length of stroke $s$, and we may write

$$d_1 = \sqrt[3]{\frac{s \times P}{w}},$$

where $w$ is a constant. The average value of this constant for the eleven shafts with three main crank bearings, all of the plain type, was found to be 15. In the former investigation this value was found to be 17.83, and as it is a divisor this also shows that crank dimensions have been increased in size. In the cases where not all the crank main bearings were of the same diameter, the largest diameter was figured with.

The average pressure on the main crank bearings, found by dividing the total pressure on one piston at the time of explosion by the aggregate projected surface of the three bearings, was found to be 222 pounds per square inch. This pressure varied between wide limits in the cranks investigated, viz., 152 and 339. The three bearings are not of the same length, the flywheel or rear end bearing being always the longest. It is found that the lengths of the different bearings bear to the total lengths the following average ratios:

Front bearing, 30 per cent.
Centre bearing, 30 per cent.
Rear bearing, 40 per cent.

The aggregate bearing surface of the main crank bearings then is

$$\frac{n\ b^2\ c}{222}.$$

The length of the front and central bearings is

$$\frac{n\ b^2\ C}{740\ d_1}$$

and the length of the rear bearing

$$\frac{n\ b^2\ C}{555\ d_1}$$

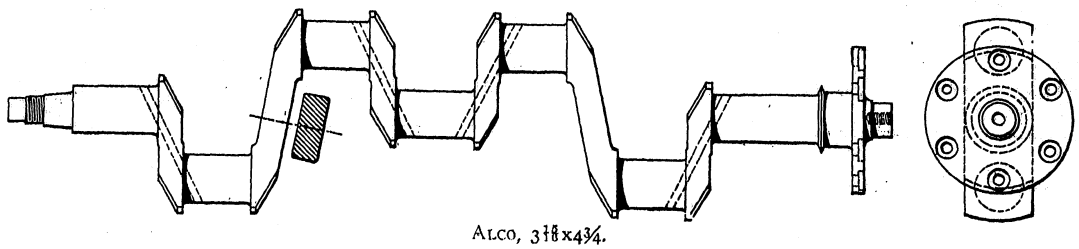
The value of $d_1$ is found from the equation

$$d_1 = \frac{\sqrt[3]{s\ (n \times b^2 \times C)}}{15}$$

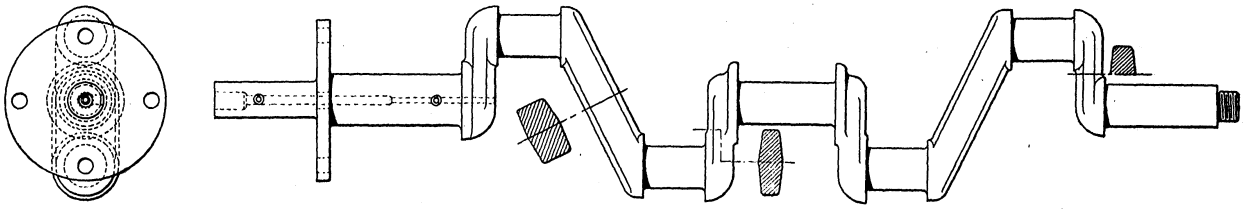
where $s$ is the length of stroke in inches, $b$ the bore in inches and $c$ the engine compression (gauge) in pounds per square inch.

(To be continued.)

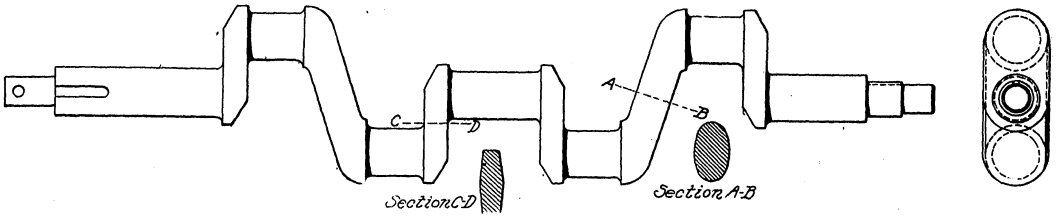
| Name..... | Alco. | E-M-F. | Maxwell. | Haynes. | Stoddard-Dayton. | Stoddard-Dayton. | Columbia. | National. | Haynes. | Alco. |
|---|---|---|---|---|---|---|---|---|---|---|
| Bore | 3 15-16 | 4 | 4 | 4¼ | 4¾ | 5 | 5 | 5 | 5 | 5⅛ |
| Stroke | 4¾ | 4½ | 4 | 5 | 5 | 5½ | 5 | 5 11-16 | 5¼ | 5¼ |
| Compression (gauge) | 72 | 72 | 62 | 60 | 70 | 70 | 85 | 88 | 56 | 65 |
| Crank pin diameter | 1.68 | 1½ | 1⅝ | 1¾ | 2 | 2¼ | 1⅝ | 2 | 2¼ | 2.20 |
| Crank pin length | 2.4 | 2⅛ | 2 | 2 | 2¼ | 2⅜ | 3 1-16 | 3 | 2¾ | 3.2 |
| Journal diameter | 1.68 | 1½-1¾ | 1⅝ | 1¾ | 2 | 2¼ | 1⅝ | 2⅛ | 2¼ | 3.20 |
| Journal length | 9.6 | 11¾ | 10¾ | 12¼ | 11¼ | 11⅝ | 12⅛ | 12 | 12 27-32 | 10.4 |
| Equivalent width of short crank arm | .90 | 0.708 | 35-64 | ¾ | 13-16 | 1 | 27-32 | 1 3-16 | 1½ | 1 |
| Depth of short crank arm | 2.4 | 2¼ | 1⅞ | 2⅛ | 2¾ | 3 | 2½ | 2¼ | 2⅞ | 2.6 |
| Equivalent width of long crank arm | 0.96 | 1.083 | 1 1-16 | 1.083 | 1 | 1 3-16 | 31-32 | 1½ | 1 7-16 | 1.55 |
| Depth of long crank arm | 2.4 | 2 | 1⅞ | 2⅛ | 2¾ | 3 | 2½ | 2¼ | 2⅞ | 2.6 |



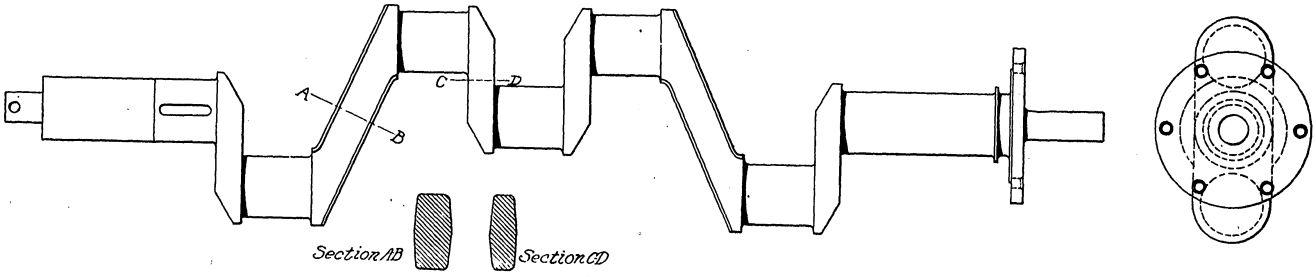
ALCO, 3 15/16 x 4¾.



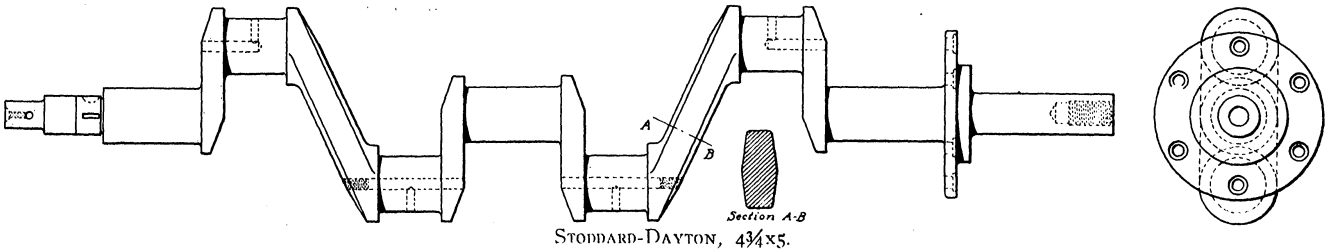
E-M-F, 4x4½.



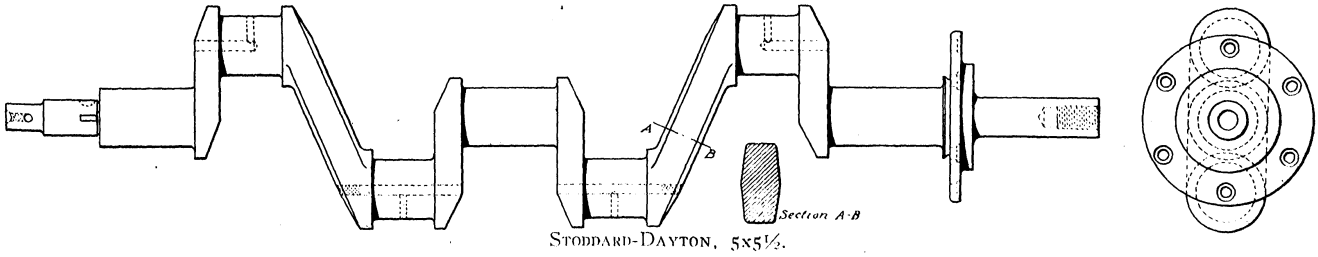

MAXWELL, 4x4.



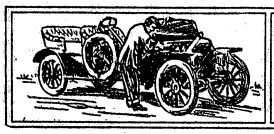

HAYNES, 4¼x5.



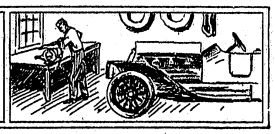

STODDARD-DAYTON, 4¾x5.




STODDARD-DAYTON, 5x5½.



# Maintenance and Repairs.



## An Improved Supplementary Air Valve.

I submit a sketch of an air valve improvement designed to eliminate what has been the source of considerable trouble on many different carburetors. Sketch marked A is the standard type as used on most carburetors. This type often sticks on account of dirt getting in on the guide, and on account of the high number of reciprocating movements, it


FIG. A.

wears badly, causing leakage around the stem and changes the adjustment of the carburetor.

To overcome sticking from dirt getting into the guide, and wearing from the same cause, I have put out a considerable number of valves like B, which consist simply of a bushing C, a leather plate D and the

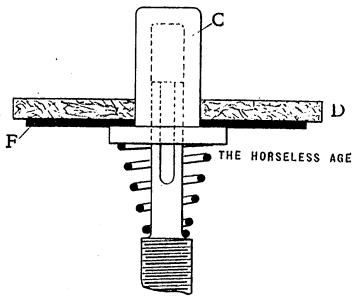



FIG. B.

stamping F. The leather piece and stamping are simply pressed on to the bushing. These seem to be standing up at the present time better than any other type of valve that I have been able to construct.

## Care of Driving Chains.

The severe conditions under which most driving chains on motor vehicles are used make it necessary that they should receive great care and attention. Unfortunately many drivers consider that, as the chain appears to be a robust sort of component, it needs only the very slightest of attention, and hence many chains are shortlived. It is evident that as driving chains are composed of a large number of carefully made small parts, there must be a number of little bearing surfaces, all of which require lubrication in their own small way. It is often difficult to insure that these parts shall be properly lubricated, unless a certain amount of trouble is taken. Once a chain is allowed to run dry, lasting damage of a serious nature is often caused, owing to the fact that the hardened surfaces gall. When the smooth faces of the rollers and pins are destroyed, trouble soon follows, and it is extremely difficult to get a chain to run well when this state of affairs has been allowed to occur. Chains should always be overhauled at least fortnightly, properly cleaned and lubricated. All the dirt and mud should be carefully taken off with a good stiff brush after the chains have been removed from the sprockets. The whole thing can be put into a trough of paraffin or turpentine, and allowed to soak for two or three hours. This method effectually removes all dust and grit from the inner surfaces which are ungetatable with a brush. A subsequent bath in boiling oil, or tallow or graphite, allows a nice film of this lubricant to pass into the inner surfaces of the whole chain. Another factor which does much to render the life of many a good chain a short one is that a large number of drivers have no idea as to what is the correct tension at which to run a chain. Some like to run them tight, as they are under the impression that unless this be done, there is a danger of the chain jumping the teeth. The right tension for a driving chain is that which would be considered just too slack for a belt drive.

## False Teeth for Gear Wheel.

Fig. C shows a method by means of which a broken gear on a magneto, pump, etc., can be temporarily repaired. The above was done by a motorist who had the misfortune to have the magneto gear of his motor break some of its teeth. The repair he describes as follows:

"I was driving a motor car fitted with low tension ignition, and while I was still several miles from home, three teeth of the magneto pinion broke clear away. The pinion was constructed of fibre clamped between gun metal plates. Not having a spare gear, I set about repairing the damaged wheel. I filed off the stumps of the three broken teeth so as to make a clear space where they had formerly been, and with a pencil I marked three lines at equal distance across the space to represent where the teeth should be. On each of these lines I bored two holes in the fibre with a small screw driver (like a bradawl), and into each hole I inserted an inch woodscrew. I screwed them in firmly, and left them so that they extended just so far as to be flush with the other teeth. I then filed down the sides of the screwheads so as to make room for the teeth of the drive. This repaired pinion, fitted to a 40 horse power engine, brought the vehicle over 38 miles, and upon examination at the garage the screws were found to be firm, and almost as sound as when they were put in."

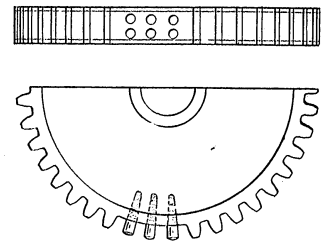


FIG. C.

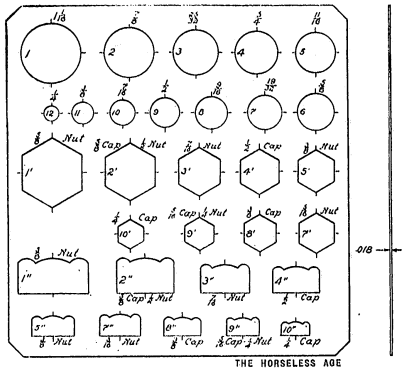
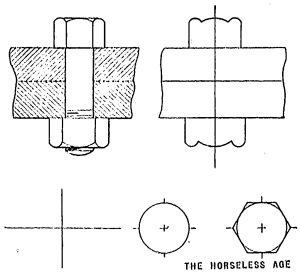



FIG. 1.—DRAUGHTSMAN'S TOOL.

## A Handy Draughtsman's Tool.

This tool I have used for the past five years and found very handy. In Fig. 1 is shown the general layout. The template, which is made out of celluloid of about 0.018 gauge, is laid out in Hartford Machine Screw Company sizes. Fig. 5 shows the first step in using the template,




FIGS. 2, 3, 5 AND 6.

in drawing the mill of a bolt or nut, as the case may be. Using the template for this purpose will save the adjusting screw on your dividers. Fig. 6 shows the next step, drawing the hexagon, which can be done with the template in one-tenth the time required to change your triangle to the various positions. Fig. 3 shows the other view of the bolt or nut, which can also be made with the template with a saving of time. The complete bolt is shown in Fig. 2. This template is especially good on tool work.

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## Promoting Interest in Electric Vehicles.

Travelers are often impressed with the great prevalence of the electric runabout in the streets of Cleveland, Buffalo and Detroit, and its rarity in the streets of New York. This contrast has been drawn so frequently that there can be no doubt that it is based on fact, but it is not an easy matter to give a plausible explanation of it. It is true that the above mentioned three lake cities have each an electric vehicle factory, and perhaps these factories push their product more strongly at home than elsewhere. Possibly also the different topographical conditions and public transportation facilities in the metropolis account for its lag in appreciating the electric vehicle. But it is certain that the market for electric runabouts could be greatly increased here, as well as in many other cities, by a properly organized campaign designed to acquaint the public with the peculiar advantages of the electric vehicle. To conduct such a campaign is the chief object of the Electric Vehicle Association of America, which holds its first annual convention at Madison Square Garden this week.

The electric was the first type of power propelled vehicle to reach a reasonable degree of perfection, and was more or less prominently in the public eye during the latter '90s. But since the beginning of the present century the gasoline car has entirely overshadowed it, and what progress has been made in the design and construction of electric vehicles has passed almost unnoticed. That important progress has been made in this period has been conclusively proven by a number of public demonstrations of electric vehicles, including a drive from Denver to Atlantic City and a drive over the route of the so-called Ideal Tour in New England. Both of these tests are very severe in respect to the grades that have to be climbed and the character of some of the roads encountered. It will probably be admitted that if anybody wanted to make these particular trips he could find a better type of vehicle than an electric car for the purpose, but these hard tests certainly prove the vehicle to be fully equal to all requirements in city and suburban business and pleasure driving.

The improvements which have been been made during the past decade have had to do with the appearance, the speed and the radius on one charge of the car. The early electric vehicles were simply horse carriage types, with an enlarged body in which the battery was carried, and with one or two motors clipped to the rear axle and geared to the rear wheels. Gradually the form of the electric runabout was improved, until today the various types of these cars are as shapely as the modern gasoline car. Some important constructional changes have also been made in the power plant. Now the battery is generally divided, one-half being carried in front under a hood and the other half under the vehicle body in the rear. This insures a better distribution of the weight and also enables the body designer to produce a body more pleasing to the eye. The motor, which in the early vehicles was always carried directly on the axle, is now generally hung from the body frame, which shields it against direct road shocks and—what is probably of greater importance—protects the axle, wheels and tires from the hammering effect of a large "unsprung" mass. Moreover, for runabouts a single motor is now very largely used, which tends to both weight economy and electrical efficiency, and the chainless drive has been largely adopted of late, on account of its cleanliness. The method of control has also been modified in recent years, battery communtation, which was practically the only means of speed control in the early cars, being avoided as much as possible.

These various changes, however, do not really describe or explain the actual improvement which has been made in electric vehicles during the past decade, which improvement has made it possible to secure a mileage of 80 and over at speeds approaching 20 miles per hour. This result has been made possible by scientific weight reduction in the running gear, the development of a special form of unusually supple "electric" tire and by the gradual perfecting of the storage battery in respect to weight efficiency and life. Many of these improvements consist only in a change in dimension, and seem of no importance when described in print, yet their aggregate result has been to make the electric runabout a thoroughly practical vehicle for business and pleasure driving in urban and suburban districts. The electric vehicle appeals because of its cleanliness and noiselessness, its simplicity of operation, relative immunity from breakdown and the "docility" which is intimately conected with moderate speed ability. It was the speed craze that relegated the electric vehicle to the background some seven or eight years ago, and with the subsidence of this craze the electric may be expected to come into its own again in the fields for which it is peculiarly adapted.

## Fore-Doors.

There can be no doubt that the fore-door feature in body design has captivated the fancy of a very large part of the motoring public. Not very long ago the idea was regarded by many well informed motorists as mainly a whim of Dame Fashion's, but as users more generally obtain experience with bodies of this style the conviction grows that protection of this kind provided for the front seat passengers is of actual value as conducing to increased comfort. Particularly does the fore-door body gain converts during these first chilly days that mark the beginning of the cold season, and

those who ride for long distances in fore-door cars in such weather are likely to be impressed with the superior coziness of the closed-front car.

One sign which evidences the popularity of the fore-door feature is the large number of cars of the ordinary type which are being fitted with forward doors, and are thus being in a measure brought up to date. Body makers are busy making and attaching fore-doors of wood, finished in conformity with the body work of existing cars of the ordinary touring type, and some of these attempts are really quite creditable, the doors being made of detachable design in some cases. An enormous number of detachable front doors of leather or pantasote are being fitted to cars to add to the comfort of their passengers and to give them the accepted fore-door appearance. These doors are in some respects a fairly good substitute for the permanent wooden or metal door and have the merit of cheapness and ready detachability. Their appearance is by no means objectionable, and they serve the function of wind breaks very well. Almost any car can be in a manner modernized by their application, and it is not strange that carriage trimmers are busy making and fitting them. The use of motor cars through the winter season is rapidly increasing, even in the smaller cities and towns, and this fact gives impetus to the adoption of all appliances which tend toward the protection of passengers from the weather.

## The Metric System.

It is a fact to which but scant attention has been called on this side of the water that the metric system of measurements is very largely used in the English automobile industry. It has generally been believed in this country that the English people were very strongly prejudiced against the metric system, this prejudice being based upon their insular conceit which would not allow them to admit that a better system than their own could be established elsewhere. But to judge by the trend of things in the automobile works this notion is more or less ill founded. It may be taken for granted that the predominance of automobiles of Continental construction in England during the past ten years has been the main reason that led to the adoption of the metric system. The prevalence of machines built according to metric measurements made it necessary for all repair shops to provide themselves with measuring instruments and tools for metric work, and so one of the great objections to the adoption of the system in English factories was removed at the outset. The best time to adopt a new system of measurements is, of course, when a factory is first started, as practically all difficulties are then avoided. The adoption of the metric system by the automobile makers of Great Britain will probably prove the entering wedge that will eventually result in its universal use in that country.

We are aware that in the United States there has been a long and bitter controversy over the metric system, and that so far the "antis" have had the better of the fight, as practically no beginning has been made in the adoption of the system here. With the exception of two automobile concerns, whose original designs were obtained from abroad, no firms in this line are using the system. The imported car never cut a large figure outside New York city, and as the centres of the American industry are located in the West they were not in the least affected by this phase of foreign practice. It would have been a splendid chance to introduce the metric system here without great inconvenience if our large factories at their inception had decided to adopt it exclusively, but probably their engineers and general managers were too much occupied with more urgent questions at those times. That the metric system will some day be in universal use there can be little doubt; the constantly strengthening commercial relations between nations will demand it, and whenever an opportunity offers of introducing it without serious expense it should be grasped. English automobile manufacturers are to be congratulated on their foresight in adopting the system at the start.

## Foreign Events.

October 15—Buenos Aires, Argentine. Race for American Cup, between Buenos Aires and La Plata.

November 4 to 12—London, England. Olympia Show.

December 3 to 18—Paris, France. Twelfth International Salon of the Automobile, Cycle and Sports, under the auspices of the A. C. of France.

January 14 to 25—Brussels Automobile Show.

February 26 to March 4—Toronto, Canada. Annual Automobile Show, St. Lawrence Arena, Ontario Motor League.

March 31 to April 8—Commercial Vehicle Exhibition at Olympia, London.

## Coming Events.

**October 14 to 18—Washington, D. C., Second Annual Washington *Post* Tour to Richmond, Va., and return.**

October 21-22—Boston, Mass., Commercial Vehicle Contest, "*American.*"

October 22 to 30—Brooklyn, N. Y., International Aviation Tournament, Belmont Park.

October 23—San Francisco, Cal., Portola Road Race.

October 24—Lawrence, Mass., Automobile Races.

October 27 to 29—Dallas, Tex., Race Meet, Dallas A. C.

October 28-29—Chicago, Ill., Commercial Vehicle Reliability Run, Chicago *Evening American.*

October 28 to 29—New York City, Commercial Vehicle Contest, New York *American.*

October 29-30—Reliability Run, Hudson County (N. J.) A. C.

November 3 to 5—Atlanta, Ga., Atlanta Automobile Association Fall Meet at Speedway.

November 5—Los Angeles, Phœnix Road Race.

November 5-6—New Orleans, La., Automobile Meet.

November 6—Mt. Vernon, N. Y., Track Meet, Mt. Vernon A. C.

November 7—Phoenix, Ariz., Track Meet, Maricopa A. C.

November 7 to 11—Chicago, Ill., Reliability Contest, Chicago M. C.

November 10 to 13—San Antonio, Tex., Races at International Fair Grounds, San Antonio A. C.

November 12—Savannah, Ga., Grand Prize Race, Savannah A. C.

November 22 to 26—Lake Charles, La., Louisiana Fair Association, Race Meet.

November 24—Redlands, Cal., Mile High Hill Climb Association's Contest.

November 24—Santa Monica, Cal., Southern California Automobile Dealers' Association Annual Road Race, 200 miles.

November 24—Savannah, Ga., Road Race, Savannah A. C.

November 24 to 26—Los Angeles, Cal., Track Meet at Motordrome.

December 1 to 8—Chicago, Ill., First Annual Aeronautical Exhibition, Coliseum, Aero Club of Illinois.

December 25 to 26—Los Angeles, Cal., Race Meet, Motordrome.

December 31 to January 7—New York City Automobile Show, Grand Central Palace, American Motor Car Manufacturers' Exhibit Association.

January 5-21—Detroit, Mich., Automobile Show, Wayne Pavilion, Detroit Automobile Dealers' Association.

January 7 to 14—New York City, N. Y., Eleventh Annual Automobile Show at Madison Square Garden, Association of Licensed Automobile Manufacturers.

January 16 to 21—New York City, Commercial Motor Vehicle Show at Madison Square Garden, A. L. A. M.

January 28 to February 4—Chicago, Ill., Tenth Annual Show at Coliseum and First Regiment Armory (pleasure vehicles and accessories only), National Association of Automobile Manufacturers.

February 6 to 11—Chicago, Ill., Tenth Annual Automobile Show, Coliseum and First Regiment Armory (pleasure and commercial cars, motorcycles and accessories), National Association of Automobile Manufacturers.

February 26 to March 4—Toronto, Canada, Annual Automobile Show, St. Lawrence Arena, Ontario Motor League.

March 4 to 11—Boston, Mass., Annual Show in Mechanics Building, Boston Automobile Dealers' Association.

March 15-18—Louisville, Ky., Annual Show, First Regiment Armory, Louisville Automobile Dealers' Association.

**April 1 to 8—Montreal, Canada, Annual Automobile and Motor Boat Show, under the auspices of the Automobile and Aero Club, of Canada, in the Coliseum Building.** E. M. Wilcox, 123 Bay street, Toronto, manager.

# A Dictionary of Automobile Terms. By Albert L. Clough.

**Angle Iron**—A piece of metal in the form of an angle or L, used as a brace for parts which are to be held in a definite angular relation.

**Angle Steel**—A form of structural steel bars or beams, the cross section of which is an angle or L, sometimes used in automobile frame and sub-frame construction. This form of cross section secures greater rigidity against transverse deflection than afforded by the same amount of metal in a circular or square cross section.

**Anneal** (v.)—To soften a metal by the application of a heat treatment. Annealing usually increases the malleability and ductibility of a metal and reduces its elastic properties. Steel may be annealed by heating it to an appropriate degree and then allowing it to cool very gradually.

Annealing is frequently resorted to in order to relieve internal stresses set up in metal parts in the processes of rolling, forging and casting.

Syn.: To draw (the temper).

**Anti-Freeze Solution**—A liquid used as a substitute for water in the engine cooling system of a gasoline automobile, which is capable of remaining fluid at the freezing temperature met with in practice.

Solutions of certain neutral salts, alcohol and glycerine are used for this purpose and also special mineral oils. Particular solutions are treated later under their respective names.

Anti-freeze solutions are also used in acetylene generators, instead of water, during cold weather.

Syn.: Non-freezing solution.

**Anti-Skid Device**—A device applicable to the wheels of an automobile, designed to enable them to obtain more secure footing upon the road surface than is realized by the use of ordinary smooth rubber tires, and thus to decrease their liability of skidding or slipping sidewise. Such devices usually consist of special knobbed or metal studded tire treads, or a series of cross chains secured about the tire and wheel felloe. See later under specific headings.

Syn.: Non skid device, traction increasing device.

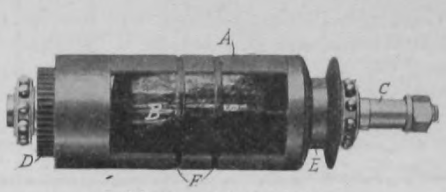
**Apron**—A term sometimes applied to extensions of metal, fabric or leather attached to the fenders of a car to further guard the car from road splash. Also sometimes applied to a sort of boot placed under the mechanism to protect it from road dirt.

**Arc Flame**—An electrical discharge which resembles the voltaic arc, in that it is not of an instantaneous, disruptive character, but persists for an appreciable length of time, and is due to the passage of a considerable quantity of electricity at a relatively low pressure through a spark gap which has been rendered conductive by the passage of a high tension, disruptive discharge. The term is applied to the discharge of a high tension magneto in which both primary and secondary windings are under the influence of the same magnetic field.

**Armature Winding**—The electrical conductors in which are generated the currents produced by a dynamo or magneto. Highly insulated copper wire is used.

**Armature, Magnetic**—A piece of magnetic material the function of which is to assist in conducting the magnetism from one pole of a magnet to the other. In practice, a piece of soft iron movably mounted in proximity to the pole or poles of an electromagnet and adapted to be moved by attraction thereof. E. g., the iron portion of a coil vibrator which is attracted by the pull of the core of the coil and returned to its initial position by a spring.

Syn.; Keeper. Also, the soft iron portion of a magneto or dynamo which carries or is enclosed within the conductors in which the current is generated. Usually but not always a rotating part.




MAGNETO ARMATURE.

A, Core; B, Winding; C, Shaft; D, Driving Gear; E, Collector Ring; F, Binding Band.

**Armature Pinion**—A small gear or pinion fixed upon the shaft which carries the armature or rotating part of an electric vehicle motor and which transmits the power to the rest of the driving mechanism.

Also, a small gear or pinion fixed upon the shaft that carries the armature of a synchronous magneto. This pinion drives the distributor shaft of the magneto.

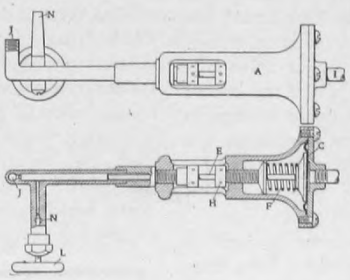
**Artillery Box**—A box fitted to the rear deck of runabouts to provide extra carrying space for tools, etc. So called because of its resemblance to the boxes used upon field gun carriages.

**Aspirating Stroke**—The outward piston stroke of an internal combustion motor during which the explosive charge is introduced into the cylinder from the carburetor.

Syn.: Suction stroke, charging stroke, intake stroke.

**Assemble v.**—To put together the various component parts of a motor car in their correct relationship.

**Assembled Car**—A car the important parts of which, such as the motor, gear box, axles, body, etc., are produced by several different makers of these parts and are then brought together at the factory of the manufacturer, whose name the car bears, where they are assembled with other parts into a complete vehicle. The term is employed in contradistinction to that class of cars the chief parts of which are produced by the concern whose name the car bears.

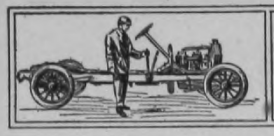



ELEVATION AND SECTION OF AUTOMATIC FIRE REGULATOR.

A, Housing; C, Diaphragn; E, Valve; F, Spring; H, Adjusting Screw; I, Connection to Water Space of Boiler; J, Gasoline Feed; L, Nozzle Valve; N, Nozzle.

**Automatic Fire Regulator**—A device employed on steam cars to regulate the fire under the boiler, so as to maintain a constant pressure therein, independent of variations in the demand for steam. It usually consists of a flexible diaphragm acted upon by the boiler pressure and a suitable linkage communicating the motion of this diaphragm to a valve in the fuel supply of the burner. When the steam pressure exceeds the desired amount the diaphragm acts to diminish the fire and vice versa. In the case of a "flash" steam generator, the diaphragm is replaced by a thermostat, which is sensitive to the temperature of the metal of the generator. The thermostat acts to maintain the generator at a constant temperature independent of the rate at which water is supplied for steam raising. As the temperature of the generator falls, the thermostat opens the fuel valve of the burner, thus increasing the fire, and vice versa.

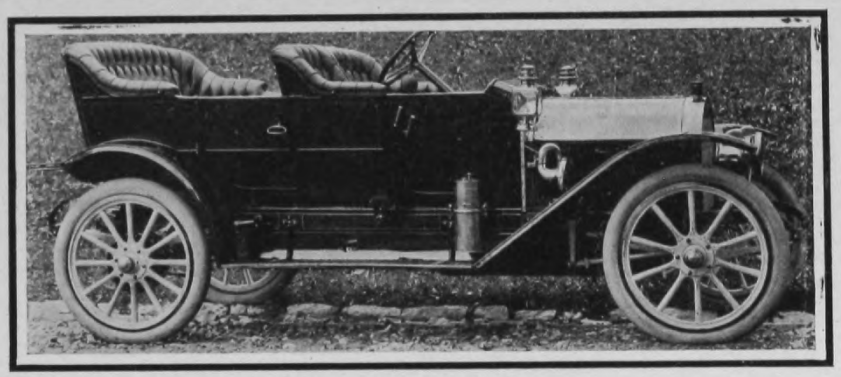
Syn.: Automatic fuel feed.



# New Vehicles and Parts.

## Moon Cars for 1911.

Following general practice in the automobile manufacturing line the Moon Motor Car Company, of St. Louis, Mo., will continue the same models for 1911 that it turned out last year, the Model 45 and Model 30. The Moon Company has worked out a number of refinements which add to their smooth running, simplicity of operation, and to the convenience and comfort of the passengers.



1911 Moon Model "30" Foredoor.

By slightly redesigning the T-head motor used in the 30 horse power car, the weight of the motor complete has been reduced 72 pounds. The valve ports have been increased in size, and the valves are now 2 inches instead of 1⅞ inches. By increasing the size of the valve ports and increasing the lift of the valves and the contour of the cams, the power of the "30" motor has been increased 25 per cent. without changing the bore and stroke. Roller valve lifters are now used in place of the mushroom type, and this, in addition to the change in the cam outline, has greatly reduced the noise. Instead of the plain spur gears previously used in the "30" motor, helical gears are now used.

The lubrication system on the "30" motor has been simplified; the pockets have been placed over the main bearings, for the retention of oil, and the plain splash is used for the rods, with the complete circulating system passing oil through the single sight feed on the dash instead of the gauge as heretofore. There are two standpipes in the lower half of the crank case, which fix the splash level, the oil falling through these into the sump, whence it is taken and again circulated, being filtered before being taken through the pump.

In place of the expanding band clutch used in the 1910 model "30," this car now carries a multiple disc clutch of the same type as has been used in the "45" for the past five years. This consists of fifty-two discs running in oil and inclosed in a bronze housing bolted direct to the flywheel by three bolts.

The foot and emergency brakes are applied on drums attached to the rear wheels. By making the bands universal, so as to grip the drums concentrically, their effectiveness has been increased. An 18-inch steering wheel is used. The entire steering mechanism is heavier, and a complete gear is used in place of a sector. The wheel base has been increased from 110 inches to 114 inches, the frame being extended to admit of this increase in wheel base.

IMPROVEMENTS OF THE "45."

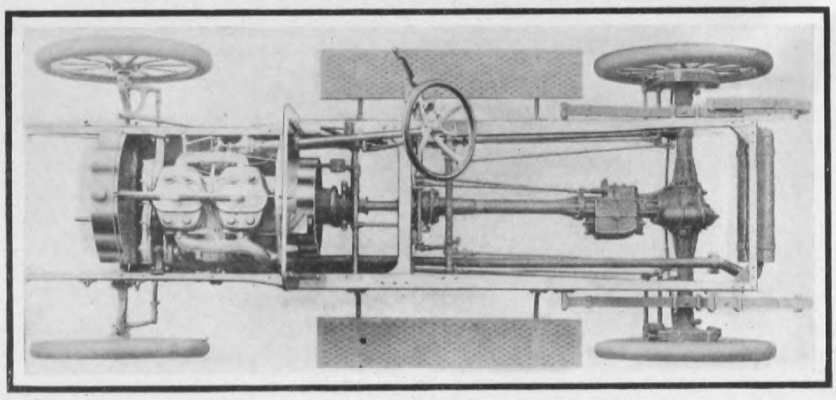
The most noticeable improvement in the motor of the Moon "45" is in the method in driving the magneto and water pump. These are now located at right angles to the crank shaft, and driven with one gear off the vertical cam shaft. This change has allowed the discontinuance of the pump gears formerly employed. The lubricating system remains the same, the crank shaft being drilled as heretofore. The force feed lubricator, instead of being located on the dash and driven by an extension of the cam shaft, is now operated by two spiral gears, which leaves the dash perfectly plain, except for the single sight feed. The exhaust manifold has been remodeled and is now straighter and provides a freer passage.

One of the most noticeable changes in the Moon "45" is the method of drive and rear spring suspension. Thee-quarter springs are used in the rear instead of full elliptic as before, and the axle drive is direct through them to the frame, doing away entirely with the drive rods and the familiar V type of torque rod with the ball and socket. The muffler is no longer carried on the rear of the frame, but is hung longitudinally underneath the body. A dust shield takes its place in the rear.

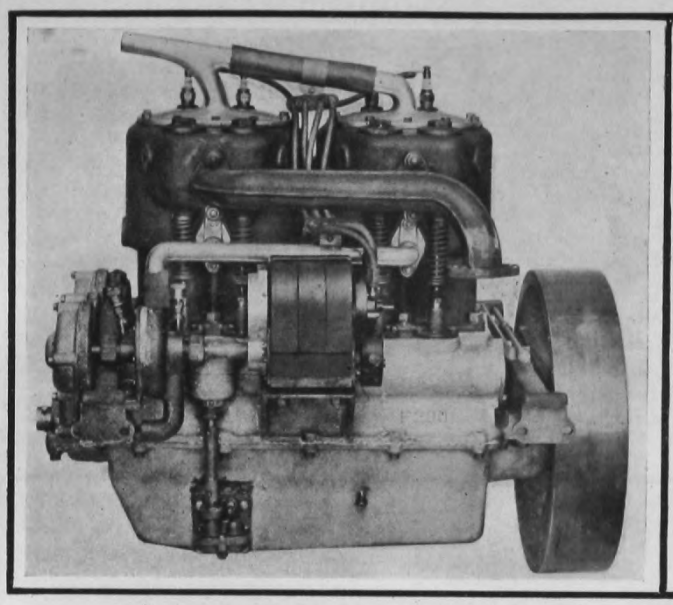
The touring car bodies for the "45" have been given 2 inches more room in the tonneau, and are a modification of both the straight line and convex type. Foredoor bodies and torpedoes have been added to the selection of bodies.

The "30" is a moderate priced car, with a 4¼x5 inch motor, multiple disc clutch, shaft drive, with the propellor shaft enclosed in a torsion tube, a three-speed selective gear set in a unit with the semi-floating rear axle, a pressed steel frame resting on three-quarter scroll elliptic springs in the rear, an I beam axle, adjustable worm and gear steering mechanism, 34 inch wheels and 114 inch wheel base.

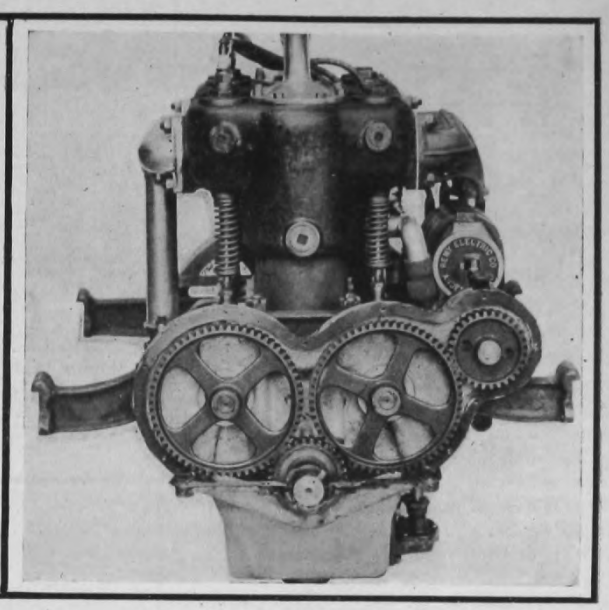
The model 45 is a higher priced product, which differs from the 30 in that the motor, gear set and rear axle are separate units, and the car has the advantages of being larger and heavier in construction. A valve in the head, 4¾x5 inch motor, with its overhead cam shaft, furnishes the power in this model, and transmits it through the multiple disc clutch attached to the flywheel and a selective sliding gear set that rests with the motor on a sub-frame. A propeller shaft, with two universal joints, is employed between the gear set and the cambered, floating rear axle. The rest of the frame and running gear design is sim-



Plan View of Moon "30" Chassis.



Magneto Side of Model "30."



Timing Gears of Model "30."

ilar to that of the Model 30, except that the wheels are 36 inches in diameter and the wheel base 121 inches.

In the Model 30 motor, which is carried on two I beam drop forged cross members, the cylinders are cast in pairs, and the valves are on opposite sides and have removable valve guides and plungers of the adjustable type. The cam shafts have three bearings each, the cams are forged integrally, and their gears are enclosed at the forward end of the motor. Each piston has four eccentric rings above the piston pin. A phosphor bronze bushing is employed at the upper end of the connecting rod, while the lower connecting rod bearings are split horizontally and lined with Parsons white bronze. The bearing caps are held in place by four bolts. Attention is called to the method of attaching the motor crank case to the I beam cross members at either end of the motor, shown in the illustrations of motor. There are two bolts at each end, which extend to the base of the crank shaft bearing. The crank shaft is a solid drop forging, and is supported in three bearings, which are independent of the lower, detachable portion of the crank case.

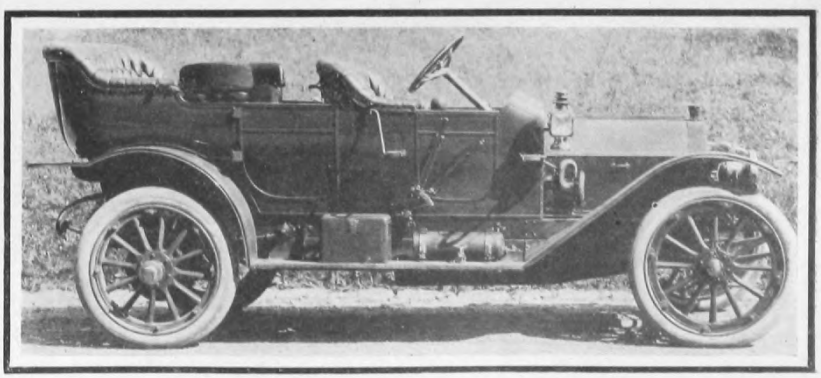
The lower portion of the crank case is subdivided horizontally, the upper division containing splash compartments into which the ends of the connecting rods dip, and the lower division being simply a reservoir where the excess oil accumulates to be strained and recirculated. The oil pump P, of the gear type, is on the outside of the crank case and driven by means of a vertical shaft and bevel gears from the exhaust cam shaft. This pump draws the oil from the reservoir and forces it into the upper division. When the oil in this division reaches a certain level it overflows into standpipes, one of which is shown at S, and returned to the reservoir to be strained and again circulated. Large oil pockets P are provided over each crank shaft bearing to catch the spray caused by the revolving parts dipping into the oil, and, being almost continually filled, a copious supply of oil is fed by gravity to these bearings at all times. Holes H are drilled on top of the lower conecting rod bearings so that the oil which runs down the rods keeps the lower end bearings well supplied, while all other mechanisms in the case and cylinders are enveloped in this mist of oil. Four oil grooves may be seen at the bottom of each piston for distributing the oil over the cylinder walls; leakage of the lubricant from the rear end of the motor is prevented by the oil ring R cut on the crank shaft, which throws the lubricant by centrifugal force into a circular groove surrounding it, from which it drains back into the crank case proper. The capacity of the reservoir is 3 gallons.

Cooling is by means of a forced water circulation maintained by a bronze water pump of the centrifugal type. This pump is supported upon a bracket cast integrally with the crank case, and is driven by shaft and a gear enclosed with and driven off the left cam shaft gear. A vertical round tube radiator is a feature of this system. No fan is used.

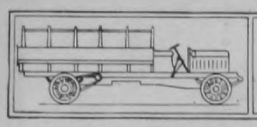
Jump spark ignition is employed with dry cells and a Remy magneto, used with a single unit coil and a single set of spark plugs. The magneto rests on a strong bracket, which is a part of the crank case, and is driven by the shaft, which passes through and drives the water pump. Its position is convenient, in that it may be readily inspected, and the ignition cables leading to the spark plugs are comparatively short and direct. The control rods are now over the rear support of the engine.

## Cole Declares Dividend.

The Cole Motor Car Company, of Indianapolis, has declared a 30 per cent. dividend. The company plans to double the output for the coming year, and has increased its capital stock from $100,000 to $300,000. J. J. Cole, president and general manager of the Cole Motor Car Company, states that the new stock is to be taken only by the present stockholders.



1911 Moon Model "45" Foredoor.

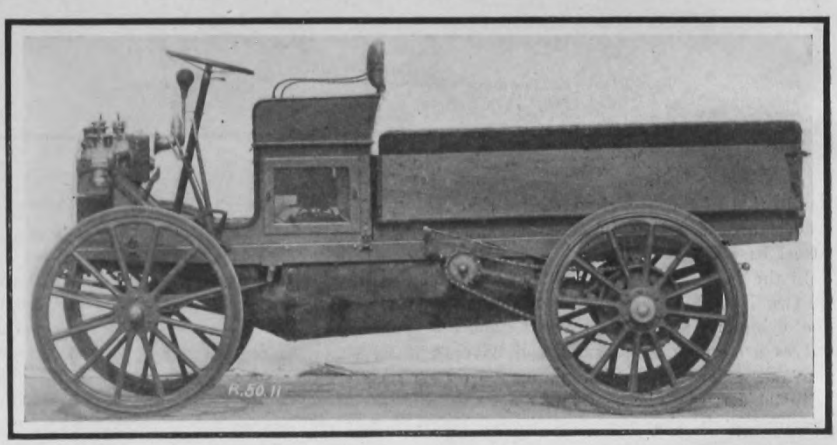


# Commercial Vehicles.

## Two Reo Commercial Models.

As announced elsewhere in this issue, the Reo Commercial Motor Car Company has been incorporated at Lansing, Mich., with a capital stock of $1,000,000 to manufacture commercial vehicles, and we are enabled to show herewith two photographs of the product of the new company. The Model J is a light delivery wagon which sells at $600. It has an angle steel frame supported on three-quarter elliptic front springs and full elliptic rear springs. The front axle is an I section drop forging and the rear axle of tubular construction. Wood artillery wheels are fitted, 28 inches in diameter, with Michelin 3 inch quick detachable tires on Goodyear rims. The car has a wheel base of 78 inches. The power plant consists of a single cylinder, horizontal, 4¾x6 inch motor, rated at 10-12 horse power. The valves are mechanically operated and protected. A float feed carburetor with supplementary air valve is used, and gasoline is carried in a 6 gallon tank. Ignition is by jump spark produced with current from a dry battery. The cooling water is circulated by a positive gear pump through an integral tubular radiator. The motor is lubricated on the gravity feed principle. The power of the motor is transmitted to a planetary gear enclosed in an oil tight case and thence through a single chain to the rear axle. The high speed clutch is of the multiple disc type, and the gear gives two speeds forward and one reverse. The steering gear is of the irreversible worm and segment type, and the brakes are applied to drums attached to the rear whel hub, being of the external contracting type. The body has inside measurements of 52x36 inches, and the car is designed for a maximum load of 500 pounds, and is geared to a speed of 14 m. p. h. A fuel consumption of 1 gallon per 11 miles with maximum load is claimed. The equipment includes three oil lamps, horn and complete tool and tire outfits.

The Model H Reo power wagon, although equipped with the same power plant as the Model J, is a heavier and somewhat lower geared machine, and is designed for a maximum load of 1,500 pounds. This model has a pressed steel frame resting on semi-elliptic front springs and full elliptic rear springs. The front axle is of 1 section and drop forged, and the rear axle is tubular. Hard rubber truck tires are fitted, and for this reason wheels of much larger diameter than those on the lighter model are used, viz., 36 inch. The front tires are 2 inches in width and the rear tires 2½. This model has a wheel base of 86 inches. The only difference in the power plant as compared with that of the Model J is that the cooling system is arranged according to thermo-siphon principle. The same type of change speed gear is used, but the drive to the rear wheels is by side chains. Lubrication is by an automatic force feed oiler, and the gasoline capacity is 7 gallons. This wagon is steered by an enclosed pinion and sector gear, and in addition to the double rear hub brakes has a brake on the motor. The inside dimensions of the body are 72x38 inches. The gasoline consumption is the same as that of the other model, viz., 1 gallon per 11 miles with maximum load. This model is regularly fitted with open expressed bodies, but stake and enclosed bodies can also be furnished at an extra cost. It sells at $750, including an equipment of three oil lamps, horn and tool outfit.



Model H Reo Power Wagon.

Model J Reo Power Wagon.

## Richmond to Have Taxi Service.

The Virginia Taxicab Service Company, Inc., is the name of an enterprise recently organized in Richmond, Va., with a capital stock of $100,000. The company hopes to profit by the experience of its unsuccessful predecessors in solving the problem of operating a taxicab service in Richmond. It has signed five years contracts with the hotels Jefferson, Lexington, Richmond and Murphy's for the exclusive taxicab privileges on their premises and for the business between these hotels and the railroad stations. Samuel E. Bowman is general manager, and the officers of the company are E. E. Smith, president; L. O. Miller, secretary and treasurer; J. W. Travers, vice president. Orders have been placed for the immediate delivery of fourteen Sultan taxicabs and one Sultan town car. The company will erect a garage, but a location has not yet been decided upon. Temporary offices have been opened at 708 East Main street. The rates will be based on the number of blocks traveled and the number of passengers carried, and meters will not be used.

## A Motor Propelled Hay Baler.

BY HERBERT L. CONNELL.

In the last few years there has been much said as to the advance which has been made in England and upon the Continent in the development of gasoline tractors for commercial and agricultural work. We also hear, now and then, of a progressive Westerner, who has made good use of the internal combustion motor in the great wheat fields, or of the newer caterpillar type of tractor used in the irrigation projects. It may be somewhat of a surprise, however, to learn of the development and regular manufacture of a truly "automobile" agricultural machine within the great manufacturing centre of pleasure cars. This machine is a motor operated and motor propelled hay baler. There has been a decided advance in this type of machinery in the last decade or so, and now most makers turn out models driven by attached gasoline engines. The Ann Arbor Machine Company (of Michigan) has gone a step farther by making the attached motor not only drive the heavy baling mechanism but also connect with the rear wheels at will, and propel the whole outfit from place to place.

Aside from the baling mechanism the first point of interest is the engine. A number of models and sizes have been experimented with, but the one now used upon the stock machine is of the Sintz-Wallin family. Briefly stated, it is a two cylinder opposed motor, developing about 20 horse power, at 600 revolutions per minute. There have been a number of changes and additions made to suit it to the work in hand. Upon one side of the engine is an ordinary balance wheel of good size, while on the other side is a peculiar looking bowl-like flywheel, to which is attached the belt pulley. Another modification is the removal of the gear pump furnished by the makers and the replacing of it by a rather large piston pump of the Ann Arbor people's own design and make.

The pump forces water from the bottom of the cooler around the cylinder in the usual manner. The cooler itself, however, is anything but usual, and is perhaps the most striking thing about the machine. As the illustration shows, it consists of a sheet metal tank in front of the engine. Above the tank part are two tent-like screens with sheet metal ends. The hot water from the motor flows, or rather drops, to the bottom of the tank from pipes, which might be thought of as ridge poles of these screen tents, through which the air freely passes. Only a little of the water is lost, for there is a sloping shelf at each side which catches most of that which may get through the screening and returns it to the tank.

In order to make this engine do its useful work the power is transmitted by a belt to a pulley provided with a friction clutch, which is mounted upon the cross shaft carrying the heavy gears that drive the baling machinery. When the machine is to proceed upon the road, the pin of the pitman is removed and the gears then take their part in getting the power to the rear wheels. Up to this point there is no particular structural difference between the "traction" and the regular power machine. Next comes what corresponds to the so-called change gear of the orthodox automobile. This is a combination rolling and sliding gear set. The early models had only one forward and reverse gear. Now there are two forward gears. This is a most excellent device, for the lower reduction makes possible easier travel over unfavorable roads and hills, and up the steep approaches of the modern basement barn. On good roads the machine makes about four miles an hour "on high," and from two to two and a half miles on the lower gear. The high gear slides into place by a collar, and the low and reverse pinions are rolled into mesh and locked in place by the lever and quadrant at the driver's right.

From these gears the power is transferred to a countershaft by a very heavy single chain. Upon this shaft is the large differential gear of the double bevel type. These gears as well as the others are excellent examples of what good work may be turned out by a foundry along this line—all the gears and sprockets being unfinished cast iron. The final step in transmission is by two large side chains to the sprockets attached to the rear wheels. Next to these are brake drums upon which work contracting metal bands. The wheels are entirely of metal, wood wheels having been supplanted upon the tractors and to a great extent upon the horse drawn machines. The front wheels are three feet in diameter with a central ridge for holding their course upon the road, while the drivers measure four feet across and have very wide cleated faces similar to those used on steam threshing engines.

The control of the machine while on the road is very simple. Steering is effected by a hand wheel actuating a drum by a worm gear. Upon this drum winds and unwinds the chain which turns the front axle, to which it is fastened on each side near the wheels. The change gear lever and its quadrant are at the right of the driver, while the clutch lever is to the left. The speed of the motor is controlled by the spark and throttle levers, which are carried up within easy reach in front of the operator. The brakes are applied by a long pedal and may be locked in place by a catch.

The many advantages of this machine are obvious. One of the most important is the doing away with one or more teams of horses, which ordinarily must be kept for hauling the baler from place to place. Uuless the ungainly steam tractor is to be constantly followed and depended upon for driving power, then the internal combustion engine must take its place and make up part of the outfit. As may be seen from the above description, ingenuity and ability have now made it possible to make this same engine do double duty, and have produced a machine which is entirely independent of outside agents for its power, either in the field or on the road. The engine itself may be easily removed from the baler, and more than earn the interest and depreciation charges against the whole equipment, by being put to other work during the "off season" for hay baling.

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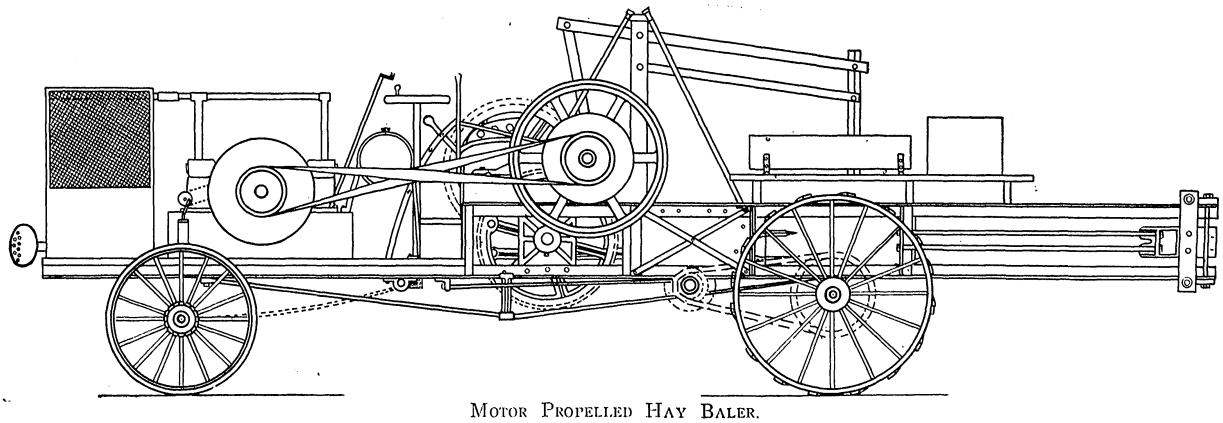
The Mount Hood Railway Company has bought two five-ton White gas trucks to be used in hauling cement and other construction material from Boring to the site of its power house on the Bull Run River. These trucks will succeed thirty-two horses.



MOTOR PROPELLED HAY BALER.

## Motor Service to a Colorado Natural Park.

Five Packard motor sightseeing cars, each comfortably accommodating twenty passengers, have been in service since last summer in carrying sightseeing parties from Manitou and Colorado Springs to Crystal Park in the Pikes Peak district of Colorado. The service is conducted by the Crystal Park Company, with offices at 64 Post Office Building, Colorado Springs, and is part of an undertaking to develop the Pikes Peak's region. During the season cars start twice daily from Colorado Springs, at 9 a. m. and 2 p. m. respectively, and eight times daily from Manitou. The round trip fare from Colorado Springs to Eagle's Nest is $1.50. The road over which this trip is made was specially built by the company and leads through some of the most magnificent scenery in the world. It is a typical mountain road consisting of innumerable loops and turns, and ascends to an elevation of 8,000 feet above the sea level, the average grade being 6 per cent. Only 10 miles of the road to the park have been completed as yet, and the last portion of the route has to be covered on the backs of bronchos. The initial trip was made toward the end of June last and the service has since been in regular operation. The road will eventually be continued right into the park. The accompanying photographs give a good idea of the scenery which can be enjoyed on a trip on one of these cars. The cars are covered and are comfortably upholstered.

## American Express Fights Wells-Fargo With Motor Trucks.

The motor truck has become a factor in the fight between the American Express Company and the Wells-Fargo, the American Express during the summer having invaded the Southwestern territory hitherto under the thumb of the Wells-Fargo Company, which had succeeded in keeping all of its rivals out of the rich field. Sixteen miles to the west of Los Angeles lies a chain of beach resorts served only by electric lines, the electric lines turning all express business, including the hauling of baggage, over to the Wells-Fargo. Parties from the East or from the interior going to these resorts could not buy through tickets. They had to change at Los Angeles, board the electric lines and check their baggage once more by the Wells-Fargo. When the American Express Company reached Los Angeles over the Salt Lake route it endeavored to get a share of the beach business, but without avail. Wells-Fargo controlled the express business of the electric lines. The American Express now has placed into service between Los Angeles, Venice, Ocean Park, Santa Monica and intermediate points two 1½ ton trucks, and is working up a good business. Instead of forcing the traveler to re-check his baggage in Los Angeles to the beach, the Salt Lake route checks baggage through to the coast towns, adding the rate from Los Angeles to the beach to the price of the ticket, and thus saves the traveler the annoyance of a double checking. At Los Angeles the baggage is turned over to the American Express Company and hauled to the beach on the motor trucks of the company.

## Motor Bus Service Well Patronized

Upward of 6,000,000 passengers rode on the motor buses of the Fifth Avenue Coach Company, of New York, during the business year which ended June 30, 1910—6,305,165 to be exact. The number of 10 cent fares collected from adults was 5,755,211, and the 5 cent fares collected totaled 549,954. The increase in the total number of passengers carried over the previous year was 2,695,871.

The service is conducted by a subsidiary of the New York Transportation Company, and is under the control of the Public Service Commission, which latter has just made public part of the Coach Company's annual report.

The company operated during the year sixty-one motor stages on its several lines in Fifth avenue, West Fifty-seventh street and Riverside Drive. The total round trips made was 153,609, the hours of operation 177,832, and the total number of miles covered during the year, 1,320,432, the equivalent of approximately fifty-three journeys around the world at the equator. The revenues are summarized as fares, $603,019.80; from livery service, $13,053.19; advertising, $14,232.12, and miscellaneous, $20. The revenue increase over the previous year was $260,919.65.

The most striking operating expense is that of "depreciation of tires in 1909." This item is $55,125.76, 10 per cent. more than the capital stock of the concern. The cost of maintenance equipment was $74,923.28, while the depreciation due to wear and tear on the vehicles is given as $112,583.28.

## Mail Contract Open to Motor Concerns.

Robert Bryson, postmaster at Indianapolis, is asking for bids for a contract to carry mail betwen the post office, sub-stations and railway stations from July 1, 1911, to June 30, 1915, but the bids must be submitted to the Second Assistant Postmaster General at Washington on or before December 6. For the first time the bidding will be open to automobile concerns. In the past the contract has been held by companies operating horse drawn vehicles. A number of Indianapolis automobile companies are preparing to submit bids.

A gasoline propelled fire engine has just been turned out by the Fort Wayne Auto Motor Company, a newly formed concern of Fort Wayne, Ind. The machine was exhibited during the past few days in the streets of that city.

## Commercial Notes.

C. A. White, a prune grower of Scotts Mills, Marion County, Ore, uses a motor truck for conveying his crop to market.

W. H. Elliott & Co., the Detroit branch of the National Grocery Company, have installed five Rapid 2 ton trucks.

Jay Bersch, who has contracted with the Post Office Department at Washington to collect the mails in Cleveland with automobiles, has decided to equip all of his mail trucks with Staggard tread tires.

The Vulcan Iron Works, of Seattle, now have in use three motor trucks of one, three and five tons capacity. They have disposed of their entire stable of horses and will depend entirely on their motor wagons for the hauling to be done by them in the future.

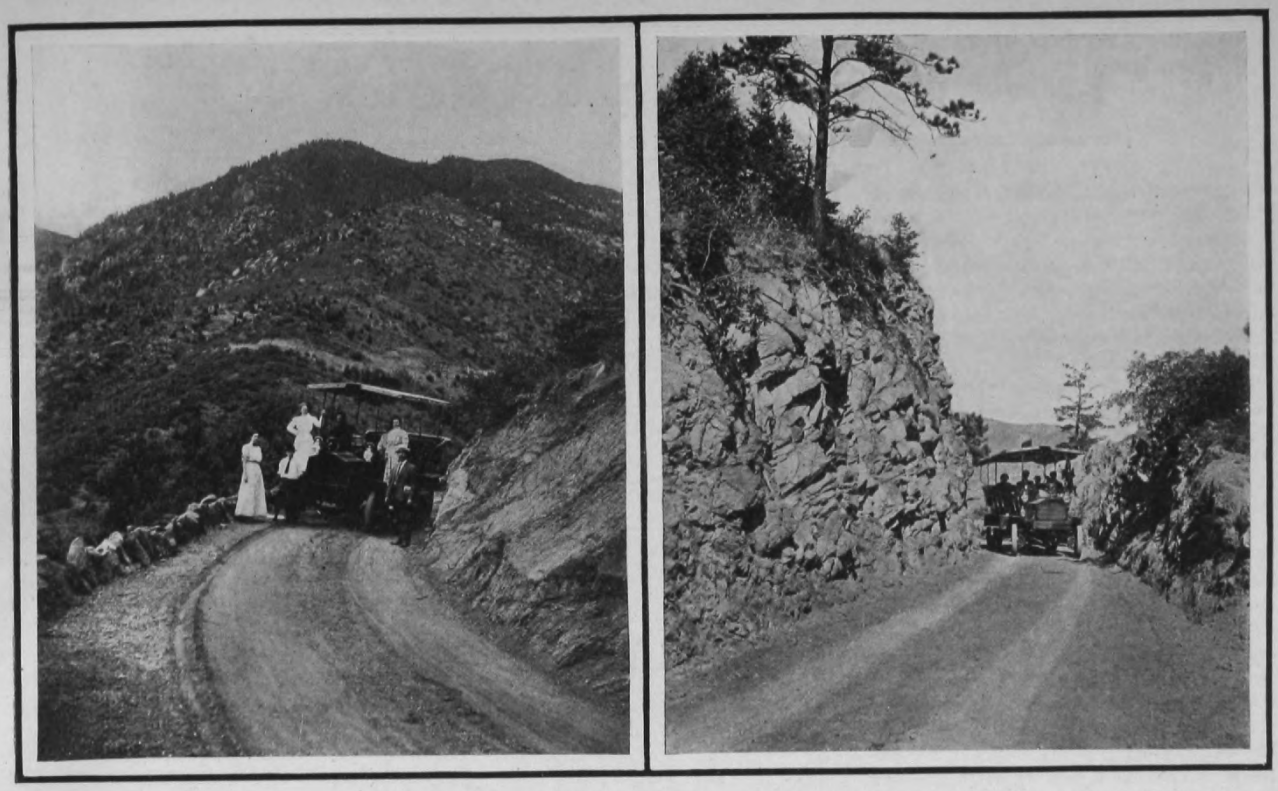
T. J. Toner, head of the Motor Car Maintenance Company, New York, which handles the Grabowsky power wagons, has entered two Grabowsky trucks for the New York *American* commercial vehicle contest to be held October 28 and 29. These cars are the standard 1 ton and 3 ton trucks, and both have been in hard daily service for more than a year in New York city.

An automobile provided by Will H. Brown, vice president of the Willys-Overland Company, will be used next winter for carrying pupils to and from the kindergarten of the Knickerbocker Hall School in Indianapolis, so inclement weather may not interfere with their studies. Every pupil using the car will be given a book with the fare marked which will be punched by the driver daily.

The Cathcart Transfer and Storage Company, of Atlanta, Ga., is the owner of the biggest automobile truck now in commission in the South. It is a Grabowsky moving van, and is larger than any of the horse drawn vans. The van is so long and so high that there is not a garage in Atlanta which it can enter, and the Cathcart Company is building a special garage to accommodate this truck.

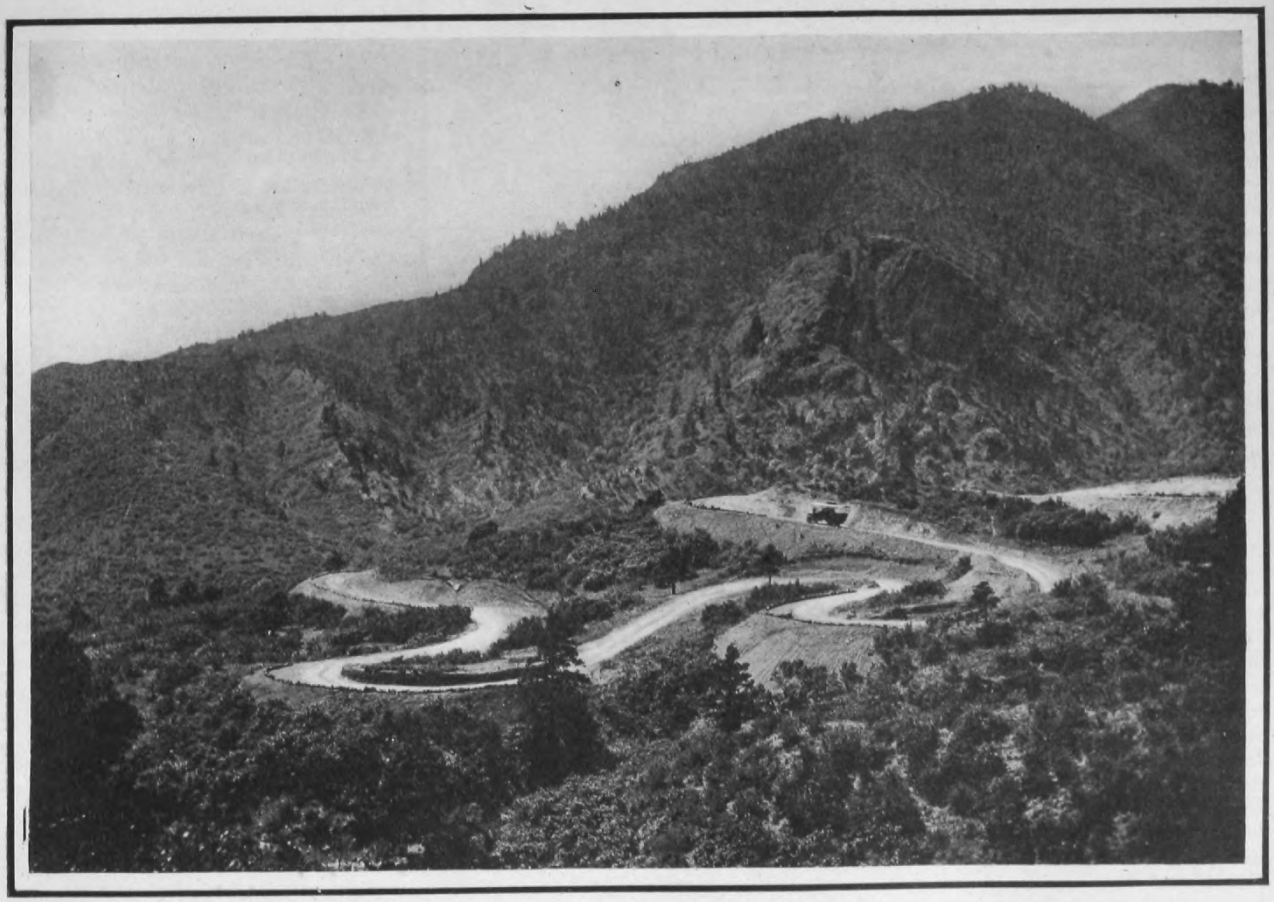
The Hand in Hand Fire Company No. 4 of Lock Haven, Pa., recently received a new Rapid chemical hose motor wagon, which was installed for service October 10. The apparatus is capable of developing a speed of 30 miles an hour, and will climb the steep grades in that vicinity. A full equipment of fire fighting appliances is carried, including axes, ladders, lanterns, hose and battery of hand extinguishers.

The Indianapolis *News* of Indianapolis is now delivering its entire city circulation to distributing stations by means of automobile service, having made a contract for twelve motor trucks. About 55,000 papers are delivered daily, the service extending to thirty-two carriers' distributing stations and 150 newsstands. Formerly twenty horse drawn vehicles were used. With the new arangement all papers are delivered within one hour and a half.



Rounding Point Sublime—Showing Fine Condition of Roadway.

Gateway to Eagle's Nest—Altitude, 8,000 Feet.



Another View of Loops—Letter S.
Views of the Crystal Park Sightseeing Service.

# Comments and Queries.

## Decarbonizing Motor Cylinders.

*Editor* HORSELESS AGE:

Although a trifle late in my reply, due to your valued publication having accumulated during my vacation, I hope the information herewith tendered may still be of use to "Subscriber," whose inquiry appeared in the August 24, 1910, issue.

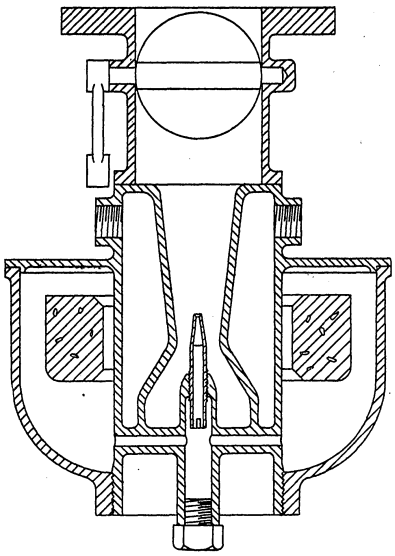
I have found what seems to me to be the quickest way of removing carbon from my Packard "Thirty." Secure in a hardware shop four metallic dishwashers, with double rings. Upon coming in with the engine hot the night before you wish to clean for carbon give each cylinder a liberal dose of kerosene and let it stand over night. In the morning remove the exhaust caps, and place one dishwasher in each cylinder, replacing caps. Start motor and run for ten minutes with the spark a trifle ahead of the centre and the throttle set so the engine will turn over slowly and smoothly. Be careful to see that while the engine is running none of the dishwashers get caught under the exhaust valves. This will remove all deposit from the cylinder heads and tops of pistons. A scraping tool will remove what little is left from the sides above the piston. With the cylinder raised to the highest point pour in a little kerosene, and with a small electric bulb, which you can connect to your battery, you will have a mirror which will reflect the top of your cylinder. A cloth inserted will absorb the kerosene and wipe up loose carbon. I used this method on my 1909 car, taking the cylinders off when they had run 16,000 miles, and found no carbon in the rings and the heads of pistons and cylinders in perfect shape. Am using the same system with my 1910 car, which has been run 9,000 miles without removing cylinders. An oil recommended to me by the agent who sold me my car seems to be freer of carbon than the kind I used last year. A line to the manufacturers of car, who very likely would recommend an oil to you, might help.

A SUBSCRIBER.

## Carburetor With Heating Chamber.

*Editor* HORSELESS AGE:

I read with interest the article by Mr. Holley on "Kerosene Carburetors," in the September 28 issue. There can be no doubt that the present carburetor must be somewhat modified, for the fuel of the future, automobile gasoline, is becoming less and less volatile, and this, together with the desire to use other hydrocarbons of high boiling point, has put many thinking as to how to solve the problem. I am enclosing a drawing of a carburetor I designed, and upon which I was granted letters patent. I employ the conventional concentric type carburetor, but I place between the float bowl and the mixing chamber a jacket, through which a heating medium may be passed. The heat may be derived from the water cooling system, or by tapping the exhaust, depending upon the amount of heat desired. While other



WOLF CARBURETOR.

means can be used to heat both mixing chamber and float bowl, I believe my carburetor to be of the most simple and compact construction

AUSTIN M. WOLF.

## Compulsory Stops at Grade Crossings.

EDITOR HORSELESS AGE:

In your recent comments on the proposed law requiring auto drivers to stop at each railroad crossing you could well have included the thought that this might be an element of danger, due to the additional time spent on the tracks. A rapidly moving rig is on the tracks but a fraction of a second, and unless the train is right there it gets over safely. But stop the auto and a number of elements of danger is added. Shifting gears often allow a rig to halt possibly on the tracks. Engines sometimes choke down in getting the rig started. The racing engine does not allow the driver to "listen," and if he is long about getting across the tracks after he has locked, it certainly will be detrimental to "stop," for with trains running a mile a minute the train can get there while the auto is getting started. The safest thing would seem to be an electrically operated signal to be thrown across the track by the train itself. An intermittent light at night and a waving flag by day could easily be within the possibilities. The driver is practically always looking ahead and would see such a moving object. In watching the road bumps, he frequently fails to see signs by the side of the road and too often the railroad cannot be seen till the auto is right at its tracks.

CHAS. E. DURYEA.

## "Trend of British Motoring."

EDITOR HORSELESS AGE:

You have a very interesting article headed "Trend of British Motoring in 1911" in your issue of September 7. You have a very nice reference to the Napier, but in one point it is erroneous, and that is that it suggests that our largest volume of trade is now centred upon the 15 horse power, four cylinder model. This reference is very misleading, as while it is perfectly true that in *numbers* the 15 horse power model sells more readily than larger ones, the 1910 season just closing has been the best year we have ever had for large six cylinder Napiers.

While it is quite true that obviously there are more people that can buy little cars than big ones, the sale of large six cylinder Napiers is still increasing, and I presume always will do so until something else arrives to take the place of the big car and do equivalent work. At the same time the people who are using little cars are increasing at a greater rate than those who can afford to use big ones. Unless, however, there is a very large increase in the sale of large cars, which we are unaware of, we are deluding ourselves with the belief that we have had a bigger year in the six cylinder trade than in any other period of our existence. At any rate the increase has been satisfactory to us.

S. F. EDGE.

## Briscoe Inaugurates a New Co-operative Plan.

Having fostered the "co-operative" idea for some years, during which time he has published a monthly pamphlet in the interest of the Maxwell car, entitled the "Co-operator," Benjamin Briscoe has carried his hobby into the organization of the United States Motor Company, of which he is president. Numerous other industrial organizations have adopted plans whereby employees could become stockholders and participate in the profits of the company. Accordingly Briscoe has had $1,000,000 worth of the U. S. Motor Company's 7 per cent. cumulative stock set aside to be offered to dealers, branch house managers and other employees, with participation in the distribution of a block of common stock aggregating $250,000.

## A Tire Maker's View of the Business Outlook.

"The tire business is bound to be larger in 1911 than it has been in 1910," said President F. A. Seiberling, of the Goodyear Tire and Rubber Company, in response to questions about the future of the industry. "I base that statement on the number of cars now running and the nearly 200,000 new cars that will be manufactured for next year's market."

Mr. Seiberling, who has just returned to Akron from a trip, in which he took a first hand survey of business conditions, talks cheerfully and with entire confidence of the future of the tire business in Akron, and consequently of the future growth of the city, which has come to depend considerably upon the rubber industry.

"There is no doubt," said Mr. Seiberling, "that the auto industry has had a check in the past few months, and that the tire industry, being an accessory of the automobile industry, has been affected. But that is past.

"This year the country has absorbed new cars up to the number of 180,000. While up to six months ago plans were being made by automobile manufacturers for 300,000 cars for 1911, the probabilities are now that the number built will be about the same as for this year. A number of manufacturers will reduce their output for next year; others will increase it, so that in my judgment the average of new cars produced for 1911 will equal the number for this year.

"It is true tire manufacturers this fall will be somewhat late in starting. This is due to general business conditions, but commencing with the new year business will be as active as it has been. The quiet at this time of the year is not unusual. In other falls, perhaps, local tire manufacturers have anticipated a coming year's business by building large stocks of tires and storing them until deliveries were called for. This year there is more conservatism in building advance stock. That is all. I have the utmost confidence in the future of the business. It will go along very nicely as soon as this political mess is straightened out.'

## New Routine at Pierce Factory.

When it began to deliver its current 36 and 48 horse power models in the latter part of August this year the Pierce-Arrow Motor Car Company of Buffalo inaugurated an important change in its manufacturing methods. It has been the custom to divide the year's output into what were called "runs." By this method a month or two months would be devoted to turning out cars of one model. Then another model would hold the boards for thirty to sixty days. It was found impossible to so arrange the time of these "runs" as to suit all dealers. At the time one model would be in demand in one part of the country it might be just between seasons for another model in another district.

During the spring and summer the manufacturing facilities at the Pierce-Arrow plant were enlarged greatly by the addition of both new buildings and new equipment. As a consequence it has been found possible to do away with the old "run" system and now the 36 and 48 horse power cars are being brought through side by side. The advantages have been particularly apparent this fall during the time the demand for enclosed cars has been greatest.

## Photographing Motor Car Parts.

The photography of motor car parts has brought into play a novel set of problems to the camera experts, the accompanying half-tone clearly indicating the manner of its solution. The parts are grouped on a

PHOTOGRAPHING AUTOMOBILE PARTS.

tray covered with snow-white cloth, and are snapped by the operator who works from the top of the platform. Each part is numbered, and a clerk jots down the names as the grouping proceeds. As a rule the photography of the various parts of a car is a task to which a producer assigns a force of trained mechanics and one completed car in running order.

An accompanying novelty not shown in the photograph, is the photography of a complete chassis. This is usually done with the assistance of a block and tackle which lift the car bodily off the floor into a perpendicular position. The scene depicted was occasioned by a thorough revision of parts catalogs which recently took place at the E-M-F Company's plant in Detroit, a bridge contiguous to the company's photograph gallery being employed for the operations.

## Willys on Branch Houses versus Agencies.

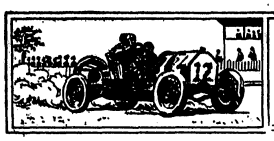
Now that there is a downward tendency in the prices of popular cars and the cost of selling as well as of manufacturing must be reduced by every legitimate means, the old question of branch houses versus selling agencies becomes timely again. The following remarks anent the subject are from an interview with John N. Willys, president of the Willys-Overland Company:

"We have carefully watched the result of the methods of selling as shown by four of the largest automobile manufacturers in the United States (the actual sale of the Willys-Overland Company being second largest in the year ending August 1, 1910), which qualifies us to make the comparison between selling through branch houses or directly to the automobile dealers who run their own business and have their own money invested in their business. The actual results show that our method of distribution greatly cuts the selling expense, and we, therefore, can place our product in the hands of the consumer, who eventually pays all the manufacturing and all the selling cost, for less money than can be hoped to be done by the other methods. If this is true, as we firmly believe it is, in regard to the branch house proposition, does not the same line of reasoning apply to the fountain head of every large automobile factory? Is it not reasonable to suppose that where any large industry is controlled by foreign capital, either Wall Street or a combination of any other capital that is not directly furnished by the management itself, that the expense of production will follow along the same lines as the expense of distribution through branch houses?

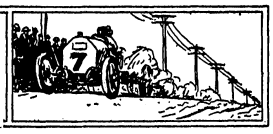
"I firmly believe that quality will be the corner stone of any concern's permanent success in the automobile industry in the future. How can an automobile manufacturer give the highest quality at the lowest cost? Can it be done by giving the management to men who are only interested so far as their salary is concerned, or can it be more successfully accomplished by the people who are financially interested in the business, taking active part in the management and production of the cars?"

## Larzelere's New Company Organizing.

With the idea of starting a new automobile factory, H. B. Larzelere, sales manager of the Chadwick Engineering Works, Pottstown, Pa., resigned from that company a few days ago and began to organize the Hance Motor Car Company in Philadelphia. Larzelere has been made general manager and president of the new concern and N. H. Adams, who has also been connected with the Chadwick Company for the past two years, will have charge of the sales and advertising departments. The company will make a further announcement within a few days.



# Sport and Contests.



## Bostonians Had a Beautiful Meet, Indeed, at Readville. President Speare Should Be Proud of It!

It is a pretty state of affairs, indeed, when a racing pilot who has only recently been outlawed by the A. A. A. can drive in a sanctioned meet in absolute violation of the rules. Yet that is what happened at Boston—right in President Speare's own stronghold—on Friday last, October 14, and it was Oldfield and his manager who perpetrated the act and defied the A. A. A. president and officials who were present. In permitting the outlaw to appear on the track and do his "stunt," Promoter W. H. Wellman placed himself in the Pickens class, and demonstrated his incompetence as a promoter of races.

Inasmuch as Oldfield had been disqualified from contests by the A. A. A., but had defiantly declared that he intended to drive at Readville Track on the above date, and that he was "bigger than the A. A. A.," the Bay State Automobile Association, which was co-operating with Wellman, withdrew its support. The official sanction was also withdrawn. By promising that Oldfield would not be allowed to drive Wellman succeeded in patching up the breach, and also got his sanction restored. Under these conditions it was Wellman's duty to see to it that things were not "framed up" in such a way that Oldfied could flaunt his defiance in the face of the president of the national governing body. The success of his trick naturally made Oldfield laugh at the "easy" officials. They permitted themselves to be outwitted, and it is a pity that none of them had the foresight or the courage to enforce the rules, even though it might have been necessary to resort to strenuous measures. They knew Pickens by reputation, and should not have allowed Oldfield and his car even to get on the course. It was bad taste, and decidedly bad judgment for Oldfield to openly defy the A. A. A. right after his declaration that he regretted being disqualified, and intimated hopes of being reinstated. However, the race officials knew anything was liable to happen under the circumstances, and should have been prepared to fight fire with fire. There was talk of disqualifying Wellman permanently from participation in sanctioned events, and throwing him out along with the Pickens coterie, and if certain things can be proved such steps may be taken. President Speare, who had been standing around looking wise prior to the incident mentioned, must have been proud of his national organization. Incidentally a meeting of the board was called, to be held at New York Tuesday of this week, to discuss the whole miserable affair.

A. A. A. representatives have been lax and neglectful all season, and if the president of the body can set no better example than that right in his own city last week, the action of A. A. A. men in more romote parts of the country is not to be wondered at. On the other hand, one has but to recall the methods of A. R. Pardington when he was referee at Indianapolis, Brighton Beach, Syracuse and elsewhere. He laid down the law and enforced it, even when in the former city it appeared as if the Speedway meet might end in a miserable fiasco. Recall also some of the instances where A. L. McMurtry, of the technical committee, has disqualified cars for not coming within the rules, regardless of whether or not there were enough cars left to fill an event or not. At Indianapolis, upon Pardington's decision following McMurtry's evidence, one large company's cars were barred from stock car events for a whole year—a drastic measure, but it taught a lesson, and had the desired effect. What the A. A. A. needs is a few more men of Pardington's calibre, who cannot be walked on by promoters, crooked or otherwise.

As for the racing at Boston itself, the program opened with a sprint match between Nelson Slater, a local favorite, in a Lancia, and Schuyler in a Firestone-Columbus. The latter pilot ate Slater's dust for the entire 5 miles, the Lancia winning in 5:54. S. P. White in a Cameron was too swift for Phil Wells in a Moon in another event of the same distance, the winner requiring 5:39, and beating his opponent by three seconds.

The line up for the hour race brought out Kerscher in Oldfield's Knox car, and caused numerous people to wonder why Oldfield and his manager should be suspended by the contest board, and yet Kerscher, Oldfield's employee, be permitted to drive Oldfield's own machine. In addition to the Knox there competed Charles Basle, S. P. A.; J. L. Judd, Jackson; Ph. Wells, Moon, and S. L. Rogers and W. A. Beverly in Simplexes. Shortly after the start Kerscher pulled into the lead, and no one got by him until the fifty-seventh mile, when he blew out a rear tire, giving Judd the lead. Kerscher soon got the Knox back to the fray, however, when the Jackson punctured a tire. The Knox pilot won with a score of 51¾ miles; Beverly, Simplex, was second, rolling up 51½ miles; Rogers, Simplex, third, with 47¼; Judd, Jackson, 39, and Wells, Moon, 33¼. Basle had trouble and retired in the first lap.

Kerscher covered his first 10 miles in 10:20 3-5; 20 miles in 20:54 3-5; 30 miles in 31:48 4-5, and his whole performance demonstrated that even though he is Barney's hired man, he is no mere joke as an understudy.

## Drove Half Mile on Board Bicycle Track in 43 Seconds.

His friends hope he will never do it again—that "motor whirl" on a bicycle saucer, for Ralph De Palma certainly frightened several thousand people, and frightened them badly, too, last Sunday, October 16, at the Clifton stadium, Passaic, N. J. On this narrow one-sixth mile board course he drove the 90 horse power Fiat "Cyclone" for several laps in most sensational style, and only stopped when ordered by officials when they feared a bad accident. In a preliminary trial the driver took the car around for six laps at high speed, at an average of a lap in fourteen seconds, although not timed officially. His car would shoot up the bank at the turns in startling fashion, his first round driving most of the people out of the end grand stand, for fear he would plunge into them.

On his second attempt he was timed officially for three laps, or one-half mile, in 43 3-5 seconds, and then flagged because the track was vibrating badly, and the boards loosening. De Palma drove perfectly at all times—always on the banking, and not on the flat "pole." He would tear over the short stretches, plunging high on the bank, but keeping the same orbit throughout without skidding. As the banking on the turns is at an angle nearly 60 degrees, it was absolutely necessary that high speed should be made in order to keep from sliding down the incline. His second lap was timed in thirteen seconds flat. De Palma declared that for the first time in his career he got cramps in his stomach, due to the sudden plunges up the turns.

Some time ago a driver attempted this trick at Atlanta, Ga., on a bicycle track, but failed, and when photographs were desired of the car high on the bank, it was tied in position, and fake photos taken while standing still. The Fiat driver believed he could actually drive on such a small course, which was his reason for making the trial.

## Fal Pilots "Ate Things Up" at Sioux City; Cutting Did Well.

Sioux City, Ia., produces something more than Sioux Indians these days—yes, indeed! Now they are producing motor enthusiasts and high speed, judging from reports of a two days' track meet held there October 14 15.

George Clark, piloting a Cutting car, was what might be termed the "star" the first day. He managed to break the mark made at that course by Oldfield on one of his recent excursions there, by covering a mile in :58 flat. Clark also did 2 miles in 1:56 and 3 miles in 2:54. A twenty-five mile race was also easy for him. The speed work as a whole, however, was not highly sensational.

Friday's summary:

Five Miles, 161-230 inch class—First heat won by Chester Cheney, Staver; second, George Selzer, Ford; third, H. A. Wetmore, Hudson; time, 5:29 4-5. Second heat won by Forbes, Firestone-Columbus; second, Von Berg, Cameron; time, 5:53½. Final won by Cheney, Staver; second, Forbes, Firestone-Columbus; third, Selzer, Ford; time, 5:35.

Five Miles, 231 to 300 inch piston displacement class—Won by Phil Wells, Moon; second, Cheney, Staver; third, Wetmore, Hudson. Time, 5:24 2-5.

Australian Pursuit Race, 600 inch class and under—Won by George Clark, Cutting. Time, 8:56 1-5.

Three hundred and one to 450 inch piston displacement class—Won by Phil Wells, Moon; second, George Clark, Cutting. Time, 5:22.

Twenty-five Miles, Free for All—Won by George Clark, Cutting; second, Wetmore, Hudson; third, Harry Woodruff, Firestone-Columbus. Time, 25:57.

Five Miles, Free for All Handicap—Won by Harry Woodruff, Firestone-Columbus; second, H. A. Wetmore, Hudson; third, Chester Cheney, Staver. Time, 5:43½.

Saturday's racing was faster than the opening day. The Fal team arrived and had things much their own way. Hugh Hughes and W. H. Pearce after a see-saw for several laps ran one-two in their Fals in the 5 mile feature event. Hughes' time was 5:26 and his team-mate one-fifth of a second slower. Pearce on a Fal also captured a 10 mile free for all handicap and a 10 mile exhibition event, likewise a 5 mile 301-450 displacement class. Gelnaw in another Fal bagged two firsts, one a 10 mile free for all and the other a 5 mile time trial.

Clark in his Cutting took a 15 mile free for all, and Wetmore in a Hudson won a 10 mile 161-230 class bout.

Saturday's summary:

Fifteen Miles, Free for All—Won by Clark, Cutting; second, Hughes, Fal; third, Pearce, Fal. Time, 15:33 2-5.

Ten Miles, 161 to 230 inch piston displacement—Won by Wetmore, Hudson; second, Selzer, Ford. Time, 11:17 2-5.

Five Mile, Free for All—Won by Gelnaw, Fal; second, Pearce, Fal; third, Hughes, Fal. Time, 5:30 1-5.

Ten Miles, Free for All Handicap—Won by Gelnaw, Fal; second, Pearce, Fal; third, Hughes, Fal. Time, 10.39 2-5.

Five Miles, 231 to 300 inch piston displacement—Won by Hughes, Fal; second, Pearce, Fal; third, Wells, Moon. Time, 5:26.

Five Miles, 301 to 450 inch piston displacement—Won by Pearce, Fal; second, Hughes, Fal; third, Wells, Moon. Time, 5:21 1-5.

Ten Miles, Free for All—Won by Pearce, Fal; second, Hughes, Fal; third, Wells, Moon. Time, 10:24.

Ten Miles, Free for All Handicap—Won by Pearce, Fal; second, Hughes, Fal; third, Gelnaw, Fal. Time, 10:28.

## Match Between Cobb and Rucker to Be Feature at Atlanta Meet.

There is not the slightest doubt that the approaching Atlanta meet will be one of the healthiest gatherings of racing cars and racing drivers ever held in this country. With more than fifty cars entered, the list is swelling remarkably, and now a feature of the meet in the form of a match between two of the foremost ball players has been announced. It is remarkable how so many varied trades and professions are now represented in motor racing. Ty Cobb, the famous batsman, whose home is in Atlanta, will try conclusions with a no less distinguished National Leaguer than "Nap" Rucker. The match will be at ten miles, best two out of three heats. The former star of the diamond will probably handle a National, and the other a Marmon car.

Manager J. M. Nye, who left New York a few days ago, following his visit to secure entries, strenuously denies that there has been any idea entertained of postponing the meet. He declares that the racing will take place rain or shine and that nothing short of the southern cyclone can prevent it.

Atlanta is cordially inviting all Northerners who expect to attend, and promises to give them a good time during the week between the Atlanta and Grand Prize races. Many New Yorkers and others have decided that they need a "post-season vacation," and intend to take advantage of the two big meets in Georgia. Certainly the ball players and their followings should turn out in full force.

Among the late entries are two Pope-Hartfords, one of which is to be piloted by Disbrow, who drove so well in the Vanderbilt and other recent races, and Robert C. Heitemeyer has announced that Matson will be at the wheel of his 90 horse power Simplex in heavy car events. These and several others added to the already large galaxy of stars promises a rattling good meet.

### Erle Was Fastest at Gaillon Climb.

Entries in this season's climb on Gaillon Hill were not as numerous as in previous contests which have attracted attention to France's annual slope conquering event. Held Sunday, October 2, it produced some sensational spurts and resulted in a new record being established for that course. Fritz Erle, driving a Benz in the free-for-all, tore up the grade in 23 seconds, shattering the former mark of 25 seconds, made in 1906 by Lee Guiness in a Darracq.

Jenatzy on a Mercedes scored second, requiring :26 2-5, while Joerns on a Germai Opel car was third fastest in :26 3-5.

The class for racing voiturettes brought out some lively light cars. A trio of Lion-Peugeots ran one, two, three in this division, Goux piloting the fastest of these in :38 flat. Jenatzy scored again in the touring car competition, driving a Pipe to victory in :34 3-5. Crespelle captured the small touring car event with a car of his own design, and Le Gui took the small car four cylinder class event.

Oiling and Repairing Atlanta Motordrome for Its Greatest Event, Scheduled for November 3, 4 and 5.

## "Speed Swallows" Flying Toward Savannah.

All motordom is talking Savannah and the Grand Prize race. While many New Yorkers and enthusiasts of other Northern cities were disappointed to a certain degree at having the race postponed and transplanted to the South, others are most enthusiastic over the prospects of a joyous vacation in Dixie for a few days.

Already the Fiat team, composed of De Palma, Nazzaro and Wagner, are encamped on the course, and the Benz crew and others are en route at this writing. Last week the Marmon team was formally entered, and all of the others on the list prior to the change of date and place are expected to re-enter. The Nationals will be out in full force, as will Grant, the Alco pilot, twice winner of the Vanderbilt Cup, and Washington A. Roebling, 2d, states that he will not only re-enter his Roebling-Planche car in the big race, but also a Mercer in the light car race as well.

Savannah has hit upon a brilliant scheme to put the course into shape—letting the vagrants do the rough labor. All the tramps and gentlemen of leisure without certain means have been put at work "massaging" the roads—fine healthful work.

New entry blanks for the Grand Prize, as well as the light car race, were issued last Thursday. The conditions for the big event state that the date of the race is Saturday, November 12, 1910. The length of the course is approximately 18½ miles, to be covered twenty-two times, making the total distance of the race about 407 miles.

Entrance fees are $1,000 for one car; $1,500 for two cars of the same make; $1,750 for three cars of the same make. The list closes November 5, 1910.

If the number of cars is too great, taking into account the length of the course, the committee shall decide, if need be, to proceed to eliminations. In this event the date and special arrangements concerning these eliminations will be subsequently fixed by the committee.

No car shall be allowed to take part in the race or in the preliminary practice on the course which has not been examined by the technical committee of the Automobile Club of America as to its construction, and which has not received a certificate from said committee that, in its opinion, it is safe to allow the car to run in the race. Every agent of oxidation, other than atmospheric air, is forbidden. The committee in charge of the race reserves to itself the right to reject any entry or entries, and to make such changes in the conditions and rules of the race as in its judgment are necessary.

Each car must carry two persons seated side by side. All cars taking part in the race must have:

(1) A reverse gear, driven by the motor. (2) An exhaust that is not directed toward the ground. (3) The overall width of a car must not exceed 68.89 inches.

There will be cash prizes for the drivers as follows: First prize, $4,000; second prize, $2,000; third prize, $1,000.

American entries should be made direct to Wm. B. Stillwell, care of Savannah Automobile Club, or Automobile Club of America, New York. Foreign entries should be made through the recognized Automobile Club in the country in which the car is manufactured, which club is the representative of the Automobile Club of America in that country.

The international light car races to take place on the day prior to the heavy car event are to be for the Savannah Challenge Trophy and the Tiedeman Cup. Contenders for the former prize must be cars with motors whose piston displacement is between 231 and 300 cubic inches. The distance over the 18½ mile course is to be fifteen laps or 277½ miles. Entry fee for one car is $250; two cars of the same make, $400; three cars of the same make, $500. A cash prize of $1,000 will be awarded to the winner in addition to the cup. The contest for the Tiedeman Trophy is for cars of 161 and including 230 cubic inches piston displacement; distance ten laps, 185 miles. Entry fees are the same as for the Savannah Challenge Trophy class. The winner will receive a cash prize of $1,000.

### Killed in Outlaw Race.

J. L. Meredith, president of an automobile company in Mason City, Ia., who had had hardly any experience in track racing, was killed in a 15 mile event when his car crashed into that driven by John Wallace, of Des Moines, Ia., at the Fair Grounds meet in that city October 6. Wallace was badly injured. The meet was an outlaw affair, and neither of the drivers was registered. The loss of life is most unfortunate, but once again it is an example of the danger of badly managed outlaw meets.

### Board Track Revival Scheduled.

Following the Grand Prize race, several of the cars and drivers will no more than have time to get to the Pacific Coast before the Los Angeles Motordrome season will open. November 26-27 will revive the racing at that remarkable course with a large program of short and middle distance events. Valuable trophies and $2,500 in cash prizes is offered.

On December 25-26, the postponed twenty four hour race on the board saucer will be the Christmas Day attraction, and it is quite probable that records will be broken. Basing calculations on the record of the cars in last April's opening meet, drivers expect to average seventy miles per hour for the twice-around-the-clock-event. This would be a total mileage of over 1,600 miles, and as no twenty-four hour race has ever been attempted on our American speedways, it is possible that Edge's Brooklands record of 1,581 miles will be surpassed.

### Chicago-Milwaukee Motor Truck Contest Planned.

The first motor truck reliability run ever held in the Middle West will take place October 28-29, when the Chicago Automobile Club and the Milwaukee Automobile Club will jointly hold a contest between these two cities, starting at Chicago. The event will be run under A. A. A. sanction, and it is said that prizes aggregating $1,000 will be awarded. The only vehicles eligible for the event are those designed to carry freight and propelled either by gasoline, steam or electric power, and the system of scoring will be similar to that on regular automobile endurance contests, with checking stations and a scale of penalizations for adjustments, replacements and time lost. Cars will be divided into eight classes according to their capacity, ranging from 500 pound loads to 7 tons. Each will be required to carry its full rated load, and the final award will be made on a basis of time, reliability and economy of operation. The trip will cover approximately 200 miles.

### Will Exhibit at Aviation Meet.

At a conference between M. J. Budlong, president of the Licensed Automobile Dealers of the City of New York, and Allan F. Ryan, manager of the International Aviation Tournament to be held at Belmont Park, October 22-30, an agreement was reached under which the members of the Dealers' Association will have the exclusive right to exhibit their cars at the aviation meet. The sanction of the A. L. A. M. show committee and the Madison Square Garden Company has been obtained for this exhibition. The grand stand betting ring at Belmont Park, which contains over 40,000 square feet of floor space, has been set aside for the purpose. The New York dealers are said to be pleased with the opportunity of showing their cars at the aviation tournament, and that the promoters of the tournament are pleased with the arrangements goes without saying.

### M. R. A. to Run "Wall Street Special."

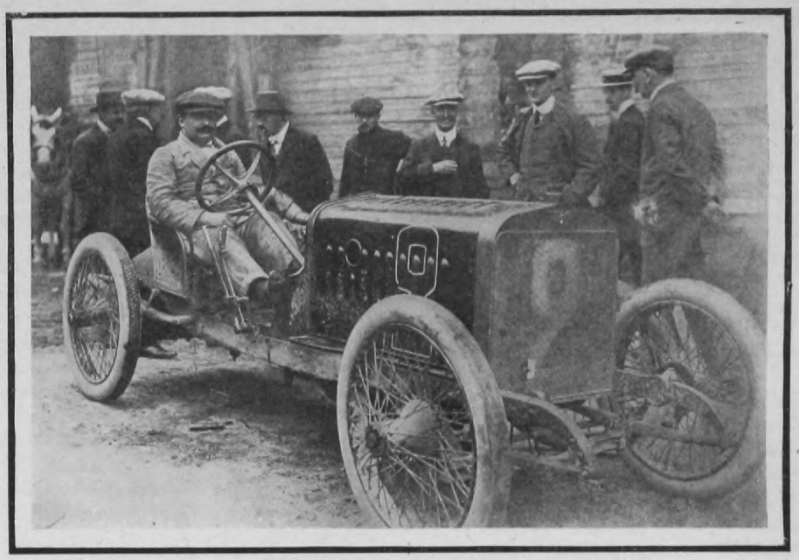
Recalling the success of the "Wall Street Special," which was run to the Savannah Grand Prize race, two years ago, the Motor Racing Association, through T. Francis Moore, has made arrangements to repeat the excursion. The trip will consume four days, leaving New York on the evening of November 9, and returning the following Sunday. Special excursions will also be run by the Seaboard Air Line, around the dates of the race.

## Technical Comment on French Small Car Race.

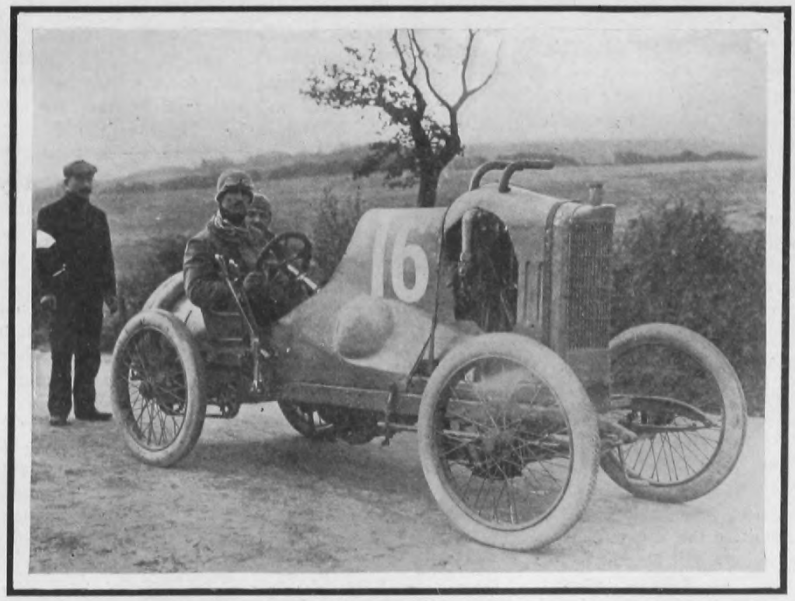
In the *Allgemeine Automobil Zeitung* of Berlin B. von Lengerke makes some comments on the technical aspects of the recent voiturette race on the Boulogne circuit. These races, under the auspices of *L'Auto,* have now been held three years in succession, and every year there has been a smaller number of entries. The races are open to single cylinder cars with a cylinder bore up to 100 mm. (4 inches); two cylinder cars up to 80 mm. (3.2 inches), and four cylinder cars up to 65 mm. (2.6 inches), the minimum weight for all classes being 600 kg. or 1,320 pounds. Under these rules the single cylinder motor with long stroke (100x250 mm.) acheived an easy victory in 1908; in 1909 the four cylinder motor showed a considerable advance, and this year the latter motor (65x200 and 65x260) achieved a decisive victory. In 1908 a single cylinder motor of 100x250 mm. cylinder dimensions developed 25 horse power on the brake; the output was increased to 30 horse power the following year and to 36 horse power this year, while the four cylinder motor, which originally was far in the rear, this year, with the cylinder dimensions already mentioned, gave an average output of 40-45 horse power, which is certainly a remarkable performance.

These astonishing results were obtained through recognition of the facts that a true spherical compression chamber admits of an enormous and unexpected increase in the compression pressure and the mean explosive pressure, and that numerous large inlet and exhaust ports in a spherical compression space permit of much more rapid admission and exhaust of the gases, and consequently of a material increase in the number of revolutions. That, besides, designers made every effort to lessen the weight of pistons, connecting rods and valve mechanism so as to reduce the inertia of the reciprocating masses is, of course, natural.

However, the prescribed limiting bore of 65 mm. makes it much more difficult for the designer to provide a substantially spherical compression chamber with large valve ports than if a bore of 100, 105 or 110 mm. could be used. In the latter case it would be possible to use several inlet and exhaust ports for each cylinder and still retain a favorable form of the compression space; this is practically impossible in the case of a cylinder of only 65 mm. bore, for the reason that an increase in the number of ports would result in a material deviation of the compression space from the spherical ideal, and what would be gained in one direction would be lost in another. Besides, in the case of strokes of 200 and 260 mm. (8 and 10.4 inches) as found on some of the competing motors this year, the inertia of the valve mechanism plays an important role, so that the designer is again confronted with the question of the relative advantages of valves in the head operated by tappet rods and levers, and of valves in side pockets operated in the usual manner.



Zucarelli on Hispano-Suiza, Winner of Voiturette Race. (Motor, Four Cylinder, 2.6 Inches by 8 Inches.)




Lion-Peugeot Small Racer (Four Cylinder Motor of 2.6 Inch Bore by 10.4 Inch Stroke.)

Peugeot adopted the first of these arrangements; Hispano-Suiza, the victorious firm, the latter. The Peugeot cars were actually the fastest, but they lost the race on account of cooling and tire troubles. The greater speed of the Peugeot car was probably due on the one hand to the longer stroke (260 mm. as compared with 200 for Hispano-Suiza), which led to an increased motor output, and, on on the other, to the chain transmission, which results in better adhesion of the driving wheels to the road. The more advantageous form of these vehicles was probably also a factor.

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Says a press sheet sent out by the New Jersey Automobile and Motor Club:

"Over one million new automobiles have been put upon the market this year by American manufacturers and that * * *"

Figures, of course, can't lie, but they can be used very carelessly.

## Mount Vernon Club Again Promoting Meet.

Saturday, October 22, is the date set for a meet at Empire City Track, Yonkers, N. Y., under the auspices of the Mt. Vernon Automobile Club. The events on the program include four 10 mile races for various classes, two 5 mile races, one free for all, while the main event is the one hour race for the "Splitdorf Magneto Trophy," donated by the manufacturers of the Splitdorf magneto, and must be won by the same driver three times before it becomes his permanent property. A cash prize also goes to the winner as well as second and third places.

Otto F. Rost, who had charge of the last meet, is general manager. The track was reconstructed this summer and all the the loose surface removed; the turns have been rebuilt and banked.

## Commercial Vehicle Contest Planned for October 28-29.

The first commercial vehicle reliability contest in several years to be held in New York city is scheduled for October 28-29. It will be held under the auspices of the New York *American* with the sanction of the A. A. A. A. H. Whiting, of the A. C. A., has been appointed referee and A. L. McMurtry, chairman of the technical committee. The rules will be similar to those used in the recent Philadelphia contest.

## Trying to Revive Portola Race.

The Oakland Automobile Dealers' Association held a meeting on September 26 to discuss plans for re-running the Portola road race. It is planned to have the affair managed by the dealers with the co-operation of the San Francisco Motor Club and other clubs of the Bay City. It is said that the Chamber of Commerce and the Merchants Exchange are willing to assist in the project. The proposed course will cover a circuit of 14 miles, and a light car race is being talked of to be held the day prior to the bigger event.

The Chicago Motor Club officials have decided to change the dates of the club's fall reliability contest from the middle of this month to November 7-11. Contestants will cover about 1,017 miles during the five days.

Caleb Bragg, the amateur, who defeated Oldfield in two straight heats at Los Angeles last April, announces that he will turn professional, owing to the fact that there are so few amateur events for which his car is eligible. He is now in charge of the Fiat racing team at Savannah.

It has been decided definitely by the Licensed Automobile Dealers' Association of Los Angeles, Cal., to abandon racing as a body. However, members will be permitted to enter contests individually at will.

## Palace Show Plans Progressing.

As has been the case for some years there will be an automobile show of unlicensed exhibitors, in the Grand Central Palace this year, coming directly before the A. L. A. M. exposition in Madison Square Garden. New Year's eve is scheduled as the opening date of the former, which will run until January 7. The promoting organization, which is not quite permanent as yet, has borrowed and made a slight addition to the name of the organization which formerly held shows on the premises. The late American Motor Car Manufacturers' Association was dissolved some ten months ago, and the newly formed organization calls itself the American Motor Car Manufacturers' Exhibit Association. C. C. Conant and Herbert Longendyke, of Troy, N. Y., who for fifteen years have managed the National Vehicle Show, will be responsible for the management of the unlicensed exhibit.

The promoters expect the co-operation of a large number of independent makers, thirty-seven of whom, it is said, have contracted for space. About 60 per cent. of the available space has already been taken. It is claimed by the association that there are over 150 makers of cars, which are not paying royalties under the Selden patent, and a large percentage of these are expected to exhibit their wares.

A department for foreign cars and foreign commercial vehicles has been arranged, and a large number of accessory dealers who are not members of the Motor and Accessories Manufacturers have subscribed for space in the balconies and elsewhere.

## Ford Eastern Service Plant.

Particulars have just been made public of the big Eastern distributing and service plant which the Ford Motor Company will erect at Jackson avenue and Honeywell street, Long Island City, N. Y., at a cost of $250,000. The company has bought outright a plot of ground at the above location, which is within a stone's throw of the end of the new Queensboro Bridge. Ground has already been broken, and by the middle of March, 1911, the first of the buildings, which will measure 265x75 feet, will be completed. It will be a four story structure of reinforced concrete. There will be a fine showroom, where agents and sub-agents can inspect new models, and where they can meet in convention on occasion.

It is the plan to maintain at this service plant a stock of parts covering every model of Ford car that has ever been made, so as to permit of furnishing repair parts promptly. Eastern dealers will also be able to replenish their stock of cars in case of an unexpectedly large demand. In order to facilitate the shipping of cars and parts, two sidings will be run from the main line of the Long Island Railroad to the Ford property. A plant similar to the above has recently been completed at Kansas City.

## Lindsley & Tryon Case Adjourned.

When the creditors held another meeting and examination of the bankruptcy case of Lindsley & Tryon, automobile dealers of Pawtucket, R. I., on October 13, before Referee Barrows, an adjournment to October 27 was made. J. J. Hahn, representing the trustee in bankruptcy, told the referee that since the last meeting certain papers had been produced which served to give information sought by the trustee, and time was desired in which to examine these. At the previous meeting, when the bankrupts were examined, Lindsley, the senior partner, could not tell what had become of an item of $500 drawn from the firm's account at bank, or explain why there were certain missing pages in the firm's books. Before the next meeting it is expected that the documents in question will have been thoroughly examined.

## D. F. and Le Roy Templeton Trying to Collect.

D. F. and Le Roy Templeton, of Norristown, Pa., have entered suit against Thos. O'Neill of that city for the recovery of $345.58, with interest from September 24, 1910. The plaintiffs have been trading as the Norris City Garage. The suit is brought upon a promissory note given by the defendant to the plaintiffs and made payable upon the People's National Bank in this borough. It is set forth that when the note was due upon the above date no one offered to make payment, nor since.

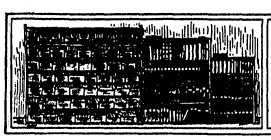
## Westgard Goes West.

Anthony L. Westgard, president of the Touring Club of America, accompanied by his wife, started from New York on a transcontinental trip Wednesday 12th inst. in a 1911 model Premier car. The couple was formally started by Gov. Horace White and Secretary of State Koenig, and other notables. The trip is being made to gather touring data for the club, and Westgard will also endeavor to stimulate interest in the various cities visited.

## Take Jackson Export Agency

J. S. Johnston & Co., of 68 Broad street, New York city, one of the oldest export houses in the trade, with offices in many cities in Central and South America, has taken the export agency for the entire line of Jackson automobiles. A series of models has already been shipped south, in charge of one of the Johnston & Co.'s salesmen.

O. S. Gillen, of the Jackson Automobile Company's sales staff, has started on a long trip to cover about 9,000 miles during the next three months. He will go through the Canadas and British Columbia, taking in the principal cities and counties north of Parallel 45, and winding up at Vancouver. Sales Manager F. A. Davis, of the company, has just returned from an eight weeks' trip through the Southwest, visiting agents.



# Our Foreign Exchanges.


## Gnome Rotating Cylinder Aeronautic Motor.

Among the most successful motors for aeroplane work abroad has been that manufactured by the Société des Moteurs Gnome, 45 rue Lafitte, Paris, France. The latest production of the Gnome factory is a fourteen cylinder machine of 100 horse power, which is fitted to the Bleriot monoplane, which will compete for the Gordon Bennett Cup in this country this month.

The cylinders of the Gnome motor are made from forged steel, and together with their cooling flanges are machined out of the solid block. One of the ingenious features of the motor is the method of securing the cylinders to the crank case. The cylinder ends are made a tight fit in the openings provided for them in the crank chamber, and after being pressed into place, transverse locking pins are inserted and hold them in place with absolute certainty. This method of fixing the cylinders, besides being advantageous from the standpoint of security, renders the cylinders instantly demountable.

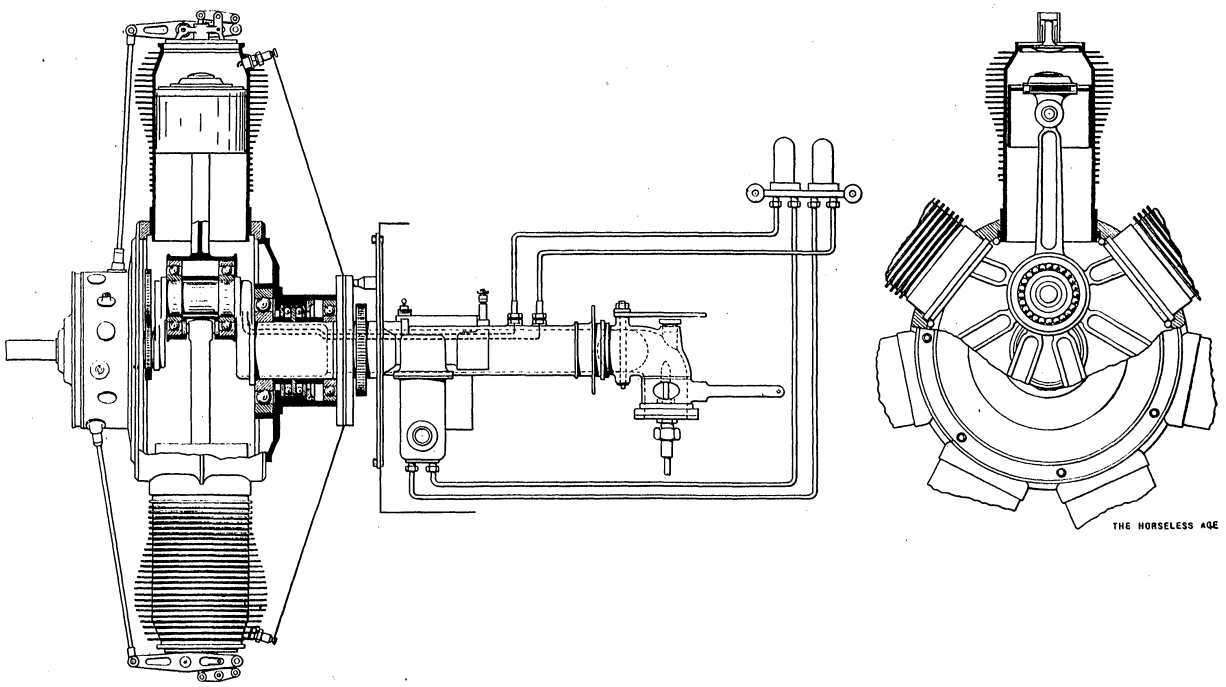
The crank chamber, which on account of the centrifugal force on the cylinders, is subjected to greater strains than in an ordinary type of motor, is also made of forged steel and consists of three parts, a cylindrical portion to which are secured the cylinders, and the two end plates. Each of these end plates is provided with a bearing by means of which the motor is carried on the stationary crank shaft. The helice being generally secured to the motor itself, the latter is provided with a thrust bearing by which the propelling effort is transmitted to the frame of the plane.

Although the crank shaft is stationary, it performs a rather important function in the operation of the motor, serving as a means of communication between the rotating mass of the motor and the exterior stationary parts; through it the gaseous mixture enters the motor, as well as the lubricating oil. The carburetor is secured to the end of the crank shaft, and the charge enters the crank chamber through the hollow crank shaft and flows thence through inlet valves located in the piston heads into the explosion chambers. Until recently these intake valves were automatically operated, but the new 50 horse power model will have mechanically operated valves. It is stated that the adoption of mechanically operated valves was not at all necessary, since the automatic valves always gave satisfactory service, and the only advantage expected is a slightly greater fuel economy.

The exhaust valves are located centrally in the heads of the cylinders, and are operated by tappet rods and levers. These mechanisms are so designed as to be unaffected by centrifugal force. The seven cylinder motor of 110 mm. bore and 120 mm. stroke (4.4 inch x 4.8 inch) gives 50 horse power, and the fourteen cylinder 100 horse power. In the fourteen cylinder motor the cylinders are arranged in two circles. In either motor seven connecting rods act on one crank pin. Only one of these rods, referred to as the master connecting rod, is directly connected to the crank pin, on which it works through two annular ball bearings. The head of this connecting rod is provided with six lugs to which the other connecting rods are pivoted.

Ignition is affected by means of a high tension magneto, which is driven in the ratio of 7 to 4 from the motor. This magneto supplies current to a distributor turning with the motor, which is provided with seven contact segments connecting to the seven spark plugs by bare wires.

In a rotating cylinder motor lubrication is one of the most difficult problems, owing to the tendency of the centrifugal force to cause the oil to leave the bearing surfaces. For lubricating the Gnome motor only pure castor oil is used, on account of its remarkable viscosity and its great lubricating qualities. It is delivered by a pump into special channels cut in the crank shaft. One of these channels opens into the connecting rod head, the others into the main bearings. The excess oil oozing from the bearings serves to lubricate the cylinders and then escapes through the exhaust valves into the atmosphere. In order



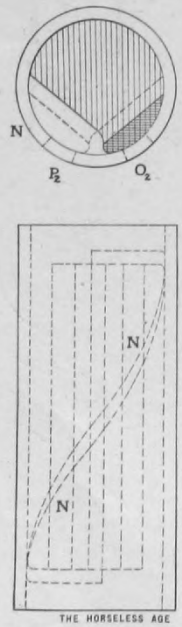

Two Sectional Views of the Gnome Motor.

that the oil may not flow too rapidly, a number of obstacles are interposed in its passage, especially the cage surrounding the ball bearings of the connecting rod head, which lets only the least oil escape. These motors are very wasteful in oil, as liberal amounts must be fed so that no seizing of pistons or bearings can possibly occur, and the oil, of course, is used only once and is then discharged. A sight feed is placed in plain view of the operator, who is thus always informed of the rate at which oil is being fed.

The 50 horse power motor weighs 167 pounds and the 100 horse power 220 pounds. Both turn at 1,200 r. p. m.

## Daimler Rocking Valve for Gasoline Motors.

A German patent has been taken out by the Daimler Motor Company, of Unterturkheim, Germany, on a novel rocking valve for gasoline motors, an illustration of which is here reproduced from *Automobil Welt*. The valve is of cylindrical form and contains two chambers, each open at one end, which are separated from each other by a longitudinal partition wall. One of these chambers serves for the intake and the other for the exhaust, longitudinal slots or ports serving to establish communication with the ports leading to the cylinders. The novel and characteristic feature of the valve resides in the fact that the partition wall $n$ (see cut) at one of its junctions with the cylindrical wall of the valve extends straight and parallel to the axis of the valve cylinder, but beginning at this wall assumes a helical form. The object in giving the longitudinal partition wall this shape is to secure an increasing cross section for the exhaust chamber and a decreasing cross section for the inlet chamber, in connection with valve ports $o^2$ and $p^2$ spaced as closely as possible so that the valve needs to be rocked only through a small angle. Another object is to insure that the stresses resulting from heat expansion of the longitudinal partition wall in operation will be distributed over as much of the valve circumference as possible.




Daimler Rocking Valve.

Bleriot Monoplane for Gordon Bennett Race, Fitted With 100 Horse Power Gnome Motor.

## Maryland Motor Car Insurance Company Licensed to Do Business.

A certificate of authority to do business in the State of Virginia was issued last week by the State Corporation Commission to the Maryland Motor Car Insurance Company, of Baltimore, Md. This concern has been organized and is licensed for the purpose of insuring motor cars exclusively, whether on land or in transit, on boats and steamers. The company is also licensed to transact an insurance business by the Bureau of Insurance in Virginia.

## Drivers' Licensing Ordinance Tested in Indianapolis.

The validity of an ordinance licensing drivers of automobiles and riders of motorcycles is being tested in the Circuit Court at Indianapolis. Under the ordinance every person driving an automobile or riding a motorcycle, whether the owner of the machine or not, must register with the Board of Public Safety and pay a fee of $1.

The objectionable feature of the ordinance is that giving the police judge the right to revoke such license. Recently the license of Albert Ferguson, colored driver for William M. Jillson, was revoked for fast driving. To make a test case Ferguson drove an automobile to police headquarters, where he was arrested. He was fined in police court and took an appeal to the Circuit Court on the ground that the ordinance is unconstitutional, on the theory that the city charter does not give the city council authority to enact such ordinances.

## Rider-Lewis Property Attached.

Alleging that the Rider-Lewis Motor Car Company, an Indiana corporation, which is now in the hands of a receiver, is planning to remove its property from Anderson, Ind., out of the State, with a view to defraud its creditors, Homer T. Spears started suit last week in the Circuit Court against the company to recover $142, which he claims is due him on a contract. A writ of attachment has been issued by the court and the property will be held until the case is decided.

## Owen to Be Absorbed by Reo.

A rumor which has been floating around Detroit for the past ten days or so was confirmed by R. E. Olds, at Lansing, Mich. last week. The Owen Motor Car Company, of Detroit, is to be absorbed by the Reo Motor Car Company, of Lansing, of which Olds is president. The latter has stated that the Owen Company is to be greatly strengthened financially and that in the future these cars are to be manufactured at Lansing.

## Candidates for Chief Examiner.

Six candidates were successful in passing the State civil service examination for the position of chief examiner of chauffeurs under the Secretary of State at a salary of $2,000. Those who passed were George Strowbridge, Arthur E. Preyer, Frederick W. Elliott, William S. Linkert, New York; George W. Jones, Little Falls; Clark M. Babbett, Buffalo. One vacancy will be filled from this list.

# Modern Road Construction in the United States.*

Since 1894, when the States of Massachusetts and New Jersey began their modern road construction, the development of such work in this country has been rapid. New Jersey had first provided for State aid in highway improvement by an act passed in 1891, but this was inoperative from various causes until June, 1894, when work was begun. Connecticut began in 1895; Maryland in 1896; New York in 1898, and other States have followed from time to time until now, in 1910, over thirty are engaged in this work.

When the work began in this country skilled highway engineers were scarce. Macadam quite naturally was the "mentor" of the engineers attempting highway work—his predecessors, Tresaguet and Telford, being overlooked.

FOLLOWED MACADAM.

The Massachusetts authorities seemed to comprehend, perhaps most clearly, the principles laid down by Macadam and all their work has been based on these axioms. Of course differing conditions, new machinery and varying requirements compelled some changes in the application of the principles, but the latter were as closely adhered to as possible under the conditions. The results show plainly that Massachusetts was particularly fortunate not only in the broad-mindedness and farsightedness of her men in charge of the work, but also in the clearness with which they understood the principles at the bottom of macadam construction.

As the extent of the work increased the highway engineering branch of the profession developed. The ranks were recruited from young, energetic and ambitious members, the opportunities afforded being attractive to such men. Consequently, today some of the brightest engineers are following it and their work is leading the world.

HIGHWAY ENGINEERS.

The earlier highway engineers came in the main from those previously employed on steam railroad work, which work had reached here a development far ahead of that in any other country, and very naturally many of the details of highway construction were worked out according to railway ideas. For instance, in grading a road anew the inclination was to establish long tangents and easy vertical curves in the profile, and with as far as possible an absolute avoidance of reverse curves in both the profile and the plan. Undoubtedly the results so secured were good, but it is doubtful if they were always worth the cost, and unquestionably the following of such a program did result in many cases in an unnecessary disturbance of local conditions, and in friction with adjacent property owners. Later, as a better appreciation of the greater flexibility of the vehicles traveling a highway over those using the railway has been had, as well as the increased necessity for economy, wherever possible to offset as far as might be the higher cost of other details, has appeared, highway engineers have been modifying somewhat the rigidity of their earlier ideas regarding the grades. It is no longer considered bad practice to adjust the new grades to meet, as far as practicable, the topography of the country traversed, but rather the contrary. The "humping" of a grade over a culvert or bridge is no longer considered objectionable, provided an appreciable saving can be made in the cost of grading and the changes in grade are not too abrupt for modern traffic. On the other hand, rough and raw "railroad cuts and fills," with barely sufficient slopes, are now frowned upon by all, and considerable effort is made to increase, by proper sloping, the attractiveness as well as safety of the slopes.

CULVERTS AND BRIDGES.

In the matter of culverts and bridges it was early recognized that the more permanent forms of construction were the more desirable from every point of view. At that time reinforced concrete was scarcely known here. The attempt was made to use brick and stone masonry as far as possible, though considerable steel work seemed necessary in most cases of over 4 feet span, owing to the cost of masonry arches. With the advent of reinforced concrete the ability of the engineers to still further reduce the use of perishable steel trusses and girders was greatly increased, and the opportunity was immediately seized.

At first in the use of concrete too little thought was given to the appearance of such structures. As their permanency impressed itself, and with the growing appreciation of the value of considering the æsthetic side of highway work, much improvement in the design of such structures has resulted. There is room, however, for further improvement, and the engineers of this country would do well to study the examples set in this matter by the foreign authorities.

In this study there should be no cause for discouragement. The States are now trying to accomplish even more in one-fourth the time than foreign countries have accomplished in a century. The magnitude of the field of operations here, the necessity for haste, the meagreness of funds for the immense work, and the deplorable lack, until recently at least, of a proper general appreciation of the value of modern roads by the public generally offer an explanation, if not an excuse, for the present backwardness of the States as a whole on this question. Many other causes or factors might be cited, but suffice it to say that, while this country is behind in results at the present time, the prospect is clear that it will not remain so long.

As regards the highway engineers themselves, the writer firmly believes that while, as referred to above, some of their practices are not up to the best foreign ideas, in some others the American highway engineers are far ahead of the rest of the world.

SURFACE CONSTRUCTION.

In the matter of road surface construction the best practice in the States is away in advance of the foreign. In the variety of materials used, in the development of methods for using the same, and in the recognition of the proper principles to be followed, the engineers of the States can give points to the foreign engineers. So far as the writer knows there is but one item of construction on which we should pattern after foreign practice, and that is in the use of machinery.

Owing to the diversity of our resources and conditions the American road surfaces built offer an immense variety of results. By no means all of them are satisfactory nor, undoubtedly, the best that could have been obtained by better methods. But the variety of materials and conditions has probably, in the short period of their use, interfered with, in many cases, a proper recognition of the best methods of use. Unwise conservatism and adherence to old practices, as well as rash and unjustifiable ignoring of well established principles, have been naturally followed by failures or unsatisfactory results. The advent of a new material for use on the roads or the conception of a new method, perhaps induced by local conditions, has too often tempted highway authorities and even the younger highway engineers to ignore or abandon the proved principles underlying such work, and to "rush after false gods" to their own (or others') destruction.

As stone macadam forms the greater part of modern road surfaces, in expatiating somewhat on the above, it will probably be well to do so that form of surfacing, and briefly refer afterward to the others.

PRINCIPLES OF STONE SURFACING.

Stone, broken by hand or by machinery, is probably the oldest and most universal of road surfacing materials. Certain well developed principles have been established concerning its use in macadam that ought to be so well recognized that their repetition would be trite and unnecessary. The writer regrets that such does not seem the case, and, therefore, feels impelled to state as follows:

*a.* The macadam surfacing is but a roof, a wearing surface over the foundation, without which latter it cannot support a load, nor in which can it remedy defects of sustaining power. It is true that to some extent the macadam may effect a distribution over the foundation of the strains com-

* A paper read by Mayor W. W. Crosby, of Baltimore, Md., at the recent National Good Roads Congress under A. A. A. auspices at St. Louis, Mo.

ing on the surface of the former, but in the design of the foundation great care should be had in allowing for such distribution.

*b*. The macadam should be planned as, and built, separate and distinct from the foundation. Any merging or lack of distinctness between the two, except possibly in the cases of sandy or sand gravelly foundation can only result in a weakening of the macadam without a corresponding increase in the strength of the foundation.

*c*. The particles forming the macadam itself should be packed as closely as possible together. There should be an actual interlocking of the pieces of stone. No macadam is worthy of the name that does not contain this interlocking, and the more perfect the latter is the better will be the macadam. This necessarily means that, in the laying of the macadam, screening to prevent improper proportions or too great variation in the sizes of the pieces being used is required, as are also the spreading and compacting of the stone in layers of only such thickness as the roller can be relied upon to compact to the utmost; the exclusion of such an excess of fine or foreign material from the mass of broken stone as will prevent the proper compaction of the latter; the reduction of the voids in the mass of broken stone to the utmost possible minimum, and the after filling of those voids by finer material to complete the compaction of the mass.

Only too often has the writer noticed in this country the ignoring of one or more of the principles expressed in the above paragraphs, but he has been impressed with the far more prevalent ignoring of them elsewhere, especially those principles mentioned under "*c*." Good results, where these latter have been ignored, are evidently not worse only because of the maintenance accorded after construction. That the cost of such maintainance could be materially reduced or that better results with the same maintenance could be secured by recognizing the principles mentioned has apparently been lost sight of, with the principles themselves, by the foreign engineers. No one who has the opportunity to examine carefully the foreign construction of road surfaces can fail to be impressed with its inferiority compared with that of the best of the States—as it has been styled "the McClintock Road."

PRINCIPLES IGNORED.

The writer has been regretfully impressed with an apparent tendency, more especially perhaps among novices in road building and with suggested new materials, to ignore in their work the points referred to above. For instance, with the use of pitch compounds (bituminous cements) in road surfacing some sort of results can be secured even if the stone is not thoroughly compacted. Usually, however, as the more experienced engineer fully realizes, the absence of the proper interlocking quickly makes itself manifest—especially in cases where a short lived cement has been used —and such a surface readily succumbs to severe strains. It, of course, takes some time frequently to demonstrate the expensiveness of inferior construction, and by that time often the same authorities as were responsible for such construction are chasing new butterflies. Much might be written concerning the details of ordinary macadam work, but the discussion while interesting perhaps would largely resolve itself into that of consideration for local conditions. For instance, the ideal macadam is built of proper trap rock with an utter absence of anything in the shape of clay or earth. Many engineers prefer for convenience in some way to add clay or similar material for the "binder." The writer is fully aware of all the discussion that has been had on this point, but retains his conviction that such a practice is only a makeshift and is not justified in principle.

LIMESTONE.

Some localities are devoid of trap and local conditions may seem to compel the use of even a soft limestone. Undoubtedly this makes a better macadam than many other local stones, and its results may be improved by "reversing" the courses, i. e., by using the No. 2's in the first course and the No. 1's in the second course as laid. The results, however, are even then usually inferior to those of the ordinary methods using suitable stone, though the "reversed" macadam may be a locally satisfactory, and indeed necessary, makeshift.

The writer has even "reversed" excellent trap rock, where severe traffic conditions seemed to call for such a procedure, with satisfactory results, by the addition of a bituminous cement. The main objections to a "reversed" macadam are a resulting excessive roughness of surface in ordinary water-bound work, and a tendency of the macadam to ravel. Both of these can be largely overcome by the use of a suitable pitch in the surface. This reversal of the courses seems to violate another principle of ordinary macadam, namely:

*d*. The sizes of the pieces of stone forming a course of macadam should be as large as practicable, and, at the same time, no longer than will retain their position in the completed road despite the ordinary tendencies to dislodgment. The presence of a proper binder may justify the apparent violation.

SIZE OF SURFACE SCREENING.

Macadam found that a one-inch cube was about the maximum that could be relied upon to retain its position in the road surface under the tilting tendencies of the loads, and with the support of the adjacent pieces interlocked with it. It has, in our modern work, been demonstrated that the cementing action of the stone dust may aid the interlocking somewhat, and under certain conditions considerably. In some cases even as large as the "three-inch size" of soft limestones have done very well in the surface of the road because of their high cementing qualities. In fact, in any macadam, it seems desirable to use a stone whose dust has at least a certain cementing value, (a makeshift is the addition of clay, before referred to.) Especially is this true under modern traffic.

Page has shown that the cementing powers of many rocks can be greatly increased by the use of limestone screenings with them, and this has greatly increased the number of available stones. There are many localities, however, where suitable stone is not available, and local conditions require substitutes of various kinds for macadam. Among such may be mentioned gravel, shells, marl, burnt clay, slag, coquina, etc. To the use of these, the principles of ordinary macadam operate in full. The application of these principles has not been generally as careful as might be wished. For instance, in the use of shells, frequently too much reliance has been placed on the mortar formed by the sand and shell dust to hold the shells themselves in place, and not enough compaction has been secured in the shells themselves to secure the best results from them.

OTHER PAVEMENTS.

In many instances local conditions have caused the abandonment of macadam entirely and instead the use of block pavements, such as brick, or sheet pavements, such as asphalt mixtures, sand, clay, etc. Some experiments also have been tried with small blocks of both natural and artificial stone. While undoubtedly the variety of experiments has been much greater in this country, it cannot yet be said that all have been successes. Nor have all been failures, by any means. There is much hope for ultimate success in perhaps most cases.

For the greater part of the modern highway work in this country "macadam" can still be considered as a standard surfacing. The writer does not consider that macadam loses its character as much by the mere substitution of a bituminous cement for the mineral colloidal cement of earlier results. When, however, the before mentioned principles of macadam are ignored, especially the one concerning the interlocking of the pieces of stone, he believes the resulting mass is no longer entitled to be called macadam.

BITUMINOUS CONCRETE.

Perhaps "bituminous concrete" would apply to such a mass, whose main reliance for integrity under stress must then come from bituminous cement in the mass. If the cement happens to be and remains a strong one, the results may be satisfactory, and perhaps even more so than the best ordinary macadam could provide under the conditions. But they cannot, ipse facto, be as good even then as if the mass were a real macadam reinforced by the addition of bitumen to its interstices. The writer believes that the truth of the above will soon be more widely recognized than it is at present, perhaps, and that instead of it being considered that "the macadam road is a thing of the past" it will be acknowledged that properly built and cemented macadam has a greater future than ever be-

fore. In fact, until recently vitrified brick, sheet asphalt, and some other pavements were largely used to fill in the gap between ordinary macadam and stone blocks. With the development of a standard bituminous macadam their use is constantly becoming more limited and dependent upon favoring local conditions.

Page has shown the horizontally shearing effect of the traffic so fatal to the life of ordinary macadam, and it was quickly seen by engineers that successful resistance to such shear could be in many cases given to macadam by the addition of some form of bituminous cement. As a corollary, it was also quickly apparent that the supply of available materials for use in macadam was contemporaneously enlarged—another factor tending toward an increase in the use of macadam strengthened by a bituminous cement. In short, the writer believes that the use of macadam properly treated to meet the conditions should be and is on the increase instead of passing away.

STANDARDIZATION.

The fact that under certain conditions the existence of a thin carpet of pitch and sand over the surface of the macadam seems desirable in no way lessens the requirements for proper macadam underneath, and the desirability for such a carpet generally is as yet by no means satisfactorily proved. However, it may be expected that valuable evidence will be forthcoming on this, as well as on numerous other points now in question, in the near future, and in the production of such evidence again the engineers of this country are leading by months, if not years. The "standardization" pleaded for by a prominent English engineer in the spring of 1910 was actually begun a year earlier in the United States. Such standardization is undoubtedly the now most pressing consideration for us. We are at work upon the question in advance of the rest of the world, and will undoubtedly soon accomplish conclusions of benefit to all.

Highway engineering is no longer the work of a skillful, if ignorant laborer; it has become an intricate science calling for deep thought and high art to meet successfully the demands on its followers. The engineers of this country have above all others responded successfully to these demands, and in greater variety and profusion of results. They have fallen behind on one point alone. We have not, as a whole, as yet, be it from lack of sufficient demand and opportunity; be it from lack of popular appreciation and support; or from even lack in ourselves of proper recognition of our duty, developed a system of maintenance—a regard for maintenance approaching the foreign or beginning to meet our needs. But "Maintenance" is a subject worthy of consideration by itself.

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Italy's foreign trade in motor vehicles for the first six months of the present calendar year shows a decline of $598,300.

## "Plugger" Crew Finds Enthusiasm in South.

A. L. Riggs, who is in charge of the Regal "Plugger," which is now on a Southern campaign, made some interesting remarks a few days ago regarding the country through which the car has passed.

"The most significant thing that comes to one's notice in touring through the South in an automobile," says Mr. Riggs, "is the necessity of better roads. For hundreds of miles we have driven the 'Plugger' through sections of country that have nothing more than cow paths for highways. Unfortunately, we have been afflicted with considerable heavy rain, and as a result the red clay and sticky mud of the South have not been conducive to congenial travel, irrespective of the fact that much of the country has no roads at all.

"It has been interesting indeed, too, to note the manner in which the 'Plugger' has been received everywhere we have gone. In Augusta, Anderson, where stood that famous old prison during the Civil War, Charlotte, Winston-Salem, Raleigh and many other places, delegations of auto enthusiasts came out to meet us as we approached these towns. Frequently our arrival in a town was the occasion of a good roads meeting, and led by prominent citizens, speeches delivered and resolutions passed, all in the interest of better highways for the South."

## Important Storage Battery Improvement Promised.

In a paper on "The Electrical Vehicle Battery," read at the first annual convention of the Electric Vehicle Association of America at Madison Square Garden, New York, on October 18, by Bruce Ford, engineer of the Electric Storage Battery Company, of Philadelphia, it was pointed out that one of the chief differences between the acid (or lead) storage battery and the newer alkaline battery is that while in the former the active material is held in place chiefly by adhesion, in the later it is held in place mechanically. Mr. Ford said that the only successful attempt to hold the active material in a lead battery in place mechanically had been made by a Frenchman, and the American rights for his invention had been secured by the Electric Storage Battery Company. A storage battery for electric vehicles constructed according to this principle is now being developed and will shortly be placed on the market. This battery will show a capacity of 9½ watt-hours when first put out, which will increase to 13 watt-hours in the course of service, and the battery will have from two to three times the life of the ordinary battery, it is claimed.

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The first annual meeting of the Electric Vehicle Association of America in Madison Square Garden on Tuesday was a complete success. A full report will appear in our next issue.

## Briscoe to Launch Out in England.

For the purpose of establishing an English Motor Car Company, which will be affiliated with the United States Motor Company, President Benjamin Briscoe, of the latter organization, sailed for Europe Wednesday, from New York on the Lusitania. He was accompanied by Mrs. Briscoe and will be in Europe five weeks.

While the trade has known of President Briscoe's contemplated European trip for some time, the announcement that the big motor car selling organization was to manufacture American designed cars in Europe, came as a complete surprise to manufacturers and the trade in general.

It is likely that the English concern will be known as the United Kingdom Motor Company, and will be located near London. Several sites have been considered, but the exact location of the plant will not be determined until Mr. Briscoe has had an opportunity to personally inspect various plants which have been under consideration.

The officials of the United States Motor Company have been investigating foreign conditions for some time, and have come to the conclusion that there is a large demand for certain types of cars which are manufactured in America, but which have not been manufactured abroad. There is a special demand for moderate priced cars and those used for business purposes, such as the Maxwell, Brush, Sampson "28" and the medium priced Stoddard-Daytons, all of which are affiliated with the United States Motor Company. The Columbia is already firmly intrenched in Europe, 1,500 cars of this make being in use in London, Paris and other European capitals.

It is the intention of the United States Motor Company to transfer its designs and duplicate tools to England, but to purchase the machinery in that country.

The efforts of the United Kingdom Motor Company will at first be devoted to the United Kingdom, Germany and Russia. After branch houses have been established in this territory, it is likely that the products of the organization will later be sent to all important European countries.

Mr. Briscoe will spend most of his time in England, but will visit some of the automobile plants in France, and study foreign automobile conditions in general.

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## Milwaukee Club's New Home Soon to Be Completed.

Arthur C. Brenckle, George West, Oscar Fischbeck, George Forgeot and Frank Prinz were elected to the directorship of the Milwaukee Automobile Club at its annual meeting at the Hotel Pnster last week. It was announced that the new clubhouse being built on Blue Mound road will be ready for occupancy the first of the year. Thirteen thousand dollars has already been collected toward the cost of the building.

# Garage and Salesroom.

## American Express Company's Garage.

The fact that concerns like the American Express Company, which is undoubtedly one of the largest users of horses in its line of business in the country, are changing over to motor vehicles, is most convincing proof of the superiority of the motor over the horse in city transport work. It goes without saying that before this big concern decided to take the step of transforming its rolling stock it investigated the question from every angle. That the company believes in the future of the commercial vehicle and in the doom of the horse in express service is well shown by a study of its mammoth garage at 219 East Forty-third street, New York city. It also contemplates building another new structure for the same purpose in Chicago.

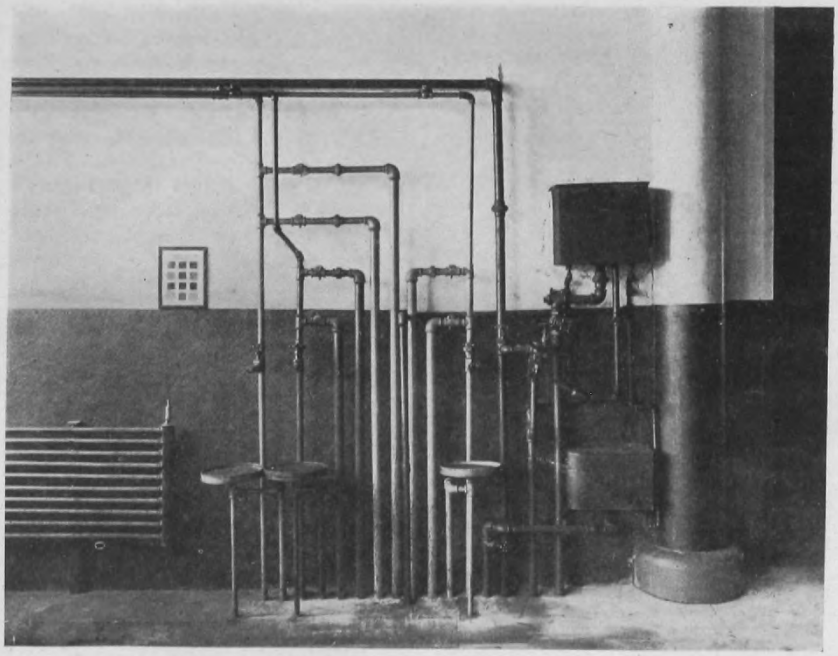
The Forty-third street garage in New York probably constitutes the largest and best equipped commercial vehicle garage in the world. The building was designed and constructed by the Andrew J. Robinson Company, 123 East Twenty-third street, New York, and in the plans ample provisions were made for a large increase in the transportation equipment which is sure to come in time. At the present time the American Express Company has in service twenty-nine 3 ton Alco trucks, three General Vehicle electrics and two Baker electrics. Of these five electric wagons one is a 3 ton truck, two are 2 ton and two 1,000 pound vehicles. In addition to the above goods vehicles, seventy-eight taxicabs are also stored and cared for, of Alco and Thomas make. It is planned to gradually increase the number of trucks and cabs until the entire capacity of the building, which is equal to 150 trucks and 500 taxicabs, will be required for their storage.

The building is located at 217-223 East Forty-third street, and runs through the block to East Forty-fourth street, where it is Nos. 224-246. It occupies two building plots, a 100x100 foot one on East Forty-third street and a 100x50 foot one on East Forty-fourth street, and consists of seven stories and a basement. In the design every endeavor was made to render the building absolutely fireproof. It is built with a steel girder framework, supported on steel and cast iron columns, enclosed in the brick walls and cement, and the floors are calculated to withstand a live load of 300 pounds to the square foot. The cast iron columns are spaced about 25 feet from centre to centre, and rest on a foundation of solid rock. In making the excavations for the foundations it was necessary to drill and blast out the solid rock in order to get below the street level, hence a very solid, permanent foundation was secured.

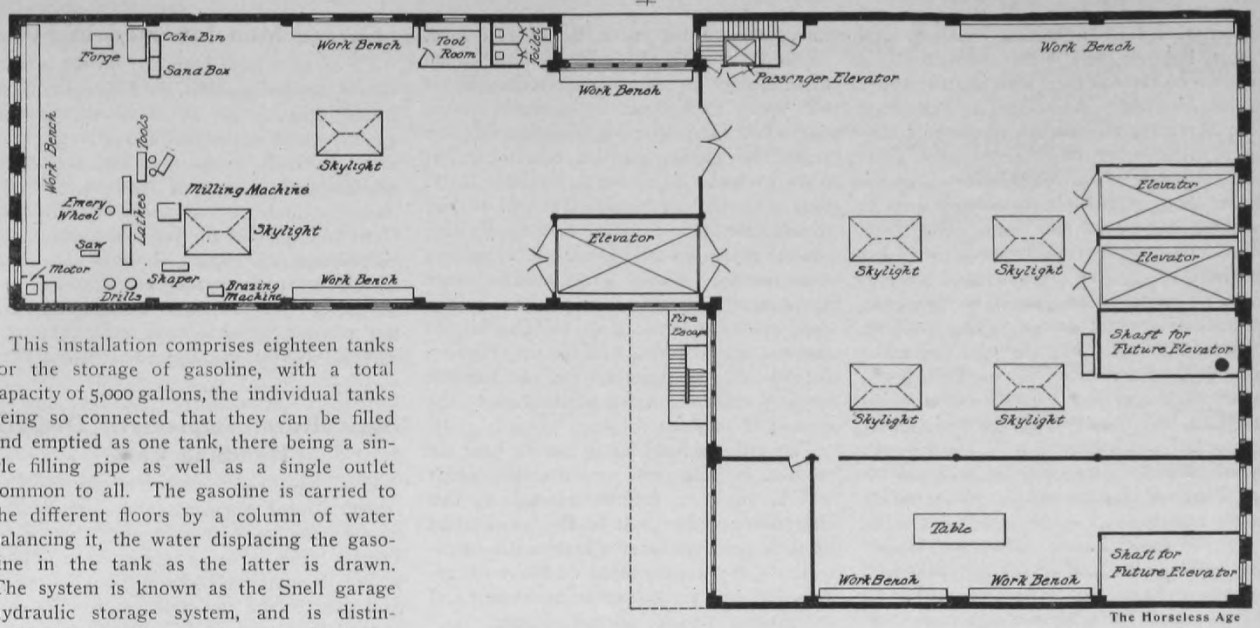
The floor arches are of 6 inch segmental terra cotta tile, plastered on the under side. All the floors are waterproofed with felt and hot pitch and finished with concrete. They are pitched so the water will drain to the gutters which run along the outer walls. By this construction all drippings from the cars are automatically carried off, which is especially valuable in winter, when the cars come in covered with snow and ice. Besides, it is an easy matter to wash the floors and keep them perfectly clean, which adds greatly to the appearance of such an establishment. The proper sloping of the floors and their waterproof construction permit of washing the vehicles anywhere in the building without moving them to a washstand.

Of the different floors, the ground floor and the seventh floor are of the greatest interest, for while all the other floors are devoted to the storage and washing of cars, the basement and the first and seventh floors contain special equipment. Of particular interest is the system of fuel and oil storage, which is so arranged that cylinder oil, gear oil, kerosene and gasoline are delivered from the tanks located under ground through pipes to every floor of the building. The system employed is that of the Hydraulic Oil Storage Company, of Detroit, Mich., with an Eastern office at 90 West street, New York.

Garage of the American Express Company.



Seventh Floor Delivery.




FLOOR PLAN OF AMERICAN EXPRESS COMPANY'S GARAGE.

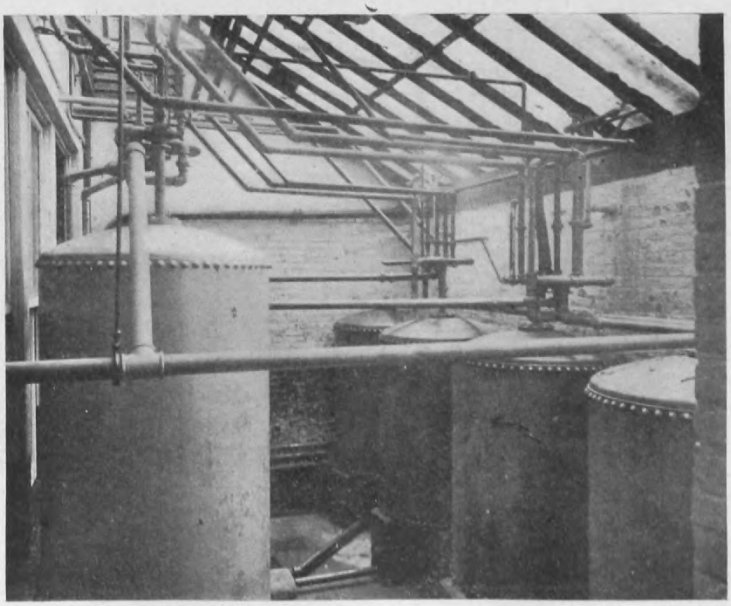
This installation comprises eighteen tanks for the storage of gasoline, with a total capacity of 5,000 gallons, the individual tanks being so connected that they can be filled and emptied as one tank, there being a single filling pipe as well as a single outlet common to all. The gasoline is carried to the different floors by a column of water balancing it, the water displacing the gasoline in the tank as the latter is drawn. The system is known as the Snell garage hydraulic storage system, and is distinguished by the absence of pumps. The principle involved is that of the difference in the specific gravities of gasoline and water, and of oil and water respectively, and the fact that they do not mix. Owing to the fact that water is more dense than gasoline a column of water 12 inches high will balance a column of gasoline 17 inches high. A constant hydrostatic head is maintained by means of a float box located on the seventh floor. From the float box the water flows down to a three-way water controlling valve, the only working part in the system. The system is first filled with water by raising the autombatic valve. This single movement closes the port leading to the water discharge pipe, and opens the port to the water float box, permitting the water to flow through the valve to the bottom of the legs of the tanks, and up these legs into the storage tanks, where it strikes a deflector and spreads evenly. The entering water displaces the air, forcing it out of the system through the gasoline delivery pipe. To fill with gasoline, the barrels at the curb are connected to the regulation filling cap located in an iron box flush with the sidewalk. The gasoline passes through the filler pipe into the top of the several tanks, where it strikes a deflector, spreading it evenly over the surface of the water, forcing out of the tanks an equal quantity of water through the water discharge pipes to the sewer. It is impossible to overfill the tanks so as to force gasoline into the sewer. The tanks are always filled with either gasoline or water, or with both, and air never enters them, and there is no loss from evaporation nor danger of explosion, and no straining is necessary, as no dirt or water can be drawn with the gasoline. The rapid flow of gasoline enables a 55 gallon portable tank to be filled in two minutes.

The gasoline tanks are in the areaway on the Forty-third street side, while the oil and kerosene tanks are in the light court to the the west. These latter tanks, of which there are six, have a capacity of 1,600 gallons. Each system of piping, including the gasoline line, the oil line, electric lines, hot and cold water lines and steam lines, is painted in a distinctive color, and charts are hung on each floor of the building on which the colors of the different lines are indicated, so that it is an easy matter to follow any line throughout the building.

The entrance through the basement is by a runway from Forty-third street, the large trucks being taken downstairs for washing and storage purposes. At the Forty-fourth street end of the basement are located the toilet rooms, washrooms and boiler room. In the boiler room is located a vacuum cleaning outfit, installed for cleaning the cabs and the floors of the building. In this room are also located the hot water boiler, hot water tanks and water pumps. The boiler room is entered from the sidewalk on Forty-fourth street, and is entirely cut off from the rest of the building.

The first floor contains the checking office, for checking cabs in and out; the superintendent's office, the drying room for drying chauffeurs' clothes, locker rooms and a drivers' waiting room. On this floor are also installed the charging boards for recharging the batteries of the electric trucks.

The seventh floor serves as a repair shop, adjustment room and stockrooms. The reason for putting the repair shop on the top floor is that the building is two floors



OIL ROOM, SHOWING CYLINDER OIL, GEAR OIL AND KEROSENE TANKS.

higher than any adjoining building, and better lighting and better ventilation is possible on the top floor than anywhere else in the building. As shown by the floor plan herewith, there are a number of skylights in the room, which give a great flood of light to every part of this floor. In the repair shop are two pits for convenience in working underneath the cars. These pits when not in use are covered by iron bar gratings, which keep them dry and serve to ventilate them. The machinery equipment consists of a motor driven milling machine, a motor driven shaper, a speed lathe, sensitive drill press, back geared drill press, power hack saw, double spindle emery wheel stand, a 16 inch Prentice screw cutting engine lathe, a blacksmith shop and a power press. Metal stands equipped with casters are used to support motors while undergoing repairs.

On the roof of the building are located the house tanks, compressed air tanks and motors for supplying compressed air to all floors of the building, for operating machinery, inflating tires and cleaning cabs. Two separate cleaning outfits are provided, viz., the compressed air apparatus, by means of which a jet of compressed air can be played upon parts to be cleaned, and which is particularly useful for forcing the dirt out of nooks and corners on the motors and vehicles (scattering it over the floors), and the vacuum apparatus, which removes the dirt from the floors and cabs.

The roof is of the same construction as the floors, but is covered with fireproof roofing tile. There are four freight elevators, each 10 feet wide by 24 feet long, traveling from the sidewalk level to the top floor, and in addition one passenger elevator, which runs from the basement to the top floor. The latter is used specially by repair men going from the shop to the first floor to make adjustments on cars there. Any car requiring repairs that will require considerable time is taken to the adjusting room on the seventh floor. The builders state that no expense was spared in order to meet the requirements of the various city departments and render the building safe to tenants and occupants of adjacent property. An exhaust ventilating system was installed to carry off the exhaust of the cars to the roof of the building.

The building has been in use for over six months, and the only improvement which will be made in future buildings of this character required will be the substitution of wide runways for the automobile elevators. While the elevators do the work required, they occupy valuable floor space and are expensive to install and operate.

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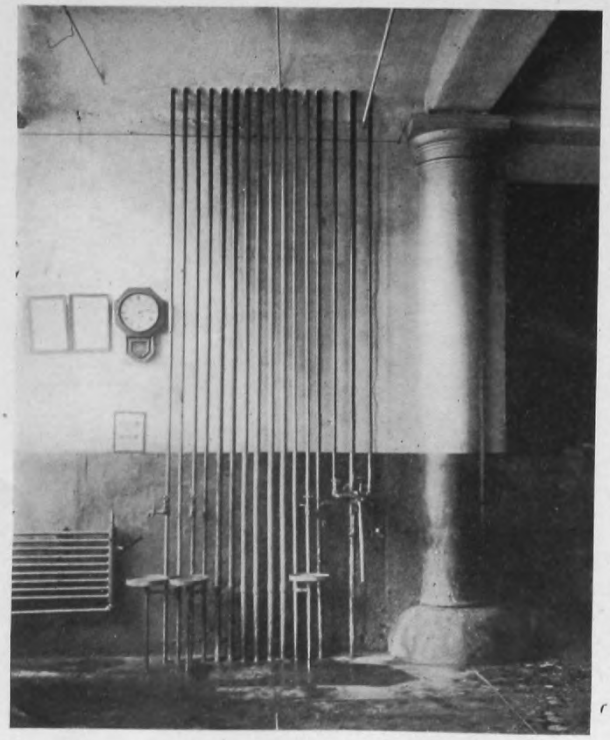
At a meeting of automobile owners of Danville, Va., held last week in the rooms of the Commercial Association, a club was organized, to be known as the Danville Automobile Association. Officers of the new club are as follows: Dr. W. L. Robinson, president; J. P. Penn, vice president and John Overby, secretary and treasurer. Other active workers are J. C. Jordan, J. J. Westbrook, J. T. Catlin, Jr., J. G. Penn and A. E. Starling.



First Floor Draw-Off for Gasoline.

## Garage Men Involved in Suit.

Three suits have been filed in the county courts at Indianapolis, by Paul R. John, former manager of the Delaware Garage, against Cecil E. Gibson and Harry Stout, directors of the company, asking $2,500 for services and $5,000 for damages. He alleges that under a contract he was manager from July 3, 1909, to August 10, 1910, and that his salary is unpaid. In the damage suit he alleges he was wrongfully ejected from the garage. The Delaware Garage Company has recently been reorganized and incorporated with Mr. Gibson as president.

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## Agricultural Implement Dealers Handling Cars.

V. C. McBride, sales manager of the Abbott Motor Company, and Bert Traub, of the same concern, have just returned to Detroit after a week spent in Chicago, where they attended the National Vehicle Show, at which automobiles were mixed somewhat promiscuously with the more ancient type of vehicle. They report that they signed up some of the best agency territory in the West and Southwest, and that dealers in agricultural goods are arranging to handle automobiles in many sections, owing to the farmers' demand.

## Garage Notes.

**Los Angeles, Cal.**—Hawley, King & Co., southern agents for Oakland cars and Grabowsky trucks, have moved to new salesrooms on South Olive street.

**Los Angeles, Cal.**—The United Motor Los Angeles Company is now agent for Columbia cars in Southern California and Arizona, with offices at 1321 South Main street, this city. J. S. Conwell is general manager.

**Washington, D. C.**—The Overland Washington Motor Company has taken the agency for Overland cars, with offices at 829 Fourteenth street. The officers are: R. C. Smith, president; H. E. F. Jones, vice president. The company will cover Virginia, West Virginia and part of Maryland.

**Washington, D. C.**—Barnes & Hendrick, formerly of 1310-12 New York avenue, have removed to new salesrooms at 1317 H street, N. W., where they are handling the Thomas Flyer and Inter-State cars.

**Chicago, Ill.**—Robert Crandall has let the contract for the construction of a 50x100 foot, two story garage on North Boulevard and Oak Park avenue. Work will be started shortly.

**Des Moines, Ia.**—Workmen are altering the old Capital Auto Garage on West Eighth street, for occupancy by the United Motors Des Moines Company, which succeeds the Capital Auto Company.

**West Liberty, Ia.**—G. S. Eby has taken the agency for Abbott-Detroit cars and

will shortly open salesrooms here and in Davenport.

**Inman, Kan.**—G. E. Brower has sold his garage to P. T. Epp, of Hutchinson, who took possession last week.

**Sylvia, Kan.**—C. A. McPherson and O. G. Hinshaw have purchased the Sylvia Motor Company.

**Baltimore, Md.**—The J. F. Wiessner & Sons Brewery Company has obtained a permit to erect a garage adjoining the company's plant on Lanvale and Gay streets. The company is negotiating for the purchase of seven large automobiles for quick delivery service in and around the city.

**Minneapolis, Minn.**—The Mich-Heinich Auto Company has opened salesrooms at 6-10 Tenth street South, for Warren-Detroit cars, under the management of H. J. Mich.

**St. Louis, Mo.**—The Pope-Hartford Motor Car Company has opened its new two story, fireproof garage and salesrooms at 5883-87 Delmar boulevard, and it is announced that the capital stock will be increased from $50,000 to $150,000. The company will handle Overland cars, light delivery wagons and trucks.

**St. Louis, Mo.**—The Grand Motor Car Company, which had been occupying temporary quarters at 743 Bayard avenue, is now in possession of its new building at 1617 South Jefferson avenue.

**St. Louis, Mo.**—H. F. Van Cleave and Jack Scharrer have opened an agency for Speedwell cars in the Langan & Taylor Building at Delmar and Euclid avenues.

**Grand Island, Neb.**—Jones & Brandes, an automobile firm of Hastings, have secured a five years' lease on the Wolbach property at Walnut and Third streets, on which they will erect a 44x132 foot, one story, brick garage. Work will be started immediately.

**Manchester, N. H.**—The Kiddrer Machine Company is fitting up a new repair shop for automobiles.

**Nashua, N. H.**—The Nashua Manufacturing Company is building a large garage at Chestnut and Factory street.

**Jersey City, N. J.**—The Olympic Garage opened a repair shop at 3193 Boulevard avenue. The Olympic Garage is agent for the Empire "20" and Abbott-Detroit cars, and is under the management of H. Schmidt & Son.

**Perth Amboy, N. J.**—Frank Van Sycle has opened a garage in the new Donahue market building on New Brunswick avenue.

**Perth Amboy, N. J.**—The Central Jersey Garage Company has given up the general garage business, but will retain the agency for the Cole car.

**New York City, N. Y.**—The Gotham Garage Company has taken a lease of the five story garage at 102-4 West Forty-sixth street.

**New York City, N. Y.**—Emil Voight, agent for C. G. V. and Enger cars, has leased the ground floor in the building at the corner of Broadway and Seventy-fourth street, which is now undergoing alterations, after which the company will take possession.

**New York, N. Y.**—C. R. Teaboldt, formerly of the E. R. Thomas New York branch, has resigned, to start in business for himself, and has organized the firm of C. R. Teaboldt & Co., to handle the Owen and Bergdoll, in the metropolitan territory, including New Jersey and Connecticut. A salesroom has been fitted up at 1597 Broadway. George F. Aitken, formerly with the Thomas Company, will be associated with Mr. Teaboldt.

**Grafton, N. Dak.**—A fire which caused the destruction of McKay Brothers' garage and seven automobiles stored therein has been charged to thieves raiding the garage about 5 o'clock a. m., on the 4th inst. Two adjoining buildings were also demolished, the loss totaling $25,000.

**Bryan, Ohio.**—The Maxwell-Briscoe Automobile Company has opened a branch office on West High street.

**Cincinnati, Ohio.**—The Suburban Auto and Garage Company, formerly located at 2713 Woodburn avenue, has secured temporary accommodation at the Empire Garage, 127 East Seventh street.

**Cleveland, Ohio.**—The National Motor Supply Company has removed to larger quarters at 1911 Euclid avenue.

**Cleveland, Ohio.**—Charles B. Benson, formerly chief tester for the F. B. Stearns Company, has opened a garage and repair shop at 1851 East Sixty-fifth street. The new concern will be known as the Charles B. Benson Company. D. F. Jones will be associated with Mr. Benson.

**Cleveland, Ohio.**—J. C. Koepke, formerly agent for Sterling cars, has accepted the agency for the Cutting car, and will locate on Upper Euclid avenue within a week.

**Columbus, Ohio.**—The Auto Repair and Sales Company has opened a garage and general repair shop at 1146 North High street.

**Columbus, Ohio.**—Vincent & Engle have opened a garage and repair shop on Parsons avenue, near Oak street.

**Portland, Ore.**—J. L. Snead has opened a salesroom for Krit cars at Union avenue and Wasco street.

**Philadelphia, Pa.**—The Lorraine Motor Company has let the contract for the erection of a modern garage at Thirty-seventh and Ludlow streets. A large machine shop, equipped for heavy automobile work, will be a feature of the plant. The officers of the company are W. L. Walker, president; Joseph Booth, vice president; E. Moore, treasurer.

**Philadelphia, Pa.**—The G. Hilton Gantert Company, agent for Selden and Stearns cars, will soon begin extensive alterations and improvements to its establishment at 510-12 North Broad street.

**Deadwood, S. Dak.**—H. H. Vrooman has opened a garage and will conduct an auto livery and repair shop.

**Onida, S. Dak.**—George W. Worley has opened a garage and machine shop in his new building and will do business under the name of the Onida Garage and Machine Shop.

**Dallas, Tex.**—After October 15, the Kissel Kar will be represented by the Ferris-Dunlap Motor Car Company, which company will thereafter be known as the Kissel Kar Company of Texas.

**Granger, Tex.**—A. B. Dozier & Co., garage men of Taylor, have established a garage in this town, with Barney Benefel, formerly with the Buick Company, at Flint, Mich., in charge.

**Salt Lake City, Utah.**—A fire broke out in the garage of the Utah Motor Car Company, at 125-7 South street, last week, badly injuring three men, and causing a loss of $600. The fire originated in the basement, where 12 barrels of cylinder oil were stored. Some oil on the floor became ignited in an unknown manner and the fire spread to one of the barrels. Although there was over a quarter of a million dollars' worth of automobiles in the premises, the fireproof condition of the building and the quick response of the fire department prevented further damage.

**Bradford, Vt.**—The Bradford Auto Garage Company, recently organized to handle the Regal line, has commenced the construction of a two story garage on Waits River, near the grist mill bridge.

**Rutland, Vt.**—Lucien H. McIntyre has resigned as president of the Rutland Garage, and has transferred his forty-three shares of stock to G. H. Grimm.

**Richmond, Va.**—Mayo Iron Works, Inc., 2400 East Main street, are making a specialty of automobile parts and general repair work.

**Richmond, Va.**—The Richmond Transfer Company has ordered four more new Alco cars for January delivery. The company maintains a garage at 105 West Canal street, the general offices of the company being located at 809 East Main street. E. D. Hotchkiss is president, W. T. Darden, secretary and treasurer, and John M. Dunn, superintendent.

**Richmond, Va.**—The Richmond Motor Company's garage at 319-21 West Main street was destroyed by fire on the 4th inst., caused by stepping on a match lying on the floor of the garage, igniting it and the vapors from a can of gasoline nearby. Ten machines were demolished, and the loss is said to be over $22,000.

**Richmond, Va.**—The Chesterfield Motor Car Company, who recently moved into a new garage at 922 West Broad street, will conduct a storage and repair business besides handling the Pope-Hartford and Reo cars. A line of accessories will also be carried.

**Spokane, Wash.**—The L. D. McCarthy Automobile Company, of Spokane, recently organized to handle the Rambler and Parry cars, has opened salesrooms at 1022 Sprague avenue. The territory controlled by this company includes eastern Washington and northern Idaho, and agencies have been placed throughout the territory.

# Items of the Industry and Trade.

***More Room in Empire Factory.***—A large addition is being erected at the Empire Motor Car Company's factory, Indianapolis, Ind., to be used for testing chasses and finally assembling as well as a repository.

***Stephenson to Remove.***—The Stephenson Motor Car Company, of Milwaukee, Wis., will shortly remove the manufacturing end of its business from its present location to South Milwaukee, where new quarters have been obtained.

***Buy Control of Kalamazoo Company.***—Osborne, Irvine & Osborn, of Kalamazoo, Mich., have secured control of the White Motor Company, of that city. C. H. Fricke, a member of the retiring firm, has been retained by the new owners as manager.

***Empire Exporting.***—Though it entered the export field but recently, the Empire Motor Car Company, of Indianapolis, Ind., is now doing considerable foreign business. Cars have been shipped to South Africa, Mexico and Australia, and more are on the way.

***Studebakers Lease New Salesroom.***—A lease has been sceured by the Studebaker Automobile Company on a big salesroom in the George Ehret building, which is now in course of construction on Broadway, New York City. The quarters obtained are on the Fifty-ninth street front of the building.

***Lozier Invades Cuba.***—The recent victories of its cars in contests is creating a demand for the Lozier Motor Company's product in Cuba and other countries as well as at home. James Clow & Sons, of Havana, have been appointed Cuban agents for the car, and will start an aggressive campaign on the island.

***Motor Factory for Cambridge.***—It is reported from Cambridge, Mass., that the Shoe and Leather Building on the Charles River esplanade is to be turned into an automobile factory in the near future. The building has been in course of reconstruction for several weeks, but the name of the prospective tenant has not been made public.

***Flanders for Building Inspector.***—Thomas A. Winterrowd, building inspector of Indianapolis, has purchased a Flanders "20," with which he will inspect buildings in the future. It is expected two additional cars will be purchased next year for the use of Mr. Winterrowd's deputies, who are using horse-drawn vehicles, which have proved unsatisfactory.

***Portland Dealers Won't Show.***—At a recent meeting of the Portland (Ore.) Automobile Dealers' Association, it was decided not to hold an automobile show this year. There is no suitable exhibition building in the city, because the Armory in which previous shows have been held is too small for the large number of automobile concerns in Portland.

***Duerr & Company to Remove.***—A new show room for Moon cars has been leased by C. A. Duerr & Company, on the Fifty-eighth street side of the new George Ehret Building, Fifty-eighth street and Broadway, New York, and the business will be removed to that location as soon as the structure is ready for occupancy. At present Duerr & Company are located on Broadway, between Fifty-sixth and Fifty-seventh streets.

***Stanley Company Building.*** — The Stanley Company, of Boston and Lawrence, Mass., which has been a factor in the shoe machinery and steam vehicle fields, is about to erect new factory buildings on the recently acquired property on Loring avenue and Clover street. Plans of the engineers and architects are well under way, and as soon as the buildings are ready for occupancy the company will commence the manfacture of a more extensive line of gasoline motors.

***Closed Cars Popular.***—It has been found by the Pierce-Arrow Motor Car Company, of Buffalo, that this season the proportion of enclosed cars to the total output is a trifle more than 60 per cent. greater for the present season than it was for 1910 cars. This increase amounts to about ten cars in each hundred. The suburbans and broughams, or limousines as they are popularly known, outnumber the landaus and landaulets in the proportion of more than three to one, the latter types being ordered principally in the spring.

***To Build Day "Utility Car."***—The Day Automobile Company was incorporated last week at Lansing, Mich., with a capital of $300,000, two-thirds of which is paid in. The officers of the company are: Thomas W. Day, president; Hugh Jennings, of baseball fame, vice president; C. F. Roberts, secretary, and Wallace E. Brown, treasurer. The company will produce the Day "Utility Car," which is specially designed for farmers' use and is a convertible pleasure and business car. The motor is a four cylinder affair producing 21 horse power.

***Empire Tire Making Additions.***—Extensions have been made recently at the Empire Tire Company's plant, of Trenton, N. J. A second story building has been added to the office building, 40x100 feet, which will be given over to the accounting department, and the other offices have been enlarged and improved. A new three story structure, 40x80 feet, has been added to the shipping department, while the main mill room building now has a third story extension 40x70 feet. Besides this a garage for the accommodation of cars used by the factory has been erected.

## One More Selden Suit.

A suit for infringement of the Selden patent has been filed against the W. A. Wood Automobile Manufacturing Company, of Kingston, N. Y., which is in the Southern District of New York, where the Selden patent has been sustained by Judge Hough in the United States Circuit Court of the Southern District of New York.

## Business Troubles.

INDIANA AUTO PARTS COMPANY.

A receiver was appointed last week for the Indiana Auto Parts Company, Marion, Ind., by Judge Paulus, of that city, upon hearing the evidence of the creditors. W. H. Anderson was named receiver, and a bond of $10,000 for him was approved. The action brought against the concern was filed a few days ago by Wm. N. Young, who alleged that the company owned him $50 for services, which amount he could not collect, and that it was heavily in debt and financially embarrassed.

SPECIAL MOTOR VEHICLE COMPANY.

Judge Warner, in the Insolvency Court of Cincinnati, Ohio, has named Bernard C. Bowen receiver for the Special Motor Vehicle Company, of that city, as a result of an action filed against the company a few days ago by Harry C. Strieker. The latter creditor claims the concern owes him $4,833. The company has been operating as an automobile agency, garage and repair shop since 1902, but the property it occupied at Eighth street and Broadway was recently condemned by the city. Inability to secure a new suitable location, it is said, placed the company in financial straits. The assets are estimated at about $3,500.

MARKO STORAGE BATTERY COMPANY.

Schedules in bankruptcy of the Marko Storage Battery Company, 250 West Fifty-fourth street, New York, filed last week, show liabilities of $8,025 and assets of $4,254, consisting of stock $1,000; machinery and fixtures, $1,000; patent at cost $1,000; accounts, $1,052; cash, $2, and goods in Boston on consignment, $200.

THOMAS S. WITHERBEE.

Thomas S. Witherbee, living at 526 West 111th street, New York city, who has been engaged for many years in the manufacture of electrical goods individually and as general manager of the Witherbee manufacturing Company and Thomas Battery Company, at 433 West Forty-second street, 1912 Broadway, and 54 West Sixty-third street, has filed a petition in bankruptcy, with liabilities of $7,174, and no assets.

## Trade Personals.

**Howard McChesney** has joined the Zembrich Automobile Company, handling the Stoddard-Dayton car in Syracuse, N. Y.

**Russell A. Field,** of the Wagner-Field Company, is vacationing in the Berkshires and getting much needed rest after a strenuous summer.

**J. H. McCullough,** of the F-A-L Motor Car Company's sales department, is at present stationed with the Kansas City agency of the company.

**John H. Rosen,** well known in the Philadelphia trade, has become affiliated with the Automobile Sales Corporation at 144-146 North Broad street.

**Stefan Kjeldsen,** who organized the S. P. O. Automobile Company two years ago, resigned as president and director of that concern on October 10.

**F. D. Stidham,** formerly of the Benz Auto Import Company, has been put in charge of the advertising department of the Fiat Automobile Company.

**T. W. Simpson,** formerly with the York Motor Car Company, of York, Pa., has joined the staff of the Stoddard-Dayton Auto Company of Baltimore, Md.

**Walter E. Flanders,** president of the E-M-F Company, has purchased 1,200 acres of farming land surrounding two lakes, near Pontiac, and transforming it into a plantation.

**Arthur Warren** has resigned from the sales staff of the Buick Motor Company in New York, to accept a similar position with the Pope-Hartford Company in the same city.

**Ross Henwood,** who drove one of the Ohio cars in the Munsey tour, has entered a roadster in the annual endurance race from Los Angeles, Cal., to Phœnix, Ariz., November 5-7.

**S. S. Poor,** Philadelphia branch manager of the Continental Caoutchouc Company, accompanied by J. C. Given, the concern's southern representative, is making a trip through the South, visiting agencies.

**E. P. Rowen,** of Chicago, Western manager for the B. F. Goodrich Company, Akron, Ohio, has been in Des Moines, during the past few days arranging for the establishment of a factory branch in that city.

**Wiley F. West** has been appointed manager of the St. Louis branch of the Firestone Tire and Rubber Company. He comes from Atlanta, Ga., where he secured the necessary experience while managing the branch store of another tire company.

**Douglas W. Case,** president of the Auto Sales Company, Indianapolis, has disposed of his interests in the company to E. J. Erdman, formerly of Oblong, Ill., who becomes president. The company has the Stearns-Fuller, Jackson and Monitor agencies.

**Edward F. Korbel,** who was one of the publicity promoters for the Vanderbilt Cup race and the Grand Prize race, before the latter was taken South, has been re-engaged to handle the press work of the international races by the Savannah Automobile Club.

**E. P. Blake,** of Boston, Mass., a veteran in the New England trade, who has been distributor for Jackson automobiles in that territory for seven years, has taken on the agency of the Abbott-Detroit for New England, and will open a retail salesroom in Boston shortly.

**George Robertson,** who was so unfortunately injured in practice for the Vanderbilt Cup race, is improving rapidly and announces that he has definitely retired from racing. He plans to enter the retail business in New York and is looking for the agency of a pleasure car and a commercial vehicle.

**C. H. Booth,** formerly manager of plant No. 5, of the E-M-F Company, has been promoted by President Walter E. Flanders to managership of plant No. 3, as well as that of his former post. Booth joined the company when it purchased the Pressed Steel Bath Tub Company, of which he was one of the principal owners.

**Burton A. Clark,** of Boston, has joined the sales force of the E. R. Thomas Motor-Branch Company, Boston. Mr. Clark has been traveling in Eastern New England for over a year, in the interest of the Michelin Tire Company, and previous to that covered the same territory for a period of eight years, representing a rawhide manufacturing company.

**Orlando F. Weber,** until recently manager of the Palmer-Singer branch at Chicago, has been appointed general manager of the Palmer & Singer Manufacturing Company, with headquarters in New York. Mr. Weber is a veteran of the automobile business in the West. His brother, Charles Weber, succeeds him at the head of the Palmer-Singer branch at Chicago.

**Vincenzo Lancia,** who made such an enviable reputation as a racing driver some years ago, and who more recently designed the Lancia car, has been in New York recently, and has just started back for Italy. While in America he held several business conferences with C. H. Tangeman, president of the Hol-Tan Company. He regrets that he will be unable to wait for the running of the Grand Prize race.

**Carl Wallerich** has been appointed a district manager for the Willys-Overland Company. His territory will be Indiana, Illinois, southern Michigan and southern Missouri. Mr. Wallerich at different times was assistant sales manager for the Overland, sales manager for the American Motor Car Sales Company at Indianapolis, and sales manager for the Haynes Automobile Company of Kokomo.

**Cornelius Barrows** has joined the United Motor Philadelphia Company, to push the sale of Columbia gasoline and electric cars. Barrows has had long experience in the sales line and was the first to launch out in the sale of Columbia cars in the Philadelphia territory, when he was sales manager of the Pennsylvania Electric Company. More recently he was connected with the Fiat interests in that city.

**R. L. DeLisser,** brother of Vice President Horace DeLisser, of the United States Motor Company, has joined the forces of the United Motors New York Company, distributor for Maxwell and Columbia cars in the metropolitan district. Mr. DeLissers in the past has been connected with the Maxwell-Briscoe Motor Company at Tarrytown, N. Y., and the Columbia Motor Car Company at Hartford, Conn. He will have charge of the Columbia interests in New York.

## New Incorporations.

Halladay Auto Company, Chicago, Ill.—Capital stock increased from $30,000 to $600,000.

The Keystone Auto Company, Indianapolis, Ind.—Capital stock, $5,000. Incorporators: C. F. Redding and others.

Capital Auto Company, Indianapolis, Ind.—Capital stock, $5,000. Incorporators: C. S. Grant, S. Glick and C. C. Pettijohn.

The Mitchell Automobile Company, Buffalo, N. Y.—Capital stock, $23,000. Incorporators: A. Karl, John J. Gibson and Jacob F. Cramer.

Cadillac Company of Indiana, Indianapolis, Ind.—Capital stock, $20,000. Incorporators: E. W. Steinheart, W. M. Fisher and F. C. Werler.

Standard Supply Company, Newark, N. J.—Capital stock, $10,000. Incorporators: Richard A. Finn, M. W. Parsons and Stuart F. Peterkin.

The Ideal Motor Car Company, Hopkinsville, Ky.—Capital stock, $10,000. Incorporators: Sam Frankel, Charles S. Jackson and Will Kimmons.

The Reo Motor Truck Company, Lansing, Mich.—Capital stock, $1,000,000. Incorporators: R. E. Olds, James H. Thompson and J. Edward Roe.

The Roddey Automobile Company, Columbia, S. C.—Capital stock, $10,000. Incorporators: J. B. Roddey, president; J. C. Cain, secretary and treasurer.

The Carolina Automobile Company, Charlotte, N. C.—Name of company changed to the Rambler Automobile Company; O. A. Robbins president.

Maury Motor Company, Columbia, Tenn.—Capital stock, $5,000. Incorporators: W. A. Dale, Horace Rainey, G. E. McKennon, Geo. T. Hughes and J. M. Dedman.

The Thomas-Mercer Motor Car Company, Los Angeles, Cal.—Capital stock, $50,000. Incorporators: A. M. Young, A. J. Wilson, F. W. Force, C. C. Buffington and W. L. Lloyd.

Fred T. Seegar & Co., Chicago, Ill.—Capital stock, $2,500. To operate a garage

business. Incorporators: Wm. J. Lavery, Leon D. De Bost and Geo. L. Cook.

San Antonio Motor Car Company, San Antonio, Tex.—Capital stock, $15,000. Incorporators: O. W. Budd, Jr., J. M. Lynch and L. R. Daniel.

Richardson Auto Tire Protector Company, Buffalo, N. Y.—Capital stock, $100,000. Incorporators: Valentine Hoefner, Ora Richardson and Jason Richardson.

The Auto Acetylene Light Co., Cleveland, O.—Capital stock, $10,000. Incorporators: N. B. Hordon, A. C. Knuth, F. M. Heidl, A. Mendel and C. A. Livingstone.

Central Motor Car Company, Hamilton, O.—Capital stock, $20,000. Incorporators: D. H. DeArmond, C. J. Jones, C. B. Thompson, James A. Cox and Frank Welsch.

Harris Automobile Company, Atlantic City, N. J.—Capital stock, $60,000. Incorporators: Wm. B. Loudenslager, James B. McDevitt, Frederick C. Muller and A. G. Boettger.

Cairo Motor Company, Cairo, Ill.—Capital stock, $3,000. Incorporators: W. H. Johnstone, Walter H. Wood, David S. Lansden, John Tiernan, H. E. Halliday and C. L. Martin.

National Association of Automobile Owners, Wilmington, Del.—Capital stock, $100,000. Incorporators: J. E. Rice, Harrisburg, Pa.; H. C. Long, R. L. Van Dusen, Philadelphia, Pa. and F. H. Hoffecker, Wilmington.

The Northwest Motor Company, Oklahoma City, Okla.—Capital stock, $100,000. Incorporators: L. R. Weiss, Chas. E. Stockler, C. P. Wickmiller, Earl Worl and M. M. Flickenger, all of Kingfisher.

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Fred H. Caley, State Register of Automobiles of Ohio, is out with a statement that people who sell automobiles must remove the number plates before parting with the car or they are liable under the statute. The department holds the person in whose name the tags were secured responsible for all injury done by illegal operation of the car, and the former owner is liable for arrest as long as the original number plates are on the car.

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An ordinance was adopted last week by the common council of Yonkers, N. Y., to regulate the driving of automobiles within the limits of the city. It will become operative on December 1, and in the various precincts different maximums of speed will be permitted. Several of these will permit a maximum speed of 23 miles an hour, while in others 15 miles an hour will be allowed.

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W. H. Cameron, chief engineer of the Willys-Overland Company, will sail for London, Wednesday, October 19, on the Lusitania, to attend the Olympia show. Before returning Mr. Cameron will tour the Continent for a month, visiting the various Continental factories, and investigating foreign motor conditions generally.

## Date Set for Hearing Selden Cases on Appeal.

A motion was heard on October 10, by the United States Circuit Court of Appeals for the second circuit, to give preference to the hearing of the appeal in the suits under the Selden patent against the Ford Motor Company and Panhard Company and the other test suits. The court has set these cases at the head of the Court of Appeals calendar for hearing November 9, 1910. In the case of injunction under Selden patent against John Wanamaker, a motion was brought by the defendants to suspend. This was opposed and Judge Hough denied the application for suspension, so that the injunction continues in force.

## Membership Campaign of Wolverine Club.

The recently organized Wolverine Automobile Club is circulating membership applications to motor car owners in and around Detroit in an effort to procure 1,000 new members within thirty days and 3,000 before spring, which is a most ambitious task. The club is organized along lines similar to the Buffalo organization and others, its objects being to advocate reasonable and non-discriminate regulation of the use of automobiles, to encourage good roads construction and maintenance, and to promote motoring contests, etc.

## Reo to Build Trucks.

It is announced from Lansing, Mich., that the Reo Motor Car Company has been incorporated there with a capital stock of $1,000,000, to manufacture motor trucks. The new concern will move into the plant formerly occupied by the E. Bement & Sons Company.

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A concern manufacturing automobile motor castings in Chagrin, Ohio, has made a proposition to the board of commerce of Parkersburg, W. Va., to locate in that city.

The Youngstown (Ohio) A. C. is planning to hold a reliability run to Cleveland and back on October 14, which will be confined to members.

## Trade Literature Received.

Flint School of Automobiling, Flint, Mich.—Prospectus of a new school.

The Speedwell Motor Car Company, Dayton, O.—Advance announcement of 1911 models.

Wabash Gear Works, Terre Haute, Ind.—Circular of cone and multiple disc clutches.

The Gilbert Mfg. Company, New Haven, Conn.—Catalogue of the Bowser carburetor, Model G.

The Cleveland Ignition Company, 404 Cuyahoga Bldg., Cleveland, O.—Circular on vibrator coils put up in a cylindrical non-corrosive metal case.

Cartercar Company, Pontiac, Mich.—Booklet on the friction transmission and chain-in-oil drive, with specifications of the different Cartercar models.

Goodfellow Tire Company, East Grand Boulevard, Detroit, Mich.—Catalogue of Goodfellow patent process tires, demountable rims and "20" runabout.

## New Agencies.

FRESNO, CAL.—Haven Auto Co., Pullman.

LOS ANGELES, CAL.—Carrigan Brothers, Pratt-Elkhart, Royal and Midland.

LOS ANGELES, CAL.—The Howard Motor Car Co., Oldsmobile.

SAN FRANCISCO, CAL.—Skinner & Elliott, Knox.

WASHINGTON, D. C.—Chas. E. Miller & Brother, Velie.

WASHINGTON, D. C.—The Wilson Company, Krit.

ATLANTA, GA.—Fulton Auto and Supply Co., Velie.

GOSHEN, IND.—The Kel-Kin Auto Agency, Hupp (for Elkhart County).

LOUISVILLE, KY.—The Broadway Auto Company, Gramm trucks.

NEW ORLEANS, LA.—Russell Motor Co., Velie.

WEST LIBERTY, IA.—J. S. Eby, Abbott-Detroit.

BALTIMORE, MD.—D. C. Walker Auto Company, 1919 N. Charles Street, Grabowsky commercial wagons, Garford, E-M-F and Flanders.

BALTIMORE, MD.—Walter Scott, 1127 W. North Avenue, "Crawford."

BALTIMORE, MD.—Norwood Brothers, 1416 Madison Avenue, Velie.

BALTIMORE, MD.—The Lambert Auto Co., 6-8 East Chase street, Hudson.

MINNEAPOLIS, MINN.—The Royal Auto Company, 517 Second avenue, Abbott-Detroit.

ST. CLOUD, MINN.—Redding & Stevenson, Hudson.

BROOKHAVEN, MISS.—A. A. Lilly, Velie.

WORCESTER, MASS.—Palace Garage, 731 Main Street, Cadillac.

KANSAS CITY, MO.—Albertson Motor Car Company, 1527 Grand Avenue, Marmon.

TRENTON, N. J.—The Risdon Motor Car Co., Apperson.

BROOKLYN, N. Y.—The Flanagan Motor Car Co., Monitor, for the territory of Long Island.

BINGHAMTON, N. Y.—Stow Mfg. Company, Everitt "30."

BUFFALO, N. Y.—The Bison Motor Sales Co., Main and Barker streets, Abbott-Detroit and Krit.

ROCHESTER, N. Y.—Thos. J. Northway, 92 Exchange street, Abbott-Detroit.

RALEIGH, N. C.—W. H. Brewer, Velie.

CLEVELAND, OHIO.—The R. H. Eckenrath Sales Co., Haynes for northeastern Ohio.

PORTLAND, ORE.—J. W. Leavitt, Overland, for Oregon.

PORTLAND, ORE.—John Deere Plow Co., 688 Washington street, Velie.

BETHLEHEM, PA.—Wm. I. Siegfried, Velie.

HARRISBURG, PA.—Zimmerman Motor Car Co., Velie.

PHILADELPHIA, PA.—General Motor Car Co., Rauch & Lang electrics.

PHILADELPHIA, PA.—Reamer & Haines, 2214 Spring Garden Street, Mercer.

READING, PA.—Central Motor Car Co., Velie.

PROVIDENCE, R. I.—Whitten Motor Vehicle Co., 200 Meeting street, Abbott-Detroit.

MEMPHIS, TENN.—Memphis Machine Works, Velie.

NASHVILLE, TENN.—Allen F. Parkes, Velie.

RICHMOND, VA.—B. G. Hathway, American.

NORTH YAKIMA, WASH.—The Yakima Auto and Supply Co., Winton.

SEATTLE, WASH.—F. H. Barshar Co., Marion, for Washington, Idaho and British Columbia.

SEATTLE, WASH.—Olympic Motor Car Company, W. D. Wallace, Mgr., Locomobile.

SEATTLE, WASH.—F. H. Bardshar Co., Marion.

SEATTLE, WASH.—Chas. T. Garfield, White trucks.

SPOKANE, WASH.—Geo. W. Merrill, 111 Pacific avenue, Thomas Flyer.

WALLA WALLA, WASH.—J. G. Miller, Elmore.