The Horseless Age

First Automobile Journal in the English Language

VOLUME XXV **NEW YORK, FEBRUARY 2, 1910** **NUMBER 5**

A New Brake and Clutch Test.

By David L. Gallup.

During the period of preparation for the roposed endurance run of the Worcester . C. the matter of brake and clutch tests eceived much attention. Previous methods f testing in similar runs had proven of ittle value, and had caused much dissatisaction with the results. One of the favorite methods of testing a clutch was to place the automobile so that the front wheels rested against an 8 inch curb, the engine was then started up and the clutch et in, and, as stated in the book of rules governing the contest, "failure to spin rear wheels was evidence of bad clutch," and was penalized accordingly. It needs no expert to appreciate the fact that the diameter of wheels, size of tires, tread of tires, condition of ground, and the like, all are variable with the different cars and would be likely to give results not fair to all contestants.

The brake test was conducted along the following lines: Contestants were sent over an imaginary line at a speed of, say, 30 miles per hour, and at the same instant brakes were applied. The car stopping in the shortest distance after the application of the brakes was considered perfect. Other cars were rated accordingly. Here, again, the conditions of road surface, tires, and the cleverness of the operator in applying his brakes, all are determining factors and are variable for the different cars. Many brakes are powerful enough to "set" the wheels, but in this type of test might produce skidding by such "setting" and might, therefore, result in a poorer showing than the car having brakes strong enough to be just on the point of "setting."

The clutch test as outlined in connection with the run of the Worcester A. C. was to be made at the automobile testing plant of the Worcester Polytechnic Institute, and so far seems to have covered all doubtful points and has developed no dissatisfaction as to results.

The contesting car is placed on the testing machine and the engine and rear wheels are started up. The operator of the car simply drives his engine at maximum power on the high gear, and resistance to the motion of the rear wheels is produced by the Alden absorption dynamo meter attached to the traction wheels of the testing plant. Enough resistance is produced to slow down the rear wheels (to zero miles per hour if necessary), and if the speed of the engine is reduced at the same time and the indications are that if the wheels are stopped, the engine will stop, the clutch is considered good. If slowing down of the wheels to zero still allows the engine to run, then this is an indication of a slipping clutch. This gives the clutch a test similar to conditions met with on the road, and also at the time when the torque, or tendency to slip, is greatest (being on the high gear). In this test, varying conditions of road surface are eliminated, as are also any effects due to clever manipulation of the clutch and throttle by the operator and which would be of value in the original method.

The brake testing apparatus at the W. P. I. consists merely of a chronograph and traction wheels of the testing plant. For this test the dynamometer is disconnected, the automobile is mounted as before on the traction wheels, and the rear wheels of the automobile are run at a given speed. At a known instant, the signal is given and the brakes are applied. By a special recording device, the interval of time between the application of the brakes and the stopping of the traction wheels is noted. In explanation, it should be stated that the traction wheels in this case are very heavy and possess considerable inertia at ordinary speeds. In order to analyze results, it is simply necessary, in comparing the brakes on the different cars, to know the total weight of the car, the time interval and the speed before the brakes were applied, which latter can be neglected by having the speed the same for all cars. It must also be remembered that the brakes have been applied to the limit.

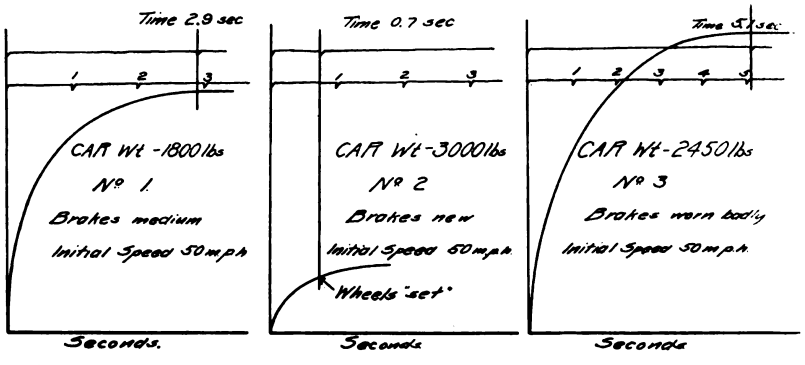


TABLE OF RESULTS.

	Weight.	Time.	Rating.	Remarks.
Car No. 1	1,800	2.9	40.3%	
Car No. 2	3,000	0.7	100.0%	Wheels "set."
Car No. 3	2,450	5.1	16.8%	

Brakes on an automobile should be designed with reference to total weight of cars and weight on the rear wheels, it being borne in mind that the linkage is of such design that the operator is strong enough to apply the brakes to the limit. To explain more fully: given two cars of weights two to one, the brakes on the heavier car should be twice as powerful as those on the lighter car. This will bring the two cars to rest in the same time and distance from a given line, provided, of course, that the same proportion of total weight of car is on the rear wheels in each case.

If the above conditions were true for all cars, there would be no need for a competitive test of this kind, but as is well known, some manufacturers provide a greater proportion of weight on the rear wheels and make the brakes strong enough to take care of this set of conditions—all of which would be shown up in a test such as outlined.

In this test the total weight of car is the only factor taken into consideration (with the exception of the time interval) and all cars are allowed only the driver, he being a part of the car and always in-

dispensable, as the number of passengers which might occupy the rear seat, and therefore have considerable effect on the result, is variable and might cause protest. In this way all contestants are treated exactly alike. The result simply shows mechanically which car under proper manipulation would come to rest the quickest. In actual road practice, however, it must be remembered that the manner in which a brake is applied determines to a great extent, and it might possibly be said, almost wholly, the rapidity with which stopping is effected. Herewith is shown a facsimile of a set of curves giving the results of brake tests on three cars, and their relative standing as determined by this test. These curves are self-explanatory.

Shop Suggestion Systems.

By "Merowe."

Much has been said and written concerning systems whereby the useful ideas of the shop men and any others can be used to the advantage of all concerned. However, of all of the articles which have come to the attention of the writer, practically none have dealt with the practical workings of such a system, but have considered the subject from the theoretical side only. The writer has been intimately connected with such a system and feels that although it might be to the advantage of some of the larger automobile concerns, a few words of caution may not be out of place.

In the particular shop referred to, multi-copy machines, together with small locked boxes, were distributed about the works. At each of these was a notice calling the attention of the employees to the fact that all were invited to make any suggestions that they might see fit. This included visitors to the plant. According to the notice, prizes were to be awarded every three months, these being three in number, $25 being the first prize, $5 the lowest. In addition to the special prizes, every suggestion which was used by the company was supposed to be paid for at the rate of 50 cents each. It might be well at this point to state that these suggestions were answered at intervals of two weeks and that no one ever received more than 50 cents for suggestions which he had handed in during that time.

WHAT WORKMEN HAD TO DO.

All that any workman had to do when he thought he had a valuable suggestion, locked box referred to, while the other was was to write it down on the multi-copy machine, illustrating it with whatever free-hand sketches he might care to make, signing his name and date, and then turning the crank until he could tear off two of the copies while the third was automatically rolled up in the base of the machine, which was locked. One of the two copies torn off was supposed to be placed in the small to be kept by the suggester as his own copy. These boxes were opened and the suggestions collected from time to time and investigated by the party in charge of the work. Although the boxes were emptied as often as time could be spared for the work, no answers were sent to the suggesters except at the first and middle of the month, thus making it easier to keep records. This, however, did not prevent investigating the suggestions as soon as time would permit. All suggestions with the answers thereto were submitted to the general manager for his O. K. just before they were actually sent out, and in this way he was able to keep in close touch with the system without devoting perhaps more than five or ten minutes every two weeks. At the quarterly periods the suggestions received during the previous quarter were arranged by the party in charge according to what he considered their value was to the company. A committee was then chosen from the heads of departments and the final decision regarding what suggestions should receive prizes was determined by this committee. The names of those receiving single awards, as well as those to whom the quarterly prizes were awarded, were posted at each box in order that the men throughout the shops might know who was doing the thinking.

THEORETICAL ADVANTAGES.

The system in this particular shop having been described, let the advantages as likely viewed by an outsider be given. They will probably be about as follows:

1. It makes thinkers out of the workmen.
2. It makes the men take an active interest in their own work.
3. It makes the men take an interest in the welfare of the company.
4. The company is able to profit in a financial way from some of the suggestions given.
5. It offers a means whereby the company can select men who are better adapted for other work than that which they are then on, since it offers a chance for suggestions along whatever lines one chooses. Otherwise, the foreman usually knows him only by the work which he is actually engaged in. Thus a *poor* carpenter may be found to be an *excellent* blacksmith, which the company perhaps is badly in need of.

Having mentioned some of the advantages which occur to an outsider, it may not be out of place to investigate what the practical workings are, and then to offer remedies which may perhaps make for the betterment of the system.

DIDN'T APPEAL.

When the writer took hold of the work in the plant referred to, there was apparently a general feeling among most of the men that the whole scheme was a farce and to be laughed at. The reason for this seemed to be that they did not consider that suggestions made were given even fair consideration. They also felt that they had given good valuable ideas to the company and that, though the ideas were to be seen in actual use soon after, they had received nothing but a note stating that the idea had been proposed before by someone else. Others had been told that the idea could not be used. Some who had even gotten an award of 50 cents felt that their particular suggestion was better than any other and that they should have received a certain amount of the company's stock instead of the half dollar. Others for this same reason withheld their suggestions, not wanting to part with them for what they considered such a paltry sum. Still others were afraid to make any suggestions for fear their foreman would think they were after his job and would accordingly fire them.

To be sure, some of the above reasons were poor ones, yet there was so much truth in others that few of the advantages expected from the system when introduced were realized in actual practice. In fact, so few suggestions had been received when the first set time came for the awarding of quarterly prizes that the date was postponed three months and then delayed another month without any special reasons. This of course (?) tended to increase the men's confidence in the system.

A SET OF RULES.

Perhaps the best way to sum the matter up is to propose a set of rules for use in carrying on such a system, giving reasons for each.

1. Unless the policy of the company is to deal fairly and squarely with the employees in carrying out the system, it had better not install the same. They should remember that most men are more willing to quietly tell others how they have been "stung" than they are to spread the news of having been treated squarely. There is also truth in the old saying, "You can fool *some* of the people *all* the time and *all* of the people *some* of time, but you cannot fool *all* of the people *all* of the time."

2. If for any reason a party making a suggestion desires that his name be withheld from all others than the committee, the same should be understood, provided the word "confidential" is written conspicuously across the upper corner of the sheet. There may be cases where it is advisable to affix no signature. The practice is not to be generally encouraged, however, and all unsigned suggestions may, at the discretion of the one in charge, be destroyed without further attention.

The advisability of this last clause may be doubted by some, but the writer has

not offered it without due consideration. It is a regrettable fact that some men in high positions cannot accept in the proper light a suggestion concerning any of the work in their department. In some cases the most bitter personal feeling was caused by well meant suggestions, and it would have been far better for all concerned had the name of the party making the same been withheld entirely.

3. Suggestions should be invited from everybody, including visitors. Even the most foolish sometimes make valuable suggestions unawares. To accommodate the office force, and especially visitors, one box should be placed in the reception hall. Visitors, being strangers, often notice possible improvements which those familiar with the plant wouldn't think of. Again, discourtesy on the part of any employees can be called to the attention of the management in this way. For instance, one suggestion ran something like this:

"To the Management:

"The undersigned reached your plant at 8:45 this morning and upon asking for Mr. A was informed that he might be seen in a few minutes. Further inquiry always brought the same answer, until after waiting for three hours the information comes that Mr. A is too busy to be interviewed at all to-day. A request to see either Mr. B or C instead brings the answer that *everybody* is too busy.

"It is therefore suggested that when in or near our plant you drop in at least for a social visit in order that we may illustrate to you what courteous treatment can be shown an out-of-town business man.

"(Signed) ——,
"Pittsburg, Pa."

Upon investigation it was found that upon the particular day in question the regular office boy had been sick and a messenger boy substituted in his place. When the visitor first asked for Mr. A the boy went to his office, found him not in, although what he supposed to be his hat and coat were there and *assumed* that Mr. A would soon be back. He accordingly told the visitor that Mr. A would see him soon. When the lad finally discovered that Mr. A was out of town, he was afraid to admit his blunder and trusted to luck that the visitor would be too busy to wait. Finding this not to be the case, however, he as a last resort capped the climax by telling the visitor that everybody was too busy to see him that day. Not knowing the facts of the case, the visitor thought he had been very much misused by Mr. A and went his way anything but rejoicing. It is needless to say that a letter of apology and explanation went to Pittsburg after the suggestion had been investigated.

4. With the exceptions noted, for each and every suggestion which is adopted by the company an award of 50 cents should be made. If there be any doubt as to whether the average value of the suggestions will make 50 cents advisable, start with a lower amount and increase it as soon as conditions warrant. Don't start with a certain sum and then lower it. If you do you will probably find that the average value of the suggestions will decrease faster than the award.

5. Always get a receipt for any sum awarded. It is convenient to write or stamp in one corner of the carbon copy when answering the suggestion the words "Received above awards, Mr. —— ——, February 16, 1909," and have the messenger get the necessary signature when he delivers the answer and money which it specifies. This precludes any possibility of the money or answer failing to reach its destination. It also removes the all too great temptation to some messenger boys to pocket the envelope which they know contains a coin, especially if the chances are that the loss will not be discovered until so long afterward that nobody will remember who carried the particular letter. Before this receipt was required the writer found several cases where it was claimed that neither answer nor money was received, thus allowing suspicion to rest upon all who had had occasion to handle the letter, from the writer to the man who was supposed to have received it. Both the carbon copy and receipt will seldom need to be referred to, but should be filed away as mentioned later.

6. No rewards should be given for suggestions which concern only the convenience or pleasure of the employees and are of no special benefit to the concern. It should be understood, however, that all such will be given consideration, and where deemed advisable an award *may* be given. Through this means the attention of the management will be called to many little inconveniences which tend to create hard feelings and discontent. In some cases it will be found that these were due simply to an oversight, while in others they are due to careless neglect of duty. The fact that anyone is liable to call attention to such matters through the means of the suggestion system tends to make all pay more attention to their duties. Many of this class of suggestions will be either unsigned or marked "confidential."

7. No awards should be given to heads of departments, although proper suggestions from them should be given due consideration. It is generally assumed that the heads of all departments will be interested in the welfare of the company without any special inducement, other than their salaries, hence few suggestions may be expected form this source, and then usually unsigned. To them the suggestion system opens a means of offering good ideas which cannot be given in any other way without creating hard feelings.

8. No award should be given for a suggestion concerning one's own work unless the party making same hasn't the authority to put it into operation. In many cases the suggester may profit more by taking the matter up directly with the head of his department rather than by making use of the suggestion box. The advisability of this rule will doubtless be denied by many at first thought, but the following example will perhaps throw a different light upon the subject: It was noticed that a certain clerk, who had previously offered a number of good suggestions concerning the work of the department to which he belonged, suddenly ceased the practice. Inquiry brought the reply that he had been asked by the department head not to offer any more suggestions except to him. At a later date, however, he placed in the box a suggestion marked "confidential." When the matter came to the manager's attention he asked why it was marked confidential, and was told of the request made by the department head. He insisted that the head of the department was correct, and that the suggestion should not have been given through the system. It was accordingly returned to the suggester with the request that he take it up with his superior. When he did so he received the answer, "To —— with it, we've got enough to do." When the time came for awarding the quarterly prizes, and the committee reviewed all suggestions for the period, they unanimously agreed that the suggestion referred to should receive first prize, $25, yet this very suggestion had never even received a 50-cent award, and nothing had been done toward putting it into practice. It is also needless to say that when action was thus forced upon the head of the department the suggester's fate was sealed, and it was not long ere he was transferred to another department.

DETERMINING NOVELTY.

The matter of determining what suggestions are new is often not the easy task that it might seem. Reference to the card file (to be referred to later) will easily show whether or not the same idea has been previously handed in through the system, and by giving the name of the first suggester as well as the date, the evidence is usually satisfactory to the later suggester. But suppose a suggestion is taken to the head of the department concerned, for his opinion of it, and he says: "Yes, it is all right. I thought of it some time ago and have been intending to put it into use as soon as possible." In many cases it occurs that changes are well under way when a suggestion is received calling for the change already contemplated. In either of the above cases it is sometimes a difficult matter to convince the suggester that he was not the first one to advance the idea. Again, too, he no doubt is often justified in his conclusion that he has been robbed of proper credit. In such contingencies it is sometimes a good policy to state the facts as nearly as possible and then award 50 cents for the "spirit shown." This is especially the case where the suggester has never been awarded a prize.

When any one's opinion is asked regarding the value of a suggestion it will be found advisable to withhold the name of the party making same until the opinion

has been given in full, and in case the opinion is unfavorable the name should not be given at all. This is due to the fact that some men are prejudiced and cannot render a fair and unbiased opinion when they know beforehand who the suggestion has come from.

RECORD SYSTEM.

The records for such system can very nicely be cared for by a card file, as follows:

For each suggestion received a card similar to Fig. 1 is filled in, giving the suggester's name in the centre of the top line. The E in the upper left hand corner indicates that the suggestion refers to a part of the engine. In a similar way, C would indicate a chassis part, B a body part, etc. Where conditions warrant, the classifications may be subdivided; for instance, Es may indicate suggestions referring to engine springs, Ec to engine cylinders, etc.

Below the classification letter is indicated whether the suggestion was considered new or old when received. In the upper right hand corner is the date received and the award allowed. Then follows a concise statement of the suggestion, to which the suggester has perhaps devoted a full page or more. Following this, a brief statement of the action taken is given, and lastly the date of answering the suggestion. These cards are arranged according to class, each class being arranged according to date. This file offers an easy means of determining whether any suggestion has been offered through the system before.

These cards for the previous period of two weeks are submitted to the manager and usually gives him all the information he desires regarding the system. Should he, however, wish more details concerning any suggestion, the original, together with the carbon copy of the answer, can be easily found, as they are filed away according to date.

A second card is made out for each man (see Fig. 2) who has ever handed in a suggestion. Any particular person's record can thus be easily found. These cards are, of course, arranged alphabetically.

In addition to the two cards illustrated, a list of awards should be kept, showing to whom given, the amount of each award and the date.

In conclusion, it may be said that conditions which exist in each individual works may warrant a number of changes in the above rules, but the writer wishes especially to caution all against any chance of hard feelings being allowed to creep in unawares. This one feature may be said to be the principal factor in determining whether a suggestion system proves to be a most beneficial scheme for all concerned or whether it is an expensive failure.

FIG. 1.

New.	Mr. John Doe.	Feb. 12, '07. $0.50.

Cast lug on rear side of cylinders to facilitate removal of exhaust valve springs.

Mr. D. promises immediate action.
Ans. 2/16/07.

FIG. 2.

Mr. John Doe.
Machine Shop, Sec. D.

Rec'd.	Class.		Award.	Remarks.
10/3/06	B	New.	$0.50	
11/22	E	New.	.00	Impractical.
12/1	C	Old.	.00	
1/8/07	S	New.	.50	Also 2d prize, $15.
2/12	E	New.	.50	

Electric Lamps as an Aid to Easy Starting in Cold Weather.

Those who keep their cars in unheated stables and frequently experience trouble in starting the motor will find the following suggestion of value:

Many such stables are now lighted with incandescent lamps, and such a lamp upon a flexible cord may be employed as a heater in a thoroughly practical manner.

A 32 candle power carbon filament lamp, provided with a wire guard, should be used, and this should be placed under the hood, preferably close to the carburetor and intake piping, the flexible conductor passing under one side of the hood and through an ordinary porcelain wire bushing to prevent a possible short circuiting of the conductor by the pressure of the edge of the bonnet.

After the lamp is in place and burning, the bonnet and radiator front should be thoroughly covered with robes, in order that the heat afforded by the lamp may be confined as completely as possible. Or, if the bonnet is equipped with one of the engine hood covers now upon the market, this may be used to good advantage.

From one to two hours will usually be sufficient even in the coldest weather to bring the temperature within the hood to such a point that the carburetor and mixture pipes will be able to produce and distribute an explosive mixture, and starting will then present no difficulties. A slight priming of the cylinders may be desirable in some instances, which, when performed, will often enable the motor to be started on the spark.

There should be no fire hazard attached to this practice if the lamp is well guarded against breakage, and the current is not switched on and off at the socket while the lamp is in place.

A lamp left burning under the hood in this manner will effectually avert the danger of freezing in case no anti-freeze solution has been supplied the system, and even a sixteen candle power lamp will generally prove sufficient for this purpose if the hood and radiator are well covered.

As the cost of burning a 32 candle power lamp is but about 1 cent per hour, and that of a 16 candle power but about one-half cent, at the usual rates charged, the expense is trivial. If the lamp is kept burning through the night the motor will be found to start readily in the morning, especially if it was warm when the lamp was put in place.

British Imports and Exports.

The returns of automobile imports and exports of the United Kingdom for 1909, which have just been made public, show what may be called a healthy growth of Britain's foreign automobile business. There was an appreciable increase in the number of both the imported and the exported cars. The average value of the exported cars remained practically the same, while the average value of the imported cars fell off considerably, reflecting the severe competition in the home market. The following table gives the values of both imports and exports for the past two years:

IMPORTS.

	1908. No.	1908. Value. £	1909. No.	1909. Value. £
Cars	3,830	1,389,552	3,666	1,223,053
Chasses	3,370	1,063,077	4,855	1,321,596
Parts	....	1,659,832	....	1,771,960
	7,200	4,112,461	8,521	4,316,609
Motorcycles	1,340	36,258	1,442	41,036
Parts	....	29,182	....	29,480
	8,540	4,177,901	9,963	4,387,125

EXPORTS.

Cars	2,216	800,636	2,583	953,846
Chasses	225	75,984	219	84,173
Parts	....	381,939	....	525,788
	2,441	1,258,559	2,802	1,563,807
Motorcycles	1,048	37,206	1,893	69,188
Parts	....	20,148	....	36,366
	3,489	1,315,913	4,695	1,669,361

FOREIGN AND COLONIAL RE-EXPORTATION.

Cars	434	161,561	550	177,064
Chasses	236	88,446	224	78,271
Parts	....	109,314	....	138,493
	670	359,321	774	393,828
Motorcycles	62	1,970	92	3,166
Parts	....	11,264	....	19,023
	732	372,555	866	416,017

Eminent Speakers at Club Banquet.

Notable speakers, including former United States Senator James C. Smith, Jr., former Governor Edward C. Stokes, Commissioner of Motor Vehicles J. B. R. Smith and others made the banquet of the New Jersey Automobile and Motor Club, held in the new Auditorium, Newark, on Monday, January 24, a memorable occasion. The keynote of all these addresses was an effort to impress upon the 300 members and guests present the necessity of regarding the rights of others, and of being good citizens first and automobilists afterward. In addition to the banquet and speeches a vaudeville program helped to make the occasion a gay one.

THE HORSELESS AGE

Founded in 1895 by E. P. Ingersoll.
Every Wednesday.

Published by THE HORSELESS AGE Company.
Fred J. Wagner, President. Charles B. Ames, Treasurer.
9-15 Murray Street, New York City.

EDITORIAL STAFF.
P. M. Heldt. Albert L. Clough.
F. E. Watts. John E. Roper, Jr.

ADVERTISING STAFF.
J. T. Coventry. Gus H. Johnson.
A. J. Gould.

SUBSCRIPTIONS (payable in advance), DOMESTIC, $2.00 a year; CANADA, $3.00. All other foreign countries included in the Postal Union, $4.00. Single copies, 10 cents.

BRENTANO'S, 37 Avenue de l'Opéra, Paris.

COMMUNICATIONS.—The Editor will be pleased to receive communications on trade topics from any authentic source. The correspondent's name should in all cases be given as an evidence of good faith, but will not be published if specially requested.

Address all communications and make all checks, drafts and money orders payable to THE HORSELESS AGE, 9-15 Murray street, New York.

Entered at the New York post office as second-class matter.

☞ One week's notice is required for change of advertisements.

Telephone: 7195 Barclay.
Cable: "Horseless." New York and London. Western Union Code.

The Automobile and Other Industries.

The automobile is generally regarded as a luxury, and some of our ultra-conservative citizens are inclined to think that it is frivolous to own a car, and that the country would be just as well off without them. We need not here dwell on the advantages of automobiles to those who use them, as this is a more or less hackneyed theme, and the fact that cars are bought in constantly increasing numbers—the rate of increase being geometric rather than arithmetic—shows beyond all question that automobiles serve a useful purpose. But we think that the beneficial effect of the development of the automobile on others than users has seldom been sufficiently emphasized. The automobile industry not only gives direct employment to more than a hundred thousand workmen in automobile factories, but furnishes work for accessories factories employing about half that number again, and keeps busy thousand of sales agencies, garages and repair shops all over the country, with a large army of well paid employees.

In 1907, when the production was close on to 55,000 cars of all kinds, a careful estimate of the number of employees in the different branches of the industry gave the following results: Auto factories, 58,000; accessories factories, 29,000; garages and sales agencies, 21,500. Last year, with a total production of 114,000 gasoline cars alone, and great activity in the electric branch, the number of employees in each branch must have been at least double the above, giving 116,000 in auto factories, 58,000 in accessories factories and 43,000 in garages and salesrooms. This makes a total of close to a quarter million employees, on whose earnings—notwithstanding that many of the men employed in the industry are comparatively young—at least half a million of people must be dependent for their livelihood.

Most of the men employed in the automobile industry earn good wages, and their standard of living is higher than that of workmen engaged in similar work in other lines of industry. This fact is reflected in the eagerness of business men's associations in different parts of the country to attract automobile and parts factories to their cities.

Perhaps no contributory industry has been more favorably influenced by the prosperity of the automobile industry than the machine tool industry. Indeed, we have been given to understand by parties in close touch with that industry that if it had not been for the demand from automobile manufacturers perhaps half of the machine tool factories would have been idle during the past year, as the general machine trade was still suffering heavily from the effect of the financial panic of 1907. Other industries have been correspondingly benefited by the rush of trade in the automobile business, and we believe it is no exaggeration to say that had it not been for the activity in the automobile field the depression following the late financial panic would have been much more protracted. After the two previous panics, in 1873 and 1893, respectively, it took each time approximately five years before any marked signs of business improvement became apparent. It was the appreciation of the automobile by the well to do of the country that brought money into circulation again after a spell of exceeding "tightness."

An Erroneous Impression Corrected.

An impression seems to prevail abroad that in this country automobiles are used chiefly for town driving. A statement to this effect was made by a German automobile manufacturer who recently visited this country in an interview given out upon his return, and a similar remark is made in a recent issue of our English contemporary, the *Autocar*. In both instances the scarcity of our improved roads is given as the reason for the confinement of motoring to urban districts.

It is true that our natural earth roads are not suited to automobile traffic (or any other traffic) during a certain period in the spring of the year of from four to eight weeks. During this period, if the cars are used at all, their use is limited to cities and the few macadamized highways to be found here and there. The touring season begins about the 1st of May and lasts well into October, and during the past few years there has been a great deal of touring at this time of year. We believe that the volume of automobiles tourist traffic in this country far exceeds that in any European country, though by reason of the vast area of this country it is less concentrated, and, therefore, less noticeable. When the *Autocar* remarks that practically no long tours are made in this country it is badly misinformed. In fact, the United States is the country of long tours, and what we regard as a long tour here would be impossible to make in the British Isles, unless one ran in a circle.

The differences in the social conditions in this and European countries account for differences in the nature of automobile traffic here and there. We do not have the large leisure class here that there is abroad. Most of our business men, however wealthy, apply themselves rather closely to business, and except for a vacation during the summer months their holidays are generally limited to single days. The great majority of automobile owners in this country, we should say, make one extended tour each year, and single day trips more or less regularly on Saturday, Sundays and holidays.

That there is a great deal of automobile tourist traffic in this country is shown by the activity of road map and tourist guide publishers in late years, by the efforts of hotel keepers along the main paths of travel to attract motor tourists, by the endeavors of State legislatures to regulate non-resident motor traffic, and, finally, by the anx-

iety of the motor interests that all legal restrictions on touring should be swept away by a Federal registration bill.

Small Cars as Auxiliaries.

It is quite commonly taken for granted that nearly all small cars, runabouts and the like, are purchased by persons of small means, who cannot afford to own larger and more expensive cars.

As a matter of fact, however, a very large number of such cars are owned by persons who also possess one or more large and expensive cars, the runabout occupying a sphere which it alone can properly fill.

The small car thus enters two quite distinct fields. It is the motor vehicle *par excellence* of a large class, to the means of which its price is eminently adapted, and it also finds a place in the garage of the larger owner of cars upon the strength of its inherent merit as a conveyance eminently adapted for certain particular uses.

Large numbers of runabouts are kept by the owners of touring and town cars, and are used by them for personal business driving in preference to the larger and more pretentious vehicles, because the runabout is more conveniently handled in crowded streets, is relatively inexpensive to operate, may be used in bad weather without compunction, may be operated in the absence of a chauffeur and is available when the large cars are out in the service of the rest of the family.

Many doctors use a runabout in their professional work, while keeping a large car for family and touring purposes.

As good small cars are sold at lower prices they are absorbed in enormous numbers by both the classes referred to above, and it may truthfully be said that the appreciation of the special merits of this class of car has never been so keen as at the present time.

Consolidation of Parts Firms.

There have been quite a number of instances recently of firms engaged in the same line of automobile parts or accessories manufacture either combining their sales department or entering into some agreement regarding production. The chief object is generally to reduce the selling cost, which in some lines where competition is very keen has become a heavy burden on the manufacturers. The principle of combination—except for stock jobbing purposes—has always been advocated in these columns as being in line with modern commercial developments, and calculated to prevent waste. In the automobile accessories line it permits of building up a better sales organization than any single concern could hope to establish. This question of a well equipped sales organization is growing vastly in importance as the market for automobile fittings extends into every section of the country. The consolidation of sales departments will benefit the customer by cutting down the selling cost, which will eventually result in lower prices, and will benefit the manufacturers by widening the markets as a result of these lower prices and by enabling them to cover the field more thoroughly than they could do individually.

Seven Passenger Cars at Low Prices.

Up to very recently seven passenger bodies were to be found only upon very high powered and expensive chassis, so that a person desiring accommodations for carrying seven passengers was compelled to buy an expensive car of high power whether he desired these qualities or not.

About a year ago it was pointed out in these columns that a demand existed among persons of large families not desirous of paying the highest prices for moderate powered seven passenger cars, and it was also stated, as our opinion, that there were no insuperable technical obstacles in the way of fulfilling this demand.

Among 1910 models there are to be found several which were offered as five passenger cars in 1909 which this year are put upon the market with seven passenger bodies at no advance in price. With the increase in wheel base, which has been quite general, no difficulty has apparently been found in securing body room for two additional passengers, and refinements in engine construction and slight changes in the springing have provided, respectively, the slight additional power required and the extra weight carrying ability. The two jump seats may be carried or not, at will, the result being a seven passenger car in the former case and an exceedingly roomy five passenger vehicle in the latter. One car of this description can now be bought for less than $2,000, and several other makes at prices around $2,500, which reduction in prices brings this type of car within the reach of a much larger circle than heretofore.

It need not be a matter for surprise if good cars of this carrying capacity are offered at still lower figures in the near future, for cost of production is by no means so closely dependent upon the passenger load carried as it has generally been assumed to be.

Improvements in Brakes and Brake Linkages.

The desire to make the mechanical parts of motor cars as unobtrusive as possible is well expressed in the very general recent use of brake mechanisms confined entirely within the limits of the frame. The use of pull rods originating at the ends of shafts protruding beyond the frame line brings these oily parts where they may soil clothing and where they are quite conspicuous, especially if the ends of the shaft are brought out so as to be nearly in line with the brake drums. If they protrude but slightly beyond the frame line the pull rods necessarily act at quite an angle and not nearly so effectively as when under a straight pull.

A number of the recently designed axles carry quite long brake operating shafts extending in from the drums and fitted for pull rod attachment at their inside ends, which are in a straight line with the equalizing connections in front.

The employment of inside brake linkages rather facilitates the application of a variety of bodies to the same chassis and adds considerably to the general appearance of the vehicle.

In connection with some of the later brake designs it is to be noted that two separate concentric drums are fitted to each wheel, one somewhat larger than the other, both brakes acting internally in these respective drums.

This arrangement should afford excellent cooling qualities, as the heat due to one brake can hardly affect the temperature of the other. The internal action of both brakes should favor the exclusion of dust and mud.

Especial care seems to be taken to prevent the unintentional oiling of the braking surfaces by lubricant which works out from the differential housing, through the axle casing and bearings, and which has been the cause of many partial brake failures. The employment of felt washers and the use of a proper grade of lubricant are among the means employed.

Brake linings are now almost universally of non-carbonizing material, the extent of braking surface provided seems still upon the increase, and more convenient means of adjustment are now provided.

GREAT QUESTIONS OF AUTOMBILE ENGINEERING

Foot Throttle versus Hand Throttle.

By Albert L. Clough.

The question of the advisability of providing a foot throttle or accelerator is by no means a new one. It will be remembered that they were used very commonly upon the earliest American cars, but at the period when American design began to be very deeply influenced by foreign practice, the foot throttle was but little used abroad—the steering column throttle lever being there the standard—and thus the hand throttle very soon began to supersede the foot throttle upon American cars. Later the throttle pedal began to "come in" again, and is now very common indeed. At the present time the majority of our manufacturers provide both kinds of throttle, and the user is thus permitted to drive with either one which his preference and the conditions of operation make best adapted to the circumstances of the moment, or to employ both in conjunction, using the hand throttle as a minimum speed stop, and the foot throttle as an accelerator proper. There are a few cars, especially among those of small power, which are fitted with the foot throttle only. And rather curiously, among the imported cars of moderate power, there are plenty of examples of the exclusive use of the foot throttle—a carburetor control upon the dash, adapted to control the idling speed of the motor—being the only other gas control device.

DETRIMENTAL EFFECT ON MOTOR.

Among manufacturers who equip their cars with the hand throttle only, it is not uncommon to hear the statement made that the foot throttle is omitted on account of the detrimental effect which its use is found to have upon the motor. Several manufacturers provide the foot throttle only as an extra, and then rather unwillingly. They claim that they find that the motor bearings wear more rapidly when the accelerator is used than when hand control is the only method supplied, all other conditions of use being the same, and that this is due to the greater suddenness with which the throttle valve is customarily opened with the former than with the latter form of control. The complaint is made that not only does the operator get into the habit of intentionally running his motor in a jerky manner—pushing open the throttle wide for an instant, and then closing it, and repeating this process frequently—but that when traversing rough roads, gas is fed the motor, as it were, "in bunches," as a result of the unintentional movements of the operator's foot affecting the accelerator pedal whenever a severe jounce is met with. The main point made is that sudden, impetuous increases of the charges supplied the cylinders, result in undue temporary stresses of the parts and the excessive wearing of bearings, and that this sort of treatment is more likely to result when throttle control is by the relatively clumsy foot upon the ordinary type of pedal accelerator than when it is by means of the more exact hand and throttle lever held upon a notched sector.

EFFECT OF ROAD SHOCKS ON FOOT THROTTLE.

The argument is that if the throttle is alternately opened and closed with suddenness, the motor responds by alternately speeding up and slowing down, and unless the spark time is automatically controlled or is not set earlier than the centre, the motor, when picking up speed, may be operating with a two high spark. The extent by which the spark is too early will depend upon its setting, the extent to which the motor is allowed to slow down before being speeded up again, upon the time lag in the ignition system and other considerations.

Unless the ignition system possesses automatic timing properties, whenever this sort of jerky throttle control is practiced, the spark will either be too late for good results when the motor is speeded up, or it will be too early during the intervals in which the motor is gathering speed. Such rapid changes of speed are not followed practically by the spark timing lever. The sudden large increase of charge which occasions the speeding up implies heavy pressures upon the piston, a cleaner mixture, higher compression and perhaps quicker propagation, so that the back pressures upon the parts which arise from too early ignition may be quite severe. Everyone is familiar with the knocking sounds arising from a worn engine, when the throttle is opened suddenly while it is slowed down under load and the spark time is not specially adjusted to the conditions. A tightly adjusted engine may make no complaint under these circumstances, but it may be under preparation to do so later.

SUDDEN ADMISSION OF CHARGE.

These bad effects due to too early spark at times, are not the only or most important consideration. The sudden admission of a nearly full charge to a motor which is very much slowed down is severe treatment. Its balance wheel and the whole car require to be accelerated, and the inertia of the car constitutes a large resistance which cannot be overcome instantaneously. When the force due to the combustion of a nearly full charge acts upon the piston, all the moving parts are stressed severely between this working pressure and the resistance offered by the sluggishly accelerating masses to be moved. The slower the motor speed when the throttle is opened, the more nearly does the working pressure act as a hammer blow, the piston head being the hammer, the anvil being the resistance to acceleration of the car mass moved and the mechanical parts of the motor standing for the substance under the hammer.

If, instead of suddenly opening the throttle, it is opened very gradually, there is but a slight increment of force exerted thereby upon the piston, which in turn accelerates the motor and car by a small increment only, and so on until the full opening is attained, and with it the full speed. At no instant is there a large resistance required to effect acceleration, opposed to the piston, but the resistance at any instant is practically only that required to furnish the tractive effort required at that particular speed. There is nothing of the "hammer on the anvil" style in this, and the parts are subjected only to normal and necessary stresses.

While it may readily be admitted that gradual throttle control is very advantageous and sudden control decidedly adverse to motor longevity, it is not safe to conclude that the use of the pedal throttle is necessarily bad.

SKILL WITH FOOT THROTTLE.

It is possible to acquire such skill with the foot that the control may be nearly as gradual and regular, thereby, as with the hand throttle. Considerable practice is, however, required before such delicacy of touch is attained. If it is intentionally misused, the employment of the accelerator is probably of actual detriment to the motor. The sudden throttle openings due to involuntary movement of the operator's body, when the car jolts, may be obviated by the use of a pedal movement which cannot be thus accidentally interfered with. Thus, the accelerator pedals of a number of cars move sidewise instead of backward or forward, downward or upward, thus allowing the body of the operator to be firmly braced against the pitch of the car by means of the pressure of the foot upon the floor board and still to have perfect control of the pedal position by a sidewise swaying of the foot.

DASHPOT MAY BE USED.

If it is desired to prevent sudden, large movements of the ordinary throttle pedal, it is not plain why the use of a dashpot in connection with it should not prove effective. Such a dashpot could be arranged to slow down opening movements to any desired degree, while allowing the pedal to close instantly upon withdrawal of the foot pressure. The dashpot is used to perform a somewhat similar office, in connection with the engagement of the clutch, which may be slowed down by this means to any desired extent, but still may be disengaged independently of the dashpot. A dashpot controlled throttle pedal might be expected to be free from the objections which some

Another Big Merger of Licensed Makers.

Following closely upon the heels of several large automobile mergers and incorporations, announcement was made on Thursday last of a new $16,000,000 New Jersey corporation, known as the United States Motor Company. It is stated that this amount of capital is divided into 50 per cent. common and 50 per cent. preferred stock, and according to present plans the new company is to acquire a number of prominent motor cars and parts factories and make and sell various types and makes of cars on a broad scale. According to Walter H. Crosby, secretary, the new company will begin with ample cash working capital, as a part of the preferred stock has been underwritten, although the amount is not stated.

It seems that the first large manufacturer to be absorbed by the new concern is the Maxwell-Briscoe Motor Company, including all its plants, which are now in operation at Tarrytown, N. Y., Providence, R. I., and New Castle, Ind. Benjamin Briscoe, J. D. Maxwell and others connected with the Maxwell-Briscoe interests will figure prominently in the management of the new corporation. It is stated that the general policy will be to acquire concerns and facilities by and through which the company will be enabled to turn out a complete line of cars ranging in price from $500 to $5,000, and to administer the business affairs of the constituent companies under a single management and market the product under a general sales organization.

Speaking of the new move, Benjamin Briscoe is quoted as saying: "Neither Mr. Maxwell nor I have relinquished in any way our responsibilities in connection with the Maxwell-Briscoe Company.

"The United States Motor Company has no intention to strive for the creation of a monopoly, nor to secure by any artificial means the control of any branch of the trade. It will not interfere with or try to injure the business of any manufacturer of automobiles or of any distributor. It expects to earn every dollar it makes, and will ask only for such rewards as are due it by virtue of its efficient organization and excellent service to the public."

The only officers of the company whose names have been made public are, Lawrence Arnold, president and Walter H. Crosby, secretary.

As we go to press we learn that the Columbia Motor Car Company, of Hartford, Conn., has been acquired by the United States Motor Company. The Columbia Company was established in 1895, and is one of the oldest manufacturers of automobiles in this country. An important feature of the deal is a provision that the royalties from the Selden patent, which is controlled by the Columbia Company, will be paid to the old stockholders of the concern. Besides the basic Selden patent the Columbia Motor Car Company controls 128 other patents covering various features of automobiles.

President Briscoe of the Maxwell-Briscoe Motor Company said that when he learned of the existence of these patents he had an investigation made by patent attorneys, and came to the conclusion that the business of his company was seriously menaced, whereupon he immediately opened negotiations with the owners of the Columbia Company.

The Columbia plant at Hartford is one of the largest automobile factories in the United States. It covers 15 acres, and the investment in buildings and machinery is stated to be $1,500,000. Preparations have already been made to manufacture 5,000 high grade cars annually in the Columbia plant, and it is stated that within a short time from 2,000 to 2,500 hands will be employed there.

---

manufacturers seem to think inhere in this form of control.

ADVANTAGE OF THE FOOT THROTTLE.

In favor of foot thottle control it may be said that it tends to limit the racing of the motor, and thus acts to restrict unnecessary wear. When gears are being changed, and one hand is busy with the wheel and the other with the gear lever, the mere lifting of the foot from the accelerator restrains motor speed until the clutch is just ready to be re-engaged. If the hand throttle is the one used, and there is any delay in finding the new gear, there will be some racing before the change is completed. If, when driving in "close quarters," the clutch has to be thrown out while both hands are busy in doing delicate steering, the engine is very likely to be left racing unless foot control is being used. Of course, if the withdrawal of the clutch automatically closes the throttle, as is the practice upon a few cars, the above mentioned advantages of the foot throttle are of less importance.

It is undoubtedly highly advisable that the foot throttle and the hand throttle, for that matter, should be operated gradually and not impetuously, but there seems to be a demand for both throttles as a part of the control equipment, and it is believed to be possible to automatically safeguard the movement of the foot throttle so that no abuse of the motor shall arise from its use, even when under the foot of a careless operator.

Lozier Cars to Be Built in Detroit.

Rumors which have been in circulation for some time past to the effect that the Lozier Motor Company will erect a factory in Detroit, were confirmed late last week by H. A. Lozier. A number of Detroit capitalists and business men will be associated with Mr. Lozier in the new enterprise. All the details were arranged and the contract signed in New York the previous week. The majority of the new automobile companies which have begun business in Detroit in the past two or three years are producing low or medium priced cars, while the acquisition of the Lozier factory gives Detroit one of the highest grade cars made in this country.

The Eastern plant of the Lozier Motor Company is said to have been working to its full capacity for the past two years producing cars selling for $5,000 to $6,000, and these have been absorbed by the dealers in a limited number of the larger cities, the greater portion having been taken in the East.

Extensive additions or new factories recently became necessary, and for this reason the proposition to furnish Detroit capital with which to build a local plant was accepted. The sum of $1,000,000 was required for these extensive additional facilities. The report of the committee, which for the past two months has been looking into the affairs of the Lozier company, was of such a nature that the amount required was considerably over-subscribed, we are informed. This new deal results in a $2,000,000 company, devoted exclusively to the manufacture of the high class cars.

Mr. Lozier and his Detroit associates have been looking over factory sites for the past week, and options on several automobile locations have been secured. Plans for the new factory are being prepared, and work on them will be commenced before the 1st of March. It will probably be late in the summer before the first Lozier car will be turned out from the Detroit factory, and in the meantime the Eastern factory will continue to work to its full capacity. It is said that the Detroit factory will eventually become the principal plant of the Lozier interests, and that enlargements and additions in the future will be made there.

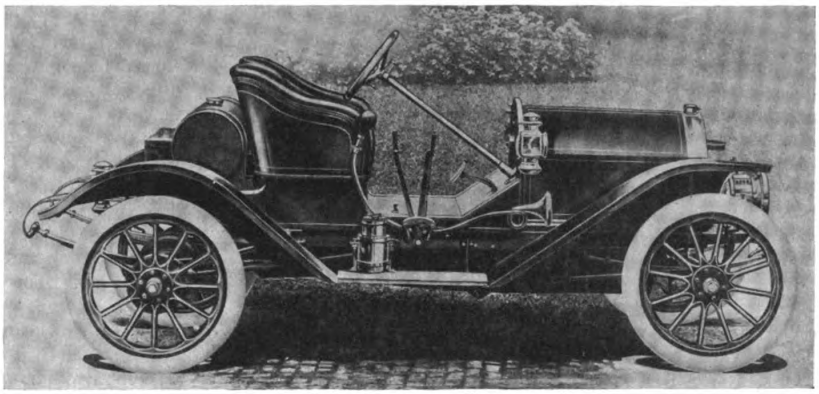
The Loziers have been prominently identified with manufacturing enterprises for the past twenty years. They at one time manufactured the Cleveland bicycle at Toledo, Ohio; Westfield, Mass.; Thompsonville, Conn., and Toronto, Ont. A few years after the bicycle business was disposed of the Toledo factory became the home of the Pope-Toledo car, and is now the principal plant of the Overland company. The Plattsburg factory also turns out a two-cycle marine motor, which enjoys considerable popularity both here and abroad.

The general offices of the company, now located in New York city, will be removed to Detroit on the completion of the new plant.

DESCRIPTIONS OF NEW VEHICLES AND PARTS

The Courier Car.

The two passenger runabout of the Courier Car Company, of Dayton, Ohio, which was first announced some time last summer, has made its appearance in New York, at the salesroom of the Stoddard-Dayton Motor Car Company, on Fifty-seventh street. The car is built only as a runabout, with the gasoline carried in an oval tank immediately back of the seat. It sells with full equipment for $1,500. The fenders are long and rakish, giving the regulation speedy effect. The dash is straight mahogany and not encumbered with apron or other detail, except a single sight feed from the oiler. The three point suspension motor is a four cylinder, four cycle, water cooled one, with cylinders cast en bloc, and has 3⅞ inch bore and 4½ inch stroke. The exhaust and inlet manifolds are cast integral. Each cylinder casting is rough bored, allowed to age, and then ground to size. The valves, which are of 1¾ inch diameter, are all on one side and actuated by a single cam shaft through roller lifters. They may be adjusted by means of hardened screws in the top of the valve lifters, which are securely locked in adjustment by lock nuts.



Courier Model 10-A-1.

The pistons are rough turned and seasoned before the final finishing by grinding. Each piston is supplied with three compression rings, the rings being ground on three sides to insure perfect fitting. The connecting rods are drop forged of E section, and provided with phosphor bronze bearings at the top and white bronze marine bearings at the bottom. The crank shaft is droped forged, with three main bearings, and is carried in white bronze bearings of extra length. The cam shaft is of high point carbon steel, with the cams forged integrally. The shaft is driven direct from the crank shaft, and has three phosphor bronze bearings. The half time gear, magneto and crank shaft gears are all contained in an oil tight compartment. The crank case is of aluminum alloy, and is supported on steel hanger arms. The upper portion contains all the crank shaft bearings, and is cast in cylindrical form, the lower portion being more in the nature of a deep plate in which the lubricant is carried. The lubrication system is a constant level splash system. Oil is pumped by a gear pump through a single dash sight feed to the three main bearings of the crank shaft, the overflow supplying the splash bowls, and thence returning to the reservoir.

The cooling water is circulated on the thermo-siphon principle through a tubular radiator. A flat belt driven, ball bearing fan is mounted on top of the crank case gear compartment. The fan belt may be adjusted by means of an eccentric bushing in which the fan stud is fastened The source of the ignition current is a magneto located on the rigth hand side of the motor and driven from the half time gear. A dental clutch is provided in the magneto drive shaft so that the magneto may be removed without disturbing any of the other parts of the motor. The exhaust manifold is on the right hand or valve side of the motor. The carburetor is, however, located on the opposite side, the incoming charge being carried to the inlet valve chambers through a chamber formed between the second and third cylinders.

The clutch is a leather faced cone piloted on the end of the crank shaft. A slip joint is provided between the clutch and universal joint in the propeller shaft, which is located at the central cross member of the frame. The propeller shaft is carried through the torsion tube to the three forward speed selective type transmission, which is located on the rear axle. The propeller shaft has but one universal joint, that being located where the torque tube is fastened to the cross member of the frame by means of a swivel joint. The torque tube relieves the propeller shaft of all torque strains. The transmission is carried on Timken roller bearings throughout. The direct drive shaft stub is also carried on Timken roller bearings in the end of the direct drive gear.

The final drive is through a bevel pinion on the end of the direct drive shaft, meshing with the differential bevel gear. The bevel pinion differential housing is carried on Timken roller bearings, with end thrust adjustment. The rear axle is of the full floating type. The differential bridge casing, which is of cast steel, is closed with a cover which permits of easy inspection of the differential, or its removal if desired. The axle tubes are pinned and brazed after the best factory practice. Both front and rear wheels are carried on annular ball bearings. The front axle is a drop forging of I section, with spring pads forged integral. The king bolts which support the steering knuckles in the axle forks are hardened and ground, and provided with pressure grease cups for lubrication. These bolts are carried on phosphor bronze bearings. All joints in the steering system are provided with screw grease cups.

The steering gear comprises a screw and nut, with ball thrust bearings above and below the screw, adjustment being secured by means of an adjusting nut above the screw. The spark and throttle control levers are on a stationary quadrant below the 16 inch steering wheel and on the left hand side of the wheel. The frame is full pressed steel, dropped over the rear axle to give a low centre of gravity. The front springs are semi-elliptic, 36 inches long and 2 inches wide, with six leaves. The rear springs are three-quarter scroll elliptic, 42 inches long, 2 inches wide, with six leaves. There are two sets of brakes, internal expanding and external contracting, both operating on rear wheel brake drums, and operated in the usual manner. The change speed control lever operates in an H slot quadrant. The emergency brake lever disengages the clutch when the brake is applied. Both levers are of manganese bronze.

The upholstering is in plain black leather. Each car comes equipped with two gas lamps, gas generator, two oil side lamps, one oil tail lamp, tools, tool box and horn.

The Columbus Buggy Company, of Columbus, Ohio, have placed two new models on the market, a torpedo type gasoline runabout, known as their Model 74 A, and a two passenger electric, known as Model IoIo. The company plans to market 100 electric and 1,500 gasoline cars during the coming season. A full description of the gasoline car appeared in one of our recent issues.

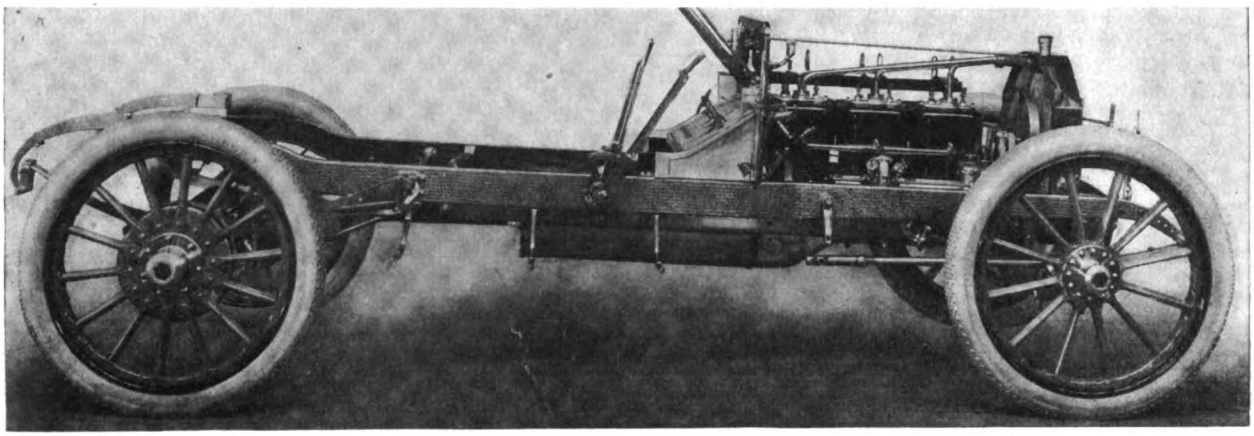
Oldsmobile 1910 Models.

The Olds Motor Works, of Lansing, Mich., have discontinued their Model X-3 and X Special, as well as the landaulet type of the four and six cylinder models and the detachable toy tonneau of the roadsters. The coupés have also disappeared from the list, while the four passenger toy tonneaus have been supplanted by the close coupled type. The Oldsmobile line for 1910 will consist solely of the touring, close coupled, roadster and limousine models on four and six cylinder chasses. The four cylinder, 40 horse power car is styled the Oldsmobile Special, and the six cylinder, 60 horse power the Oldsmobile Limited.

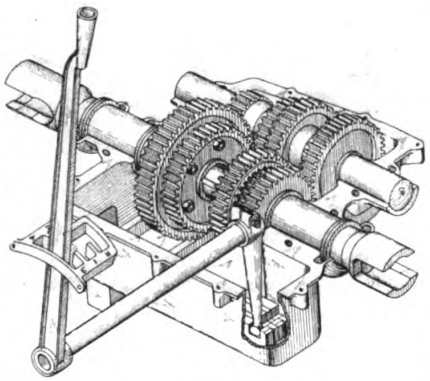
Coming to the specifications proper, the first deviation from the 1909 cars is in the matter of wheel base, the four cylinder model being lengthened 6 inches, while the six cylinder car remains the same. There has been practically no change in the tread. The seating capacity, however, has been increased by two in the four cylinder touring car, which result has been achieved by lengthening the body and installing auxiliary seats, which may be instantly detached and removed. Thus the car may be converted into a five or seven passenger model at will. The bodies are of wood except in the case of the roadsters and limousines, which are of sheet aluminum.

The motor will be the same for 1910 as the previous year, no change of any importance having been found necessary. In the transmission, however, one notable improvement has been made, viz., the addition of another speed forward, making four speeds forward and reverse, which will be standard on all models. The same cooling system as last year will be continued, the cellular radiator and the centrifugal pump having been found thoroughly efficient. The shape of this radiator, together with the curved fender with its long lip, will be the priucipal mark of identification of the Oldsmobile.

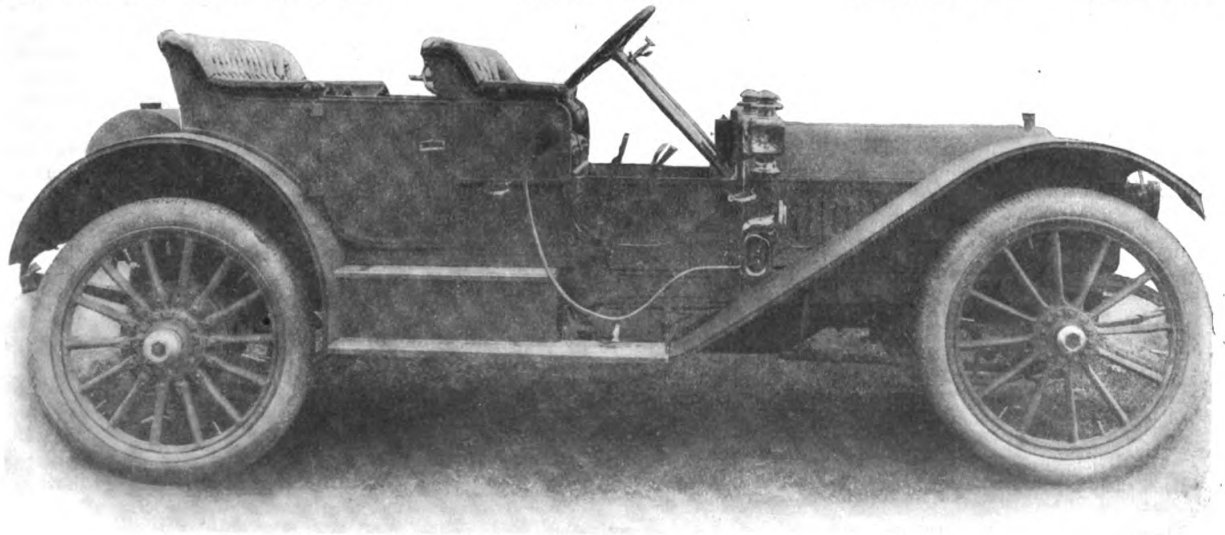
In the ignition system a distinct departure has been made. The Bosch magneto, with four volt dry cell battery for starting, will be used. The Olds Motor Works state that they found the Bosch dual ignition eminently satisfactory and much simpler than the old system. The elimination of the expensive storage battery, commutator, etc., permits the inclusion of a magneto as standard equipment. The carburetor to be used on the new cars will be called the Olds Venturi, a modification of the Venturi type carburetor, with which they have been experimenting for some time. There has been a marked increase in the gasoline capacity



SIDE ELEVATION OF CHASSIS.



CHANGE SPEED GEAR.



OLDSMOBILE CLOSE COUPLED SIX CYLINDER CAR.

f the different cars, varying from 22 to 40 allons for the touring car and roadster, re-pectively. It is obvious that this large ca-acity gives to the comparatively light oadster a large radius on one fuel supply. 'he pressure feed system used on the 1909 ixes will be installed on all 1910 models, xcept the roadster and close coupled cars.

The brakes, both foot and hand lever, re of the same type as last year, but of eavier construction and larger diameter, nd will hold the car fully loaded on any grade, it is claimed. In the matter of springs there is another marked change. The full elliptic rear spring has been suc-eeded by the three-quarter elliptic, a type which is coming into use more and more. It not only adds to the easy riding qualities of the car, but also obviates the necessity for radius rods. Shock absorbers are stand-ard on all models.

The steering and starting gear and front axle remain the same for next year, except for the addition of 1 inch to the diameter of the steering wheel. The rear axle, how-ever, is of different design and construc-tion, being of the full floating type with an-nular ball bearings, made by the Weston-Mott Company.

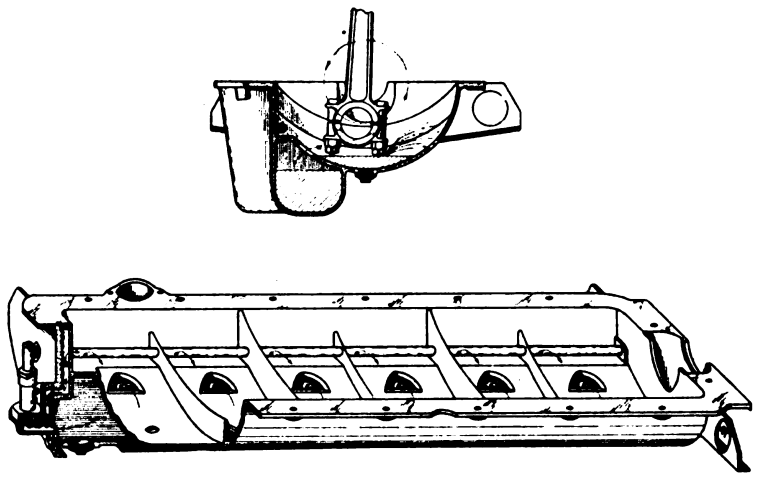
Another departure from the old régime is the introduction of the 42 inch wheel as standard on all six cylinder models. Ex-cept for the above and for the fact that the number of spokes in the rear wheel will be increased to fourteen in the six cylinder cars, the construction will be the same. The rims used will be the Universal quick de-tachable type for the four cylinder and clincher for the six cylinder models. Tires will be 36x4 inches all around for the four cylinder cars, while the sixes will have 42x4½ inch Goodrich-Bailey tread tires.

There will be no important changes in the frame construction. In the matter of equipment there will be found a few im-provements, such as combination oil and electric side and tail lamps, etc.

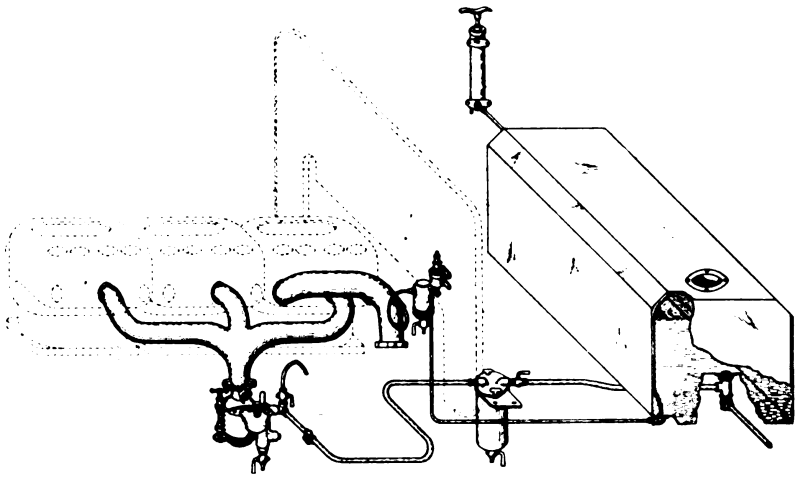
Representation of Cars in Nebraska.

During the past year 4,240 new automo-biles were purchased by motorists in the State of Nebraska. Makes of gasoline cars, of which more than ten of each were sold, list up as follows: Buick, 517; Reo, 399; Ford, 338; Maxwell, 293; Jackson, 226; E-M-F, 199; Overland, 183; International, 143; Rambler, 121; Cadillac, 117; Mitchell, 97; Chalmers, 95; Velie, 91; Oakland, 87; Brush, 74; Olds, 62; Homemade, 55; Franklin, 37; White steamer, 35; Stoddard-Dayton, 34; Regal, 33; Interstate, 31; Au-burn, 29; Holsman, 25; Lambert, 25; Fuller, 24; Mason, 23; Stanley steamers, 23; Stevens-Duryea, 22; Winton, 21; Schacht, 16; Hupmobile, 15; Sears-Roebuck, 13; Car-ter, 13; Victor, 14; Thomas, 11; Orient, 11; Kissel, 10; Black, 10.

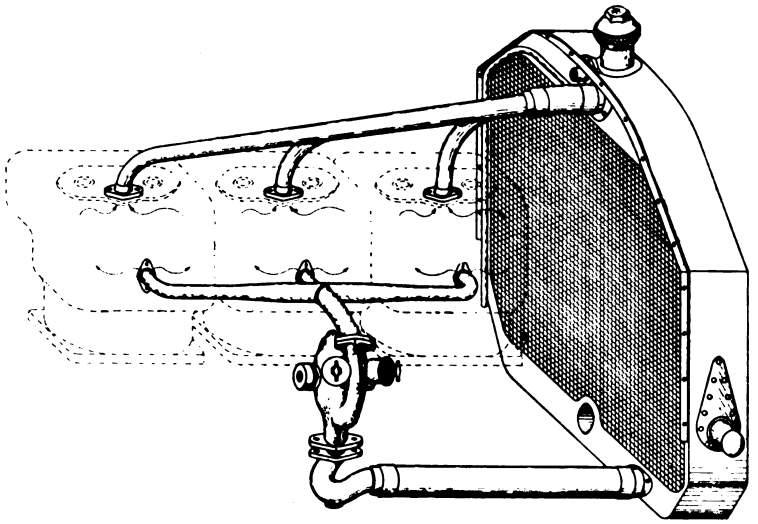
Electrics were sold in the following num-bers: Woods, 10; Detroit, 10; Baker, 8; Columbia, 7; Waverley, 4; Babcock, 4; Anderson, 3; Rauch-Lang, 2.



MOTOR OILING SYSTEM.



OLDSMOBILE FUEL SYSTEM.



OLDSMOBILE COOLING SYST..M.

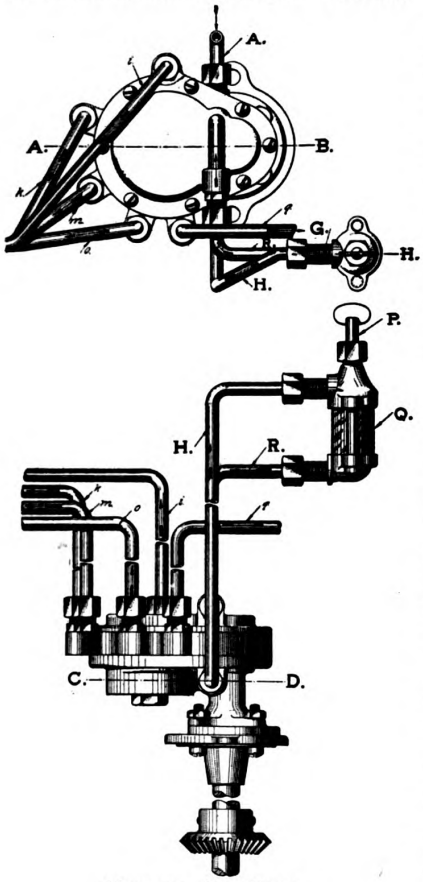
New Maxwell Pump Oiler.

One novel feature of the 1910 four cylinder Maxwell is the oiling device. The lubricant is supplied by a gear pump of interesting design, shown in detail in the accompanying illustrations. The operation is as follows:

The lubricant enters the pump from above through the tube A. From here a set of gears E F, called the sigh feed gears, forces the oil through tube H through the sight feed Q and by way of tube R back to the pump body, where a second distributing gear set X Y distributes it through the leads *i, k, m, o, q* to the four cylinders and to the clutch. Though the action of the pump is very simple, its construction does not lend itself to easy description, for which reason we shall explain each detail separately.

Beginning with the oil pump body, the oil enters from the tank at A and issues at the opening B. Since the teeth of the sight feed gear E and the oil pump shaft pinion F are in mesh at G, further progress of the oil is made impossible, so that the teeth of the gear E are made to carry the oil around in the direction of the arrow.

It is important to observe here that the pumping capacity of the gear E and pinion F is considerably in excess of the normal demand for lubrication, and the gear pump is capable of delivering a greater quantity of oil than is ordinarily needed. Provision is made to divert the surplus of oil delivered, and to lead it back to whence it issued. This is done by means of the diaphragm valve shown in sections A-B, C-D and E-F. The surplus oil rejected by tube H passes into the hole I, which discharges it into the chamber J, where the diaphragm K is so arranged that it will not lift from its seat to allow oil to pass until the sight feed has received the quantity of oil for which it is set.



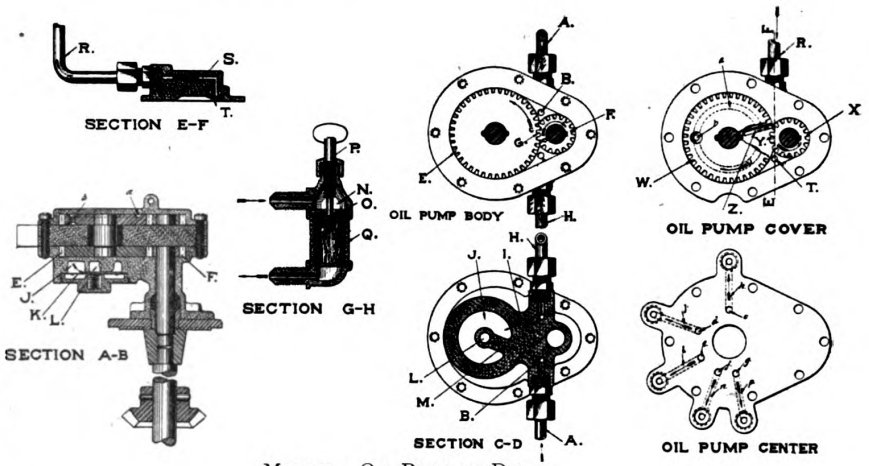
MAXWELL OIL PUMP.

The overflow oil which passes into the chamber L when the diaphragm is off its seat discharges into the opening M, which delivers it at B, where the gear E and the pinion F first received it. In other words, the diaphragm, by lifting from its seat, leads the surplus oil back to A, where it began its journey, but the oil traveling to cylinders and clutch passes on through the tube H to the sight feed Q.

The sight feed itself is more clearly shown in section G-H. As the oil passes through the valve seat O the flow may be regulated by turning the needle valve P; the oil can then be seen flowing into the tube R, which discharges it into the hole S in the oil pump cover, from whence it is conducted to the point T.

The lubricant has now reached the point whence it is to be distributed to the five places of application, namely, cylinders 1, 2, 3, 4 and the clutch, and the further travel of oil is illustrated in the sketch of the oil pump cover.

From the point T, also shown in the oil pump cover, the fluid is conveyed by the teeth of the distributing gear W. Since the gears are in mesh, and the oil cannot progress beyond them, it is carried around the case in the direction of the arrow U and compelled to enter the channel Z, passing through it and coming out on the opposite side of the gear W; here the channel *a* leads it to the hole *b*. This hole *b*, in revolving on the oil pump centre, makes connection successively with the oil holes *c, d, e, f* and *g*, and the lubricant has now entered upon the last part of its journey and is led to its final application, the surfaces of the cylinders and the clutch.



MAXWELL OIL PUMP IN DETAIL.

Upon closer examination of the drawing of the oil pump centre it will be observed that the spacing of the oil holes *g, f, e, d* becomes wider from left to right. This spacing makes it possible to give each cylinder just the amount of lubricant it needs, cylinder No. 1 receiving a litle more than cylinder No. 2; cylinder No. 2 receiving a little more than cylinder No. 3, and cylinder No. 3 a little more than cylinder No. 4. Hole *c* conducts oil to hole *h*, which discharges into tube *i*, which delivers to cylinder No. 1. Hole *d* conducts oil to hole *j*, which discharges into tube *k*, which delivers into cylinder No. 2. Hole *c* conducts oil to hole *l*, which discharges into tube *m*, which delivers to cylinder No. 3. Hole *f* conducts oil to hole *n*, which discharges into tube *o*, which delivers to cylinder No. 4. Hole *g* conducts oil to hole *p*, which discharges into tube *q*, which delivers oil to the clutch.

New Diamond Motorcycle Tire.

The Diamond Rubber Company, of Akron, Ohio, after experimenting for several months on a motorcycle tire, have placed such a tire of anti-skid type on the market. In making a tire for a motorcycle several problems present themselves for solution. The resiliency must be retained, while the tread must be as near punctureproof as it is practicable to make it and prevent skidding. It will be noticed that this tire has a heavy, flat, corrugated tread which is claimed to lend the desired qualities.

DIAMOND MOTORCYCLE TIRE.

New Studebaker Theatre Truck.

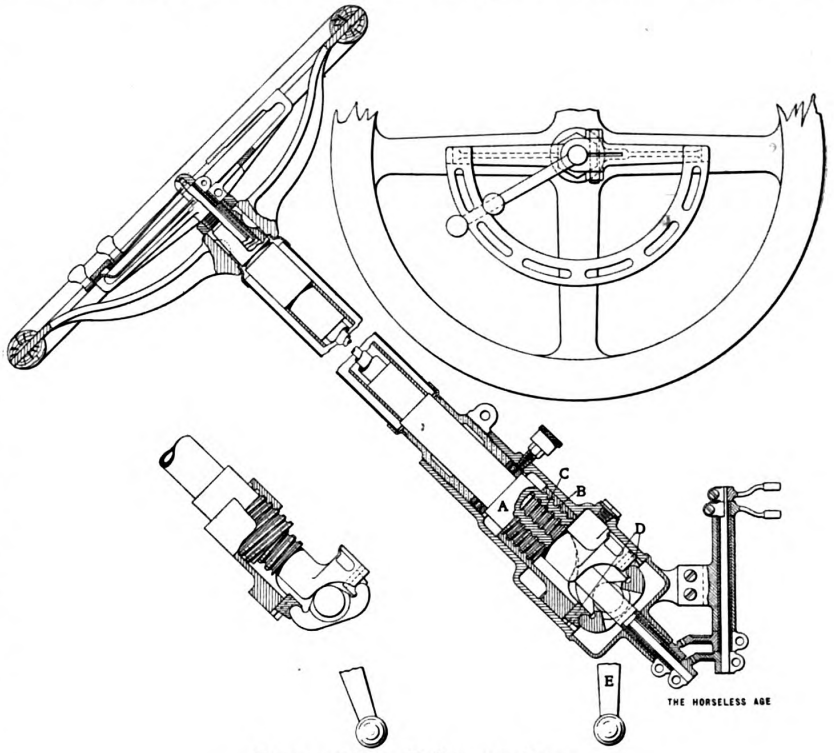
The Studebaker Brothers Company, of South Bend, Ind., realizing the urgent demand for a vehicle for the rapid and careful transportation of the special scenery used by theatrical companies on the road, to and from the depot and theatre, have constructed a truck with a special body designed to meet the requirements of this service. The platform is 20 feet long and 6 feet wide, with the driver's seat overhanging on one side, so that long pieces of scenery may project both fore and aft, as shown in the illustration. The top is so constructed that it carries within itself a top with side curtains that slide out to cover the trailer when necessary. The top is also constructed so that it may be removed, leaving the truck with a clear platform so that large pieces that might be wider than the platform can be carried. The length of the trailer is 20 feet, making the combined length of the trailer and truck over 40 feet. The trailer is attached by a link coupling, permitting the truck to turn short corners quite as readily as though it were but the ordinary length truck.

This is the first vehicle of its type ever built for carrying theatrical scenery to and from the depot and theatre, and it has proven itself so useful that it will, no doubt, become a permanent type of vehicle. The truck is built on a Studebaker electric chassis of 2,500 pounds capacity, and is driven through two motors suspended from the frame, each of 80 volt 20 ampere rating, taking their current from a battery of 44-13 m. v. exide cells suspended from the frame. The capacity of this truck, as above mentioned, is 2,500 pounds, and with an average load of two-thirds of the rated capacity will give a mileage on hard level road surfaces of approximately 40 miles per charge at an average speed of 9¼ miles per hour. Steering is by hand wheel and worm and sector gear. The wheel base is 111 inches; wheels are 36 inches front and 42 inches diameter in the rear, fitted with 4 inch tires all around. The width of the driver's seat is 45½ inches, and the height of the truck floor from the ground is 48 inches.

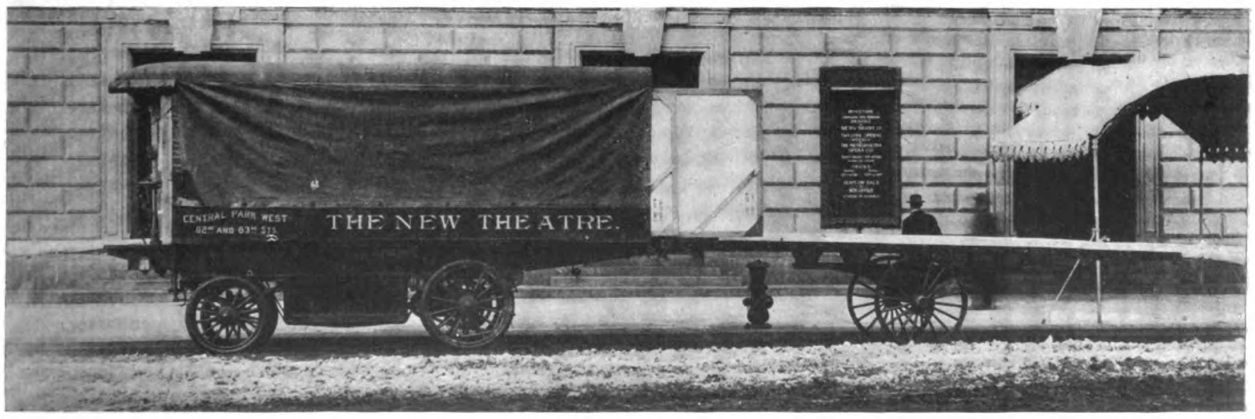
The Gemmer Steering Gear.

The Gemmer Manufacturing Company, of Detroit, Mich., who have during the past two years added three large factory buildings to their initial plant, and have just finished a modern concrete structure, have three distinct designs of steering gears for 1910. Two of these designs, both of the worm and gear type, are very similar and of familiar form, so that only the third, the double screw type, will be described.

The working parts of the screw type consist of a double screw A (that is, an internal and an external screw), working inside of a nut B and outside of another screw C. The screw B is right hand and the screw C left hand. When the steering wheel, which is connected with the nut A, is rotated in one direction, by the action of the right and left threads, one nut is forced down against one of the pivot blocks D, depressing that side of the rocker arm shaft, giving the steering arm E its movement. Rotating the steering wheel in the opposite direction reverses the action on the rocker arm shaft and moves the steering arm in the opposite direction. It is to be seen at once that all the work on the rocker shaft is done under compression; that is, the external nut pressing on one side gives it a movement in one direction and the internal nut pressing on the other gives it the reverse movement. The spark and throttle control levers are on a stationary quadrant above the wheel, and a rod and a seamless tube are led to the bottom of the column, from where



GEMMER MODEL C STEERING GEAR.

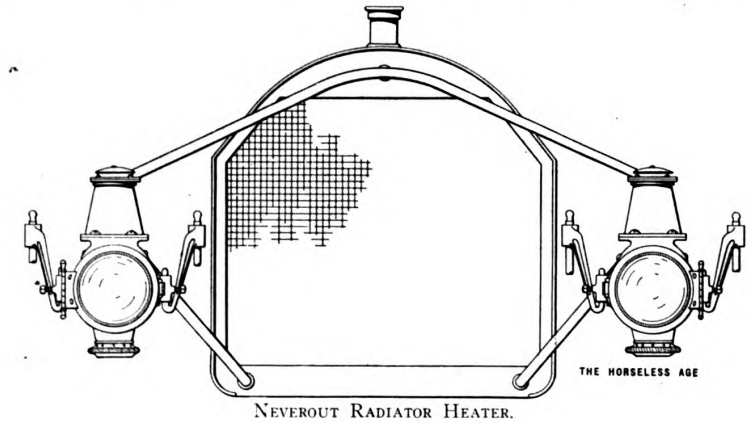


STUDEBAKER ELECTRIC TRUCK, WITH TRAILER, FOR HANDLING THEATRE PROPERTY.

connection is made to vertical shafts by means of segments of bevel gears. A ball collar thrust bearing takes all the thrust, all of the thrust being in one direction. Above the thrust bearing is an adjusting nut by which lost motion can be entirely eliminated. Owing to the construction of the threads the wearing surfaces overrun, thus preventing the forming of a shoulder, and there is consequently no danger of binding. The spiders are cast with a full rim, which is provided with mahogany laminæ on both sides. The nuts are made with two different pitches, the slower giving a complete throw of the arm (60°) in about 1 4-5 turns, and the other in about 1¼ turns of the hand wheel.

Neverout Radiator Heater.

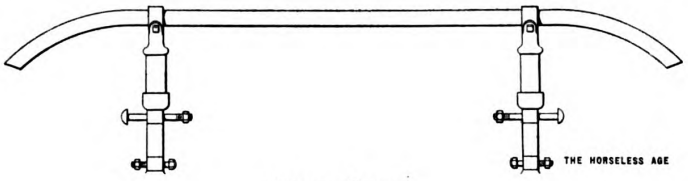
The Rose Manufacturing Company, 910 Arch street, Philadelphia, Pa., manufacturers of Neverout lamps, have recently placed on the market a radiator heater to prevent freezing of radiators in winter. When these heaters are used, it is claimed, a car can be left standing for hours in zero weather with no donger of freezing. The heater consists of two specially constructed lamps, the upper portion or chimney of the lamp having a brass water jacket to which connection is made from the radiator. A connection from the bottom of the radiator to the bottom of each lamp's water jacket is made by means of a flexible tube. The top connection is made by a tube arch connecting the top of the lamp water jackets, the tube being attached at the centre to the radiator. Thus the water is taken in from the bottom of the radiator to the lamps, heated and discharged into the top of the radiator. The lamps are provided with the regulation gas burners and differ from other lamps only in the fact that they utilize the waste heat from the gas flame to heat the water jackets. The lamps are attached to the car by adjustable brackets which fit the permanent lamp brackets of the car. In addition to the Neverout radiator heater searchlights, above described, a combination tail lamp and license tag bracket is being produced. The tag is held directly in the light of the tail lamp, as the law requires, is held rigidly by metal clasps, and can be instantly attached or detached for convenience in touring from one State to the other, when a change of tags is required.



NEVEROUT RADIATOR HEATER.

The Aremco Bumper.

The Aremco bumper, manufactured by the Rothstein Manufacturing Company, 1955 Park avenue, New York city, is well designed as to outward appearance and as to structural features. The bumper bar is specially made with a view to strength and durability of two pieces of steel tubing, one shrunk over the other. It is then covered with a heavy coating of brass to protect it from the weather, and also to make it harmonize with the finish of the rest of the device.

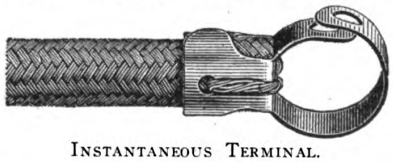


AREMCO BUMPER.

The springs are contained within cylindrical casings and are completely protected from dust and moisture. The device is secured to the car by bolts passing through the front spring shackles as well as by bolts passing through angle irons secured to the front spring horns. Aside from the steel bumper tube itself, which is closed at the ends by brass caps, all parts are made of solid brass castings. The play of the springs is about 1 inch, which is said to have been found ample for all contingencies.

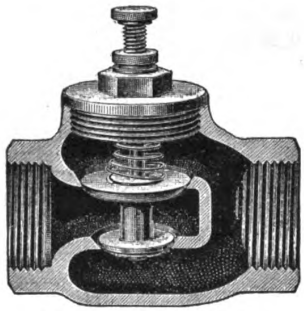
Morgan Novelties.

B. Morgan, Newport, R. I., is producing several new articles, principal among


INSTANTANEOUS TERMINAL.

which are his instantaneous wire terminals and a balance check valve for use between the carburetor and crank case on two cycle motors. The terminals are stamped and formed from spring brass sheets. The shank is formed to fit the body of the wire insulation. The cable, passing through a hole in the top of the shank, is divided, and a portion is bent either way, securely holding the terminal in perfect contact. The attachment to spark plugs is made by a divided ring with holes slightly larger than the body of the spark plug screw at either end. The ring is compressed so that the holes coincide and slip over the spark plug stem, the spring action holding them securely in position.


GAS HOSE CONNECTIONS.


BALANCE CHECK VALVE.

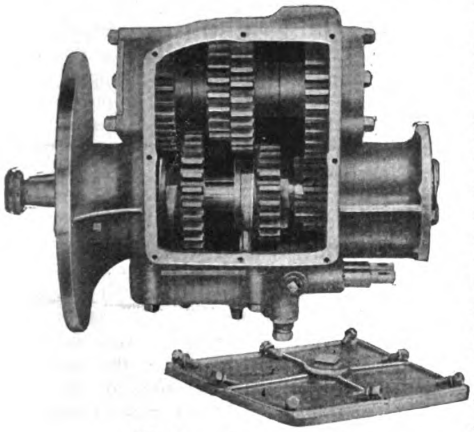
The Morgan balanced check valve is constructed with two concentric heads, operating in unison. The area of these two valves is greater than the pipe for which the valve is designed. Gas hose connections are also manufactured in nipple, Y. T and cross shapes.

Standard Adjustable Wind Shield.

Charles E. Miller, 101 Reade street, New York, is distributor for the new Standard adjustable folding wind shield, which is made in three widths. It is all brass bound with ⅞ inch brass tubing, and contains genuine French plate glass. The wind shield has no cams, springs or catches, and can be adjusted to any position with one hand while the car is in motion. The device for holding the shield in any desired position consists of two cylinders and plungers, one at either side. The plungers are expanding, and the friction of these against the walls of the cylinder folds the folding portion of the front in the position desired.

Warner Manufacturing Company's Rear Axle Transmission.

The Warner Manufacturing Company, of Toledo, Ohio, manufacture a line of transmissions, steering gears and control levers, one of their leading products being a three forward speed, ear axle selective sliding gear transmission made to bolt to the rear axle differential housing. The direct drive shaft and direct drive gear are carried on combined radial and thrust ball bearings, the direct drive gear being supplied with two sets of these bearings. The countershaft runs in annular ball bearings. The direct drive shaft has integral flutes or keys, being milled from a solid bar. The stub end is carried in a bronze bearing in the direct drive gear. The connection between the direct drive gear and the direct drive shaft sliding

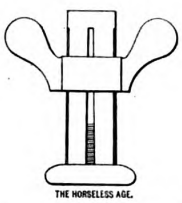


WARNER TRANSMISSION.

gear is through a four jawed clutch. Chrome vanadium gear steel is used throughout in the gear blanks, which are hardened, oil treated and ground to size and guaranteed interchangeable. The sliding gears are positively locked in and out of mesh by a spring lock which drops into notches in the shifting bars. The gear case is perfectly oil tight, having stuffing boxes at both ends of the drive shaft. A cover on top of the case permits the easy inspection of the transmission, while a plug in the cover permits the easy refilling of the case with oil or transmission grease. This style of transmission can be supplied in subframe or engine type.

Schrader's New Stay Bolt Cap.

A Schraders Sons, 28 Rose street, New York city, have recently put on the market a quick acting stay bolt cap for long stem tire lugs. This is composed of a pressed steel cap slotted in three places to within a short distance of the top, and having threads at the lower end corresponding to those on the stem of the lug. These slots allow the cap to expand away from the stem so that the cap can be removed or adjusted to any position on the lug stem. A pressed steel washer swivel at the bottom



SCHRADER'S TIRE LUG CAP.

prevents the cap from expanding beyond the desired limit, and also prevents cutting into the wood felloe of the wheel. A thumb nut drilled to fit the body of the cap when it is compressed to fit the threads of the stem prevents the cap from loosening.

The Reichert Taximeter.

This instrument has now been in use for more than a year by the Universal Taximeter Cab Company, of 153 East Fifty-third street, New York, and during that time has proven satisfactory in every way. The special feature of this instrument is the legibility of the fare and extra indicating figues, due to the fact that they are in white on a black ground and over 1 inch in height. The size of the instrument is below the average of the instruments now on the market. In order to get a large size figure in a small space the plates on which the figures are inscribed are cut in halves horizontally and pivoted around a common centre, the upper part of one figure having the lower half of the next on its back. To illustrate, let us say the figure 1 is in view. Then when the change comes to the 2 the upper half of the 1 falls over, covering the lower half of the 1. This exposes the upper half of the 2 on the next card and the upper half of the former 1 forms the lower half of the 2.

On the back are the usual recording dials. On the left are the three cash dials—initial fares, mileage and time units, and extras. At the lower left are the mileage figures given in whole miles, the total miles being given in black figures and the live or pay miles in red.

The instrument is of the "one tariff" type, but can be furnished to work on any desired tariff schedule. The flag has only

REICHERT TAXIMETER.

two positions, a disengaged and an operating position. When placed in the operating position it cannot be returned to the disengaged position without operating the payment or disengaged lever. This puts the instrument in a non-operative position while the fare is being settled. The flag may then be returned to the disengaged position. A knob on the back is provided for charging up extras. This cannot be operated until the flag is put in the operating position. A small hand wheel on the back is used for winding the clock. Means are also provided by which the flag may be locked in the disengaged position.

Gray Gasoline Filter.

The Gray-Hawley Manufacturing Company, of Detroit, Mich., have brought out what they claim to be a light, compact, practical filter at a reasonable price. It consists of a brass cylinder with a

GRAY GASOLINE FILTER.

nut at the top which extends into the cylinder about three-quarters its length. In the lower portion of the nut, which is hollow, are spaced four wire screens of different mesh. These screens are held in position by separating rings and a nut. They may be easily and quickly removed for cleaning by unscrewing the one nut. The four way valve is ground to a bearing, and a spring and ratchet arrangement holds it in any position it is set. Dirt, water and other impurities cannot pass through the screens, and are quickly drained off by turning the handle of the four way cock to the proper position, which closes the tank connections and opens a port in the bottom of the filter. The filter can be inserted in any convenient location on the gasoline line between the carburetor and tank.

Chalmers-Detroit to Change Name.

Owing to the fact that so many concerns manufacturing cars in Detroit, Mich, have taken the liberty to affix that city's name to their product, the Chalmers-Detroit Motor Company have decided, in order to avoid confusion, to drop the "Detroit" part of their name, and in the future will be known as the Chalmers Motor Company. Hereafter the cars turned out by this company will be known as the Chalmers "30" and Chalmers "40."

COMMENTS AND QUERIES OF READERS.

Queries.

Editor HORSELESS AGE:

Kindly answer the following questions through the columns of your paper:

What is the correct "dual ignition system," if there is one? There are several ignition systems which are termed "dual," but they operate in different ways. Can you publish diagrams of two or three of the leading "dual systems" as are found on American cars, and explain how they operate?

Is there any car on the market today equipped with a lubricating system in which the carburetor draws air from the crank case through a separator, thus drawing the lubricant in as a mist? Would this system work well on the so called high duty type of two cycle motor using cylinder precompression?

What is the best way to ascertain whether the carburetor is flooding, the cause of the flooding and how can same be remedied?

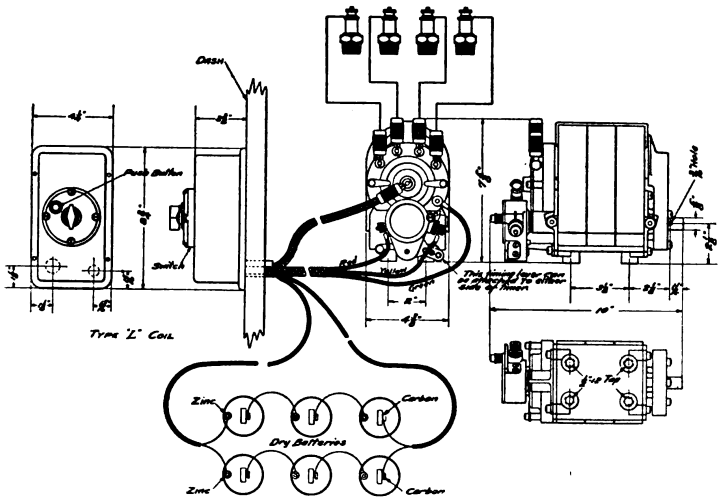
What are the methods of obtaining a single spark per ignition as are now in use. R. M.

[We believe that the term "dual" ignition system was introduced by the Bosch Magneto Company. At least, we first saw it in their literature. Previous to that time there had been double ignition systems in which every element of an ignition system, viz., the current source, the circuit breaker or timer, the step up coil, the distributor and the spark plug, was duplicated. In other words, there were two sources of current, two interrupters, two coils (one, perhaps, constituted by a double wound armature), two high tension distributors and two sets of spark plugs. In the Bosch system only the source of current, the interrupter and the transformer or coil were provided in duplicate, the same high tension distributor and the same set of plugs being used for both systems. We would call any system which has two separate sources of current a dual system. The Bosch connections were shown in diagram in our issue of January 12, page 56; the Splitdorf in our issue of December 29, 1909, page 772. The Remy system of connections is shown herewith. These two systems are typical. We do not know how far you expect us to go into the operation of these systems, but would say that each system comprises a switch by means of which the magneto armature circuit can be cut out and the battery circuit be cut in instead, or vice versa.

Most two cycle motors draw their charge from the crank case through a screen, designated to eliminate back explosions into the crank chamber. We do not know of any instances where the separator described by Mr. Udale has been applied to standard cars and cannot say how it would work on the motor mentioned. This is a subject for experiment.

If a carburetor is flooding you get a rich mixture, which is indicated by black smoke in the exhaust. With most carburetors gasoline will leak from the mixing chamber if the carburetor floods, when the engine is not running. The flooding may be caused either by a defect in the float, reducing its buoyancy, or by a defect of the needle valve, or dirt on the valve seat preventing it from closing when the proper level of fuel has been attained in the float chamber. If you have a cork float the glazing of the cork may have worn off and it may have become gasoline soaked. A metal float may have sprung a leak and partially filled with gasoline. In either case the remedy is more or less obvious.

In order to obtain a single spark per ignition you must close and open the primary circuit of the ignition system once per cycle. You should understand that with the former system of multiple spark ignition the primary circuit has two breaks, one at the timer and the other at the vibrator. The timer establishes the circuit during a certain fraction of the revolution of the timer shaft, say one-eighth. This corresponds to a greater or lesser period of time, according to whether the engine runs fast or slow. During the time the circuit is closed at the timer it is opened and closed again a number of times at the magnetic vibrator, and each time a spark is produced. The period of vibration of the vibrator is constant, and the number of sparks per explosion produced is equal to the quotient of the time the circuit is closed at the timer by the period of the vibrator. In order to produce only a single spark per explosion you may regard the vibrator to be eliminated, when the spark would occur at the moment the circuit was interrupted by the timer. Such a system is not used, however, because the time the circuit would be closed through the coil would vary directly as the speed of the motor. This time should not vary at all, but always be equal to the periods it takes to fully build up the magnetism of the coil, for if the circuit remains closed longer the current is wasted. For this reason special interrupters are used which are automatic as to time. The Atwater Kent interrupter was illustrated in THE HORSELESS AGE of January 12, page 86, and the Briggs & Stratton interrupter in THE HORSELESS AGE of September 1, page 240.—ED.]



REMY FOUR CYLINDER WIRING DIAGRAM.

Injection of Moisture with the Charge.

Editor HORSELESS AGE:

I am beginning a series of investigations on the effect of moisture in the mixture of a gasoline engine and would like to find out if any work along this line has been conducted heretofore. If possible, I would like to obtain some literature or accounts of experiments on this subject. C. J. B.

[Experiments have been made by a number of European engineers to determine the effect of injecting moisture into the cylinder during the inlet stroke. The chief object is to increase the limit of compression. Gas engines are at present being manufactured by Ganz & Co., a large concern of Budapest, Hungary, after the Banki system, in which this principle is made use of. The Banki motor is described in Guldner's "Internal Combustion Engines," published by D. Van

Nostrand Company, of New York. According to Guldner, the first to inject water with the fuel was Capitaine, who applied the principle to a kerosene motor in 1888. Banki began his work along this line in 1894. If the compression were not altered the injection of water would unfavorably affect the output and fuel efficiency, as water vapor has a higher specific heat than the products of combustion, but, as stated above, the chief object of the water is to permit of carrying the compression pressure to a higher value without danger of trouble from preignition.—Ed.]

Cars for Unimproved Dirt Roads.

Editor Horseless Age:

Why is it not worth while for some standard maker to produce a car for dirt roads? To show the market for it—I was recently asked to select a car for a friend who specified 20 inch clearance, solid tires, air cooled engine, speed not over 20 m. p. h., 20 miles per gallon of gasoline, and simplicity suited to ranch blacksmith shop repairs.

This limited me to the high wheel buggy type, and I wrote to various users, with the following results: My first choice: "mileage, 20 m. p. g." "All difficult problems solved." "Defects incidental to cheap, sloppy and inefficient construction." "The three months' guarantee of the makers about equal the life of the car." "Such rigs are apparently intended for one season's use only."

My second choice guarantees only 10 m. p. g., which is to expensive in gasoline, and besides shows at once fatal friction loss somewhere. Friction losses mean, of course, excessive wear and correspondingly short life.

Users of my third choice reported tires practically gone after one year's use. Excessive noise due to dust wear on exposed parts, and probable useful life not over two years.

I, of course, declined to buy for my friend, as his very reasonable specification excluded all standard cars, and these reports from users exclude the other type. His inquiry, and others of the same nature coming from British colonies, prove a demand not now to be filled from any source; a demand negligible in a year so prosperous as the present for auto manufacturers, but which should not be neglected in the lean years to come.

Why, therefore, should not some company which is at present producing in quantity a thoroughly good standard car, undertake as a side issue to produce an equally good dirt road car having the above specifications, and, preferably, an air cooled two cycle engine, and a spring wagon body, in which farmers and ranchers can seat four persons and carry ilght produce?

Such a car can be produced cheaply, not to weigh over 1,000 to 1,200 pounds and to carry, say, 1,000 pounds. Wide, solid tires are a great object, but speed is not useful nor desirable. Therefore, engine size can be small. Simplicity is essential, but by no means impossible, and good material absolutely essential. Farmers (who are now rich) cry for such a car, and many others would turn toward it, because standard cars cannot be run successfully over that class of dirt roads which prevail in most parts of the world.

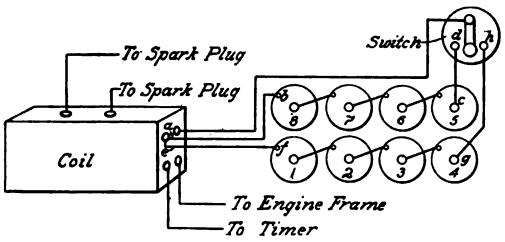
Many who are now buying the bugyy type, and many more who would buy a satisfactory buggy type, would, of course, prefer a standard car if one were obtainable anywhere, fitted for their conditions. H.

Battery Connections.

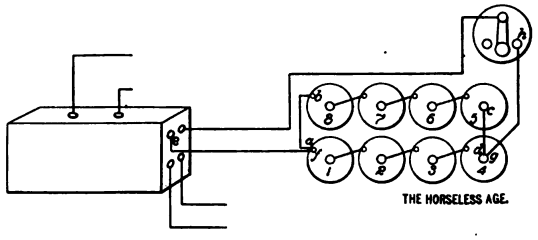
Editor Horseless Age:

Won't you please publish in an early issue the proper figure to illustrate the article "Battery Efficiency" in the issue of December 15? R. T. Kirby.

[It was through an oversight that the reference letters were omitted from the cut which appeared in that article. The two cuts herewith show the original connection and the final connection, respectively. Originally the battery was connected so the two halves could be used alternately. The connections were then changed so the two halves were connected in parallel and delivered current simultaneously.—Ed.]



Original Connections.



Final Connections.

Cause of Inside Cylinder Wall Cracking.

Editor Horseless Age:

In The Horseless Age of January 12, 1910, there was a query as to the cause of gas engine cylinders cracking on the cylinder wall, within the water jacket, without apparent reason. Recently I saw a case of this nature, and from the investigation of the fracture I believe we discovered the cause.

The engine under consideration was a double opposed 5x5 inch engine of moderate compression, used upon a twelve passenger transfer car. After being in service several months it was noticed that water was leaking into the cylinder, at first in small quantities, and later to such an extent that it was impossible to operate the car. This cylinder was removed from the car, and when tested under water pressure in the jacket the fracture could be plainly seen by looking into the cylinder. The crack was in the counterbore at a line where the curved head joins the cylinder wall. This crack was about 2½ inches long and had been gradually increasing, and would ultimately have extended entirely around the cylinder and allowed the cylinder head to be forced into the jacket. We cut into the water jacket space, and repaired the fracture. The cylinder was replaced upon the car and gave satisfaction. A few weeks later the other cylinder developed the trouble and was repaired in the same manner. Both of these cylinders have now been in use two or there months and seem to be as good as when new. The repairs cost about $3.50 per cylinder.

Now as to the cause. When we cut into the jacket wall and exposed the fracture from the water jacket side a well defined seam could be seen. This was a foundry fault, called a "cold-shut," and produced by pouring the metal too cold or too slowly into the mould, which prevents perfect amalgamation of the iron as the surfaces meet around the core. When the second cylinder was repaired the same conditions were noted and a similar seam located in exactly the same place on the cylinder wall.

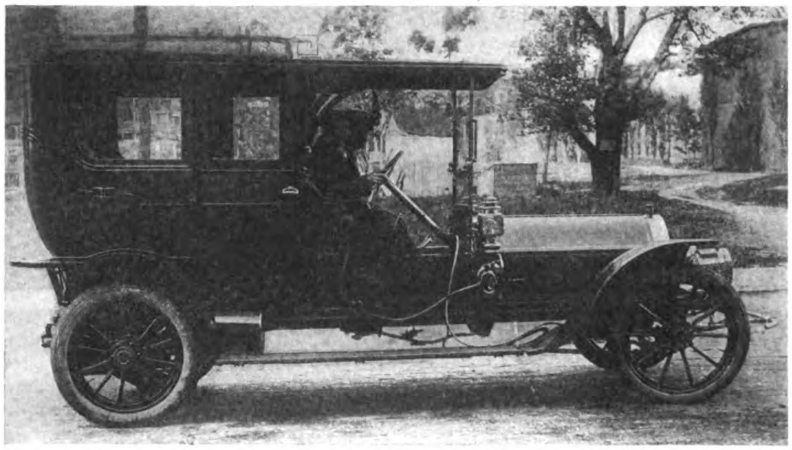
Of course, there is no way of detecting these faults by the usual methods of testing cylinders under water pressure, and the engine builders had no reason to suppose that the cylinders were in any way imperfect. Albert Barnes.

Non-Resident Exemption in Pennsylvania.

Editor Horseless Age:

Will you kindly tell me the provisions of the 1910 Pennsylvania auto law? Do they reciprocate with New York State on the matter of licenses? Is there any period (visiting period) when a license or registration from another State is recognized? J. W. Kirkner.

[The section of the Pennsylvania State law regarding exemption of non-residents reads as follows: "Provided, however, that non-residents of this commonwealth shall be exempt for a period of ten days from the provisions of this section if they have complied with the requirements of the State in which they reside, and display upon their motor vehicles number tags that indicate the State by which they are issued



MR. HOFMAN'S CAR WITH CLOSED BODY (SHOWING HOFMAN ROAD INDICATOR CONNECTED BY A FLEXIBLE SHAFT).

and their register number; provided further, that this privilege shall not apply to residents of States which do not extend similar privileges to residents of this commonwealth." Since all non-resident owners of automobiles are exempt from registration in the State of New York, you are exempt from registration in Pennsylvania for ten days.—ED.]

Tire Pressure Query.

Editor HORSELESS AGE:

If the tires of a car weighing 1,600 pounds are inflated to 80 pounds per 8 inches while the car is on jacks, what is the pressure per square inch when the tires support said car? It is to be assumed that the weight of the car is equally distributed and the tires are 30 x 3½ inches. B.

[The pressure will be the same after the load is on the tires, to all practical purposes. Calculation shows that the tires under these conditions would flatten about 1-6 inch radially. Assuming that the tire holds its circular shape at the point of contact, except for the flattened portion, the contents of the annular segment by which the flat reduces the air content of the tube would be less than ½ cubic inch. (The area of the flat is 5 square inches; the maximum height of the segment 1-6 inch.) As the contents of the tube are more than 500 cubic inches, placing the load on the tire would reduce the contents about in the ratio of one-tenth of one per cent. and increase the inflation pressure in the same proportion. The difference in the pressure before and after loading the tires would certainly be far too slight to be indicated by a tire gauge.—ED.]

Combustion of Heptane — Typographical Error Corrected.

Editor HORSELESS AGE:

After reading your article on "Heat Values of Different Gasolines," page 159, I would call your attention to the equation on the reaction of heptane at the bottom of the second column. This is not a proper balance, as in the reaction you have 22 units of oxygen and have only supplied 2 units to make such combustion. This is probably a typographical error. Should not the equation read as follows:

$$C_7H_{16} + 11\,O_2 = 7CO_2 + 8H_2O.$$

The equation given above makes a proper balance of both the carbon and oxygen constituents. THOMAS FARMER, JR.

[Your statement of the equation is correct. In the article HO_2 appeared in place of $11\,O_2$, through a typographical error.—ED.]

The Aerometer—A Home Built Car.

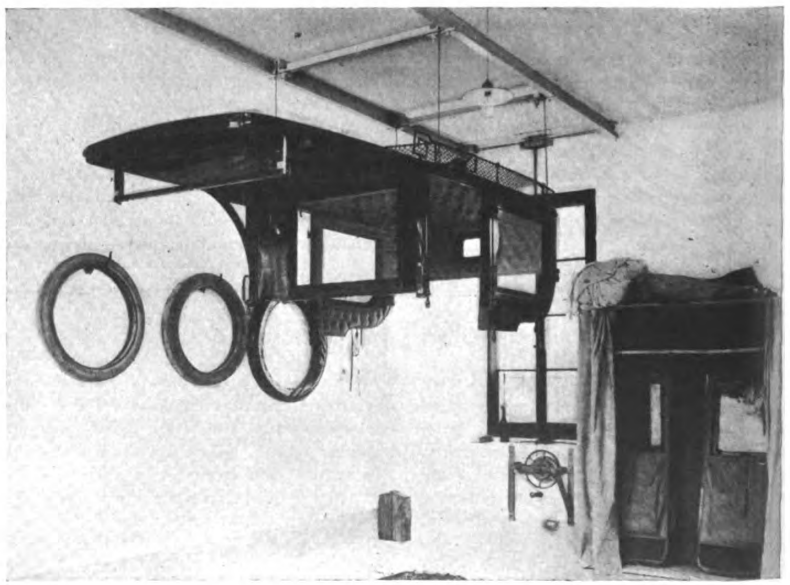
Editor HORSELESS AGE:

As one of your subscribers I should like to know whether the announcement made by the Warner Instrument Company (HORSELESS AGE, December 29, 1909, p. 68) about their new areometer is to be taken seriously. It reads: "* * it is operated by four metal cups, which revolve under pressure of the wind caused by the speed of the aeroplane. The speed of the areoplane is told in miles per hour by the speed hand. The aerometer tells the aeroplane's speed with the same infallable accuracy that the autometer indicates the speed of an automobile." Is is really possible that the Warner people have overlooked the fact that an aeroplane does not travel along in the air while this stands still, and that while going against the wind the indicator will show a much greater speed than the aeroplane actually develops, while going with the wind it would show correspondingly less? Kindly let me know your opinion on the subject.

At the same time I take the opportunity of sending you the photos of my six cylinder, 50-60 horse power limousine-phaeton car, which I built last winter in Aiken, S. C., and also my arrangement in my Swiss garage, which permits, with the attendance of only one person, to transform the "limousine" into a phaeton (double) in less than twenty-five minutes, putting dust covers on and light summer top included. For the open car I have a special set of side doors. The car has been in constant use in Switzerland, doing lots of climbing, and it works to my best satisfaction.

JOSEF HOFMANN.

[Without corresponding with the Warner Instrument Company, we should say that what they claim for their instrument is, that it shows the speed of the aeroplane relative to the medium in which it moves. This is really the important factor, far more important than the actual speed of the



JOSEF HOFMAN'S GARAGE AT MONT PELERIN SUR VEVEY, SWITZERLAND, 1,600 FEET ABOVE LAKE GENEVA.

(The garage is built for two cars and is connected with a spacious workshop and a mechanical and chemical laboratory.)

aeroplane. For instance, if we know an aeroplane moved at a speed of, say, 30 miles per hour relative to the air, this knowledge is much more definite and valuable than if we knew that it moved at an absolute speed of, say, 35 miles per hour, without knowing the velocity and direction of the wind. With the aerometer the velocity of the wind can be easily determined, and the direction of the wind is also easily ascertainable, and if the speed of the aeroplane with relation to the air has been determined, it is then an easy matter to ascertain its absolute speed by making suitable allowance for the effect of air currents. There is absolutely no possibility of the Warner Instrument Company having overlooked this fact.—ED.)

MR. HOFMAN'S CAR WITH OPEN BODY.

Design Formulae.

Editor HORSELESS AGE:

Will you kindly give me the following information: Formulæ for selecting the proper size and determining the proper number of balls in bearings to replace plain bearings on the crank shafts of the following motors, fitted with either a cone, disc or internal expanding clutch: Double cylinder opposed, double cylinder vertical, four cylinder vertical and six cylinder vertical.

Also formulæ for transmission loads, both for direct and chain drive, using ball bearings. Also radius rod formulæ for a chain driven car. F. G. W.

[We presume that you want to use annular ball bearings in the motors. In that case the best plan to follow is to make a sketch of the crank shaft showing the locations of the bearings and send it to some of the manufacturers of this type of ball bearings, together with the bore of the motor and the compression carried, and the manufacturer will then recommend one of his standard sizes of bearings as suitable for the purpose.

The subject of transmission bearing loads is too involved to be handled in this department. It was fully covered in an article by George E. Ackerman in the HORSELESS AGE, of April 7, 1909. We would advise you to look it up in your files or get a copy of this issue if you have none.

We believe that radius rods are generally designed without the use of mathematics, but it is quite possible to evolve an equation for their calculation. The radius rods transmit the forward push of the rear wheels to the frame and the maximum load on them in regular operation depends upon the adherence of the rear wheels to the ground. However, it will sometimes occur, if the chains are not kept carefully adjusted that they will ride on the sprockets, in which case the distance rods will be subjected to far greater compressive strains than in regular operation. In such a case it is probably to be preferred to have the chain snap than to have the distance rod buckle, and in order to insure that the chain will snap before the rod buckles the latter must be made of greater compressive strength than the tensile strength of the chain.

The distance rod practically forms a column with free ends. The formula for the strength of such columns is

$$\frac{P}{A} = \frac{S_c}{1 + q\frac{l^2}{r^2}},$$

in which P is the load on the column, A the cross sectional area, S_c the compression strength of the material; q a constant which may be taken as 4/25000 for steel; l, the length of the column and r the least radius of gyration of the cross section. The limit of elasticity of steel under compression is in the neighborhood of 50,000 pounds per square inch, and if we wish to calculate a rod which is to be stronger than the chain, we could figure on a safe working limit of 40,000 pounds per square inch. Suppose that the ultimate strength of the chain is 17,000 pounds, which is the figure for a roller chain with ⅜ inch nickel steel rivets of well known make; also, that the distance rod is 30 inches in length, and that it is to be of solid circular cross section. It may be remembered that in that case $A = \frac{d^2\pi}{4}$ and $r^2 = \frac{d^2}{16}$, where d is the diameter of the section and r the least radius of gyration. Substituting in the above equation we have

$$\frac{17{,}000}{\frac{d^2\pi}{4}} = \frac{40{,}000}{1 + \frac{4}{25{,}000} \times \frac{900}{\frac{d^2}{16}}}.$$

Simplifying:

$$\frac{68{,}000}{d^2\pi} = \frac{40{,}000}{1 + 2.3/d^2}$$

$$\frac{17}{d} = \frac{10\pi}{1 + \frac{2.3}{d^2}}$$

$$17 + \frac{39.1}{d^2} = 31.4\,d^2$$

$$17\,d^2 + 39.1 = 31.4\,d^4$$

$$39.1 = 31.4\,d^4 - 17\,d^2$$

Completing the square:

$$41.38 = 31.4\,d^4 - 17\,d^2 + 2.28$$

Extracting square roots:

$$6.43 = 5.61\,d^2 - 1.51$$

$$d = 1.19 \text{ inch.}$$

This should be the section at the middle of the length of the rod which can be slightly tapered toward the ends.

If the calculation is based on the working load in ordinary operation much smaller figures are arrived at.—ED.]

Rush of Applications for A. L. A. M. Membership.

Applications for membership in the Association of Licensed Automobile Manufacturers have been pouring into the office of that association during the past two weeks, and Manager Alfred Reeves and other officials have been kept busy considering the claims and arguments of the applicants who are anxious to get under cover. Last week seven new licenses were granted, two of which were to importers, and it is probable that a few more will be passed upon favorably within the next few days.

Evidently several manufacturers who have not been heard from do not care to be taken under the wing of the association, or else intend to fight the decision. These include the Ford Motor Company, which has always fought the Selden patent claim; the Thomas B. Jeffery Company, the International Harvester Company, and some of the old time importers, including Panhard-Levassor and Renault Frères. The latter, dealers in foreign cars, are fighting the patent on their own hook, and are represented by Coudert Brothers.

General Manager Alfred Reeves and officials of the Licensed Association claim that they are giving applicants every consideration, but that a number of manufacturers who went into business after Judge Hough's decision was handed down last September stand little show of getting into the licensed body.

It is claimed that 85 per cent. of the industry is now represented in the A. L. A. M., and it is stated that very shortly steps will be taken to enforce the Selden patent among those makers who are outside the fold.

Chicago's Big Exposition Opens Saturday.

The last rush is on to get things in shape for the Ninth Annual National Automobile Exhibition, which will open in the Coliseum and First Regiment Armory, Chicago, Saturday evening, February 5. As was the case with the two recent New York shows, it is expected that the N. A. A. M. affair will be larger and grander than any of its predecessors. Filled to overflowing with cars and accessories of all descriptions, the 1910 models for the first time clustered together in one place in the Middle West will doubtless present a gorgeous appearance.

Following the custom of the past, no formal ceremony will mark the opening of the big show. General Manager Miles will merely satisfy himself that the general effect of the Coliseum and Armory is satisfactory along about 2:30 o'clock on Saturday, and then quietly give the signal to the doorman to open up.

DECORATIONS.

With its novel setting of trees, so arranged as to have the effect of a huge forest, the spectacle is one which will please the eye and show up the vehicles to excellent advantage. The trees were cut down about two weeks ago, and have been transported from the backwoods to Chicago's South Side on flat cars. It required a force of about 100 men to handle these big plants, many of which are 60 feet tall. In order to have the proper foliage quantities of natural leaves were imported from Germany, which still retain their color after having been treated with a fireproofing solution. These are being attached to the large trunks and limbs in the Coliseum, which are shy of foliage just at this season—a neat little piece of nature faking.

EXHIBITS DEPARTMENTIZED.

Like its predecessors, the show will be departmentized. On the main floors of the Coliseum, Annex and Armory, and in the basement of the former will be found the gasoline and electric cars. In the galleries the accessories will be arrayed, while most of the second floor of the Annex will be devoted to motorcycle displays.

The cars themselves range in price all the way from $485 to $10,000, while motorcycles run up as high as $600. It is estimated that the total value of all the cars in the buildings will amount to $5,000,000 or more, while the accessory displays will represent an enormous expenditure.

Manager Sam Miles and his staff have been somewhat busy the last few days arranging for the installation of the exhibits, which will commence to enter the building Thursday, February 3. Miles has been assured that the railroads running into Chicago will give every consideration to the show committee and exhibitors, in so far as the freighting of their cars into Chicago without delay is concerned. J. S. Marvin, traffic manager of the N. A. A. M., reports that between seventy-five and one hundred carloads of machines have arrived, or are at present en route from New York, and in addition to these, of course, a much larger number come from the various factories direct.

REDUCED RAILROAD RATES.

A feature this year which will greatly appeal to out of town visitors is that for the first time in the history of these shows reduced rates have been offered by the Central Passenger Association. Provided at least 1,000 persons take advantage of it and present certificates, as mentioned below, this association will grant a rate of one and one-half fare for the round trip. This rate is made on account of the convention of the A. A. A. and not owing to the show, but membership in the A. A. A. is not necessary to obtain this rate. Visitors from various cities can obtain a certificate from a ticket agent at the point from which they start, and when presented at headquarters at the show will be validated. This rate holds good between February 2 and February 16. The territory embraced by the Central Passenger Association covers Indiana, Ohio, Michigan and part of Illinois, northern Kentucky, eastern West Virginia, western Pennsylvania and western New York. It is bounded on the east by Buffalo, Niagara Falls, Salamanca, Pittsburgh and Wheeling; on the south by the Ohio River, including Louisville, and on the west by a line drawn from Chicago through Peoria to and including St. Louis. The Central Passenger Association will invite the Trunk Line Association and Western Passenger Association to co-operate. Should they consent, the rate will apply to practically all parts of the country.

The list of exhibitors shows that fair proportion of the cars and accessories to be displayed were not exhibited at either of the metropolitan shows, and from a dealers' and manufacturers' standpoint the Windy City affair is already an assured success. Even though many deals for agencies, etc., were closed at the New York expositions, large numbers of tradesmen from all over the West and Southwest who did not get to the metropolis will be in attendance in Chicago. An immense amount of wholesale business is expected to be transacted by exhibitors.

That the Coliseum will be crowded with private individuals, owners of cars and prospective purchasers is a foregone conclusion. If the retail business done at Chicago equals that done at the Palace and Garden shows exhibitors will have plenty of reason to feel that the show has been worth while.

The usual quota of meetings (which are usually not well attended) has been scheduled. The directors of the N. A. A. M. will meet at 10 a. m. on February 9, and another meeting of importance will be that of the traffic department, attended by representatives of both N. A. A. M. and A. L. A. M., at which J. S. Marvin, general traffic manager of the three associations, will preside.

Reeves Says Detroit Will Not Get New York Shows.

According to Alfred Reeves, the new general manager of the Licensed Association, there is no great danger of New York not being able to hold automobile shows next year owing to a lack of exhibition space. Mr. Reeves was discussing the question last week, when mention of Detroit trying to steal the show away from New York next winter was brought up.

"It is true that Detroit is the centre of the motor vehicle industry in this country," Reeves said, "but as a sales point it is comparatively unimportant. New York, which produces few cars, is the sales market of the country, because the Eastern States absorb such a great proportion of all the cars built. Another feature, and one of the most important as regards the disposal of automobiles, is that the entire country is willing to take New York's verdict. Any make of car that attains a vogue here can be sold anywhere.

"There has been considerable talk of a dealers' show in Detroit in midsummer; that is, an open air show. Such an affair, I believe, would be of benefit and could be made a success. It would stimulate interest in a part of the season that is ordinarily dull from a selling standpoint. This year, too, a midsummer show would serve to introduce many of the 1911 models. A great many makers will start on their next year's production very early this season.

"As for the local shows, there is nothing disquieting in the situation. It is the intention to leave the Grand Central Palace standing until just before it is replaced by a huge building that will be available for all sorts of trade and other exhibitions. I do not think it will be torn down within two years, and when it does disappear another building will quickly take its place.

"No one seems to know definitely about Madison Square Garden, but the general impression is that it will remain standing for two or three years more, at least. At any rate the shows of 1911 are assured, and wherever they are held they will undoubtedly prove, as in the past, the most important in the country."

While it is true that certain interests in Detroit are endeavoring to transplant the big annual show, New York automobile men are of the opinion that the metropolis is destined to remain the greatest show and sales centre in America, and few of them believe that Detroit business men are serious in asserting Detroit can compete with New York in this respect.

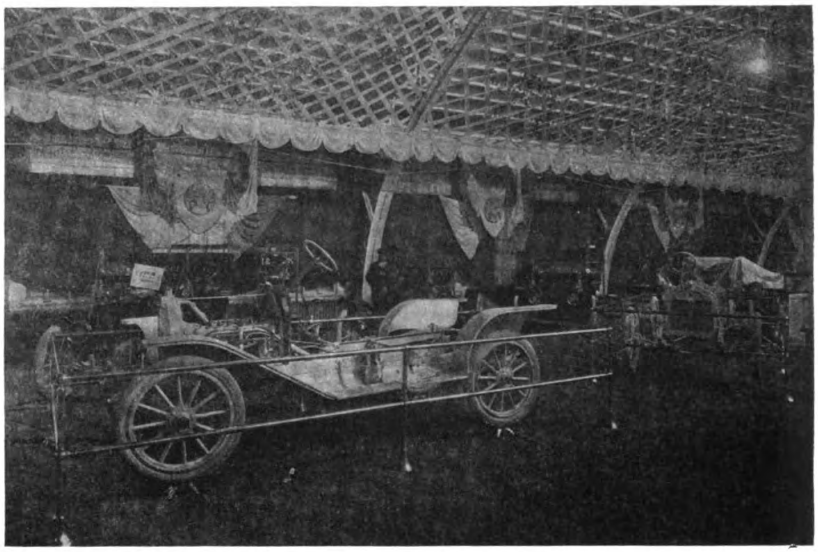
Detroit's Successful Local Show.

DETROIT, January 29.—The third annual show of the Detroit Automobile Dealers Association, which was held at the Wayne Hotel Gardens, January 24 to 29 inclusive, was by far the most successful in the history of automobile exhibitions held in this city. Indeed, it was probably the best local show so far held in this country. While great credit is due to the management for this success local conditions are extremely favorable for an automobile exhibition. Anyone who has not visited Detroit during the past six months cannot appreciate the enthusiasm which has been aroused there by the prodigious demand for cars and the unprecedented preparations to build them.

This enthusiasm was further increased during the show week by the announcement of plans for the erection of large factories by the Lozier, Hudson and Maxwell companies, and culminated in the appointment of a committee to formulate plans for an automobile exhibition of national scope to be held in Detroit in the near future. This proposed show may take the form of an open air exhibition at the State Fair Grounds in the early fall.

With these conditions prevailing it was natural that the attendance should be unusually good, as was the case; several times the hall was crowded almost to the danger point, and even on Society Night, when the admission was increased to $1.00, there was a good crowd.

The decorations were very similar to those of a year ago. On the lower floor the spaces were divided by aisles formed by green latticed posts set with pattern stained glass above and lighted by incandescent bulbs. The aisles were covered with trellises which supported vines and roses.

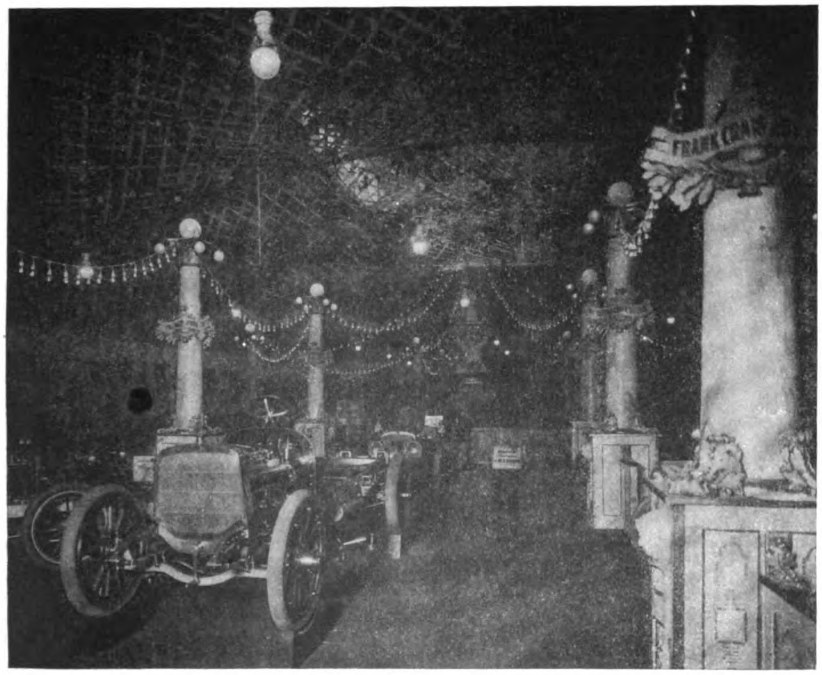


E-M-F STAND AT DETROIT SHOW.

The upper room had no marked divisions, its arched roof being trellised and ornamented with vines and roses. The most prominent ornament was a large central fountain surrounded by cusioned seats. Staff pillars and statues were liberally used. The lighting was unusually good, being both by arcs and strings of incandescents. The general color scheme was white and gold, with green for the floor and a touch of green in the marble of the grand stair case.

This year's show differed from previous exhibitions in being devoted exclusively to automobiles. There was not room to include any accessories or motorcycles and the only accessories shown were one or two which are used on prominent makes of cars, which were demonstrated to better explain the cars in operation.

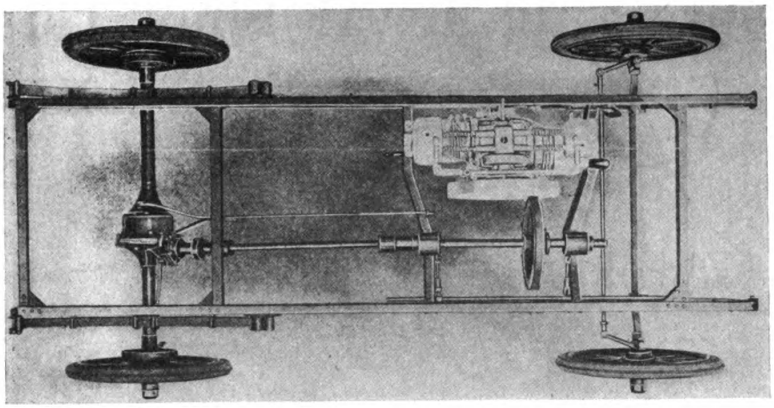
Sales are reported to have been very good, and many contracts were closed with dealers in outlying territory. A list of the cars exhibited follows. It will be noted that a number of new machines were exhibited and particular attention is called to the fact that several of them are commercial vehicles. The following are the leading features of these cars, which will be more fully described in subsequent issues as complete data becomes available.



GENERAL VIEW IN THE DETROIT SHOW.

DETROIT-DEARBORN.

This car is characterized by a low centre of gravity, which is obtained by a double frame, large wheel diameter, and good road clearance. It is shown with runabout and torpedo bodies. The motor is a four cylinder with pair cast cylinders and valves on opposite sides. It is cooled by the thermo-siphon system, and uses the Mea magneto for ignition. The clutch is of the expanding type. The change gear is of the sliding selective pattern. A straight tubular axle is used in front and an American ball bearing axle at the rear. The front springs are semi-elliptic, 2x36 inches. The rear are three-quarter elliptic, 2x42 inches.



PLAN VIEW OF VAN DYKE DELIVERY WAGON CHASSIS.

The wheel base is 112 inches, and the tires are 36x3½ inches.

WELCH-DETROIT.

This car is built by the Detroit branch of the Welch company, which has built high powered cars in the neighboring city of Pontiac for a long time. It is powered by a four cylinder, 5x5½ inch engine, rated at 50 horse power. Its valves are on opposite sides, and the cylinders are cast in pairs. The change gear is a three speed, sliding selective. All of these features are departures from previous Welch practice. The body is a seven passenger touring. The wheel base is 122 inches, while the tires are 36x4 front, and 36x4½ rear.

The Michigan Steam Motor Company, of Pontiac, Mich., exhibit the steam truck which we described in a recent issue.

TEMPLETON-DU BRIE.

This is a light delivery car, with its motor placed under a hood in front. Its hood, seats, and top are similar to those of pleasure vehicles, and the open delivery body is made so that the flaring sides can be removed an dextra seats placed across for carrying passengers. The motor is a two cylinder, vertical, two-cycle one. The pistons have two diameters, with 4½ inch working bore and stroke. Precompression of the charge takes place in the annular chambers above the 6 inch diameter of the lower portion of the pistons. The pressure is raised to 40 pounds in this chamber and the mixture is transferred through a port and inclined passage to the working chamber of the other cylinder, where the compression is increased to 70 pounds. Inlet from the carburetor is by automatic poppet valves. The transmission is a special form of planetary, mounted on the rear axle, with disc clutches. The smaller gears are on the outside of the larger. All parts are fully enclosed. The frame is of pressed steel. Front axle is an I section forging with ball bearing wheels. Semi-elliptic springs are used in front and platform at the rear. The steering is by a worm and sector gear. Equalized expanding brakes act on the rear wheels. Pedals are used entirely for control, they being interlocked so that no two speeds can be thrown in at the same time. The car is manufactured by the Templeton-Du-Brie Car Company, of Detroit.

VAN DYKE DELIVERY WAGON.

This delivery wagon, which is of 1,000 pounds, rated capacity, is manufactured by the Van Dyke Motor Car Company, of Detroit. The chassis is remarkable for its simplicity. The 4⅜ by 4 inch opposed cylinder, water cooled, motor is placed near the front of the frame and at one side with its cylinders fore and aft. A traveling friction wheel and universal jointed shaft connect it with the bevel driven rear axle. Ignition is by magneto, and lubrication by a force feed pump. Cooling is by vertical tube radiator, the water being positively circulated by a gear pump. The rear axle gears have a 6 to 1 ratio, as the car is designed for slow speeds. Hyatt roller bearings are used at the rear wheels and ball bearings at the front. The front axle is an I section forging. The frame is of pressed steel. Steering is by a rack and pinion gear.

The wheel base is 86 inches and the tread 56 inches. Thirty by 3½ inch tires are fitted, either solid or pneumatic at the purchaser's option.

LIST OF EXHIBITORS.

Frank Craig, Abbott-Detroit; Grant Brothers Auto Co., American Simplex and Chalmers-Detroit; Anhut Motor Car Co., Anhut Six; J. P. Schneider, Baker electric, Pierce, Stevens-Duryea; Brush Runabout Co., Brush; Buick Motor Co., Buick; Cadillac Motor Car Co., Cadillac; Cartercar Co., Cartercar; J. B. McIntosh Auto Co., Cole and Lambert; Anderson Carriage Co., Detroit electric; Detroit-Dearborn Motor Car Co., Detroit-Dearborn; Harper & Aldrich, Demotcar; Neal-Kitchel Motor Sales Co., De Tamble and Jarry; Cunningham Auto Co., E-M-F "30" and Flanders "20"; Fee-Bock Auto Co., Elmore, Waverley and Overland; Ford Motor Co., Ford; Auto Commercial Co., Grabowsky trucks; Broadway Auto Co., Haynes; J. H. Brady Automobile Co., Hudson and Peerless; Herreshoff Motor Co., Herreshoff; R. W. Keeler, Hupmobile; Seidler-Miner Automobile Co., Jackson; P. W. Schulte & Co., Kissel-Kar; Detroit Motor Sales Co., Keystone Six, Paige-Detroit and Warren-Detroit; Gilmore & Fear, Krit and Mitchell; Lozier-Detroit Motor Car Co., Lozier; Maxwell-Briscoe-McLeod Co., Maxwell; Michigan Motor Car Co., Michigan Six; Michigan Steam Motor Co., Michigan steam trucks; Oldsmobile Co., Oldsmobile; Bemb Auto Sales Co., Palmer-Singer; W. A. Paterson & Co., Paterson; Standard Auto Co., Packard; Rapid Motor Vehicle Co., Rapid trucks; William F. V. Neumann & Co., Rauch-Lang electrics and Stoddard-Dayton; Regal Motor Sales Co., Regal; Gillespie Auto Sales Co., Reo and Thomas Flyer; Palmer Auto Co., Stearns; Templeton-Due Brie Car Co., Templeton-Du Brie trucks; Winton Motor Carriage Co., Winton; Michigan Motor Sales Co., Welch; Van Dyke Motor Co., Van Dyke.

Washington's Show Pleased.

Thirty exhibits of new 1910 models graced the opening of the Washington, D. C., sixth annual automobile and aeronautical show at Convention Hall, Monday, January 24. The hall being draped with thousands of yards of bunting of the national colors, the show was given a highly patriotic setting. From the start the show was well patronized by the élite of Washington, as well as the trade in that vicinity. A large proportion of the visitors during the week were women. Glaring colors and freak designs in bodies were missing. Very few of the extreme styles of torpedo body shown at the New York exihibition were present.

Among the accessories displayed there were many of the new things which were shown at Madison Square Garden and the Grand Central Palace three weeks ago, and much interest was taken by visitors in this department. In addition to motor cars and accessories several motor boats were also displayed, while a feature of the show was the aeroplane and glider exhibit.

Gasoline pleasure cars displayed included the Peerless, Chalmers-Detroit, Locomobile, Packard, Stearns, Oldsmobile, Overland, Palmer and Singer, E-M-F, Buick, Hudson, Stevens-Duryea, Flanders, Royal Tourist, Welch, Hupmobile, Cadillac, White, Pierce-Arrow, Franklin, Speedwell, Brush, Studebaker, Ford, Marion, Reo, Premier, Moon, American-Simplex, Oakland, Regal, Matheson, Pope-Hartford, Winton, Elmore and Mora. The electrics included the Studebaker, Waverley, Baker, Rausch & Lang and Woods.

Notes of Local Shows.

The first annual automobile show in Grand Rapids, Mich., will take place February 17, 18 and 19, and twenty-seven makes of cars will be exhibited. Drawings for space at the Furniture City's exhibit took place last week, and nearly all the local agents of well known cars will have booths.

Hartford, Conn., will have two shows running simultaneously during the week of February 14-19, one in Foot Guard Hall, under the auspices of the Hartford Automobile Dealers' Association, and the other in the First Regiment Armory, run by the Connecticut Automobile Show Association, a co-operative body of manufacturers and dealers. The latter exhibition is not being run as a rival of the regular established Hartford show, but it is being held rather to accommodate the large number of cars and manufacturers who desire to be represented and who could not find room at the Foot Guard show.

AUTOMOBILE LAW AND LEGAL EVENTS.

Recent Decisions.

QUESTION FOR THE JURY.

Where the plaintiff was "traveling east" and had gone through the narrow space to the right of the "Ghost Show," had passed between the "Snakes" and the "Crazy House," and was trying to pass in front of the "Holy City" in an automobile when the streets were partially occupied by a street carnival after night, and there was no light on either the inside or the outside of the "Holy City," and the automobile came in contact with guy ropes and tentpins of the "Holy City" which were in the street, and the auto sustained an injury in the region of its mechanical viscera, besides other injuries, not fatal, but more or less serious, it was held that the question of negligence and contributory negligence was one for the jury. It was further held that an ordinance in regard to drivers of automobiles in relation to animals hitched to vehicles was properly ruled out as evidence, as the "Holy City" would not be regarded in the same class as animals hitched to vehicles. There was no error in allowing proof that the tentpins were removed after the accident, where it was not for the purpose of proving an admission, but was for the purpose of showing that the tent could be held secure by pins in another place.—Great Cosmoplitan Shows vs. Petty, Ga. App., 66 S. E., 624.

FAILURE TO DISPLAY REAR LIGHTS.

The defendant was operating his automobile during a certain period in a public street of the city of Rochester, having no red light visible from the rear; his vehicle was equipped with the ordinary tail lamp, which had been lighted but the light for some unexplained reason had gone out; the two lamps showing white lights in front, as required by the statute, were burning; these lamps, as is usual, had red glass in the back; the defendant testified that "the rear of the tonneau extends out so far that the front lights cannot be seen from the rear." Conviction in the police court. This was affirmed by the county court and affirmed in Appellate Division, People vs. Bauer, 133 A. D., 939 (mem. only). The construction in the county court was that the statute applied without regard to intent or the cause responsible for the condition, and the failure to keep the light in the rear burning rendered the defendant liable.

GARAGE OWNER'S CLAIM.

In an action for storage at a garage, and for work, labor and services and material, where the answer was a general denial, it was held error to allow the defendant to prove the loss of a spare tire attached to his car while the car was in the plantiff's garage.—Empire State Garage vs. Carroll, 120 N. Y. Supp., 41.

CONTRIBUTORY NEGLIGENCE ON THE PART OF A CHILD.

Where a child, too young to be allowed to testify, was injured by an automobile at a crossing where no warning was given, and the machine was going fast, it was held that the child could not be held to the same degree of care as a mature person, and it was a question for the jury whether he had exercised the proper degree of care, and a demurrer to the complaint on its merits was error.—Goss vs. Foster, 134 App. Div., 243.

ON WRONG SIDE OF ROAD.

A pedestrian was held not guilty of contributory negligence where he did not look for an automobile that was approaching on the wrong side of the road. Bradley vs. Jaeckel, 119 N. Y. Supp., 1071, Lehman, J., dissenting, said: "To affirm the verdict of the jury we must hold that where a person crosses a street without looking for approaching vehicles, he is not guilty of contributory negligence if he is struck by a vehicle on the wrong side of the street where he had no warning of its approach. Such a doctrine appears to me both unreasonable and without authority."

Indiana Road Law Ruling Reversed.

The Supreme Court of Indiana has handed down a new opinion to the effect that the law under which roads have been built by taxation is valid. In November the court held that the same law was unconstitutional, but consented to a rehearing, with the result stated. The opinion is in the case of Samuel M. Smith against the county commissioners of Hamilton County, who sought, among other things, to prevent the commissioners from making a road bond issue on the ground that it was unconstitutional.

Under the law fifty or more residents of a township may petition the commissioners for the construction or improvement of a highway. If the petition is granted the commissioners issue bonds to meet the cost, and later the county is reimbursed by a general tax in the township in which the work is done.

Much stress was laid on a section of the law, which it was said restricted road work to certain townships, reading as follows:

"Whenever a petition signed by fifty or more freeholders and voters of any township in any county of this State, includes any incorporated town or city in such township, having a population of less than 30,000 inhabitants, praying for the improvement of a highway, etc."

The court held that this section should read "including," which would make the law general, and also apply to any incorporated city or town of less than 30,000 population.

An opinion has also been handed down that the 3 mile gravel road law is valid. Under this law, upon the petition of fifty freeholders or voters in any township, a road of not more than 3 miles in length, connecting with an improved highway at each end, may be built by the county commissioners without presenting the question to a vote of the township. This law was also held invalid in November.

When the former opinions were given all road work in Indiana was stopped, and the only method left to build roads was by assessments against abutting property. About $2,000,000 worth of work was under way at the time, and the validity of about $10,000,000 worth of road bonds was questioned. There is general approval over the State at the new opinion of the court, which will permit the good roads work to continue.

Investigation of Geo. L. Odenbrett's Death.

Further investigation is being made to determine the responsibility for the death of George L. Odenbrett, a prominent automobile dealer of Milwauke, Wis., who was killed by the explosion of a recharging tank in the plant of the Gas Tank Recharge Company, owned by him and John Heber, last November. The tank was manufactured by the Autolux Manufacturing Company, of Milwaukee, officers of which were the principal witnesses at several hearings held late last week. The district attorney called four experts, as follows: J. E. Smith, chemist for National Board of Underwriters; A. C. Morrison, secretary of the International Acetylene Association; Prof. H. M. Moorehead, of People's Gas Company, Chicago, and Prof. G. G. Pond, of the Pennsylvania State College. No verdict has yet been rendered, and it may be several days before this can be done because of the great mass of evidence.

National Legislative Convention.

February 15 to 17, inclusive, are the dates scheduled for the National Legislative Convention of the A. A. A., to be held at Washington, D. C. The chief object of the meeting will be to show the great need for action on the part of legislators on the Federal registration automobile bill, which, if passed, will enable an owner, after conforming to the automobile regulations of his own State, to secure national registration for his machine at a nominal fee. He will then be at liberty to tour through any part of the United States without the nuisance of taking out licenses in various States as he crosses the border line.

Various governors of States have appointed delegates to represent them, indicating that these executives are interested in this

Federal bill, which was introduced into Congress by Congressman W. W. Cocks. Senator Chauncey M. Depew of New York has been invited to deliver the opening address to the delegates and State representatives, and Vice President James S. Sherman has been asked to speak, and has consented. Other well known speakers include Senator A. J. Beveridge of Indiana, Congressman John Dalzell of Pennsylvania and Hon. Frederick C. Martingale.

The convention will take place in the New Willard Hotel, and on February 10 headquarters will be established there in charge of Chas. Thaddeus Terry, chairman of the legislative board of the A. A. A.

Question of Exemption of Municipal Autos.

State Registrar of Automobiles Fred H. Caley has requested Attorney General Denman of Ohio to render an opinion on the question whether a municipal automobile is exempt from the payment of the registration fee. When Columbus purchased several automobiles for the use of the fire department several years ago, Secretary of State Thompson ruled that the car need not be registered. But since that time many other cities have purchased automobiles for many municipal departments, and the question has assumed a different phase. Now they are aften taken outside of the city limits, and used for pleasure, and an effort will be made to have them come within the provisions of the law, to afford proper identification in case of accident.

Want Exchange of Courtesies.

Reciprocity in motoring regulations between the States of Pennsylvania and New Jersey came up for hot discussion at the annual meeting of the Century Motor Club of Philadelphia last week. Members of that club are anxious to bring New Jersey to its senses relative to the interchange of courtesies, for Pennsylvania reciprocates with other States in the matter of licenses. New Jersey refuses to recognize tags of other States, every driver of a motor car within its bounds being required to take out a New Jersey license. Yet many automobiles are seen daily upon the streets of Philadelphia carrying only a New Jersey tag, which is contrary to the law. The club has asked the director of public safety of Philadelphia to prosecute these offenders, and hopes ultimately to come to some agreement with the lawmakers of New Jersey.

Proposed Milwaukee Garage Ordinance.

A new garage ordinance is being considered by the Building Commission of Milwaukee, Wis. It forbids a garage being maintained in a building occupied as a dwelling, a hospital, theatre, dancing academy, roller rink, church, school, boarding or tenement house, or any place of public assemblage. The only exception is that a private garage may be located in a building occupied in part as a dwelling for the family of the owner or lessee.

The ordinance also provides that garages built in the future must be of fireproof construction and located at least 20 feet from other buildings. Gasoline storage tanks are to be located with the approval of the chief of the fire department and must consist of steel. If the ordinance becomes a law Milwaukee motorists believe the garage fires will become much less numerous.

Manufacturers' Serial Numbers to Be Given in Ohio Licenses.

The Ohio State Automobile Department has made a ruling for 1910 licenses which provides that the manufacturers' serial number must be given in the application, or the blank will be returned for revision. This action is taken in order to put a stop, if possible, to the wholesale stealing of motor cars. It is believed that by giving the manufacturers' number a better means of identification of stolen cars is afforded, and that reports of stolen cars will not be so numerous. The usual custom is to dismantle stolen cars and to use several to manufacture other automobiles which cannot be identified.

Taximeter Inspection in Chicago.

Chicago, Ill., following the example of Boston, Mass., is holding a rigid inspection of taximeters. John Kjellander, the city sealer, intends to determine positively whether or not the figures recorded on the various machines are accurate records of the distance traversed, and of the time, which are the basis of the charge to the passenger. All drivers are obliged to send their meters to the sealer's office, and if found correct they will be returned officially sealed. If found to be inaccurate the sealer's office will adjust them correctly and return them to the owners under seal, Any driver operating with a broken seal will be prosecuted.

Legal Notes.

Orders have been issued in Dayton and Cincinnati to arrest all auto owners or drivers operating motor cars without the 1910 number plates after February 1.

In Columbus Director of Safety McCune has issued orders that all cars must be provided with number plates after February 10, when the city will start to enforce the horse drawn vehicle license. Several cities in Ohio have been making wholesale arrests during the past few weeks.

The recent decision of Pennsylvania State authorities that every person who drives a motor vehicle in that State must have a driver's license unless he or she is the actual owner of the machine, has aroused considerable criticism among Pennsylvania automobilists. It is reported that some of the clubs are preparing to try out the interpretation of the new law by bringing test suits against the State Highway Department.

Licensed Dealers Committee Named.

Percy Owen, temporary chairman of the Association of Licensed Automobile Dealers, in New York City, has named the Committee on Permanent Organization, appointed by him in accordance with a resolution passed at the first meeting of the dealers. The members of the committee are: Gen. John T. Cutting, Oldsmobile Company, of New York; W. B. Hurlburt, E. R. Thomas Motor Company; Frank Eveland, A. G. Spalding & Brothers; Robert Slusser, Harrolds Motor Car Company; Percy Owen, chairman, Carl H. Page & Co.

This committee, which includes two ex-presidents of the New York Automobile Trade Association, is carefully going over the problem which will confront the Licensed Dealers' Association and endeavor to draw up such constitution and by-laws as will make the organization entirely satisfactory to all the members of the trade. A report will be ready for the meeting to be held at the Automobile Club of America, Wednesday, February 2.

A. C. A. Banquet Amid Aeroplanes.

With covers laid for 600 guests, the banquet of the Automobile Club of America, which took place at the Waldorf-Astoria, Monday evening, January 31, was the largest and most successful ever held by that organization. Judge E. H. Gary presided and speeches were made by Martin W. Littleton, Lawrence Y. Sherman, Lieutenant Governor of Illinois; Charles A. Towne and Charles F. Moore. The former of these speakers remarked that he did not wish to startle the guests but that he thought the automobile was "an organized, sporadic, uncontrolable device of the devil." Novel decorations in the form of aeroplane models, including Santos Dumont monoplanes, two Curtiss monoplanes, a pair of Paulhan's and a Bleriot, made the large hall most attractive.

Goodrich Tire Company's Annual Meeting.

At the annual meeting of the stockholders of the B. F. Goodrich Company, of Akron, Ohio, it was said that plans have been approved for spending about $1,000,000 during the coming year in betterments and additions to the plant. Several six story additions will be built on Falor street, similar in design to the additions erected during 1909.

Walter A. Folger, treasurer, retired from that position, and his place was taken by W. A. Means, former assistant treasurer. Secretary C. B. Raymond was given the adtional title of assistant treasurer. Other officers remained the same, as follows: B. G. Work, president; F. H. Mason, first vice president; H. E. Raymond, second vice president, and E. C. Shaw, general manager. The usual quarterly dividend of 2½ per cent. was declared.

GARAGE AND SALESROOM.

Some Vermont Garages.

By A. C. W.

Since early fall I have been considering starting a garage in a town in Vermont where only forty or fifty automobiles are owned. I was somewhat familiar with city garages, but the problem of operating a garage in a small town seemed different in several respects, especially in that the small amount of work and smaller number of "regular boarders" would make it necessary to restrict the equipment rather narrowly, lest the interest on the investment should eat up all the profits, if not all the income, of the shop. So in order to find out about what equipment and stock was found most essential in a small shop I resolved to visit a number of such shops. Since early in October I have visited ten garages in six different towns in Vermont. This probably includes nearly all the garages of any importance in the State, and they range from some that compare very favorably in size, architecture and equipment with those found in much larger cities to small wooden buildings equipped with little but windows and a gasoline tank.

I am writing out what I saw for THE HORSELESS AGE, thinking it may be of interest not only to garage men but to the increasing number of tourists who take pleasure in the beautifully varied scenery and clear, bracing air of the Green Mountains. The order observed below is simply that in which I visited the various garages.

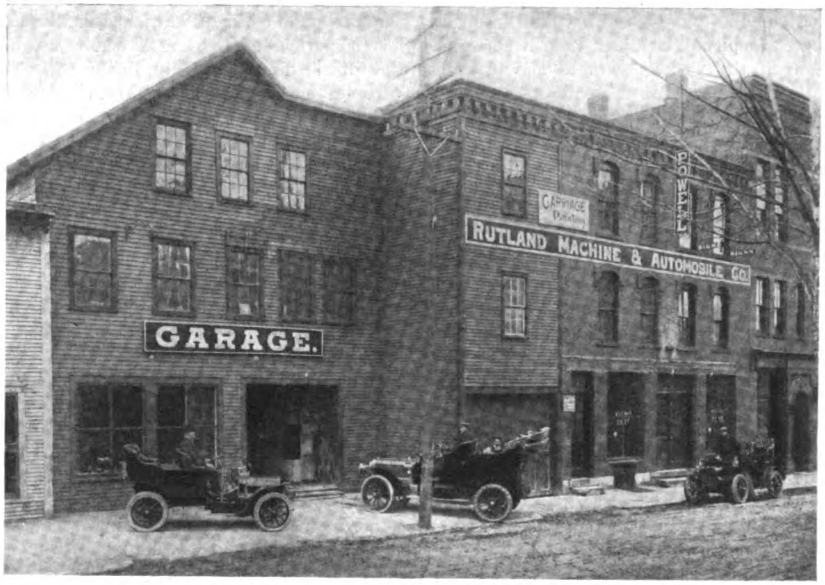
THE RUTLAND GARAGE COMPANY.

As briefly noted in THE HORSELESS AGE some weeks ago, the Rutland Garage Company is a recent consolidation of several garages formerly doing business in Rutland. At the time I visited there the building was being overhauled and new equipment was to be put in, so the present description must necessarily be incomplete. The brick building is located on Willow street, about two or three blocks from the railroad station, and seems admirably adapted for the purpose. It has a frontage of 75 feet, with a large door near the centre, and the concrete floor is at about the street level. The building is nearly 70 feet deep and a roomy office is provided in one of the front corners, somewhat raised above the garage floor. Practically all of this floor is available for live storage. The second floor is of wood and is reached by an elevator. The machine and repair shop occupies one end of this floor for 30 feet and the rest is available for live or dead storage, as occasion may require. The shop was to be provided with machine tools, a pit, a steam vulcanizer for tires, and a mercury arc rectifier for charging storage batteries. The building is heated by steam, and the washstand on the first floor is arranged to use warm water for washing in the winter. Gasoline is stored in a tank of 10 barrels' capacity, from which it is drawn by a measuring pump. This company has State agencies for the Locomobile, Chalmers-Detroit and Hudson cars, and the agency for Studebaker cars in Rutland and Addison counties.

THE RUTLAND MACHINE AND AUTOMOBILE COMPANY.

About two blocks from the Rutland Garage Company, and about an equal distance from the railroad station, are located the Rutland Machine and Automobile Company, at 55 to 61 Wales street. Their building is partly wood and partly brick. Part of the first floor, that at the right in the photograph, is used for an office, where a stock of automobile and bicycle goods is kept. Above the office is a rather extensive tire repairing shop, fitted with two steam vulcanizers, where both automobile and tire repairing is done. The part of the building seen at the left in the photograph extends back from the street farther and provides the greater part of the floor space. The basement and first floor are used for storage purposes, while the second floor is devoted to the machine shop, 32x70 feet. This shop is provided with more equipment of machine tools and smal tools than any garage I have seen in Vermont. This is undoubtedly accounted for by the fact that considerable job work is done in the shop besides automobile repairing. There are four engine lathes, one turret lathe, two speed lathes, one milling machine, one planer, one drill press and two emery grinders. There is also a very large stock of drills, reamers, taps, etc., for a small machine shop. In this shop is a small direct current dynamo for battery charging, belted to a small alternating current motor which drives it.

The third floor is used as paint shop and storage loft. There are about 10,000 square feet of floor, of which about 4,500 feet are used for automobile storage, half as much for machine shop and tool room and the remainder for office, tire repairs, paint shop and loft. A pit is provided in the basement floor and there is an elevated track for cars in the machine shop. Washstands are in the basement and first floors, the latter with an overhead swinging arm. The floor of the basement is concrete, while the other floors are wood. An elevator run by electric motor communicates with all the floors, and part of the building is heated by steam.

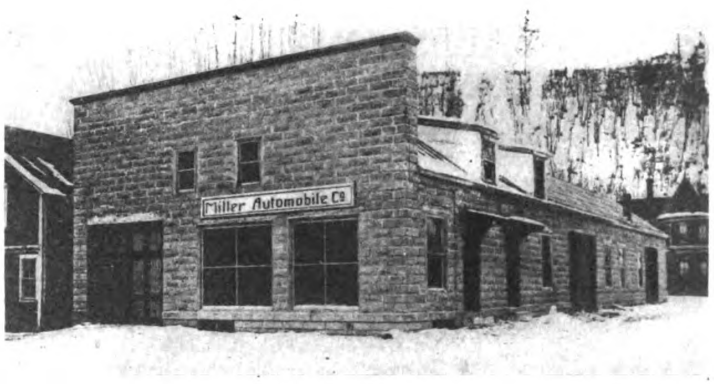


RUTLAND MACHINE AND AUTOMOBILE COMPANY, RUTLAND, VT.

This company has agencies for Franklin and Reo cars. The Vermont Marble Company, of Proctor, Vt., has been their customer for a number of the air cooled cars which are used by the officers and superintendents of the company in going about to their various shops and quarries.

VAN NESS GARAGE, BURLINGTON.

The garage business of Burlington seems to be divided up among the three leading garages in something like this manner: The transient tourists stop at the Van Ness Garage, which is situated back of the leading hotel. The repair work, replacing of parts, adjusting and general overhauling are done



MILLER AUTOMOBILE COMPANY'S GARAGE, WHITE RIVER JUNCTION, VT.

at George A. Collison's Garage, while the Vermont Motor Company sell most of the supplies and have the "regular boarders." Of course, more or less repairing is done at all these places, and they all sell tires and supplies, but the work could hardly be more completely classified than it apparently is if the various garages should enter into an agreement so to divide it.

The Van Ness House is located at the corner of Main and St. Paul streets, one block west from Church street, the main business street of Burlington. The Van Ness Garage is owned and operated by the same people who own and operate the hotel, and is situated back of the hotel, as mentioned above, with entrance from St. Paul street. The building is of slightly irregular shape, with nearly 10,000 square feet of ground surface, all on the first floor. The walls are of brick, the floor is of concrete, and except for some wood about the roof construction the whole building is fireproof. As shown in the photograph, most of one side consists of doors, thus making it possible to crowd in a larger number of cars in a busy day than could ordinarily be accommodated in the same space. The washstand is in a section of the building closed off from both sides by partitions and provided with an outside door. The office is not at the garage, but at 101 College street. The stock room is at the garage, with the usual line of tires, oils and sundries. Part of the building is heated for work in cold weather, and a pit is provided, but no machine shop, although I understand that some machines will be put in next year. A Bowser gasoline tank of 500 gallons capacity is provided. The Van Ness Garage has the agencies for the Premier, Mitchell and Reo automobiles.

THE GEORGE A. COLLISON GARAGE, BURLINGTON.

The garage of George A. Collison was one of the first opened in Burlington. It occupies a wooden building facing Maple street, between Church and St. Paul streets. The building has two floors, 30x60 feet, access to the second floor being by means of a rope elevator. Another building in the rear, 30x45 feet, is available for storage. The main building is heated by stoves during the winter. Two pits are provided on the first floor, while on the second floor are two lathes, 17 inches by 10 feet and 12 inches by 5 feet, respectively; also a speed lathe and a drill press. Mr. Collison has a large amount of overhauling and painting to do during the winter, having overhauled, he says, twenty-seven cars during the winter of 1908-09. In this garage I noticed what might be called a handmade crane, consisting merely of a wooden horse in the general form of a carpenter's horse, but 8 or 9 feet high, and with a beam of sufficient length to stand over a car and lift a body or engine by means of tackle blocks. Mr. Collison has no regular agencies for automobiles, but handles the Olds car as sub-agent.

VERMONT MOTOR COMPANY, BURLINGTON.

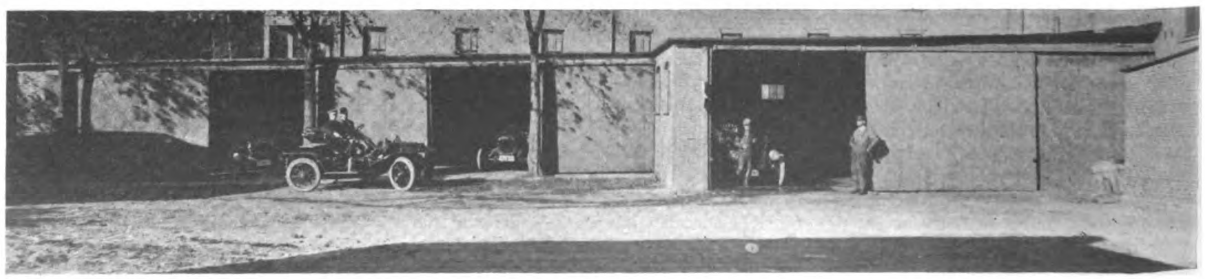
The garage of the Vermont Motor Company is situated on Winooski avenue, facing the Carnegie Library, between College and Main streets, and one block east from Church street. It is a one floor wooden building with about 3,000 square feet of floor space, all concrete. When I called there the office and machine shop were being heated by stoves, but they planned to install a steam heating plant later. The machine shop contained a 13 inch lathe, a Barnes drill and two pits. A Bowser gasoline tank of 445 gallons capacity is used here, the pump being located near the door, and provided with a hose to fill the tanks of automobiles directly from the pump. The Vermont Motor Company have agencies for the Maxwell and Jackson cars.

THE MILLER AUTOMOBILE COMPANY, WHITE RIVER JUNCTION.

The garage of the Miller Automobile Company is situated about one or two blocks west from the railroad station, which seems to be the main feature of the town. The building was constructed of cement blocks expressly for a garage. It is 36 feet wide and 100 feet long, with one concrete floor, and a gallery over the office, which is used for a stock room, and another gallery over the machine shop, where are located the electric vulcanizer and a mercury arc rectifier for battery charging. The offices are located in the front of the building, as seen in the photograph, while the machine shop is at the extreme rear with an outside door, and a door also into the central storage portion of the building. The shop is 30x36 feet and contains a lathe, a drill press and three pits. A steam boiler was being installed. Besides a stock room upstairs there is in the office a showcase containing an assortment of sundries and supplies. The washstand is directly back of the office, and is connected for hot water. The Miller Automobile Company has also a 40x75 foot garage in Woodstock, Vt., constructed also of cement blocks and used for storage purposes, Woodstock being a summer resort frequented by automobilists. They have agencies for the Pierce Arrow and Cadillac cars, and carry quite a stock of repair parts for the Cadillac car, of which they have sold a large number.

ARTHUR JONES, WINDSOR.

The garage of Arthur Jones is located on State street, a little way west from the State Prison. Mr. Jones began repairing automobiles in a small wooden building nearly three years ago, and has added to the building once or twice as the needs of his



VAN NESS GARAGE, BURLINGTON, VT.

business required, until he now has about 30x75 feet, with one concrete floor. One end of the building is devoted to a small office and stock room, the rest being available for repair work. A washstand and one pit are provided; also an engine lathe, a drill press, a forge and an electric vulcanizer. The building is heated by a stove, and the 300 gallon gasoline tank has a plain pump. Mr. Jones has no agencies, but carries a stock of tools, sundries and repairs.

GATES GARAGE, BELLOWS FALLS.

Gates Garage is located on Westminster street, just outside the main business square of Bellows Falls. The building is a wooden one, 35x60 feet, with one wooden floor and a basement, and is heated by the familiar stove. Mr. Gates was a carriage painter before entering the automobile business, and has made a specialty of painting and repairing cars. He has agencies for the Jackson, Buick and Ford cars, the last being, I believe, a sub-agency. He has a 288 gallon gasoline tank with measuring pump, and carries quite an assortment of supplies and oils.

THE E. R. CLARK AUTO COMPANY, BRATTLEBORO.

The E. R. Clark Auto Company are located near the lower end of Main street, not far from the railroad station. They occupy a brick building about 50x70 feet, with one wooden floor and basement. There are show windows on the main floor. The washstand is situated in one of the rear corners of the main floor and is provided with a concrete floor and a partition partially shutting it off from the main floor. A little office is located in one of the front corners, and a small stock room in the other front corner. They have a 600 gallon gasoline tank with measuring pump located at the back side of the main floor. They handle the Cadillac, Maxwell, Interstate and Empire "20" cars, and carry a line of spare parts for these cars. At the time I visited them they were assembling one or two cars from stock parts in the basement.

MANLEY BROTHERS, BRATTLEBORO.

Manley Brothers have a garage located back of the Brooks House on Main street near the corner of Elliott street. It is a single story brick building constructed for the purpose, with brick walls and concrete floor. The main building is 50x85 feet, with an office and stock room about 15x40 feet added to the rear. There is also a separate building 40x60 feet, available for storage. The shop contains a drill press and lathe, an emery wheel, an air pump and a gas forge. There are two washstands with hose at the sides, a Bowser pump with two gasoline tanks of a total capacity of 1,000 gallons, an electric vulcanizer for tubes and cases, and a mercury arc rectifier for recharging storage batteries. They have agencies for the Thomas, Rambler, Mitchell and Ford automobiles.

SUMMARY.

I found that the charges for storage, washing and work upon cars were fairly uniform throughout the State. The charge for storing a car over night was generally 75 cents or $1, and in one case only 50 cents for a small car. The business of keeping regular boarders seems very little developed in Vermont, charges being frequently only $5 per month for simple storage; in one case it was $8 per month, including washing once per week, and in another case $15 to $20 per month, including the necessary washing and polishing. The charge for washing a car was generally about $1, and 50 cents extra for polishing the brass.

Labor on cars was generally charged up at only 50 cents per hour, regardless of the ability of the workman, although in one case the apparently fairer method was adopted of charging 60 cents per hour for the labor of a first class man, while the work of a common laborer was billed at 30 cents per hour.

Most of the garages carry a considerable assortment of oils and of tires; the stock of tires or the sales for a single season in several cases amounting to about $3,000.

I had some discussion with various garage men about equipment, especially about machine tools, and found it the common opinion that no considerable investment in machine tools could generally be considered profitable in the small shop if a jobbing machine shop was conveniently available, because their machines stood idle so great a part of the time, but that it was very convenient both for themselves and their customers, especially if the job shop was not convenient.

Des Moines Dealers Band Together.

Des Moines, Ia., automobile dealers have organized the Des Moines Automobile Dealers' Association, chiefly for the purpose of assuring an annual automobile show for that city. Articles of incorporation of the new organization were filed January 23, with the following directors: T. J. Williams, Ross Clemens, Harold Wells, Dean Schooler, D. T. Patton and C. R. Prouty. Officers will be elected at an early date. Sixteen local dealers are at present members of the new organization. The first show under its auspices is scheduled for March 7-12.

Dealers' Association Items.

The Automobile Dealers' Association of Southern California at a recent meeting decided by a vote of 22 to 2 not to dissolve. For weeks the question of forming a new organization and burying the old had been under discussion, but the indications now are that all past differences on the part of various members will be forgotten, and they will work in harmony.

Reorganization of the Seattle Trade Dealers' Association occurred a few days ago, and the following officers were elected for this year: H. P. Grant, of the Seattle Automobile Club, president; R. P. Rice, Seattle manager of the Ford Motor Car Company, vice president; H. C. Fenn, of the Overland Autombile Company, treasurer; Fred Haines, Seattle agent for the Pierce-Arrow, secretary.

Garage Notes.

Long Beach, Cal.—The Pacific Garage, Cook & Shields, proprietors, have moved into their new garage at 30-32 Locust street.

San Bernardino, Cal.—An addition is being built to the Chino Garage, on D street.

Santa Rosa, Cal.—Davis & Mee, of San Francisco, will open a salesroom in the Glaudin Building at Fourth and Washington streets.

Denver, Col.—The Studebaker Automobile Company have moved into their new garage at 1515 Cleveland place. The building is 50x125 feet. The first floor contains the salesroom, and the upper floor has a complete shop for the manufacture of the company's batteries. A rest room for the employees is a feature of the new plant.

Washington, D. C.—Theodore Barnes, Jr., and David S. Hendricks have formed a partnership under the style of Barnes & Hendricks, to handle the Pullman cars, and have established an office in the Central Garage at 1310-12 New York avenue. Mr. Barnes was formerly connected with the Cook & Stoddard Company, Franklin agents, and David S. Hendricks was salesman for the Warner Motor Company, agents for the Crawford car.

Atlanta, Ga.—The Southern Motor Car and Truck Company have succeeded to the business of the Elmore Motor Car Company, and have moved from the old salesrooms at No. 218 Peachtree street to larger quarters at 158-60 Marietta street. The new location has 5,000 feet of floor space. The commercial motor truck branch of the business will receive special attention.

Chicago, Ill.—The Chicago branch of the Overland Automobile Company will remove this week from their present quarters at 1413 Michigan avenue to the new Overland Building, 2425 Michigan avenue.

Booneville, Ind.—The Booneville Foundry and Machine Works will erect a garage and repair shop on Third street.

Des Moines, Ia.—The Hawkeye Transfer Company have plans for the erection of a repository for automobiles and buggies, to cost $75,000.

Hutchinson, Kan.—Claud Giles and George Shears have formed the Auto Tire Repair Company, and will open for business on South Walnut street.

Wichita, Kan.—The Smyth Motor Car Company will move to 114 North Emporia avenue, as soon as the building is vacated by the Arnold Motor Company, next week. The Arnold Company goes to South Lawrence avenue.

Louisville, Ky.—An order has been issued from the building inspector's office that every garage in the city shall be examined as to its safety in respect to human life. It is claimed that gasoline and other combustible materials are kept in garages and the attendants are careless about handling them. In order that the exact condition of affairs may be ascertained, In-

spector Piazza will make a personal inspection of all the garages in the city.

New Orleans, La.—The Crescent City Auto Company will erect a garage at Lafayette and Dryades streets, to cost $26,000.

New Orleans, La.—The Myatt-Dicks Motor Company will build a garage at St. Charles and Julia streets.

Lewiston, Me.—Wade & Dunton Motor Company have moved into their new salesrooms at 16 Park street. They handle the Chalmers-Detroit, Overland, Thomas Flyer, Ford and Mitchell cars.

Boston, Mass.—W. M. Jenkins & Co., agents for the Mitchell, have doubled their quarters by adding 288 Columbus avenue to their old quarters at 286.

Newton Highlands, Mass.—A garage 150x75 feet will be erected on Walnut street, between the Simpson House and Stevens Block this spring.

Bad Axe, Mich.—The Thumb Auto Company opened their new garage last week, and will do a repair business in connection with the garage.

Detroit, Mich.—The Security Auto Company are building a 50x250 foot brick garage on Woodward avenue, south of Warren street. The company are now occupying temporary quarters at 868 Woodward avenue.

Duluth, Minn.—The West End Automobile Company will erect a garage on Superior street, between Seventeenth and Eighteenth avenues.

St. Louis, Mo.—C. F. & J. R. Brown have installed a charging plant in their garage on Belmar avenue and have taken the agency for the Detroit electric cars.

Springfield, Mo.—L. S. Atkinson is building a garage 60x100 feet, with a capacity of forty cars, which he expects to occupy about February 15.

Bember, Neb.—Fred Wiggers and Albert Toelle have purchased a plot on which they will erect a garage. Mr. Bogenhagen will have charge of the new enterprise.

Omaha, Neb.—The Kissel Automobile Company, a new branch to handle the Kisselkar, manufactured in Hartford, Wis., have taken temporary quarters at 2016 Farnam street. The firm is composed of Ralph Mansfield, H. W. Holtzinger and C. E. Holt.

Albany, N. Y.—The Mohawk Valley Auto Company, whose garage is on Sheridan avenue, have opened salesrooms at 78 Maiden lane.

Brooklyn, N. Y.—The Peerless Garage and Sales Company, sole distributors of Peerless and Mercer cars for Long Island, opened a new garage at 1523-25 Bedford avenue last week.

New York City, N. Y.—The Jackson Square Realty Company have filed plans for the construction of a six story and basement garage with a frontage of 72½ feet, and a depth of 126.4 feet, at No. 245-251 West Twelfth street, running through to No. 10-14 Jane street. The cost is estimated at $175,000.

Rochester, N. Y.—The Babcock Electric Company's garage was destroyed by fire on January 26, and twenty electric cars were more less damaged to the extent of $7,000. The fire originated in the boiling over of a pot of grease on a gas heater, which the night watchman and a boy were working over. The damage, it is said, will total $200,000, which is partly covered by insurance.

Hillsboro, N. H.—S. N. Baker is erecting a garage and repair shop in the rear of his block on Water street. He will also keep a full line of accessories and parts.

Winston, N. C.—The Motor Company will build an addition to their garage on Church street.

Kenmore, N. D.—John J. Willmott will open a garage and machine shop as the Kenmare Garage and Machinery Company.

Cleveland, Ohio.—The Sterling Motor Sales Company has been organized by J. C. Koepe, formerly superintendent of the White Company's garage. The new company will occupy temporary quarters at 606 Columbia Building for a few weeks, when they will move to the down-town district, where a building is now in course of preparation for them.

Columbus, Ohio.—The Reliance Truck and Garage Company, incorporated several months ago, has announced the organization as follows: Theodore Leonard, president; Andrew Timberman, vice president; George C. Bohn, secretary, and Frank Tray, treasurer. The company will open a garage and sales agency for the Reliance trucks at the corner of Third and Lynn streets.

Columbus, Ohio.—The O. G. Roberts Company, which opened a sales agency and garage on East Gay street a year ago has plans prepared for an addition to the establishment on which work will be begun as soon as the weather will permit. The present building is 80x150 feet and the addition will be 70x90 feet. The concern has recently taken the agency for the Courier in addition to the Stoddard-Dayton, Stearns, Marion, Jackson and Overland.

Columbus, Ohio.—The Burdell Automobile Company, agent for the E-M-F and the Flanders "20" will soon open a modern salesroom on North Fourth street.

Philadelphia, Pa.—Within a short time the Chalmers-Hipple Motor Company, who handle Chalmers and Hudson cars at Broad and Vine streets, will remove to a larger modern building at 206 North Broad streets.

Philadelphia, Pa.—J. B. Thompson has obtained a permit to build a garage at 6401 Sherwood road, for J. H. Casamare, to cost $6,500.

Philadelphia, Pa.—Frank P. Lapetina and Robert E. Connor have opened a garage at 1141 Broad street South.

Memphis, Tenn.—The Memphis Automobile Company are building a 50x143 foot garage and repair shop on Monroe avenue and South Fourth street, to cost $10,000.

Memphis, Tenn.—The Blomberg Automobile Company, recently organized, will occupy the garage being built at 415 Monroe avenue, by Robert York. It will be 150x60 feet, and of brick and steel construction.

Memphis, Tenn.—The Cullen-Butler Automobile Company will occupy one-half of the large double garage now in course of erection on Monroe avenue and South Fourth street. The building will have a terra cotta and plate glass front and will cost in the neighborhood of $25,000.

Nashville, Tenn.—F. O. Draughon, who was formerly connected with the Stearns Company in Toledo, Ohio, has opened an auto livery garage and repair shop at Seventh avenue and Broadway, and will do business as the Standard Motor Car Company.

Houston, Tex.—F. Lee Carroll Auto Company, with Russell Goss as manager, have leased the building on the corner of Travis street and Rusk avenue to be used as an exclusive salesroom for the Overland cars.

Waco, Tex.—Reeves & Rotan have taken a lease of 107 S. Fifth street and will open a salesroom. They will handle the Interstate car.

Norfolk, Va.—The Tidewater Automobile and Garage Company, Inc., now located at 115 West Main street, have had plans prepared for the construction of a modern fireproof brick garage on Tazewell and Boush streets, to cost $10,000.

Colfax, Wis.—The Ford and Brush will be handled in the country districts of northwestern Wisconsin by Ole G. Kinney, of Colfax, Wis., former member of the Wisconsin Legislature. Headquarters will be at Eau Claire, Wis. in connection with the Bonnell Carriage works.

Green Bay, Wis.—W. H. St. John has taken over the interest of J. C. Zimmerman in the Green Bay Motor Company. The garage on North Jefferson street has recently been enlarged, having now two floors 110x70 feet.

Marshfield, Wis.—Orrin Hughes has purchased a 52x88 foot lot on Second street, on which he will build a two story garage.

Seattle, Wash.—The Seattle branch of the Michelin Tire Company is now established in its new home at 701 East Pike street. J. M. Cummings is the local manager.

Stevens Point, Wis.—H. J. Finch, of Stevens Point, Wis., and Arthur Beijer, of Phillips, Wis., have formed the Beijer-Finch Company to handle the Ford in Portage, Waupaca and Wood counties. Headquarters are at Blake's garage in Stevens Point.

Cheyenne, Wyo.—F. R. Dildane, proprietor of the Capitol Avenue Livery Stables, has gone into the garage business, and is now proprietor of what was formerly known as the Cheyenne Auto and Supply Company, at 1710 Central avenue. Mr. Dildane is agent for the E-M-F and Studebaker cars.

AUTO SPORTS AND COMPETITIONS.

A. A. A. Contest Schedule for 1910.

A list of proposed contests for the coming season, from which the contest board of the A. A. A. will make up its official schedule, has just been announced by that board. Dates for ninety-five contests of various sorts have been applied for by various organization and placed on the tentative list for sanctions, being divided, viz: fifteen road races, fifteen hillclimbs, twenty-two reliability contests and forty-three track meets. The list with approximate dates is as follows:

RELIABILITY CONTESTS.

Philadelphia, Century Motor Club, ———.
Philadelphia, Quaker City Motor Club, April 15.
Denver to Mexico—Flag to Flag—G. A. Wahlgreen, May 1.
Hartford, Auto Club of Hartford, May 1.
Harrisburg, Motor Club of Harrisburg, May 2 to 7.
Norristown, Norristown Auto Club, May 18.
Fort Worth, Fort Worth Star-Telegram, May 22.
Detroit, Detroit Auto Dealers' Association, May 25.
National (Glidden) Tour, A. A. A., June 15-30.
Denver, Denver Motor Club, June.
New York to Seattle, M. R. Guggenheim, July 4.
Philadelphia to Wildwood, North Wildwood Auto Club, July 2.
Minneapolis-Tribune, Minneapolis Auto Club, August 1.
Munsey Tour, Frank A. Munsey Company, August 15.
Minneapolis, Minnesota State Auto Association, August 31.
Philadelphia to Wildwood, North Wildwood Auto Club, September 3.
Cleveland, Cleveland Auto Club, September.
Kansas City, Auto Club of Kansas City, September.
Louisville, Louisville Auto Club, October 8.
Chicago, Chicago Motor Club, October 15.
Denver, Denver Motor Club, October.
Worcester, Worcester Auto Club, October.

ROAD RACES.

Denver, Denver Motor Club, May 30.
Riverhead, Motor Contest Association, June 1.
Cobe, Chicago Auto Club, June 25.
Grand Rapids, Grand Rapids Auto Club, middle July.
Denver, Denver Motor Club, September 5.
Lowell, Lowell Auto Club, September 5.
Vanderbilt, Motor Cups Holding Company, October 1.
Fairmount Park, Quaker City Motor Club, October 8.
Savannah, Savannah Auto Club, ———.

HILL CLIMBS.

Atlanta, Atlanta Journal, February 22.
Kansas City, Auto Club of Kansas City, April.
Bridgeport, Auto Club of Bridgeport, May 30.
Wilkes-Barre, Wilkes-Barre Auto Club, June 11.
Worcester, Worcester Auto Club, June 4.
Cleveland, Cleveland Auto Club, June.
Ossining, Upper Westchester Auto Club, June 18.
Plainfield, Plainfield Auto Club, July 11.
Richfield, Richfield Springs Auto Club, middle July.
Algonquin-Chicago, Chicago Motor Club, middle August.
Denver, Denver Motor Club, November.
Minneapolis, Minneapolis Auto Club, ———.
St. Paul, Auto Club of St. Paul, ———.

TRACK RACES.

New Orleans, New Orleans Auto Club, February 5 and 6.
Montgomery (Ala.) Auto Association, February 12 or April 30.
Birmingham, Birmingham Police Relief Association, April 27.
Atlanta, Atlanta Auto Association, May 5, 6 and 7.
Indianapolis Motor Speedway, May 29, 30 and 31.
Boston, Bay State Auto Association, May 30.
Brighton Beach, Motor Racing Association, May 30.
Philadelphia, Quaker City Motor Club, June 4.
Columbus, Columbus Auto Club, June 14.
Indianapolis Motor Speedway, July 1, 2 and 4.
Dallas, Dallas Auto Club, July 4.
Cheyenne (Wyo.) Motor Club, July 4.
St. Paul (Minn.) State Automobile Association, July 4.
Wildwood, Motor Club of Wildwood, July 4.
Wildwood, North Wildwood Auto Club, July 4.
Wildwood, North Wildwood Auto Club, August 6.
Cheyenne (Wyo.) Motor Club, August 17.
Cheyenne (Wyo.) Motor Club, September 5.
Wildwood, Motor Club of Wildwood, September 5.
Wildwood, North Wildwood Auto Club, September 5.
Galveston, Galveston Cotton Carnival, July.
Kansas City, Auto Club of Kansas City, July 23.
Philadelphia, Quaker City Motor Club, August 6.
Indianapolis Motor Speedway, August 12 and 13.
Indianapolis Motor Speedway, September 2, 3 and 5.
Minneapolis State Fair, Auto Clubs of Minneapolis and St. Paul, September 5 and 10.
Providence, Rhode Island Motor Club, September 9 and 10.
Indianapolis Motor Speedway, October 7 and 8.
Dallas, Dallas Auto Club, October 25.
Atlanta, Atlanta Auto Association, November 15.
New Orleans, New Orleans Auto Club, November 5 and 6.
San Antonio, San Antonio Auto Club, November 6, 9, 13.

PACIFIC COAST.

ROAD RACES.

Santa Rosa, May 9.
Portland Rose Carnival, Portland Auto Club, June 11.
Santa Monica, Licensed Motor Car Dealers' Association of Los Angeles, July 4.
Mt. Baldy, September 10.
San Francisco-Portola, Auto Club of California, October 23.
Los Angeles-Phœnix, Maricopa Auto Club, November 24.

HILL CLIMBS.

Altadena, Licensed Motor Car Dealers' Association, Los Angeles, February 22.
Mile High Hill Climb, Redlands Mile High Hill Climb Association, November 24.

TRACK RACES.

Los Angeles (Cal.) Motor Racing Association, January 9.
Los Angeles (Cal.) Motor Racing Association, February 12, 13.
Los Angeles (Cal.) Motor Racing Association, March 12, 13.
Los Angeles (Cal.) Motordrome Company, April 8, 9, 10.
Los Angeles (Cal.) Motordrome Company, April 13.
Los Angeles (Cal.) Motordrome Company, April 15, 16, 17.
Los Angeles Cal.) Motordrome Company, twenty-four hour, April 30, May 1.
Santa Rosa, Santa Rosa Auto Association, May 15 (16).
Los Angeles (Cal.) Motordrome Company, May 29, 30, 31.
Los Angeles (Cal.) Motordrome Company, July 2, 3, 4.
Los Angeles (Cal.) Motordrome Company, Labor Day.
Seattle, M. R. Guggenheim, September 10, 11 and 12.
Spokane, Spokane Interstate Fair, ———.

Glidden Tour Plans.

The American Automobile Association has decided to retain for competition the historic trophy donated by Charles A. Glidden, of Boston, which has been contested for in all the Glidden tours of the past. At a meeting held last Wednesday the contest board decided to make this trophy the principal prize in the tour of next summer, which, instead of being known as the "Annual Reliability Contest of the A. A. A. for the Glidden and Other Trophies," will be called the "National Tour for the Glidden Trophy."

For a route the following has been selected: Starting from Cincinnati, contestants will proceed through Louisville, Ky.; Nashville, Tenn.; Memphis, Little Rock, Ark. Dallas, Tex.; Oklahoma City, Okla.; Wichita, Kan.; Topeka, St. Joseph, Mo.; Des Moines, Ia.; Cedar Rapids and Davenport, with the windup at Chicago. This will comprise between 2,200 and 2,300 miles, and there is a chance of part of the route being cut so as to make the contest even shorter.

Tire Contests Would Be Welcomed.

For the past few years a number of tire manufacturers have endeavored to get promoting organizations to run tire endurance contests in connection with reliability and other runs. While such competiton would doubtless be of considerable benefit to the producers of tires, none of the larger clubs or organizations has ever taken up the matter seriously. Manufacturers from time to time have wanted such a contest held in connection with the annual Glidden Tour of the A. A. A., and the contest board of the latter body has never seemed to approve of it.

Howard E. Coffin, chairman of the contest committee of the Manufacturers' Contest Association, is strongly in favor of a movement at present to bring about an automobile tire touring competition.

"I believe that tire matters should be settled in open competition on the big tours," said Mr. Coffin recently. "Trophies should be offered for tires in every contest, and rules should be formulated for such competition.

"I believe that the contest board of the manufacturers will insist, now that the matter has been brought to its attention, that the suggestion of the Goodrich Company be carried out. Carburetors, magnetos and other parts, and oil as well, will receive attention, and the makers who interest themselves in touring contests and racing contests to win honors will be made parties to an agreement to advertise only the facts in regard to their victories, in case these advertisements are misleading and make one

believe that the victories went in several directions. The tire situation in particular is of interest to the people who motor and to the makers, as all are anxious to have tires that will stand hard touring conditions. The recent Fort Worth, Tex., reliability run included a tire competition, which proved a success, and the promoters of the coming Flag to Flag Tour will have a similar one."

New Orleans Speed Carnival Entries.

Quite a classy field has been lined up for the first track race meet of the season, which will take place at New Orleans during the Mardi Gras Carnival February 5 and 6. Among the well known entrants are Geo. Robertson, with a new special 90 horse power Simplex; Ralph De Palma, in a 90 horse power stock Fiat; Robert Burman, Louis Chevrolet, Arthur Chevrolet, Joe Grennon and Joe Nelson, in Buicks; Geo. Clark and William Lynch, in Jacksons; Arthur W. Greiner, in a National; Barney Oldfield, Benz; Ben Kirscher, Darracq; "Speedy" Shaw, in a Knox, and others. A good sized list of events are on the program for the two days, and the rivalry between Robertson, De Palma and Oldfield in the free-for-all is expected to be especially keen.

Lowell A. C. Does Not Want Race.

At Lowell, Mass., it is reported that the Lowell A. C. does not wish to hold the National Stock Chassis Competition next fall under its own auspices, and while there is a possibility of this contest being repeated in September, the board of governors of the club do not want the responsibility of running it. At a meeting of the club held recently H. O. Heinze, who had much to do with the running of the last contest, favored a plan to the effect that twenty of Lowell's citizens guarantee $500 each toward the expenses required for promoting the race, and Heinze said that he would be one of the twenty, although he would have nothing to do with the carnival. The proposition did not meet with general favor, and for the present nothing further will be done by the club to renew the matter.

Oakland, Cal., Wants Climb.

Oakland, Cal., merchants and automobile dealers are giving their support for the hill climb which is to take place February 22, under the auspices of the Automobile Trades Association. A number of cups have been offered for winners in events for the longest climb; also for the steepest, and for cars with and without passengers.

Club Notes.

Representatives of twenty-two automobile clubs in Minnesota attended the annual meeting in St. Paul on January 19, as guests of the St. Paul Automobile Club. Following the reception, the latter club elected the following officers: Frank M. Joyce, president; Dr. J. A. Gage, first vice president; J. H. Hiheldaffer, second vice president, and L. A. Wood, secretary and treasurer.

An automobile club has been organized at Placquemine, Ia., with the following officers: John Deblieux, president; Dr. A. A. Allain, vice president; Henry Nadler, secretary and treasurer.

Canton, Ohio, has organized a motor club known as the Stark County Automobile Association, with a membership of about seventy at present. The club expects to join forces with the Ohio Automobile Association, and through that body become affiliated with the A. A. A.

New York State Automobile Association will have its next annual meeting in the clubhouse of the Long Island A. C., Brooklyn, N. Y., beginning March 18. Members of the club expect to give the State body a warm welcome, and are preparing a program of entertainment for them.

Four Days' Show for Denver.

February 23-26 are the dates selected for the Denver Motor Club's second annual automobile show, to be held in the Denver (Col.) Auditorium. A show committee consisting of C. P. Allen, chairman; Dr. Edward F. Dean and Wm. D. Nash was appointed by the board of governors recently, and this committee will have entire charge of all details connected with the exhibition. A display of both pleasure and commercial vehicles, trucks, buses, fire engines, etc., is expected to produce the largest automobile exposition ever seen west of Chicago. The price of floor space is 30 cents per square foot, and the club intends to rebate one-half the net profits to the exhibitors, on a pro rata basis.

Portland, Ore., Show.

Fully 2,500 persons visited the second annual Portland, Ore. automobile show, which opened Monday, January 24, and witnessed the most complete exposition of motor cars ever held in the far Northwest. The main hall of the Armory Building was illuminated with a myriad of incandescent lights and arc lamps, which made the highly enameled tonneaus and polished chasses present a brilliant spectacle. Fifty cars were reported sold on the opening night. A feature of the exhibition was the display of aeroplanes, including the Herring-Curtiss machine recently purchased by E. H. Wemme, a Portland capitalist and also the bi-plane of J. C. Burkhardt.

Robertson Will Not Sell Parry.

George H. Robertson, the racing driver, will not handle the Parry car in the metropolitan territory, as was reported two weeks ago. Robertson made a trip to the Parry Auto Company's factory in Indianapolis alst week, but failed to come to any agreement regarding the agency. When negotiations were opened it was thought that the Parry would become a licensed car.

Trade Personals.

Wallace Hood, who for the past few years has been manager of the Motor Car Company branch in Washington, D. C., has been made sales manager of the Chalmers-Detroit Motor Company.

F. A. Hall, formerly manager of the hoist department of the Yale & Towne Manufacturing Company, has joined the Cameron Engineering Company, 150-156 Berriman street, Brooklyn, as vice-president and treasurer.

R. T. Hodgkins has succeeded F. A. Hall as manager of the chain block and hoist department of the Yale & Towne Manufacturing Company, 9-13 Murray street, New York city. Mr. Hodgkins was Mr. Hall's chief assistant for some years.

C. Paul Tracy, who for the past four years has been with the Pittsburg branch of the Winton Motor Company as assistant manager, severed his connection with that concern February 1, to accept a position as secretary and treasurer of the Carnegie Fuel Company, with headquarters at Minneapolis.

H. A. Kaiser, who has been traveling through the East and Middle West for the Universal Auto and Motor Boat Supply Company, has accepted the agencies for a number of manufacturers and jobbers, including the Universal Auto and Motor Boat Supply Company and the Perfection Igniter Manufacturing Company, and has opened an office and salesroom at 1093 Bedford avenue, Brooklyn, N. Y.

Death of George J. Bradley.

George J. Bradley, one of the prominent men in the Diamond Rubber Company's sales organization, died at his home, No. 1920 East Ninty-third street, Cleveland, Ohio, at 1 p. m., Thursday, January 27, after a short illness of pneumonia. Mr. Bradley was manager of the Detroit and Cleveland branches of the Diamond company. Early the previous week he contracted a slight cold in Detroit. He reached Cleveland, Thursday, January 20, and spent the day in his office, and on Friday was too ill to leave his home. His condition grew rapidly worse and after a consultation of physicians on Monday pneumonia serum was administered but without success. He sank into unconsciousness Wednesday and remained in that condition to the end.

Mr. Bradley was a man of commanding individuality and exceptional strength of character. Although but thirty-one years of age he was a foremost figure among men identified with the automobile business, and held with the Diamond Rubber Company a position of great trust and responsibility. He had been with the company seven years, his initial experience having been that of salesman in the New York City branch. Five years ago he was made manager of the Cleveland branch and somewhat later the Detroit branch was also placed under his management.

NOTES OF THE INDUSTRY AND TRADE.

Miscellaneous Notes.

Thomas B. Jeffery & Co. will erect a new office building adjoining their present plant.

Oliver Brothers, Lockport, N. Y., are preparing to embark in the manufacture of automobile radiators, and have installed new machinery for this purpose.

Eastern Maine will have an automobile show at Bangor, in the Auditorium, on April 28 and 29, at which it is said a number of Boston dealers intend to exhibit.

F. H. Hinckley, of Mystic, R. I., has been appointed receiver of the West Mystic Manufacturing Company, who until recently were engaged in the manufacture of motor cars.

New officers of the Michigan Auto Body Company, Milford, Mich., were elected last week as follows: Jacob Stevens, president; Frank A. Black, vice president; William A. Gleason, secretary.

The National Automobile Mutual Insurance Company, of Boston, Mass., filed with the clerk of the House of Representatives a petition for a charter. It is the company's intention to do automobile fire and liability insurance exclusively.

S. J. Rowe, of Waynesboro, Md., head of the Rowe Motor Company, announces that the factory of that concern will be located at Martinsburg, Md. It is expected that building will commence March 1.

It is rumored that the General Motors Company are negotiating for the purchase of the plant of the H. H. Babcock Company, of Watertown, N. Y. George H. Babcock, president of the latter concern, however, denies that any deal is being made.

New officers of the Capital Machine and Auto Company, Sacramento, Cal., were elected on January 16 as follows: James G. Patterson, president; Geo. W. Lane, vice president; H. H. Sydenham, secretary and treasurer.

The Atlantic Motor Car Company, 227 West Fifty-seventh street, New York city, agents for the Stoddard-Dayton and Courier cars, have taken on the agency of the "New Era" autocycles, which are manufactured at Dayton, Ohio.

An automobile show will be held in Logansport, Ind., some time during March, the exhibit to be held in the Broadway Skating Rink. A number of dealers and manufacturers have indicated they will exhibit, including a number located in Indianapolis.

F. W. Conrad, of the Pacific Garage, Montesano, Wash., has written a letter to the Diamond Rubber Company, informing them that he has been using a set of their tires on a six cylinder, seven passenger Franklin car, and that these tires, according to speedometer records, gave the following mileages: Left front, 9,420 miles; right front, 9,348 miles; right rear, 9,188 miles; left rear, 9,179 miles.

The Cleveland Speed Indicator Company, Cleveland, Ohio, will move into the sales rooms at 1806 Euclid avenue. A new plant is to be erected in the near future. A. A. Grimes, formerly with the Warner Instrument Company, will have charge of the sales department.

S. E. Duff, of the Star Rubber Company, of Akron, Ohio, has concluded arrangements for the establishment of a branch in Nashville, Tenn. W. A. Anderson, of the Rock City Auto Company, has been chosen manager, with headquarters at Third avenue and Thomas street.

The Victor Manufacturing Company, of Detroit, and the Walkerville Carriage Goods Company, have closed a contract whereby the factory formerly occupied by the Imperial Rattan Company at Walkerville, Ont., Canada, will be utilized for the manufacture of automobiles by these two concerns.

The Hess-Bright Manufacturing Company will make a display of their H-B ball bearings at their recently opened Chicago branch, 1800 Michigan avenue, during the time of the Chicago automobile show, and will present engineering visitors with a slide rule, the same as they did at the New York Show.

The Hendee Manufacturing Company, of Springfield, Mass., are at present building two gasoline engines for flying machines in their shop on State street. One of these is a 25 horse power engine, and has four vertical cylinders, while the other is a 50 horse power engine, and has eight cylinders arranged in V fashion.

The R. J. Irvin Manufacturing Company, of Indianapolis, will erect a substantial addition to its new factory building immediately. The company manufacture bodies and tops, and recently moved into a new building, but has found it is not large enough. In order to extend the business the concern has increased its capital stock from $50,000 to $125,000.

The Seagrave Manufacturing Company, of Columbus, Ohio, have completed a modern two story fireproof addition to their plant, which will increase the floor space more than 16,000 square feet. The addition will be used to build the motors and propellers of the motor propelled fire apparatus which has become the most important part of the product of the concern.

As a result of several mass meetings held in Boston, Mass., a number of chauffeurs who do not pretend to belong to the "joy-riding-we-own-the-road" class have formed the Massachusetts Automobile Operators' Association, with J. Edward Connors, president; Harry Kroh, vice president, and Charles P. Buker, secretary. The object of the organization is to put a check upon the reckless and incompetent drivers in Boston.

Albany, N. Y., will have its first automobile show under military auspices during the week of March 7 to 12. At a meeting of the officers of the Tenth Regiment, National Guard, held last week, it was voted to hold the show in the armory, and plans for same definitely settled.

Among the companies recently admitted to membership in the Merchants and Manufacturers' Association, the leading commercial association in Milwaukee, Wis., are the following, all associated with the automobile industry: Jonas Automobile Company, agents for the Peerless and Cadillac; Davis Manufacturing Company, builders of antomobile engines, and Bartels-Maguire Oil Company.

New Incorporations.

The Chalmers-Hippe Motor Company, Philadelphia, Pa.—Capital stock, $50,000.

The Bergdoll-Hall Motor Car Company, Philadelphia, Pa.—Capital stock, $25,000.

The Carlson Motor Vehicle Company, Philadelphia, Pa.—Capital stock, $10,000.

The Bridge Street Auto-Garage Company, Manchester, N. H.—Capital stock, $10,000.

Woods Motor Vehicle Company, Chicago, Ill.—Capital stock increased from $150,000 to $300,000.

The Randolph Motor Car Company, Chicago, Ill.—Capital stock increased from $300,000 to $500,000.

The Blevin Manufacturing Company, Putnam, Conn.—Capital stock, $50,000. To manufacture auto parts.

The Totten Automobile Company, Rock Island, Ill.—Capital stock, $10,000. Incorporators, Frank Lynch, M. L. Totten, E. G. Don.

The Plymouth Garage Company, Chicago, Ill.—Capital stock, $2,500. Incorporators, John H. McGay, John J. Downey and Isaac N. Walker.

The Collins-Green Manufacturing Company, Detroit, Mich.—To manufacture wind shields. Capital stock, $10,000. Incorporators, R. E. Collins, Charles F. Green and others.

The Motor Car Conveyance Company, New York City, N. Y.—Capital stock, $100,000. Incorporators, C. E. Lockwood, East Orange, N. J.; A. Lee, Brooklyn, and J. W. Chapman, New York city.

The Hatfield Company, Cornwall-on-Hudson, N. Y.—To deal in automobiles. Capital stock, $125,000. Incorporators, D. H. McConnell, A. S. Hoyt, G. W. Blanelord, C. B. Hatfield and G. G. Brown.

The Hartford Automobile and Boat Supply Company, South Hartford, Conn.—Officers, J. Edward Oakes, president and treasurer; Wm. J. Rabbitt, vice president and

general manager, and George J. Stoner, secretary.

The Mutual Benefit Automobile Association, Augusta, Me.—Capital stock, $300,000. Incorporators, E. M. Leavitt, of Winthrop, and others.

Fairmont Automobile Company, Fairmont, W. Va.—Capital stock, $5,000. Incorporators, H. F. Smith, E. M. Showalter and H. D. Showalter.

Obenberger Drop Forge Company, Milwaukee, Wis.—Capital stock, $30,000. Incorporators, H. W. Ladish, John Obenberger and H. C. Fuller.

The Kilpatrick-French Motor Car Company, Lenanon, Ohio.—Incorporators, J. A. Kilpatrick, A. N. French, Albert French, Howard Ivins and C. Wilbur Ivins.

Auto Sales Company, Chicago, Ill.—Capital stock, $10,000. To deal in automobiles, engines, machinery, etc. Incorporators, H. S. Hawley, E. H. Bell, C. P. Coggeswell, Jr., and Victor Courtright.

The Merriam & Howland Auto Company, Amsterdam, N. Y.—Capital stock, $15,000. Incorporators, N. L. Finch, of Gloversville; W. J. Merriam, L. H. Howland, L. H. Finch and C. H. Inman, of Amsterdam.

The L. W. Thompson Company, Louisville, Ky.—To deal in automobiles.—Capital stock, $10,000. Incorporators, L. W. Thompson, J. F. Ecker, R. P. Thompson, of Gallipolis, Ohio, and James Fintze, Newark, Ohio.

The Canfield Transfer Company, Canfield, Ohio.—Capital stock, $50,000. To establish an auto bus and transfer business between Canfield and Youngstown. Incorporators, H. W. Corll, C. H. Neff, Melvin Neff and Lola E. Mock.

The business of the Garage Equipment Company, of Milwaukee, Wis., has been incorporated under the name of the Garage Equipment Manufacturing Company. The concern is capitalized at $100,000. G. F. Discher, Theodore Koerner and D. H. Discher appear as incorporators.

National Garage System.

The Buick Auto Supply and Garage Company (the National Garage System), with general offices at Saginaw, Mich., have just issued a printed map showing its proposed string of 443 related garages in twenty-one different States. This "garage trust," which expects to get more or less of a monopoly of the garage business of the country within a short time, now has representation in various cities in Michigan, Illinois, Ohio, Indiana, Pennsylvania, New York, New Jersey, Massachusetts, Wisconsin, Missouri, Iowa, New Hampshire, Connecticut, Rhode Island, Vermont, Delaware, Maryland, Virginia, West Virginia, Kentucky and Maine.

New Top Company for Detroit.

The Sterling Auto Top Company have filed articles of incorporation, and have bought outright the Auto Accessories Manufacturing Company, located at 144 Congress street, Detroit, Mich. The officers of the new concern are: Bert Morley, president and treasurer; Claire L. Barnes, vice president; W. F. Connolly, secretary. The policy of the company will be to extend the manufacture of automobile tops and wind shields. Additional equipment will be installed, so that a capacity of 200 wind shields and 150 tops a day may be secured. Mr. Morley has been identified with the industry for the past six years.

Matheson-Palmer & Singer Suit Settled Out of Court.

The suit for damages brought by the Palmer & Singer Manufacturing Company, of New York, against the Matheson Motor Car Company, of Wilkes-Barre, to which repeated references have been made in these columns, has been settled out of court.

New Agencies.

BIRMINGHAM, ALA.—W. H. Johnston, Rainier.

LOS ANGELES, CAL.—Glen D. Edmonds, Klinekar.

OAKLAND, CAL.—The Wagner-Renliff Motor Co., Twelfth street, Auburn.

OAKLAND, CAL.—C. H. Davis, Cartercar.

SAN FRANCISCO, CAL.—Frank O. Renstrom, Klinekar.

DENVER, COL.—The Monroe Motor Co., 1640 Broadway, Krit and Warren-Detroit cars.

DENVER, COL.—The Arapahoe Motor Co., 1942 Arapahoe street, Elmore.

HARTFORD, CONN.—Russell P. Taber, 1100 Main street, Knox.

INDIANAPOLIS, IND.—The Conduit Automobile Co., North Delaware street, Velie "40."

INDIANAPOLIS, IND.—The Reliable Auto Exchange, 820 Washington street, E-M-F.

TAMA, IA.—A. F. Meves, Moline.

LOUISVILLE, KY.—The Brown Automobile Co., National.

BALTIMORE, MD.—L. H. Ghaab, 116 West Mt. Royal avenue, Rainier.

BOSTON, MASS.—New England Motor Vehicle Company, 591 Boylston street, Rainier.

BOSTON, MASS.—White, Ware & Co., 1024 Boylston street, Corbin.

BAY CITY, MICH.—W. M. Martin, Brush.

DETROT, MICH.—Century Motor Sales Co., 1329 Woodward avenue, Beyster delivery cars.

DETROIT, MICH.—R. R. Montgomery, American.

DETROIT, MICH.—The Century Motor Sales Co., 1329 Woodward avenue, Beyster delivery wagon (for Michigan).

HUDSON, MICH.—J. A. Dillon, Brush.

JACKSON, MICH.—Jones & Record, Brush.

KALAMAZOO, MICH.—Kalamazoo Motor Car Co., Brush.

MARQUETTE, MICH.—The Pioneer Motor Co., E-M-F.

MENOMINEE, MICH.—P. B. Boyer, Brush.

PORT HURON, MICH.—George Yokem, Brush.

ADA, MINN.—Melberg & Nelson, Ford.

PELICAN RAPIDS, MINN.—Frazee Brothers, De Tamble (and for Fergus Falls).

REDWOOD FALLS, MINN.—C. F. Apitz, Ford.

ST. PAUL, MINN.—Bazile Auto Co., De Tamble.

ST. PAUL, MINN.—The Ramaley Auto Co., National and Viele.

KANSAS CITY, MO.—A. M. Wiker, Lanpher.

KANSAS CITY, MO.—Boyd Automobile Co., 3100 Main street, Sterling (for State of Kansas and western Missouri).

KANSAS CITY, MO.—The Monarch Motor Car Co., "Cole 30" and "National 40."

KANSAS CITY, MO.—Berger's Automobile Co., 1524 Grand avenue, E-M-F cars.

KANSAS CITY, MO.—Mells Motor Car Co., 624 East Fifteenth street, Lambert.

LINCOLN, NEB.—The Lord Automobile Co., Ford.

LINCOLN, NEB.—The Lord Automobile Co., Ford.

OMAHA, NEB.—The Kissel Automobile Co., 2016 Farnam street, Kissel car.

NEWARK, N. J.—Alexander Brunner, Klinekar.

ALBANY, N. Y.—R. M. Robinson, Rainier.

BROOKLYN, N. Y.—I. C. Kirkham, 1060 Bedford avenue, Hart-Kraft commercial wagons.

BUFFALO, N. Y.—George G. Buse, Moon.

BUFFALO, N. Y.—H. M. Colgrove, Klinekar.

KINGSTON, N. Y.—Deyo & Johnson, Klinekar.

NEW YORK, N. Y.—George H. Robertson, Parry.

SCHENECTADY, N. Y.—S. D. Ashley, Velie.

SYRACUSE, N. Y.—The watertown Auto Company, Ford, Winton Six, Pullman and Ford cars.

SYRACUSE, N. Y.—Edwin C. Ide & Co., Klinekar.

FARGO, N. DAK.—The Fargo Auto and Supply Co., Reo.

DAYTON, OHIO.—Speedwell Motor Co., Staver-Chicago.

CAMBRIDGE, OHIO.—Fritz Brothers, Hupmobile.

CHARLOTTE, N. C.—C. C. Coddington, Buick and Rainier.

CLEVELAND, OHIO.—Lucien O. Van Epp, 1926 Euclid avenue, E-M-F (for Cleveland and Cuyaboga County).

CLEVELAND, OHIO.—The Euclid Automobile Co., Atlas.

CLEVELAND, OHIO.—J. H. Greenwald, Moon.

COLUMBUS, OHIO.—Howald & Wilkinson, Buick and Welch.

KENTON, OHIO.—Kenton Auto and Electric Co., Hupmobile.

MARIETTA, OHIO.—Walter S. Wood, Hupmobile.

MILLERSBURG, OHIO.—William N. Crow (for Holmes County), Great Western "30."

YOUNGSTOWN, OHIO.—Eddy & Henderson, East Chalmers avenue, Brush.

ZANESVILLE, OHIO.—Fritz Brothers, Hupmobile.

PHILADELPHIA, PA.—The Automobile Repair and Sales Co., 911 North Broad street, Michigan Six.

PHILADELPHIA, PA.—H. E. Bradford, 134 Washington street, Selden.

PHILADELPHIA, PA.—The Krouse Motor Car Co., 317 North Broad street, Halladay.

PHILADELPHIA, PA.—The Collings Carriage Co., Rainier.

PITTSBURG, PA.—The Pittsburg Automobile Co., Grant Boulevard and Seventh avenue, E-M-F.

PITTSBURG, PA.—The Keystone Automobile Co., Marmon.

EL PASO, TEX.—P. L. Abel Cycle and Motor Co., 324 Texas street, Franklin.

BARTLETT, TEX.—C. M. Blair, Great Western "30."

MANITOWOC, WIS.—Hall Brothers, Kisselkar.

MARSHFIELD, WIS.—Orrin Hughes, E-M-F.

RACINE, WIS.—Jacob A. Bosustow, Reo (for Racine County).

SUPERIOR, WIS.—The Ross Motor Co., Overland.

Trade Literature Received.

Speedwell Motor Car Co., Dayton, Ohio.—Catalogue of Speedwell cars.

Peerless Motor Car Co., Cleveland, Ohio.—Catalogue of 1910 Peerless cars.

Firestone Tire and Rubber Co., Akron, Ohio.—Art panel calendar for 1910.

The Schacht Manufacturing Co., Cincinnati, Ohio.—Catalogue of "The Invincible Schacht-Mobile."

Michelin Tire Co., Milltown, N. J.—Catalogue of Michelin tires, demountable rims and tire sundries.

International Engineering Co., 1779 Broadway, New York City.—Catalogue of R. B. F. radial and thrust ball bearings.