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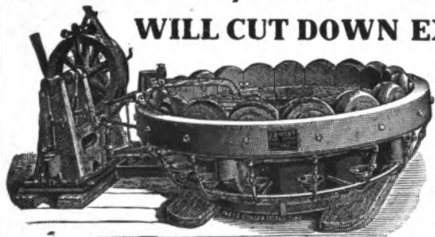
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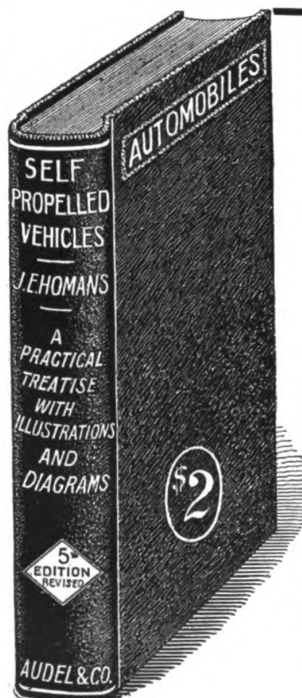
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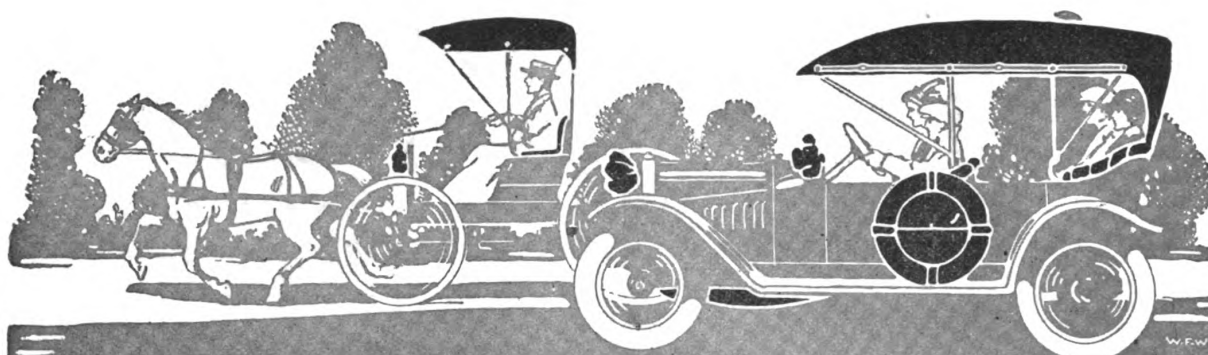
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The Hub

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FOREIGN REPRESENTATIVES:

FRANCE—L. Dupont, publisher of *Le Guide des Carrossiers*, 78 Rue Boissiere, Paris. Subscription price, 15 francs, postpaid.

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Combinations to Capture Foreign Trade

After a thorough examination, the Federal Trade Commission has recommended the authorization of industrial combinations in this country for the purpose of meeting the competition of similar industrial combinations authorized and aided by other nations.

Agreement is general among business men that combination in restraint of trade are an unmixed evil to the development of home trade and industry. In foreign trade, however, the situation is entirely different. Not only do other nations permit combinations for the exploitation of foreign markets, but they encourage them. The plans which have been adopted abroad for extension of foreign trade constitute a mobilization of industrial resources for the conquest of foreign markets.

In this warfare the United States is at a great disadvantage because its prohibition of industrial combinations extends to all such combinations, irrespective of whether they are formed to control the home market or to gain a foothold in foreign markets. One of the purposes for which the Federal Trade Commission was created was to conduct an inquiry into foreign trade conditions and to make a recommendation as to what action, if any,

should be taken to enable American industries to compete for foreign trade under the most favorable conditions. Congress should give heed to the report made by the Commission and pass appropriate legislation at this session. The United States will never have a more favorable opportunity for entering foreign markets than is now presented, and it would be folly to throw it away.

Electrical Vehicle Problems

A great deal of space is occupied in this issue of The Hub by a paper on "Electrical Vehicle Problems and Activities," by E. P. Chalfant, read before the Electric Vehicle Division of the National Electric Light Association at its convention held in Chicago, May 22-26. Mr. Chalfant handles the subject in an able and masterly manner, and his paper is well worth reading.

The lamentable showing of production compared with the gasoline car calls for serious consideration on the part of the builders of electric vehicles and central stations, the chief cause of which is in the matter of publicity.

The principal benefactors of an increased output are the central stations and they have been slow in giving the electric vehicle the support it so badly needs.

There is much to be said in favor of the electric vehicle and Mr. Chalfant didn't overlook any points in his excellent paper.

Philippine Trade Expansion

The trade expansion which has taken place in the Philippines since the islands have been under the control of the United States, has been remarkable. The total exports from the islands in 1899 were \$14,847,000. In 1914 they were \$48,690,000.

The total imports in 1899 were \$19,193,000 and in 1914 they were \$48,589,000.

The total foreign trade of the islands was \$34,000,000 in 1899, and the average since the beginning of the European war has been about \$100,000,000.

Metal Wheels Gain in Europe

The war has been responsible for the almost complete elimination of the wood artillery wheel. For truck service the cast-steel wheel is generally employed by the French and Italian armies. The British, while large users of cast-steel wheels, also employ a percentage of disc wheels. For automobile ambulance service and light trucks, particularly those with twin pneumatics at the rear, the steel disc wheel is in a decided majority. American trucks brought into Europe for army service are all fitted with wood artillery wheels. These are allowed to remain, but

Need of a Settled Tariff Policy

The necessity for a settled American tariff policy was emphasized by Dr. Frank R. Rutter, assistant chief of the Bureau of Foreign and Domestic Commerce, Department of Commerce, in an address before the National Gas Engine Association at Chicago. If the country is to hold its own in the bitter competition for trade that will follow the war, the government must be given the opportunity to make favorable commercial treaties with foreign countries. "It should be borne in mind," said Dr. Rutter, "that concessions can not be obtained in the tariffs of other countries if we are not willing to make concessions ourselves."

"A fixed commercial policy is particularly necessary at the present time," said the speaker. "With rumors of trade agreements that will give preferential rates of duty between the Allies, and with rumors of a customs union to cover Germany and Austria-Hungary, we must be in a position to know definitely the effect on our industries of any proposed foreign action. Can we not, if we know the situation well enough to make proper representations, obtain rates of duty that will at least put our products on an equality with those of other countries (a privilege which we do not now enjoy in France) and possibly in a position of even greater advantage?"

The proposed tariff commission was referred to as a step in the right direction, as it would serve the excellent purpose of taking the tariff out of politics. The commission is also authorized to study commercial conditions and to advise regarding commercial policies and commercial treaties, and in this way will be of the greatest possible assistance in establishing a settled tariff policy.

C. B. N. A. Membership Letter No. 3

Clen Perrine, chairman of the membership committee of the Carriage Builders' National Association, and P. E. Ebrenz, president of the organization, have mailed Letter No. 3, soliciting membership. It is as follows:

Dear Sir—Our several letters in regard to membership in the Carriage Builders' National Association have so far had no favorable reply from you.

"In union there is strength," and the carriage builders need all of the strength of their united effort, in order to defeat the threatened freight increases. We therefore need your support.

You will receive far more benefit than the face value of \$10 per year (which is the annual membership dues) in the prestige it will give you among the dealers whose associations are co-operating with the C. B. N. A.

This committee will supply free to all members poster stamps, as per sample attached, showing that through this association said member supports this co-operation with the dealers' association. The stamps alone are worth more to you, and cost more than a year's membership in the C. B. N. A. Can you afford to be an outsider in this movement?

Reports from all over the country agree that there has been a decided improvement in the horse-drawn vehicle business during the last few months. There is a revival of interest therefore on the part of the dealer, and it is up to you to join hands in this co-operative movement for the benefit of the trade, and therefore help to present a united front on every occasion where our interests are assailed, or advantage may be gained by united effort.

Send in your application for membership and tell us how many of these membership stamps you can use; they cost you nothing, if you are a member, and will help to establish your position with the dealers as a legitimate manufacturer in the carriage business.

Kindly address your reply to 1630 Gest street.

Discounting Farmers' Notes

Since the uniform note blanks were prepared for members of the Western Association the Federal Reserve Bank has ruled that farmers' notes given for agricultural implements or other farm operating equipment, may be discounted within six months of maturity.

In order to be sure that the form was all right it was submitted to Charles M. Sawyer, chairman board of directors Federal Reserve Bank of Kansas City, and he says that if name of article for which note is given is filled in it will be all the evidence needed to show that the note is agricultural paper. It is made very clear, however, that the obligation must mature at one time. That is, the note must not be drawn payable in specified amounts at different intervals. Hence, if a sale is made payable in instalments and the dealer anticipates discounting it with the Federal Reserve Bank a separate note must be taken for each instalment.

The forms as printed provide for three partial payments. This was for the purpose of saving expense in filing same to hold possession of property.—Implement Dealers' Bulletin.

A Long and Honorable Record

The best wishes of a great host of friends in the vehicle trade will follow E. W. Harral in his retirement from the Fairfield (Conn.) Rubber Co., after holding the reins in that concern since 1880. Mr. Harral says it is hard to leave old and tried assistants, some of whom have been with him for 28 to 32 years. E. W. Harral and his brother, the Major, were conspicuous figures at C. B. N. A. gatherings for many years, where they always occupied large and prominent space for their company. The Major went into retirement several years ago. Under the management of E. W. Harral the company attained a reputation for honest dealing that ought to be a great source of satisfaction to him in the years to come in addition to the pride that every man feels in turning over his property to such excellent hands.

To Tax Motor Vehicles on Road Wear

Because of the wear and tear of the vehicles on the highways, all owners of automobiles and motor trucks will have to pay additional fees to the state of New York within a year. Governor Whitman has signed the Hewitt bill providing for the levy of the fees by February 1, next year.

The bill directs the commissioner of highways, superintendent of public works and the state engineer to adopt a schedule of fees for the registration of omnibuses that carry passengers and trucks for the transportation of freight. They are to classify the vehicles upon the basis of time and extent of use upon the highways relative to the wear and tear of the roads. The schedule is to be turned over to the secretary of state by the first of next year.

C. B. N. A. Convention Announcement

Secretary H. C. McLearn, of the Carriage Builders' National Association, from his headquarters at Mt. Vernon, N. Y., has sent out his announcement in relation to the coming annual convention and exhibition, which is substantially as follows:

The forty-fourth annual meeting of this association will be held in Cincinnati, O., during the week commencing September 24, 1916.

At the same time and place the annual exhibition of parts of vehicles, automobiles, models, new inventions, harness, horse equipment and materials pertaining to the carriage, wagon, automobile and accessory industries, will be held.

The committee in Cincinnati having this in charge have arranged with the Hotel Gibson to have all the different parts of the convention held in their hotel: the convention the business meetings, the reception, the banquet, and the exhibition, so by this everything will be conducted under one roof, in rooms suitable for these purposes.

The following rules and regulations have been adopted to govern the exhibit:

Exhibitors must be either active or associate members of the association.

The exhibits must be confined to models, parts of vehicles or automobiles, and to materials used in the construction of the same, or to coachmen's outfits, harness and horse furnishings. No finished vehicle will be admitted.

For various reasons, so as to get the best results and furnish the proper accommodations to the exhibitors, the committee have arranged and laid off the exhibition hall in sections somewhat different from the usual manner.

The space will be sold according to the following scale of prices:

Nos. 2, 3, 4; 24 x 25, 600 ft., each.....	\$240
Nos. 5, 6, 7, 8, 9, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21; 8 x 12, 96 feet, each.....	40
No. 10; 12 x 16, 192 feet.....	70
Nos. 23, 24, 25, 26; 256 feet, each.....	103
No. 27; 123 x 2 feet.....	49
No. 28; 9.8 x 11.6, 103 feet.....	41
No. 30; 17.8 x 17.11, 296 feet.....	118
No. 31; 15 x 17, 265 feet.....	106
No. 34; 15 x 17.5, 261 feet.....	105
Nos. 36, 37, 38, 39; 8.6 x 13, 110 feet, each.....	45
Nos. 42, 43, 44, 45, 46; 11 x 13, 143 feet, each.....	57
No. 48; 14 x 27, 378 feet.....	151
Nos. 49, 50; 13.6 x 14, 189 feet, each.....	75
No. 51; 14 x 27, 378 feet.....	151
Nos. 52, 53; 7 x 27, 189 feet, each.....	75

Application for any of these spaces can be made at once and they will be assigned in order of application.

The committee will arrange to have the exhibition space policed by day and watched by night, but does not assume the responsibility for loss or damage.

Exhibits can be placed in position on Friday, September 22, and must not be removed until 6 p. m., Thursday, September 28.

The exhibitors will close their exhibits from 10:30 a. m. until 12 noon on Tuesday and Wednesday, so that the attendants and visitors can attend the business meetings.

With these exceptions the hall will be open from 8 a. m. until 6 p. m. from Monday to Thursday, and on Friday until 5.

Floor space only will be sold. This may be furnished by the exhibitor to suit his needs. But the committee or its employes cannot undertake to furnish any of these articles. Exhibitors must not sublet to anyone not members of the association.

No signs in the body of the hall shall be so displaced as to interfere with proper observance of community interest.

The president of the association will appoint a special committee on exhibition to examine the exhibits and make a report to the convention of such articles as show improvement in their special lines, or show a high order of inventive ability.

By resolution passed at the annual meeting held in New Haven, Conn., October 17, 1883, it is required that any firm or company wishing to exhibit goods at the convention should have at least one of its partners or officers a member of the association; and the fact that a representative or employe is a member will not alone be sufficient.

The admission to the exhibition hall shall be by ticket, to be produced at the entrance door on registration. This ticket will be provided free to all members of the association, both active and associate. And also to all carriage, wagon, sleigh, automobile and motor car builders who are not members of the association, but not to any manufacturer or dealer in the accessory goods who is not a member of the association.

The exhibitors will be provided with badges for themselves and their attendants, and these will be delivered to them on the first day the exhibition is open.

Farm Credits Bill Passed

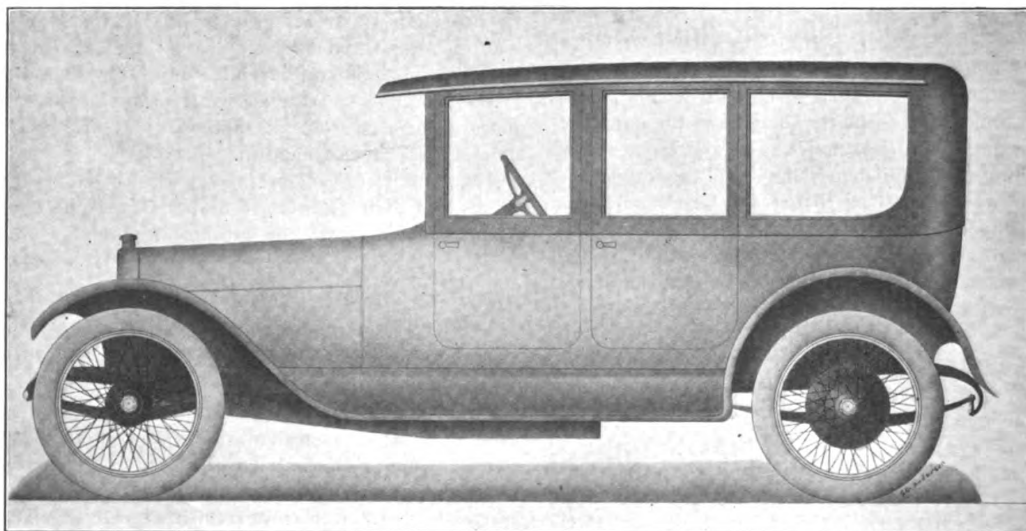
The U. S. Senate has passed what is known as the Hollis rural credits bill. Briefly it creates a farm loan board composed of the Secretary of the Treasury and four other members appointed by the President and confirmed by the Senate. It provides for 12 or more federal land banks, which will be under the control of the farm loan board, each to have a capital stock of not less than \$500,000, contributed in part by the government. Then there is a scheme for joint stock land banks and farm loan associations to borrow from the nearest federal bank 50 per cent of the value of their farms on long termed mortgages at an interest rate which will be fixed by the farm loan board of not more than 6 per cent. There is also a provision under which the individual farmer may apply to the joint land bank. The government may issue bonds against these farm mortgages and these bonds are made lawful investments for public and trust funds. There seems to be a question whether the government assumes responsibility for these bonds.

Pittsburgh Horse Vehicles to Carry Light

The ordinance requiring horse-drawn vehicles to carry a light was passed finally by City Council of Pittsburgh, Pa. The light is to be in a "conspicuous place and visible for a distance of at least 200 feet in front and rear of the vehicle." All horse-drawn vehicles, except those carrying "hay or straw in bulk," are included in the ordinance adopted.

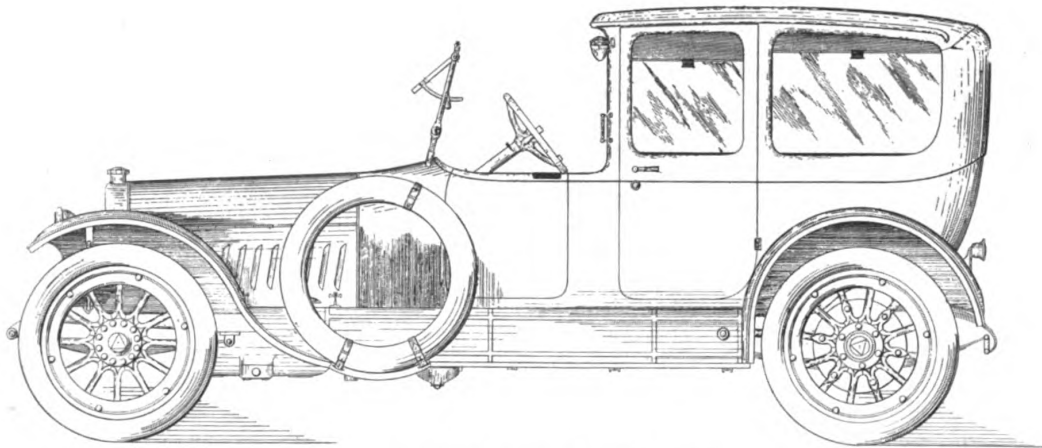
A resolution insisting that the director of public safety enforce the ordinance requiring lights on automobile trucks was approved.

Drawings by Graduates of the 1916 Class
of the Carriage Technical School

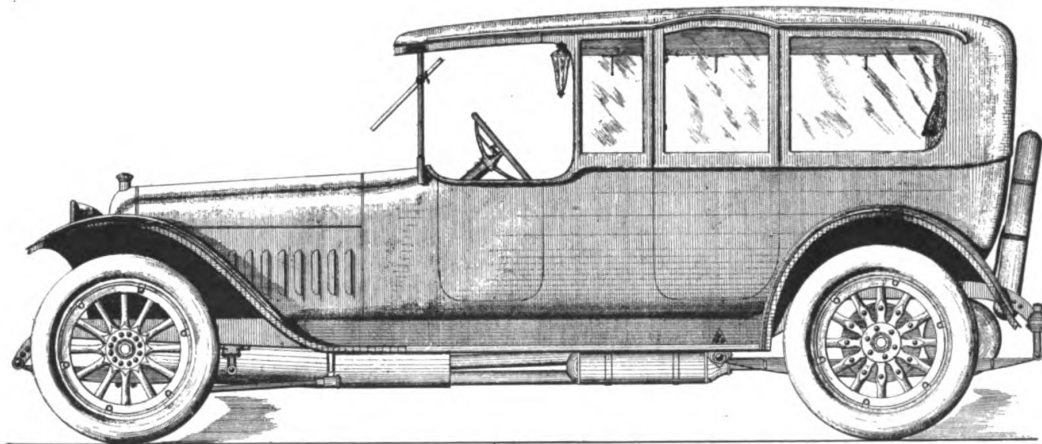


INSIDE DRIVE TOWN CAR—BY S. R. ANDERSON

Drawings by Graduates of the 1916 Class
of the Carriage Technical School



CABRIOLET—BY E. LUNBERG



LIMOUSINE—BY WM. PREHN

English View "After the War"

Some time ago a statement was made by a man well known in American financial circles that following closely upon the declaration of peace in Europe there would be a great tide of immigration to the United States. This gentleman saw in the future vast armies of men and capital coming to this country, and urged manufacturers to make hay while the sun is shining. His was a gloomy view. He believed there would be sharper competition between the newcomers and the present manufacturers than ever came from the manufacturers of Europe, operating from their native heaths.

The financier view with great apprehension the vastly increased immigration to the United States, but all men do not see the picture just as he saw it. Hon. Champ Clark, in a recent letter, expressed the belief that the immigration into this country during the next generation will be negligible. He cites the fact that so many have been killed on both sides of the great war that every able-bodied man will be needed and used at home in the restoration of normal conditions.

This view is borne out by the editor of *Arms and Explosives*, of London, who in a recent number said, "manufacturing facilities will be less to the extent that many workers will have dropped out of the ranks, by death or disablement, the last named as well as the dependents of the first named becoming a charge upon the community."

It has been believed by many that a majority of the immigrants into the United States come here because they want to reside in a republic, but undoubtedly this is not true. The stream of Irishmen into this country ceased as soon as working conditions became better in Ireland. Then we had the German immigrant, and finally he ceased to come. His condition in Germany was practically as good as in America.

The real anxiety should be and is felt for and by the warring nations. Looking into the future the editor of *Arms and Explosives* says:

"Anxiety very naturally prevails in gunmaking circles with regard to future prospects. All luxury businesses, and many which supply what only rank as necessities to those with well filled purses, are influenced in ordinary times by the prevailing standard of prosperity. According to accepted financial tests the war is eating up wealth at a rate which will leave the world poorer to the extent of cutting away margins over and above the income necessary for ordinary living expenses. In addition to actual wealth consumed the great migration of money to America will have the effect of placing many countries in the position of paying tribute to that quarter. The other side of the picture is that the consuming power of humanity and the productive capacity of the earth will remain much at their old level. Manufacturing facilities, on the other hand, will be less to the extent that many workers will have dropped out of the ranks by death or disablement, the last named, as well as the dependents of the first named, becoming a charge upon the community.

"Diminished commercial activity in countries adversely affected by the war will react on those other countries which have been able to maintain their manufacturing facilities in working order. Germany, as a great competitor in the world's markets, is certain, whatever the result of the war, to emerge with weakened financial credit and with a mountain of prejudice and suspicion operating against her which may require generations to remove.

Austria will suffer from the same kind of disability as that which is bound to prejudice her neighbor's efforts to resume peaceful industry. Unhappy Belgium, even with the assistance which her allies will feel honored to provide, must take years to restore the well-ordered activity of her hard-working population. The ravaged industrial area of France will likewise take some time to re-establish all its former thriving condition. Russia, which by her mineral development was fast becoming one of the important industrial nations, will suffer from the interruption of her activity.

"The total position is that a partially crippled world must, as soon as may be, set to work to repair the disasters caused by the war and to resume those relations toward the distant pastoral countries whose development has for the moment been arrested. The uplifting of the war cloud, which has hovered for the past half century over the nations of the old world, can hardly have any other effect than to stimulate activity in all producing centers. Arrears of supply must, as a matter of duty, be overtaken with all speed. The work of reconstructing that which has been destroyed will equally press for attention. Notwithstanding the burden of the recently enacted taxation manufacturers will endeavor to provide themselves with the funds necessary for coping with the demand which will assail them from all sides. They will also be concerned to find peaceful uses for the extra plant laid down to supply the necessities of war. Though the time has not arrived for discussing these matters in detail the end of the present world's war will certainly witness many inducements for resisting the lethargy which usually follows a life and death struggle between nations."

Button to Stop Car From Rear Seat

A New York inventor recently brought out a device whereby, in cases of emergency, the occupants in the rear seat of an automobile can bring the car to a stop by push buttons which shut off the engine and apply the brakes. It is especially in instances when the chauffeur fails in his duties or is suddenly incapacitated that the invention is most valuable.

The device serves to apply the brakes and control the power of the car on which it is installed by means of a spring held under compression, which is electrically released. It weighs but 15 pounds and can be mounted in any car without interfering with the existing equipment. One novel feature of the system is that while the occupants of the rear seat can apply the brakes and bring the car to a halt in time of emergency, provision is made to prevent them from interfering with the control of the vehicle at all times when the chauffeur is properly driving the car. Furthermore, in an emergency the chauffeur can apply the brakes by means of the device by depressing a push button conveniently located on the steering wheel.

Ed. Maxwell Has Paralytic Stroke

W. E. Maxwell, purchasing agent of the Parry Mfg. Co., Indianapolis, Ind., suffered a stroke of paralysis at his home on May 26. His condition at one time was very critical. He and his wife were at the table taking dinner with a friend when he was suddenly stricken, his left side being affected. From latest information, however, he was recovering rapidly and it was hoped that he would soon be back at his office ready for business.

Definitions of Bodies and Axles

The report of the nomenclature division of the Society of Automobile Engineers submitted to the standard committee at its meeting on June 12 included a definition of different types of bodies. "It is thought," says the report, "that some authority should take action to make possible the use of names which will be understood generally, rather than those which are meaningless except to persons conversant with the terminology peculiar to individual manufacturers. It is surprising how many distinctly different types of body are being sold under the name 'brougham,' for instance."

The definitions are as follows:

- Roadster**—An open car seating two or three. It may have additional seats on running boards or in rear deck.
- Coupelet**—Seats two or three. It has a folding top and full-height doors with disappearing panels of glass.
- Coupe**—An inside operated, enclosed car seating two or three. A fourth seat facing backward is sometimes added.
- Convertible Coupe**—A roadster provided with a detachable coupe top.
- Clover Leaf**—An open car seating three or four. The rear seat is close to the divided front seat and entrance is only through doors in front of the front seat.
- Touring Car**—An open car seating four or more with direct entrance to tonneau.
- Salon Touring Car**—A touring car with passage between front seats, with or without separate entrance to front seats.
- Convertible Touring Car**—A touring car with folding top and disappearing or removable glass sides.
- Sedan**—A closed car seating four or more all in one compartment.
- Convertible Sedan**—A salon touring car provided with a detachable sedan top.
- Open Sedan**—A sedan so constructed that the sides can be removed or stowed so as to leave the space entirely clear from the glass front to the back.
- Limousine**—A closed car seating three to five inside, with driver's seat outside, covered with a roof.
- Open Limousine**—A touring car with permanent standing top and disappearing or removable glass sides.
- Berline**—A limousine having the driver's seat entirely inclosed.
- Brougham**—A limousine with no roof over the driver's seat.
- Landaulet**—A closed car with folding top, seats for three or more inside, and driver's seat outside.

The definitions of the general type of rear axles are as follows:

- Dead Axle**—An axle carrying road wheels with no provision in the axle itself for driving them.
- Live Axle**—General name for type of axle with concentric driving shaft.
- Plain Live Axle**—Has shafts supported directly in bearings at center and at ends, carrying differential and road wheels. (The plain live axle is practically extinct).
- Semi-Floating Axle**—Has differential carried on separate bearings, the inner ends of the shafts being carried by the differential side gears, and the outer ends supported in bearings. The semi-floating axle shaft carries torsion, bending moment, and shear. It also carries ten-

sion and compression if the wheel bearings do not take thrust, and compression if they take thrust in only one direction.

Three-Quarter Floating Axle—Inner ends of shafts carried as in semi-floating axle. Outer ends supported by wheels, which depend on shafts for alignment. Only one bearing is used in each wheel hub. The three-quarter floating axle shaft carries torsion and the bending moment imposed by the wheel on corners and uneven road surfaces. It also carries tension and compression if the wheel bearings are not arranged to take thrust.

Full-Floating Axle—Same as three-quarter floating axle except that each wheel has two bearings and does not depend on shaft for alignment. The wheel may be driven by a flange or a jaw clutch. The full-floating axle shaft is relieved from all strains except torsion, and in one possible construction, tension and compression.

The different types of live axle can be driven by bevel gear, spiral bevel gear, worm, double-reduction gear or single chain.

In other constructions, the rear wheels are driven by double chains, internal gears, or jointed cross-shaft.

Semi-Annual Meeting of National Association of Tanners

The National Association of Tanners held its semi-annual meeting on Thursday, June 1, at Hotel Astor, New York City. President H. Fred Lesh, in his address, mentioned the establishment of the Boston office and stated that the members, on being canvassed, were practically unanimously in favor of dues being raised to \$50. All members, except three or four, paid the new rate. Ample funds are necessary for the important and expanding activities of the National Association of Tanners, and it is far better to spend money and do things rather than economize unwisely. He also paid special attention to the problems confronting American tanners, on account of the European war. The question of anthrax and disinfection of hides was discussed in a clear and emphatic manner.

George H. Raymond, of Hans Rees' Sons, discussed the Tanning School at Pratt Institute, and stated that 62 members of the National Association of Tanners have offered to subscribe toward the \$15,000 a year subscription fund for establishing a research laboratory. Eighteen of these subscriptions are based on \$300 a year for five years, and out of the 18, 14 are willing to aid in underwriting the fund.

How the Japanese Advertise

An exchange calls attention to an amusing statement, in an issue of the Biblical World, which appeared in an article entitled "The Japanese Bible." The item states that the Japanese merchants have secularized the sacred tunes to such an extent that it is a common sight to see a band of Japanese marching through the streets advertising tea, rice and dried fish to the tune of "Onward, Christian Soldiers," or "Nearer, My God, to Thee."

To make a still more ludicrous contrast, the advertisers dress in grotesque costumes and perform acrobatic tricks to the tune of the hymn.

Meeting of Southern Vehicle League

The regular annual meeting of the Vehicle League held in Greensboro, N. C., on May 16 was attended by a representative gathering of the buggy and wagon manufacturers covering the entire southeastern territory. Many vital subjects of especial interest to the vehicle manufacturing trade at this particular time, were up for discussion and disposal.

President Hackney's annual address, as usual, was both timely and instructive, regarding not only what had been accomplished in the past, but predicted that the future was still bright before the vehicle manufacturers.

The board of governors has had the affairs of the league in charge during the past year and have given them necessary attention. There is a present membership of 27. Three new members were recommended for reception. The conduct of the credit bureau has been most satisfactory during the year and the finances of the league are in good condition.

The report of the commissioner showed a great volume of work accomplished during the year, and the accumulation of credit information that is invaluable to our members. The moral effect of the three year existence of the league has been most wholesome in bringing about a better business standing of the vehicle industry throughout the southeastern section.

As the credit bureau had proved so successful in protecting the members from loss, it was decided to enlarge the scope of the organization and admit all vehicles and allied industries interested in ledger experience exchange.

One of the cardinal principles of the league is to foster the development of sound and sane business practices in the vehicle industry so that it may take its proper place among other industries that command the respect of the best business and banking interests of the country. To this end the hitherto unrestrained guarantee on vehicles has been discouraged and the adoption of reasonable terms to fit the economic conditions of the south has been most earnestly advocated.

More than special interest was taken during the open discussion on the tremendous advance in the cost of raw material, and it developed that the advance in the cost of steel, iron, cloth, carpets, and even woodwork would completely wipe out all margin of profit if the manufacturer did not watch his cost and raise his selling price accordingly.

The old officers and governing board and commissioner were reelected for another year and the same schedule of fees adopted that has prevailed the past 12 months.

The meeting was one of interest and enthusiasm from start to finish and the prevailing feeling among all present was one of optimism. H. A. WHITE, Secretary.

Returning to Horses

A prominent dealer told the London (Eng.) Daily Graphic that since the budget and the announcement of the new tax he had received more inquiries for horses for private use than during the whole of the previous twelve months. "For some months now," he said, "many wealthy people have been thinking of returning to horses. It has not been entirely a matter of expense, but so many chauffeurs have gone, gasoline has been difficult to obtain, and finally, in view of the government's pronouncement against pleasure motoring, they have not cared to

use their cars. The matter of looking after horses is not so difficult as with motor cars. There are old men on every estate brought up from boyhood with horses who can be used. So old carriages, dog carts, governess cars, and all sorts of vehicles which have long been rusting in the stables are being brought out again. Others want to go back to horses for purely economical reasons; they cannot afford to run their cars with the increased and increasing price of gasoline and the new tax. But while many people want horses, they are by no means easy to obtain, and there is a scarcity of the light types not wanted by the military, because there has been no great demand for them and consequently breeding has fallen off."

Why the Increase in Prices of Paper?

Merchants who are compelled to pay what seems to be exorbitant prices for all kinds of paper stock and who find the increased price in every sheet of printed matter are wont to ask why. The only answer is, "War." That may satisfy some, but is the war responsible? We are told that the increase is due to the curtailment of the imports of pulp wood. But statistics fail to show such a shortage as one might expect. Then we are told that the cost of pulp wood has advanced, but it has not advanced in harmony with the advance in the cost of paper. For the eight months ending with February, 1914, there were imported into the United States 704,591 cords of pulp wood, having a value of \$4,847,598; during the same period of 1915 the pulp wood imports totaled 662,905 cords, having a value of \$4,547,588, and in 1916, 632,070 cords, having a value of \$4,143,941.

These figures fail to show cause for the price of paper of various kinds advancing in price from 20 to more than 100 per cent. To the man unfamiliar with all the details of paper manufacture it looks very much as though there is a gentleman of color in the proverbial wood pile. He may be in the pulp. We are told that there is a tremendous scarcity of paper, but the average consumer of paper has been able to buy all the paper he wants, provided he has been able to reach the unprecedented price. During the past few weeks there has been a slight decline in the price of some grades of paper, but the decline has been so small as to be next to invisible.

This increased cost of doing business has been quite an item with the dealers who do extensive mail advertising. The government has urged everybody to save waste paper, and this is all well and good, but if the government will start a search for the aforesaid gentleman of color in the pulp pile, earlier relief may be had.

Automatic Door Opener

A large packing concern in California has installed an automatic means for opening the doors of its horse stable which allows the horses to escape at any time of the day or night if there is danger of fire. The device is operated in much the same manner as an automatic sprinkler.

When the temperature in the stables rises to a certain point a weight is released which falls on a lever that in turn releases all the doors simultaneously. At the same instant certain noises are made mechanically which will frighten the horses from their places. The releasing lever is occasionally operated by hand to give the horses a fire drill. Each horse soon learns to trot from its stall when the door opens and the alarm sounds.

Greater Garage Service for Electric Cars

By Harry Salvat*

We all know that the electric car is more nearly fool-proof than the gasoline car and is unquestionably the vehicle for city use. Plenty of proof can be offered to substantiate this claim. The fact being conceded—why is it that we do not have more electric cars, both passenger and commercial, on our streets? It is the judgment of the writer that one of the principal reasons is that manufacturers are making no effort to cultivate and hold the best business “boosters” they can hope to have, namely, the public garages.

It might surprise you to learn that there are not more than three garages in the city of Chicago taking care of electric cars that are friendly toward them. Why? Simply because the manufacturers' representative knocks them every opportunity he gets with the very natural result that the garage man only takes care of an electric car until such time as he can replace it with a gasoline car.

Very recently I called at a garage where about 30 electric cars and 40 gasoline cars are garaged. While I was there the owner of an electric car came in and a conversation with the garage owner ran as follows:

Customer: “Hello, Ed. A nice day.”

Garage Owner: “Yes. Splendid for a trip in the country. Why don't you sell your ‘juice-box’ and buy a nice touring car?”

I was greatly surprised. The electric car owner left the garage feeling as if he probably were foolish for not procuring a gas car in which he could enjoy long country runs. After he departed, I asked the garageman why he had spoken to his customer in that manner and he replied: “Harry if I could trade all my electric boarders for gasoline cars, I would give three to one.” I asked what the trouble was and he stated that he made money on his gasoline cars on the sale of gasoline, oil, supplies, etc. Also, that if he had a gasoline car prospect and 'phoned some dealer in regard to it, or just gave the dealer the name of a prospective buyer and the dealer was fortunate enough to sell the party, he could always expect a check for being a good fellow and recommending that particular car. With the electrics it was an entirely different problem. With every electric car boarder he had, he stated he received a ticket to h— with it. I questioned him with reference to this and he then took me into his office and brought out a bunch of reports sent him by the electric car manufacturers which would stagger an elephant. Most of them were letters he had received after a car had been down to the manufacturer's for inspection and they read as follows: “Batteries sulphated; should have long over-charge.” “Not sufficiently charged.” “Grease cups not turned.” The fact is that although the car goes to the manufacturer once a month for inspection, for which the car owner pays \$3 a month, the grease cups would rust if they were not turned and filled by the garage man. Another report which is continually received and which is absolutely absurd reads as follows: “Tires not sufficiently inflated—right rear 80 pounds; left rear 70 pounds; right front 68 pounds and left front 72 pounds.”

As a matter of fact the tire companies only recommend 70 pounds all around and the garageman watches this pretty closely. However, imagine a lady receiving these reports monthly. She begins to believe that her car is

being ruined by the garageman when really these reports are so trivial that they are of no importance whatsoever. They merely irritate the car owner. Eventually, from various conversations with friends the lady finds out that those owning gasoline cars never receive any of these reports and she comes to the conclusion that these cars are receiving splendid care at their garage. The result is that she feels that her electric is too delicate and requires too much attention.

Further, the gasoline car manufacturers are boosting the garage men every chance they get as to the sale of supplies, etc. They even go so far as to advise their patrons to buy their gasoline from the garage owner and not to patronize the filling stations and tire brokers along the road.

However, with the electrics it is just the opposite. In my opinion the electric car manufacturers and dealers simply keep up this inspection system so as to be able to keep in continual touch with the cars they have sold; trying to keep the owner supplied with batteries, tires, etc., perpetually. In some instances where car owners are keeping their cars in a garage where all kinds of repairing, painting and supply work is being taken care of and the manufacturer has no chance to do business with him in that regard, the manufacturer when he gets a chance recommends some other garage to the car owner where no repairing is done or supplies are sold, feeling that by so doing the work will again come back to his (the manufacturer's) shop. Whether the owner's car is receiving the best of service and attention does not seem to interest him in the least.

If the garage owner should be fortunate enough to be able to sell one of his patrons a set of batteries or some tires, he never hears the end of the story because each and every time the car is sent down to be inspected by the manufacturer a report is made that the car rattles, the paint is cracking or the car runs slow; it runs either to the right or left, or, in fact, any way but what it should. These reports are kept up until the garage owner either loses the customer or the car owner trades in his old car.

You can readily see that when a car owner continually receives these reports and has to take them up with the garage owner, who, knowing where the trouble really lies, contradicts the reports of the manufacturer and argues with the customer trying to show where the reports are wrong; that the customer becomes quite discouraged with his car and the first thing you know he trades his electric for a gasoline car.

Now, then, what is the solution? First make every garage owner a friend of yours, cooperate with him every chance you get. Do not touch a battery or tire sale on a car that he is taking care of, as this is his business, not yours. If he makes good, you will do better. Remember, that if the electric garage man does not do well and is not successful, the manufacturer will go broke. The electric garage is the stomach for the food that you assimilate. If the stomach is in bad condition and not doing its work properly, you will look pale and not feel very strong. To improve it, you will have to find out where the trouble lies and see what your stomach can best digest. In other words, it is up to you, manufacturers, to wake up. Become friendly with the electric garage men and cooperate with them, then you will see that better conditions will prevail in the electric field. It is no more than natural to believe that as long as the electric garage man is not

*Extract of paper read before the National Electric Light Association convention in Chicago, May 22-26, 1916.

being treated properly by the manufacturers, he is not going to plug and work to help the electric vehicle business.

Every time an electric garage is put out of business or changes to a gasoline garage, it is one spoke broken in the wheel upon which the electric vehicle business rides I know and you all know that there have been a great many spokes broken and I feel it is now up to us to get together and repair these broken spokes and get some new wheels for our good prosperous business.

The following will give you some idea of the work outlined for an electric garage man in taking care of an electric as compared with the work of a gasoline garage man:

The electric garage man receives a flat rate of either \$35 or \$40 per month for his cars; the late model cars are built with large batteries consuming a large amount of current; they have wire wheels; some of them carry an extra wheel which must be taken care of; the cars have three mats—a rubber mat, a fur mat and a mat to harmonize with the beautiful upholstery of the car. These mats must be taken out and cleaned every day and the way they are made up it is not the simplest matter in the world to replace them. If you happen to have a new man on the job, it is almost necessary to have a blue-print made up for him with directions showing how they are to be put in the cars until he becomes familiar with the work. The mat must be placed around two drives in the car; two revolving seats; two foot brakes; meter buttons and exhilarator buttons. Then he must see that the wheels on the car are tight and in good order; that the tires are pumped up to 85 pounds and then make sure of it. This must be done for two reasons: if he has 20 or 30 cars with tire pressure low, it means that the cars will pull two or three more amperes of current and if he runs along that way from month to month he will find that his profits are going to the power company.

Then we must deliver the cars anywhere from $\frac{1}{2}$ mile to $3\frac{1}{2}$ miles and get there as quickly as possible after being notified. No damage must be done; no mud splashes put on the fenders and then if you are lucky enough to reach the house about 8:30 or so you can take the children to school if you please, or take Mr. Jones or Mr. Smith to the elevated train. It will take only about ten minutes or so. The hiker has nothing to do anyway but wait for calls, so Mr. Jones may just as well make use of him as not while he has a chance.

On about 25 per cent of our deliveries we give the hikers car fare for the return trip. Otherwise, you will find them examining all the store fronts along the street as they return. That takes care of the morning delivery. In the evening after the car has undoubtedly been used most of the day and done some good hard running, it is most likely that the owner would like to take a small run either to the theatre or probably to play a little game of pinochle, say, about five miles or so from home; the car will make this run easily, but the owner wants to feel safe. The garage man, therefore, gets a nice telephone call asking him to please send for the car, give it a little boost and return it to the house in about an hour or so. It is necessary that we again call for the car, paying another car fare, taking chances of damaging the car. After the car comes in it must be put on charge (and it is usually during the peak hours and, believe me, it hurts to have to pay \$15 a kilowatt for current consumed be-

tween 4:30 and 8:30) and then we must redeliver the car.

Then another thing. The ladies take their cars down town and leave them in front of stores in the shopping district where it is necessary that they be moved every half hour. They instruct the doormen at the stores to watch the cars for them and move them when necessary. Very often in so doing the cars are bumped, bending fenders, breaking head and tail light glasses, etc. Of course, the owner does not inspect the car upon her return and does not know whether or not any damage has been done. Consequently, when the garage notifies the owner that repairs are necessary she knows nothing about it and complains that the damage must have been done in the garage or by our man delivering or calling for the car. No argument can convince her that we are not to blame and the consequences are that we must make the repairs without being able to charge for it.

Ninety per cent of the electric garages which have gone out of the electric business were forced out simply because they could get no support from the manufacturers. These men who are switching from electric to gasoline are not going to do the electric business any good as you can readily see, for, naturally, they are going to talk and push gasoline cars as long as they are going to handle them.

It is entirely up to the manufacturers to regulate these conditions. Their contracts with their agents should stipulate that tires, batteries, etc., should not be handled or sold by them to car owners who keep their cars in public garages. Also that if the garages do not happen to handle supplies of any kind, a tire or battery sold should be billed through said garage so that in that way the garage man could make his share of the profit just the same.

I feel sure that if you manufacturers will get together and do this you will release the brakes on progress and will find that the electric car will get its share of the business.

I think you will also find that this will eliminate a great deal of trouble for the car owner on adjustments of tires and batteries. He can deal simply with one party and not have to go from the dealer to the garage man and the garage man to the dealer.

The battery guarantees the dealers are giving are unreasonable and naturally invite trouble. They actually remind me of the faker selling on the corner, "Now you see and now you don't see." The idea of giving a car owner a guarantee on a battery which you know cannot be fulfilled and simply have the idea in mind of beating someone else is outrageous.

Now, gentlemen, this is not an article on engineering or improving of electric cars, simply an appeal to you for the future of the electric vehicle business by which means I and a great many of you are earning a living.

We have the goods to sell and the people want them, only we don't seem to know how to feed the "goose that lays the golden egg" and, believe me, the garage is the goose that lays the golden egg for the manufacturers.

It is a lucky thing for the electric garage men in Chicago that the manufacturers and dealers are not politicians. If they were they would surely revoke our licenses to sell parts or accessories of any kind.

One manufacturer went so far as to say that all the garage men should do to the electric car was to wash the mud off its wheels. If this only were done by the garage

men. as per this suggestion, I would like to see where the electric business in Chicago would be at the end of six or eight months.

As stated previously, compare the service given an electric car to that given a gasoline car:

Electric	Gasoline
Storage	Wash car
Charge	Polish
Wash	Store
Polish	Clean
Clean	
Call for and deliver	
Flush battery	
Oil	
Keep wheels in line	
Turn grease cups (at least every 3 days)	
Look after brushes and controller contacts	
Inflate tires	
Furnish drivers when desired	
Keep record on battery so it will not get shorted	
Carry liability insurance while cars are being delivered and called for	
Carry property damage insurance	
Keep skid-chains repaired	
Keep charcoal heaters going	
Pay car fares on deliveries of cars	
Then last, but not least, the electric garage man must have a special claim agent to adjust difficulties which arise between the garage man, manufacturer and car owner	

The gasoline garage man gets \$35 per month for his largest limousine. Thirty dollars on a seven-passenger touring car, without windows—simply a wind-shield to be washed. Twenty-five dollars a month for small touring cars without hardly any cleaning or polishing.

The electric garage man gets either \$35 or \$40 on his cars. However, the electric garage man must furnish the power while the gasoline garage man does not, and makes a profit of from two to three cents a gallon on his gasoline and about 30 cents a gallon on the sale of oil.

The gasoline man gets paid for every little thing done on the car, such as turning grease cups, changing tires, etc. Also, if the gas car owner needs a tire, spark plug, fender or some similar part he gets it through the garage man. It is not so with the electric car with a long guarantee tied to it.

Why is it that the Ford, Overland and similar large automobile companies have been so successful? Simply because they have given all the garage men an opportunity to make a profit on the sale of their cars, so that they all become boosters for their particular cars. This, however, is not done in the electric car game.

Now, gentlemen, I do not want any of you to feel that this is meant for any one manufacturer in particular. It is simply a layout of the true conditions in Chicago and I feel it ought to be looked into.

Meeting of Sterling Lace Creditors

The first meeting of creditors of Sterling Lace Leather Co., Inc., of Buffalo, N. Y., was held at the Bankruptcy Court Room, No. 410 Federal Building, Buffalo, June 19, at 11 o'clock a. m., to prove their claims, appoint a trustee, and examine the bankrupt. The Sterling Lace Leather Co. was adjudicated bankrupt May 22 last.

Movement to Restore Driveways to Horse-Drawn Vehicles

In the statewide movement for "good roads" that are good for horses as well as motor vehicles, horse owners and automobilists in New York City are joining hands to provide a place for driving horses in Central Park.

It is purposed to construct a new drive exclusively for automobiles as near as possible to the outside walls of the park, avoiding all grade crossings, and then restore the east and west driveways, together with some of the transverse roads, to their original use for horse-drawn pleasure vehicles and riding horses.

The movement originated with the Mayor's Central Committee on Street Traffic and Safety. This committee recently passed a resolution approving the project just outlined, and at the last meeting of the Citizens' Street Traffic Committee, held at the Automobile Club of America, this solution of the park problem received the further indorsement of that general committee, the secretary of which is Elmer Thompson, also secretary of the Automobile Club. The resolutions were incorporated in a letter to Arthur Woods, Commissioner of Police, who has turned the matter of the resolution over to the Commissioner of Parks, Cabot Ward, who is said to be heartily in favor of the project, though in doubt about the possibility of carrying it out. Mr. Ward, it is understood, recognizes the fact that the advent of motor vehicles has not only made it next to impossible to drive horses with safety in the park, but has greatly increased the perils of pedestrians, and particularly women and children, in crossing the present automobile driveways to reach the recreation grounds.

With Mr. Thompson, secretary of the Automobile Club, and Mr. Taylor, who as editor of the Rider and Driver, represents the horse interests, working hand in hand with the city officials to restore some of the park drives to the carriages, there is believed to be more than a fair chance of success. The drives were one of the sights of New York every afternoon during the driving season before the harness and saddle horses were forced off the roads. No horse show in the world presented such an array of sumptuous equipages, many of them drawn by splendid pairs that were champions of the show ring. Thousands of pedestrians used to throng the sidewalks along the fashionable east drive to see this daily promenade on wheels. Notable men and beautiful women of society in the carriages added to the splendor of the pageant, which was celebrated all over the world.

Goodrich vs. Firestone Trade-Mark Suit

The B. F. Goodrich Co. has won the first round in the controversy over black tread tires by a decision just handed down in the U. S. Patent Office. An application by the Firestone Tire & Rubber Co., for registration of a black tread band and red sides as a trade-mark was opposed by the Goodrich Co., which claims to possess trade-mark rights in a black tread band used with sides of any contrasting color, especially light gray and white, and also claims to have used the specific combination of black and red on pneumatic tires prior to the earliest date of adoption by the Firestone Co. The Examiner of Interference denied a motion by the latter concern to dismiss the Goodrich opposition.

Senate Aroused to Need of Horses

Senator Key Pittman, of Nevada, who is sponsor for the bill recently introduced in the Senate calling for an appropriation of \$200,000 for the purchase and maintenance of stallions to be used in the production of horses for agricultural and military purposes, had the following to say in discussing the measure which has been referred to the Committee on Agriculture and Forestry, of which Senator Gore, of Oklahoma, is chairman.

"I was actuated in the introduction of the bill by a knowledge of conditions in my own state, where we once had an abundance of horses of an enduring type. Within the past 18 months buyers, both local and foreign, have taken many thousands of head of the very sort of animal we require for such campaigns as we are now prosecuting in Mexico, and where with only a small force of cavalry in operation the remount situation is acute. Realizing that the geographical position of my state and the high freight rates would make it one of the last to receive the attention of the representatives of foreign governments I thought it was imperative that something be done to repair a damage which must be nation-wide.

"This belief was strengthened upon investigation," continued Senator Pittman. "General Aleshire, the Quartermaster-General of the United States, testified before the Committee on Military Affairs recently that not more than 250,000 horses of the cavalry remount and light artillery types are available for the uses of our government at the present time, and that of this number 30,000 are in that condition where they could be pressed into immediate service. These figures were obtained by a special census taken in districts where the government remount stations are situated and they furnish every American a grave subject of consideration. With purchasing campaigns still being prosecuted the supply must be lower today. Statistics at hand indicate that we have lost since the commencement of the Continental war approximately 1,500,000 horses and mules, and it is high time that we set about replenishing these.

"There is no element of preparedness of more vital necessity than the army horse, and especially along our southern border, where he is absolutely essential. In the east, where good roads exist, he does not dominate the situation to the same extent as in the south and southwest, but it is a generally recognized fact the world over that the army of no country is stronger than its cavalry and light artillery horse equipment. We have failed hitherto to give this animal the important position accorded him by the Old World nations, but it is all the more reason for a prompt and satisfying adjustment of this problem which carries a powerful economic appeal to the country at large."

A Lamp Glass Dimmer

When unexpectedly coming into an area of restricted lighting, lamp glasses can be quite effectively dimmed by the following method. Carry on the car a little tin of metal polishing paste; a small quantity of this paste should be smeared on a damp cloth and rubbed over the inside of the glass. It will dry in a few seconds and produces quite a good opalescent effect. When no longer required, it can be removed, just as easily, with a dry cloth.

Automobilists Do Not Want the New York Speedway

The Horse World publishes a communication from R. O. Currie, of New York, as follows:

It may be of interest to the public to know that the effort now being made at Albany to turn the New York speedway over to the automobilists does not come from the organizations representing that interest. The governors of the Automobile Club of America, the largest and most representative organization of its kind in this country, at a meeting on April 14 passed a resolution to the effect that it has never made any effort to use that little strip of ground, does not want it, and, on the other hand, considers it entirely reasonable and fair that it should be preserved for the horse.

The public has often been told that a few people are using the speedway and that it is drawing less and less every year, which are entirely the reverse of true. As a matter of fact, there were more horses on the speedway during 1915, and more people there to see them than during any other year since the drive was opened.

Commencing May 9 and ending November 21, there were 22 matinees, with an average of 10 brushes each day, and on some days 14, with from two to eight horses contesting in each brush.

As secretary of the Road Drivers' Association of New York City, I am sending you these facts in order that we may get a square deal. The speedway is the only spot in Manhattan where a man who loves a horse can drive him with safety. There are many hundreds of such horses in New York City. There has been too much published about the speedway which is not true. The automobile has every street and park in the city. May we not retain this little spot?

Bock Bearing Company Reorganized

The plant of the Bock Bearing Co. on Phillips avenue Toledo, O., has been taken over by a new corporation having a capital of \$1,650,000. The new company was incorporated recently under the name of the Bock Taper Roller Bearing Co. Of the stock issued by the new corporation, \$1,200,000 will be common and \$450,000 will be 7 per cent cumulative preferred. Holders of old stock will exchange share for share of new stock, and old preferred will receive two shares of new common for one of preferred. The capacity of the plant will be tripled, giving an output of 3,000 bearings daily.

The following officers have been elected: President, W. E. Bock; vice-president, Eugent Rheinfrank; secretary and treasurer, C. H. Clement. The officers, with M. H. Murch, of Cleveland, and J. E. Duniplace, of Toledo, comprise the directorate.

Horse and Mule Exports

Our exports of horses and mules in 1914 amounted to \$4,000,000 in value, while in 1915 the total amounted to \$77,000,000. While this was a great gain in foreign sales, the total number exported (355,000) for 1915 represents about 1½ per cent of the supply in the United States, and was not sufficient to prevent a decline of about 4.6 per cent in the average price. The low price is partly due to inferior quality. Good horses will continue to bring good prices.

Wheels and the Cinematograph

Why Wheels Appear to Rotate Backward or Remain Stationary on the Screen

Most everyone at some time or another has seen the hero of a cinematograph film driving furiously in pursuit of the villain, while the wheels of both cars solemnly remain stationary or rotate backward, so destroying the illusion of speed.

This is noticeable not only in pictures of cars but in those of guns or any other wheeled vehicle moving at a certain speed, and to understand the phenomenon one must have some idea of the camera mechanism used to take these pictures. Broadly speaking, and without at-

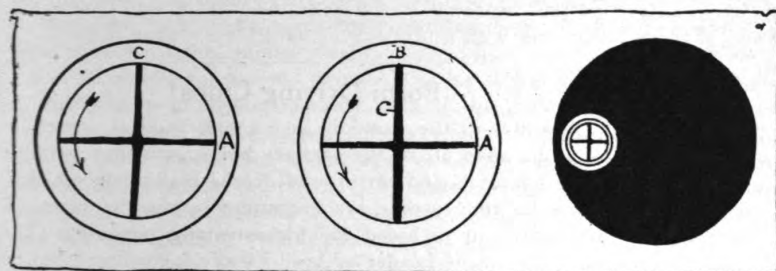


Fig. 1—A diagram of a wheel and cinematograph shutter showing how the wheel may appear stationary

tempting to go into details, says Light Car, the cinematograph camera can be regarded as a machine which takes a series of separate photographs, and is parallel with an ordinary camera, in which there is a constant succession of plates exposed one after the other by a man who removes and replaces a cap over the lens very rapidly. Thus the pictures are not taken as a continuous stream but in a series of jerks, each picture being exposed exactly as though it were a single plate. To do this, imagine a disc rotating in front of the lens, and having a series of holes drilled in it, very like the chambers of a revolver. As each hole comes opposite to the lens the film is exposed, then the interval between that hole and the next cuts off the lens's view while another piece of film moves up to be exposed by the following hole. Thus we have a succession of pictures which, thrown on a screen by a similar mechanism, would give a series of pictures of an object moving in jerks, for the lantern has a similar disc to cut off the lens while the next picture moves into position. Actually, this cut off is a bare flicker on the screen.

Taking the Photograph

The mechanism of the camera being actuated by hand, its speed can vary, and it is easy to imagine that, should the operator desire, a photograph might be taken of a car at 40 miles per hour, then the lens cut off, and several seconds later the next exposure made. As the car would have moved some distance between the exposures a very jerky film would be recorded.

Now, in taking a picture of a car the camera handle may be rotated at a steady speed, but as the car picks up the spokes of the wheel go faster. Therefore, the space over which these spokes travel in the interval between picture and picture varies all the time.

Imagine now a four-spoke wheel similar to that shown in Fig. 1 on the left-hand side, and suppose that between you and it there is a large disc with one hole in it as shown on the extreme right. Now the eye is the lens, and is fitted with a screen, so should some one rotate the wheel while the disc revolves slowly you will get a glimpse of the wheel every time the hole in the disc comes opposite your eye.

Spoke Movement

Now suppose that the speed of the wheel relative to the disc is such that the spoke A in the center picture has moved from A to B—that is to say, occupies now the place previously occupied by spoke C, and that in this time the disc has gone round once. The first glimpse will show a wheel in the position shown in the left-hand view; the next glimpse, however, will show it exactly the same even though spoke A now is where spoke C was. Therefore, the wheel would not appear to have moved at all because one has no means of distinguishing one spoke from another. Were they lettered all you would see would be that the wheel was the same, but the letter for some reason had moved one spoke around. Now, it does not matter how many spokes there are, or how many holes in the disc, for if one spoke moves from its original position a distance equal to the distance between spoke and spoke in the interval between the glimpses of that wheel then to the beholder the wheel is stationary. This is why wheels often appear stationary, yet the car, obviously, is going fast.

Now, for purposes of explanation, take a single spoked wheel, as in Fig. 2 on the left hand again. If this spoke has moved one complete circle between glimpses, then the wheel appears stationary; but suppose that one gets one's first glimpse of the spoke at A, and then rotates the disc in front of the eye rather faster, obviously the spoke will not have completed a revolution when the disc aperture again comes opposite the eye. Therefore, the spoke

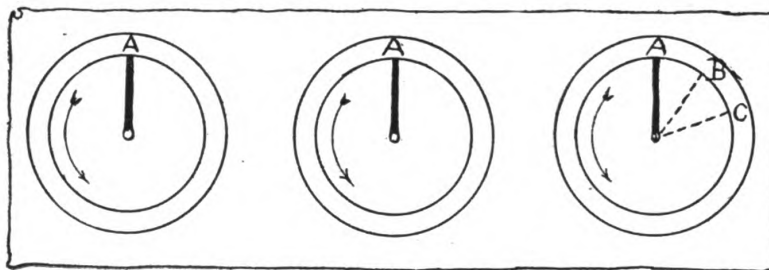


Fig. 2—A diagram to explain how the wheel appears to travel backwards on the screen

will be in the position shown in dotted lines B.

The Backward Motion

Now a funny thing has happened, for, although the wheel is rotating in the direction of the arrow, the spoke is seen at A first of all, and afterward at the dotted line B; in other words, further back than it was before. Continuing to rotate the disc at this speed, one will see that one's third glimpse of the spoke will be at the dotted line C, or further back still. Then, as far as the eye can tell,

the wheel is traveling backwards, since the spoke is seen further back each time.

Again, it does not matter how many spokes there are, or how many apertures in the disc, if the speed of the disc is the greater in relation to the speed of the wheel, then that wheel appears to revolve backward. Naturally, if the disc revolves faster than the wheel, then the spokes appear to revolve forward. Obviously, the wheel could produce either effect if it is traveling at a varying speed relative to the steady revolutions of the camera.

Predicts Big Attendance at C. B. N. A. Convention

R. E. Logsdon, publicity agent of the Cincinnati Chamber of Commerce, says:

"Manufacturing conditions in the vehicle industry at Cincinnati, according to confidential reports received by the Cincinnati Chamber of Commerce, are above normal. Compared with the same period last year the increase is remarkable. The supply of skilled labor in connection with this industry is considered short. There are many circumstances which go to make up these conditions. But it is reasonable to believe that there has been a marked improvement in the vehicle industry, and the market tone is firm with a prospect of continued good business for an indefinite period. This is cheering news to members of the Carriage Builders' National Association, Enamel Leather Manufacturers' Association, and the Harness and Accessory Traveling Salesmen. It is usual to refer to such a marked increase in business as a "revival," but many Cincinnati people are inclined to believe that progress in the industry as evidenced by reports similar to the above indicates a steady advance rather than a revival. For this reason it is predicted that the convention of carriage builders at Cincinnati, September 25-30, will be larger than for many years, and that the discussions at this meeting will result in a rejuvenation of old markets and the discovery of new ones by the carriage people."

High Class Auto Plant for Philadelphia

A new auto manufacturing company to build a high class automobile has been incorporated for half a million dollars in Philadelphia. The capital is all paid in. The company will be known as the S. S. E. Co. and is composed of New York and Chicago capitalists. Ground has been purchased in the vicinity of the Hess-Bright plant in Kensington on which a large plant will be built.

The officials of the company are: Victor Lee Emerson, designer of the Emerson engine, formerly president of the Emerson Marine Engine Co., and holder of a number of patents covering gasoline engines; E. E. Smathers, a New York capitalist of prominence, and C. B. Shaeffer, of Chicago, and head of the Shaeffer-Smathers Oil Co. Mr. Emerson is general manager, Mr. Smathers president, and Mr. Shaeffer vice-president. Temporary offices have been opened at Twenty-third and Chestnut streets.

The buildings and equipment will cost close to \$1,000,000 in addition to \$250,000 already spent in getting the enterprise under way. The company owns and controls its own patents and will make everything going into the finished car except the tire and electrical equipment. Mr. Emerson estimates the value of the first year's output at \$5,000,000.

The plant will be located on a piece of ground having

a frontage of 2,000 feet on the main line of the Pennsylvania Railroad. It will cover approximately 20 acres. The buildings will be of concrete and steel and one story high under a saw-tooth roof. The equipment will be along most modern lines and will be electrically operated throughout.

It is claimed that the car will be the highest priced of any made either in this country or in Europe. The chassis alone will cost in excess of \$5,000. The body will be made in a number of styles and will be both open and closed.

None but the highest grade of workmanship and material will be used and the main idea will be to turn out a highly scientific and flawless car regardless of price. Two of the principal features will be nimbleness and lightness. So pronounced is the latter feature that it will move while standing with a pressure of hardly more than 3 lbs.

Form Driving Clubs!

A writer in the London Live Stock Journal, which is a strong advocate of the hackney horse, says that judging from editorials and correspondence he really believes that some hackney people are beginning to see the farce of trying to run a breed for high-stepping purposes. He adds that in the *Leader* of April 7 is the following: "Fancy work is not going to keep the breed alive." Another writer, he quotes, says: "We ought to judge on easy and graceful action." Certainly, he continues, that is just where the trotter excels, or he could not trot so fast. The hackney was intended to be a driving horse. Then why not drive him? Why not have the driving clubs and prove that there is still an interest in driving? Making excuses about motors and the roads by people who only own hackneys for show will not keep the breed alive. There are more motors in North America than any other part of the globe, but still that does not prevent the existence of several hundred driving clubs. In some small towns in the States there are from 100 to 300 members of these clubs. Now is the time for all horse lovers to show that they are sincere, and to use their horses on the road. This will give encouragement to others. Everybody who loves a horse cannot find time or money to keep race horses or go hunting, therefore he must get his bit of sport on the road; but so long as we keep harness horses only for "fancy work," then we can expect no consideration from the Road Board. Rider and Driver suggests that members of the American Hackney Horse Society, each in his own town or neighborhood, organize a driving club, and believes the sport of driving not only light harness roadsters but gigs, pair-horse phaetons, tandems and coaches would rapidly increase. The so-called dangers of the motor car and the hard and slippery roads are much exaggerated and could be overcome and regulated.

England Buys Plant Site

The England Mfg. Co., Detroit, Mich., making a specialty of pressed steel door panels for automobiles, and at present located in a factory at Jefferson and Campbell streets, has acquired a three-acre factory site adjoining the plants of the Federal Motor Truck Co., and contemplates building a plant comprising 54,000 sq. ft. of floor space to enlarge its business in its specialty. The plant is to be ready for occupancy in 60 days.

Evolution of the Vehicle

When one consults authorities in an effort to learn something of the history of vehicles used by man, he is led far into the past.

"Probably," states one authority—and one regarded as authentic—"the first instrument used for drawing burdens was the sledge."

This, of course, has no reference to burdens on the backs of beasts—a method that was employed, perhaps, by Adam and his immediate descendants. One finds sledges pictured upon the monuments of ancient Egypt. A little later, when the Egyptians began employing huge blocks of stone in their monuments and pyramid-building operations, rollers of wood were used.

The next natural step was the substitution of wheels, cut in solid pieces from large logs, for rollers. And in a little while, no doubt, came the substitution of wheels with spokes for the clumsy, solid wheels.

Use of vehicles drawn by animals was introduced, it is thought, soon after the domestication of the horse and ox. From that period improvements were made from time to time. During the middle ages vehicles were slung on wooden strips to lessen the jar. Steel springs were not introduced until about 1700, and the elliptical spring was invented in 1804. While hackney coaches, so called, first plied for hire in London as early as 1605, their use did not become general for a long time. And long after they made their appearance upon the streets of cities, the older and generally employed horse litter continued to convey passengers from point to point in the country and from city to city.

For centuries the horse litter had been used as a hired carriage by those unable to maintain separate conveyances for themselves. As late as 1680 it was to be seen upon the streets of English cities and upon English highways. One of the last references to the horse litter was made in 1680, when an accident to General Shippen was recounted: "He came in a horse litter wounded to London; when he paused by the brewhouse, in St. John street, a mastiff attacked the horses, and he was tossed like a dog in a blanket."

Many a fair maid and bustling matron of those long-gone days made journeys of considerable length in the horse litter, either their own or hired for the trip. It was not a very comfortable sort of conveyance, one surmises, but it was better—at least, more dignified—than walking, and was in great favor with women who, for any reason, did not care to ride horseback and with gouty old gentlemen, who found themselves less tortured by it than by the rougher exercise of the horse and the saddle.

It is generally understood that the sedan chair was born in Sedan, France; hence its name. Just when this introduction of a new method of conveyance was made is not stated, but the sedan chair was popular throughout Europe for many generations; it was especially the polite mode of conveyance in England long after the hackney coach had made its appearance. Great numbers of these chairs were always available for immediate use, and numerous old engravings and pictures show every phase of their service. They were very popular with ladies—in fact, were considered almost indispensable in fashionable circles—and they were used extensively by men as well.

One of Hogarth's famous prints in *The Rake's Progress* shows the young dandy just alighting from a sedan chair and being arrested for debt. Nothing perhaps, fitted bet-

ter into the romantic demands of the novelist engaged in depicting the social life of past generations than did the sedan chair. There was a romance in itself about this richly upholstered and man-borne conveyance of the ladies and dandies of ages ago. One can imagine the fine women of the period, in their silks and brocades, being conveyed to fashionable events by liveried chair-bearers—who became coachmen and footmen in later years, when wheeled vehicles supplanted the chair.

In 1634 Sir Francis Duncomb obtained letters patent allowing him to let "covered chairs"—sedan chairs—for hire for fourteen years. It is not known whether he made a success of this early attempt at monopoly, for, even at that time, hackney coaches had become numerous. At first these had not been allowed to stand in the street, but had to remain in the owners' yards until called for. Their owners and drivers must have manifested some latter-day propensity for getting around such regulations, however.

By 1653 these coaches had increased to such numbers that King Charles I. issued a proclamation, stating that the "general and promiscuous use of hackney coaches in great numbers cause disturbance to the king and queen personally, to the nobility and others of place and degree; they pester the streets, break up the pavement and cause increase in the price of forage."

In the annals of old London one finds that carriages were first "driven at a rapid pace" in 1654, and also, that in 1662 hackney coaches were forbidden to ply for hire on Sundays. Statistics show that there were 2,490 hackney coaches in London in 1662, but the number of horse litters and sedan chairs is not stated. About that time the horse litter was approaching the end of its career, and the sedan chair was coming into favor.

With the increasing popularity of the wheeled vehicle the carriage makers' art advanced. The eighteenth century post chaise was often very elegant in its appointments, and, perhaps as a rule, not so slender in its important parts as indicated by many drawings that pictured it. Very elegant, too, were many of the substantially-built road coaches constructed for the country gentlemen of America. While the saddle horse was the favorite mode of conveyance of the men, they used the coaches frequently for long journeys, and there were often special coaches for the women of the family.

Indeed, the historical romances that began cropping out in such numbers some years ago would have missed some of their most picturesque features had it not been for the family coach, with the grinning negro driver on the seat, and the fair passengers, decked in furbelows and laces, on their way from plantation to plantation to attend some fashionable function of the day.

Most of us, perhaps, are under the impression that the automobile is entirely the product of latter-day genius; that the swiftly gliding vehicle is among the latest of modern inventions. And yet there is on record in the United States patent office, under date of October 17, 1789, a patent granted for a steam automobile, only it was called a "self-propelled carriage."

Earliest patents for self-propelled carriages or wagons covered devices that relied upon springs as the motive power, something upon the principle of a watch. In due time, however, and in order, came the steam-propelled vehicle, the gas carriage, the air carriage and the electric wagon.

Wonderment was evoked by the first successful auto-

mobiles, and yet they are now as firmly fixed in the order of our daily life as are the skyscrapers of the city. One reason for their popularity is because they have appealed especially to the heart of woman—and woman's favor rules the inanimate, as well as the animate world.

So it does not seem such a far cry, in view of recent developments, to the airship as a popular and general means of travel. Many a young miss now devoting her days to the polishing processes of the boarding school, may own her airship in the days to come, just as her mother now calls for her automobile when she wishes to go shopping or pay a round of social calls.

Starting a Balky Horse

Of all vices that equine flesh is heir to, the most annoying to the average horse owner and driver is balking, or near balking, which consists in rearing or plunging when first asked to start, particularly after a few days' rest, or what is still worse, trying to start with a jump when only half hitched. The main reason that I think it is so aggravating, writes Alfred H. Pope, in *Dumb Animals*, is that so few know how to combat it. A balky horse has the most sense, the confirmed runaway the least, of any horse.

I have bought more balky horses than those with any other vice for that reason. Once they are broken of balking, they make the best of horses, not afraid of the objects that usually scare those of other temperaments.

The little simple trick I am going to describe and that has proved so satisfactory in so many cases is not intended to break the horse of balking, which in most cases involves a lot of time, patience, and more or less thorough knowledge of horse nature, but rather to help those who have been caught, perhaps with a new horse that started away from home all right but has now balked, because the conditions under which he has balked before have again presented themselves.

The average driver, when caught in this way, starts in by petting and coaxing the horse and winds up by losing his temper and beating it until stopped by passersby or some policeman.

A horse has only one idea in his head at a time, and in this case he has decided not to go any further with that particular load, and the coaxing and petting are not sufficient to cause him to think of anything else. The whipping only makes him more stubborn and determined not to move. Now we have got to find something that will give him something else to think about.

All horses, and mules more so than horses, hate to have their ears hampered. In fact no horse ever decides upon a different course of action without first moving his ears from the normal position, and here is the key to the whole idea. As soon as it balks get down from the seat and deliberately take one ear and push it under the crown piece of the bridle so that it is fast and leave the horse to its own devices for a few minutes. He will commence shaking his head and doing everything he can think of to get that ear loose, until he has forgotten all about balking and his whole thoughts are centered upon freeing that ear. Now let the driver get back on the wagon, call on the horse to start, and off he goes. I have proved this trick to be successful with cow-horses that thought it necessary to buck and pitch when first mounted in the morning, and with rearers in the saddle and horses hard to hitch. Leave the ear where it is for about 20 minutes, then stop and free it. Let the horse have time to shake

his head and be satisfied that everything is all right again, and off he will go as pleasantly as possible.

As I said before, this trick will not break a horse from balking, but it will invariable start one that has balked on the road, provided he hasn't already been whipped and abused to a point where nothing matters.

Put Humor in Your Advertising

When the dealer prepares to write an advertisement designed for publication during the summer months, he should carefully consider a few important essentials. The most important consideration is good nature on his part. He should remember that he cannot compel customers to come to his store; he must win them. As every dealer knows, more flies are caught with molasses than with vinegar. It is equally true that more customers are won through a good natured advertisement than through a message which "hurls" stern facts at their heads. A little consideration will convince anyone that it isn't uncommon for the dealer to become serious and morbid during a hot spell of weather. Now, if a person writes an advertisement when he feels this way, and allows his feelings to direct the message, the result will be an arrogant, domineering message which will do more harm than good. All the advertiser's art should be directed to making his advertising messages so pleasant that the majority of the citizens who read them will be attracted and won over to his line of reasoning. It is fortunate that humor can be cultivated. Humor is one of the most important things in the whole art of advertising, and we do not exaggerate when we say a good humorous advertisement is worth its weight in gold!

We have no space to devote to a discussion of what humor really is; we must confine our remarks to a summary of the results which may be expected through the introduction of humor in the dealer's advertising campaign. Before the dealer can write a really humorous advertisement, he must understand the facts he desires to present in a thoroughly delicate way. Humor offers the advertiser greater assistance, because its introduction prevents him from straying from what is natural and normal. Humor appeals to the reader on his weakest side. There are not five men in one hundred who have cultivated a resistance against humor. The humorous advertiser immediately gets on good terms with the public, and each individual will listen to him while he states his reasons why it will pay all citizens to trade at his store.

A little thought will convince the dealer that humor has a beneficial effect upon his own nature, as well as that of his customers. When the dealer shows occasionally symptoms of humor his customers are certain that he is good-natured, is determined to be agreeable, and is honest. The dealer with this kind of a reputation is pretty apt to be successful.

Will Not Take Used Cars as Part Payment

The dealers of Fort Wayne, Ind., all of whom are members of the Auto Trade Association, have decided not to accept used cars as part payment for new machines. Heretofore they have allowed owners of old cars varying sums to apply on the purchase price of a new car, but hereafter the terms for a new car will be cash. The old car may be left with the dealer, however, and he will try to dispose of it.

Pivotal Point of Labor Union

An Influence for Good When Properly Directed—Danger of Unlimited Power

Every great and excellent thing in the world has had to fight for its right to live. The building up of any and every beneficent institution, commercial, artistic, educational, has been a struggle against misunderstanding, inertia, and stupidity. Men often fight against a thing because they are not ripe for its acceptance. As a close observer of men and an employer of labor for over 35 years, I feel that I am particularly apt to treat the subject in hand with absolute impartiality, especially at this time, when ill health has relegated me to the retired list and I have no axes to grind either way.

I remember reading some 25 years ago, that an engineer on a fast passenger train became violently insane. The time on his run had been cut down to 50 miles an hour. It was very rapid running at that time and it told severely on the man's nerves. Suddenly while at the throttle reason gave way and the engineer started to make a record run. He imagined there was another fast train just behind; his life was at stake and safety for himself and his train demanded that he should make 100 miles an hour. He had nearly attained his pace and was flying past a station where he should have stopped for orders, when the fireman, realizing the situation, laid the mad engineer low with a link-pin and the train was slowed down just in time to escape wreck.

There is a natural law well recognized and defined by men who think, called Law of Diminishing Returns, sometimes referred to as the Law of Pivotal Points. A man starts in to take systematic exercises, and he finds that his strength increases. He takes more exercise and keeps on until he gets "stale"—that is, he becomes sore and lame. He has passed the Pivotal Point and is getting a diminishing return. In running a railroad engine a certain amount of coal is required to pull a train of given weight a mile, say, at the rate of 50 miles an hour. You double the amount of your coal, and simple folks might say you double your speed but railroad men know better. The double amount of coal will give you only about 60 miles instead of 50 with a heavy train. Increase your coal and from this on you get a Diminishing Return. If you insist on 80 miles an hour you get your speed at a terrific cost and a terrible risk.

Another case: Your body requires a certain amount of food—the body is an engine; food is fuel; life is combustion. Better the quality and quantity of your food and up to a certain point you increase your strength. Go on increasing it, and you reach a point where you get diminishing returns. Go on increasing your food and you get death.

Loan money at five per cent, and your investment is reasonably secure and safe. Loan money at ten per cent and you do not double the returns; on the contrary, you have taken on so much risk! Loan money at 20 per cent and you probably lose it; for the man who borrows at 20 per cent does not intend to pay if he can help it.

The Law of Diminishing Returns was what Oliver Wendell Holmes had in mind when he said: "Because I like a pinch of salt in my soup is no reason that I wish to be immersed in brine."

Labor unions well illustrate the Law of Diminishing Returns. Labor unions have increased wages, shortened

hours, introduced government factory inspection, have partially done away with child labor, and accomplished other useful, excellent and beautiful things. But when labor unions go beyond the Pivotal Point and attempt to dictate the amount of the output—forbidding any men to earn more than so much; decide on the proportion of apprentices to workmen, that is, who shall advance and who not; declare what work shall be done in schools, in prisons and what not; tear out work that has been done by non-union men and require that it shall be done over by union men; insist that you must join a union, or else be deprived of the right to work; then the union has passed the Pivotal Point, and has ceased to give an equitable return.

When your children do not go to school for fear of the cry "scab"; when your wife dare not hang out the washing in the back yard for fear of the cry "scab"; when you hesitate to go to your work knowing you may be carried home on a shutter; when brickbats take the place of reason, and the walking delegate says: "Carry a union card or take out an accident policy," then things have gone so far that in self-protection the union must be temporarily laid low with a link-pin.

The people of America cannot afford to let any combination of men become an engine for the destruction of liberty. There are a million and a half men in America paying dues in labor unions. There are 8,000 paid walking delegates or business agents, who look to the laborers for support. A million dollars a year is paid to organizers, the money being paid by the laborers. Here we get an institution that supports a large number of men who do not work; who call a strike or declare it off; who can prey on both employe or employer at will.

Local unions meet weekly or daily. The men are called together to receive orders. Conference and consultation are out of the question—unions are run by the men who get paid for running them. And the talking men in any union are, almost without exception, men who hope to rise, by loyalty to the union and not by helping along their employer. Did you ever hear of a union where the men were called together to discuss methods and means to better the business that supplied them work? Not exactly!

Members of a union hope to rise by helping along the union. They want more pay, shorter hours, and give their time to stating grievances that grow by telling. They wish to become walking delegates, organizers or officers in the union. Men who are loyal to the firm, who have ambitions about furthering the business; who expect to become superintendents, foremen, partners and officers in the company, keep out of unions, because they are not wanted there.

Labor union organizers constantly fan the fallacy that employers are the enemies of the men to whom they supply work; that capital is at war with labor, and that success lies in secretly combining against capital. The organizers and helpers are really paid attorneys and their business is to distort the truth for their own interests.

Labor union meetings are all *ex parte*—only one side is represented. The employer, his superintendents and foremen are carefully excluded.

With the "open shop" the labor union is a good thing. It brings men together, and that which cements friendships and makes for brotherhood as well.

But the "closed shop" creates a sharp line of demarca-

tion between labor and capital, and between union and non-union men. It says, "Once a laborer always a laborer." It stops the law of evolution; throttles ambition; stifles endeavor; and tends to make tramps of steady and honest workingmen. Workingmen who own homes cannot afford to join unions, and men who are in unions cannot afford to invest in homes. Because to strike is not a matter of choice; they have to throw up their jobs at the crook of the finger of a man who, perhaps, has no home, no wife, no children, no aged parents. Men over 40 who go on strike do not get back. Strikes are ordered by young men who have no property interests, no family ties and nothing to lose. For old men who cannot earn the scale there is no work. Men with children to feed and clothe had better not forfeit the friendship of their employer by disregarding or opposing his interests.

When the unions have power to dictate a closed shop, they have reached a point where they say, "You must join our union or starve." When unionism reaches a point where it dictates to the employer whom he shall hire, and decides who shall have the right to labor and who not, then unionism has become un-American—a menace too great to overlook.

Unlimited power is always dangerous when centered in the hands of a few men. They undertake to manipulate and regulate the lives of those who toil, and take toll for their service. The result is, that being human, they are drunk-power-crazed by success, and are attempting to run an engine fitted for 50 miles an hour at a speed of 100. It is the working out of the Law of Diminishing Returns. From being a benefit, the labor union has become a burden. The few men who control the labor unions have created a phantom in their minds called "Capital," which they think is after them and is going to shunt them into the ditch. They have frightened the laborers so long with ghost stories that they have come to believe their lies. What shall be done about this insane clutch for power? Must we forever endure the rule of the demagogue?

Who is right in this question of "Labor versus Capital"? I'll tell you both sides are right and both sides are wrong. The capitalists of this country, for the most part were once workingmen, and many are workingmen now. And any laborer who owns a home and has a savings-bank account is a capitalist.

The open shop means liberty. The closed shop means slavery. Moreover, it means faction, feud, strife, violence. The open shop will make employers considerate, and labor unions cautious.

Employers are not base and grasping, any more than men who work for wages are truthful, trusting and intent on giving honest service. Men are men, and safety lies in the balance of power.—Chas. Scheuer, in *Trunks, Leather Goods and Umbrellas*.

Hayes to Make Wire Wheels

To meet the demand for wire wheels as well as the wood type, the Hayes Wheel Co., Jackson, Mich., has decided to manufacture the wire type along with its wood wheel production. General selling agent for the Hayes wire wheel will be the Castle & Kyte Co., 872 Woodward avenue, Detroit. The latter is a new organization, composed of F. E. Castle, well known in the trade as the head of the F. E. Castle Co., and H. W. Kyte, former assistant general manager of the Houk Mfg. Co., Buffalo.

Against Deferred Payments for Motor Vehicles

In view of certain advertisements which have appeared relative to buying motor cars on the deferred payment plan and the use of the names of certain cars without authorization from the manufacturers, the National Automobile Chamber of Commerce at its directors' meeting on May 3, voted to institute a broad and vigorous campaign of education, not alone among publishers, but among members of the N. A. C. C., calling attention to the fact that widespread advertising of credit plans is detrimental to the industry; that members be encouraged to avoid adopting policies which may undermine the business and that they be encouraged to pursue those policies which can alone maintain and continue permanent success. The resolution is as follows:

"Whereas certain influences are working and certain efforts are being made for the organization of plans which will have a disastrous undermining effect on the stability of the automobile industry, and

"Whereas it is the opinion of this committee that injurious results will follow the adoption of these methods by any considerable number of automobile manufacturers, and

"Whereas the methods of deferred payments under consideration are very objectionable from the factory standpoint, and are objectionable to a large degree from the dealers' standpoint, and have a disastrous effect on the purchasing public, which will unavoidably react injuriously, now, therefore, be it

"Resolved, That a broad and vigorous campaign of education be conducted by the National Chamber of Commerce, instructing and enlightening its membership along these lines and calling their attention to the fact that methods which on superficial consideration seem to have merit are in reality potent forces for destroying the foundation on which our industry has been built, and that every effort be made to encourage the membership to avoid adopting policies which will undermine the stability of the industry and to encourage them to pursue and develop those policies which can alone maintain and continue permanent success."

It Is to Laugh

An exchange publishes a few instances of publicity errors which are decidedly amusing. For instance:

Sign in bakery window: "Home-made pize."

Card in restaurant: "Small steak, 20 cents. Extra small steak, 25 cents."

Advertisement in poultry journal: "Plymouth Rock hens ready to lay \$1.25 each."

From a prepared-roofing ad: "It's bright-red color is permanent and will remain permanent."

In report of a wedding: "The ceremony was performed by two Jewish rabbits."

A Milwaukee paper informs us that "John Huckbody of Wausau lost thirty chickens by freezing to death."

On a coupon: "The holder of this coupon when properly punched is entitled to one of our beautiful photographs."

An English report on education says: "The female teachers were instructed in plain cooking; they had, in fact, to go through the process of cooking themselves in turn."

Paint Shop

Points on Baking

By W. G. Scott

In many of the automobile factories, stamping works, toy shops, and other industries, where time is of vital importance and an extremely hard finish is desired, it is customary to bake the goods.

Two kinds of heat, dry and steam, are generally used in the japanning ovens. Dry heat, usually from a gas-fired oven, is more intense in its effect than steam heat by at least 20 to 30 deg. F., or, in other words, a varnish baked at 140 deg. F. for two hours by dry heat will have approximately the same hardness as one baked at 160 deg. F. by steam heat for the same length of time.

Furthermore, less discoloration takes place under the influence of steam than with dry heat, due to the condition of the hot air in the oven.

All japanning ovens should be provided with dampers and escape flues for getting rid of the fumes, smoke, etc., otherwise the drying will be greatly retarded.

The work intended to be japanned or baked, no matter whether it is brushed, dipped, or sprayed, should be allowed to stand until the paint or varnish has "set" before it is put in the oven, and it should never be placed in the oven when the temperature is at its maximum, as the work will show streaks, spots and variations in lustre, and more "fullness" at the bottom than at the top of the article.

It is best to start with a minimum or low heat and gradually raise the temperature until the desired point is reached, then hold it there for the given length of time.

The various temperatures connected with the baking of paints, enamels, varnish, etc., will be governed by the composition of the article to be baked, for instance, wood or metal; the color and kind of paint and varnish; the number of coats; and the length of time the work is to be baked.

Woodwork, as a rule, no matter what kind of paint, enamel, or varnish used, cannot be baked at a higher temperature than that required to drive off the moisture or water in the wood.

With one-coat work on ordinary work the baking heat should not exceed 200 deg. F., and even this will be too high if the baking is prolonged.

To insure satisfactory results and permit of as high a bake as possible, the wood should receive a priming coat of "thin oil," made by thinning three parts of boiled linseed oil with one part of benzine.

This priming coat is to be baked at 220 or 240 deg. F. for two hours, then allowed to cool. It will be found that the oil has blistered in spots, due to the escape of moisture, therefore smooth the surface with sandpaper, give the article another coat of "thin oil" and bake at 200 deg. F. for three hours, then allow to cool until the next day. By this procedure the first coat will have had a five-hours' baking at an average temperature of about 210 deg. F. and be perfectly dry, while the second coat will be soft enough to take the subsequent coats of paint.

If the article is to be finished in white or any other delicate pale color, thin the paste paint to brush consistency with a mixture consisting of five parts of pale baking varnish, two parts of turpentine and one part of kerosene.

Bake this primer at 180 deg. F. for two hours. This heat will cause the priming coat to turn slightly yellow, but it is essential that the primer be decidedly hard. The second coat may consist of a paste paint thinned as above, or the proportion of thinners may be varied to secure any desired result. Turpentine exerts a flattening effect and is driven off quickly by heat, consequently its only function is to thin the paint and reduce the lustre.

Kerosene is driven off very slowly by the baking heat and, unlike turpentine, does not exert a flattening effect. It acts as a thinner, improves the flowing and levelling properties, and imparts toughness, also permits of a higher baking heat without showing discoloration. It, however, retards the drying and gives rise to numerous bubbles when the paint is applied with a brush.

The second coat of paint should either be baked at a lower heat for the same length of time as the primer, or at the same temperature for a shorter time; usually it is baked at 160 deg. F. for two hours.

The final varnish coat, in compliance with the above treatments, should be baked at 140 or 150 deg. F. for about two hours.

As a rule, each succeeding coat is baked at a lower temperature, usually 20 degrees, than the preceding one.

Wooden articles are most difficult to bake, as the wood is warped by the heat and the moisture in escaping causes the paint to blister.

Very little difficulty is experienced with iron, brass, tinware and other metals in baking, providing certain precautions are taken.

For instance, iron work must be free from grease, oil and dirt before applying a coat of paint or baking varnish, and it is best to slightly roughen the surface with fine sandpaper or by means of a sandblast.

Brass castings should have the sand and scale removed by pickling before applying the baking material.

Tinware must not be subjected to a higher heat than 350 deg. F., otherwise the solder will melt.

Planished zinc and copper should receive a wash of copper acetate solution, made by dissolving one pound of neutral acetate of copper in two gallons of warm water. Allow to dry on the surface, wipe off the dry powdery oxide with a dry cloth, then apply the paint or varnish.

Aluminum is the most difficult of all metals to paint, or rather, to make the paint adhere to it.

The nearest approach to success consists in first going over the surface with a strong solution of caustic potash, made by dissolving two pounds of concentrated lye in one gallon of hot water, then rinsing with clean hot water, allowing to dry, and finally applying a coat of the neutral copper acetate solution.

With the surface of any of these metals in proper shape

they are then ready for painting and may be finished flat or glossy, in any desired color.

Priming Coats

The primer or undercoat should be non-absorbent, but must possess sufficient "tooth" to take the second coat.

Lithopone, zinc oxide, whiting, asbestine, barytes and silica are the pigments generally used for the primer.

White lead may be used if the work is to be baked by steam, but in a gas-fired oven the lead is liable to be discolored by the sulphuretted hydrogen.

The proper baking temperature for a white primer is 180 to 220 deg. F, but a trial must be made first to see if it will stand the higher heat without discoloring.

A trial test for time must also be made; for instance, the white primer must stand a bake of two hours at 180 deg. F. and only one hour at 220 deg. F. without discoloring.

In such case, the choice of heats will depend upon the subsequent coats and the number of bakings.

If the work is to receive a second coat of flat white and a finishing coat of pale varnish, then the lower temperature with a two-hour bake should be used.

Now, if the second coat of flat white is baked at 160 deg. F. for two hours, and the final coat of varnish at 140 deg. F. for two hours, then the primer will have been subjected to a baking time of six hours in all, at an average temperature of 160 deg. F.; the second coat has been subjected to four hours' heat treatment of 150 deg. F.; and, finally, the varnish has been subjected to a two-hours' bake at 140 deg. F.

Similar results could have been obtained by baking all of the different coats at 150 deg. F. for different lengths of time, namely—the primer for six hours, the second coat for four hours, and the varnish for two hours.

There are a great many different ways of baking; that is, in regard to temperature and time.

Some japanners prefer a long bake at a low temperature, while others claim that better results are obtained by baking for a short time at a high heat.

Hardened damar varnish may be baked at 220 deg. F. for two hours, or at 300 deg. F. for half an hour without being discolored, but none of the oil varnish will stand baking at 300 deg. F. without turning yellow or brown.

As a rule, a good baking varnish will stand the following heats, viz., one hour to 160 deg. F., or two hours at 150 deg. F., or three hours at 140 deg. F.

Some of the hard gum varnishes, such as Congo, Kauri, and North Coast, will stand baking at 180 deg. F., but the rosin varnishes will not stand this heat, due to the fact that rosin itself begins to soften at a temperature of 154 deg. F. However, by treating the rosin with glycerine of calcium, it may be made to stand a much higher temperature without softening.

The amount of oil in a baking varnish has much to do with its baking properties; if too long in oil the varnish will wrinkle, "craze," and lose part of its lustre in the baking; if too short in oil the film will be hard and brittle.

Experience has shown that the best results have been obtained with baking varnishes containing from 16 to 32 gallons of oil per 100 pounds of gum.

Polishing and rubbing varnishes with 4 to 12 gallons of oil may be baked, but becomes harder and more brittle than when allowed to air dry.

Black baking japans with Gilsonite, asphaltum, or man-

jack for a gum base, usually contain from 4 to 24 gallons of oil, and in some cases 32 gallons.

These blacks when made for high baking heats, 300 to 5,000 deg. F., invariably contain a large amount of kerosene oil as a thinner. Kerosene oil is essential in black baking japans, in baking paints, and in baking varnish.

It promotes flow, is not volatilized by heat as rapidly as turpentine and benzine, and adds greatly to the toughness of the material.

Canadian Shortage of Paint Materials

It is reported that paint manufacturers in Canada are meeting with difficulties in securing materials for their product. There is a demand in other lines for the pig lead obtained formerly in British Columbia, while the supply of zinc from Belgium and France is now cut off, but is being obtained to some extent in the United States. Canadian manufacturers are also deprived of coloring materials like the siennas from Italy and color-making chemicals from Germany.

A few months ago a retail merchant forwarded to the Dominion government for analysis a brand of paint offered direct to consumers at 33 cents per quart. The merchant was advised that the pigment had very little covering power, consisting mostly of barium sulphate and silicates, while the vehicle or liquid portion of the paint was stated to contain no linseed oil.

Mixed paints are retailed by the imperial gallon. The paint referred to above was therefore offered at \$1.32 per imperial gallon, while the price of the better quality of mixed paints even before the war was \$2.25, later increasing to \$2.50, and since April 1. the local price has been \$2.75. There is no paint made in New Brunswick, most of it being imported from Ontario, though some purchases are made in Halifax, Nova Scotia.

Survey of Ford Profit Sharing

Henry Ford announced the plan whereby his employees should share in the profits of the company early in January, 1914, and put the plan into effect on the 14th of that month of a minimum wage of \$5 for every employee. Statistics gathered in two surveys, one in 1914 after the plan had been in operation for five months, and the other which has just been completed, show:

The average bank deposit of the 29,314 men now employed, is \$204, as against \$62.12, the average of the 12,960 men employed in 1914.

The bank accounts of the present employees total \$5,968,936, an increase of nearly \$5,000,000 over two years ago.

The number of bank depositors has increased from 5,872 to 17,116.

The men are now buying homes worth \$21,787,493, an increase of \$18,500,000.

In 1914, 2,572 carried life insurance totalling \$2,471,663; in 1916, 17,116 men are carrying \$14,822,916, an increase of over \$500,000 a month.

Two year ago only 364 of the men owned their homes; today 1,136 are home owners.

The total wealth of employees, as represented by bank accounts, real estate and real estate equities, is \$8,096,460, an average of \$617.33 for each man.

Nearly 12,000 more men are now renting homes than in 1914, which has caused the number of men paying board bills to decrease 50 per cent.

Large Single vs. Dual Solid Tires for Rear Truck Wheels

By W. A. Allen*

Abstract

This paper is mainly an argument in favor of the use of large, single rear wheel truck tires instead of smaller dual tires. Although the practice of using large singles is comparatively new, the author gives the results of experience and research to show the advantages of the newer method of rear tire equipment.

In developing his arguments in favor of single tires, the author goes into the history of dual tire application to show why it was necessary to use two tires in the earlier days of truck operation. As the necessity for increased carrying capacity grew, tire manufacturers found the then existing single tire equipment inadequate, and they set about to develop suitable equipment to meet the new condition, the result being dual practice. According to Mr. Allen, dual tires were supposed to have a carrying capacity $2\frac{1}{2}$ to 3 times that of a single tire of the size of which the combination was composed. The method of attaching the earlier dual tires is shown to have been poor, inasmuch as the cross bars tended to draw the rubber together in such a way that it was impossible to secure the same degree of friction over the entire base, owing to the outward spring which took place in the center of the cross-bar, thus relieving compression under these bars. This reduced the stability of attachment, which resulted in circumferential creeping of the whole tire to a much greater extent as the width of the dual equipment increased. Inability to correct this weakness resulted in conclusion to the effect that tires of such method of attachment were not suitable when widths in excess of 4 or 5 in. were employed. The metal base type of tire was developed to overcome the difficulty.

Mr. Allen holds that dual tires are overrated, and believes that the practice of saying that dual equipment is capable of carrying loads double that of the single of which it is composed, is open for discussion.

Some reasons for advocating large singles in place of small dual equipment are:

1. The contact area of single tires exceeds that of the duals which they are proposed to replace.
2. The load per sq. in. distributed over the contact area is in every case reduced correspondingly with the increase in contact area.
3. Small dual equipment does not give satisfactory performance for the reason that neither single tire is sturdy enough to resist momentary imposition of the total wheel load, such as occurs, for example, when traveling over rough road surfaces, excessively crowned or furrowed roads. It is pointed out that in such cases one of the small tires carries during a large part of the time the entire wheel load, which is shifted back and forth from one small tire to the other; with large, single units the load is concentrated on a tire sufficiently sturdy to absorb reasonable load inequalities.
4. Saving in tire cost, ranging from 8 to 15 per cent.
5. Saving in wheel cost, because of narrower felloe and wheel rim.
6. Saving in cost of handling and applying one tire in place of two.

7. Saving in wheel, tire and rim weight.
8. Fitting of non-skid chains easier.
9. Better trackage with front wheels.
10. Greater height of rubber tread, providing better cushioning properties and increasing tire life.
11. Less strain on axle and wheel bearings.

The large single tire has, however, its limitations and pending the results of further investigation, it seems advisable to consider 7 in. tires as the limit of practical single equipment.

Research and practice, covering a somewhat extended period, have brought to the author the conviction that the use of large single tires, rather than a pair of small units on rear truck wheels, while still comparatively new, has nevertheless proved a progressive development. In order to discuss the subject thoroughly a brief historical review of the solid tire industry will be enlightening.

The use of dual or twin truck tire equipment was inaugurated during the early development of an infant industry. It was offered as the then most practicable way of meeting conditions, the exact severity of which were not thoroughly known. An accurate forecast of the vari-

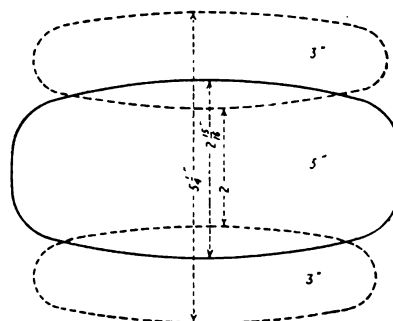


Fig. 1—Relative bearing contact (2,500 lbs. load) for 3 in. dual and 5 in. single tires

able operating conditions that followed the extension of the industry into all phases of commercial transportation was not then possible. Due to such extension, the service has become more severe along lines of greater loads, higher speed and increased zone of activity to the point of overbalancing such bettered conditions as improved roadways, more skillful operators and improved suspension and design.

Original Reasons for Dual Tires

Early in the development of a solid tire that would satisfactorily meet the demands of commercial truck service, three requisites were encountered. Listed in order of importance, these are: (1) Large carrying capacity; (2) permanency of attachment; and (3) freedom from tendency to skid.

The necessity for increased carrying capacity soon appeared, and shortly tire manufacturers found no existing single tire equipment adequate to meet practicably and serviceably the new conditions. They at once started to develop suitable tire equipment, the result being that dual tires were recommended for all necessities above the range of single tire equipment. Later the practice was extended to rear wheels generally, because tires applied in dual form were in some manner calculated to equal in carrying capacity from $2\frac{1}{2}$ to 3 times that of one of the units of which they were composed. Just why this was so con-

*Manager of truck tire department, B. F. Goodrich Co. Paper presented at semi-annual meeting, June 12-16, 1916, of Society of Automobile Engineers.

sidered has never been satisfactorily explained. It must therefore be assumed that the original capacities, which are in effect today with no material change, were reasonably accurate. Practice and observation have confirmed the fairly general reliability of these schedules. Intelligible service or performance data are scarce, however, and so we find existing capacity schedules considerably deviated from in a number of instances. All these practices should be harmonized and a new and correct schedule should be established and followed.

Early Methods of Attachment

Permanency or stability of attachment will now be considered, with reference particularly to its influence on dual

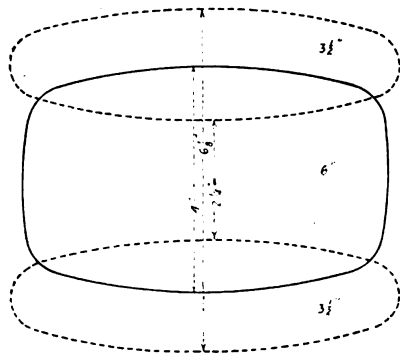


Fig. 2—Relative bearing contact (3,500 lbs. load) for 3 1/2 in. dual and 6 in. single tires

tires. The early type of tire was attached by circumferential wires or other clamping means to provide substantially a compression of the rubber tire, in turn bringing its base into direct and firm contact with the wheel rim. The friction between the wheel rim and tire base thus obtained was designed to exceed the driving torque. Most prominent of these types was that in which solid metal cross wires were embedded in the tire base at frequent intervals and extended laterally across the tire in such a manner that the ends were exposed. Circumferential wires were fitted over these ends under sufficient tension to draw the cross wires radially inward, thereby compressing the rubber underneath so as to secure and maintain a frictional contact between the tire and rim.

Then, as at present, the application was one depending upon frictional fit to perform properly its intended function. As this type of tire was increased in width it was found impossible to secure the same degree of friction over its entire base, owing to the upward spring that took place in the center of the longer cross bars, thus relieving the compression of the rubber under these bars. As a consequence the stability of attachment was reduced, resulting in circumferential creeping of the whole tire to a much greater extent than was true of those of narrower design. This movement resulted in rapid damage to the base and the tire was rendered useless prematurely, while its tread showed almost no wear in many cases. Inability to correct this weakness resulted in the conclusion that the design was not suitable for tires of greater than 4 or 5 in. width.

It was at this point that dual tires made their entry. Even triple applications were made in some cases. While results were somewhat more satisfactory, much room was still left for improvement. No similarly fastened tire has ever been free from the weaknesses explained, particularly

when used as equipment for driving wheels and when subject to varying and indifferent methods of application.

The third condition, namely that of tendency to skid, may be passed over with little discussion since this was wrongly considered as being wholly attributable to the design or character of tire. It is now generally recognized as being directly traceable to conditions of driving and braking.

New Type of Attachment

Early in 1909 a new tire designed to correct the weaknesses of previous types was placed on the market. In general this type resembled similar tires used to some extent in continental Europe, although they were not advanced beyond the experimental stage. The American tire, commonly referred to as the "metal base" type, embodied some entirely new features of shape and construction, and stands today, with minor refinements, as representative of the most advanced and successful practice. With the development of this tire, together with efficient standardization and accuracy in wheels, we have a condition whereby correct application is practically assured in every case. The frictional fit is adequate under the most severe conditions to resist any tendency for movement of the tire in any direction, regardless of size, since adhesion of the metal base to the felloe band increases directly with the tire width. This fact accounts largely for the perfection of attachment of the rubber tread to a steel rim or metal tire base, unattainable in any other known manner. The result is uniform and successful performance, as is amply evidenced by the results obtained. Weaknesses inherent in single tires of large size were overcome in this later type, so that such tires were at once brought into the field of practicability.

Dual Tires Overrated

The practice of rating two tires when applied dually at from 25 to 50 per cent more than the sum of capacities

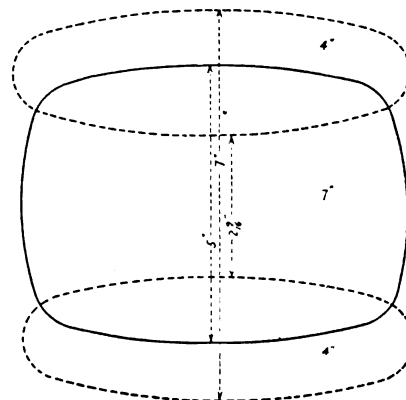


Fig. 3—Relative bearing contact (5,000 lbs. load) for 4 in. dual and 7 in. single tires

of the singles that make up the dual unit, is believed open to discussion, if not to direct criticism. No rule of theory or practice exists that will show such possibilities. It seems manifest, however, that dual tires are somewhat overrated, while singles may be somewhat underrated, according to existing schedules. This subject is under careful investigation. It is believed that a more logical schedule will be proposed in the near future. Such a schedule should in no case rate duals at more than the sum of the capacities of the single units employed. This

would correspond to foreign methods, as well as be more nearly mechanically correct.

Single Tires to Replace Duals

Since it is proposed that single tires of certain sizes replace dual tires of stated sizes, a comparison of carrying capacity according to existing capacity schedules for the given sizes will follow. This comparison will indicate that the proposed single tires are not equal in capacity to the dual tires they are expected to replace. In order to explain this point Table I and Figs. 1, 2 and 3 have been prepared. In each case the data are the composite results of several experiments made under ideal and similar conditions. Table I shows clearly that in every case with equal loading the contact area of single tires exceeds that of the dual tires they are expected to replace, and that the load per sq. in. distributed over the contact area arrived at is in every case reduced correspondingly with the increase in contact area. Obviously, this is in favor of the single equipment. Figs. 1, 2 and 3 show the area of contact, the shape of the area and the reduced width of tread. This reduction in width of tread ranges from 30 to 40 per cent and is of material importance.

Table I. Carrying Capacities of Single and Dual Tires.

Size of Tire, In.	Type.	Load*	Contact	Distributed
		Applied, Lbs.	Area, Sq. In.	Load, Lbs. per Sq. In.
36 x 3	Dual	2,500	16.5	151.5
36 x 5	Single	2,500	17.2	145.4
36 x 3½	Dual	3,500	23.6	148.3
36 x 6	Single	3,500	24.0	145.8
36 x 4	Dual	5,000	26.9	185.8
36 x 7	Single	5,000	31.5	158.7

*Corresponds to present schedule ratings for dual tires in sizes being compared.

Effects of Overload

All materials have a well defined limit of capacity for distortion in varying directions. Rubber is no exception, but its capacities are truly remarkable; in a popular sense its most natural enemy in solid-tire service can be considered as overloading.

Self-Lubricating Bearings

A radical departure in bushing construction is seen in the O. and S. Never-Oil self-lubricating bearings and bushings, made by the O. and S. Bearing Co., Detroit, Mich. Primarily these bearings are for use in places where oscillating or slow moving parts are to be taken care of, such as spring eyes, tie rods, torque arms, brakes, steering gears, etc. The bearing consists of a compressed mineral fibrous lubricant that is confined between two steel shells, rendering under all conditions of service a perfectly lubricated dust proof bearing that is free from climatic influences.

These bearings have been adopted as standard part of the construction of some of the largest automobile and parts manufacturers in the country.

The double member bearing for use in spring eyes or heavy duty oscillation is assembled by press fit in the spring eye or retainer. The bolt is slotted to match the stamped keys on the inside of the bushing, which prevents slipping of the bolt. The shackles are drawn tight against the extension of the inner member, thus preventing end squeak and assuring perfect oscillation of the entire bear-

ing surface on the pre-lubricated fibrous material between the outer and inner members.

Tests have proven that almost without exception the bearing outwears the spring or part to which it is applied.

The single member Never-Oil bearing or self-lubricating bushing is a steel shell lined with the pre-lubricated fibrous material. This bushing can replace any of the present metallic bushings, and is used in tie rods, brakes, steering gears and other oscillating or slow revolution parts of automobile construction in any dimension having not less than 3/32 in. wall. A test case was made recently by a large manufacturing concern, which reported that after subjecting the bearing to 3,500,000 oscillations, giving 165 half-turns per minute, with a carrying load of 900 lbs., the result showed no noticeable wear at all.

For Preparedness in St. Louis

The unpreparedness of the United States for war was the subject of discussion taken by several speakers at the May meeting of the members of the St. Louis Hardware, Vehicle and Implement Manufacturers' Association, held at the Planters' Hotel.

W. H. Roninger, manager of the Banner Buggy Co., among others, declared the United States should spend millions of dollars in building the most powerful navy in the world to protect itself from attacks which foreign nations, impoverished by the present war, will be tempted to make on account of our temptingly large amount of wealth, at the close of hostilities. At the close of the meeting a preparedness resolution was drawn and adopted, to be sent to Washington.

Uphold Buggy Rate

The Interstate Commerce Commission last month handed down a decision on a complaint filed by the Marshalltown, Ia., Buggy Co. against the Burlington Railroad, in which it holds that a rate of 91.5 cents per 100 pounds on buggy bodies, less than carloads, crated, from St. Louis to Marshalltown, was not unreasonable.

The complainant's principal evidence against the rate was the fact that a commodity rate on buggies, knocked down and boxed or crated, with wheels, seats and tops inside, was applicable at the time of movement. The Commission upholds the contention of the carrier that buggy bodies are more fragile than complete buggies fully boxed or crated.

Caffrey Business Sold for \$10

All the right, title and interest in the good will in the business carried on by Charles S. Caffrey in Camden, N. J., in his lifetime and in the name of Charles S. Caffrey as a trade mark, was sold recently at the Camden Court House by Mahlon W. Newton, the executor of the estate. It was purchased by the Excelsior Drum Co. for \$10. The Excelsior Drum Co. are the present occupants of the building at Tenth and Market streets, where the late Charles S. Caffrey carried on the business in the building of light carriages.

Don't sell side lines too close with the idea that they do not need to carry their share of the running expenses. A side line is as much part of the business as any portion of the main line.

N. A. C. C. Elects Officers

At a record gathering of automobile manufacturers in connection with the annual meeting of the National Automobile Chamber of Commerce, Inc., in New York, June 7 and 8, Charles Clifton, of the Pierce-Arrow Motor Car Co., was again elected president of the organization. The other officers elected are as follows:

Vice-president, Wilfred C. Leland (Cadillac); second vice-president, Hugh Chalmers (Chalmers), gasoline division; second vice-president, Windsor T. White (White), commercial vehicle division; second vice-president, H. H. Rice (Waverley), electric vehicle division; secretary, R. D. Chapin (Hudson); treasurer, George Pope; general manager, Alfred Reeves.

The commercial vehicle makers in the N. A. C. C. held a commercial vehicle convention at which many standards were adopted, furthering the plans for more efficient service to the buyers of trucks as well as of pleasure cars.

The commercial vehicle convention decided that no truck show was necessary at this time, although the pleasure car shows will be held in both New York and Chicago. They decided against any change in the standardization of frame widths at this time.

For the protection of buyers of trucks, a standard definition of motor truck chassis, both gasoline and electric, was decided upon and the convention, together with the annual meeting, approved a form of service policy which is expected to supply even better service to the car owner.

Almost all the 97 companies holding membership in the N. A. C. C. were represented at the meeting.

St. Louis Accessories Elect Officers

At the regular monthly meeting of the Motor Trade Accessory Association, held May 16, at the Marquette Hotel, St. Louis, the following officers were elected for the coming year: L. E. Allmon, manager of the Missouri Auto Specialty Co., president; Everett S. Marvin, Imperial Oil Co., vice-president; A. R. Baxter, Phoenix Auto Supply Co., treasurer; directors, F. M. Moore, manager St. Louis branch of the Firestone Tire and Rubber Co.; Leonard N. Coats, Commercial Auto Body Co.; William L. Ferrier, Fred Campbell Auto Supply Co.; Louis Moller, Jr., Rapp & Moller Carriage Co.; Allan H. Clark, Vehicle Top and Supply Co.; sergeant-at-arms, George Schatgen, Fisk Rubber Co.

Allan H. Clark, retiring president, presided at the meeting and introduced the speakers. The chairman of the legislative committee, E. S. Marvin, read the report regarding what automobile row had done to help the recent clean-up week campaign. The moving pictures taken by Albert von Hoffman of the Automobile Baseball League teams in action, was very much enjoyed by the members.

St. Louis Builders Meet

The St. Louis Carriage, Wagon and Auto Body Builders' Association held its monthly meeting at the American Annex Hotel, May 23, with 65 members present. Louis Moller, Jr., president of the association, presided.

At the April meeting the association addressed a resolution to the Congressmen representing the St. Louis districts, asking for relief from the shortage of materials necessary for the carriage and automobile trades. Replies were read from Speaker Champ Clark, Secretary of the Interior William Redfield, Senator James Reed, and Rep-

resentatives Igoe and Dyer. All shifted or disclaimed any responsibility, but promised that an effort would be made to remedy the situation.

A motion was made and carried to have a picnic at Normandy Grove, and the entertainment committee, with Frank Kranz as chairman, was instructed to complete arrangements. A cabaret and musical entertainment was provided. There will be no more social meetings of the association until September.

Parts Makers in Big Merger

A merger capitalized at \$10,000,000 has been formed by the Rands Mfg. Co., Vanguard Mfg. Co., Superior Mfg. Co., Universal Metal Co., and the Diamond Mfg. Co., to be known as the Motor Products Corporation. The new company will have its main office in New York City and its headquarters office in Detroit. W. C. Rands, president of the Rands Mfg. Co., is president; D. B. Lee, vice-president of the Diamond Mfg. Co., treasurer and general manager; C. F. Jensen, president of the Vanguard Mfg. Co., vice-president and director of purchases; H. H. Seeley, president of the Superior Mfg. Co., vice-president and sales manager; M. Louis Brown, treasurer of the Universal Metal Co., secretary, and also manager of the tube mill, and R. R. Seeley, production manager. It is purposed to build a large plant to take the place of the four Detroit ones, erect a new factory in Walkerville, and enlarge its factory in Ann Arbor.

It might appear at first thought that windshields will be the main product of the corporation, but W. C. Rands says that the company has many other fields of manufacturing in view and that, among other plans of the organization was the installation of a drop forge plant and the addition of a large screw machine department to the activities of the organization.

Eventually the windshield business of the corporation will not be over 30 per cent of the total business, said Mr. Rands.

Comet Automobile Co. Formed With \$1,000,00 Capital

The Comet Automobile Co. has been incorporated with a capital stock of \$1,000,000, to manufacture automobiles and commercial trucks, at Rockford, Ill. The auto, which will be known as the Comet, will have six cylinders and a wheelbase of 112 in., and will sell at about \$800. The trucks will sell at about \$1,000.

The company has rented offices in the Rockford Trust Building, where several floors will be utilized for workout and testing purposes. Later, factory space will be secured with 50,000 sq. ft. of floor space. It is planned to put 100 men at work, increasing this number as business warrants. Following the acquirement of a temporary location, the company will construct a building with at least 300,000 sq. ft. of floor space.

The officers of the new company are the following: President, Harry R. Sackett, Chicago; vice-president, Joseph Callahan, Chicago; treasurer and general manager, George W. Jagers. The secretary, who is at present engaged with another firm, will be named later. It is planned to place the first car upon the market September 1.

Mr. Jagers will be in active charge of construction. He is a practical engine man, also a body builder and will eventually build the bodies and motors in the Comet factory.

To What Extent Shall Car Builders Make Parts

In answer to the questions: Should a car manufacturer make his parts, or should he assemble them, and if he should manufacture them, what proportion should he make and which should he buy? H. M. Jewett, president of the Paige-Detroit Motor Car Co., told those attending the regular monthly meeting of the Detroit Section of the Society of Automobile Engineers the evening of May 18 that it is all a case of the individual conditions with each company. From the experiences and troubles each maker has had, he has his own ideas of what he should and should not buy from the parts makers. One large producer may make some part that another concern equally big has always purchased from a parts manufacturer, and there are so many qualifying conditions that no rules can be laid down.

Each manufacturer can take his particular viewpoint on the subject of manufacture versus assembly from his own personal experience in the business. Mr. Jewett divided the subject into four parts: the manufacturer producing a high priced car costing \$3,000 or over, in limited quantities; the volume producer making 10,000 machines or more; the maker that is forced into the manufacture of certain parts through business necessity; and the parts that are seldom manufactured by the automobile company.

Taking up the first of these, naturally the high priced cars are produced in limited quantities, and the result is that in order to get high price, the machine must have extreme individuality. The maker of that car must really make practically everything there is in it, for the purchaser of a high priced car has to feel that he is getting the worth of his money. The automobile maker in that class can ill afford, according to Mr. Jewett, to buy axles, engines, bodies, frames, wheels, etc., from parts manufacturers, because the latter are producing parts for cars in volume business, and it would be very difficult, from a sales standpoint, to convince the car buyer that such parts are any better than the ones made for the volume producer. This is especially true because the volume producer is advertising that on account of his quantity he can buy cheaper, so naturally, with his limited output, the high priced maker would have that argument to face.

Going to the second division—the volume producer—there is great opportunity for diversity of opinion here. It is a common supposition that a manufacturer producing over 10,000 units can make his parts cheaper, said Mr. Jewett, but he questioned if that is entirely true, mentioning some conflicting policies of big makers to show that all do not hold any unified view of the matter. He showed where Overland, for instance, buys certain parts; he cited some of the Buick company's units that are made outside its plants; he called attention to Studebaker's purchasing certain things; mentioned other plants in a very frank manner, and gave it as his opinion that conditions altered cases and that there were good reasons back of each policy.

Many of the accessory makers themselves are not making every part. They assemble too, Mr. Jewett explained. A great many of the axle companies today are buying the gears that go into their units; gearset makers do the same thing, buying gears and malleables and machining and assembling them.

But there are certain things that manufacturers very seldom make. Bearings are one. Usually these are patented processes, requiring intricate and costly machinery, and a car maker can go out and purchase a bearing from a firm making a specialty of this part and secure a better bearing and cheaper than it could be made by the car plant. This example holds good for a great many of the parts that are seldom made by the car factory. Steering gears are another thing seldom made by the car factory; frames might come under this class also.

The machinery often required for the making of certain parts would not be economical for a great many manufacturers of cars to install. Take, for instance, rear axle housings. A press to do this would be capable of such large production that unless the maker were a very large producer the press would lie idle practically three-quarters of the year, which is not economy.

Manufacturers have two ways of looking at the condition. One spends a great deal of money telling the public that he is an assembler; another that he makes everything in his cars.

As an illustration of peculiar conditions that are to be found in each individual plant, Mr. Jewett told of walking through a purely assembly plant one day and noticing that they were enameling fenders. He asked why this was done, since no other part of the car was manufactured. The reply of the superintendent was that they could not get the fenders enameled well enough outside. This suggests the thought as to why others are not enameling them for the same reason. Very possibly those others that are not enameling them are having very good success with fenders they buy already enameled. That is the only answer, because if all were having trouble in getting deliveries on properly enameled fenders, they would all have enameling plants the same as this particular case.

This leads to a consideration of the manufacturer who is forced to make his parts. Wherever a maker makes his own parts there is a substantial reason why he spends his money in machinery, tools, equipment and material instead of buying the unit. According to Mr. Jewett, you will find generally that each part that a manufacturer produces himself results from not being able to get deliveries or a fair price from the parts maker or through not being able to get this part good enough. He may not wish to buy a standard motor because that engine may be used by several different makers of cars selling at various prices.

The amount of capital needed to make cars outright is another consideration. Where the maker buys from a parts producer the latter's capital is being used in the business, and just as long as the car maker can buy those parts as good as he thinks they ought to be and at a right price, Mr. Jewett does not think any car maker is going to get into the parts making business. However, the motor is the most logical thing to produce, it being the most important part of the car.

The Paige president paid tribute to the brains of the S. A. E. that have made possible the interchange of parts of standard design through standardization.

The Discussion

Mr. White, in opening the discussion, commented that in one particular price class the reason why manufacturers make a great many of their parts is because of class individuality. Another is the refinement of workmanship. Special conditions of silence, durability and workmanship

dictate the individual manufacture of special parts. Then there is the matter of quality of material, which the individual maker can insure if he makes his own parts. In another class, in quantity production, where they have to buy parts, they have trouble due to lack of material. Sometimes there is practically only one part maker making a particular thing, and these concerns may be so full of orders that they are incapable of producing parts having special refinements. There is also the matter of prices which certain parts makers charge. In making special things, parts concerns are often confronted with the lack of floor space, and sometimes for financial reasons they simply cannot afford to lay down the special equipment necessary.

Taking up the discussion, Mr. Zimmerschied said:

I have been very much interested in Mr. Jewett's exposition of this subject, and I know that the engineers can profit greatly by it, because he has given us a business view of it; and if there is anything that most of us engineers need, it is a little glimpse of the business side once in a while. At the same time we like to draw pictures and look at diagrams and curves, and perhaps I can organize the thoughts I have in my mind if I draw such a chart.

To my mind, the automobile industry can be subdivided in two ways a sort of dual classification. First, quan-

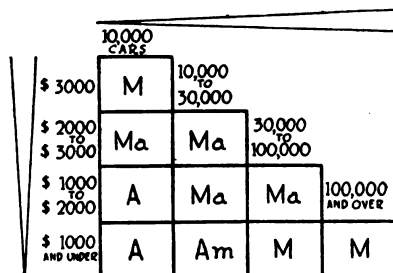


Chart drawn by K. M. Zimmerschied

tity, and second, price; something like the illustration. Quantities up to 10,000 cars, in the first class. From 10,000 to 30,000 is what you might call the medium quantity production. Thirty thousand to 100,000 plus is the super-quantity production class, you might call it. Then down the other way we will start with \$3,000 and up, \$2,000 to \$3,000, \$1,000 to \$2,000, and under \$1,000. Now, we find, if we go to cross-section all this area, that we would not be able to fill in all these spaces, because the \$3,000 class never rises above 10,000 a year; so we have a square for that class that never will get higher in production. However, the \$2,000 to \$3,000 class will run over here into the 10,000 to 30,000 per year. The \$1,000 to \$2,000 might run over into the 30,000 to 100,000, and in the \$1,000 down we run out into the 100,000 plus. So that that covers practically the field of all our automobile endeavor.

Now, if we plot the tendency toward the manufacture of his own parts, we would find, as Mr. Jewett has said, that in the \$3,000 class, that is the maximum, because the manufacturer wants the extreme of individuality; so we will draw here a wedge, running to practically zero at the bottom, the thickness of that wedge at any point indicating the tendency toward manufacturing his own parts which the manufacturer in that class follows. And in the same way we find another wedge, running out this way, which would indicate the pull on the manufacturer to make his own parts, on account of quantity.

Now, in any one of these squares, it is evident that the summation of these two tendencies, and these two bases, would be in the \$3,000 class, to manufacture all the parts. We will see here, more than in this case of maximum production, a maximum cheapness to manufacture all the parts. We might find very largely the same tendency here, and a similar tendency toward assembly; so I will introduce two small a's. Maximum tendency to manufacture, but on account of this component, a small tendency toward assembly. Why? On account of these two, it is all assembly, small quantity, small price. They have not the capital, they have not the draw to manufacture the parts.

Now, then, suppose a group of men are going to start manufacturing an automobile. They think it is a good field to go into, and they are going to market the product. Following the line of least resistance, they would start in some of these classes here to manufacture a conventional product, which has a steady market, buying most of their parts outside. In trying to sell that product, however, they find at the end of the second or third year that they are not getting along very fast, because they have not this individuality which sells. They have got a lot of parts, a lot of manufacturers, and they are very much like their neighbors' cars; so in order to gain an influential position in the industry, they have either the choice of going up in price and getting into the individualistic class there, or else going out the other way and getting a large volume, and larger profits, without necessarily sacrificing individuality. But you notice it is always a question of individuality, if you are going to establish, to attain a position in the business, an influential position.

Now, on the position of the parts manufacturer, I think that we owe a great tribute to the parts manufacturers for a great many of our big advances. The old saying that "necessity is the mother of invention" is not so true, to my mind, as that "competition is the mother of invention."

"Now for a Buggy Ride"

The third and last poster issued by the Vehicle Trade Press Committee, entitled "Now for a Buggy Ride," has been issued. It is 15 x 29 inches, printed in four colors, and, like its predecessors, exemplifies the delights and comforts of a buggy ride. Dad is seated in an up-to-date runabout, while sonny approaches with outstretched arms exclaiming, "I'm coming, daddy."

These posters can be secured at low cost by manufacturers and dealers, as the C. B. N. A. is bearing the expense of the original painting, and plates.

A sample, with the special low prices quoted, will be sent to manufacturers and dealers who make the request on their business stationery, addressed to the Vehicle Trade Press Committee, A. M. Ware, chairman, 1010 Arch street, Philadelphia.

Newly enacted legislation in New York compels the owner, when offering for use a stallion, to register full description, breeding, etc., of the animal, accompanying same with a certificate for soundness from a veterinarian. Any incurable or infectious disease with which the stallion may be afflicted disqualifies him for public use. Three dollars is the fee for such enrollment, \$1 for renewal and 50 cents for transfer of the animal.

Live Auto Show

Something new in automobile shows was inaugurated Saturday, May 20, at the Panama California International Exposition, when the motor demonstration field was opened with a big program of special automobile events. Down at San Diego the automobile is not permitted to sit idly on a Persian rug and attract attention by its beauty.

At the conclusion of the opening day program, dozens of cars were dust covered and some of them battered, but the big crowd had enjoyed a truly Roman holiday and the automobile dealers had established the merits of their cars, to say nothing of the resourcefulness of the drivers. The expositon has built two grades 35 and 50 per cent for the purpose of demonstrating hill-climbing ability.

The Metz car and the Saxon were not quite able to climb the smaller grade on the high, although many attempts were made. However, it was not the fault of power so much as traction, as the hill was badly cut up and the grade was covered with light sand. The slow race in high was won by a Paige; the quick get away race was won by a Hudson supersix, and the Australian pursuit went to Talcot P. Smith of the Saxon agency.

The Australian pursuit race is not a test on the car, but is a trying one for the driver. One lap of the track is made in the car, the second lap is made on horse back, the third lap is made on a bicycle and the final lap in the car. In addition to these contests, tire changing competitions were held and many other features of interest to motorists were offered, following the big automobile parade from down town.

The automobile reserve corps of California made a test run to the motor demonstration field and gave their maneuvers showing the superiority of motor trucks to cavalry, both on the march and in actual field tactics. United States regulars from Fort Rosecrans participated in the maneuvers.

Special programs will be given on the motor demonstration field each week and exposition bronze buttons will be given to all motorists traveling more than 500 miles coming to the exposition, and a Tiffany silver medal, given by Motor, will be presented to all trans-continental motorists.

Kentucky Wagon Gets Army Contract

The Kentucky Wagon Works, of Louisville, was awarded a contract June 14 for 600 escort wagons on bids opened the day previous by Major Theodore B. Hacker, of the United States Quartermaster's Department. The successful bid was \$102.35 each and the delivery time from 60 to 180 days, making the value of the contract \$61,410. The bid was the lowest of eight received. The American Car and Foundry Co., of Jeffersonville, tendered a bid of \$114.89. The highest bid was \$137.50, submitted by George B. Marks, Brooklyn, N. Y. The Louisville firm has made many of these wagons and recently has been working on a big contract. Studebaker's, of South Bend, Ind., were among the unsuccessful bidders, asking \$120.89.

July 1 bids for similar wagons, under identical specifications, will be asked for delivery during the first fiscal year that opens on that date. These bids will be for any quantity from 1,000 to 5,000. This method of asking bids on wagons is an entirely new one. The bidders will be required to give time of delivery.

Hayes Wheel Activities

The Hayes wheel plant, Jackson, Mich., is turning out 700 sets of Ford wheels a day, and, according to the statement of J. M. Aiken, superintendent, fully expects soon to reach a capacity of 1,000 sets of wheels a day.

Twelve carloads of wheels are being shipped from the local plant to the various Ford factories each week. The aggregate output of the large factory is 16,800 wheels a week. A night shift of 30 employes is working in the hub department and other departments are working their full quota of men to keep the capacity up to 700 sets of wheels daily. The output will be increased to 1,000 sets a day by adding more machinery and men. Mr. Aiken says that the greatest difficulty encountered is securing homes for the employes.

The company has purchased the Chaplin Wheel Co., of Chatham, Ont., and will hereafter manufacture in that city under the name of the Hayes Wheel Co.

Troy Co. Gets Big Order for Trailers

The Troy (O.) Wagon Works has received a large order for trailers from the United States government. This, in addition to a \$400,000 order from the French government June 3, assures plenty of employment for all the men that can be secured.

Work on the concrete foundation of the company's new building, which is to be erected to accommodate the growing trailer business, has been begun. It is triangular in shape, the longest side being 160 feet and the shortest 86 feet, and adjoins the building erected last year. The present structure is well adapted for economical production and the new one is to be along similar lines. Work on the building will be rushed as the company has orders in sight to test the full capacity of the trailer plant.

T. M. Sechler Married Fifty Years

Thomas M. Sechler, of Moline, Ill., announces the golden jubilee anniversary of his marriage. Thomas M. Sechler and Juliet A. McCullough were married at Irononton, O., June 7, 1866. Upon the first page of a prettily printed folder is that statement, as well as a photographic reproduction of Mr. and Mrs. Sechler's home at that time, and portraits of the happy couple as they appeared in those days, enclosed in golden medallions. Upon the third page is a half-tone of the house where Mr. and Mrs. Sechler resided, and under it the wording, "Still living at 1702 Sixth avenue, Moline, Ill., June 7, 1916." Mr. and Mrs. Sechler are very well known to the carriage trade, and are regular attendants at the annual conventions of the C. B. N. A.

Durant Becomes President of General Motors

W. C. Durant, who organized the General Motors Co., has recently been elected to the head of this company, taking the place of Charles W. Nash, resigned. Mr. Nash will continue his connection with the company in an advisory capacity until the end of the fiscal year of the company, August 1.

At the same meeting, Albert Strauss, of J. & W. Seligman Co., resigned as a director, and was succeeded by W. C. Leland, vice-president and general manager of the Cadillac Motor Car Co. He served a term on the board in 1910.

Decline in Vehicle Trade

In 1909 the census bureau told us that the average annual production of horse-drawn pleasure vehicles, that is, buggies and carriages, was 843 000 jobs. Up to that time we had not heard much complaint from vehicle interests about the automobile affecting the vehicle trade, and indeed the country trade in motor cars had not reached a large volume. The farmer who drove an automobile in those days was an exception to the rule. Since 1909, however, the sale of motor cars in the country has increased enormously and the general assumption is that the automobile business has prospered at the expense of the horse vehicle trade. This assumption is correct, but judging by the latest census of vehicle manufacturers, the decline in buggy trade has not been as large as generally estimated.

Census figures on production are notoriously inaccurate, but the comparisons made between the productions of different years may be accepted as fairly correct. As late as 1914 an investigation made by the carriage builders' association disclosed that more than 1,000,000 jobs were produced the preceding year, yet the census of 1909 placed the annual production at only 843,000 jobs. But the census probably contained the same mistakes in 1914 that it did in 1909, hence the percentage of decline in carriage production during that five-year period as reported by the census bureau, probably is correct. This reduction is said to be 33 per cent, a decline from 843,000 to 558,000 jobs. The decrease in value was only 30 per cent.

One who has heard what some implement dealers have said about the buggy trade in the last three years would conclude that the business had decreased about 75 per cent instead of 33. It has decreased to that extent so far as a great many dealers are concerned, simply because they have not been giving the trade the attention it received from them in former years. A few years ago, when farmers began to buy automobiles, many dealers practically abandoned the buggy trade. They jumped to the erroneous conclusion that the horse-drawn vehicle business was a thing of the past. The catalog houses did not jump. They are getting a larger share of the trade than they did in former days. The dealers who held on are doing well. One who called on us last week has sold 75 jobs this year.—Farm Implement News.

Can Furnish 9,000 Trucks Monthly

An inquiry has been made by the War Department as to the number of commercial cars of suitable characteristics available in this country on short notice for use by the army. Out of 200 manufacturers approached 113 responded.

It was found that by eliminating trucks that are too light or too weak and those that are too heavy or cumbersome, it would be possible to obtain something like 3,000 trucks a month of a type that will conform in all main essentials to army needs. It also will be possible to obtain 6,000 additional trucks a month of a type that nearly conforms to departmental specifications and that could be used in an emergency.

The specifications, among other things, limit the weight to 5,000 lbs., for the reason that heavier trucks are apt to cut through the crust of roads or break through country bridges and give much trouble generally over such poor roads as are likely to be used.

Gardner Gets Big Body Order

Russell E. Gardner, president of the St. Louis Chevrolet Co., announces that he has obtained the contract for 600,000 Chevrolet bodies because he was favored with barge freight rates on 10,000,000 feet of lumber that will be used in their construction. River barge freight rates figure largely in the distribution of these bodies to assembly plants.

The hardwood will be brought from southern points on river barges which average between 750,000 and 1,000,000 ft. load. The factories to receive bodies from the St. Louis plant are located at Minneapolis, Kansas City, Atlanta, and Oakland, Cal. The Kansas City plant is reached by Missouri river barges, which are in regular operation and the Minneapolis plant by the upper Mississippi barges. The Atlanta and Oakland bodies can be shipped by river to New Orleans and then transhipped by Gulf steamers and through the Panama Canal. The 600,000 bodies are to be delivered at the rate of 200,000 a year.

The St. Louis Chevrolet Co. is now completing additions to each of its two plants, at Broadway and Bulwer and Second and Rutger streets, at a cost of \$50,000 each.

Macauley Now Packard President

At a recent meeting of the stockholders of the Packard Motor Car Co., Alvan Macauley was made president of the company. Mr. Macauley has virtually been president for the past two years, Henry B. Joy having devoted most of his time to military preparedness, and as Mr. Macauley has for some time been performing the duties of the president's office, it was at the request of Mr. Joy that the title of the presidency was given to Mr. Macauley in recognition of his services.

The company also voted to increase its capital by \$5,000,000 common stock at par value, for the purpose of providing additional treasury stock. The new increase gives the company \$13,000,000 of common stock. A modification in the by-laws of the company was also effected to create the office of chairman of the board, which is filled by Henry B. Joy. This change in titles of the officials, however, does not change in any degree the manufacturing policy which has been in effect for over a year.

Du Pont Farikoid Co. Buys Fairfield Rubber Company

The Du Pont Fabrikoid Co. has purchased the Fairfield Rubber Co. with plants at Fairfield, Conn. The Fairfield company manufactures a coat textile similar to fabrikoid, and is used extensively by automobile and carriage manufacturers.

All the present employees will be retained, the change affecting only the owners. The company will not consolidate with the purchasers, but will continue as the Fairfield Rubber Co. endeavoring to uphold, if not better the present standard of their product.

J. K. Rodgers, sales manager of the Du Pont Fabrikoid Co., will act in the same capacity for the Fairfield company.

The Gaillard Engineering Works, 147 Rogers avenue, Brooklyn, N. Y., has just received a patent on a wheel pulley which they are about to place on the market.

Paige Uses Mechanical Conveyor

The mechanical conveyor system installed in the Paige plant several months ago for the final assembly of cars has been an important factor in the speeding up of production which enables the Paige to show an increase of 300 per cent over this period of the season last year.

The mechanical conveyor is a moving platform several hundred feet long which operates like an endless chain. Cars in embryo are fastened to this platform and they move along one group of workmen to the next as vital parts of the chassis are attached. The rear axle is the first part placed on the platform; the frame, tank, steering wheel, power plant and other parts follow in their proper order and a real car, capable of running off under its own power, emerges from the other end of the conveyor in a surprisingly short time.

A Quick Delivery

Two fleets of Studebaker wagons, a total of 42 vehicles, have just been bought by the United States government. In this connection a record for quick shipments was made by the Studebaker Corporation of South Bend, Ind. Within one week after the order was received the wagons were finished to specifications and sent to their destinations.

The government order consisted of 18 more water wagons in addition to the wagons of the same type ordered recently by the government, and also 24 of the two-yard Ideal dump wagons all equipped with stub poles, horn and bumper and trail chains, making it possible to hook these behind tractors or trucks for transportation in trains across the desert places of Mexico.

Franklin Puts Up Another Addition

Ground has been broken for an extension of the plant of the H. H. Franklin Mfg. Co., in Syracuse, N. Y., which will provide 143,000 additional square feet of floor space. This is the fourth important factory addition started by the company within 12 months.

Upon completion of the building the plant will have facilities for the production of 50 Franklin cars a day.

The structure, to be devoted to general manufacturing operations and the shipping department, will represent an investment of \$500,000, including machinery. It will be three stories high and constructed of reinforced concrete. Provision is to be made for adding three more floors as requirements demand.

The latest Franklin building will span four railroad tracks, permitting all loading under cover.

Bell Company Expanding

The Bell Motor Car Co., which was organized in York, Pa., less than a year ago, for the purpose of manufacturing automobiles, has increased its capitalization to \$1,000,000. The company has just purchased a 15 acre factory site in East York at Rockburn Station, upon which it proposes to erect, between now and the first of the year, modern factory buildings. The company has been placing upon the market this season two models, a pleasure car and a light, 1,000 pound commercial car, equipped with electric lights and starter.

As soon as the new factory buildings are completed this concern expects to be able to provide employment for at least 500 to 1,000 men.

Wagon Works Petitions for Receiver

The Kessler Wagon Works, Aramingo, and Girard avenues, Philadelphia, Pa., through its president, Charles H. Hassert, admitted to Court No. 2 that the corporation is indebted to the extent of \$17,000 and that it would be for the best interests of the creditors and stockholders if a receiver would be given control of the assets.

The admission was made in the form of an answer to the petition of Willis G. Kendig, a stockholder, who asked for the receivership on the ground that the assets would be dissipated if judgment were allowed to be executed by several creditors who threatened to sue out their claims. The assets of the firm are placed at \$40,000. The liabilities of \$17,000 include a \$10,000 mortgage on the corporation's property.

Fifth Avenue Bus Adopts Moline-Knight

The Fifth Avenue Coach Co., New York City, will standardize the Moline-Knight engines for its new equipment exclusively. The company has been experimenting with various types of Knight motors, running over a period of years. All the new equipment will be Moline-Knight motored, and the company's plans are so laid out that production of this equipment will start in July. It now has a few of these machines running.

To Make Automobile Sleepers

The Bradley Mfg. Co., recently incorporated in Tacoma, Wash., will produce a folding berth or automobile sleeper that can be quickly adjusted to any model of automobile, and used for sleeping quarters.

The bed can be adjusted in from three to five minutes and weighs only 30 lbs. It folds up so it can be conveniently placed on the running board of an automobile.

A three-story building near Tacoma will house the new manufacturing plant.

Fiat Auto Factory in Hungary

A branch of the Fiat Automobile Works has been founded in Hungary by the local branch of the Anglo-Austrian Bank and the Fiat Works Limited Co., of Vienna. The capital stock is 1,000,000 crowns (\$203,000). A factory situated at Kelenfold, in the suburbs of Budapest, has been rented. This is being enlarged, and operations will begin in a short time.

Moon's Business Doubled in May

The business of the Moon Motor Car Co., St. Louis, for May was double that of May, 1915, in cars shipped and four times the same month last year in cars ordered. The additional output was handled with only an increase of 33 1/3 per cent in the factory employees. The company has been receiving materials in larger quantities so that it has been able to keep about a month ahead of the demand.

Cincinnati Conventions

Two other conventions will be held in Cincinnati the week the Carriage Builders' National Association meets there. These will be the meetings of the Carriage, Harness and Accessory Traveling Men's Association and the Enamel Leather Manufacturers' Association.

Trade News From Near and Far

Business Changes

J. Wm. Howard has succeeded to the vehicle and implement business of the King Hardware Co., at Carlisle, Ky.

Mullikin & Canno have succeeded to the vehicle, implement and hardware business of Claude Mullikin, Dewey, Okla.

Manford Webb has purchased a half interest in the implement and vehicle business of his father, Chas. T. Webb, at Wingate, Ind. Firm name will now be C. T. Webb & Son.

Lindley & McGonigal, who recently purchased the implement and vehicle business of Brock & Son, at Fairmount, Ind., have disposed of most of the stock at public auction. It is reported that the remainder will probably be moved to Greentown, Ind.

New Firms and Incorporations

Hendrick & Ellis is a new implement and vehicle firm at Martinsville, Ind.

A new carriage factory will be established by W. Griffin, at New Decatur, Ala.

The Rome Supply Co. will engage in the vehicle and implement business at Carrollton, Ga.

P. W. Fox has started up in the implement, vehicle and farm implement business at Jacksonville, Ill.

Colvin & Mosley have engaged in business at Okmulgee, Okla., with a line of vehicles, implements, hardware, etc.

The Stone Hardware Co. has started in business at Hastings, Okla., with a line of vehicles, implements, hardware, etc.

The Fort Pierce Hardware Co. has been organized at Fort Pierce, Fla., for the purpose of dealing in vehicles, implements, etc.

The Arcadia Hardware & Lumber Co. has been incorporated and organized at Arcadia, O. The company will handle heavy farm implements, vehicles, hardware, etc.

News of the Vehicle Trade

The Hickman (Ky.) Wagon Works, owned by S. L. Dodds, will move to Clarksdale, Miss.

Columbia Wagon Co., of Columbia, Pa., is being pushed to the limit to fill orders which include automobile bodies.

The Ringgenberg & Cullison Wagon and Carriage factory at Plymouth, Ind., has moved its quarters, now occupying a larger and more modern building.

The Louisville Wagon Mfg. Co. is increasing the capacity of its automobile department 25 per cent and will soon be in the market for additional machinery.

The Limousine Top Co., Kalamazoo, Mich., manufacturer of automobile tops, has acquired an additional building and will increase its output considerably.

The Maxwell Motor Co., Detroit, automobile manufacturer, is completing improvements to its plant involving

an outlay of \$250,000, which will greatly increase its production.

The Crown Fender Co., Ypsilanti, Mich., will increase its capital stock from \$60,000 to \$100,000. The new plant of this company is nearing completion and is expected to be in operation within a short time.

The Ideal Wheel Co., Massillon, O., has increased its capital stock from \$50,000 to \$150,000, to provide additional capital to erect a new factory building. It manufactures wheels with steel spokes, designed for use on solid rubber tires.

The Chevrolet Motor Co. has acquired a site just outside the city limits of Fort Worth for the new assembling plant which it will build. The building will be of brick and concrete, two stories, containing 150,000 sq. ft. of floor space.

The Safety Automobile Light Co., Knoxville, Tenn., has been organized with \$25,000 capital stock, and contemplates a plant to manufacture a special lamp for automobiles. J. G. Buchanan, A. M. Treadwell, and others, are the incorporators.

The F. S. Carr Rubber Co., of Canada, Ltd., Granby, Quebec, has been incorporated with a capital stock of \$200,000 by James E. Day, 26 Adelaide street west; John M. Ferguson, 46 St. Andrew Gardens; Joseph P. Walch and others, to manufacture rubber goods, automobile tires, etc.

The Thomas B. Jeffery Co., Kenosha, Wis., maker of automobiles and motor trucks, has awarded a contract for erecting additions to cost over \$250,000. Plans are being completed for a 40-ton gray iron foundry, one story, of steel and concrete, 120 x 650 ft., and a body building shop, 150 x 250 ft., four or five stories. Charles T. Jeffery is president and general manager.

The Timken Roller Bearing Co., Canton, O., has placed contracts for two new buildings, one 50 ft. wide, U shaped, the base 105 ft. long and the side sections 220 and 210 ft. in length, three stories. This will be partly for office and manufacturing purposes. The other will be 100 x 105 ft., one story, for factory use. These extensions are in addition to other construction work planned by the Timken interests previously announced.

Doings of Motor Truck Builders

J. B. Barsdale is planning to build a \$50,000 plant for the manufacture of commercial vehicles at Superior, Wis.

The Denneen Motor Co., Cleveland, has acquired the old car shops of the Cleveland Railway Co., Coltman road and East 123d street, which will be used as a temporary location for assembling motor trucks.

The Four Wheel Drive Mfg. Co., Minneapolis, Minn., David W. Henry, president, has purchased the factory buildings of the Nott Fire Engine Co. and expects to inaugurate operations at once in the manufacture of trucks ranging in capacity from two to four tons.

The Kissel Motor Car Co., Hartford, Wis., has completed work on a new three-story building, 84 x 320 ft., and will at once erect another three-story shop, 72 x 316 ft. Plans are also being prepared for a new administration building, four stories. Approximately \$100,000 is being expended.

The American Motor Truck Co. has been incorporated under the laws of Delaware with a capital of \$3,000,000 to manufacture, sell and deal in various kinds of motor trucks, engines and so on. The incorporators are H. H. Walker, Theodore B. Hoy and George E. Touloupoulos, of New York.

The incorporation of the Corliss Motor Truck Co., Corliss, Wis., indicates the establishment of a large commercial car factory at Corliss in the plant formerly occupied by the defunct Wisconsin Engine Co. The corporate articles are signed by members of a law firm of Milwaukee. Capital \$100,000.

Capitalists of New London, Conn., have formed a truck company to produce a truck of standard parts of 1,000 pounds load capacity to be put in the market with the name of the New London truck. One chassis was displayed at a recent show in New London. Details of the company's organization and its plans for production have not yet been made public.

The Thomas Motor Truck Co. has been formed in New York City to build trucks for New York trade and to sell them from factory direct. The parts used will be purchased chiefly in the territory adjacent to New York, and the truck will be designed to meet as fully as possible the operating conditions of that limited territory. Charles K. Thomas, former president of the Federal Motor Truck Co., of New York, is the head of the company. The series of trucks will consist of $\frac{3}{4}$, 1, 1½ and 2-ton capacities.

Among the Tire Makers

The Punctureless Auto Tire Co., Akron, has acquired a site in Barberton on which it will erect a plant, 60 x 400 ft., and a power house.

The Double Service Tire & Rubber Co., Akron, is moving to Barberton. The company bought four acres of land and work has started on the new buildings.

The General Tire & Rubber Co. is building a large addition to its plant in Akron. The company was formerly the Western Tire & Rubber Co., Kansas City, Mo.

Excellent progress is being made on the construction of the plant of the Pearce Tire & Rubber Co., Ashtabula. It is expected that the building will be completed by August 1.

Contracts for three new factory buildings for manufacturing, shipping and storehouse purposes have been let by the Federal Rubber Co., Cudahy, Wis. These buildings will be fireproof.

Plans have been completed by Edward Sterns, president of the Efficiency Oil Corporation, and the inventor of the Sterns automobile inner tube, to establish in St. Louis a plant for the Sterns Tire & Tube Co.

The Goodyear Tire & Rubber Co., Akron, has filed papers with the secretary of state increasing its preferred stock from \$7,000,000 to \$25,000,000. The common stock of the company already amounts to \$25,000,000, making a total capital of \$50,000,000.

The Perfection Tire & Motor Co., Niagara Falls, Ont., with plants at Fort Madison, Ia., and Wabash, Ind., is carrying on negotiations with the city council. The company is contemplating the erection of a plant to manufacture automobiles, tires, etc., to cost upward of \$300,000.

Among the Body Manufacturers

The American Body Co., Buffalo, N. Y., will build a \$10,000 addition to its plant at Niagara street.

Schroeder Bros., Milwaukee, are contemplating the establishment of an automobile body plant in Dodgeville, Wis.

The Decatur Carriage Works, Decatur, Ind., have added a line of commercial bodies for automobiles to their products.

Acker & Lyle, Inc., Hackensack, N. J., has been incorporated to manufacture bodies, parts, cars, carriages, etc.; capital \$125,000.

The Elizabeth Auto Body Co., Elizabeth, N. J., will erect a plant, 100 x 100 ft., on South Spring street, and an engine room, 40 x 40 ft.

The Commercial Auto Body Co. has been organized in Chicago with a capital of \$10,000 by Thos. D. Huff, Horace Wright Cook and S. C. Wood.

The Emerson-Brantingham Co., of Rockford, Ill., plan to install about August 1 a department for the manufacture of automobile bodies and fenders.

The Trippensee Mfg. Co., Detroit, Mich., maker of automobile bodies, has increased its capital stock from \$100,000 to \$125,000, for the enlargement of its plant.

Plans have been prepared for the construction of a two-story 95 x 350 ft. factory in Detroit, Mich., for the Wadsworth Mfg. Co., maker of automobile bodies. The estimated cost is \$60,000.

F. C. Kramer, of Savannah, Ga., is about to erect a factory 150 x 200, of steel and reinforced concrete, for the manufacture of commercial bodies and automobile wheels. It is expected that the plant will be ready for operation April 1, 1917.

Henry Goodman, who has managed the New York office of the Springfield Metal Body Co. for two years, has incorporated the Goodman Auto Body Co. and will handle the Springfield business in eastern territory, the change taking effect June 1. He will continue the office at 1737 Broadway. Mr. Goodman, who is president of the new company, was connected with the Pope Mfg. Co. for 18 years.

The Auto Body Co., Lansing, Mich., will increase its capitalization from \$500,000 to \$1,000,000, the increase having been authorized at a meeting of stockholders. A 209 per cent stock dividend was authorized for distribution among stockholders of record July 1, with a cash dividend of 5 per cent June 30. Increase in business for 1916 has necessitated another addition, now in process of building, which will double the shop capacity, and add several hundred men to the present force.

The Leon Rubay Co. has been established in Cleveland, O., with a capital of \$300,000, to manufacture high class bodies for the trade. The plant of the G. D. Hutchcroft & Son Co., body makers, at 1318 West 78th street, has been purchased and will be enlarged. The bodies to be produced will be of the highest type it is possible to manu-

facture in quantities, and will be patterned after special custom designs. Rubay, who is one of the old-timers, was at one time wholesale sales manager for Rothschild & Co., the famous French body makers, and later was with Holbrook & Co., in New York. For the past two years he has been associated with the White Co. in Cleveland as general manager of the pleasure vehicle department.

Personal Mention

N. Walter MacIntyre, for many years associated with the William Young Carriage Co., St. Louis, Mo., has been made general manager of the plant of the Valley Steel Co., a corporation recently formed in East St. Louis.

E. A. Hatfield, for the past five years assistant secretary and sales manager of the Bain Wagon Co., Kenosha, Wis., has resigned his position to take effect July 1. He will move to St. Louis and be associated in a new organization, the Mississippi Valley Motor Car Co., distributors of Oakland cars.

F. J. Walsh, formerly with the Reifling Carriage & Wagon Co., St. Louis, Mo., has joined the M. and N. Auto Equipment Co., local distributors of the Olson Unit, as manager of city sales.

Accessory Manufacturers Merge

The United Motors Corporation, New York City, is an association of leading automobile accessory and parts makers in their respective lines. The capital stock of \$60,000,000 has been fully subscribed.

The companies comprising this merger are the Dayton Engineering Laboratories, New Departure Mfg. Co., Hyatt Roller Bearing Co., Remy Electric Co. and the Perlman Rim Co. These companies will be operated similarly to those now forming the United States Steel corporations. Each will retain its own name and its own organization. The present personnel and scope of operations of each company will be maintained as heretofore. The companies have associated for the purpose of a further constructive development of plants and products. As they stand in this new relation today the companies are backed by the strongest group of bankers in New York.

Alfred P. Sloan, Jr., vice-president and general manager of the Hyatt Roller Bearing Co., at Harrison, N. J., and Detroit, Mich., is its president, and Edward A. Deeds, president of the Dayton Engineering Laboratories Co., of Dayton, O., its vice-president. DeWitt Page, president of the New Departure Mfg. Co., of Bristol, Conn., is secretary and treasurer. These men, together with L. G. Kaufman, president of the Chatham and Phoenix National Bank, of New York City, and S. A. Fletcher, a prominent banker of Indianapolis, Ind., comprise the board of directors.

The president, Mr. Sloan, and the vice-president, Mr. Deeds, will be in entire control of the affairs of the corporation.

Sold Into War

More than \$160,000,000 worth of horses and mules have been exported from this country to Europe since the beginning of the war.

24,000 Carloads of Automobiles Shipped in May

The National Automobile Chamber of Commerce at its monthly meeting in New York City, June 7, reported a return to normal conditions in shipments. May shipments amounted to more than 24,000 carloads, as compared with 15,392 in May last year. Conditions have so improved that the use of flat cars is no longer necessary.

The truck interests also met in convention, the meeting being attended by about 40 makers with Windsor T. White, chairman. Policies of service and repair were adopted, so as to better the conditions of the truck users. There will be no truck show this year.

The truck committee adopted at its meeting the definition of standard type chassis. Just what is included under the definition has not as yet been completed.

Maxwell to Build Homes

Maxwell Motor Co., which has a plant in Newcastle, Ind., has arranged with the town authorities for a suburban development plan under which houses are to be built and sold to workmen at cost. A company known as the Greater Newcastle Co., has been incorporated with \$100,000 capital. It will take care of dividing a tract of land of 75 acres belonging to the Maxwell Co. into small lots. The city has purchased 10 acres of this land for a park, and the other 65 acres have been cut into 250 building lots, none smaller than 50 x 132 ft. The houses will be sold on a payment of 10 per cent of the cost of construction (\$1,600 to \$1,900) and the remainder in weekly installments of \$5 or \$6.

Wagon Business Increases 25 Per Cent

The Fort Smith Wagon Co., of Fort Smith, Ark., recently reported the volume of business at least 25 per cent increased over one year ago. The company's number of employees and the operating schedule have been increased in about the same proportion as the volume of business. The firm declares that collections are getting fairly good, and in fact last year was a sort of cleaning up year in the south. Many accounts that had been carried over from the year before were paid off. The general feeling is optimistic. The crop outlook is good, and if fair crops and reasonable prices are realized, conditions will be fully normal.

General Motors Doubles Profits

An eight-month financial statement of the General Motors Co., Flint, Mich., shows that its business has nearly doubled. Estimated gross sales up to March 31 totaled \$100,000,000 on the sale of 86,568 cars and trucks. Comparing these with sales of 48,478 cars and trucks during the same period of last year and an income of \$57,362,839 shows an increase in cash of over \$42,000,000. The balance available for common stock is \$17,000,000, as compared with \$9,581,542 last year. The cash balance shows \$3,000,000 in excess of a year ago.

Thermoid Coupling on Velie and Reo

The Thermoid Rubber Co., Trenton, N. J., announces that the Velie Motor Vehicle Co. and the Reo Motor Car Co., Lansing, Mich., have adopted for standard equipment the Thermoid hard fabric flexible coupling.

OBITUARY

L. P. Bannister, 56, died in Chicago, May 25. He had been ill for about a year and had undergone two serious operations. He had been connected with the Muncie Wheel Co. for many years as traveling salesman, and was very popular with the vehicle industry. He was a brother of O. B. Bannister, president of that concern. He leaves a widow and one daughter, 17 years old.

Lowe Emerson, 79, former buggy manufacturer and capitalist, who was a colonel in the commissary department in the Army of the Potomac, died June 2, at the home of his daughter, Mrs. Herbert Aiken, Merryton place, College Hill, Cincinnati. Mr. Emerson made a fortune as one of the first manufacturers of machine-made buggies in Cincinnati, being a member of the firm of Emerson & Fischer.

Charles H. T. Gerstenberg, one of the oldest carriage manufacturers in the eastern district, died May 23, after a brief illness at his home, 96 Taylor street, Brooklyn, N. Y. Mr. Gerstenberg moved to Brooklyn from Manhattan 40 years ago and became identified with the carriage manufacturing business as a member of the firm of H. Duhamel & Co., in Clymer street. Later he branched out for himself and had a factory in Bedford avenue. A few years ago he went back to Clymer street and remained there until his death. Lately he had confined himself largely to the making of automobile bodies. He is survived by his widow and two sons.

John J. Hoover, carriage builder, Lancaster, Pa., had his back broken by the breaking of an elevator, which caused his death on May 27.

William F. Powers, veteran carriage maker of Lansing, Mich., died May 25. About two years ago he suffered a stroke of paralysis and others have followed. Mr. Powers is survived by two sons and five daughters.

Nelson J. Riley, one of the most prominent business men of South Bend, Ind., died May 30, following an illness of more than six months. Mr. Riley moved to South Bend from St. Joseph, Mo., 21 years ago and became connected with the Studebaker Corporation, of which he was later elected vice-president. About a year ago he resigned as assistant secretary of the Studebaker Corporation and was vice-president of the Studebaker Vehicle Works for several years. Mr. Riley was married to Mary Studebaker, daughter of Mr. and Mrs. P. E. Studebaker, in 1882. The widow and three sons survive.

George H. Rolf, 77, retired wagon manufacturer, died June 1 at his home, 838 Clark street, Cincinnati. He located in Cincinnati when 16 years old, coming from Germany.

David R. Snyder, 68, well known wagon and vehicle manufacturer, of Danville, Ill., died on May 26. Mr. Snyder had been in poor health for several years. In 1885 he moved his wagon works to Danville from Auburn, Ind. Eight months ago he was compelled to retire from activity in the concern of D. D. Snyder & Co. Mr. Snyder was born in Pennsylvania. In 1885 his parents removed to Auburn, Ind., where Mr. Snyder and his brother later engaged in the manufacturing of wagons. They afterwards added vehicles. The widow, one son and one daughter survive.

Horse and Vehicle Exports

Exports of commercial vehicles and horses since the beginning of the war amounted to about \$350,000,000. Of this sum \$160,000,000 was spent for horses and mules, of which \$130,000,000 was for horses and the remainder for mules. Of the \$160,000,000 represented in motor cars, about \$100,000,000 was spent for commercial vehicles and \$60,000,000 for passenger cars. France is the greatest consumer of the animals, 122,000 being estimated as the consumption of that country alone. England has taken 38,000 and Canada 77,000.

WANTS

Help and situation wanted advertisements, 1 cent a word; all other advertisements in this department, 5 cents a word; initials and figures count as words. Minimum price, 30 cents for each advertisement.

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PATENTS

Patents—H. W. T. Jenner, patent attorney and mechanical expert, 606 F St., Washington, D. C. Established 1883. I make a free examination and report if a patent can be had and exactly what it will cost. Send for circular.

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Just a Sketch of Its Contents

The list of the **WHOLESALE** and **JOBGING TRADE** is so arranged as to make it convenient to separate the association members from those not so recognized.

The **RETAIL HARNESS MAKERS** of the United States and Canada comprise the principal part of the Directory, arranged by State, Town and County, and in the large cities, the street and number is given. Those rating (approximately) over \$1,000 are marked.

A list of **HARNESS DEALERS** as distinguished from retail harness manufacturers, is also given. The value of this list to those who solicit the vehicle, implement, hardware and department stores will be readily appreciated.

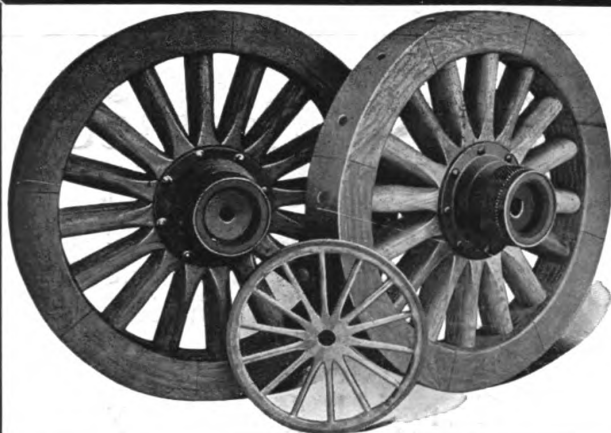
A list is also published of Export Commission Merchants, giving the class of merchandise they handle.

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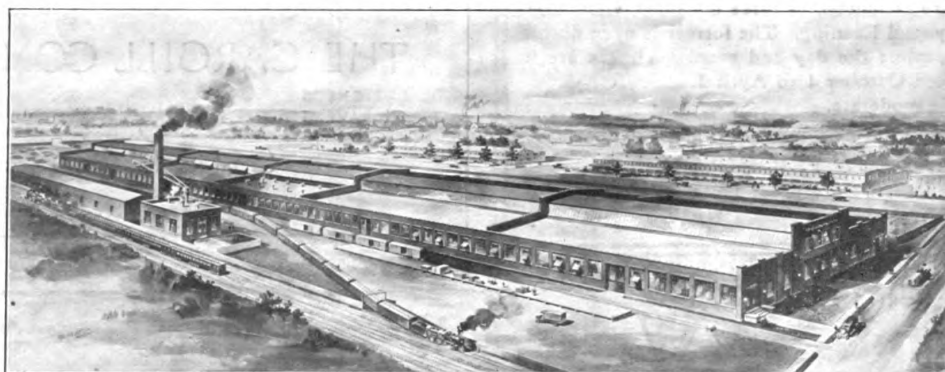
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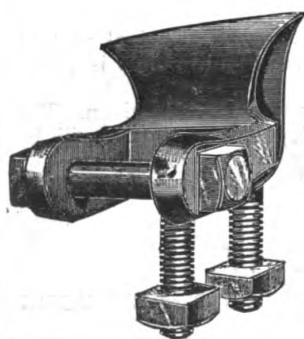
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