

# Automobile, Truck, Tractor and Highway News of

## Neglect of Rear Axle Expensive

### Constant Attention Necessary to Insure Freedom From Much Trouble

Among the hardest working units on the mechanism of the modern motor car is the rear axle. The function of this part is not only to help carry the weight of the car but also to transmit the power. Whenever the car is in motion the rear axle is the scene of intense mechanical activity. It will be obvious then that this part of the mechanism should have the most scrupulous care. It does not always get it, as we shall point out in the course of this article.

Rear axles fall readily into two distinct classifications, dead axles and live ones. It is live axles which are used on all modern passenger cars. The term "live" simply means that the axle turns. Dead axles do not turn and they are only used on vehicles having double chain drive.

When we come to examine live axles we find it necessary to classify them still further into three minor classes, known respectively as floating, semi-floating and three-quarter floating. A further classification comes later, according to the type of gearing used to transmit the power.

The live axle consists principally of a hollow spheroid, from which project on either side two tubes. In the central spheroid is located the differential unit embodying a number of gears. From the differential project two shafts, which occupy the tubes projecting from the central spheroid of the rear axle. At the ends of these shafts the wheels are attached.

The classifications of floating, semi-floating and three-quarter floating are derived from the method used in attaching the wheels to the shafts.

The floating axle does do very nearly that thing. It is not called upon to bear any of the weight of the car, it simply transmits the power to the wheels and takes a little of the torsional or twisting stresses. The floating axle has its bearings outside the tube, so that the wheels really rest on the tubes and not on the shafts. In this type of axle the shafts may be removed without disturbing any other parts.

The semi-floating axle has its bearings on the inside of the tube, so that the shafts are called upon to bear some of the load as well as to transmit power. The shafts are not as easily removed as in the case of the floating axle.

The three-quarter floating axle has the bearing on the outside of the tube and there is a rigid connection between shafts and wheels. This type demands that the shafts shall bear some of the load in addition to transmitting power.

When it comes to the types of gears used in transmitting power, we find that the passenger cars of today employ three, straight bevel, spiral bevel and two-speed bevel. In the truck field we find three additional types, the worm internal gear and double chain drive, though the latter is growing less every year. During the last few years the spiral bevel has come rapidly to the front, until today it is the popular type. There are obvious reasons for this, its quiet running and general efficiency being the leading ones. Many makers still stick to the straight bevel while the two-speed bevel has only one prominent adherent.

The car owner who has experienced that most tenacious trouble commonly known as "rear axle trouble" will not need the advice to do everything possible to guard against it. Many serious troubles may develop in this unit and only the utmost care will obviate some of them. Axle shafts sometimes break or are twisted out of their proper shape. Bearings are sometimes crushed. The differential gears are peculiarly liable to chipping, which may very probably result in the ruin of the whole unit.

As is generally the case, the principal item in the proper care of the rear axle is lubrication. Never make the mistake of using grease in this part, as used to be the rule. Oil is the proper lubrication for the rear axle. Once or twice during the running season the rear axle should be drained, and after being flushed with kerosene fresh oil should be put in. Note also that while the part should be kept well filled with oil all the time, an excess is not desirable, for the extra quantity is likely to work down into the braking system, with the functioning of which it interferes. Sometimes it is necessary to place felt washers in the axle tubes to prevent the excess oil working out in this way. Many modern cars have holes drilled in the end of the tubes to allow excess oil to drain out, and it is possible to drill holes in this way when they have not been provided by the car maker.



LEGLESS RIDER TOURS COUNTRY WITH SPECIAL MOTORCYCLE SIDECAR

Richard E. New of McKinney, Texas, used to entertain crowds at County Fairs by ascending with a balloon and parachuting to the ground. This was many years ago, when he was a young fellow. One day in 1913 at Dodge City, Kansas, his parachute failed to work, and while an awning on which he landed broke his fall somewhat, he sustained injuries that necessitated amputation of both of his legs above the knees. Despite this handicap, New still possesses his early love to roam about the country, with the result that he is touring the United States with a specially constructed Harley-Davidson Sidecar Outfit. The machine is so constructed that New rides in the sidecar and starts the motor, and operates all of the controls from this position. He just recently arrived in the city and after a short visit expects to continue on his way.

## Complete Tool Kit Indispensable To Motorists, Claim

One of the best ways to "doll up" a car at this time in anticipation of a series of enjoyable tours this spring is to equip it for every reasonable emergency that may arise. While "dolling up" may be interpreted to deal more particularly to fittings that appeal more particularly to the eye any veteran automobile tourist will tell you that "it's the things you don't see and don't think of that make motoring a real joy-ride or a glide into gloom."

While "dolling up" your car, don't fail to consider the tool box. Here should be the useful articles that every car should carry to provide against emergencies that arise sooner or later with the most careful of drivers.

Among the tire repair tools there should be a wrench for rapidly removing the nuts which hold the tire in place. One should also

A set of ignition brushes boxed and labeled; several extra spark plugs, clean and adjusted, and in a carrier; tire pressure gauge; squirt can of oil, with a flexible nozzle if there are many oil holes in an out of the way corners; hydrometer for testing battery; ammeter or trouble light, for testing electric current; box each of assorted nuts, assorted cotter pins, assorted cap screws and assorted washers, a spool of copper wire, several lengths of different sizes brass spring wire; a bag of clean waste or rags, and if you like clean hands, a box of the new kind of soap paste which can be used without water.

All of the things enumerated will stow in the tool box or under the seat, if properly wrapped, labeled and packed away. Some of them will not be needed often, but when you need a thing while touring, you need it badly.

## Auto Dollars Well Invested Dealer Claims

"A dollar properly spent for an automobile goes farther than a dollar spent in any other manner excepting a railroad ticket," says F. G. Delano of the Salem Automobile company.

"As a matter of fact, the man who buys an automobile is buying miles rather than a piece of personal property. He measures the satisfaction he gets out of the transaction by the number of miles he can run the car, hence that car owner who gets the most service from his automobile is making his dollars go the farthest."

"This fact is becoming apparent to automobile owners to the extent that they very carefully analyze the ability of the dealer to assume responsibility for the performance of the car he sells. It's just as impossible to expect a car to run without gasoline, as it is to expect it to give a continuous satisfactory performance without the consciousness and personal co-operation of the dealer who sold it with the man who bought it."

Fire and tobacco are a fine combination, but don't let the fire loose where it may destroy a forest or a city. When you are through with your smoke, put out every spark.

Leave no smoke behind.

## Six Hundred Million For Highways

### Two Million Dollars a Day Available For Highway Work This Season

Washington, May 21.—Approximately \$2,000,000 is available every working day during the present year for expenditure upon the highways of the United States, according to a statement today by Professor C. J. Tilden, director of the Highway and Highway Transport Education committee.

The actual sum available from state and county bond issues and federal aid for the year is \$6,000,000, a sum fifty percent greater than the total cost of the Panama canal, according to figures obtained from the bureau of Public Roads.

This point was made by Professor Tilden in stressing the need for more courses in highway construction and economics in colleges and universities. To spend this amount wisely, he said, would require the services of more than 10,000 trained highway engineers. At this time, universities are graduating only about 1,000 civil engineers annually, of whom a small percentage turn to highway construction. The supply is far short of the demand, according to Professor Tilden.

Through the agency of the committee of which he is director, Professor Tilden is endeavoring to persuade institutions of higher learning to include courses in the highway economics in their regular curriculums. Professor Tilden

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occupies the chair of engineering mechanics at Yale university, but is on leave as director of the committee.

Another and more popular campaign is being undertaken by the committee by means of a national essay contest among high school pupils on the subject "Good Roads and Highway Transport." Several hundred letters of inquiry are received daily from all sections of the country. Even the island possessions and the territories are seeking information on the contest.

News of the contest has been conveyed to pupils by their teachers and school superintendents in response to an announcement sent out by Dr. P. P. Claxton, United

States commissioner of education, who is chairman of the highway transport committee. Essays must be more than 500 words in length and must be in the hands of the local committees not later than June 15, when the contest closes.

Only pupils of high school grade are eligible to compete. Virtually all state superintendents are making state committees to award state honors and prizes, and are announcing the contest to their pupils. Commissioner Claxton will name the national committee which will award the main prize.

As a means of encouraging pupils to write essays, the committee requested one of its members, H. S. Firestone, Akron, Ohio, to offer a national prize. Mr. Firestone put

up a four year university scholarship, with a value of not less than \$4,000, as the award for the best essay written on this subject.

A similar contest held last year resulted in approximately 200 essays being written. The Firestone scholarship was awarded to Miss Katherine F. Butterfield, a year old high school girl of Washington, Idaho.

**Tow Line Hook.**  
A convenient hook for the use of a tow line is made in the form of a corkscrew, which is slipped around the line. It is a matter of seconds to attach or detach the device and the hook will drop or cut the rope, as soon as otherwise happens.

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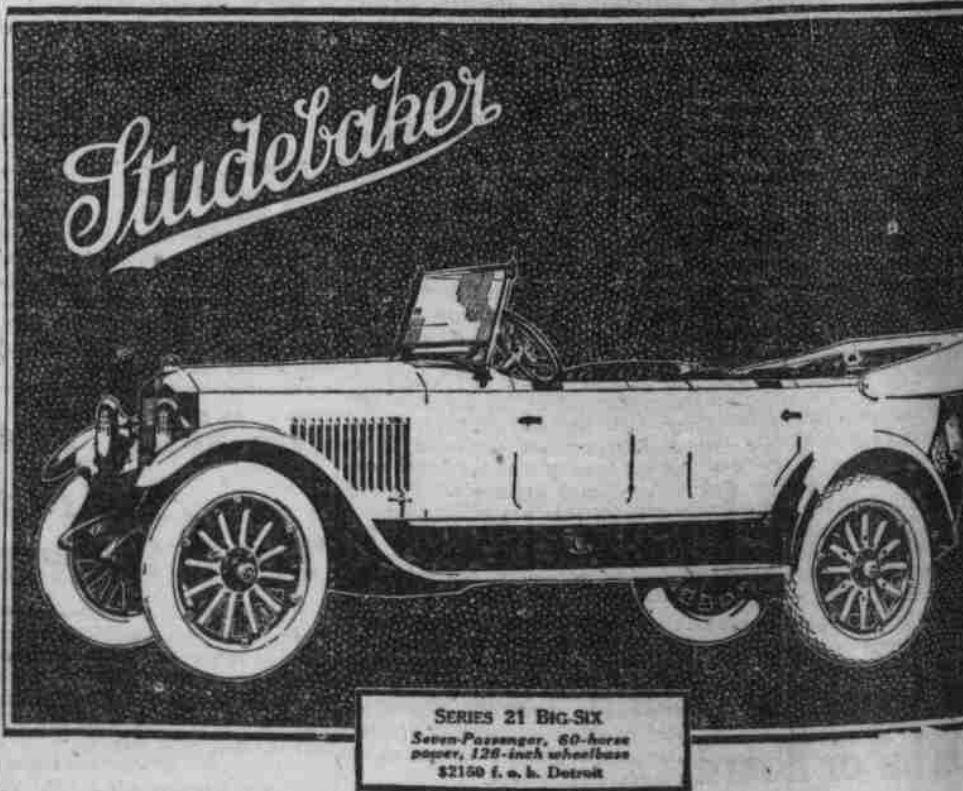
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