TRUCK AS TRACTOR IS MADE EFFICIENT

Motor Vehicle Attains Maximum of Usefulness Only by Pulling Its Load.

TWO METHODS AVAILABLE

Four-Wheel Trailer Principle One Way and Semi-Trailer Plan Is Another to Take Auto Out of Packhorse Class.

BY C. H. MARTIN.

Read before National Team Owners' Association in Springfield Mass., June 29, 1915.

If one will only stop to think that it has taken thousands of years to bring the wagon and horse up to where they are and that the first practical

they are and that the first practical motor-propelled vehicle for the highway made its appearance a few short years ago, he certainly must realize that wonders have been accomplished in a comparatively short time.

When the invention of the differential gear made the motor-propelled vehicle for the highway a possibility the pleasure car took precedence and occupied the minds of engineers, because the public demanded it. Pleasures, after all, receive consideration before business.

After the pleasure automobile was well on its way thought was given to

After the pleasure automobile was well on its way thought was given to the business end and the development of the motor truck began. The line af least resistance was followed and the design of the pleasure car taken, on the principle that if a machine would carry a load of passengers a larger machine of the same type would carry a load of merchandise.

Economy Is Reason for Truck. The principal reason for the existence of the motor vehicle for business purposes, whether it be delivery wagon heavy truck or tractor, is economy.

It may be of time. It may be of money. But as time is money, it all comes to the same thing. The machine that will do the most work for the least money is what the designer is striving to produce.

After the major truck had been in

is striving to produce.

After the motor truck had been in practical use a short time it was brought pretty forcibly to the minds of engineers that its necessarily high first cost, correspondingly high operating cost and limited range of action would allow a narrow margin of profit when it was brought in competition with the horse. It would show a profit on long hauls, good road conditions, good... Titles for loading and unloading; but where the hauls were short or loading and unloading conditions bad, the horse could haul cheaper.

cheaper.

The motor truck has been brought to a high state of development. But, after all, it comes in the class of weight-carrying, or pack animals.

Truck Becomes Tractor.

The next step was to make the truck do more work than it had been doing and show a greater profit than it had been showing, and the only way to do this was to make it into a tractor which would draw its load instead of carrying it. The efficiency was greatly increased, as in the case of the horse, when he became a tractor instead of a carrier.

In all live factories today the tractor principle is coming in for special attention. Why it delayed so long is hard to understand. It is a self-evident fact that if you have a bunch of merchandise to move and have a good Truck Becomes Tructor.

road to move over, you would not put this merchandise on the back of a horse and carry it. Why has not the same process of reasoning come into

same process of reasoning come into play long before with regard to the motor truck? Why not utilize all the power that there is in that truck?

There is sufficient power to draw over good going considerable more than the frame, springs, axies and tires will support in carrying the load. In all the standard trucks today the transmission and driving mechanism, consisting of gears, shafts, keys and all train-taking parts from the engine back to the wheels, are designed to withstand the power that the engine will develop. If a truck, built to carry five tons, be driven up to a brick wall with its full load on its back and the power applied, the wheels will slip on the dry street. This shows that the power applied, the wheels will slip on the dry street. This shows that the truck is capable of drawing bening it as much as the traction between the road and the driving wheels will ad-

Two Methods Available.

There are two methods of making the motor truck into a tractor. One is the four-wheel trailer principle, and the other is the two-wheel or semi-trailer principle. Here comes in the traction problem; and it is one of the traction problem: and it is one of the grentest problems that confront the designer and user of the motor vehicle today. Where we must depend entirely on friction, as is the case on the city streets, where no cleats or spikes are allowed, we must use for a tire a substance that has a high coefficient of friction. Much experimenting has been done with wood blocks, combination wood and steel and other substances. But we have all come back stances. But we have all come back to rubber. Now, about the only rea-son for the rubber on a tire is for the fraction that it gives. The cushioning effect of solid rubber is of little value. Springs are made to take care of all road shocks and do it well. Steel tires have been used for years on drawn wheels, and it is safe to continue their use.

their use.

If it were not for the problem of traction, we would use steel tires on the driving wheels also and get away from one of the heaviest items of expense for where the wheel simply rolls and does no driving, steel is unquestionably the cheapest—therefore the best. The railroad locomotive obtains sufficient traction on steel tires to sufficient traction on steel tires to move from 40 to 50 times its weight, but 2 per cent is the maximum grade on any except the mountain roads, and they rarely go over three.

Grade Increases Need of Weight. As we ascend a grade the percent-se of weight necessary for traction

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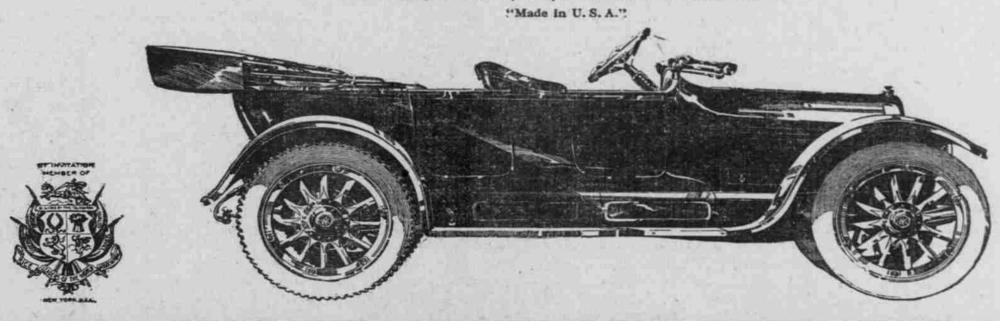
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