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.

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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 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 the business end and the development of the motor truck began. The line of 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 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 facilities for loading and unloading; but where the hauls were short or loading and unloading conditions bad, the horse could haul 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 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 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, axles 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 truck is capable of drawing behind it as much as the traction between the road and the driving wheels will admit of.

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 greatest 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 to rubber. Now, about the only reason for the rubber on a tire is for the traction 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.

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 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 percentage of weight necessary for traction increases by leaps and bounds, and as the grades on our highway are not, as in the case of the railroad, limited to 2 per cent, the motor truck, when used as a tractor, must have a percentage of weight on the driving wheels in proportion to the grade it runs over, and the road surface encountered. A large per cent is necessary on a steep, icy hill, or a wet asphalt hill, and these same driving wheels must be shod with rubber until some better and cheaper substance comes along.

The bulk of merchandise is loaded and unloaded at chutes or platforms, or other places where it is necessary to back the vehicle in order to place it properly. Were it not for these two problems—that of traction and of necessity to back to a given position—any motor truck could be called on to do duty as a tractor without change by simply having wagons hitched on behind. This is done with varying degrees of success in many places, but to obtain the highest degree of efficiency the design must be such that the tractor and trailer can be handled by one man, can have traction sufficient to go any place and be backed easily and quickly to any given position, and the trailer disconnected and left to be loaded or unloaded. There are some four-wheel trailers made that, with the assistance of an extra man, can be backed to a given position. But no part of the load can be used for traction. Vehicles of this class are successfully used over level roads in many sections of the country.

But a much higher degree of efficiency is reached in the semi-trailer plan, where part of the load is carried by the driving wheels and part drawn behind on two trailing wheels. In this manner the capacity of a truck is doubled. There is always sufficient weight for traction. It can be backed to any position without the aid of an extra man, and can be jacked up and left standing for loading or unloading while the tractor is after another load.

Granting that the motor truck is a highly developed piece of mechanism, it is limited in its carrying capacity, can handle only the kind of merchandise for which its body is designed, and must wait while loads are being put on or taken off; but when it is used as a tractor its field is widened, inasmuch as its capacity is doubled—it carries its normal load and draws as much more on two wheels trailing behind. It can handle as many different kinds of loads as there are different kinds of wagons to attach—low-bed wagons, end-dump wagons, bottom-dump wagons, long or short wagons, or passenger buses. Half the weight is carried on steel tires; the total weight is spread over three axles; the truck and driver are constantly occupied—no waiting for loads; loads may be left standing to be unloaded when convenient.

Chelan County Orders Road Signs.

WENATCHEE, Wash., July 17.—(Special.)—For the benefit of tourists and others using the county roads, the Chelan County Commissioners have ordered signboards placed at the intersection of the main thoroughfares. These will give the mileage and direction to the most important towns on the road.

NEW MODELS INTEREST

MAKERS EXPLAIN CONTINUED EFFORT TO LENGTHEN CAR'S LIFE.

Demands of Buyers Grow More Exacting as Years Go by—Studebaker Reports Improvements.

It is surprising how much interest is displayed by the general public in the plans of automobile manufacturers relative to new models. This has been very noticeably emphasized the past week by the comment the Studebaker announcement for 1916 has created in numerous cities. Word received from Studebaker branch house managers and dealers over the country is to one effect, that never before has such interest and enthusiasm been shown over new models. Indications are also said to point that the coming year will prove the greatest selling season in the history of the industry.

More than ever the automobile is being used for business purposes, for pleasure and recreation. Horse delivery is regarded as a luxury to a business of even ordinary size. The day seems to be approaching rapidly when every man with what may be considered a comfortable income will be the possessor of a motor car. These conditions help toward creating a general public interest in what the manufacturers are doing. The effect of this interest is to develop the new buyers who make it possible for the quantity producer to lower his prices. A goodly portion of these readers of automobile announcements may not be immediately concerned in the purchase of a car, but their interest indicates that the educational effect may some time produce results.

Each succeeding year has brought more exacting demands from the buyers of cars in the way of greater serviceability. Recognizing the insistence for more pulling power, Studebaker has enlarged the bore of the motors in the new models, and made other changes that now produce 50 horsepower in the six cylinder motors and 40 in the four cylinder.

Another effort on the part of manufacturers has been to lengthen the life of cars. This is a feature which Studebaker has also given close attention in the new models. Vibration has been greatly reduced and silence secured by increasing the rigidity of parts, following European engineering practice. The crankshaft has been made stiffer, for one thing, and made to revolve on larger ball bearing areas, while the motor bearings are bronze backed babbit. A rotary balance device at the Studebaker plants makes it possible to see that shafts are properly balanced at critical speeds.

All these improvements have the effect of reducing the wear on a car to the minimum, which naturally means for it greatly prolonged life. A person of sufficient wisdom to gather enough money to purchase a motorcar may be reckoned upon as casting about for the greatest value when he buys. All of which makes the automobile sections of the newspapers the more attractive to the average reader.

Three on Cycle Make Time.

ASHLAND, Or., July 17.—(Special.)—A trip from Klamath Falls to Ashland, a distance of 65 miles, covered in four hours, was the record made by three passengers on a motorcycle July 12. This was done by Claude Coon, Charley De Lap and a younger brother of the latter, who rode on a cushion in front of the driver. Some of the distance was over a rough mountain road. The machine was a Harley-Davidson.

Longest "Drive Away" Planned.

Clarence T. and Sumner E. Johnson, two brothers, purchased new model four and six-cylinder Studebaker touring cars at the Detroit factory recently. They will drive the cars back to their home city, Moscow, Idaho. This will in all probability prove to be the longest "drive-away" ever started from the factory since the idea was inaugurated.