tenance charges low on the whole truck; a good tractive grip and a reasonable cost all are properties which are required in a truck tire.

Operating Costs.—Fig. 2 gives a graphical view of percentage costs for a light, a medium and a heavyweight truck, each averaging 50 miles a day. The higher proportion which the light truck has in the items of labor, depreciation and maintenance is noticeable. Against this increase is the lower percentage of the entire cost charged to fuel and tires.

Many of the larger department stores will not allow their drivers to make any repairs or even to carry a

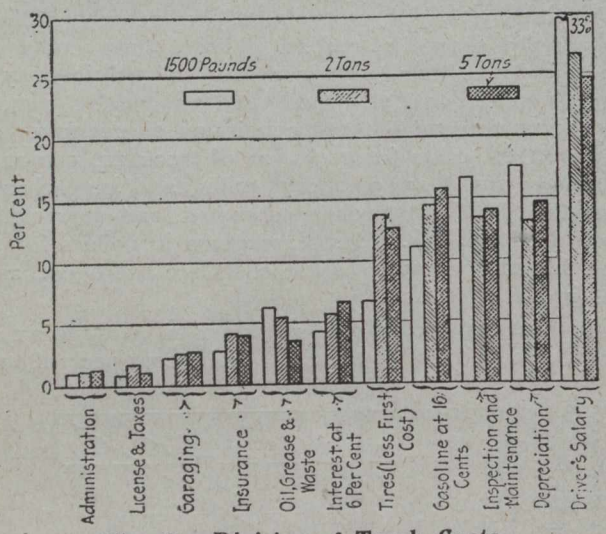

Fig. 2.—Division of Truck Costs.

wrench or a pair of pliers. A regular force looks after each truck and keeps it cleaned, oiled and set up. Ownership of eight or ten trucks will justify an owner in employing a mechanic who, with a small outfit of tools and a helper, can keep the trucks clean and in adjustment and make many of the smaller repairs. Reliable service garages are now to be found which will do the same work for a reasonable charge, and this is more satisfactory than to leave it to the driver.

It is impossible for the manufacturer to devise a shop test that will equal the brutality of actual service. The modern motor truck has had to meet the demand for a vehicle that will stand abuse. The careless or indifferent driver is quick to find this out. Operating costs for the same make and capacity of truck engaged in exactly the same kind of work for one firm will frequently show a variation of 40 per cent. in the items of gasoline, oil, tires and maintenance. It is easy to see how a poor driver will shorten the life of a truck.

Manufacturers have tried to meet this condition by making truck parts as few and simple as possible; by standardization of parts; by making wrong assemblies impossible; by printing detailed information about oiling and caring for the truck; and by instituting a follow-up service to get the truck owner started right. The truck governor has helped to solve the speeding problem. Another aid is the recording speedometer, which gives a graphical log of each day's run—velocity plotted against time: thus every minute of the day is accounted for; the number of stops and time of each, maximum speed, etc. The chart will show, for example, whether it will pay to put on a second man to hasten deliveries or whether a re-routing of existing lines will give a better all-round service. A driver's record sheet, if it is brief and informing and filled out each day, is frequently helpful. It must be drawn off at the office and kept up to date. Records are of little use unless changed conditions can be recognized at once.

Lubrication is probably the most important item in truck maintenance. Manufacturers have tried to make oiling simple and easy to do by making oiling places few and accessible, and by providing charts and printed instructions for this work; some parts every day, some parts twice a week, etc. Still, there are about seventy places in the average truck that must be lubricated, and if there is no intelligent head to look after this work local wear soon starts, and then things go fast. Motor oil should be changed frequently, at least once for every 1,000 or 1,500 miles' run. It is not enough to build up the supply, as the oil is fast charged with carbon and with grit from the intake air and soon loses its lubricating qualities.

Fig. 3 gives curves for gasoline trucks plotted from the data of Table I. These curves, if continued out to the line of zero miles per day, show the daily fixed charges for each truck. The cost per day increases quite uniformly with the increase in size of the truck, whether the daily run be a large or a small one. The cost per ton-mile is based on a full load each way. This chart shows that under such favorable conditions of haulage a heavy truck may reach a ton-mile cost of as low as 5 cents, provided that the nature of the work is such that the truck can be run daily at the rate of 50 or 60 miles a day. This is a heavy mileage for a big truck, and such an ideal service as would be represented by a full haul each way on level roads, with loading and unloading time minimized so that the truck could be under way for six or seven hours each day and with no extra helper required, is not often found.

In deciding upon a truck one of the most important questions to settle is that of size. On the good roads of this section it is more disastrous to buy a truck too large for the work than to buy one that is too small. A 5-ton truck costs some 25 per cent. more to operate than a 3-ton machine, nor is this cost reduced very much by taking a lighter load on the heavier truck. Interest, depreciation, maintenance, taxes, insurance and fuel—all are higher. Until very recently the tendency has been for

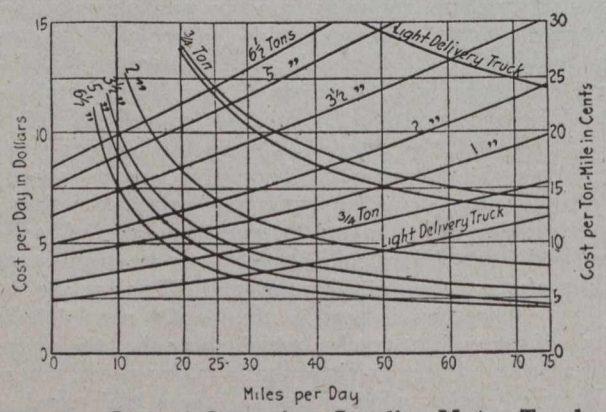

Fig. 3.—Cost of Operating Gasoline Motor Trucks.

owners to buy trucks too large for their needs. Now the buyers have commenced to realize that it costs too much to "deliver the vehicle."

Another point that must not be overlooked is that the capacity of a truck is figured for average conditions, and that the average road condition throughout the country is very much harder on the truck than it is here. A half load on a truck carried over a road full of ruts and chuckholes is much worse for the truck than a 20 per cent. overload on a good concrete or asphalt road. A 6½-ton truck recently carried an 11-ton casting up the Mount Wilson