horse-drawn equipment includes six horses, three wagons, harness, blankets, etc.

In Table IV. is shown the daily cost of operation, the cost of operation per ton of material handled, the cost of operation per mile of material hauled, and the cost of operation per ton-mile performed by the motor truck compared with the horse-drawn equipment. The saving effected in each of these items by substituting the motor truck for the horse-drawn equipment is also shown.

Table IV.

	Cost per Day	Cost per Ton	Cost per Mile	Cost per Ton-Mile
5-ton motor truck..	$10.82	$0.22	$0.60	$0.146
1 two-horse truck ..	6.29	0.295	0.632	0.227
3 two-horse trucks..	18.86			
Saving by using motor truck ...	8.04	0.075	0.032	0.081

Other advantages that would be gained by using the automobile truck in place of the horse-drawn vehicles are: Saving in wear and tear of the shop floors and streets, greater cleanliness of same, less housing facilities required, thus permitting the greater part of the present stables to be torn down or used for other purposes, power-driven auxiliary equipment on truck to assist in loading and unloading heavy material, and ability to make occasional long hauls not possible with horse-drawn equipment.

The investigation of the transportation conditions at the plant under discussion resulted in the following answer to the question submitted by the management: It will be materially to your advantage, both financially and otherwise, to substitute one-five-ton gasoline motor truck for your present horse-drawn equipment consisting of three two-horse-drawn trucks.

Factors in Purchasing Trucks.—When considering the purchase of a motor truck it is sometimes advisable to obtain from the dealers, or manufacturers, a list of the users of the different trucks which have been demonstrated, and send them a list of questions to answer along the following lines:

1. What is the capacity of your truck?

2. Do you find it necessary to operate the truck with a skilled mechanic?

3. What is the mileage obtained per gallon of gasoline and lubricating oil?

4. About how many miles a day do you drive the truck?

5. Over what kind of roads?

6. About what is the average load that you carry?

7. What mileage do you get from one set of tires? or, if not convenient to give this in miles, how long does one set of tires last in months?

8. Do you feel that for hauling a heavy character the ———— truck is satisfactory?

9. Have you any comments or suggestions to make relative to the ———— truck that would be of assistance to a prospective purchaser at the present time?

From the answers to the above questions much valuable information may be obtained at first hand which will prove of considerable assistance in choosing between different makes of trucks.

Attention is directed to an undesirable condition, almost universal, in the haulage of material. Too much time is spent at the terminals in loading and unloading, thereby reducing the earning power of the outfit. Every transportation engineer understands the importance of keeping the equipment moving the largest possible per cent of time. By referring again to Table IV., it will be noted from the summaries of the log that, while the speed and consequently the mileage of the motor truck is nearly twice that of the horse-drawn vehicles, the per cent. of time actually spent on the road is less. It is interesting to state, also, that, although the material handled was of a very heavy character, certain recommendations—two removable nesting bodies handled by electric travelling cranes, and the installation of a light, self-powered jib crane on the truck—were made, which would result in the reduction of idle time by at least fifty per cent., thereby considerably increasing the earning power of the truck.

UNITED STATES STEEL PRODUCTION.

The total production of steel ingots and castings in the United States in 1914 amounted to 23,513,030 tons, according to the American Iron and Steel Institute. This output compares with 31,300,874 tons in 1913 and 31,251,303 in 1912. The ingots production alone last year was 22,819,784 tons, compared with 30,280,130 in 1913 and 30,284,682 in 1912. The output of castings in 1915 was 693,246 tons, as against 1,020,744 and 966,621 in the two previous years, respectively. Of the 1914 total output of ingots and castings, 17,174,684 tons were made by the open-hearth process, 6,220,646 by Bessemer, 89,869 crucible, 24,009 electric and 3,522 miscellaneous.

All kinds of finished rolled iron and steel produced in the United States in 1914 amounted to 18,370,196 tons, compared with 24,791,243 tons in 1913 and 24,656,841 in 1912. The 1914 output was made up of the following classes: Iron and steel rails, 1,945,095 tons; plates and shapes, 4,719,246; wire rods, 2,431,714; structural shapes, 2,031,124; nail plate, 38,573; and bars, skelp and other forms, 7,204,444.

Production of iron and steel plates and sheets in 1914 aggregated 4,719,246 tons, compared with 5,571,073 in 1913. Merchant bars produced last year amounted to 2,523,631 tons, against 3,957,609 in 1913. The 1914 concrete bars output was 288,471 tons, compared with 319,670 in the previous year. The production of tinplates last year amounted to 1,939,785,000 pounds and terne plates 146,105,000 pounds, compared with respective figures of 1,708,186,000 and 136,944,000 for 1913.

Legislation to require the railways of the United States to build nothing but steel or steel underframe cars and to withdraw the wooden cars within a given period has been advocated for several years, but Congress has never taken any definite action. There would now appear to be no need for such action, as the railways themselves have practically discontinued the building of wooden passenger cars, and such cars as are now in service will be withdrawn as they become worn out or obsolete. At the rate at which the change is now going on the larger proportion of the railways will have all the steel cars required for high-speed and heavy traffic within a compartively short time. In fact, many of them are now in this condition.

Underground development and surface betterments to cost not less than $1,000,000 are being considered in plans for operating its extensive holdings in Western Canada by the British Columbia Copper Co., according to Oscar Lachmund, general manager. H. D. Quimby will be associated with the company as field engineer. "Eventually we plan to erect a 2,000-ton daily capacity concentrator at our Copper Mountain properties, which will cost about $500,000," said Mr. Lachmund. "This will be operated by a power plant, either at Princeton or Coalmont, that will require approximately $300,000 to construct and equip, and if the Kettle Valley Railway Co. does not extend its line to Copper Mountain we will construct an aerial tram from the camp to Princeton, about nine miles."