that the average truck owner could save 20 per cent. of his operating costs by properly analyzing his problem.

Methods of Reducing Trucking Costs.—To get a low cost per ton it is necessary to keep the truck moving. Devices which cut down the time of loading and unloading are very important. Among these are self-dumping bodies of various kinds for stone, hot asphalt or lumber; loading chutes or bins which are filled by elevator or conveyer; there is also a movable steel tipple which can be run alongside a train of flat cars and be filled by shovelers while the truck is out on the road, so that the actual time required to fill the truck is very little.

Table II.—Comparison of Operating Costs of a Single-Horse Wagon and a Light Gasoline Delivery Truck.

Cost of wagon equipment (horse, $250; wagon, $140; harness, $40), $430.

Cost of 700-lb. capacity gasoline truck, $600.

	Wagon costs.		Truck costs.	
	Idle.	20 miles per day.	Idle.	60 miles per day.
Estimated life, years ..	10	10	10	2.5
Depreciation	$0.108	$0.156	$0.200	$0.760
Interest at 6 per cent...	0.086	0.086	0.120	0.120
Taxes	0.009	0.009	0.012	0.012
Stable and garage rent	0.200	0.200	0.166	0.166
Insurance (fire and theft)	0.030	0.030	0.045	0.045
Driver (⅓ time when idle)	0.666	2.000	0.666	2.000
Feed—				
Hay, 10 lb. and 15 lb.	0.102	0.153	....	....
Oats, 10 qt. and 15 qt.	0.200	0.300	....	....
Gasoline, at 16c. per gal.	....	....	....	0.640
Lubricating oil, at 40c.	....	....	....	0.130
Hostler (1 man to 12 horses)	0.200	0.300	....	....
Cleaning and oiling ...	....	....	....	0.400
Shoes and veterinary ..	0.095	0.135	....	....
Tires and tubes	....	....	....	0.625
Repairs to wagon	....	0.090	....	....
Maintenance	....	....	....	1.200
Water, bedding, etc. ..	0.045	0.045	....	0.005
Total cost per day ..	$1.741	$3.404	$1.209	$6.103

Another device is the use of extra truck bodies, which are loaded while the truck is on the road and swung onto the truck by an air lift or other hoist. A firm of wholesale grocers in Los Angeles is using this method very satisfactorily. In interurban delivery service loading nests or cartridges are being used. These are filled in the store and run out onto the truck. There is some promise in the extension of this device for relieving the congestion around freight stations and also for interurban service where a heavy truck can bring over all of the orders for an entire community and local deliveries be taken care of by light trucks, each with its especial cartridge. A scheme somewhat similar to this is now being tried out by the city of Los Angeles. The incombustible rubbish is gathered by a house-to-house collection, using wagons. The material is put in large cans which are carried to a central point and a heavy truck is used to haul all of the cans to the city dump.

Comparisons of Operating Costs of Horse-drawn and Motor Trucks.—The use of an extra man to facilitate deliveries will often save enough time to make a good investment. Ont of the large department stores in Los Angeles found that on a certain route where one man had averaged 110 stops a day two men were able to make 190 deliveries. The use of self-starters on trucks of this type is also becoming common. These save a little time on each stop and also keep the driver out of the dirt, and particular customers appreciate this feature. At the plant of the Southern California Gas Company the night man unloads the trucks and stores the pipe and old meters that have been collected during the day, and then puts onto the truck the new supplies that have been requisitioned for the coming day.

Fig. 4 and Table II. show a comparison between the cost of running a light gasoline delivery truck such as is used for close-in delivery work by grocers and the cost of running a one-horse delivery wagon. The costs are from actual costs gathered in Los Angeles and vicinity and averaged. For each vehicle the cost is figured for the vehicle idle and again when running at a fair maximum daily average. The figures show that there is no excuse for using a horse for this kind of work, whether the number of deliveries be large or small. Twenty miles a day is a maximum for any delivery horse if used 300 days a year. If more than 20 miles a day are to be covered, it is necessary to duplicate equipment.

COMING MEETINGS.

AMERICAN MINING CONGRESS. In Chicago, November 13. Secretary, J. F. Callbreath, Munsey Bldg., Washington, D.C.

NATIONAL COMMERCIAL GAS ASSOCIATION. Convention in Atlantic City, N.J., November 13-18. Secretary, Louis Stotz, 61 Broadway, New York City.

NATIONAL ASSOCIATION OF RAILWAY COMMISSIONERS. Convention in Washington, D.C., November 14. Secretary, W. H. Connolly, Washington.

KANSAS GOOD ROADS ASSOCIATION. Annual meeting in Lawrence Society headquarters in Kansas City, November 16-17.

CANADIAN NATIONAL CLAY PRODUCTS ASSOCIATION. Convention at the Royal Connaught Hotel, Hamilton, Ont., January 23rd-25th, 1917.

CITY MANAGERS' ASSOCIATION. Convention in Springfield, Mass., November 21-23. O. E. Carr, Niagara Falls, N.Y.

AMERICAN ASSOCIATION OF STATE HIGHWAY OFFICIALS. Annual meeting, St. Louis, Mo., December 5-7. Secretary, Dr. Joseph Hyde Pratt, Chapel Hill, N.C.

PORTLAND CEMENT ASSOCIATION. Annual meeting, New York, N.Y., December 11-13. Assistant to General Manager, A. H. Ogle, Chicago, Ill.

WESTERN PAVING BRICK MANUFACTURERS' ASSOCIATION, Kansas City, Mo., January 20th, 1917. Secretary, G. W. Thurston, 416 Dwight Bldg., Kansas City, Mo.

AMERICAN ROAD BUILDERS' ASSOCIATION. Fourteenth Annual Convention; Seventh American Good Roads Congress under the auspices of the A.R.B.A., and Eighth National Good Roads Show of Machinery and Materials, Mechanics' Hall, Boston, Mass., February 5-9, 1917. Secretary, E. L. Powers, 150 Nassau Street, New York, N.Y.

TENTH CHICAGO CEMENT SHOW, Coliseum, Chicago, Ill., February 7-15, 1917. Secretary, Blain S. Smith, 210 South La Salle Street, Chicago, Ill.