of the difference in the material, the speed of the engine, and the skill of the operator. The average outfit uses the ordinary hoist engine, which has a speed of about 200 feet per minute. Thus on a 400-foot span, 2 minutes are required to haul in the bucket and about 1 minute to dump it and return it ready for another load—3 minutes per trip. This will be found to be a very conservative figure, for many plants run as high as 40 trips per hour. Much time can be saved by using a two-speed hoist, arranged to run at about 150 feet per minute under a heavy pull, and at about 450 feet per minute under a lighter pull, thus bringing in the bucket in 1 minute instead of 2, and enabling the operator to get out 30 buckets per hour under similar conditions.

The commonest form of gravel plant is the "bar run" outfit. This consists merely of the bucket, cables, mast and engine, digging the gravel from a pit or creek-bed and depositing it on the ground in a pile. Many such outfits are in use in various locations, and are generally called "gravel dippers," the owners, as a rule, making a business of "dipping" gravel for townships, road supervisors, contractors or private individuals.

In or near cities where strict specifications are enforced regarding the gravel used, it is customary to erect screening plants to wash the sand and gravel thoroughly and grade it into sizes. These plants present an interesting study, but it is not our purpose to enter here into a discussion of their details of design and construction. There are many kinds of screening outfits, the simplest kind having an elevated table upon which the gravel is dumped, and from which it is washed by a stream of water through an inclined trough, in its course passing over inclined screens that give the required separation. The most complex plants with the greatest output and most efficient operation are more expensive, being equipped with revolving screens, washing tanks, crushers, overhead bins, etc. Between these two limits there are endless varieties of screening outfits.

**Cost.**—The following estimates of the cost of plants are based upon new material throughout, although in actual practice much second-hand but serviceable material is used, such as old lumber, second-hand cables, and engines. The "bar run" outfit, with a one-yard bucket, costs, complete, including a reasonable allowance for freight, erection, etc., about \$2,250, while a screening plant of the more simple type, including a water pump and the screen towers, will be about \$3,000, which is subject to increase on account of bins, crushers, etc., to sometimes as high as \$10,000.

**Operating Cost.**—The average bar run outfit, with a one-yard bucket, can easily excavate, with the ordinary engine and engineer of average ability, 250 yards per 10hour day, often running much higher or lower according to conditions. Many plants hire only one man, who tends to his own boiler, as well as making all minor repairs. It is economy, however, where results are desired, to employ an engineer, fireman and a laborer. The daily costs will be as follows: Engineer, \$4; fireman, \$2.50; laborer, \$2; coal, \$3; oil and miscellaneous, \$1.50. Total, \$13.

The yearly fixed or overhead charges are ordinarily not computed, but should be for an accurate notion of the business. They are as follows:

p storest on \$2 250 at 6 per cent	\$135.00
Denewal of cables blocks and sheaves	400.00
Depreciation of engine	200.00
Sepreciation of bucket	150.00
	THE REAL

Total ......\$885.00

The depreciation items are as a rule replaced by the actual money spent on repairing the outfit.

Counting out Sundays and days when no work is done on account of weather, it is safe to figure a year at 200 days.

200 x \$13 daily pay roll, Annual charge as above	, etc	885.00
Total	\$	3,485.00

As an actual matter of fact, the cost at most plants is much more than this. Sometimes the men are paid yearly, whether they work or not. Frequently there is not enough business available, so that, instead of operating steadily and excavating 50,000 yards, 20,000 or 30,000 yards will be the year's business, costing 12 to 17 cents per yard.

Screening Plants.—These plants require more careful operation, and as they are generally dependent upon the retail trade near cities and towns, the output is determined not so much by the capacity of the plant as by the amount of sales made. The daily expense is greater, on account of the attention necessary to keep the screens clean, operate the pump, dispose of boulders, etc., as well as the necessity of maintaining some sort of an office and a set of accounts. In view of these facts, the above figures will be modified as follows:

200 x \$15			 	\$3,000.00
Annual cha	rge		 	1,000.00
Accounts a	nd collection	s	 	1,000.00
Total			 	\$5,000.00

This figure is very conservative and can be attained by proper management of a plant. At the customary retail prices of 35 cents per yard, a profit of \$5,500 per year results. As most plants are managed by the owner, this sum represents his salary and profits for the year.

A large plant, with a capacity and a demand for 400 yards per day, running at full capacity, will put out screened gravel for as low as 10 cents per yard, and is a very profitable business.

## RAILWAY EARNINGS.

The following are the railway earnings for the first three weeks of March:-

	Canadian	Pacific	Railw	ay.		.V		
	19	16.	IG	15.				
March 7	\$2,10	08,000	\$1,6	67,000	+	\$531,000		
March 14	2,2	58,000	1,7	31,000	+	527,000		
March 21	2,2	81,000	1,7	38,000	+	543,000		
Grand Trunk Railway.								
March 7	\$ 90	2,026	\$ 8	52,151	+	\$139,875		
March 14		57,542	8	57,147	+	100,395		
March 21		57,233	8	57,937	+	109,296		
	Canadian	Northern	Raily	way.				
March 7	\$ 54	10,200	\$ 4	28,700	+	\$111,500		
March 14	53	38,000	4	12,000	+	126,000		
March 21	54	19,000	4:	21,700	+	127,300		

A decrease of 44 per cent. in the operating costs for the Schenectady, N.Y., garbage plant is expected this year. The difference is accountable to reduction of working staff and efficient management.