

## LARGE PORTABLE ROAD CRUSHERS

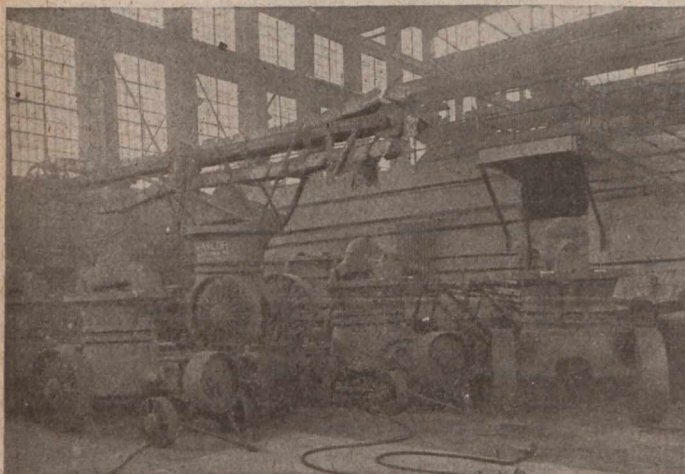
BY R. R. SHAFTER

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**E**IGHT portable gyratory crushers, believed to be the largest of their kind ever constructed, were built last year in the shops of the Traylor Engineering & Manufacturing Co., of Allentown, Pa., for the use of the American Expeditionary Force in road construction work in France.

The accompanying illustration shows some of these crushers in process of assembly in the Traylor shops. Each of the crushers weighs about 8 tons. They are made of cast steel practically throughout, in order to reduce the weight and increase the strength. They are capable of handling stone of "one man size" or up to 11 ins., and each crusher has a capacity of 25 tons of 2-in. stone per hour, with a power consumption of only 18 k.w.

The machines are of the "Bulldog" design, wherein the crusher-shaft is decidedly shorter than in the old type of



LARGE PORTABLE CRUSHERS PARTLY ASSEMBLED

gyratory crusher, thus decreasing the likelihood of bending or breaking the shafts.

Each crusher is mounted on a heavy set of road wheels, with a pair of front wheels under the support or outboard bearing of the countershaft of the machine. On the end of the countershaft is supplied a pulley for driving a folding elevator, which equipment was furnished with each crusher.

This type of machine proved to be a very durable, compact and economical crusher for road and general work, and on account of the extensive road building programs now under way, the Traylor Co. is preparing to add a line of these large portable crushers to the other machines which the company carries in stock.

## PROPOSES DRAINAGE CANAL FOR NIAGARA

**T**HE problem of freeing the Niagara river from sewage pollution, which still remains unsolved, although exhaustive investigation by the International Joint Commission resulted two years ago in a plan which, by reason of its heavy cost on the cities of Buffalo, the Tonawandas and Niagara Falls, as well as La Salle village, is apparently being "side-stepped" by those municipalities, was again discussed by City Engineer T. W. Barrelly, of Tonawanda, at the National City Planning Conference, held a couple of months ago in Niagara Falls.

Mr. Barrally recited the conditions affecting the situation, and found two methods of relief. They were: First, preliminary treatment of the sewage previous to its discharge into the river; second, removal of sewage by diversion to Lake Ontario.

Discussing diversion project, Mr. Barrally dismissed the proposition of an open canal along the margin of the river on account of prohibitive cost unless it were possible to take advantage of the difference in elevation of the lakes for developing water-power. A plan to construct a marginal sewer in a deep tunnel extending from the Tonawandas to Lake Ontario was advocated by the speaker.

"In making a preliminary study of the sewage disposal problem of the Niagara frontier for the pure water committee of the Tonawanda Chamber of Commerce," he said, "I have developed a plan for a marginal sewer in a deep tunnel extending from Tonawanda to Lake Ontario. There exists at the present time the old Erie canal running along the margin of the Niagara river from Buffalo to Tonawanda, and now substantially abandoned as a canal. The new barge canal route utilizes the river from Buffalo to the mouth of the Tonawanda creek at Tonawanda. At present a part of the sewage of the city of Buffalo enters the canal, including the Hertel avenue trunk sewer.

"This canal would be utilized as a drainage canal from Buffalo to Tonawanda, where it would drop about 275 ft. into the tunnel and develop water power. A similar development may be carried out at La Salle at Cayuga creek outlet. The tunnel would be about 21 miles in length and of sufficient capacity to dilute the sewage in accordance with the standards required.

"Increased dilution is secured at intervals along the route by this project and thus ample provision made to avoid the creation of nuisance along the route or at the lake. Accurate figures of cost can be made only after extensive surveys and borings and detail designs. Assuming that the tunnel is in rock, a tunnel 20 ft. in diameter could probably be constructed for \$125 per ft., or a total cost of about \$13,000,000 for the tunnel. Changes at the cities to make connections with the canal and tunnel for the existing sewerage systems, and power houses, machinery, etc., would cost about \$7,000,000 additional, or a total of \$20,000,000 for the entire project.

## Water-power Development

"Assuming a diversion of 4,000 c.f.s., representing a dilution of 4 c.f.s. for each 1,000 of population, and based on a total population of 1,000,000, a head of 275 ft., and a turbine efficiency of 80%, we get a total of 100,000 h.p.

"Distributing this over the entire cost of the project, which may be as high as \$20,000,000, would give a cost of \$200 per horsepower.

"Since this power may be ultimately sold under a 40% load factor and to the extent of about 200,000 h.p. on this basis, we would have \$100 per horsepower delivered to consumers, for the cost of the entire project.

"Probable yearly cost for power development:—

Interest on \$2,000,000 at 4½%	\$ 900,000
Depreciation	200,000
Other expenditures	250,000
Sinking fund @ 4%	132,000

Total .....\$1,482,000

"Cost per horsepower reckoned as 24-hour, seven-day power, \$14.82 per horsepower per year, or if reckoned on 11 hours per week day, or under a 40% load factor, the cost would be about \$7.50.

"The full income would not, of course, be attained for several years. These figures are approximate and are only given because they indicate the financial advantages possible in comparison with a sewage treatment project.

"A large part of the profit on the investment would be indirect, resulting from the more rapid growth of the cities due to power development, and consequent employment of more men and building up of industrial communities.

"This solution is attractive because it would accomplish two most desirable things, the diversion of sewage from the river and income to carry the financial burden of the project.

"Whatever method is adopted should be undertaken under state or federal regulation. It would be possible, however, to form all the municipalities and towns within the area to be served into a sanitary district, in the same manner as was adopted at Chicago in carrying out the Chicago drainage canal project."