

two ends of the centre sill up to the bolsters are covered top and bottom by a  $\frac{1}{2}$ -inch cover plate. Between the bolsters, the bottom flanges of the two channels are strongly latticed together, and the top flanges are reinforced by two 8-inch x  $3\frac{1}{2}$  x  $\frac{1}{2}$ -inch angles. The tank is strongly riveted in the centre to the sill in order to transmit any shock which might occur in shunting. The tank rests on two body bolsters. This arrangement allows free expansion from the centre towards the ends. The centre sill, as a column, will have a safe capacity of 458,000 lbs. (approximately 230 tons), which means a breaking capacity of more than double, which is ample to resist the ordinary impact due to shunting. The body bolsters have cover plates extended in order to act not only as splices for the main material of the centre sill, but also to be able to resist the strain due to "poling." The

casting which is placed at each end of the bolster is provided with a pocket to receive the "pole."

The saving of weight due to this kind of design is about 3,500 lbs. per car, the approximate weight of an ordinary tank car of the same capacity being about 44,000 lbs.

The car is provided with necessary walking planks to pass from one car to another, and a platform on the top around the dome to facilitate the operation of filling the tank.

Only forty cars of such a design will be required to take care of the fuel oil necessary for running trains between Jasper and Prince Rupert, this allowing three cars at each of the six divisional points, while 18 empty cars are going back to Prince Rupert for filling purposes, leaving four cars to spare in case of repair or accident.

### COMBINED MIXER AND ROAD ROLLER.

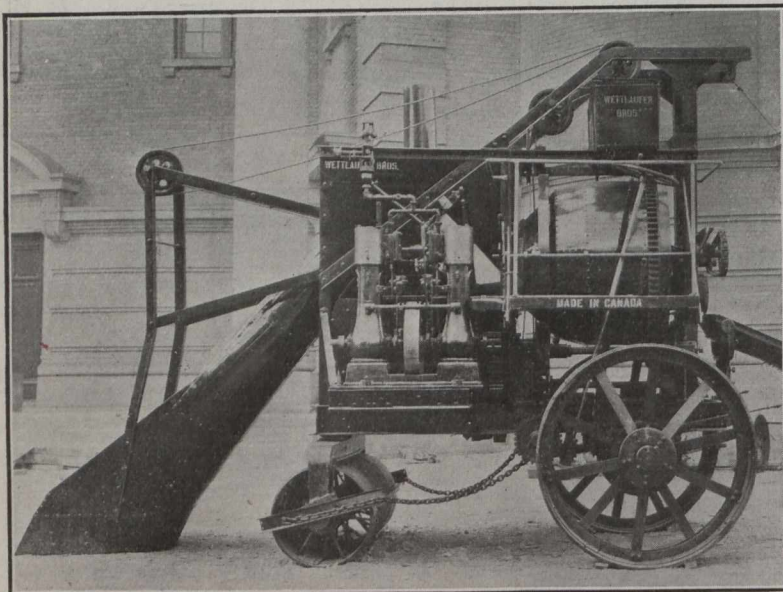
EVERY contractor has hitherto found it necessary to own at least two big machines—a concrete mixer and a road roller—in order to build concrete roads or roads with a concrete foundation. Wettlaufer Bros., Toronto, now claim that a contractor need invest

through cast steel gears. The power transmission is sturdily built, and this, in fact, can be said of the whole machine.

The rear roller wheels are each 60 in. dia. x 17 in. face. The front roller is 34 in. dia. x 5 ft. 9 $\frac{1}{2}$  in. face, and is constructed as four separate wheels. Smaller wheels are also supplied with the machine, to be used as desired. The overall length of the machine is about 10 ft.; height 12 ft. 6 in., with roller wheels; rolling width approximately 9 ft.

Forming a compact and integral part of the roller, there is mounted a heart-shaped concrete mixer, which has a capacity of 14 to 16 cu. ft. per batch, with a drum speed of 16 r.p.m. The drum is 48 in. diam. x 44 in. in length. The hopper speed is from 8 to 15 seconds. There is a boom delivery of any length desired, but the drum is built high enough to permit a gravity chute to be used to any part of the roadway. The centre of the discharge end of the drum is 6 ft. 9 in. above the ground.

The machine is not being marketed as an asphalt roller, but is primarily intended to enable the contractor to roll the subgrade at night and then to mix concrete during the day, all with the same machine. Whether or not the idea of combining a mixer with a roller proves to be practical and economical, the machine is certainly a new idea and interesting, and it will find a place in paving history.



Combined Concrete Mixer and Road Roller Machine is Here Shown with Small Wheels. Larger Wheels are Used for Rolling.

in but one machine, which will take the place, they say, of both mixer and roller.

They have just placed on the market a most ingenious and unique machine—a combined concrete mixer and steam-driven road roller. The machine weighs 24,000 lbs. with road roller wheels; 15,000 lbs. with small wheels. The entire machine is controlled by one man from one platform, all levers being within reach. He is not required to leave the operating platform excepting to stoke the fire occasionally.

The machine is capable of rolling at a speed of 9,284 ft. per hour. The power is developed from a dry back horizontal boiler of 16-18 h.p. (at 125 lbs. steam), by means of a pair of 5 x 5 twin engines, with a speed of 300 r.p.m. The machine has two speeds forward, and is reversible at each speed. The power is transmitted

The two principal copper producers on the British Columbia coast are the Granby and Britannia companies, and when the plants being installed by them are completed these two companies together will be able to register an output for the coast of 80,000,000 lbs. to 90,000,000 lbs. of copper per annum.

What is said to be the largest aqueduct in existence is that along the Owens River, at Los Angeles. It is designed to deliver a minimum of 258,000,000 gallons of water daily into the San Fernando reservoir, 25 miles north-west of the city. No pumping plant is required, as the source of supply is several hundred feet above the city. The water will furnish power—7,000 horse-power is anticipated—for electric lighting and other purposes. The total cost of the water-works will be \$25,000,000, and the installation of the power plant will cost approximately \$5,000,000 more.