Measurements taken for settlement and displacement during concreting showed very little, if any, movement of any kind. Settlement readings, taken for the settlement of the arch when the falsework was removed showed less than 1-16-inch. The falsework was left up for five weeks after the arch had been crowned. The bridge was entirely finished and filled in in the meantime.

Gravel of a very good quality was hauled from a pit about 1½ miles distant, and was worth 25 cents per load of one-third cord. Lumber for lagging cost $30 per M. Most of the bracing and a good deal of the falsework was taken from the old bridge. Cement cost $1.70 per barrel, and labor was as follows:—

Laborers	$1 50	per day of 10 hours.
Carpenters	1 75 to 2 25	
Teams	3 50	"

The contract price of the bridge, exclusive of the steel, was $9,399. The steel was supplied by the city, about 18¼ tons being used, costing $1,453.

The bridge was designed by Jas. A. Bell, city engineer, St. Thomas, and the writer was inspector-in-charge.

TORONTO'S ASPHALT PLANT.

The city of Toronto has over eight miles of asphalt pavements, and most of the repairing is done by day labor by the city. During 1907 they let the contract for the construction of an asphalt plant of a capacity of 1,500 square yards per day of nine hours. The contract price was $28,575.

The buildings containing and enclosing the plant are built of steel, the walls and roofs are covered with galvanized iron, and the floors are of reinforced concrete. The plant consists of:—

Two self-contained rotary driers, manufactured by Warren Asphalt Paving Co., the revolving cylinders being 40 in. diameter and 19 ft. 6 in. long; draft is supplied by a 50-in. exhaust fan, which discharges into a Cyclone dust collector; the driers are fed by two chain elevators, and the hot sand or stone is discharged into an enclosed elevator and conveyed to steel storage bins (capacity, 10 cubic yards each), situated on the second floor, the stone bin being fitted with a rotary screen. There is also a storage bin for limestone dust provided on the second floor, having a capacity of four cubic yards and fed by a dust elevator. The hot material and the dust are drawn by gravity into their respective weighing boxes, which discharge into the mixer; the mixer has a capacity of 1,100 pounds of topping mixture.

The asphalt cement is prepared in three enclosed melting tanks, provided with mechanical agitation, and having a capacity of 2,000 imperial gallons each. The asphalt cement is elevated by air pressure to the asphalt weighing bucket, running on an overhead trolley to the mixer.

The storage tank for flux has a capacity of 10,000 imperial gallons. The flux is blown from it to the weighing tank on the first floor and drawn by gravity into the kettles.

The asphalt barrels are hoisted to the charging floor by a barrel elevator. Power to the main portion of the plant is supplied by a 10 in. x 12 in. automatic cut-off centre crank engine, manufactured by the Erie Engine Works, and to the agitating tanks and barrel elevator by a 5 in. x 5 in. vertical automatic cut-off engine, manufactured by the Sturtevant Blower Works. Compressed air, used for forcing the asphalt cement out of the tanks and for other purposes is furnished by a 6 in. x 8 in. x 12 in. Knowles direct-acting air compressor. Steam is supplied to these engines by a 60 horse-power Star water tube self-contained boiler. Street and plant tools, including an 8-ton and 5-ton steam asphalt rollers, five wagons, hand rollers, pitch kettles, etc., and 12 Wilkinson asphalt dump wagons complete the equipment.

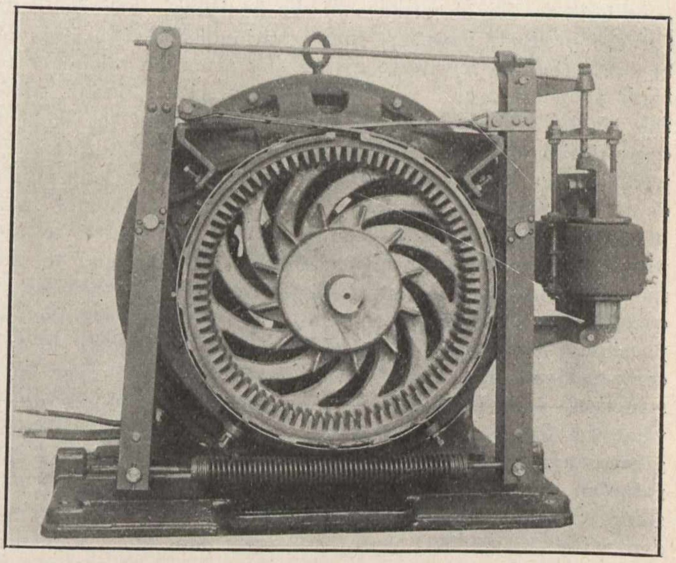
The plant was constructed under supervision and direction of City Engineer Rust's office, Mr. G. G. Powell, A.M. Can. Soc. C.E., assistant engineer, having direct charge of the work.

A NEW MOTOR FRICTION BRAKE.

In many applications of electric motor drive the quick and accurate stops necessary could not be made without the use of suitable brakes. Brakes also serve to prevent accidents by automatically stopping and holding the load in case of failure of the current supply from any cause. A number of magnetically operated direct current motor brakes have been designed, but electro magnets using alternating current require a considerably greater expenditure of energy for a given braking effect than those using direct current. Moreover the flywheel effect of the rotors of alternating current motors is greater than that of direct current motors of corresponding capacity. Again, the magnet core must be laminated when alternating current is used, and the cost of construction thus increased. It is largely due to these facts that there are so few successful alternating current motor brakes.

A type of alternating current brake which satisfactorily overcomes these difficulties has just been placed on the market by the Westinghouse Electric and Manufacturing Company. This brake is characterized by simplicity and strength in construction and reliability in action; it is self-contained, and is readily applied and easily adjusted. It is operated by electro-magnets.

The brake referred to, designated as the "PB" type, is intended for use on Westinghouse two and three-phase induction motors of from 5 to 100 horse-power, 25, 40 and 60



cycles. The braking action depends on the contraction of a coiled steel spring.

The advantage of this construction is that the brake will operate equally well with the motor tilted at a considerable angle from the horizontal position, as on roller lift drawbridges. The construction is shown in the illustration. The cast-iron brake shoes are held against the brake wheel by steel bands. The two vertical pivotal brake beams are connected at the top by a tie rod and at the bottom by a coiled steel spring, and a polyphase solenoid operating magnet is attached to the brake beams by a lever. The ends of the brake bands are attached to the beams above the pivots; the spring tends to draw the lower ends of the beams together, thus drawing the band and shoe against the wheel.

The friction of the wheel against the shoes tilts the beams through a small angle until they strike against lugs on the framework. These lugs are above the pivots, and are so placed that when the beams press against them the tops are separated and the brakes more firmly set by the motor itself. A very heavy breaking action is thus obtained with a comparatively light spring and magnet. When the motor is operating the current passes through the coils, the core is pulled down, the brake is released and the spring elongated. On stopping the motor the brake circuit is opened, allowing the spring to contract and apply the brake.