

# Pretoria Avenue Lift Bridge, Ottawa

Two 52½ ft. Fixed Spans and a Central 95 ft. Electrically Operated Direct Lift Span Giving 30 ft. Maximum Clearance

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**T**O provide the eastern district of the city of Ottawa with a street car service a bridge had to be built over the Rideau Canal at Pretoria Ave.

The cost of this structure, which has just been recently completed, was about \$125,000, divided equally between the Dominion government and the city of Ottawa.

Owing to the unsuitability of the approaches a high level bridge could not be constructed economically, so a direct lift bridge was decided on as the most suitable for the site. The bridge consists of a central 95 ft. lift span and two 52 ft. 6 in. stationary spans. The curved wing walls and the winding paths and roads forming the approaches to the bridge provide a very artistic setting for the structure. Fig. 1 shows with the lift span open to permit traffic under the bridge, and closed to allow traffic to proceed along the bridge.

Twelve-inch piling was driven in fifty foot lengths for the foundation of the piers and abutments. These piles were tested to 17 tons per pile. A 1:3:5 mixture was used for the abutments. The abutment walls are 7 feet wide at the base and 18 inches at the top. Above the waterline the abutments were faced with sandstone and this gives them a very pleasing appearance. The contract for the piers and abutments was carried out by Mr. R. Brewder of Ottawa.

The roadway is 44 feet wide and will carry a double street car track. The sidewalks on both sides are 6 feet wide. The side spans are of plate girder construction but the outer girders are encased in concrete, so that their appearance is that of concrete or masonry arches; they thus harmonize with the piers and retaining walls.

## No Cables in Movable Span

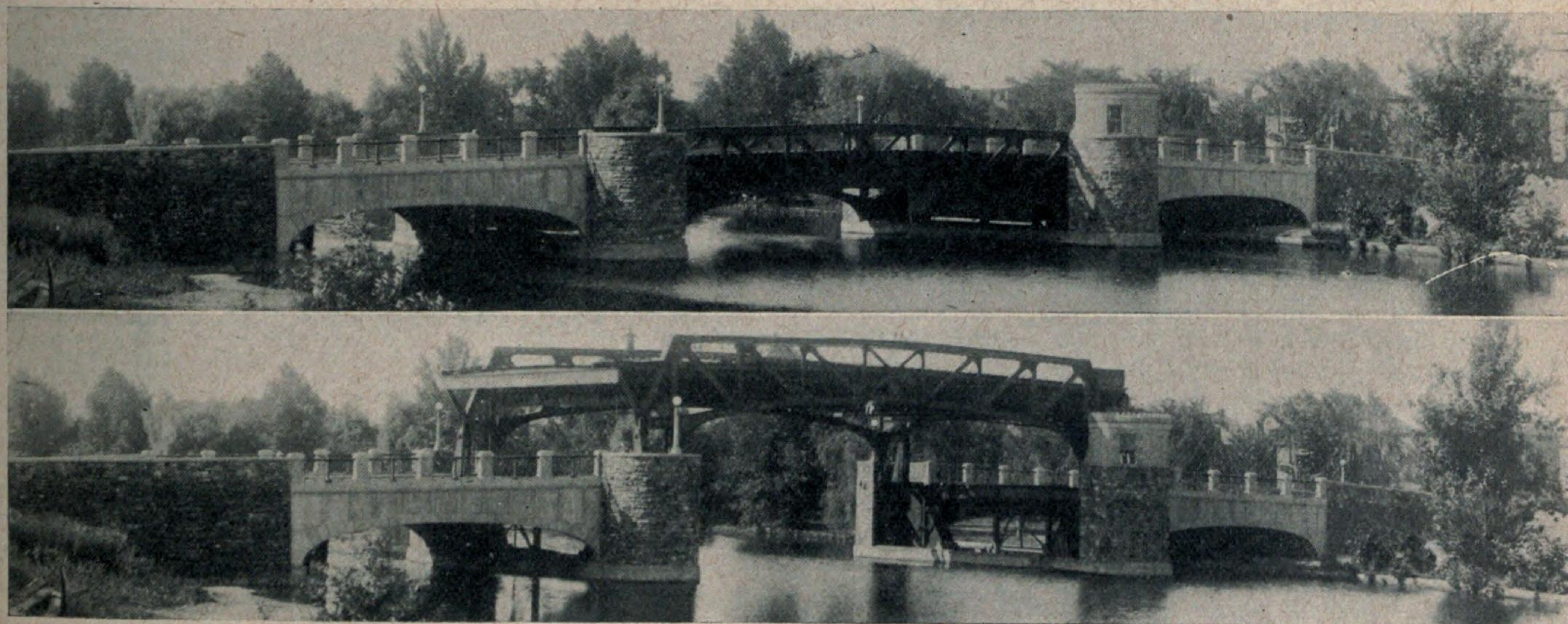
The most interesting part of the structure is the movable span and this is particularly noteworthy, since it is of a type which has been developed recently but

which has, nevertheless, gained consideration from leading Canadian and United States engineers. This type of bridge is known as the Strauss direct lift bridge. In contrast to the bascule bridge which lifts by rotating around one end as the lid on a box, the direct lift bridge moves straight up and down like an elevator, but the Strauss direct lift bridge is distinguished from the elevator and from other lift bridges which have been built in former years, by the completed absence of cables or wire ropes. Such cables or wire ropes have been for many years the only means of bringing about a vertical movement and of connecting such a structure with the necessary counterweights, but experience has shown that these cables do not stand up where they are used out of doors and exposed to the action of the elements. This bridge represents a departure in this field, in that it comprises a system of levers for the cables and sheaves and in this way brings about both exact counterbalancing and the operation of the bridge through any height of lift. In this instance, the vertical movement of the lift span is 20 ft. so that when the bridge is fully open it affords a clear channel of about 80 ft. in width and of 30 ft. clearance. All mechanism, counterweights, etc., are entirely hidden under the roadway. The bridge is perfectly balanced in every position.

The bridge is operated by electrical motors, and it is possible to open or close it in less than a minute. The mechanical and electrical installation are fully up-to-date and includes all the latest and most modern control and safety devices.

## Automatic Chain Barriers

Among the latter are two so-called automatic chain barriers, one at each end of the bridge, which, when the bridge is closed, are concealed under the roadway, but which come into action when the bridge is to be raised. These barriers, which are controlled electrically from the operator's house, have some resemblance to a lawn



The Pretoria Ave. lift bridge, Ottawa, closed and open

\*City Engineer's Department, Ottawa.



