

JEFFERSON STREET LIFT BRIDGE, CLEVELAND, O., (PARTIALLY OPENED) OPERATED BY TWO 25-H.P. MOTORS; AN EXTRA MOTOR IS ATTACHED TO EACH LEAF AND HELD IN RESERVE FOR EMERGENCIES. BOTH ARMS ARE CONTROLLED FROM ONE SIDE, CAN BE RAISED TOGETHER OR SEPARATELY, AND ARE AUTOMATIC IN STOPPING AT THE EXTREME POSITIONS, PRECLUDING ALL POSSIBILITY OF ACCIDENTAL DAMAGE TO THE STRUCTURE THROUGH NEGLECT ON THE PART OF THE OPERATOR. *Fig. 5.*

enlargement of the Welland Canal to allow of the larger class of steamers to reach Prescott and thence, by the utilization of properly designed barges, to admit of the economical transport of the products of the West to foreign countries via the sea-going vessels at Montreal.

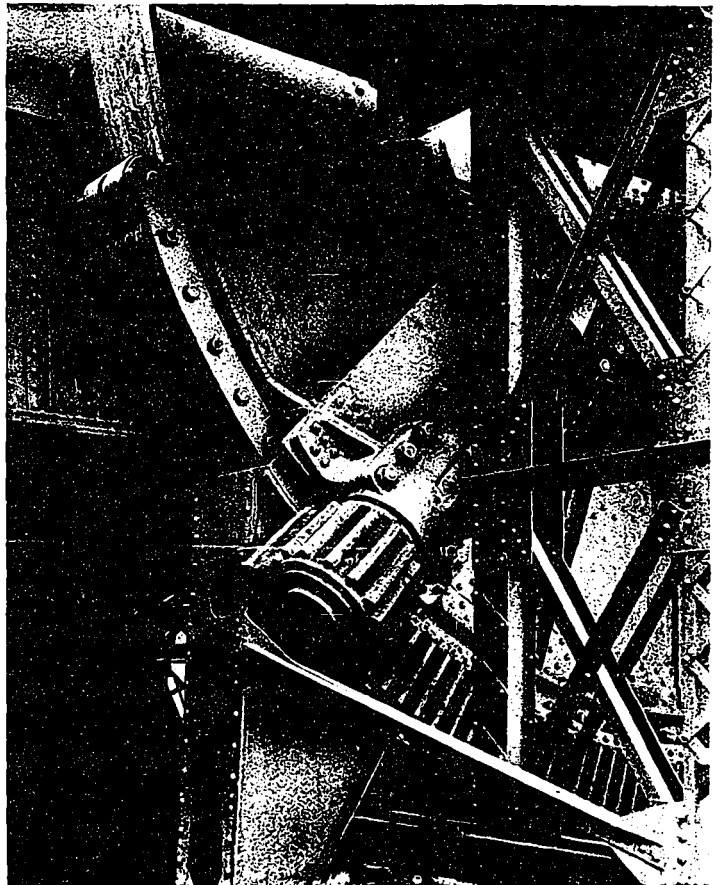
The above facts are mentioned to call attention to the measures that will be requisite in the near future, if not already imminent.

Bridging of navigable streams is not the least of the problems to be confronted in the matter of providing navigation facilities adequate to the futurity of a country so rapidly reaching out in commercial enterprise as Canada. The evolution of movable bridges in older countries of established prestige in trade and commerce is sufficient indication, in itself, of this fact. For ages gone by it has been an axiom of political geography that navigable streams or waterways be not obstructed against navigation whether there appears to be any immediate necessity for keeping the way open or not. Hence we observe the evolution of the movable bridge from the trunnion or bascule—modelled after the principle of the mediæval pivot drawbridges spanning the moats surrounding castles or strongholds—to the modern lift bridge of 275 foot span, giving safe support to the heaviest railway trains and uninterrupted passage to largest transport vessels.

The first movable bridges were mainly built of wood and designed to revolve around a hinge pivot or trunnion in a vertical direction. In some cases they were counterbalanced similar to a seesaw. They were very effective in the defence of castles and fortresses, but became obsolete upon the introduction of gunpowder and cannons. With the advance of civilization, the interests of commerce and navigation called for a bridge that could be alternately employed to span waters and provide safe crossing from above to either side. Very little progress was made in this type of bridge construction until the

nineteenth century, when iron was generally substituted for wood, proving at once light and of great strength.

From the year 1800 until the construction of the Tower Bridge at London, England, the greatest achievements in bascule bridge construction were accomplished by Knip-



SHOWING THE BEARING SURFACE, A SEMI-CIRCULAR REVOLVING SEGMENT RESTING UPON TWENTY-NINE 10-INCH ANTI-FRICTION ROLLERS, RECESSED AND HELD IN ALIGNMENT BY DISTANCE BARS. *Fig. 6.*