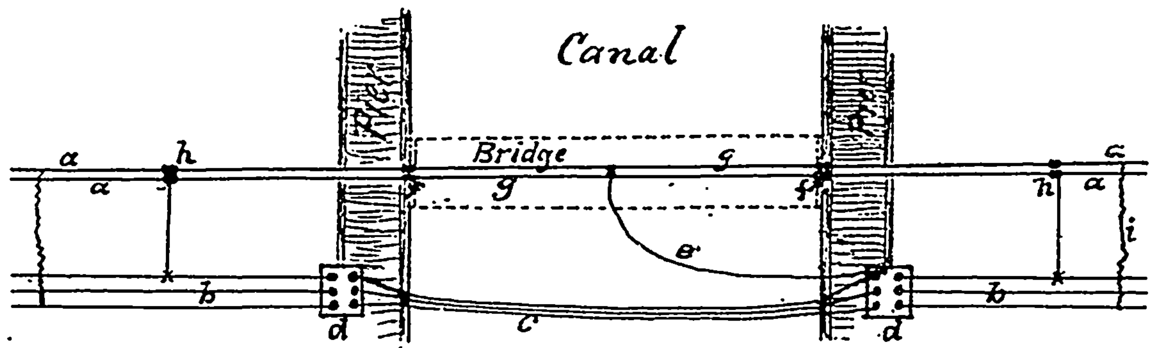
traffic and passengers across the canal by ferry scow.

The electrical apparatus of the bridge contains a safety device, which has been used for the first time, we believe, in the history of electrically swung bridges. In the accompanying explanatory diagram, the curves at the approaches to the bridge are omitted for the sake of clearness.

The road passes over the draw-bridge crossing, so as to reduce the chance of a car going over the draw when the bridge is moving. There is a 500-foot section on each side of the bridge which is fed from the trolley wire on the drawbridge, and this in turn is fed by a cable brought up through the centre of the bridge. Just as soon as the bridge is moved six inches or more the contact is broken, the feed sections are dead, and the car coming into the section can receive no power. The approaches to the bridge are sharp curves, which would prevent the car getting over the draw with its own momentum. The bridge is also moved with the power received from the wire, a very neat arrangement being designed for the connection of those wires to the bridge by W. R Scott, superintendent of construction for McCartney, McElroy & Co.

Instead of using a ridged bracket the company has put up a flexible one which permits the trolley wire to be supported on a wire which does away with the pound of the wheel on the bracket when the car is running fast. There is about 95,000 lbs. of copper in the feeder, which is placed to the best advantage along the line. When the feeder comes to the canal it passes it by three submarine cables, which are protected at the junction houses with circuit breakers. There are 45 pole lightning arresters placed on the poles and ground to a separate ground (not the track). All the overhead work, fitting and connecting, were built and designed by McCartney, McElroy & Co, of New York, contracting engineers.



PLAN OF ELECTRICAL SWINGING APPARATUS, BURLINGTON BEACH BRIDGE.

(a) Working Trolley Wires (two oo Copper Wire). (b) Feed Wires from Power House (three oooo Copper Wires). (c) Feed Wires, Submarine Cables (three oooo Copper Wires). (d) Terminal Houses with three circuit Breakers and Switcher to protect Cables. (e) Cable from Terminal House Feeding Wire on Bridge. (f) Contact Plates on Bridge and Shore Trolley Wires. (g) Trolley Wire on Bridge and 500' on each end, fed from e. When Bridge is moved 6' or more, g receives no current. (h) Trolley Wire Insulators making an Electrical Break between a and g.

For THE CANADIAN ENGINEER.

CREOSOTING TIMBERS.

BY WILLIAM B. M'KENZIE, MEM. CAN. SOC. C.E., MEM. AM. SOC. C.E., ASST. ENG. INTERCOLONIAL RAILWAY.

(Concluded from last issue.)

Filling the Cylinders with Oil.—While the vacuum is still on, the creosote heated by steam-pipes to about 125° Fah., is allowed to run by gravitation from the gauge tank, until the cylinders are completely filled. The creosote should be maintained at a temperature of about 125° Fah. during the treatment. It is important that no water from condensed steam or otherwise should be allowed to mix with the creosote as it rises to the top of the cylinders, and in this case the wood at the top only receives an injection of dirty water. The cylinders will run about 3 5ths full by gravitation, then, with the aid of the force pump, they are completely filled with creosote. The valves are now closed and the reading of the gauge-tank noted; the pressure is applied by the force-pump and the creosote is forced into the empty cells of the wood under a pressure of from 110 to 135 lbs. per square inch, which pressure is kept up until the specified number of pounds of oil has been forced into the timber as indicated by the gauge-tank; the usual time required being from three to six hours for piles of short-leaf or Loblolly pine. The pressure is then released, the unabsorbed creosote in the cylinders forced by the air-pump back into the gauge-tank, the cylinder doors opened and the timber removed. From the taking out of one charge of 10 to 20 piles to the putting in of another, the time consumed is usually about 20 to 27 hours. The quantity of oil absorbed by the timber is measured by determining the difference in volume of the oil in the gauge-tank before and after the operation, and as $2\frac{1}{4}$ or $2\frac{1}{2}$ lbs. of creosote is absorbed per cubic foot of timber, while the cylinders are filling, this amount should be deducted from the specified quantity.

Creosote.—The production of the dead oil of coal tar in the United States is insufficient for the needs of the country, and a considerable quantity is imported from England. What is commercially known as "London oil," a thick and heavy oil, is considered to be the best produced in England for marine work. Creosote at 65° Fah., weighs about 8 to 9 lbs. per U. S. gallon, and boils from 380° to 760° Fah. Analysis of American and English oils used in 1895 for treating piles are as follows:

AMERICAN OIL.

The sample as received, well mixed, contains water	0.18	per cent
Oils (lighter than water distilling over between 350° and 410° Fah., carbolic acid, creosote, etc.)	1.13	"
Oils (heavier than water distilling between 410° and 540° Fah., naphthaline, etc., crystalline..	73.10	"
Higher phenoloid bodies, distilling between 540° and 610° Fah..	14.67	"
Heavy crystalline substance and a little red oil distilling between 610° and 680° Fah	6.79	"
Soft pitch, not volatile at 680° Fah.	4.15	"
	100.00	"

ENGLISH OIL.

The sample, as received, well mixed, contains water	0 25	per cent.
Oils (lighter than water, distilling over between 392° and 450° Fah., phenol)	9.50	"
Oils (heavier than water, distilling over between		