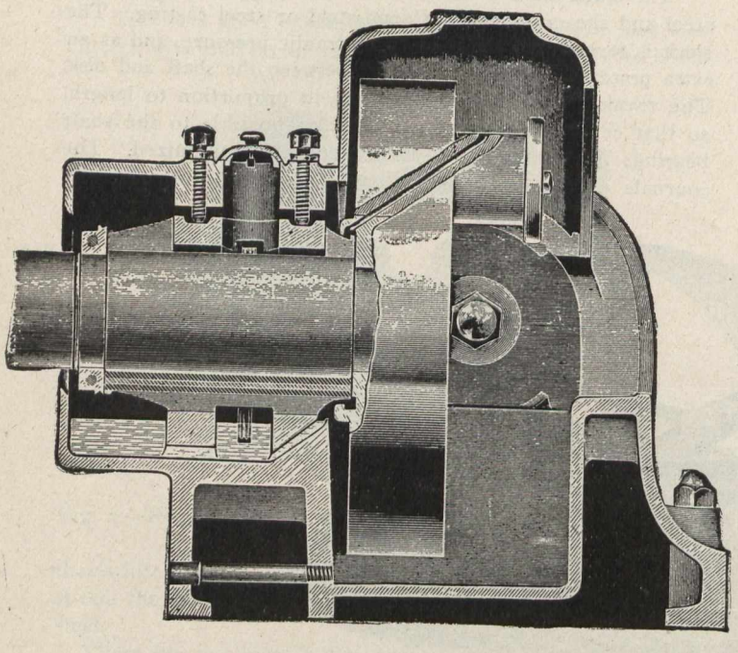
crank shaft. The shaft bearings have ring oiling in addition to the regular system of oiling, as described.

The connecting rod is a solid steel forging, the crosshead end being solid—without straps, and the crank end either solid or of the marine type, the bearing surfaces being lined



with genuine babbitt, compressed into place, bored out and carefully scraped to gauge. The connecting rod boxes are interchangeable, so that they may be replaced at any time.

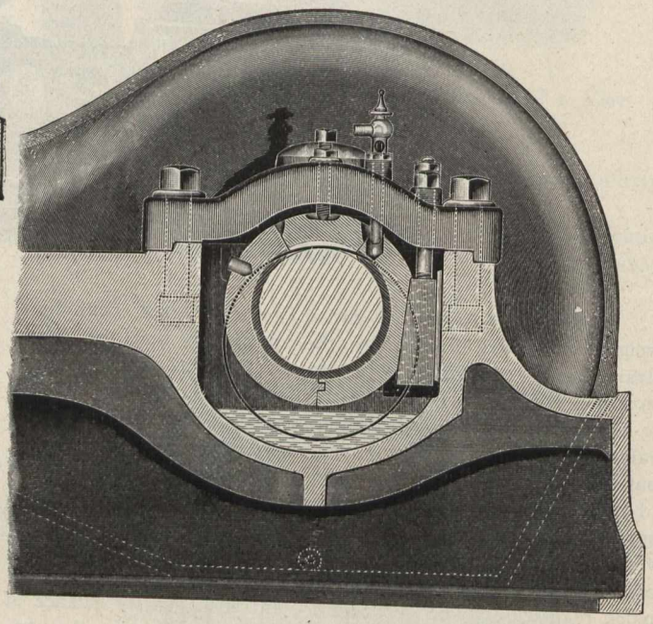
The crosshead is of the ordinary type, made of steel with an adjustable bottom shoe, which is lined with babbitt.

Large oil pockets are provided at each end of the guide, into which the crosshead shoe dips, so that it practically floats in oil.

A regular and copious supply of lubricant to all working parts of an engine is perhaps more essential than any other detail to its successful and satisfactory working, as well as to its length of life. The continuous oiling of all the bearings of the Robb-Armstrong engine is provided for by a large reservoir placed on a pedestal above the engine, and the oil is piped to every bearing with a sight feed valve for each, which may be adjusted once for all; the engine oiling system being started or stopped by opening or shutting a single valve at reservoir. As stated previously, the main bearings have ring oiling in addition to the sight drop, and the crank pin is also supplied in two ways. The oil is all returned to the crank pit, where it may be drawn off and filtered, or allowed to drain to a separator and filter attached to the engine. The frame and crank, as well as the eccentric are entirely enclosed by sheet metal casings, which prevent the oil being thrown outside the engine. The cylinders are provided with positive feed lubricators.

The Robb-Armstrong engines are designed with the special object of being made in quantities by the interchangeable system. The drawings, gauges, templates and manufacturing plant are especially adapted for it, and a large stock of duplicate parts always kept on hand. Every part of each engine is numbered, corresponding with drawings, which are placed in their files for reference, so that the customer may obtain duplicate parts at any time by telegraphing the number of the engine and part required.

The value and efficiency of a steam engine depends on its ability to do continuous, hard work, without undue wear or breakage, and be as economical as possible in the use of steam. The special features of the Robb-Armstrong Corliss engines



are the improved valve gear, extreme simplicity in the number and arrangement of parts, and the fact that every wearing part may be replaced, thus keeping the engine in perfect condition indefinitely.

PROPOSAL FOR VIADUCT ACROSS NORTHUMBERLAND STRAITS

For many years past, the question of winter communication with Prince Edward Island, has been very serious for the inhabitants, who are often cut off from the mainland weeks at a time, as was the case last winter. When Prince Edward Island entered the Confederation, it was on the understanding that constant communication should be kept up with the island, but this promise has never been fulfilled, and the demand made at the present session of the Dominion Parliament for a tunnel under the Straits of Northumberland was not complied with, as the expense was considered too great.

A suggestion for a viaduct across the straits,—instead of a tunnel, has been sent to "The Canadian Engineer" by J. C. Underhay, C.E. A section of the formation underlying the straits is given herewith, and Mr. Underhay estimates that a viaduct between Cape Traverse, P.E.I., and Cape Tormentine, N.B., can be built in six years at a cost of only $3,000,000; as against $10,000,000,—the estimated cost of the tunnel.

The upper stratum of the bed of the strait consists of fifty to eighty feet of shale clay, with, however, frequent outcrops of rock, which would make a tunnel expensive, but the character of the bottom is not known in detail.

Upon such data as Mr. Underhay has, he makes the following estimate:

"The estimate for a roadway having a breadth of 66 feet on the top, six feet above high water, with a flare or batter of 45 degrees as it goes down, which would give it a breadth of 268 feet on the bottom in the deepest part would be 9,000,000 yards, made up as follows:

Two miles at 27 feet in depth.....	1,002,080 c. y.
Two miles at 36 feet in depth.....	1,436,160 "
Three miles at 45 feet in depth.....	2,930,400 "
One and one-quarter miles at 96 feet in depth	3,581,600 "

Estimated time of construction, six years, made up as follows:

100 scows, with four men to each scow, 170 days each year, 20 yds. per day; for each scow	2,040,000 yds.
12 cars, 1,200 days, at 300 yds. per day.....	4,320,000 "
12 cars, 960 nights, at 240 yds. per car.....	2,592,000 "

At an estimated cost of $3,000,000, made up as follows: