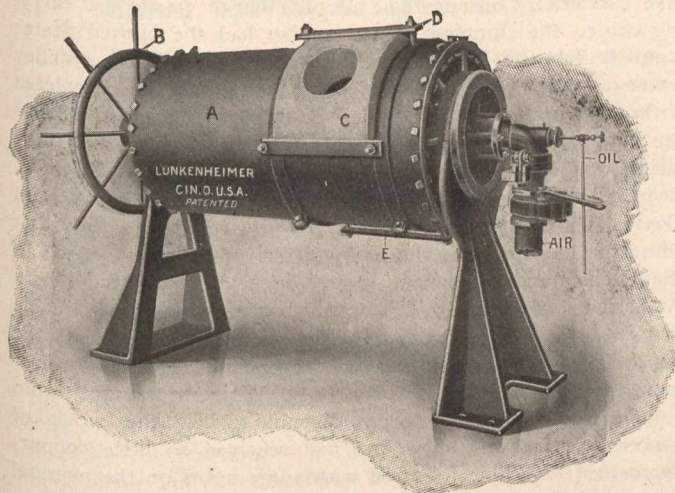


about five hundred and fifty pounds, and the oil consumption varies from two to two and one-half gallons of crude oil per hundred pounds of metal melted. The life of the linings is from three to four hundred heats, this varying with the kind of metal melted. It is easy to re-line, which cannot be said of all types of furnaces. With the first furnace



sold to each customer within a radius of one thousand miles of Cincinnati, the makers send an expert to start the furnace and instruct the furnace-room employees as to how to secure best results in handling, etc.

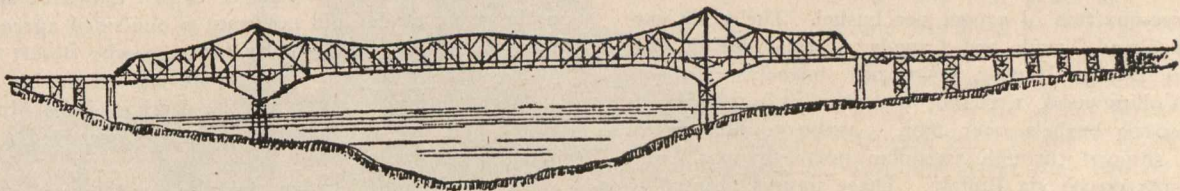
Further particulars can be had from the manufacturers, the Lunkenheimier Co., Cincinnati, O.



#### PROPOSED BRIDGE OVER STRAIT OF CANSO.

Waddell & Hedrick, Kansas City, Mo., have been instructed by the Strait of Canso Bridge Co. to prepare full working plans for the proposed cantilever bridge across the Canso Strait. It is estimated to cost \$5,000,000, and will have the largest span in the world, viz., 1,800 feet, being 100 feet more than the longest span of the Forth Bridge, and 205 feet more than that of the Brooklyn Bridge. The total length of the bridge from shore to shore will be 3,300 feet, and the main span will be 150 feet above high water level. 35,000 tons of steel will be required for its construction, all of which could be supplied from the mills which the Dominion Iron and Steel Co. propose to establish at Sydney, C.B., this year. The work will take about three years to complete.

The approach on the Cape Breton side will be made by a branch line from the I.C.R., near Point Tupper, to the Hastings end of the bridge. The connection from Cape Porcupine will be by a spur line to the I.C.R., near Harbor au Bauche Station, thus overcoming the greater part of the present heavy grades.



Strait of Canso Bridge.

This bridge will save about one hour on every trip to and from Cape Breton at no greater cost than that of the present service. The completion of this bridge will enable the I.C.R. to run night trains to and from Cape Breton, and it is believed that it will increase the chances of Sydney harbor being made a port of call for the Canadian fast line.

Mr. Waddell, the head of the firm of Waddell & Hedrick, is a Canadian by birth, and is considered one of the best authorities on bridge structure on this continent. His text books: "De Pontibus," and others, for bridge engineers, are universally used by the engineering fraternity in the United States and Canada. He was professor of engineering in the University of Japan for some years, and was knighted by the Emperor for his services in that capacity.

#### THE ASSOCIATION OF ONTARIO LAND SURVEYORS.

The twelfth annual meeting of the Association of Ontario Land Surveyors was held in Toronto on February 23rd, 24th, and 25th, under the presidency of W. R. Aylsworth. Those present included: Capt. K. Gamble, Major V. Sankey, G. B. Kirkpatrick, H. de Q. Sewell, H. L. Esten, W. A. Brown, J. F. Whitson, W. A. McLean, A. J. Van Nostrand, D. D. James, A. T. Ward, T. B. Speight, and G. W. McFarlen, of Toronto; W. R. Aylsworth, Belleville; A. Niven, Haliburton; A. S. Code, Alvinston; E. T. Wilkie, Carleton Place; C. A. Jones, London; W. M. Manigault, Strathroy; L. V. Rorke, Sudbury; G. L. Brown, Morrisburg; James Robertson, Glencoe; J. W. Fitzgerald, Peterboro; J. H. Shaw, North Bay; G. A. McCubbin, St. Thomas; Thos. Fawcett, Niagara Falls; P. S. Gibson, Willowdale; J. W. Tyrrell, and E. G. Barrow, Hamilton; J. Patten, Little Current; W. J. Blair, Berlin; and J. A. Calvert, St. Joseph, Mich. The president in his address referred to the satisfactory condition of the association, and stated that efforts were being made to improve the present high standard of the profession. The secretary-treasurer, Capt. Killaly Gamble, reported that the association's finances were in a satisfactory condition.

At the afternoon session, a paper by E. C. Steele was read on "Surveys of Mining Claims," in which the writer referred to the surveying of claims staked out by licensees under the Mines Act in the unsurveyed territory of Ontario, and dealt with the difficulties encountered by surveyors in defining the correct boundary lines from the unprofessional methods generally adopted by the licensees. All lines should be run on an astronomical north, south, east or west course, but licensees as a rule possessed neither the instruments nor knowledge to enable this to be done and the surveyor's mission was to evolve mathematical accuracy out of chaos. The paper contained many suggestions as to how this could best be accomplished.

A paper on "Water Power Surveys and Reports," by W. A. McLean, was listened to with much interest. The writer stated that the estimated developed water powers of the principal countries of the world were: Germany and Austria, 180,000-h.p.; Switzerland, 160,000-h.p.; Sweden, 200,000-h.p.; United States, 400,000-h.p. The available water-power was: Sweden, 2,000,000; France, 10,000,000; Germany, Austria, Switzerland and Italy, 10,000,000-h.p. Niagara Falls could furnish 6,000,000-h.p., half of which belonged to Ontario. Reference was made to the Government regulations regarding water-powers, and suggestions were made as to the best methods of ascertaining the volume of water, height, and power of a fall. With regard to the latter, the following formula was suggested:  $H.P. = .00189 V H$ , in which H is the height of the fall, and V the cubic feet of water, per minute, passing over it. As turbines could utilize 75 per cent. of the total horse-power, in determining the effective horse-power, the formula could be reduced to  $H.P. = .0014 V H$ .

The permanency of the fall and opportunity for storage were matters to be carefully considered in estimating the value of water-powers. The cost of power depended upon the capital necessary for development, and in that respect must rest upon individual merits and the ingenuity of the engineer. The placing of dams, head-race, penstocks, flumes, tail-race, buildings and plant were dependent on natural surroundings and demanded originality in making the best use of them.

Other papers read were: "The Board of Examiners," by Charles Unwin, and "The Amateur Assistant on Survey Parties," by J. Cozens.

On February 24th the report of the Committee on Drainage was presented, after which P. S. Gibson read a paper on "A Few Points Relating to the Ditches and Water Courses