Making Soft Steel in the Electric Furnace

Results of the First Commercial Experiments with the Lash Process, made by the Canadian Lash Steel Process Co., Ltd. Experiments Conducted by Independent Metallurgical and Electrical Engineers. Sample of Soft Steel Made in Furnace Shown in Photograph.

By Horace W. Lash*

In the February 7th, 1908, issue of The Canadian Manufacturer was published a description of the Lash Process for making steel, which outlined in a general way what The Canadian Lash Steel Process Co., Limited, was undertaking in the way of the development of this process in the electric furnace, and promised our readers a report of the results after the plant was in operation.

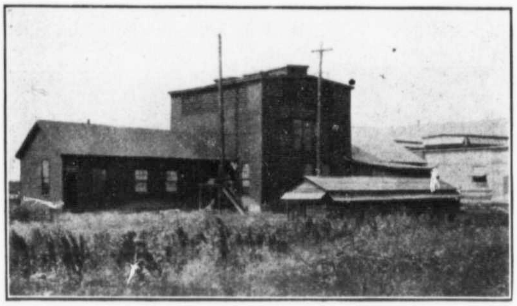

Fig. 1—Plant of Canadian Lash Steel Process Co.

The company, having built their plant, and completed their test runs, a description of the same, and the results of these runs are given below. A brief description of the process is as follows:—

The lash process consists of making a mixture of concentrated magnetic ores, or iron ore sands, granulated pig iron and carbon, and charging the same into either an electric or open hearth furnace and producing steel. It is not a direct process in the strict sense of the word, but is an ore and pig process, the ore, however being greatly in excess of the amount of pig iron used, and practically eliminating the scrap, using only such scrap as is made in the regular operation of a steel works.

The amount of pig iron required to make a ton of steel is less than one-half of what is required in regular open hearth practice when the mixture is used in an electric furnace, on account of its non-oxidizing atmosphere; this feature, coupled with the fact that the rest of the mixture is iron ore, which is, of course, the cheapest source of metallic iron, will produce a ton of steel ingots at a price much lower than they are produced in regular practice, either in the United States or Canada, figuring the electric power required at its regular market price as sold in large quantities.

Figure No. 1 gives a view of the plant, which is located in Niagara Falls, N.Y., corner 28th Street, and Buffalo Ave.

Figure No. 2 gives a view of the furnace just before starting the plant, which furnace is of the Heroult type of 1,000 h.p. capacity, and is capable of making 4 to 5 tons of steel in one heat.

Figure No. 3 shows the same furnace in operation, and was taken during the making of the 20th heat.

Figure No. 4 shows the hydraulic tilting mechanism of the furnace, and the back of the furnace in a tilted position while pouring.

Figure No. 5 shows the transformers which were made by the General Electric Co., and are of 750 k.w. capacity.

Figure No. 6 shows the casting crane with the slag ladle hanging thereon, and a view into the pit, where the casting was done; all ingots cast at this plant were bottom poured in groups, and were 6x6 inches square, weighing on an average of 500 pounds each.

Figure No. 7 shows the mixing plant in which the material was mixed that was charged into the furnace, the ore, granulated pig iron or cast iron borings, and carbon in the form of coke, charcoal or anthracite coal being put into this plant and thoroughly mixed with a small proportion of slacked lime, the slacked lime being used to keep the material in bond.

Figure No. 8 shows the billet yard, and a pile of billets representing the first 10 heats.

Figure No. 9, photograph taken by The Canadian Manufacturer of a specimen of the Lash steel, forged from an ingot to one inch square, bent cold. This steel is 0.24 carbon, showing a tensile strength of 73,000 pounds. Attention is called to the flow of the metal at the bend, and that it is without a fracture.

Operation of Furnace.

The operation of this plant was as follows:—

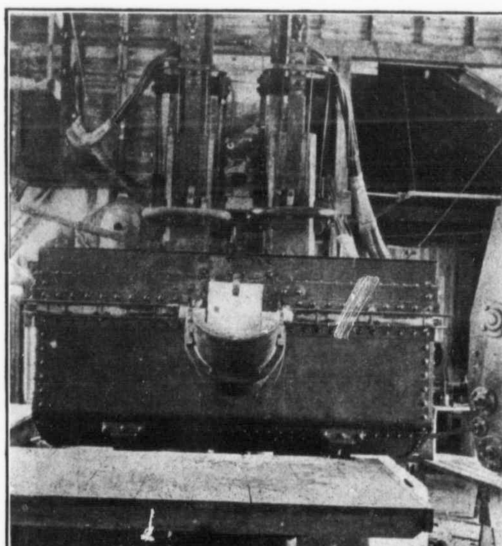

Fig. 2—Heroult Electric Furnace.

67 per cent. of magnetic iron ore, 23 per cent. of cast iron borings or granulated pig iron, and 10 per cent of coke dust, was put into the mixing pan in batches of about 500 pounds and allowed to thoroughly mix for 10 or 15

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