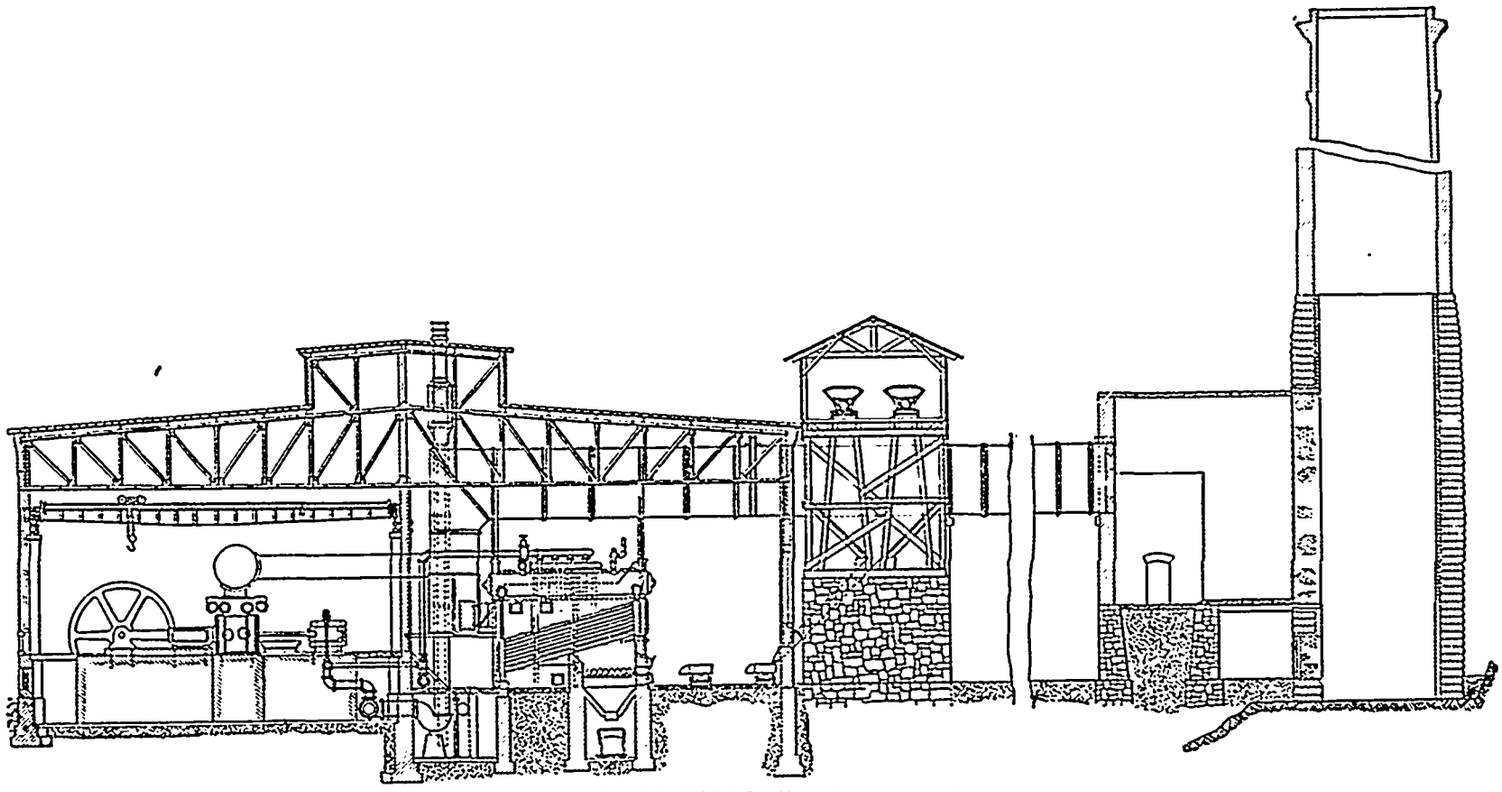
four cars containing two tons of smelting mixture and two cars each containing the proper amount of coke to go with four tons of charge.

The slag and matte runs from the blast-furnace into 16-in. settlers, the slag overflowing into 225 cu. ft. capacity Pollock cinder cars, which are hauled to the dump by standard-gauge locomotives. The matte is tapped into 10-ton cast-steel ladles and taken to the converter by a 40-ton Case Manufacturing Company's electric crane. The same crane removes the converter shells for re-lining, and takes care of the converter slag and white metal, pouring them into moulds for return into the pocket trestle, or for shipment to the refinery. The coal bins at the boilers and the silica and clay bins at the clay mills are kept full by six-car train-loads of material.

The flue dust is drawn from the dust chamber into a standard-gauge, bottom-dump gondola especially fitted for the service, and this car is hauled to the top of the pocket trestle on the upper level and the dust drawn into a pocket fitted for the purpose, whence it is drawn to a briquetting machine, pressed into briquettes and added to the charge.

The electric tramway consists of two parallel 30-in. gauge tracks running under two lines of grates under the pocket trestle, then over suspension scales to opposite sides of the furnaces on the feed-floor level, passing over the top of the boiler room, coal bins and converter lining house, silica and clay bins. The two tracks have cross-over connections but under normal working conditions each track carries a train entirely independent of the other.



SECTION OF WORKS AT COPPER CLIFF.

The blast-furnaces are 50-in. by 204 in. at the tuyeres; 14 ft. 9 in. from center of tuyeres to the feed-floor, and have on each side four lower jackets each 51 in. wide and 8 ft. 6 in. high and two upper jackets 8 ft. 6 in. wide and 6 ft. high. Each lower side-jacket carries four 6-in. tuyeres. Both ends of the furnace are made alike, so that either end can be used for removing matte and slag. There is no brick work under the deck beams. The converters are 84 in. by 126 in. and are tilted by a train of gears and a worm, driven by electric motor.

The water for the plant is supplied by a 16-in. diameter pipe running from a dam situated about 5,000 ft. from the plant itself. The water is run by gravity into the jackets, and when drawn out is pumped into a tank above the smelting plant for fire purposes, or into the reservoir, which is near the foot of the plant, and the hot water is also used in the boilers in order to economize at that point.

On the Manufacture of Sulphuric Acid at Sydney, C.B.

By C. A. MEISSNER, Sydney, Cape Breton.*

The manufacture of sulphuric acid for the purpose of making sulphate of ammonia, or the uses in the sulphite wood pulp industry, is one of the branches of the coke department where coke is made in patent ovens and the by-products are saved. Ammonium sulphate is made from the ammonia in the gas from the ovens, which is washed out and the resulting gas liquor is mixed with milk of lime which liberates the fixed ammonia and passes through suitable stills where it comes into contact with steam. By this means the free and combined, or fixed, ammonia is given off in gaseous form, and then passed into sulphuric acid contained in lead lined tanks. This acid is the ordinary chamber acid of 54° to 55° Beaume diluted down to about 42° Be.

Usually the sulphuric acid is made near the by-products plant in which it is to be used, unless commercial acid is readily and economically available, and distances from acid factories and suqsequent freight rates are not too high.

Sulphuric acid is made largely out of iron or copper pyrites,—$Fe\ S_2$ and $(Cu_2\ S)\ (Fe_2\ S_3)$--also from native sulphur. In some cases the nickeliferous pyrites are roasted and the nickel subsequently extracted, as well as the copper. Arsenical and auriferous pyrites are used in some cases and the arsenic and gold extracted. Zinciferous sulphur ores are beginning to be largely used for this purpose, and are liable to become an important factor. Native sulphur running

* Paper to be presented at the ensuing annual meetings of The Canadian Mining Institute.