Disposition of Smelt.

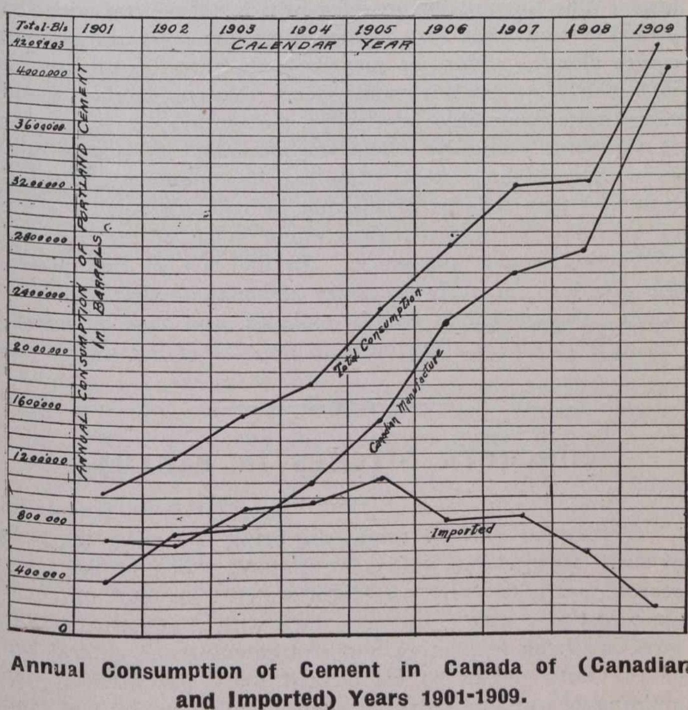
The refined copper product at the various smelteries is cast into a variety of shapes, such as ingots, weighing about 20 lbs. each, used for making brass, bronze, bearing metal, etc.; ingot bars consisting of two or three ingots joined together endways in one piece for convenience in shipping, thus avoiding the use of the casks required for small ingots; wire bars about 4 ins. square and 4½ ft. long, weighing 225 to 250 lbs. for rolling and drawing into wire for electrical purposes; cakes, both square and round, varying in weight from 120 to 6,000 lbs. and from 14 ins. by 17 ins., up to 56 ins. square, for rolling into sheets intended for making copper boilers, bath tubs, vacuum pans, digesters, etc., billets for manufacturing seamless drawn tubes; and when there is an appreciable amount of silver associated with copper, into anodes for subsequent electrolytic treatment to recover the silver.

Each plant possesses a well-equipped physical and chemical laboratory. This is maintained primarily to determine electric conductivity, and the percentage assay of copper. At the same time, too, considerable research work is carried on for the purpose of bringing to light unknown factors bearing on the refining and quality of the copper.

ANNUAL CONSUMPTION OF PORTLAND CEMENT.

The accompanying curves with the annual consumption of Portland Cement plotted against the calendar year shows very clearly the growth of the cement industry in Canada and also the history of imports of cement.

The top curve shows the total consumption of cement in Canada. The next curve shows the consumption of ce-



Annual Consumption of Cement in Canada of (Canadian and Imported) Years 1901-1909.

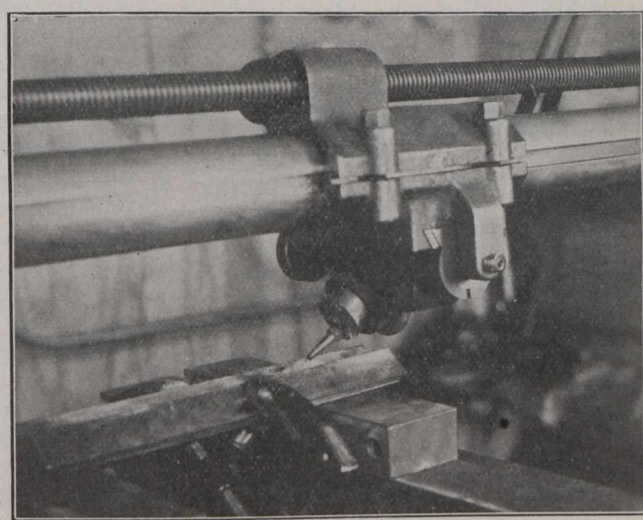
ment of Canadian manufacture and the bottom curve shows the consumption of imported cement. In 1901 of all the cement used in Canada 64 per cent. was imported, in 1909 only 3 per cent. was imported; 97 per cent. or over 4,000,000 barrels being of Canadian manufacture.

The above curves were plotted from data given in the Annual Report of the Mineral Production of Canada-Department of mines.

ACETYLENE WELDING AND CUTTING MACHINE.

Hand welding and hand cutting are now familiar operations to which the acetylene blow-pipe is highly adapted. Where straight-line operations have to be carried out, especially in connection with repetition work, a machine is often applicable and advisable. Where sheets are very thin, machine welding is very desirable, because of the certainty with which it can be regulated. The machine can be advantageously used in sheet metal work, where the thicknesses range up to, say, 3-16 or 7-32 inch. Straight cutting of both thin and thick work can be advantageously done with the machine because of the precision of the movement.

An acetylene welding and cutting machine has recently been built by the Davis-Bournonville Company, of 90 West street, New York City. The patent rights involved are held by this concern. There is a cylindrical upright perhaps six or seven feet in height. This carries a long hollow arm projecting for six or seven feet on one side. By means of a rack and pinion, this arm may be adjusted to any height desired. The arm carries a long screw, rotatably and horizontally mounted in suitable bearings. At the base of the upright, loose and tight pulleys are mounted on a short horizontal shaft and are driven from an ordinary counter-



The Machine Rigged With Welding Torch.

shaft above. This latter shaft and a rotatable rod arranged in the hollow arm are put into driving connection by bevel gears. At the outer end of the arm, an arrangement of gears enables the inclosed rod to drive the screw. The turning of this screw operates a carriage back and forth horizontally along the arm. Upon the carriage, the torch and its controlling fixtures are mounted. The work is placed or secured on a suitable fixed table. Flexible tubes bring the oxygen and acetylene to the torch. The tip is practically the ordinary form. It is arranged at an angle, say 40 or 45 degrees, to the horizontal, this angle being to the rear of the welding movement. The torch then moves over the work much after the way a cowcatcher passes along over a railway track.

The method of welding is often quite simple. Thus, if the weld is to be a flat one and of inconsiderable length, the two pieces are simply clamped in the exact relative positions they are to occupy finally. Room must of course be left for the tip to pass. The operation of welding is then not unlike that which occurs with an ordinary shaper. The carriage with the torch moves evenly along at the proper rate of speed. The countershaft, running at say 140 revo-