

"It consists of an L shaped cast iron box about 30 inches long, lined with tile or water jacketted to suit conditions which is placed in free communication with the tap hole of the furnace, which should be as wide as possible. The walls are deep enough to afford a sufficient head to retain the amount of slag and matte desired in the furnace. Placed in this box at right angles to the face of the tap jacket is a water jacket partition below which is an aperture a few inches in height and which serves to laterally divert the matte. Referring to the sketches: "Fig. 1, is merely a diagram showing its manner of operation.

"Fig. 2, is a cross section on the line AA in Fig. 1.

"Fig. 3, shows a plan of the actual apparatus.

"Fig. 4, is a vertical section on the line BB in Fig. 3.

"The manner of operation is as follows:—

"The apparatus is pressed closely against the tap jacket E of the furnace, with its bottom on a level with the bottom of the tap hole F.

"When the furnace is in full operation the matte and slag will be maintained within the furnace at levels corresponding to the head afforded by the height of the slag and matte overflows O. & P.

"The slag from the double stream flowing from the furnace will be arrested by the water jacket barriers M and will be retained in the first division T to overflow at O, whilst the matte will flow through the space N into the second division U and rise until its head balances those of the matte and slag in the first division of the box or the matte slag and blast pressure in the furnace and overflow at P. It will thus be seen that the levels of matte and slag in the furnace will depend upon the weight of blast and the height of the overflows O & P which may be varied considerably at the will of the furnaceman.

"Its operation requires but little attention or skill, and it will run for two or three weeks without change which is quickly effected, the apparatus being mounted on small wheels which run on rails on a truck placed at a height corresponding to two short rails at the furnace.

"It is not bolted in any way to the furnace, the only connection necessary being made by tamping a small quantity of fire clay in the groove L which when filled with slag, which chills between the surface of the jacket and the flange, makes an extremely efficient seal under the most stringent conditions.

"The tap hole V is provided to tap out any small quantity of lead which may accumulate, and also for tapping out the fluid contents of the furnace when necessary.

"Where the production of matte falls extremely low, the operator does not attempt a continuous flow of matte for any length of time but builds up the level of the matte overflow reducing it at regular intervals. The oscillation of the contents of the box due to the blast, prevents in this design the solidification of the matte even when it is allowed to stand for a reasonable time. Should however the matte in the second division U become solidified, it is easily removed without interfering in the least with operation of the furnace."

Naturally, some time was occupied in perfecting this device and in becoming familiar with its operation, but it is now a recognized adjunct of the furnace, and the advantages gained by its use, in comparison with the discarded cumbersome settlers or forehearts, may be summarized briefly:—a better saving of lead and silver values in slags; a more perfect equilibrium within the furnace; conducting to more perfect metallurgical work and less tendency to irregularities producing

troublesome crusts and accretions; less time lost in changing settlers; a saving of labour in handling the same and preparing the contents for resmelting; and a saving in iron and steel tools, as well as matte pots.

THE REVISION OF THE MINES ACT OF ONTARIO*

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Many resolutions have been passed and numerous recommendations made with reference to the revision of the Mines Act which is to be undertaken at the next session of the Ontario Legislature. These resolutions and recommendations have been varied, but it is noteworthy that at almost every meeting at which the Ontario Mining Law was discussed there was a demand for a mining law to be enacted by the Legislature and to be applicable to the whole of the Province. This demand is wise and fully justified. Sir Frederick Pollock has well said that the criteria of just laws in a civilized community are generality, equality and certainty, and few men are more competent to speak on the subject.

A good mining law must satisfy these three tests. It should be steadily kept in mind that our mining laws, like other laws, should be made by our legislatures and parliaments after full discussion by the representatives of the people. The function of a government and its officials should be to carry into effect the laws so made. The distinction between the law making powers of the legislature and the executive and administrative powers of the government is too often ignored. In view of the unanimity of the demand for a uniform mining law, it is to be hoped that in the interests of the mining industry a stable and well considered statute will be passed by the Ontario Legislature which shall not be subject to sudden alteration by Orders-in-Council.

The rights of explorers and prospectors should be clearly and distinctly defined, and also what has to be done to protect any discoveries they may chance to make. The mineral areas of Ontario have largely to be yet explored, and this will not be thoroughly done unless the pioneers are certain of protection and justice. The conditions upon which mining locations or claims can be held should also be clearly and plainly set forth.

It is for the Legislature to say what these conditions shall be, and for the Government to enforce the enactment of the Legislature.

In framing such a law for submission to the Legislature, the Government have many difficult questions to consider, many complicated problems to solve. The Government and the Legislature have to consider not only the prospector and discoverer, but likewise the miner and the investor in mining enterprises, and also the interests of other industries, such as, for instance, the lumbering industry, and of the public. The history of mining development in this Province has to be carefully considered, and it may be taken for granted that the best results will be obtained by making the necessary amendments and modifications of our existing legislation rather than by attempting an entirely new Act, although a new Act might easily be drawn that would be more perfect theoretically and more rigidly logical. The practical results of drastic and violent changes in our laws do not warrant the risks of such an experiment with our mining Act.

The main object is the development of our mining industry, which is of increasingly great importance.

*A paper read at the annual meeting of the Canadian Mining Institute, Quebec, March, 1906.