

inch space, and successive sizings in screens from 0.3 inch to 0.5 inch mesh. The oversize from the screens, which consisted of molybdenite, mica, and rock, was treated on a Wilfley table, and yielded a commercial product. The Hartz jig was not adapted for concentrating this ore; but good results were obtained with the Wetherill magnetic separator, although, owing to the high current and slow speed necessary, it is doubtful if this separation can be done on a practical basis. Treatment by a modified form of the Elmore process

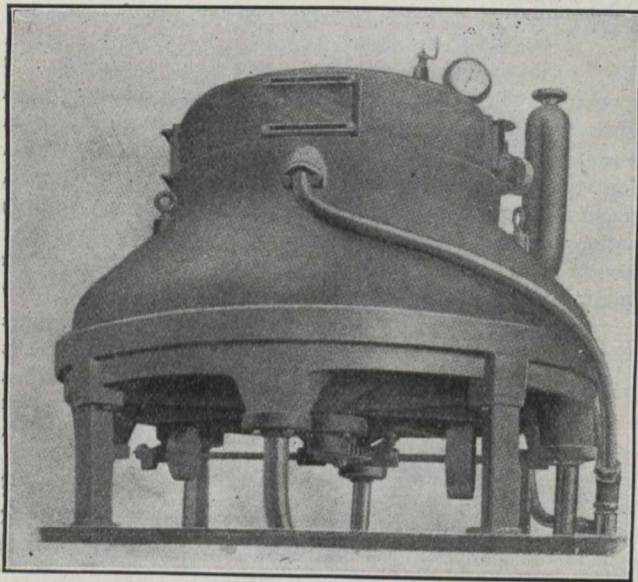


Fig. 1 Illustrates an Elmore Concentrator.

was only partially successful, as the large particles of molybdenite were not affected by the oil. Another sample consisting of quartz and feldspar with 2.5 per cent. molybdenite, was crushed and sized, but gave no clean ore on any of the screens. The whole sample was then ground to pass an 0.05 inch screen, and concentrated on a Wilfley table; the final concentration being effected by the oil process. The experiments carried out by Mr. Wells showed that no standard method can be adopted for concentrating molybdenum ores. Separate mill tests are required to determine the proper treatment in each case."

Crushing and dry concentration has been employed at Cooper, Maine, where the ore is granite, containing fairly coarse foliated molybdenite. According to T. L. Walker, M.A. Ph.D., the plant of the American Molybdenum Company consisted of a 35 horse-power boiler and engine, a Sturtevant jaw crusher and roll, and four sets of special rolls, each 3 feet in diameter and 10 inches wide. The crusher was located a couple of feet above the floor, from which the material, crushed to about one-fourth inch square, is elevated to the Sturtevant roll, 18 inches in diameter by 4 inches wide, which reduces the ore to about one-eighth inch. It is then elevated to a bin at the top of the building, from which it falls to a series of two special rolls, thence elevated to a third special roll, and run through a 34 mesh screen. The molybdenite caught on the screen is delivered to a box at the end. The material going through the screen is carried by an elevator and screw conveyer to a fourth roll, from which it falls onto a 40 inch screen and from that to a 60 mesh screen. What goes through the 60 mesh screen is elevated and sent to the tailings pile. It is readily seen that the repeated elevations of the material mean a considerable waste of power. In a report to the government Mr. Walker says: "Such a process, if mechanically perfected, might work profitably on deposits where, as in this one, the molybdenite flakes are comparatively broad, but would be wholly unsuited to deposits

like many of those in Colorado and elsewhere, in which the individual flakes are of almost microscopic size."

A process apparently well suited to molybdenite ores has been recently brought forward by F. E. Elmore, and is as follows:—

"Based primarily upon the fact that, in a flowing pulp of crushed ore and water, oil has a selective action for the metallic mineral particles as distinct from the rocky particles or gangue. This selective action is materially increased in some cases by the presence of an acid; gases dissolved in water are liberated, partially or entirely, upon subjecting the same to a pressure less than that of the surrounding atmosphere. These liberated gases may be augmented by the generation of gases in the pulp or by introduction from an external source. The gases attach themselves to the greased mineral particles, and being largely increased in volume as a result of the partial vacuum applied, cause the greased particles with their attendant bubbles of air or gas to float to the surface of the liquid."

A London (England) company manufactures the apparatus, and in order to demonstrate the suitability of this process for various ores, they have established a testing plant and make trial on small shipments. Three such experiments made in concentrating molybdenite resulted as follows:—

Sample Number	Nature of Gangue	PER CENT MOLYBDENUM.			Per Cent Saved
		In Ore	In Tail-ings	In Con-centrates	
1	Feldspar	3.40	0.25	40.80	93.2
2	Much garnet and magnetite	2.30	0.06	51.57	98.1
3	Not stated	5.21	0.17	54.7	97.0

A sample of the ore from the claims of the St Maurice Syndicate, Lake Kewagama, was treated by this process by

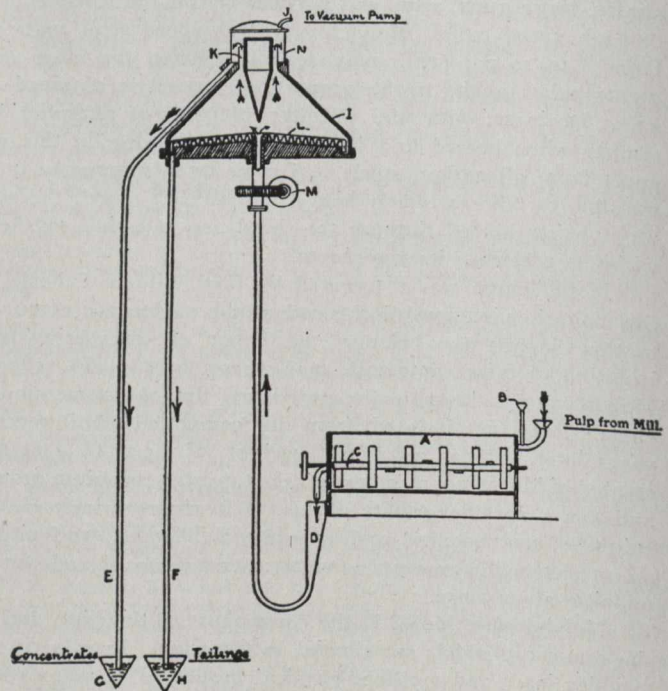


Fig. 2.—Elmore Vacuum Concentrator: Section.

the Denver Engineering Works Company, of Denver, Colo. The sample was small, but the concentration was very satisfactory, with a minimum loss in the tailings as illustrated by the following report:—

Following are the results obtained by the Elmore process on the sample of molybdenite submitted by Mr. J. C. Gwillim. The mineral seemed free at 16 mesh, but owing to the small diameter of the delivery tube of the laboratory machine it was found necessary to crush it finer before making the test.