

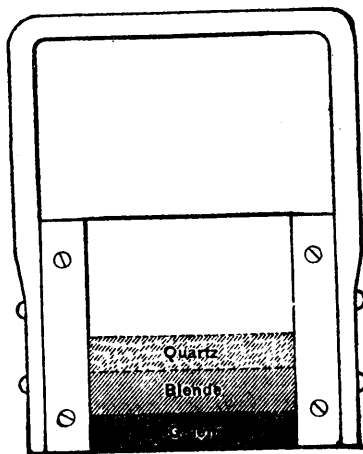
Mining, Metallurgy, Mineralogy

NOTES ON THE ASSAY SPITZLUTTE.

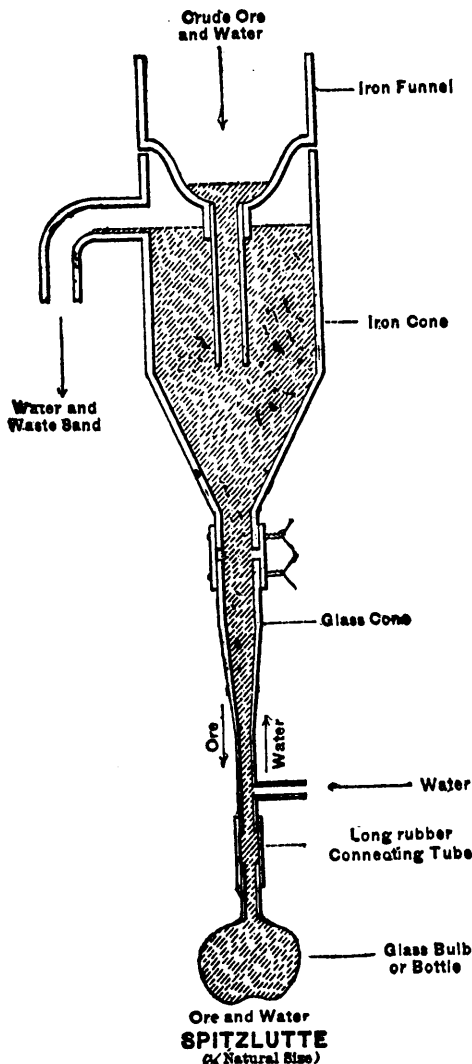
Robt. H. Richards, S. B., Professor of Mining, read recently, before the American Institute of Mining Engineers, a description of an assay spitzlutte from the mining laboratory of the Massachusetts Institute of Technology. Prof. Richards says:

The spitzlutte, as described by Rittinger, is an instrument by which sand is sorted in a continual upward-flowing stream of water. Its usual form is that of a pointed box, placed with the point downward, the box receiving its feed of sand and water on one side, and discharging its tailings on the other. The assorted product or concentration is discharged at the bottom, at the apex of the box, through which it falls against an upward current of water, which current serves to effect the assorting and separation. To make this exposure to the quicksand condition still more effective, an inverted dam is placed across the spitzlutte, which forces the sand in its passage from the feed side to the discharge, to pass down into the more active portion of the upward-flowing current of water.

In the form adopted for small tests in the mining laboratory of the Massachusetts Institute of Technology (see accompanying sketch) the feed is through a central funnel instead of being at the side, and the apex of this funnel, extending down nearly to the apex of the cone, takes the place of the inverted dam in the large spitzlutte. To keep the experiment perfectly under control a bulb or bottle is attached by a rubber connecting-tube to



JIG WITH GLASS SIDES
(Natural Size)



AN ASSAY SPITZLUTTE FOR MINING LABORATORIES.

receive the concentrations, and between this bottle and the apex of the spitzlutte is placed a glass tube of conical form, with a side tube for the admission of water. By regulating the admission of water through this tube the concentration may be allowed to go down into the bulb as fast or as slowly as the richness of the ore seems to demand.

This spitzlutte may be used on products that have been previously sized to take out the heavy mineral. As an example of this, a test was made upon a sample of ore where the galena, blende, and quartz were much mixed up, but separated perfectly when crushed. The sample of ore was from Newburyport, and assayed 16.50% lead. After sizing through a series of sieves the ore yielded concentrations and tailings to the spitzlutte as follows:

Through. On.	Concentrations, Lead.	Middlings, Lead.	Tailings, Lead.
12 — 20	47.28%	11.38%	2.48%
20 — 30	47.81%		1.67%
30 — 40	48.61%		2.56%
40 — 50	51.93%		3.54%
50 — 90	50.95%		1.18%
90 —	31.93%		Not worked.

Again this spitzlutte can be used on natural products. By these I mean products that have been crushed simply without

being subjected to the usual process of sizing by a series of sieves. In this case its overflow sand must be re-treated by the miner's pan or sichertrog to extract the finer portion of the ore. It makes a very good preliminary to the miner's pan, taking out the largest grains, which interfere with the pan's best action, leaving the finer grains of ore for the pan to finish.

The spitzlutte has been used by us mainly to separate mercury and amalgam from pulp after amalgamating tests. For this purpose it is very efficient. It is also used to gain an approximate idea of how an ore will concentrate, and how fine it should be crushed in order to concentrate it to the best advantage on the large scale.

The little jig (shown in the accompanying sketch) used as a lecture experiment and as a test of larger machines, is 6 inches deep, 4 inches long and 3 inches wide, with plate glass sides, wooden ends, and a sieve bottom of 30 meshes to the inch.

This jig will show very perfect lines of separation between quartz, specific gravity 2.6, blende, specific gravity 4, and galena, specific gravity 7.5. It will show a partial separation between blende, specific gravity 4, and magnetite, specific gravity 5.1.

The separation of red marble, white barite and blue galena is very marked, and makes a good lecture experiment.

In using this jig to test the running of larger machines it simply shows with what ease or difficulty a given set of layers may be obtained.