

A. H. SMITH.
 APPARATUS FOR SEPARATING MINERALS.
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1,056,952.

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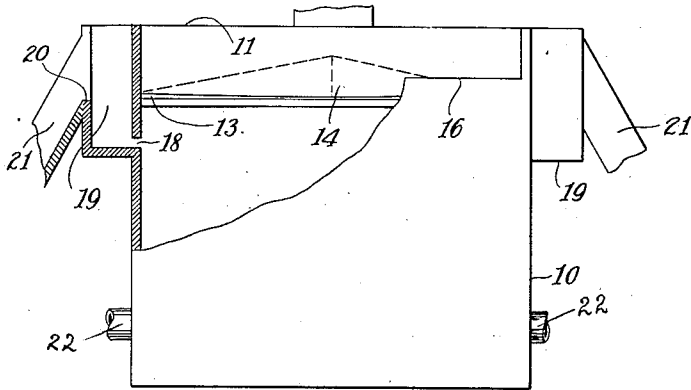


Fig. 1

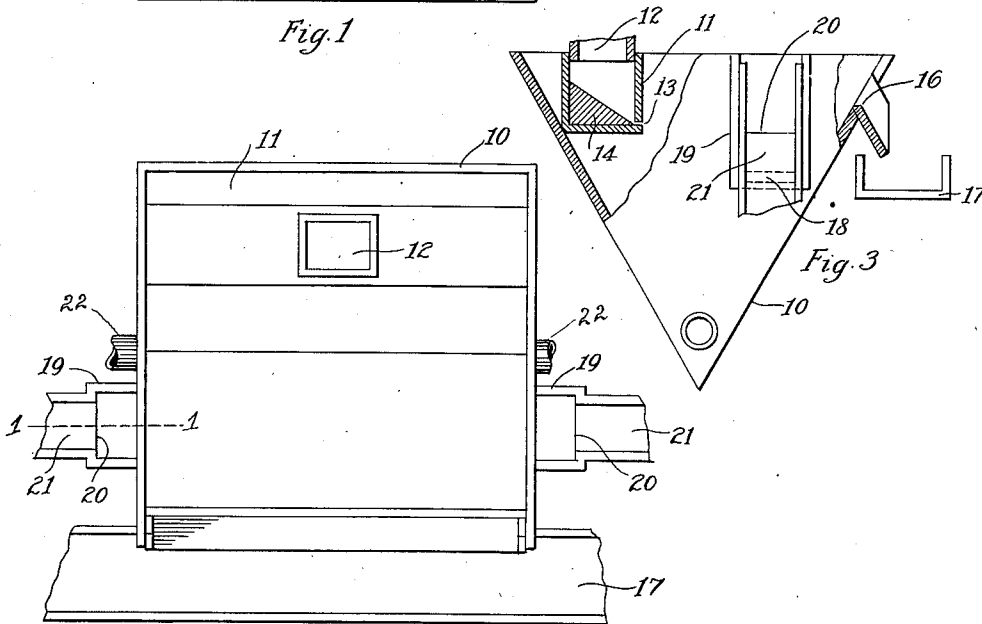


Fig. 2

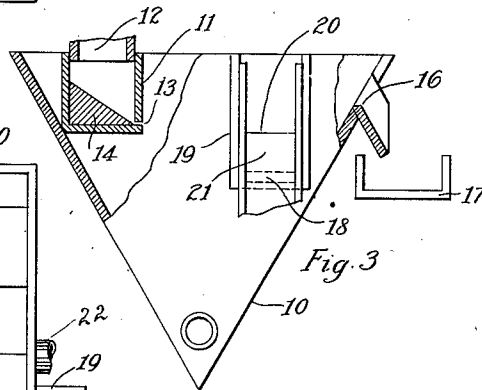


Fig. 3

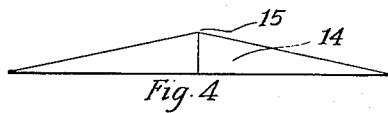


Fig. 4

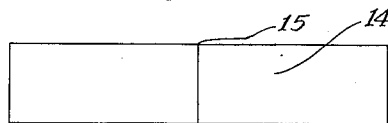


Fig. 5

WITNESSES:

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UNITED STATES PATENT OFFICE.

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APPARATUS FOR SEPARATING MINERALS.

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To all whom it may concern:

Be it known that I, ALEXANDER HERBERT SMITH, a subject of the King of Great Britain and Ireland, and residing at Glasgow, in the county of Lanark, Scotland, have invented a new and useful Improvement in Apparatus for Separating Minerals; and I do hereby declare the following to be a full, clear, and exact description of the same.

This invention relates to devices for the flotation of minerals and more particularly to devices for evenly feeding mineral-feed and oil or any mixture to a spitzkasten.

The invention also relates to devices for preventing the water and gangue from flowing into the concentrate launder with the floating mineral.

To this end I have provided the arrangement herein-described and illustrated, but it is understood that this arrangement is one of many possible embodiments of the invention and that various changes in the dimensions, proportions and construction thereof may be made without departing from the scope of the claims.

In the annexed drawings forming a part of this specification Figure 1 is a front elevation, partly in section on the line 1--1 of Fig. 2, of a spitzkasten provided with the devices of the invention; Fig. 2 is a plan of the same; Fig. 3 is an end elevation of the same; partly in central vertical section. Fig. 4 is a front elevation of the distributing block of the feeding device, and Fig. 5 is a plan of the same.

Referring more particularly to the drawings, the new devices are shown applied to a spitzkasten 10, which may be supported by any usual or desired means (not shown). At the rear side, the spitzkasten is provided with a feed box 11 extending the length thereof and secured in any convenient manner. The upper wall of the feed box is provided with an opening 12 where the feed enters, while the front wall of the box is provided, at the lower edge thereof, with a slit 13 from which the mineral feed is discharged into the spitzkasten. This slot is narrowest at the middle part and gradually increases in width toward each end. The exact dimensions of the slit may be determined according to circumstances; but $\frac{1}{8}$ inch at the middle and $\frac{1}{4}$ inch at the ends has been found satisfactory.

In order that the feed may flow from the slit 13 in a fine even stream, a distributing

block 14 is provided. This block is highest at its middle 15 and slopes forward as clearly shown in Fig. 3, and also toward the ends as shown by Fig. 4. The feed coming in through the opening 12 is distributed by the block to the slit 13 and passes out evenly into the spitzkasten.

The front side of the spitzkasten is provided with the lip 16 across which the mineral floats into the concentrate launder 17. In order to prevent the water and gangue from flowing over the lip 16 into the concentrate launder with the floating mineral, a slot 18 is cut in each side of the spitzkasten about 15 inches lower than the lip 16, and this slot is surrounded on the outside by a pocket 19 having a lip 20 over which the water and gangue flow into the take away launder 21. The lip 20 should be a convenient distance lower than the lip 16, for instance from two to four inches would answer.

The operation of the device is as follows: The mineral feed is passed in at the opening 12 and strikes the block 14, which distributes it along the slit 13 from which the feed issues in a fine even stream extending uniformly the whole length of the slit. The floating mineral passes off over the lip 16 into the concentrate launder 17, while the water and gangue flow through the slots 18, over the lips 20, into the take away launders 21. The gangue and water also flow out through the pipe 22. This is the principal place when the gangue is extracted from the spitzkasten by a pump, air lift, or other such device.

I claim:

1. In the flotation of minerals, the combination of a decanting separator having an open top and a straight side wall, the front wall being provided with a lip for the concentrate, a side wall being provided with a slot lower than said lip and remote from the bottom of the separator; a pocket surrounding said slot and provided with a lip lower than the lip for the concentrate and higher than said slot; and means for conducting mineral feed into the separator.

2. In the flotation of minerals the combination of a spitzkasten provided with a concentrate lip and a slot lower than said lip and remote from the bottom of the spitzkasten; a pocket surrounding said slot and provided with a lip lower than said concentrate lip and higher than said slot; and

means for feeding mineral feed into the spitzkasten.

3. In the flotation of minerals, the combination of a spitzkasten having an open
5 top, a concentrate lip and a straight side wall having a slot lower than said lip and remote from the bottom of the spitzkasten; a pocket surrounding said slot and provided
10 with a lip higher than said slot and lower than the concentrate lip; and means for conducting mineral feed into the spitzkasten.

4. In the flotation of minerals, the combination of a spitzkasten having front and
15 rear inclined walls and straight side walls, the front wall being provided with a lip

for the concentrate, the side walls being provided with slots near the front wall and lower than said lip; pockets surrounding said slots and each provided with a lip
20 lower than the lip for the concentrate and higher than said slots; and means for conducting the mineral feed into the spitzkasten.

In testimony whereof, I have signed my
25 name to this specification in the presence of two subscribing witnesses.

ALEXANDER HERBERT SMITH.

Witnesses:

MONTROSE L. LEE,
ALVIN BERRY.