

Aug. 24, 1926.

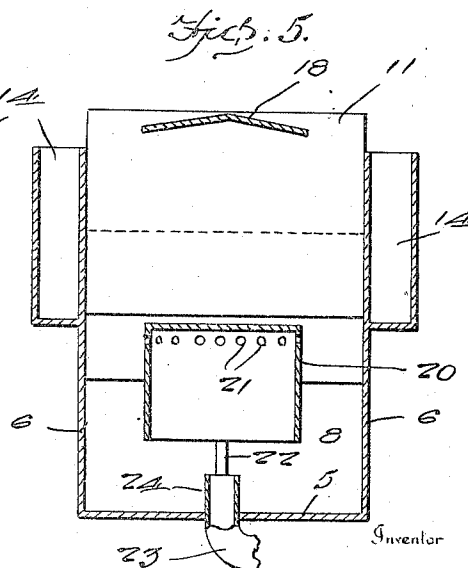
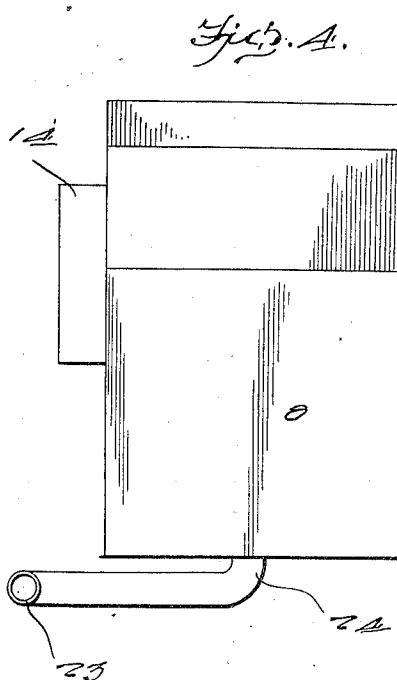
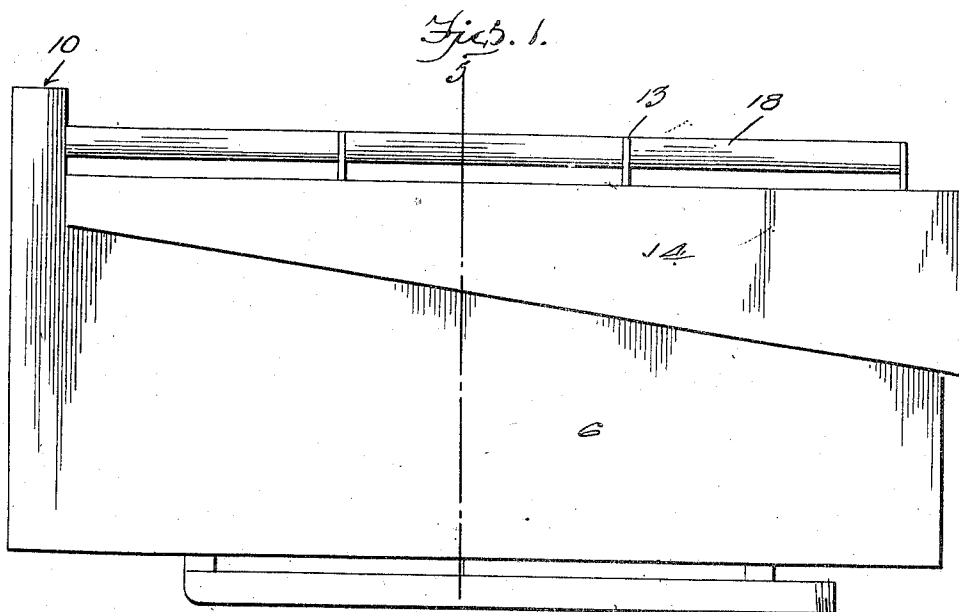
1,597,368

S. E. MEYER

FLOTATION MACHINE

Filed Nov. 3, 1925

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

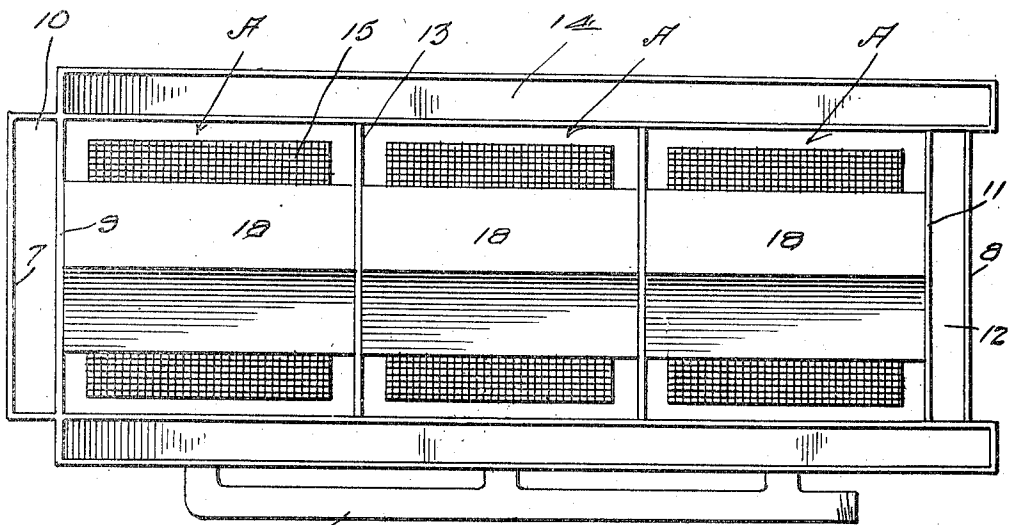
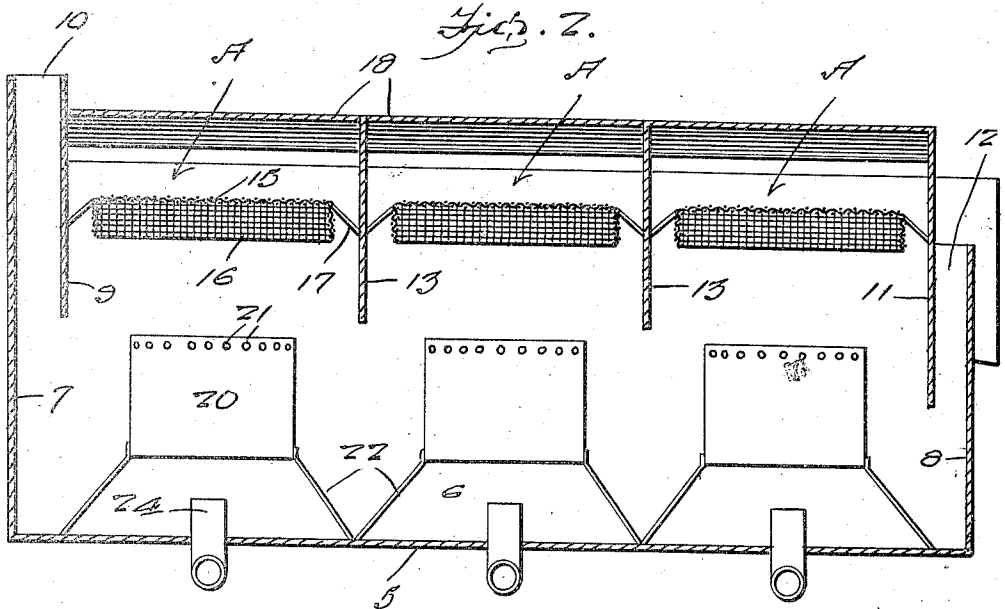


Fig. 3.

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UNITED STATES PATENT OFFICE.

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FLOTATION MACHINE.

Application filed November 3, 1925. Serial No. 66,557.

The present invention relates to flotation machines, and has for its prime object to provide an exceedingly efficient machine of this nature for separating minerals such as gold, silver, and copper from their ores.

Another very important object of the invention is to provide a flotation machine of this nature using a process of aeration to raise the pulp or feed through froth forming screens.

Another very important object of the machine is to eliminate the necessity of using the mats of porous material which so frequently become clogged or choked and prevent the proper operation of the flotation process.

The above objects are carried out by a simple structure which is thoroughly reliable, inexpensive to manufacture, strong, and otherwise well adapted to the purpose for which it is designed.

With the above and numerous other objects in view as will appear as the description proceeds, the invention resides in certain novel features of construction; and in the combination and arrangement of parts as will be hereinafter more fully described and claimed.

In the drawing:—

Figure 1 is a side elevation of the flotation machine embodying the features of my invention,

Figure 2 is a vertical longitudinal section therethrough,

Figure 3 is a top plan view thereof,

Figure 4 is an end elevation thereof, and

Figure 5 is a vertical transverse section taken therethrough substantially on the line 5—5 of Figure 1 looking in the direction of the arrow.

Referring to the drawing in detail it will be seen that I provide a casing including the bottom 5, sides 6, and ends 7 and 8. A partition 9 forms with the end 7 and entrance 10 for the feed or pulp. A partition 11 forms with the end 8 the exit 12. The casing is divided into a plurality of cells by partitions 9 and 11 and partition 13, the cells being indicated generally by the letter A. On the sides 6 exteriorly of the casing there are provided launders 14, the bottoms of which incline downwardly from end 7 to end 8. The cells A are identical in construction and a detailed description of one will suffice for all. In each cell A there

material, the body of which is indicated by the numeral 15. This body 15 is rectangular in formation having the depending flange portions 16 at the edges thereof. The screen is supported by members 17 projecting from the partitions 9, 11, and 13. Covers 18 extend between the partitions 9 and 11 and partition 13 and are of an inverted V-shaped formation in cross section as is clearly shown in Figure 5 so that the apex lines thereof extend above the median longitudinal dimension of the casing. The sides of the covers are spaced inwardly from the sides of the screens as is clearly seen in Figure 3. These covers 18 are disposed wholly above the upper edges of the sides 6, as is clearly seen in Figures 1 and 2. Below each screen there is mounted an aerator 20 of an inverted cup-shaped formation having a plurality of apertures 21 adjacent the upper end thereof. These aerators are supported on members 22 rising from the bottom 5. An air line 23 has branches 24 extending through the bottom 5, one below each aerator 20.

As is well known, a flotation machine is used in the concentration of minerals such as gold, silver, and copper. The ore being ground to a fine state and being mixed with water forms what is known as a pulp or feed. This pulp or feed is treated with certain chemicals and oils for causing the minerals to float by the aid of a flotation machine. This machine which I have described in detail above can be operated either on the level or on an incline to coincide with the flotation machine shown in Letters Patent No. 1,574,403, issued to me February 23, 1926.

As stated above, the main object of this machine is to do away with the mats of porous material. To do this I enter the air under pressure into the feed or pulp. The air rising by its own force on its way up draws the feed with it into the aerators 20 where the feed or pulp is subjected to an intense emulsification. The air, not being able to escape is forced through the apertures 21 under less pressure and continues upwardly through the feed or pulp and comes into contact with the screen 15. The flanges 16 force the air to go through the screen thereby forming a froth. These screens are smaller in area than the inside of the cells so as to leave spaces therebetween, that is spaces between the edges of

the screen and the sides of the cells which allows all sand that might accumulate on top of the screen to work itself back over the edges into the feed. The cover 18 forces the froth from the center of the cells over the edges of the sides 6 into the launders 14.

Particular attention is directed to the fact that by segregating the product from the first cell or two and returning the product from the balance of the cells in the series of the machine into the head of the first cell, a concentrate can be produced in the first cell or two of such a quality to justify doing away with the expense of retreating the product from a rougher machine through a recleaning machine. As is well known in the process of flotation, the rougher concentrate or the product from the rougher machine is run through what is called a recleaning machine to raise the grade of the concentrate, the process being the same as producing the rougher concentrate.

The use of a recleaning machine can be done away with as I have explained with my machine.

One of the big problems of the flotation process in the mining or milling industry is the elimination of the concrete or canvas mat which becomes choked up with the lime that is used in the flotation process. With the screen in my machine this problem is overcome as the screen acts in place of the mats. The air coming up through the feed in the form of bubbles, upon striking the screen forms a froth.

It is thought that the construction, operation, utility, and advantages of this flotation machine will now be clearly understood by those skilled in this art without a more detailed description thereof.

The present embodiment of the machine has been disclosed merely by way of example since in actual practice it attains the features of advantage enumerated as desirable in the statement of the invention and the above description. Numerous changes in

the details of construction, and in the combination and arrangement of parts may be resorted to without departing from the spirit or scope of the invention as herein-
after claimed or sacrificing any of its advantages.

Having thus described the invention, what I claim as new is:—

1. A flotation machine of the class described including in combination, a casing having an entrance and an exit for feed, aerating means in the bottom of the casing, a screen supported above the aerating means, and a cover spaced above the casing and the screen to guide the froth formed by the screen over the sides of the casing, said screens provided with depending marginal flanges, the edges of said screen being spaced from the casing to allow sand which may pass therethrough to flow back into the feed.

2. A flotation machine of the class described including, in combination, a casing provided with an entrance and an exit for feed, a plurality of partitions in the upper portion of the casing dividing said casing into cells, an aerator in the casing below each cell, a screen in each cell, and a cover over each cell above the screen and above the side walls of the casing, said screens having their edges spaced from the interior of the cells.

3. A flotation machine of the class described including, in combination, a casing provided with an entrance and an exit for feed, a plurality of partitions in the upper portion of the casing dividing said casing into cells, an aerator in the casing below each cell, a screen in each cell, a cover over each cell above the screen and above the side walls of the casing, said screens having their edges spaced from the interior of the cells, and each screen including a body having marginal depending flanges.

In testimony whereof I affix my signature.

STEPHEN E. MEYER.