Nov. 22, 1949 L. S. OVERPECK 2,488,640

CONTINUOUS CLEANUP SLUICE BOX AND CONCENTRATOR

Filed Sept. 14, 1946

Fig. 1.

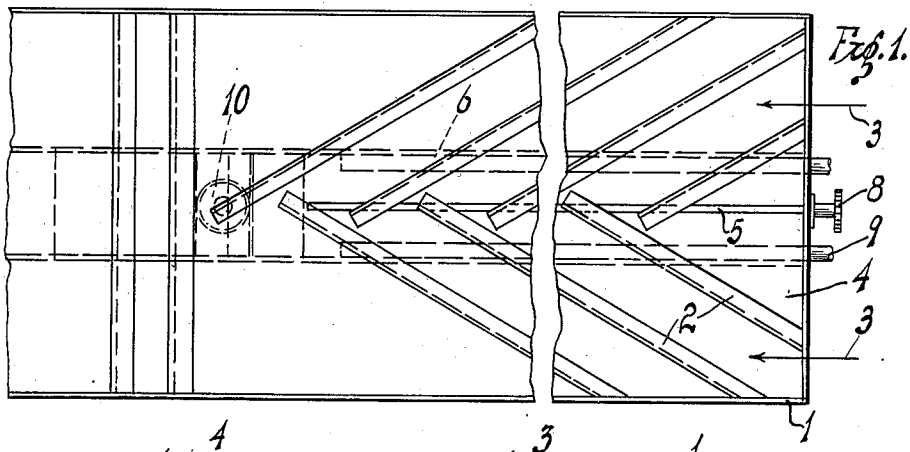


Fig. 2.

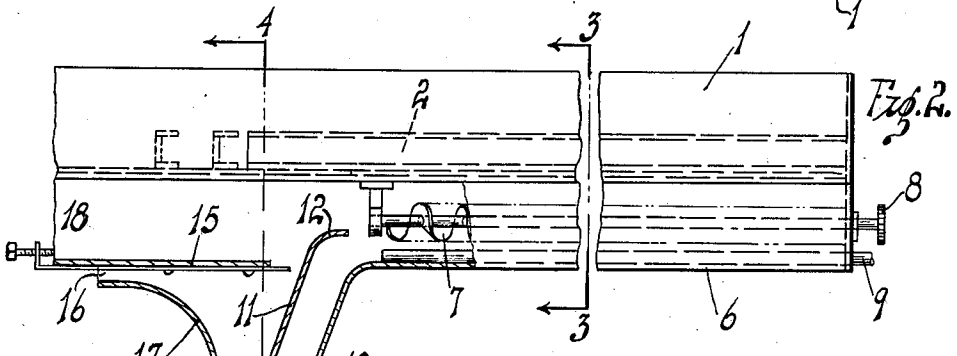


Fig. 4.

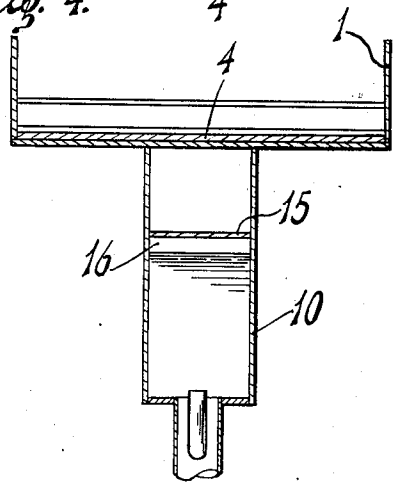
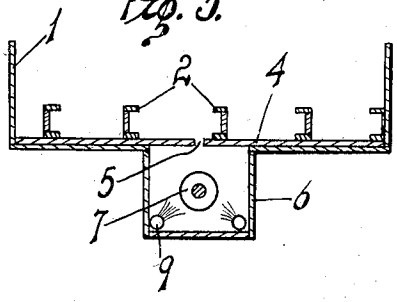


Fig. 3.



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Patented Nov. 22, 1949

2,488,640

UNITED STATES PATENT OFFICE

2,488,640

CONTINUOUS CLEANUP SLUICE BOX AND CONCENTRATOR

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Application September 14, 1946, Serial No. 697,088

6 Claims. (Cl. 209—458)

1

This invention relates to a novel continuous cleanup sluice box and concentrator, which is used primarily in placer mining to separate and impound precious and non-precious metals and minerals from gangue material. My device, however, can also be used on dredges and in gravel plants.

The prime object of my invention is to provide a novel device of the character stated, in which a means is provided of securing a continuous cleanup, that is, a continuous withdrawal of the concentrates or valuable metallic particles.

A further object is to provide a novel arrangement of the riffles in the box, whereby said riffles are kept free and deliver the valuable particles through a longitudinal slot, into a launder positioned below the sluice box, these valuable particles being then collected from the launder.

Still another object is to provide a novel separation means in the launder, adjacent the outlet end thereof, whereby a number of concentrates can be simultaneously withdrawn from the material progressing through the launder.

More particularly, I provide a means of separating the particles of high specific gravity, of medium specific and low specific gravity. It is understood that the specific gravities of the specific particles are only relative.

A feature of my invention is the elimination of the carrying off of values by clay balls and other means of "stealing" in the sluice box.

Another feature of my invention is to provide a sluice box in which both precious and non-precious metals can be recovered in one operation.

I also provide a means of immediately arranging the values and withdrawing them so that subsequent losses are eliminated.

Still another feature of my invention is the ability to recover bulky concentrates which do not have sufficient storage space in sluice boxes heretofore in use.

Other objects, advantages and features of invention may appear from the accompanying drawing, the subjoined detailed description and the appended claims.

In the drawing:

Figure 1 is a fragmentary top plan view of my sluice box and concentrator.

Figure 2 is a fragmentary, longitudinal sectional view of the same.

Figure 3 is a sectional view taken on the line 3—3 of Figure 2.

Figure 4 is a sectional view taken on line 4—4 of Figure 2.

2

Referring more particularly to the drawing, the numeral 1 indicates a sluice box of suitable width and length. At the head of the box, a suitable screen or grizzly (not shown), is provided to reject coarse material, boulders, etc. Within the box 1, I provide a series of spaced riffles 2. These riffles may be in various shapes such as plain, Z, I, or channel shaped as desired. The riffles are arranged substantially in pairs and are inclined in the direction of flow of the material, through the box.

The material flows in the direction shown by the arrow 3 in Figure 1. The riffles 2 are mounted on a false bottom 4 and a longitudinal slot 5 is provided in the false bottom 4, this slot extending substantially the length of the box 1, however, it terminates approximately at the sump at the lower end of the grizzly, which will be subsequently described.

The riffles 2 direct the concentrates towards the center of the sluice box and these values then drop through the slots 5 and into the launder 6. The launder is substantially a rectangular flume or trough, and may be formed as a part of the bottom of the sluice box 1. A spiral conveyor 7 is mounted in the launder and the conveyor is suitably driven from a source of power not shown, for example, through the sprocket 8.

A pair of water pipes 9 are provided in the launder and extend longitudinally therethrough, these pipes spraying water inwardly to assist in carrying the values along in the launder. Adjacent the outlet end of the launder, I provide a sump 10. This sump will have tapering sides substantially as shown and a transverse baffle 11, the upper end of the baffle is bent forwardly as shown at 12, and thus extends into the stream of material flowing through the launder. The heavier values, i. e., those of high specific gravity, will be moving along the bottom of the launder, and thus will be caught by the baffle and deflected downwardly into the sump.

A withdrawal pipe 13 is provided in the bottom of the sump 10, and the values of high specific gravity are collected in this pipe. A water jet 14 projects upwardly in the pipe 13 and water flowing through this pipe or jet, will agitate this material, and the values of lesser specific gravity will flow upwardly and will be deflected downwardly by a second transverse baffle 15. These values which I will term mediums specific gravity are then withdrawn at the throat 16. It is to be noted that the wall of the sump 10 is curved, as shown at 17, thus promoting the flow of values to the outlet throat 16.

The middlings or values of lesser specific gravity flow over the baffles 11—15, and are collected at the outlet 18. It will be evident from the foregoing that I continuously collect values of different specific gravities and accomplish this continuously while the sluice box is in operation. The slot 5 terminates approximately at the inlet of the sump 10, the reason for this being that it is desirable that all values shall drop into the launder before the sump is reached, otherwise, some of the values might pass over the baffle 11.

Having described my invention, I claim:

1. A continuous cleanup sluice box and concentrator comprising a floor, said floor having a longitudinal slot therein, a launder positioned below said slot and adapted to receive values dropping through said slot, a plurality of inclined riffles on the floor, said riffles being inclined towards said slot, and a sump at the outlet end of said launder, said sump receiving the values from the launder, and a spiral conveyor in said launder means to rotate said conveyor, whereby the values are assisted in their movement through the launder.

2. A continuous cleanup sluice box and concentrator comprising a floor, said floor having a longitudinal slot therein, a launder positioned below said slot and adapted to receive values dropping through said slot, a plurality of inclined riffles on the floor, said riffles being inclined towards said slot, and a sump at the outlet end of said launder, said sump receiving the values from the launder, an outlet pipe in the bottom of said sump, a transverse baffle in said sump, said baffle projecting upwardly into the stream of material flowing through the launder.

3. A continuous cleanup sluice box and concentrator comprising a floor, said floor having a longitudinal slot therein, a launder positioned below said slot and adapted to receive values dropping through said slot, a plurality of inclined riffles on the floor, said riffles being inclined towards said slot, and a sump at the outlet end of said launder, said sump receiving the values from the launder, an outlet pipe in the bottom of said sump, a transverse baffle in said sump, said baffle projecting upwardly into the stream of material flowing through the launder, a second horizontal transversely extending baffle in the sump, said sump having an outlet throat below said second baffle, and a main outlet above said second baffle.

4. A continuous cleanup sluice box and concentrator comprising a floor, said floor having a longitudinal slot therein, a launder positioned below said slot and adapted to receive values dropping through said slot, a plurality of inclined riffles on the floor, said riffles being inclined towards said slot, and a sump at the outlet end of said launder, said sump receiving the values from the launder, an outlet pipe in the bottom of said sump, a transverse baffle in said sump, said baffle projecting upwardly into the stream of material flowing through the launder, and a water jet in the sump, said water jet being directed upwardly.

5. A continuous cleanup sluice box and concentrator comprising a floor, said floor having a longitudinal slot therein, a launder positioned below said slot and adapted to receive values dropping through said slot, a plurality of inclined riffles on the floor, said riffles being inclined towards said slot, and a sump at the outlet end of said launder, said sump receiving the values from the launder, an outlet pipe in the bottom of said sump, a transverse baffle in said sump, said baffle projecting upwardly into the stream of material flowing through the launder, a second horizontal transversely extending baffle in the sump, said sump having an outlet throat below said second baffle, and a main outlet above said second baffle, and a water jet in said sump, said water jet being directed upwardly.

6. A continuous cleanup sluice box and concentrator comprising a floor, said floor having a longitudinal slot therein, a launder positioned below said slot and adapted to receive values dropping through said slot, a plurality of inclined riffles on the floor, said riffles being inclined toward said slot, a sump positioned at the outward end of said launder, said sump receiving the values from the launder, an outlet pipe in the bottom of said sump, a transverse baffle mounted in said sump and spaced from the wall of said sump whereby a passage is provided between the baffle and the wall of the sump, said baffle projecting upwardly to the stream of material flowing through the launder.

LEM S. OVERPECK.

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The following references are of record in the file of this patent:

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