(No Model.)

A. H. RAPP.

CONCENTRATOR.

No. 520,939. Patented June 5, 1894.

Fig. 1.

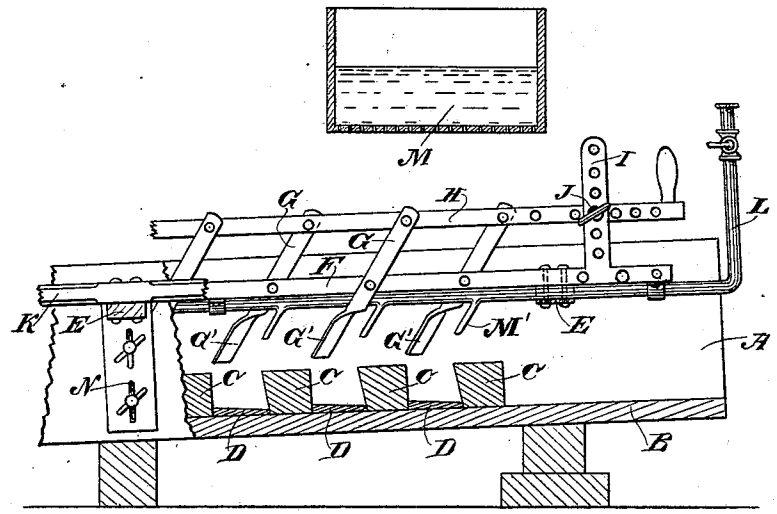


Fig. 3.

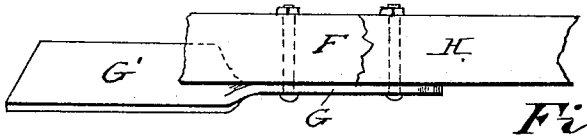
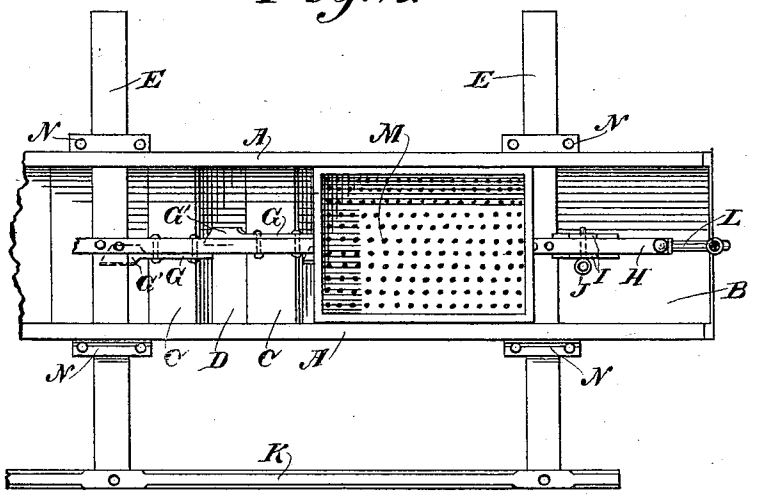


Fig. 2.



Witnesses,
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ALMIRE H. RAPP, OF SAN FRANCISCO, CALIFORNIA.

CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 520,939, dated June 5, 1894.

Application filed January 20, 1894. Serial No. 497,542. (No model.) Patented in Belgium May 19, 1891, No. 29,612.

To all whom it may concern:

Be it known that I, ALMIRE H. RAPP, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Concentrators, (for which I have obtained Letters Patent in Belgium, dated May 19, 1891, No. 29,612, Vol. 2, Genl. Reg.;) and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus which is designed to facilitate the separation of fine particles of gold, metals, and other heavy substances which are contained in sand, earth, tailings, &c.

It consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section of my apparatus. Fig. 2 is a plan view. Fig. 3 is an enlarged detail showing one of the blades G secured to the bars F and H.

The object of my invention is to provide an improved apparatus for the separation of any valuable or heavy material from the lighter sands, earth and tailings with which it is mixed. These substances are very difficult to separate from the light material, and it is the object of my invention to assist in the separation and to overcome these difficulties.

A A are the sides and B the bottom of a sluice or channel through which the tailings are allowed to pass with a sufficient quantity of water to keep the mass thin enough for the purposes of separation. The sluice is set at any desired angle to provide a sufficiently rapid flow of the material. Across this sluice I fix the bars or riffles C so as to leave intervals or spaces between them. These riffles may be of any suitable or desired form. In the present case I have shown them in the form of bars, all the sides of which are at right angles with each other, with the exception of the side which is presented toward the lower end of the sluice, and this side is beveled or cut away, so that in transverse section the bars are in the form of a trapezoid, and this inclined side forms an undercut or eddy upon the upper side of each of the transverse spaces or pockets between the bars. Upon the bottom of each of these pockets and between the transverse bars, are fixed the wedge-shaped plates D. These are made of various forms, either so as to overcome the general inclination of the sluice, and make a level bottom for each of the spaces, or the angle may be made sufficiently great to cause a slight inclination in the opposite direction from that of the sluice according to the work to be done. Across the upper part of the sluice are fixed the transverse sliding bars E, and to these are secured the longitudinal bars F having pivoted to them the shanks G of the agitating blades G′, these blades being turned with relation to the shank so as to present flat surfaces toward the moving current. The upper ends of the shanks G are connected by a bar H and the blades G are set at any desired angle or position with relation to the flowing current by means of a fixed standard I and a pin or latch J which engages holes or notches in the connecting arm or bar H.

K is a connecting bar uniting the transverse sliding bars E, and either by hand or by means of any mechanical device, these bars are caused to reciprocate transversely to the sluice, carrying with them the bars F and the blades G′. If the sluice be narrow, a single set of these blades will be sufficient. If it be wide, two or more of them may be employed, so that the width of the sluice is divided into several channels between these blades, and the transverse reciprocation of the blades agitates and checks alternately the whole of the current which is passing down through the sluice. This action serves to divert the flowing current and to throw the material carried by it downwardly into the pockets or chambers between the transverse riffles, and in these chambers a peculiar eddying action takes place, the tendency of which is to throw the heavier material against the bottom and the upper side of the pocket where it gradually accumulates, while the lighter material, circling round, finally rises and passes over the next adjacent riffle, and the same action takes places in the next pocket and so on until the whole of the heavier portions have been separated from those which are lighter, and the latter flow off to the waste or discharge. It will be manifest that this operation may be carried on either with or without the use of mercury in these

pockets. If there is much free metal and light scale gold or mercury which it is desired to save, the pockets may be charged with mercury with which the free metal will amalgamate, but in the case of sulphurets or other heavy valuable substances the concentration may take place without the use of mercury.

L is a water pipe receiving water from any suitable source of supply, and having jet tubes M′ extending down in line with and behind the agitating or arresting plates G′ and these jets of water being directed upon the current flowing below, assist in changing its direction and throwing it into the parts between the sluices previously described. In addition to these I have shown a reservoir or tank M situated above the sluice at convenient invervals, this reservoir having the bottoms perforated with small holes so that water introduced into the reservoir will fall upon the current of passing material in the form of a fine rain, and this greatly aids in the precipitation of the heavy material which it is desired to concentrate.

The depth to which the blades dip into the current is regulated by means of slotted standards N upon which the frame carrying the movable blades is supported, and latches or locking screws which serve to clamp the parts when the proper elevation is obtained. By means of these devices the position of the blades may be changed to accommodate any class of work which is to be done with the apparatus.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a concentrator, a sluice having the transversely movable agitating plates provided with lower portions which dip into the passing current, and are turned at an angle to present flat surfaces to obstruct the flow of the current, and means by which said plates are reciprocated in horizontal planes transversely of the sluice.

2. A concentrator comprising a conveying sluice or channel, arresting and agitating plates each pivotally secured and adapted to dip into the current, means for reciprocating said plates in horizontal planes transversely of the sluice, and means for varying the angle or position of the plates with relation to the flowing current.

3. In a concentrating sluice, the transversely movable agitating plates each pivotally secured, and a means for varying their angle in the direction of the flow of the current.

4. In a concentrator, a sluice having the transverse riffles along its bottom, said riffles having the sides toward the lower end of the sluice formed with undercuts, intermediate pockets between the riffles, transversely movable plates having their ends obstructing the flow of the current and adapted to reciprocate immediately over the pockets, and means for reciprocating the plates.

5. The concentrating sluice having transverse riffles, the blades or plates pivoted to arms above the sluice and adapted to be reciprocated transversely to the line of travel of the current within the sluice, a means for adjusting the angle of said plates or lifting them entirely out of the current, consisting of a bar connecting the upper ends of the shanks or handles of said plates, a standard and a latching device by which said arm is held in any desired position, substantially as herein described.

In witness whereof I have hereunto set my hand.

ALMIRE H. RAPP.

Witnesses:
GEO. H. STRONG,
S. H. NOURSE.