



(No Model.)

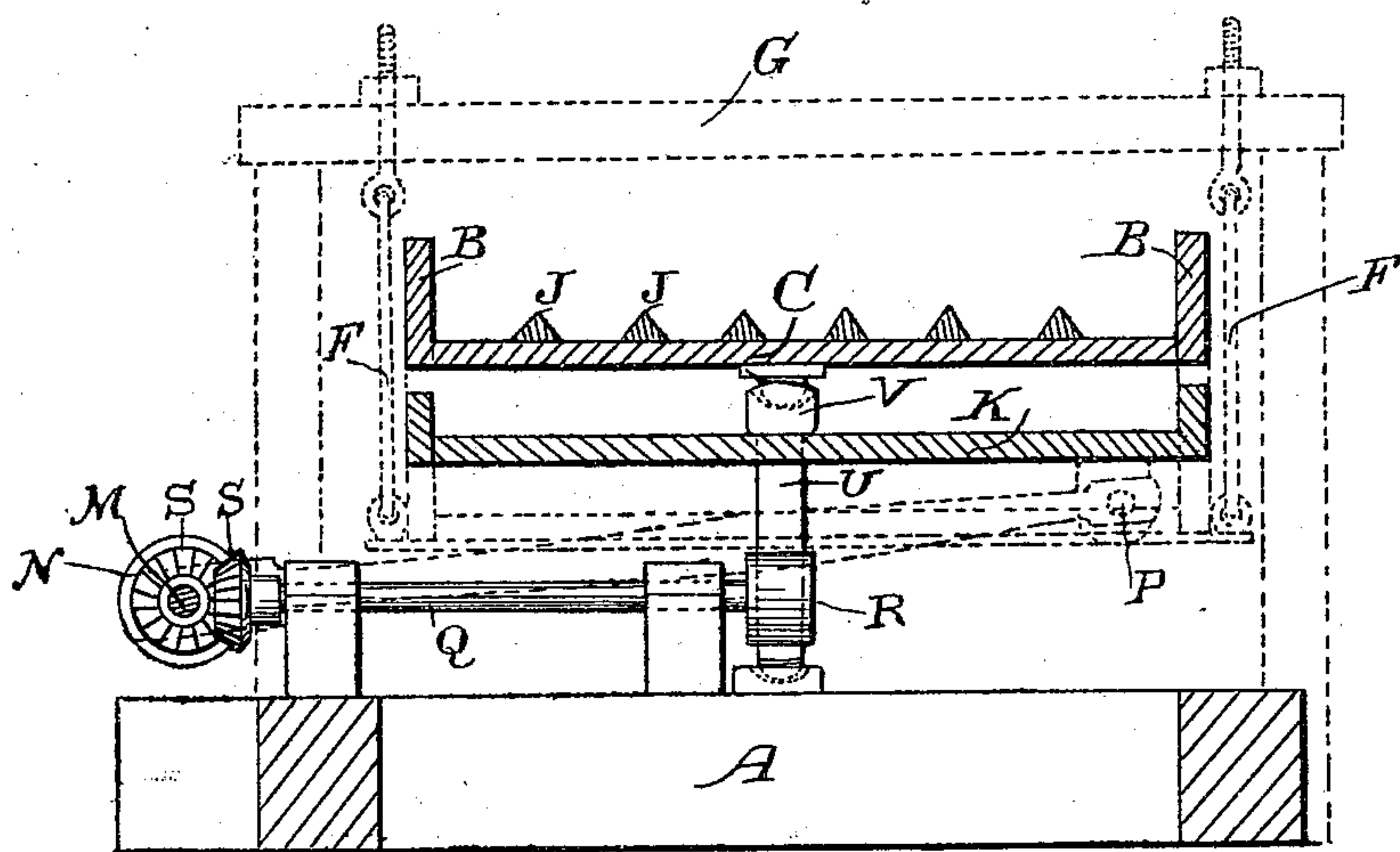
2 Sheets—Sheet 2.

J. JACOBS.  
CONCENTRATOR.

No. 547,640.

Patented Oct. 8, 1895.

Fig. 3.



Witnesses,

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# UNITED STATES PATENT OFFICE.

JEHU JACOBS, OF HENLEY, CALIFORNIA.

## CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 547,640, dated October 8, 1895.

Application filed February 1, 1895. Serial No. 537,002. (No model.)

*To all whom it may concern:*

Be it known that I, JEHU JACOBS, a citizen of the United States, residing at Henley, county of Siskiyou, State of California, have invented an Improvement in Concentrators; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an apparatus for separating valuable precious and heavy metals and sulphurets from worthless sand and light tailings.

It consists of the constructions and combinations of devices hereinafter described and claimed.

Figure 1 is a longitudinal vertical section taken through the apparatus. Fig. 2 is a plan view with part of the tables broken away to show the mechanism beneath. Fig. 3 is a transverse section on the dotted line  $xx$  of Figs. 1 and 2. Fig. 4 is a detached view of a slotted crank N. Fig. 5 is a modification of Fig. 4.

A is a frame or bed upon which the various parts of the apparatus are supported and carried. The surfaces, over which the pulp or sand to be acted on flows, are flat and are inclined with relation to each other, as will be hereinafter described.

B B are side rails or frames to which the tables C, D, and E are attached. These side frames are suspended at one end by links F from a suitable supporting-bar G with adjustable bolts, having eyes or hooks for their suspension and nuts by which they are elevated or depressed to regulate the incline of the table.

The upper end of the apparatus rests upon a head-block H, upon which it is slidable both longitudinally and transversely.

I is a bumper fixed upon the lower part of the table and adapted to strike against the head-block H when the table is released from the action of the cam by which it is moved away from the head-block, and this bumping motion tends to separate the sulphurets and heavier material from the lighter sand and cause it to move up the inclined surfaces of the tables to be discharged at the upper end, while the water which is delivered upon the table washes the sand and lighter material down to the discharge end.

The table C, upon which the material is first

received, is slightly inclined, as shown, and is divided by ribs J into a series of channels over which the material moves gradually until it reaches the table D. This table D is approximately horizontal while the apparatus is in the proper position and the other tables suitably inclined for the work. It has fixed upon it, extending transversely across it, strips of copper or other material overlapping so that the edges project upwardly and form a little check to prevent the sulphurets passing over the edge and to keep a little water on the top of the table. From the edge of the table D the material falls upon the inclined table E and the sand flows down so as to discharge over the lower end of this table. Connected with the upper end of this table and beneath the tables C and D is another inclined table K, the lower edge of which meets and forms a joint with the table E. The rear edge, extending up beneath the table C, is connected with the frame B by means of adjusting-screws L, by which I am enabled to regulate its inclination. The edge which meets the edge of the table E is connected therewith by plates E', which allow it to move about these hinges and enables me to raise or lower the rear edge of the table K to give this table the proper inclination, and any sulphurets or heavy valuable material which may have passed over the edge of the table D and fallen upon the table E will be caused to move up the incline of the table K by the concussion caused by the swinging of the table longitudinally and its abrupt striking against the stop. This acts in the same manner as with the table C above to discharge any heavy valuable material over the upper edge of the plate or table.

In order to produce all of the necessary movements in a single operation, I have shown a driving-shaft M, journaled parallel with the table at one side and a little below. Power is communicated to this shaft by any usual or suitable mechanism, so as to rotate it. Upon the ends of the shaft are slotted cranks N, (see Fig. 4,) the crank-pins of which may be adjustable in the slots, or the cranks themselves may be adjustable upon the ends of the shaft, (see Fig. 5,) the object being in either case to lengthen or shorten the stroke.

O are connecting-rods having one end adapted to fit the crank-pins, and the other ends



are connected with pins P, fixed upon the lower side of the table, near its opposite ends, so that as the crank-shaft rotates the table will be oscillated from side to side.

5 Q is a shaft extending transversely beneath the upper end of the table, suitably journaled in boxes upon the frame and having fixed upon the end, nearly beneath the center of the table, a cam R. This shaft is  
10 driven from the shaft M by means of bevel-gears S, fixed upon the two shafts M and Q, and meshing with each other.

The cam R may be double or single, and its curved face is grooved or hollowed out, as  
15 shown.

T is a lever-arm having a lug T' projecting from the bottom, and this lug fits in a socket made in the end of the frame beneath the upper end of the table, so that the end of the  
20 lever T projecting beneath the cam is acted upon by the cam and the lever is caused to tilt at each stroke of the cam moving about its fulcrum-point T'. The opposite end of the lever T projects to some distance outward and has  
25 fixed upon it a weight which is adjustable so as to bring the lever down with any degree of force after it has been moved by the cam.

U is an inclined standard projecting upwardly from the top of the lever T, having a  
30 socket made in the upper end into which fits a projection or spur V from the upper end of the table C.

It will be understood that the pivotal points T' and V are not necessarily made in this  
35 particular manner, as they might be fixed pivots; but for convenience, and to allow sufficient freedom of motion without too great a wear of parts, I have shown this construction.

The operation will now be as follows: As the  
40 shaft M is rotated, the pitmen or connecting-rods O will produce a constant side-shaking motion of the table, the action of the cam R upon the shaft Q and upon the lever T tilting it about its fulcrum-point, thus moving the  
45 arm U forward and moving the table at the same time. The relation of the arms T and U is such that when the table swings longitudinally it also receives a lifting or tossing motion of the upper end, which facilitates the  
50 separation and movement of the material upon it. The loose pivotal connections allow of this forward movement and at the same time allow the side movements of the table, as these connections form a sort of universal  
55 joint. As soon as the point of the cam releases the end of the lever T, the weight upon the outer end of the lever, as well as the tendency of the table itself to swing back upon its suspending-rods, brings it suddenly back  
60 to its original position, and the bumper I, striking against the head-block H, produces a shock which acts, as before described, to move the heavier materials up the inclined surfaces. The shaking motions keep the mate-  
65 rial upon the tables constantly agitated and

loosened up, with a sufficient supply of water to thin them down, so that the heavier material will always settle to the bottom, while the lighter flows off.

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

1. A concentrator consisting of inclined suspended tables over which the material to be separated is caused to flow, a longitudinal  
75 crank shaft and a transverse shaft geared one to another and connections from the longitudinal shaft to the table, a cam on a transverse shaft, a fulcrumed lever having an arm connected with the table and a second arm in the  
80 path of said cam whereby the tables are caused to oscillate sidewise and endwise, and are given a slight lifting motion.

2. A concentrator consisting of a suspended table, a longitudinal shaft and connections  
85 therefrom to the table, a transverse shaft, gearing interposed between said shafts, a fulcrumed lever having an arm connected with the table and a second arm adapted to be actuated by the rotation of the transverse shaft  
90 whereby a combined longitudinal and lifting movement is given the table, and a means whereby the table is abruptly stopped after it has been moved forward.

3. In a concentrator, inclined suspended  
95 and connected tables, mechanism consisting of the longitudinal shaft with cranks and connecting rods whereby a side shaking motion of the table is produced, a transverse shaft, an intermediate mechanism whereby it  
100 is driven from the longitudinal shaft, a cam or tappet fixed upon said shaft, a lever arm fulcrumed upon the frame having one end adapted to be engaged by the tappet and an arm extending upwardly and connected with  
105 the table whereby a combined longitudinal and lifting movement is given the table.

4. A concentrator consisting of an inclined receiving table with sub-dividing channels, an approximately level table upon which the  
110 material is delivered from the first table and overlapping plates at the discharge end of the second table, a third inclined table situated below the level of the second table upon which the material from the upper table is  
115 delivered and over which the waste material is discharged, an inclined adjustable table hinged to the rear edge of said lower table having screws by which its angle of inclination may be adjusted and a mechanism where-  
120 by a longitudinal and transverse oscillating motion is produced, a head-block and a bumper by which the return of the table is abruptly stopped after it has been moved forward.

In witness whereof I have hereunto set my  
125 hand.

JEHU JACOBS.

Witnesses:

THOMAS JONES,

JACOB A. STROBECK.