

(No Model.)

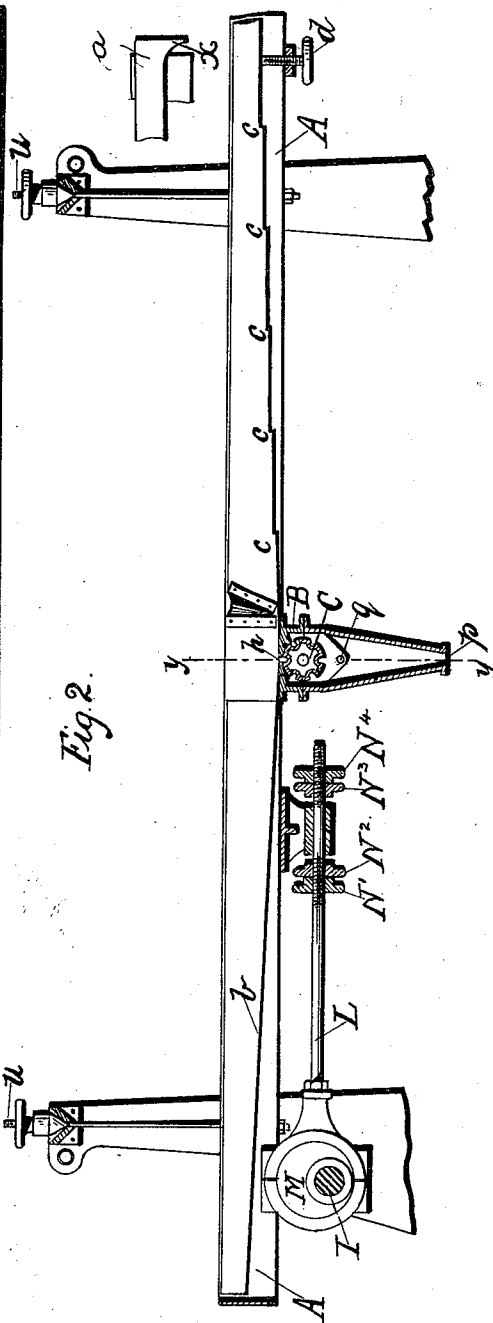
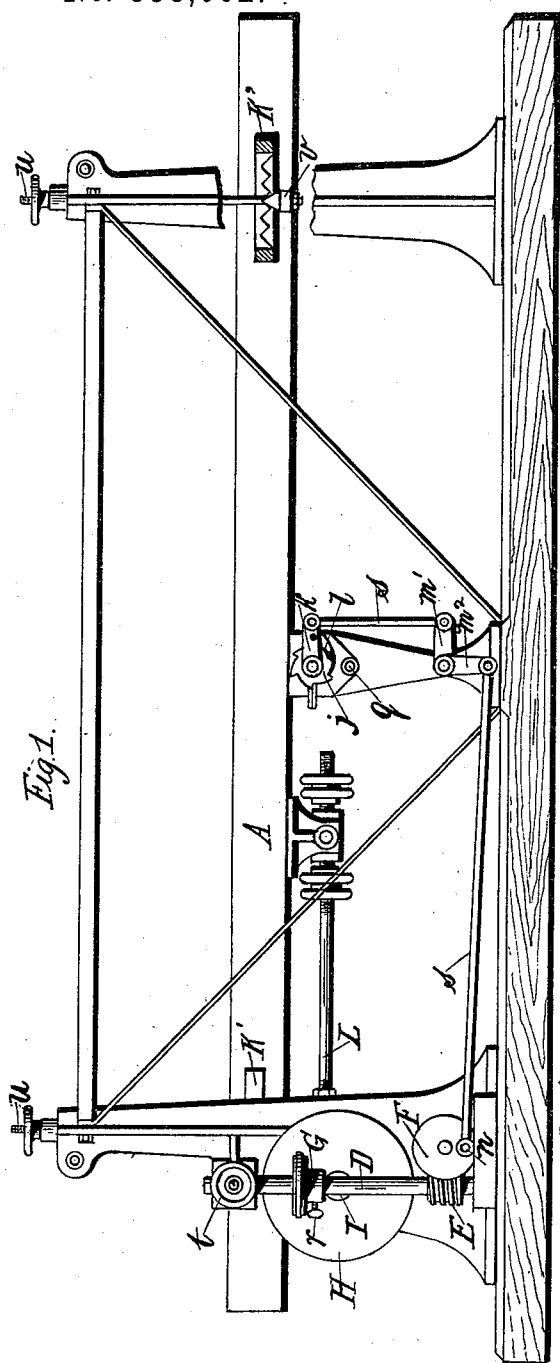
3 Sheets—Sheet 1.

J. J. CRANMER.

ORE CONCENTRATOR.

No. 533,002.

Patented Jan. 22, 1895.



Witnesses

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F. L. Minkleton

By

Attorney

Inventor.

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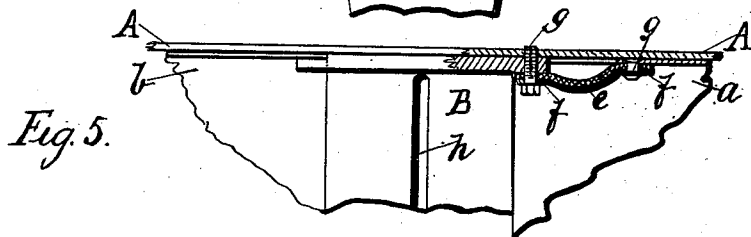
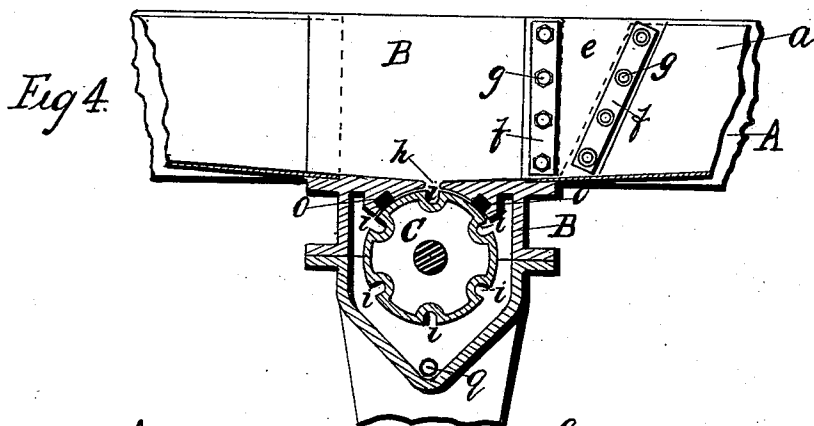
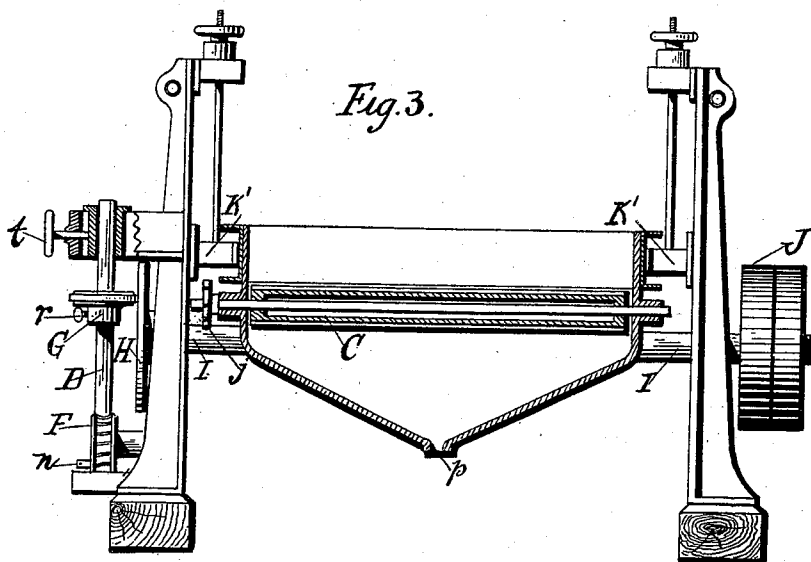
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J. J. CRANMER.
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3 Sheets—Sheet 2.

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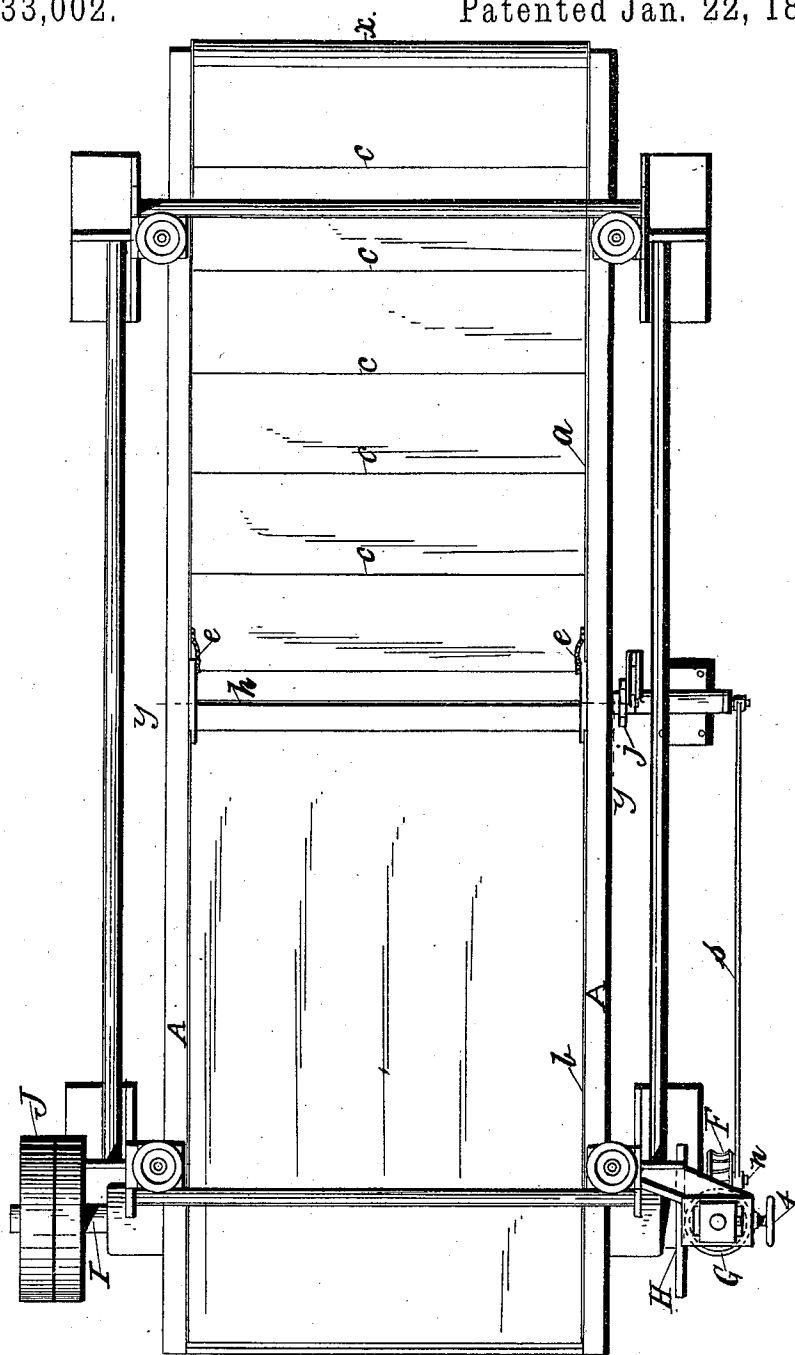
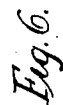
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3 Sheets—Sheet 3.

J. J. CRANMER.
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No. 533,002.

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UNITED STATES PATENT OFFICE.

JOHN J. CRANMER, OF CRIPPLE CREEK, COLORADO.

ORE-CONCENTRATOR.

SPECIFICATION forming part of Letters Patent No. 533,002, dated January 22, 1895.

Application filed March 29, 1894. Serial No. 505,598. (No model.)

To all whom it may concern:

Be it known that I, JOHN J. CRANMER, a citizen of the United States of America, residing at Cripple Creek, in the county of El Paso and State of Colorado, have invented certain new and useful Improvements in Ore-Concentrators, of which the following is a specification.

My invention is an improvement in ore concentrators of that class in which the concentrates are obtained by passing the gangue over the table, which is subjected to agitation.

My invention consists in certain novel features of construction, which I have described hereinafter in connection with features that are old.

The apparatus is shown in the accompanying drawings, in which—

Figure 1 represents a side elevation of the concentrating table; Fig. 2, a sectional elevation. Fig. 3 is a sectional end elevation along the line *y y* in Figs. 2 and 6. Fig. 4 is a section of the discharge spout, with its grooved discharging roller and also shows the method of joining the movable half of the table's bed with the sides of the main frame. Fig. 5 is a part plan of Fig. 4, and Fig. 6 is a plan of the machine.

Referring to the drawings, it will be seen that the table of my machine, consists of an outer or main frame A, within which is a table bed, consisting of two parts or sections, *a*, *b*, which parts have sides of their own fitting closely within the sides of the main frame A. The two halves or parts of this bed are arranged synclinally to each other as I have shown more clearly in Fig. 2. The rear or right hand half of the table is slightly stepped, the steps conforming closely with the slope of the bed. They are shown at *c*. They can be formed straight or in any other manner as described.

The rear or right-hand half of the table bed has a vertical adjustment at its rear end by means of a hand wheel and screw *d*, and at the point where the movable part joins the fixed part a tight and flexible joint is formed by means of a piece of rubber or leather, which is riveted to the beveled end of the side of the table bed *a*, and to the casting B, which extends up for that purpose and also

to secure the table beds and the discharge spout to the main frame A. The discharge spout is formed in part by the casting B, the lower part thereof being formed of a separate casting attached to the part B, shown clearly in Fig. 2. A strip of iron *f*, *f*, is placed between the heads of the rails or bolts *g g*, and the rubber *e*. By this means, a joint is secured, which accommodates itself to any vertical movement of the table bed *b*, at its farther end.

The sides of the main frame A are solid, so that percussion affects equally both sides of the machine.

To the center of the machine and at the synclinal axis of the two beds of my machine and in the casting of the discharge spout B, to which they are riveted, is an opening *h*, Figs. 2, 4, 5, and 6, running the entire width of the beds, beneath which is fitted a shaft carrying a grooved cylinder C, the grooves *i*, *i*, *i*, of which run the entire length of the cylinder. On the shaft of this grooved cylinder is fitted a ratchet wheel, Figs. 1 and 3 the teeth on which correspond in number and position with the grooves of the cylinder. On this same shaft is a lever *k*, (Fig. 1) and a pawl *l*, which engages with the ratchet wheel and by the movement of the arrangement of levers *m'* and *m''* and crank-pin *u*, gives an intermittent rotary motion to the said grooved cylinder.

At *o*, *o*, (Fig. 4) are two grooves in the casting B, which are filled with soft rubber, which pressing upon the revolving cylinder, acts as packing over its entire length and prevents leakage of water from around the cylinder. The function of the grooved cylinder is to cause the discharge of the concentrates, as they collect at the synclinal of the two beds, into the hopper beneath; and as they gather at the lower point, they will settle into the opening *h*, and fill the groove *i*. The groove *i*, with its contents, travels around, passing the packing *o*, and on till the contents are dropped in the hopper B. By this movement another groove is presented to the opening *h*, and is filled and eventually discharged in the same manner as the previous one, and this operation will be repeated so long as the machine is in action and the material supplied.

At *p*, the discharge hopper is provided with

a gate or valve and at q , is an inlet hole, for water, which is for the purpose of assisting in the final discharge of the concentrates, through the gate at p , in a thick slime, and as it fills up the hopper around and about the cylinder C, it also assists in the delivery of the concentrates from the grooves i, i, i , by washing them clean as they travel round.

The mechanism which rotates the cylinder C, will be seen more clearly in Fig. 1. A vertical shaft D, is fitted with a worm E, engaging with a worm wheel F. On the same shaft D, is also a friction wheel G in contact with a revolving disk H, which receives its motion from the main shaft I, through the driving pulleys J. This friction wheel G, is adjustable along the length of the shaft D, being fitted with a feather key, and a set screw r . By the movement of the wheel G, up or down on shaft D, a faster or slower motion can be given to the worm wheel F, which actuating the connecting rods s', s'' , through the crank-pin n , and the levers m', m'' and k , and the ratchet wheel j , and pawl l , produces the intermittent rotary motion in the cylinder C, before spoken of.

The arrangement for pressing the friction wheel G, in contact with the disk H, is shown in Fig. 3, and consists of a square frame or box to receive the bearing of the shaft D, and the back wheel t , and screw, force or release the said friction wheel to or from the driving disk at pleasure.

The suspending of the table is accomplished in the customary manner, but provision is made for elevating or depressing either or both sets of hangers by threading their upper ends u, u , Figs. 1 and 2. At their lower extremities the suspending rods are provided with pivotal points or knife edges v , Fig. 1, as on their upper ends and on the sides of the main frame A, are castings $K' K''$, Figs. 1 and 3, with a series of notches in which this point works, and by placing the pivotal point v , on one or another of these notches, the table can be caused to swing more to the right hand or to the left, as desired.

Agitation is effected by and through a rod L, working from an eccentric M, fitted to the main shaft T. This agitation rod is beneath the table bed of the machine, and the force of the concussion is at the command of the operator, by shifting the pivotal points v , in the various notches of the casting K' or K'' , as well as the resultant lost motion by means of the adjustment of the stops $N' N'' N''' N''''$.

The operation of the machine is as follows: The pulp or stock is led from any suitable pulverizing machine to the left-hand end b , of the table bed, and the machine being in agitation, it is gradually worked forward down the incline to the center of the machine, where it lies in a bed, the heavier particles or concentrates, settling at the lowest

point around and about the opening h . The lighter portion or gangue, moves over the tail, assisted by such an amount of water as is necessary to effect a proper concentration, and the motion of the machine, which is so adjusted by the stops $N' N'' N'''$ and N'''' , and the "hang" of the machine by the pivotal points v , as to give a forward thrust to the material. In its movement upon the incline, a , Fig. 2, it encounters on its course, the steps c, c, c , which, retarding its movement, tends to intercept and throw back to the center again, any concentrates that may have passed beyond. Hence the screw d , which is provided so that an exact adjustment of the slope of this half s , of the table's bed can be secured suitably to the result desired and the character of the ore under treatment, without affecting the angle consigned to the other half b . The gangue and water are finally delivered at the rounded end x , Fig. 2, and the concentrates at the gate at p , by means of the cylinder C, the action of which has been previously explained.

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

1. In an ore concentrator, in combination with the main frame of the synclinal bed sections supported thereby and a flexible connection between said sections and means for adjusting one of said sections in relation to the other, substantially as described.

2. In combination with the main frame of the synclinal bed sections having a flexible connection, the stepped rear section, said steps beginning at the flexible connection and gradually rising toward the end of said section forming shoulders for the concentrates to strike against and means for adjusting the stepped section, substantially as described.

3. In combination with the main frame and the synclinal bed sections of a plate interposed between said sections and secured to the main frame, said plate forming the upper part of a hopper and having a slot for the discharge of the ore, substantially as described.

4. In combination with the main frame, the synclinal bed section and the plate B interposed between said section and securing them to the main frame, of the hopper secured to said plate, the grooved roller journaled in the hopper, packings in the plate B to bear on said roller and an inlet in the hopper for water below said roller, substantially as described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN J. CRANMER.

Witnesses:

B. G. MONTGOMERY,
G. F. WINKLER.