

A. DIEU.
ORE WASHER AND CONCENTRATOR.
APPLICATION FILED NOV. 12, 1907.

933,633.

Patented Sept. 7, 1909.

3 SHEETS—SHEET 1.

Fig. 3.

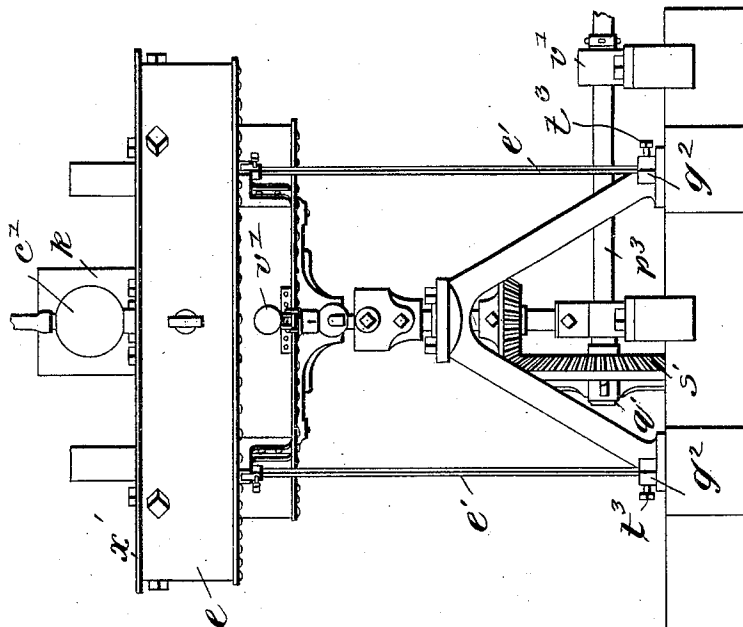
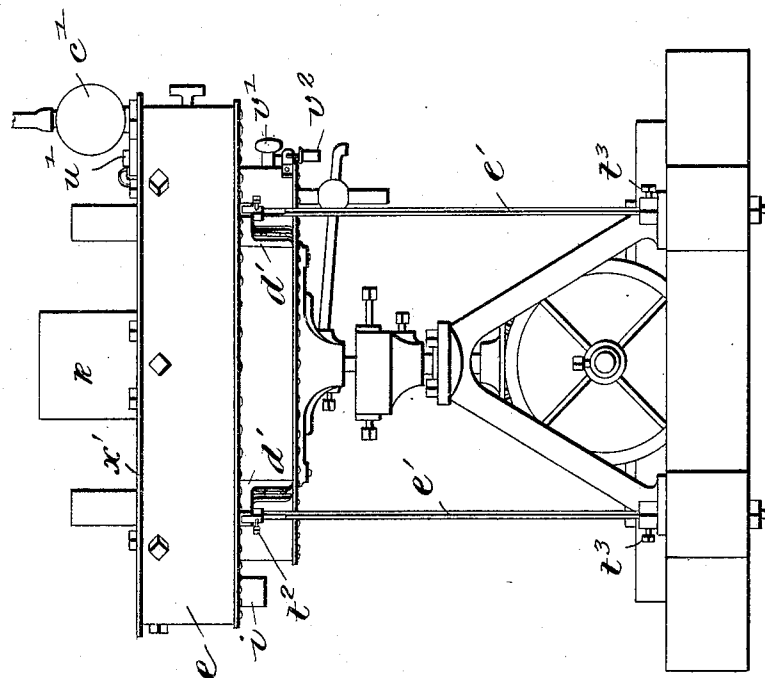


Fig. 1.



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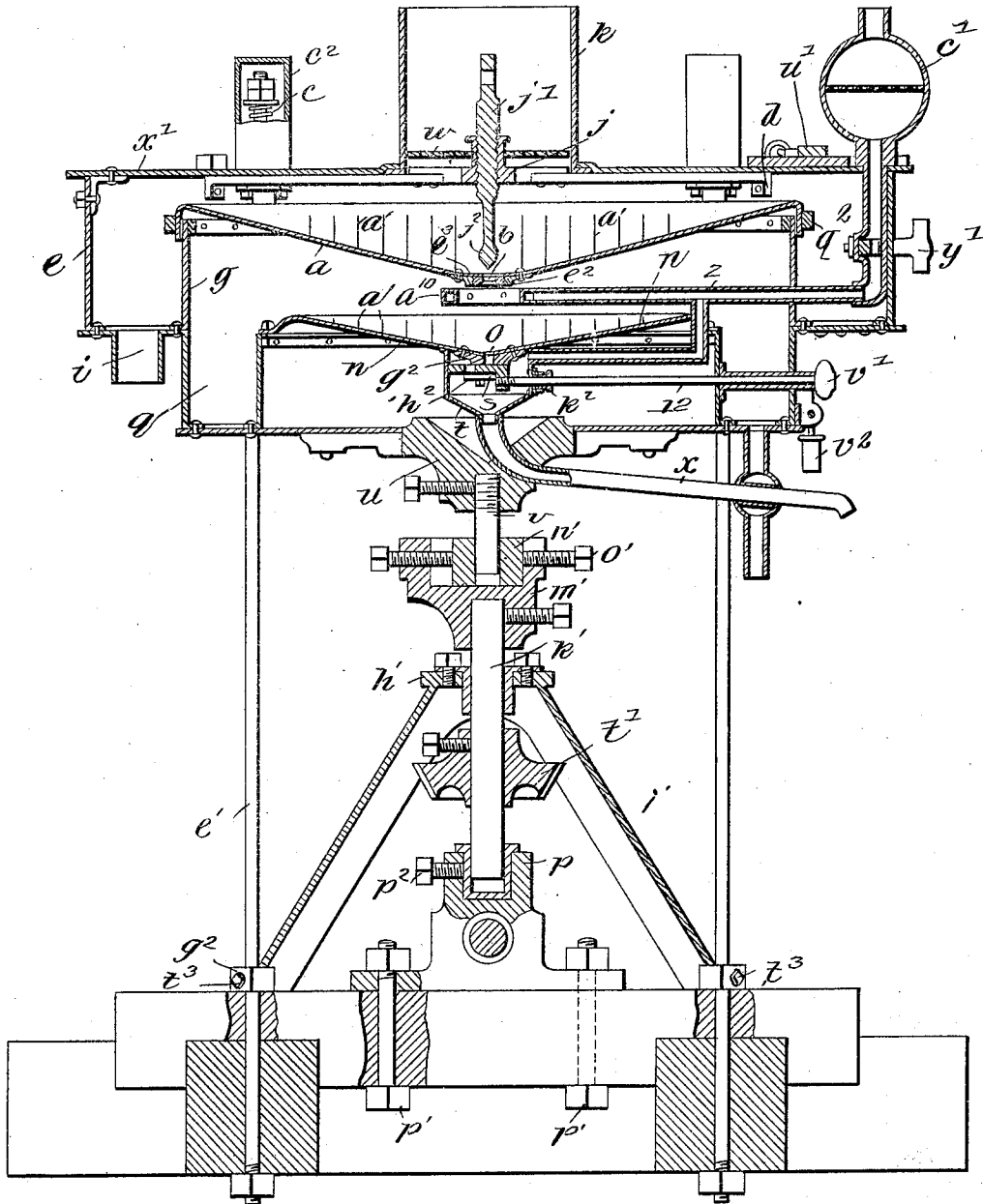
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3 SHEETS—SHEET 2.

Fig 2.



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3 SHEETS—SHEET 3.

Fig. 4.

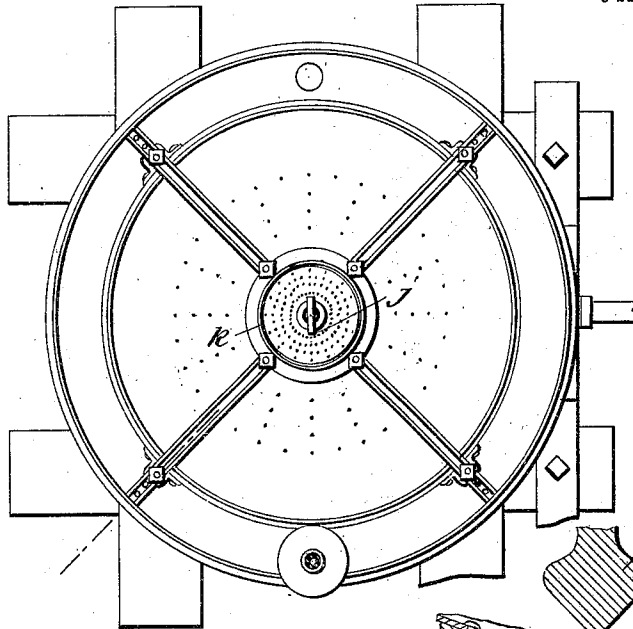


Fig. 5.

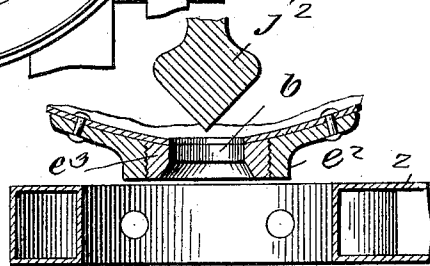


Fig. 6.

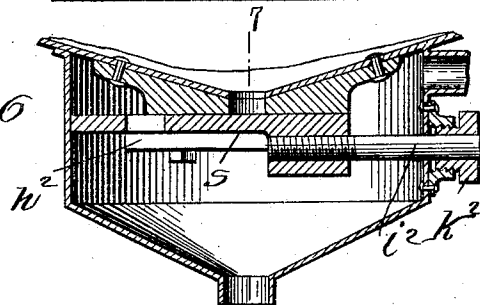


Fig. 7.

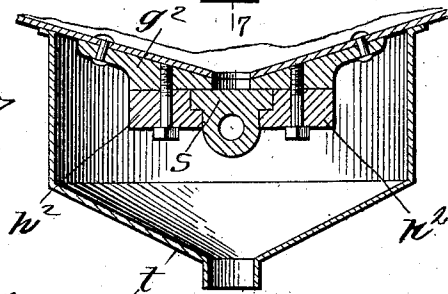


Fig. 8.

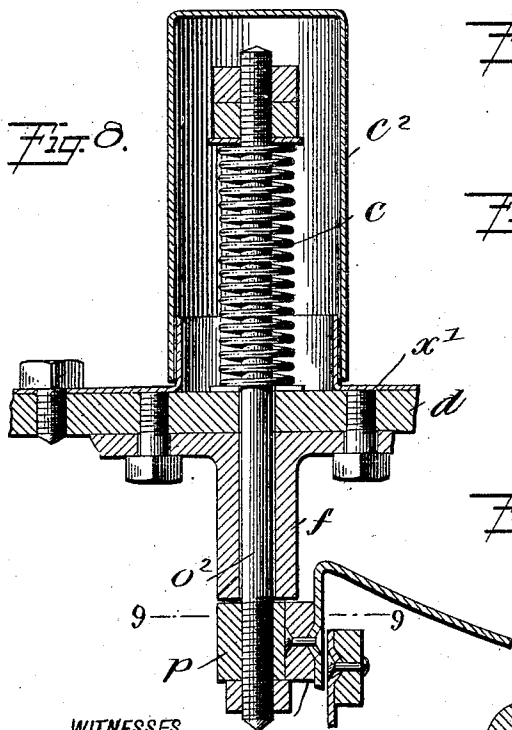
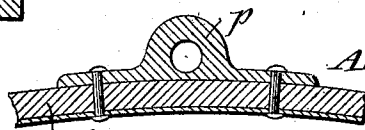


Fig. 9.



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UNITED STATES PATENT OFFICE.

ALEJANDRO DIEU, OF MEDELLIN, COLOMBIA.

ORE WASHER AND CONCENTRATOR.

933,633.

Specification of Letters Patent.

Patented Sept. 7, 1909.

Application filed November 12, 1907. Serial No. 401,799.

To all whom it may concern:

Be it known that I, ALEJANDRO DIEU, a citizen of the Republic of France, residing now at Medellin, Department of Antioquia, Republic of Colombia, in South America, have invented certain new and useful Improvements in Ore Washers and Concentrators, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in which similar letters indicate corresponding parts in all the figures.

My invention is an improvement in ore washers and concentrators, and consists in certain novel constructions and combinations of parts hereinafter described and claimed.

Referring to the drawings forming a part hereof—Figure 1 is a side view of the improvement, Fig. 2 is a central vertical section, Fig. 3 is a front view, Fig. 4 is a plan view with the cover removed, Fig. 5 is an enlarged detail of the orifice of the upper trough, Fig. 6 is a similar view of the lower trough, Fig. 7 is a section on the line 7—7 of Fig. 6, Fig. 8 is a vertical section through one of the springs supporting the upper trough, and Fig. 9 is a section on the line 9—9 of Fig. 8.

A conical trough batea or basin *a* provided with a central orifice *b*, and studded with points or pins *a'* lower than the level of the edges of the trough is supported by means of four springs *c*, from a suitable bracket *d*, secured to the upper edges of the cylindrical casing *e* inclosing the trough.

The trough *a* is provided at its periphery with a downwardly extending flange which is riveted to a ring *q*², and to the ring are secured at suitable intervals bearings *p*², through which pass bolts *o*², the said bolts extending upwardly through a sleeve *f* secured to the bracket *d* by means of screws as shown, and through the said bracket, the upper end of the bolt being provided with nuts, between which and the bracket is arranged a spring *c*. Each of the springs is inclosed by a casing *c*², the cover *x'* of the device having openings corresponding to the covers and the edges of the openings being turned up to form flanges for engaging the inner surface of the said covers. The cover *x'* is fastened in place by screws, and by a pad-lock *u'* as shown in Figs. 1 and 2.

At the center of the bracket *d* is a threaded opening *j*, through which extends a bolt

j' having a conical head, the head *j*² being designed to act as a valve to close the central opening of the trough more or less as shown in detail in Fig. 5. At the central opening, 60 a bushing *e*² is riveted to the trough, the bushing being threaded for receiving a perforated nut or ring *e*³, the perforation of the nut forming the opening for the trough. An open-ended cylinder *k* is arranged at the 65 center of the bracket to provide a feed entrance for the device, and a perforated metallic and movable screen *w* is arranged at the bottom of the cylinder. A second trough *n* is arranged concentric with the first 70 trough, the said trough being directly below the first trough and somewhat smaller in diameter, and being also studded with metallic points *a'* as shown. The second trough *n* is independent of the first trough, being 75 firmly attached to the case *e* by rivets as shown in Fig. 2. At its center the trough is provided with an opening *o*, the said opening being surrounded by a bushing *g*², provided with guides *h*², in which is movable a 80 valve *s*, the said valve having a handle *i*² extending outside of the casing and provided with a knob *v'* for manipulating the same. A funnel *t* is arranged below the opening, the rod *i*² passing through the wall 85 of the funnel, and a stuffing-box *h*² is provided in the wall of the funnel for encircling the rod. A cross arm or bracket *u* is firmly attached to the lower part of the casing *e*, and the said cross arm has at its center a 90 downwardly extending pin *v*, which is received in an opening in a block *n'*, which in turn is received in a box *m'*, the cross-section of the box being considerably greater than the cross section of the block. Bolts *o'* 95 are threaded through the box from opposite sides, and engage the block, whereby the said block may be adjusted from side to side of the box. The box *m'* is provided on its lower face with a bearing, in which is received the upper end of a vertical shaft *k'*, the lower end of the shaft being received in a step *p* secured to the base of the device by bolts *p'*. A set screw *p*² traverses the bearing for securing the box to the shaft. A 105 bevel gear *t'* is secured to the shaft, and meshes with another bevel gear *s'* on a horizontal shaft *p*³, which is journaled in suitable bearings *q'*, *r'*, on the base. Blocks *d'* are riveted in the angle formed by the junction 110 of the casing inclosing the lower and the casing inclosing the upper trough, each

of said blocks being provided with a suitable opening for receiving the end of a vertical rod e' , which extends to the base and is received in an opening in a block g^2 , the said rods being retained in place in the upper and lower blocks by means of set screws t^2 , t^3 , respectively. The mounting above described is elastic in order to permit the oscillating movement produced by the mechanism to be described. A ring h' is provided for supporting the upper end of the vertical shaft h' , the said ring forming a bearing through which the shaft extends, and braces i' extend between the ring and the base for properly supporting the same.

A rubber pipe connects the lower end of the funnel t with a pipe x' outside of the casing, for permitting the values to pass outside of the casing when the valve before mentioned is opened. The sphere e' is provided at its center with a horizontal perforated diaphragm, and is adapted to receive water, the said sphere being connected to a ring a^{10} , by means of a pipe z encircling the opening through the upper trough, the said ring being perforated to permit the passage of water, and the flow of the water is controlled by a valve y' in the said pipe.

In operation the ores being already crushed and screened, they are fed through the cylinder k to the device, passing through the screen w before reaching the concentrator, sufficient water being used to cause the proper movement of the ores. The pulp passes into the batea or trough a , and under the influence of the oscillating motion received from the eccentric, the heavier parts (gold, sulfurets, &c.), will collect in the bottom, while the lighter parts (tailings, slime and the like) will pass over the edges and along the canal or passage formed between the wall g and the wall e , finally being discharged by the pipe i . The metallic points with which the floor of the batea is studded, assist in stirring the pulp and maintaining it in loose condition. This is due to the fact that the batea will be moved relatively to the pulp. The springs c supporting the batea, will be so graduated as to keep it adjusted against the head j^2 of the bolt j , while the batea is full of sands and concentrates; as soon however as the quantity of these increases to a sufficient extent, the springs yield under the heavier weight of the batea and the bottom of the batea moves away from the head, thus permitting the opening b to discharge the excess of concentrates which pass to the lower batea or basin. As soon, however, as the concentrates diminish, the batea being lighter will be thrown back by the springs, thus again closing the opening b . The concentrates are dropped into the batea n and water is added through the pipe z , and a similar action takes place in batea n , the metals concentrating at the center of

the batea, and the waste products passing over the edge thereof into the passage q . The values are removed by opening the pad-lock v^2 , that fastens the slide valve s , after which the said valve is pulled out by the knob v' , and the values are discharged through the pipe x . The slide valve is provided with a lug, which extends between a pair of lugs on the casing as shown in Figs. 1 and 3, and the pad-lock traverses openings in the lugs. It will be observed that when the shaft h' is rotated, the block n' is rotated, and since the pin y rests in the opening of the block, it is revolved around the axis of the shaft h' , thus imparting to both of the basins an oscillatory movement, without however rotating either of said basins.

I claim—

1. An ore washer and concentrator, comprising a basin having a funnel-shaped bottom provided with an opening, a second basin below the basin and concentric therewith and having a funnel-shaped bottom provided with an opening, said first basin being spring supported, a valve closing the opening in the bottom of the upper basin and normally fixed with respect to the basin, a slide valve closing the opening in the bottom of the lower basin, and means for oscillating said basins in unison on an eccentric axis for the purpose set forth.

2. An ore washer and concentrator, comprising a basin having a funnel-shaped bottom provided with a central opening, a second basin below the basin and independent thereof and having a funnel-shaped bottom provided with an opening, springs for supporting said first basin, a valve closing the opening in the bottom of the upper basin and normally fixed with respect to the basin, means for adjusting said valve with respect to the basin, a slide valve closing the opening in the bottom of the lower basin, and means for oscillating said basins in unison on an eccentric axis.

3. An ore washer and concentrator, comprising a basin having a funnel-shaped bottom provided with an opening, springs for supporting said basin, a valve closing the opening in the basin and normally fixed with respect to the basin, and means for oscillating said basin on an eccentric axis.

4. An ore washer and concentrator, comprising a spring-supported substantially funnel-shaped basin provided with a central opening, a valve closing the opening and normally fixed with respect to the basin, and means for oscillating said basin on an eccentric axis.

5. An ore washer and concentrator, comprising a spring-supported basin provided with a central opening, a valve closing the opening and normally fixed with respect to the basin, and means for oscillating said basin on an eccentric axis.

6. An ore washer and concentrator, comprising a spring-supported substantially funnel-shaped basin provided with a central opening, a valve for closing said opening
5 and normally fixed with respect to the basin, a second substantially funnel-shaped basin below and independent of the first basin, said second basin being of smaller diameter and
10 concentric with the first basin, and being provided with a valve-controlled opening, and means for oscillating said basins on an eccentric axis.

7. An ore washer and concentrator, comprising a spring-supported substantially
15 funnel-shaped basin provided with a central opening, and having the bottom thereof

studded with projections, a valve closing the opening and normally fixed with respect to the basin, and means for oscillating the basin on an eccentric axis. 20

8. An ore washer and concentrator, comprising a substantially funnel-shaped basin provided with a central opening, a valve closing the opening the valve being normally fixed with respect to the basin, and
25 means for oscillating said basin.

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

ALEJANDRO DIEU.

Witnesses:

SATURNINO PALENCIA,
GREGORIO PÉREZ.