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Patented Apr. 4, 1899.

J. F. MASON.  
ORE WASHER AND SEPARATOR.

(Application filed July 30, 1898.)

(No Model.)

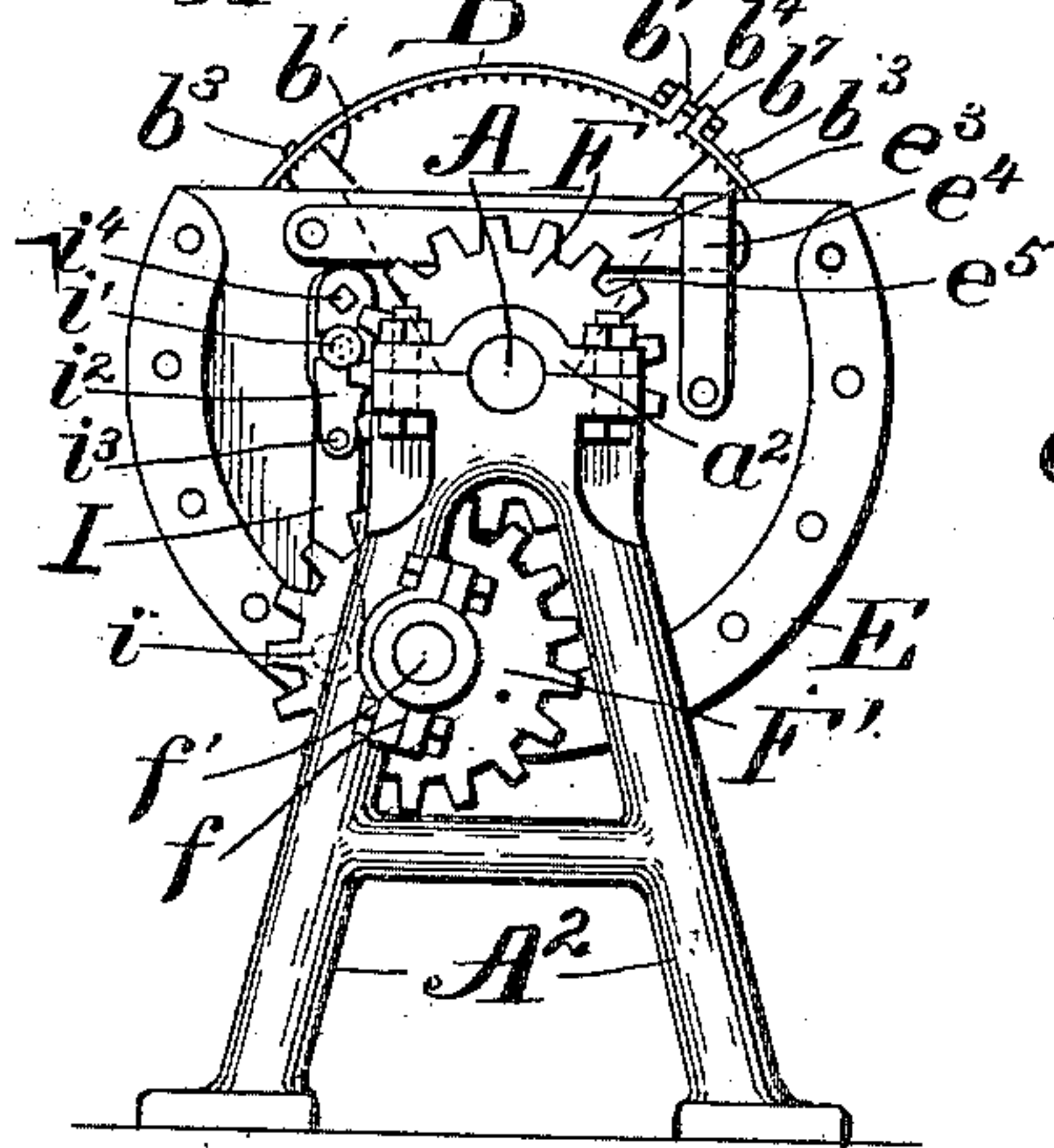
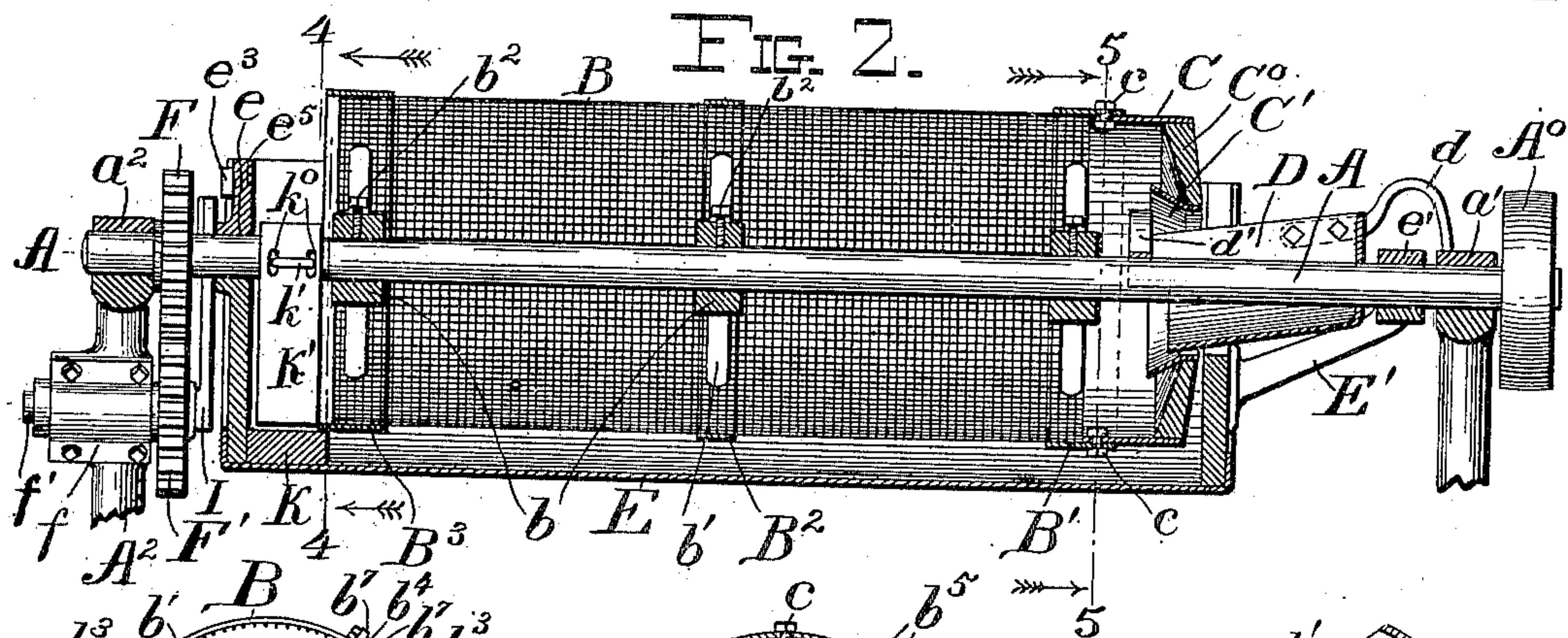
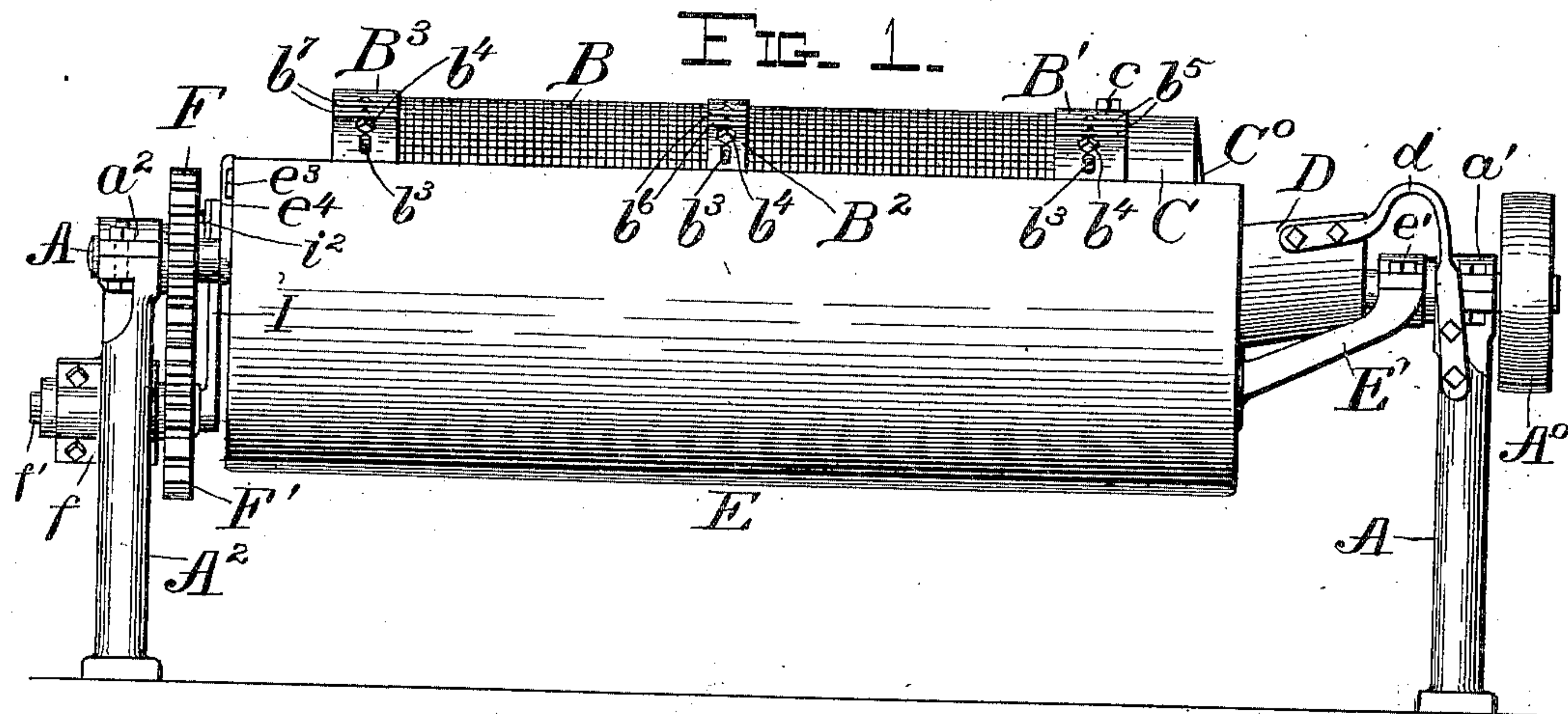


FIG. 3.

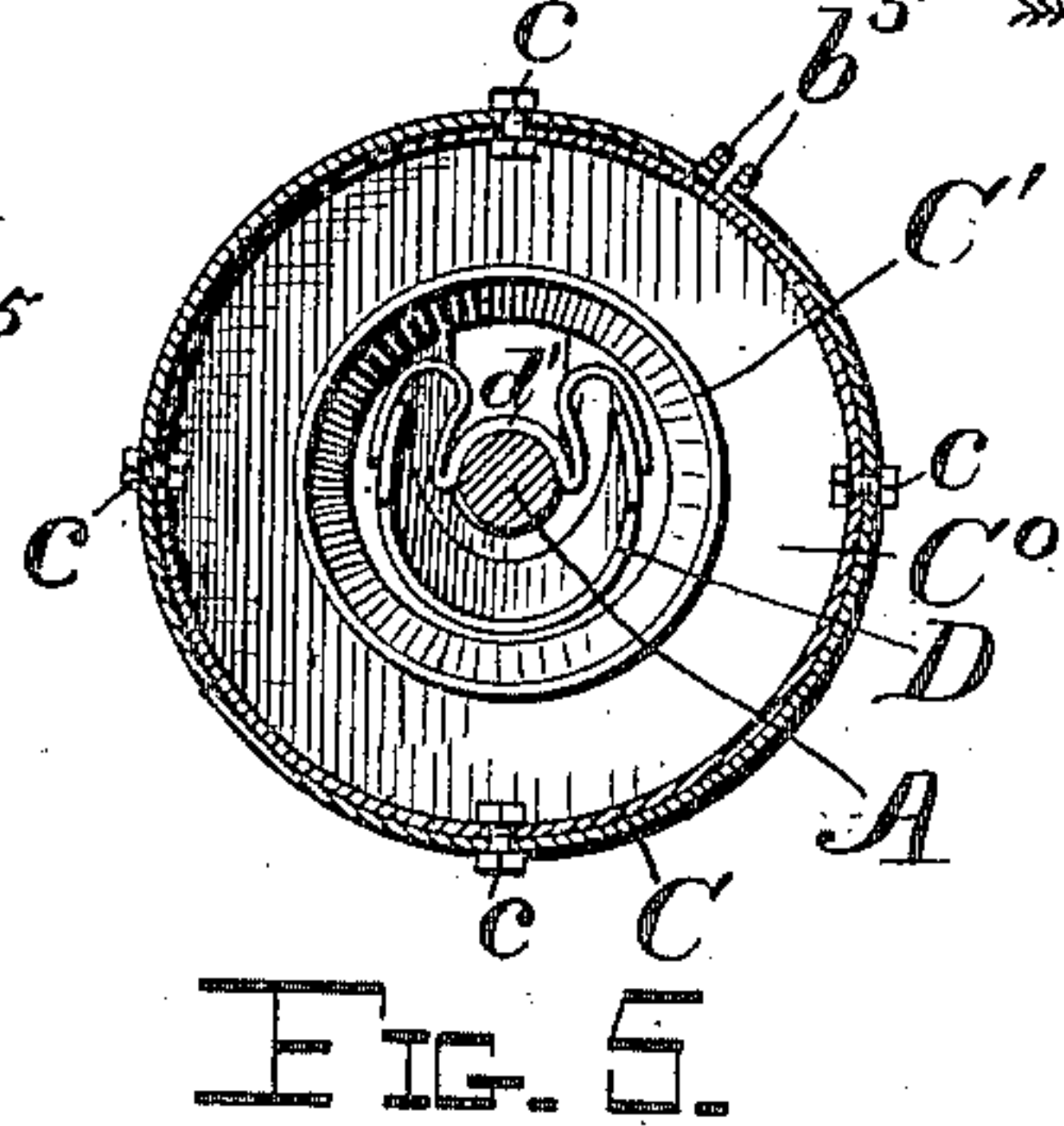


FIG. 5.

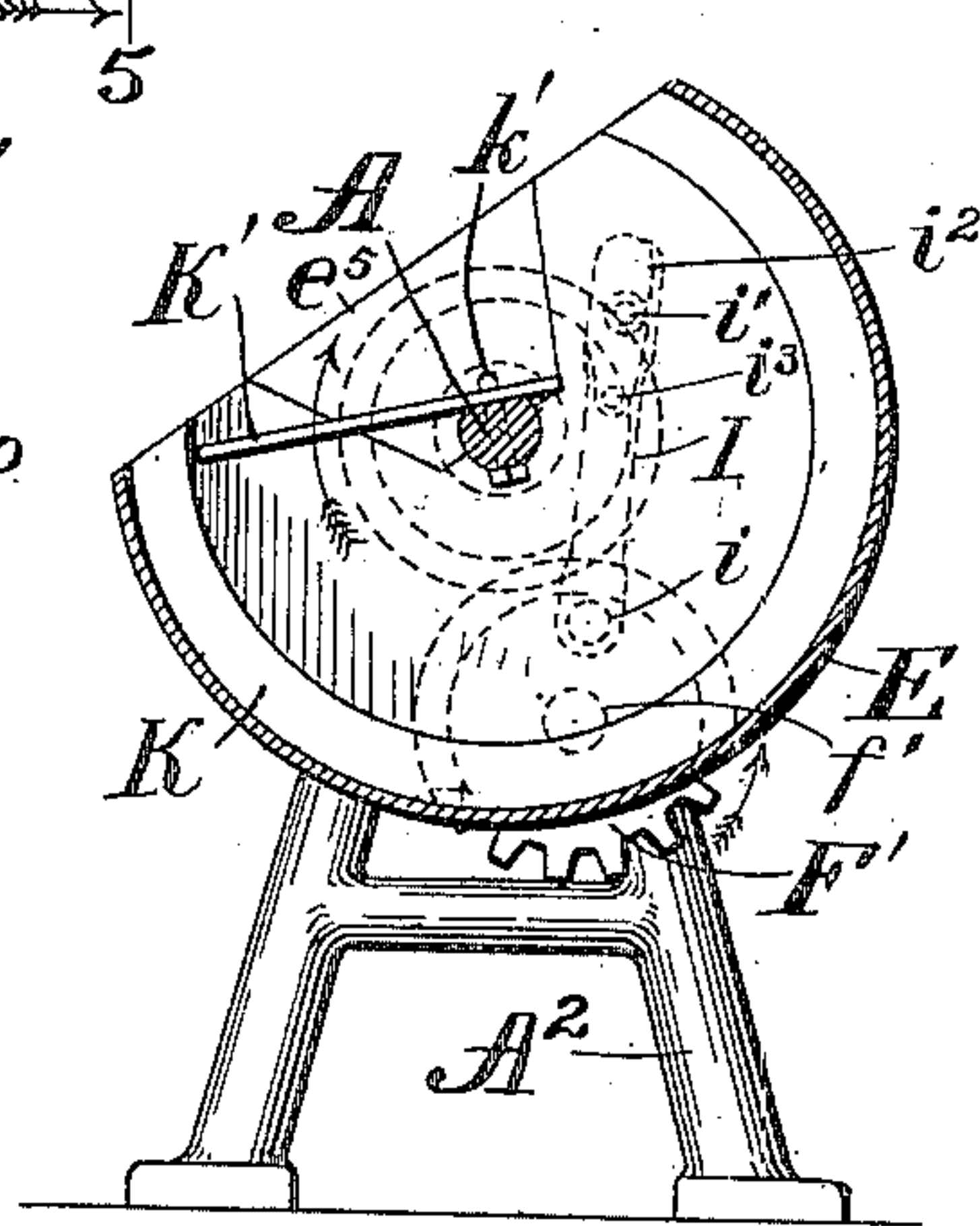


FIG. 4.

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# UNITED STATES PATENT OFFICE.

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## ORE WASHER AND SEPARATOR.

SPECIFICATION forming part of Letters Patent No. 622,507, dated April 4, 1899.

Application filed July 30, 1898. Serial No. 687,339. (No model.)

*To all whom it may concern:*

Be it known that I, JAMES F. MASON, a citizen of the United States, residing at Waycross, in the county of Ware and State of Georgia, have invented certain new and useful Improvements in Ore Washers and Separators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in ore-washers, and more particularly to ore-washers for separating and saving gold.

My invention, which consists in the novel apparatus hereinafter described and claimed, will be understood by reference to the accompanying drawings, wherein the same parts are indicated by the same letters throughout the several views.

Figure 1 represents a side elevation of my ore-washer. Fig. 2 represents a central longitudinal section through the same. Fig. 3 represents an end elevation of the apparatus as seen from the left in Fig. 1. Fig. 4 represents a vertical section through the apparatus, taken on the line 4 4 of Fig. 2, looking in the direction of the arrow and showing the outer trough as rocked over to one side; and Fig. 5 represents a vertical section taken on the line 5 5 in Fig. 2 and looking in the direction of the arrow.

A represents a horizontal shaft, upon which is rigidly mounted in a concentric manner the cylindrical screen B, the said screen being supported upon the said shaft by means of arms  $b'$ , which radiate from collars  $b$ , inclosing the said shaft and clamped thereon by means of screws  $b^2$ , as seen most clearly in Fig. 2. The ends of the said radial arms  $b'$  are provided with short studs  $b^3$ , which pass through the meshes of the screen B and engage in small openings provided therefor in the bands  $B'$ ,  $B^2$ , and  $B^3$ , which surround the said screen and are clamped thereon by means of bolts  $b^4$ , engaging in perforated lugs  $b^5$ ,  $b^6$ , and  $b^7$  upon the ends of said bands, as seen most clearly in Fig. 1. The object in so constructing the screen is to allow of an interchange of the cylinders of different degrees

of coarseness or fineness of mesh. This is done by loosening the clamping-bolts from the bands surrounding the cylinder, when the latter may be readily removed and another substituted therefor and clamped in place as before. The ends of the said cylinder are open; but one end, that which receives the ore washings, is fitted with a head having a rim or flange C, which fits closely within the end of said cylinder and is secured therein by means of bolts  $c$  and an annular disk  $C^0$ , having a central opening fitted with a collar  $C'$ , which projects inwardly and is made somewhat flaring, as shown most clearly in Fig. 2. This collar  $C'$  also surrounds the shaft A.

A spout D, mounted at its upper and outer ends upon braces or standards  $d$ , fits up under the shaft A and partially incloses the latter, and the mouth of the said spout projects partially through the flaring collar  $C'$ , fitted in the central opening of the annular disk  $C^0$ , so as to discharge the ore and water upon the ring or flange C, the said ore and water being delivered to the said spout D in any suitable manner. The inner end of the spout is supported upon the shaft A by means of a bent metallic support  $d'$ , the middle portion  $d$  thereof being shaped to fit the shaft A and make a smooth bearing therefor, as seen most clearly in Fig. 5. The said shaft A is journaled at or near its ends in bearings  $a'$   $a^2$  upon suitable supports  $A'$   $A^2$ , and a pulley  $A^0$  is fixed upon one end of said shaft for the engagement of a belt for rotating the said shaft and screen.

E represents a hollow water-tight trough having the form in cross-section of an arc of a circle, as shown in Figs. 3 and 4, the said trough being of a slightly-greater diameter than the said screen B. The shaft A passes through the ends of said trough, and a journal-bearing is formed at one end, as at  $e$ , to allow the said shaft to rotate freely within the said trough. At the other end the trough is cut away to receive the shaft A and spout D, above described, and the said trough is supported upon the said shaft in this latter end by means of a bracket  $E'$ , provided with a journal-bearing  $e'$ , fitted upon the said shaft A. The various journal-bearings are all



made so as to readily be taken apart for the purpose of renewing the bearing or for any other reason.

A toothed gear F is fixed upon the shaft A at or near its end opposite that upon which the pulley is mounted, and this toothed gear meshes with a similar gear F', mounted upon a short shaft f', journaled in a bearing f upon one of the legs of the upright A<sup>2</sup>.

A pitman I is mounted at one end upon a wrist-pin i upon the toothed gear F', and at its other end the said pitman engages a pin or stud i' upon the end of the trough E, as seen most clearly in Fig. 3. The pitman engages this stud or pin i' by means of a slot extending partially across said pitman and into which the said pin enters laterally and is held by means of a slotted catch i<sup>2</sup>, pivoted at i<sup>3</sup> upon the pitman, which also swings over said pin i' and is secured by means of a bolt i<sup>4</sup>, which passes through the said catch and the pitman near its end, as seen most clearly in Fig. 3. By means of this pitman, operated through the gears F F', as the shaft A and the screen B are rotated a rocking motion is given to the said trough. Within the opposite end of the trough from the discharge-spout D is fitted a thick curved rib K, which extends from one edge of the trough to the other completely about one end thereof. The band B<sup>3</sup> upon the end of the screen B overlaps slightly the said rib K, as seen most clearly in Fig. 2, so that the larger particles of the ore and refuse will pass out of this end of the screen upon the said curved rib A. For discharging these particles of refuse a blade K' is mounted near one end upon the shaft K and is of such length that it may turn freely within the said curved rib. This blade is made adjustable to compensate for wear upon its outer end by being attached to the shaft A by means of a clip k', which passes through longitudinal slots k<sup>0</sup> in the said blade and is secured by nuts upon the ends thereof. It will thus be seen that as the operating end of the blade becomes worn it may be adjusted by shifting the said blade along the said slots upon the clip. It will thus be seen that as the shaft A and screen B are given a continuous rotary motion the trough E is given a rocking motion beneath the said screen. As the shaft rotates, the blade K' swings around, and the gearing between the said shaft and the trough is so arranged that as the said blade is moving upwardly at one side the trough is rocking in the opposite direction, thus causing the ready discharge of the refuse that has accumulated upon the rib K, the said blade and the said trough at this time moving in opposite directions, as indicated by the arrows in Fig. 4.

The operation of the device is as follows: The shaft A is driven by any suitable source of power connected to the pulley A<sup>0</sup>, and with it the wire screen B, the speed of revolution, however, being moderate. The gear-wheel F, fixed upon the shaft A and meshing with

the gear F', causes the trough E to be given a rocking motion through the pitman I, as hereinbefore described. The blade K', rigidly mounted upon the shaft A, turns continuously through a circle and swings in and out of the said trough while the latter is rocking. The ore and water enter the end of the screen-cylinder by way of the spout D, as seen to the right in Fig. 2, and fall within the said screen. The rotation of the cylinder causes the ore to be agitated, and the heavy particles of gold fall through the mesh of the cylinder into the trough beneath, which is kept constantly rocking by the operation of the machine, thus creating a constant agitation of the water therein and thoroughly washing the ore. The trough being water-tight, the surplus water will escape therefrom only by being splashed over the sides of the said trough, so that no particles of gold can be carried away by the waste water. The refuse which cannot pass through the meshes of the screen into the trough beneath either by reason of the size of the particles or by reason of the agitation of the water carrying them on will pass out of the opposite end of the screen and will lodge upon the curved rib K. It will be seen that by reason of the amount of water which remains within the trough and screen during the operation of the machine the refuse will make its way out of the screen and upon the rib K gradually, thus allowing it to be thoroughly disintegrated and the particles of gold separated therefrom thoroughly before passing out of the screen. The blade K', swinging around constantly, enters the trough at one side within the rib K and in completing that portion of its movement which brings it up to the other side of the trough pushes along with it all particles of refuse that have accumulated upon the said rib. As hereinbefore referred to, the rocking mechanism of the trough E is so geared as to cause the side of the said trough from which the refuse is discharged to swing downwardly as the said blade swings upwardly at that side, so that just as the blade reaches the edge of the trough in its upward swing this edge of the trough reaches its lowest position. The flanged collar C' prevents the water from splashing out through the opening in the disk C<sup>0</sup> in the head of the screen while the machine is in operation. The gold is removed from the trough E by removing the trough from the shaft A, which is done by detaching the bearing e' at the head of the trough from the shaft, and at the other end the bearing e is released by disengaging the pivoted arm e<sup>3</sup> from the catch e<sup>4</sup>, which allows the wedge-shaped section e<sup>5</sup> to swing outward and separate the sections of the bearing e. The pitman is disengaged from the end of the trough by releasing the bolt i<sup>4</sup> and swinging the pivoted catch i<sup>2</sup> over to one side, as described.

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



1. In an ore-washer, the combination with a horizontally-arranged shaft, a cylindrical screen rigidly secured to said shaft, a trough journaled upon said shaft beneath said screen, means for rotating said shaft and screen, and means for simultaneously rocking said trough in a path parallel to said screen, substantially as described.

2. In an ore-washer, the combination with a horizontal shaft mounted in suitable bearings, a cylindrical screen rigidly mounted upon said shaft, a trough journaled upon said shaft beneath said screen, and partially surrounding the latter, gearing between said shaft and said trough for imparting to the latter a rocking motion in a path parallel to said screen during the rotation of the shaft, a spout entering one end of the said screen for delivering the ore and water thereto, and means for rotating said shaft, substantially as described.

3. In an ore-washer, the combination with a horizontal shaft journaled in suitable supports, a screen rigidly mounted upon said shaft, a trough journaled upon said shaft beneath said screen and partially surrounding the latter, a blade rigidly mounted upon said shaft and rotating in and out of said trough at one end of said screen, gearing between said shaft and said trough for imparting to said trough a rocking motion during the rotation of said shaft, a spout entering one end of said screen for delivering the ore and water thereto, and means for rotating said shaft, substantially as described.

4. In an ore-washer, the combination with a horizontal shaft journaled upon suitable supports, a screen rigidly mounted upon said shaft, a trough journaled upon said shaft beneath said screen and partially inclosing the latter, an annular disk fitted in the head of said screen and having a central circular opening, a flaring collar fitted in said open-

ing and extending into said screen, a spout entering the said screen through the central opening in said disk, gearing between said shaft and said trough for imparting to said trough a rocking motion during the rotation of said shaft, and means for rotating said shaft, substantially as described.

5. In an ore-washer, the combination with a horizontal shaft journaled in suitable supports, a separable screen rigidly mounted upon said shaft, an annular disk having a central opening fitted in the head of said screen, a flanged collar fitted in said opening and extending into the screen, a spout entering said screen through the central opening in said disk, a trough supported beneath said screen upon journals inclosing said shaft, and partially surrounding said screen, gearing between said shaft and said trough for imparting to the trough a rocking motion during the rotation of the shaft, means for discharging the refuse from one end of said trough, and means for rotating said shaft, substantially as described.

6. In an ore-washer, the combination with a rotating screen, a trough supported beneath said screen upon bearings concentric with the axis of rotation of the said screen, gearing between said screen and said trough for imparting to the trough a rocking motion during the rotation of the screen, a thickened rib within one end of said trough partially surrounding the end of the screen in close relation thereto, a blade rigidly mounted upon the axis of said screen and rotating therewith within said rib, substantially as described.

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

JAMES F. MASON.

Witnesses:

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J. STEPHEN GIUSTA.