(No Model.) 2 Sheets—Sheet 1.

J. C. WISWELL.

MACHINE FOR CRUSHING AND PULVERIZING ORES.

No. 563,702. Patented July 7, 1896.

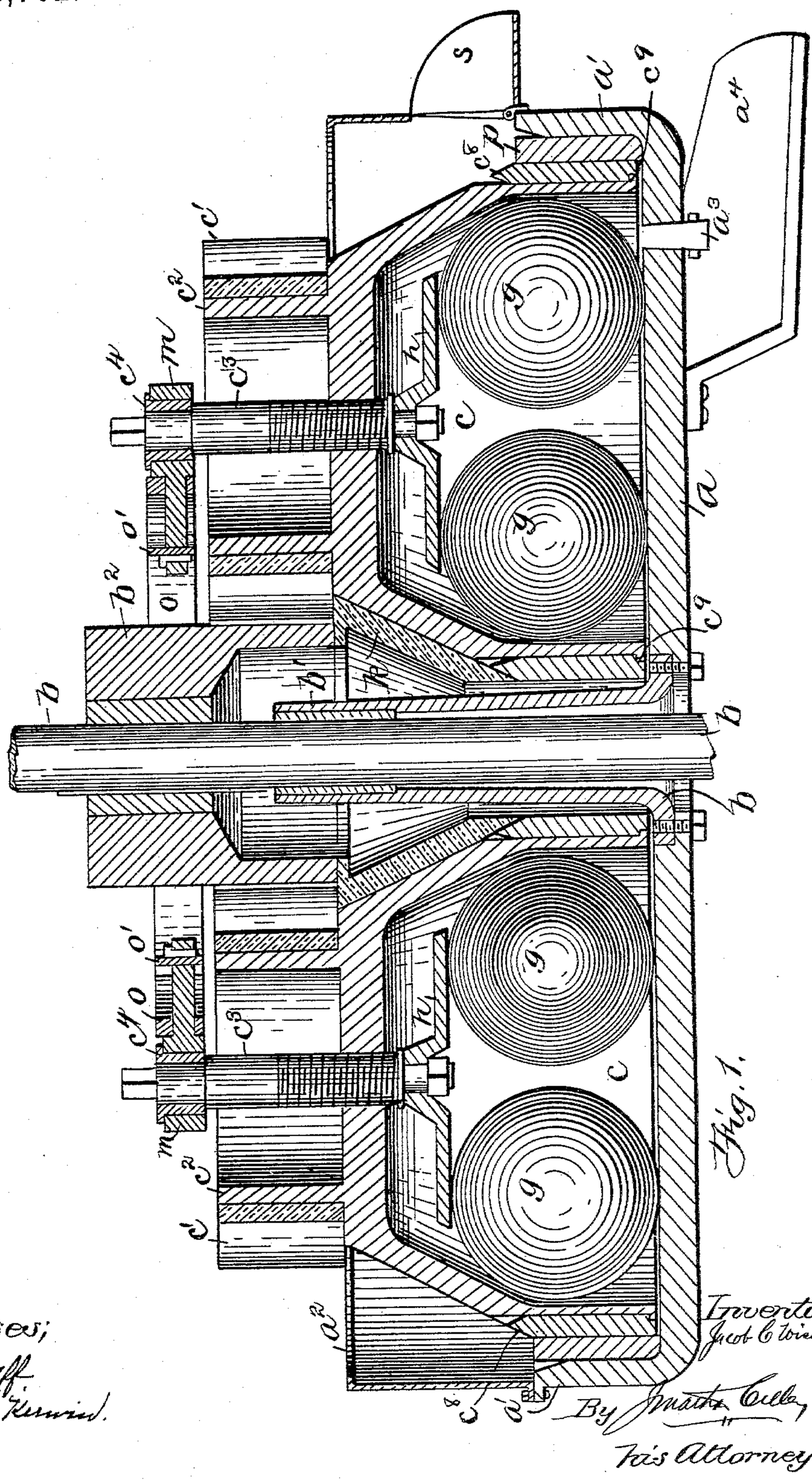

Fig. 1.

Witnesses;
John H. Daff
Winfred L. Kimmel.

Inventor
Jacob C. Wiswell
By Smith & Gilly
His Attorney.

(No Model.)

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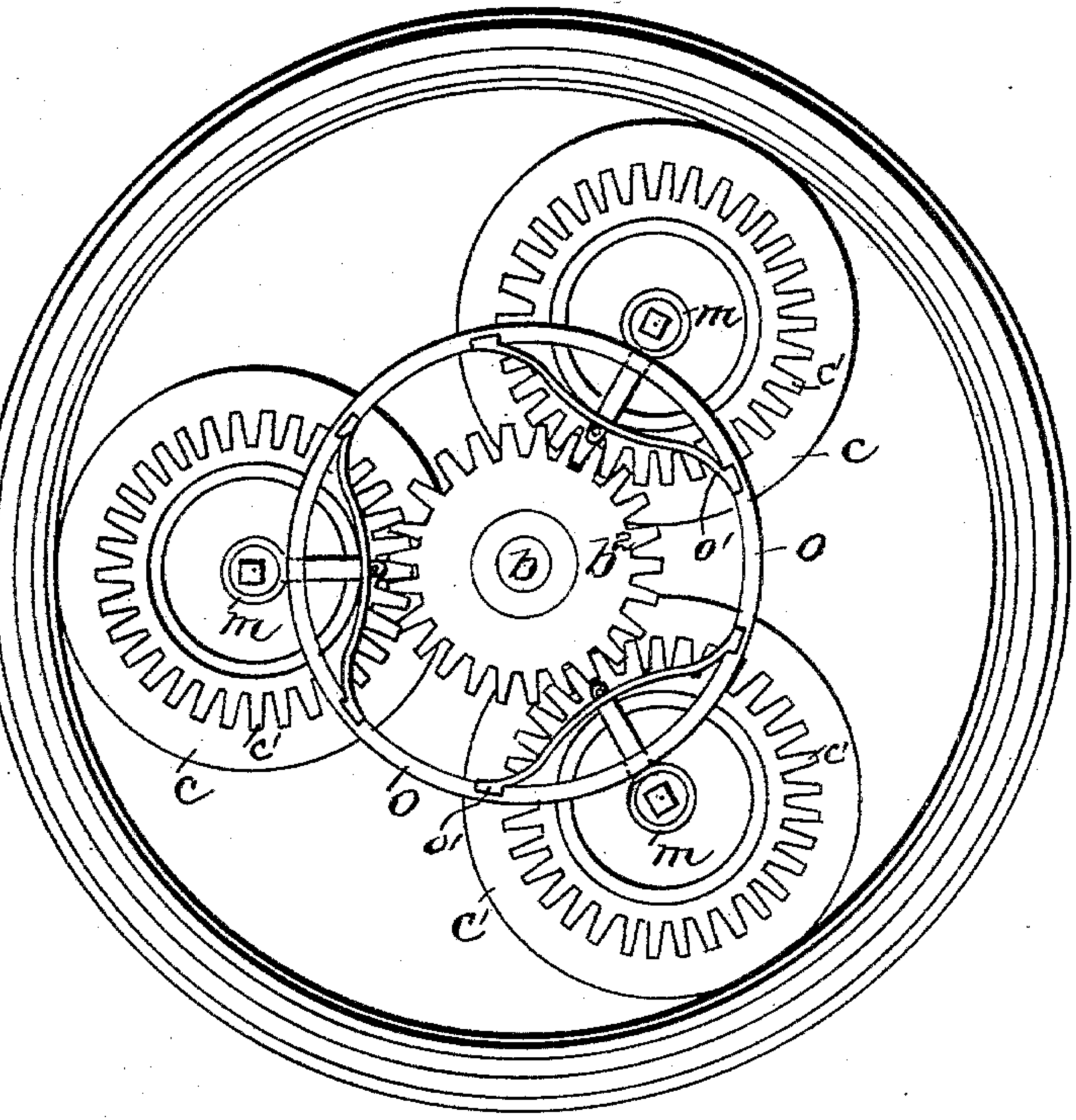

Fig. 2.

Witnesses;
John H. Daff.
Winifred G. Kerwin.

Inventor;
Jacob C. Wiswell
By Jonathan Tilley,
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UNITED STATES PATENT OFFICE.

JACOB C. WISWELL, OF MEDFORD, MASSACHUSETTS, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO HENRY B. WELLS AND SOLOMON EATON, OF BOSTON, WINGATE P. SARGENT, OF MELROSE, AND HENRY G. DILLAWAY AND HENRY B. BROWN, OF QUINCY, MASSACHUSETTS.

MACHINE FOR CRUSHING AND PULVERIZING ORES.

SPECIFICATION forming part of Letters Patent No. 563,702, dated July 7, 1896.

Application filed October 24, 1895. Serial No. 566,702. (No model.)

To all whom it may concern:

Be it known that I, JACOB C. WISWELL, of West Medford, in the county of Middlesex and Commonwealth of Massachusetts, have invented a new and useful Machine for Crushing and Pulverizing Ores, of which the following is a specification.

My invention relates to mining machinery, and has for its object to produce a machine which combines both a crusher and a pulverizer designed for the reduction of auriferous gangues, the liberation and recovery of the precious metals, and more especially the recovery of the fine float-gold.

In the accompanying drawings, forming part of this specification, Figure 1 is a longitudinal cross-section of the machine, and Fig. 2 a top plan reduced.

The pan *a* constitutes the bed of the machine and has the flange a' and a curb a^2, secured upon the flange a', to confine the requisite amount of pulp. In the bottom of the pan *a* is the faucet a^3 and spout a^4 to carry off the amalgam when desired. Driving-shaft *b* has a bearing in the sleeve b', secured to pan *a*, and carries a gear b^2, splined on the shaft *b*, so that the gear can move freely endwise of the shaft. Gear b^2 drives gears c', which are secured to the collars c^2 of the hollow rolls *c*. These rolls are carried upon spindles c^3, threaded at their lower portions to engage threaded holes in the top of the rolls and travel slightly above the surface of pan *a*, supported thus by balls *g*, upon which rest the disks *h*, secured to the lower extremities of the spindles c^3 by nuts and washers. A cone-shaped wedge *k* surrounds but does not touch shaft *b*, and resting upon the upper inclined surfaces of rolls *c* forms a support upon which rests gear b^2.

The upper portions of spindles c^3 have the sleeve-washers c^4 and embraced by the arms *m*, whose inner portions pass through slots in the ring *o* and are connected to springs o', secured to the inner surface of ring *o*. Squared heads on the spindles c^3 provide for adjustment of spindles c^3 endwise to raise or lower the rolls *c*. The lower edges of rolls *c* have the flanges c^9, supporting the shoes c^8, secured about the outer peripheries of the rolls, and which act against the inner surface of ring *p*.

The operation of the machine will now be understood. Power being applied to shaft *b*, rolls *c* rotate on their own axes and by their contact outwardly with rim *p* are caused to travel, thus rotating in a circular path about the pan *a*, bearing inwardly upon the wedge-cone *k*. Wear of the shoes c^8 and the constant widening of the circle in which the rolls travel will be compensated for by the wedge *k* moving downward automatically and by the springs o' forcing spindles c^3 outwardly.

This mill does not rub or pound the ores and therefore makes no slimes. It serves three purposes—crushes by means of the rotating rolls which operate on a horizontal plane, being thrust rigidly against the vertical sides of the pan. This work is all done above the fine pulverizing which is effected upon the bottom by means of the iron balls carrying the great weight of the structures above them, this weight being very advantageous in amalgamation. The wearing-surfaces will be true as long as they last, and the mill can be easily conveyed from place to place.

Having now fully described my said invention, what I desire to secure by Letters Patent, and therefore claim, is—

1. In an ore crushing and pulverizing machine a pan; balls resting upon the pan; hollow inverted rolls supported upon the balls and means for rotating the rolls on their own axes and also causing them to travel about the pan in a circular path simultaneously, as described.

2. In a machine of the character described, a pan; balls resting upon the pan; hollow inverted rolls supported upon the balls; a wedge-cone bearing upon the upper surfaces of the rolls, and means for rotating the balls and rolls, as and for the purposes set forth.

3. In a machine of the character described, a pan; balls resting upon the pan; hollow inverted rolls supported by the balls and means for revolving the balls within the rolls, rotating the rolls on their own axes and caus-

ing the rolls and balls to travel about the pan all simultaneously, as set forth.

4. In combination pan *a:* balls *g* resting thereon; disks *h* resting on the balls, spindles c^3 carrying disks *h;* rolls *c* carried by spindles c^3; gears c' b^2 driving rolls *c;* wedge-cone *k* bearing upon rolls *c* and supporting gear b^2; ring *o* and elastic connections between the ring and spindles c^3 all as and for the purposes set forth.

JACOB C. WISWELL.

Witnesses:
JONATHAN CILLEY,
D. P. CARNEY.