T. A. COCHRANE & J. HENDY.

ORE-FEEDER.

No. 176,281. Patented April 18, 1876.

Fig. 1.

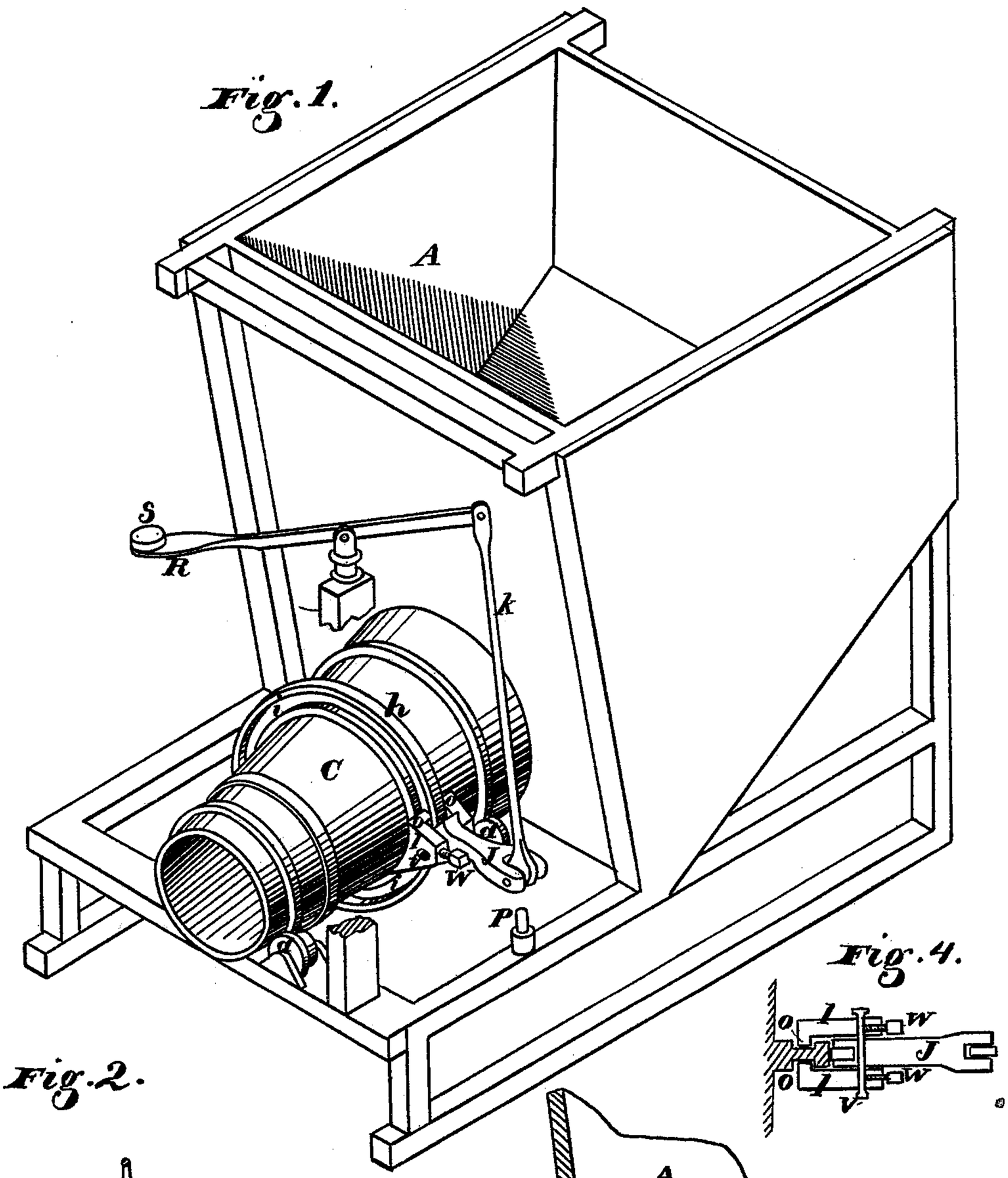


Fig. 4.

Fig. 2.

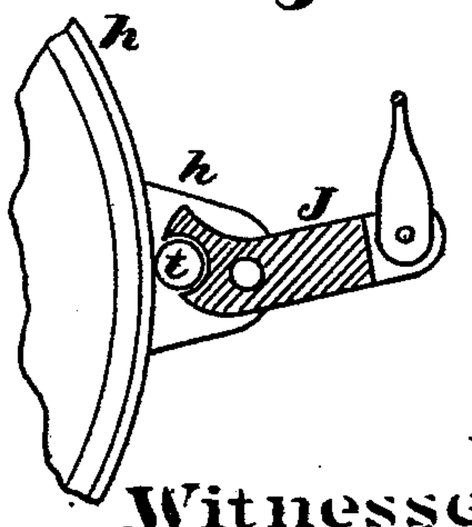
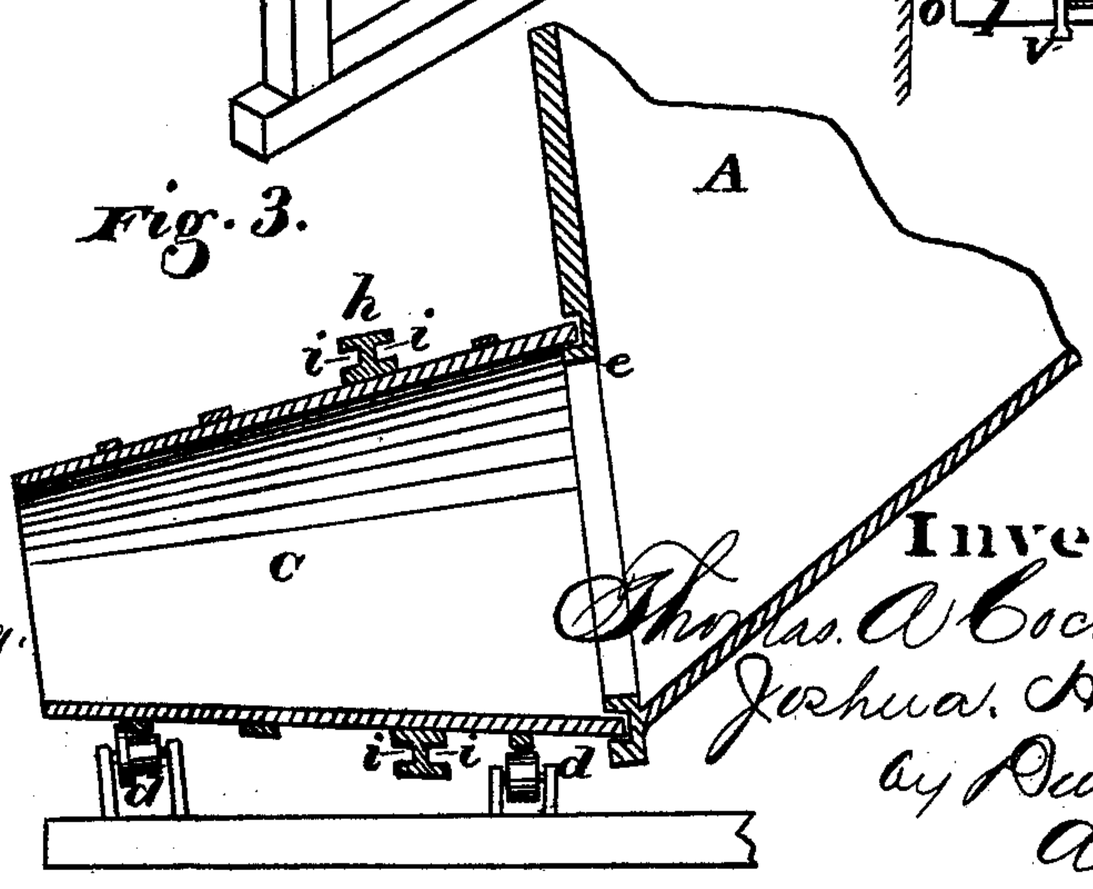


Fig. 3.



Witnesses
Geo. H. Strong.
Jno. L. Boone

Inventor
Thos. A. Cochrane
Joshua. Hendy
by Dewey & Co
Attys.

UNITED STATES PATENT OFFICE.

THOMAS A. COCHRANE AND JOSHUA HENDY, OF SAN FRANCISCO, CAL.

IMPROVEMENT IN ORE-FEEDERS.

Specification forming part of Letters Patent No. **176,281,** dated April 18, 1876; application filed September 23, 1875.

To all whom it may concern:

Be it known that we, THOMAS A. COCHRANE and JOSHUA HENDY, of San Francisco city and county, State of California, have invented an Improved Ore-Feeder; and we do hereby declare the following description and accompanying drawings are sufficient to enable any person skilled in the art or science to which it most nearly appertains to make and use our said invention or improvement without further invention or experiment.

Our invention relates to an improved machine for automatically feeding ore to the stamps of quartz-crushing mills. It consists of a cylinder or truncated hollow cone, which is connected at one end with the ore-hopper, while its opposite end projects over the upper open end of the mortar, in combination with devices hereinafter explained.

This cylinder is rotated by the drop of the stamp, so that a quantity of the ore will be fed through the cylinder into the mortar after each drop of the stamp.

Our invention also includes an improved clutching device for rotating the cylinder by the up and down motion of a rod or lever, and a buffer attachment upon the end of the lever with which a tappet on the stamp-stem comes in contact, so as to relieve the sudden jar or stroke which results when the tappet comes in contact with the end of the lever.

Referring to the accompanying drawing, in which Figure 1 is a perspective view of my device; Fig. 2, a vertical section of the clutch; Fig. 3, a vertical section of the feeding-cone; Fig. 4, a horizontal section of the clutch—

The ore-hopper A is mounted upon a suitable frame-work, B, which extends forward a short distance in front of the hopper, as represented.

A circular opening is made in the front side of the hopper near its bottom. A short hollow cylinder, C, is mounted upon the frame-work B in front of the hopper, so that its rear end will fit in the circular opening in the hopper, while its forward end projects over the front end of the frame-work. The hollow cylinder C is supported upon anti-friction bearings or rollers *d d*, so that it can rotate easily, its end turning loosely on the side of the hopper.

A flange, *e*, on the inside of the hopper, overlaps the edges of the inner end of the cylinder so as to prevent the ore from getting into the joint. This tube or cylinder can be round or conical, as desired, and its interior may be either smooth or provided with ribs or spiral flanges to feed the ore forward as it rotates. We prefer to make it smooth inside, as the rotation of the tube will cause the ore to continually drop forward and thus accomplish the feeding with great regularity.

The outer end of the tube or cylinder projects over the upper open end of the mortar, so that the ore will drop into it and fall beneath the stamp at each drop of the stamp-stem. The tube or cylinder can be rotated in a variety of ways, but we have devised for this purpose a clutch-pawl, G, which is constructed and operated in the following manner:

Around the tube or cylinder C, near its middle, we make a flange, *h*, and on each side of this flange we make a groove, *i*, which extends entirely around the cylinder.

J is a pawl-bar, one end of which is attached to the lower end of the rod *k*. The opposite end of this bar is just as wide as the flange *h* on the tube or cylinder, and its extremity is curved so as to be eccentric to the opposite or pivoted end. In the end of this pawl-bar we place a friction-roller, *t*, which will bear against the face of the flange and give an easy and positive action to its movements. A pawl, *l*, is secured to each side of the pawl-bar J by a loose attachment or bolt, V, which passes through the bar and side plates, and these plates extend upon each side of the flange *h*.

Each plate has a rib, O, formed on its inner edge, and these ribs are of the proper size and curvature to fit in the grooves *i* in the sides of the flange. The holes in the side plates *l*, through which the bolt V passes, are slotted or elongated, and a set-screw, W, passes through the edge of each plate, so that one will press against each end of the bolt. By turning these set-screws the gripe of the end of the bar J and plates *l* can be tightened or loosened upon the flange by moving the griping parts to or from each other, according to the direction in which the set-screws are turned. Now, as the outer end of the

pawl-bar is lifted, its inner eccentric end will bind against the face of the rim *h*, while the ribs O bind in the grooves *i* and the cylinder will be rotated a distance equal to the lift of the pawl, and as the pawl is lowered its eccentric end is freed and the ribs move backward in the grooves, thus providing a simple and effective pawl arrangement for operating the cylinder.

P is a stop against which the outer end of the pawl strikes as it drops after each lift.

R is the lever which receives the stroke of the tappet on its outer end, while the upper end of the rod *k* is attached to its opposite end.

In order to render the stroke of the tappet on the end of the lever elastic, and prevent the suddenness which occurs when the tappet strikes a a solid object, we secure an india-rubber or other elastic buffer, S, upon the end of the lever, so that it will receive the blow of the tappet and thus give an easy and effective stroke, which will not jar the cylinder or operative mechanism too suddenly. The cylinder will thus be rotated slightly by each stroke of the tappet on the lever R, and the ore will be conducted slowly through it from the hopper to the battery.

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

1. In combination with the rotating cylinder C having grooved flange *h*, the pawl-bar J having plates *l l*, and the ribs O corresponding with the grooves *i* in the flange *h*, substantially as and for the purpose described.

2. In combination with a rotating feeder, the adjustable friction-ratchet gripe, consisting of the pawl-bar J with its friction-bearing roller *t*, having the side plates *l l* with their griping-ribs *i* secured to it by the bolt V, and made adjustable by means of the set-screw W, the whole arranged to gripe upon the grooved flange *h*, substantially as and for the purpose described.

3. In combination with a rotating feeder the jointed lever R *k* and elastic buffer S, substantially as and for the purpose set forth.

THOMAS A. COCHRANE.
JOSHUA HENDY.

Witnesses:
JNO. L. BOONE,
C. M. RICHARDSON.