S. KENDALL.
Ore-Stamp.

No. 210,940. Patented Dec. 17, 1878.

Fig. 1.

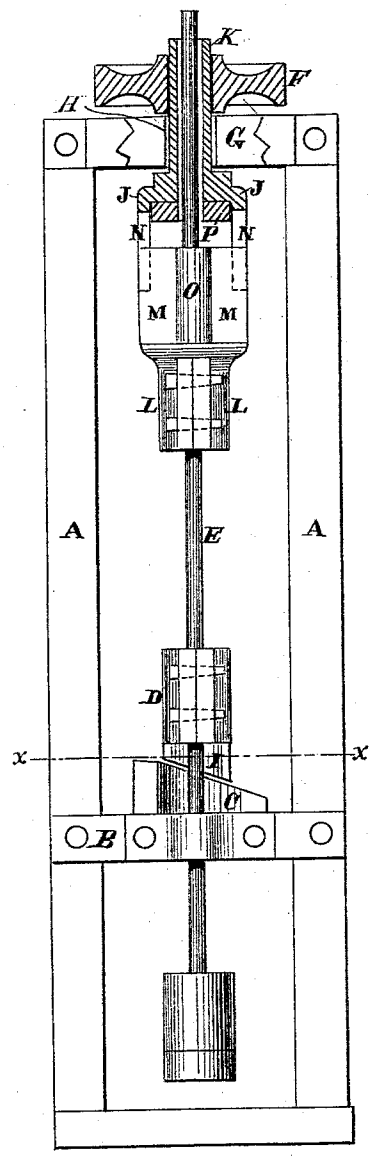


Fig. 2

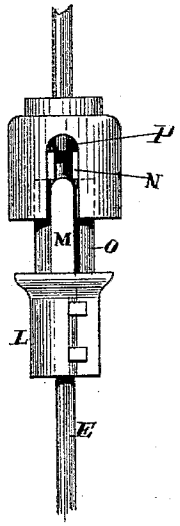


Fig. 3.

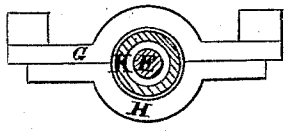
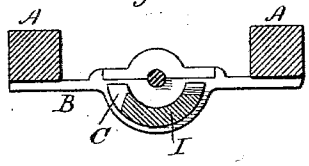


Fig. 4.



Witnesses

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UNITED STATES PATENT OFFICE.

STEPHEN KENDALL, OF JACKSON, CALIFORNIA.

IMPROVEMENT IN ORE-STAMPS.

Specification forming part of Letters Patent No. **210,940**, dated December 17, 1878; application filed October 28, 1878.

To all whom it may concern:

Be it known that I, STEPHEN KENDALL, of Jackson, county of Amador, and State of California, have invented Improvements in Ore-Crushing Mills; and I hereby declare the following to be a full, clear, and exact description thereof, reference being had to the accompanying drawings.

My invention relates to certain improvements in stamping apparatus, such as is employed for crushing ores and other substances.

My present invention has for its object an improved method of operating a vertically-moving stamp and stem by means of a horizontally-rotating pulley, the axis of which is coincident with the stamp-stem itself; and it consists in the employment of a peculiar clutch, one part of which is connected so as to rotate with the pulley, while the other part is secured to the stamp-stem, so that when the pulley is rotated the action of this clutch will cause the stem to rotate also, and the union is such that the stem and stamp are allowed to rise and fall freely by the action of the lifting-cam.

My invention also contemplates the employment of an elastic cushion or spring, which receives the impact of the rising stamp, and assists to return it when running at high rates of speed.

My invention further consists in a curved tappet attached to and partially encircling the stamp-rod, whereby a direct lift on the stamp-rod is obtained and side strain is avoided, which would produce a tipping of the stamp.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is an elevation with a portion cut away. Fig. 2 is an elevation of the clutch. Fig. 3 is a cross-section on line *x x* of Fig. 1. Fig. 4 is a cross-section on line *y y*, Fig. 1.

Let A represent the frame-work of my mill, which is properly secured to the mortar in which the ore is crushed. Across between the frames is the girt-timber B, on which is the incline or cam C. This cam is secured in a horizontal position, as shown, so that as the stem is rotated, as hereinafter described, and the flange I on the tappet D strikes said cam, the stamp will be raised until the flange on the tappet runs off said cam, allowing the stamp to drop onto the ore in the mortar.

The tappet I is made in a curve concentric with the stamp-rod E, and partially encircles it, so that the bearing-surface between it and the stationary cam is distributed around a portion of the circumference of the rod, and the lift is not at one point, thus overcoming the difficulty heretofore experienced of canting the rod and preventing even wear. The cam C is made usually in general conformity to the tappet I.

The stamping and grinding action accomplished by the stamps in the mill is due to both the rotary and vertical motion given to the stamp-stem. In order, however, that both motions may be given, it is necessary for the stem to be allowed a free vertical motion through the horizontal pulley which revolves it, so that said pulley cannot be keyed to the stem. In order to accomplish this I form a peculiar clutch on the stem, one part of which is secured to the stamp-stem and the other part to the pulley, so arranged that the stamp can rise and fall as the tappet rises on or falls from the cam, while at the same time the stamp is rotated in the mortar as well as when on the cam. On the cross-timber G of the frame is the box, through which the stamp-stem projects. On the stamp-stem, under said cross-timber, is the upper or female portion, J, of the clutch, having an extended sleeve, K, which projects up through the box H, and to the upper end of which the pulley F is secured. The stamp-stem then passes up through the upper portion of the clutch, the sleeve, and the pulley, as shown, being free both to revolve in them and to rise and fall. In order, however, that the stem may be rotated by power applied to the pulley, above the tappet and below the upper part of the clutch is keyed the lower or male portion, L, of the clutch, having feathers or projections M, which engage in correspondingly-shaped grooves or slots N in the upper part of the clutch.

Now, as the stamp-stem is rotated by power applied to the pulley, the flange on the tappet, by engaging on the cam, will lift said stamp-stem and stamp, the stem being free to move up and down through the upper part of the clutch, the sleeve, and the pulley. The feathers or projections M on the lower part, L, of the clutch, by engaging with the slots in the up-

per part of the clutch, hold the stem so that the pulley rotates it at all times, whether the stamp-stem is rising or falling, while by the slots in the clutch being extended, as shown, play enough is given to the stem to let it rise and fall the necessary distance.

The upper part of the clutch is hollowed out to admit of the extension or shank O of the lower part of the clutch entering it, and in this hollowed-out part of the clutch is placed a cushion, P, formed of rubber or other suitable material, so that when the stamp is running at high speed, in case the stem is raised higher than the cam ordinarily lifts it, the top of this shank or extension O will come in contact with this rubber cushion and prevent too much jar, besides aiding in sending the stamp back to its place rapidly.

By the means described I can use an ordinary round piece of shafting or bar-iron for a stamp-stem, and not have to form it with a square head or with feathers in order to give it a rotary and vertical motion at once. The construction of the mill is simplified materially, and there is less friction than by the method formerly used.

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

1. The clutch consisting of the part J, with its sleeve K, to serve as a guide and journal, and having the driving-pulley secured to it, said part J having the vertical grooves N, in combination with the part L, secured to the stem and provided with the projections M, to fit the grooves, so that the stamp and stem may be rotated and allowed a reciprocating motion, substantially as herein described.

2. The clutch consisting of the parts J and L, with the grooves or slots N and corresponding projections M, secured, respectively, to the driving-pulley and stamp-stem, in combination with the elastic spring or cushion P, to receive the impact of the rising stamp-stem, substantially as herein described.

3. In an ore-stamp, the combination of the rod E, the tappet D, having the curved cam-faced projection I, partially surrounding the rod, and the cam C, partially encircling the stamp-rod and concentric to it, substantially as described.

In witness whereof I have hereunto set my hand.

STEPHEN KENDALL.

Witnesses:
FRANK A. BROOKS,
GEO. H. STRONG.