

C. S. STANCHFIELD.
Stamp-Mill.

No. 215,074.

Patented May 6, 1879.

Fig. 1.

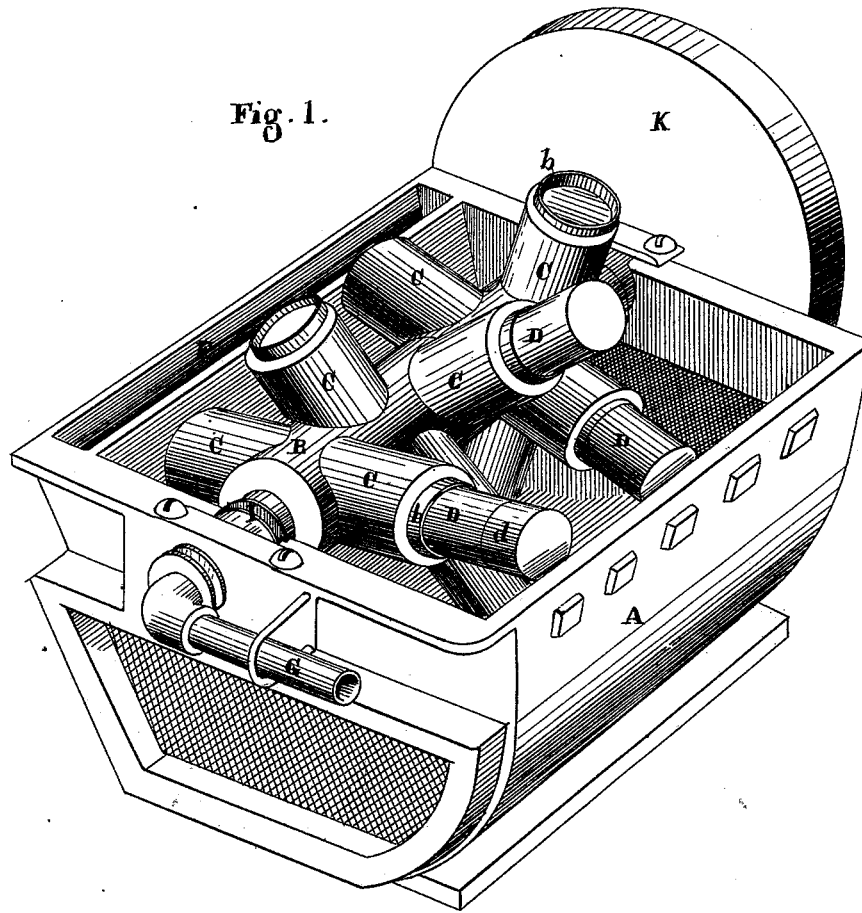
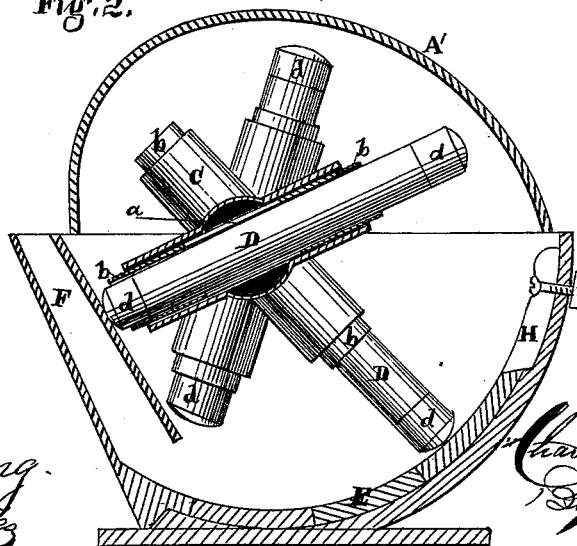


Fig. 2.



Witnesses

Leah Strong
Frank A. Brooks

Inventor

Charles S. Stanchfield
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UNITED STATES PATENT OFFICE

CHARLES S. STANCHFIELD, OF OAKLAND, CALIFORNIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO JOHN W. PRESTON, OF SAME PLACE.

IMPROVEMENT IN STAMP-MILLS.

Specification forming part of Letters Patent No. **215,074**, dated May 6, 1879; application filed February 26, 1879.

To all whom it may concern:

Be it known that I, CHARLES S. STANCHFIELD, of Oakland, county of Alameda, and State of California, have invented an Improved Stamp-Mill; and I hereby declare the following to be a full, clear, and exact description thereof, reference being made to the accompanying drawings.

My invention relates to an improved ore stamp-mill; and my improvements consist in forming upon a hollow shaft, journaled to one side of the center of an evolute or eccentric case or mortar, a series of hollow guides, properly bushed or lined, in each of which plays loosely a stamp, which strikes a blow as the shaft is rotated. These guides being attached to the shaft at right angles, and the stamps playing loosely in them, said stamps are free to move out of said guides from either end, and can strike two blows for each revolution of the shaft. The mortar being made in an evolute or eccentric form, after the stamps strike their blow they slide up the incline or curve, grinding or pulverizing the ore as they move, until they reach suitable ribs, which free the stamps from any rock that may have been carried up in the outward movement, and at this point gravity begins to act, and the stamp falls the other way and crushes the ore, said operation being repeated.

It further consists in feeding water to the mortar through the hollow shaft and guides, thereby lubricating the stamp-stems and keeping them free from grit.

Figure 1 is a perspective view of my stamp-mill with the cover removed. Fig. 2 is a section of the same.

The mortar A is made of an eccentric form, and has a correspondingly-shaped cover, A', as shown. Longitudinally across this mortar or case is placed a hollow shaft or trunnion B, on which is formed a series of cylindrical guides, C, said guides being arranged side by side, and projecting both ways from the shaft, at right angles with it. These guides are made hollow and are connected with the hollow shaft for the purpose hereinafter described. Each of the hollow guides has a steel or iron bushing, b, fitted into it, which slightly projects out of the ends of the guides, for the pur-

pose hereinafter described. Slots a are made around the center of the bushing, so as to communicate with the hollow trunnion or shaft, for the purpose hereinafter described. Stamps D slide back and forth in the guides, and have upon each end the shoes d, as shown.

In the bottom of the battery are placed the dies E, which may be formed of curved plates placed beneath the stamps, so as to be easily renewed when worn out. The end of the battery is provided with a screen, through which the pulp may pass off, the ore being fed to the stamps through the feed-opening F. As many stamps may be employed upon the shaft as are practicable, and they are set so as to have a regular interval between their drop. A pipe, G, is led into the end of the trunnion or hollow shaft, through which water may be introduced, which will flow out into the mortar through the hollow guides and keep the stamp-stem free from grit.

The operation of my device is as follows: The ore is fed in through the feed-opening, and the shaft is rotated by any suitable power. As the stamps slide freely in the guides, when the shaft is rotated at proper speed said stamps slide or drop consecutively on the ore just as it reaches the dies under the feed-opening. As the stamps drop and strike the ore they crush it, and as they are carried around by the rotation of the shaft the shoes slide along on the dies and further pulverize or grind the ore.

The mortar or case being made in an eccentric or evolute form, and the shaft being journaled at one side of the center, as shown, as each stamp slides along on the dies it gradually comes farther out of the guide, centrifugal force keeping it in close contact with the ore on the dies. Before the time, however, that it reaches a horizontal position, the pressure gradually decreases, and the shoe slides off the dies onto a rib, H, held in place by a bolt, as shown. As the stamp slides onto the rib, any ore which may have accumulated on the shoe will fall back onto the die again. Before the shoe reaches the upper end of this rib the stamp has assumed a horizontal position, and the instant it passes this position gravity will cause it to slide or drop in the

other direction and out of the other end of the guide, giving another blow upon the quartz on the dies. Each stamp, therefore, strikes two blows for each revolution of the shaft.

The water admitted to the hollow shaft is ejected through the guides, around the stamps, going first out of one end of the guide, and then out of the other, alternately, as each end is pointed downward by the revolution of the shaft. This action not only furnishes water to the battery, but also serves to lubricate the stamp-stem, and to wash off any grit or sand from the stamp. The steel bushing inside the guide, and in which the stamp slides, is made removable, the ends projecting slightly, and being beveled or brought to an edge, so as to scrape any ore or dirt off the stamp-stems, the dirt then falling back into the battery. They may be changed when worn, and prevent any wear taking place in the interior of the guide.

The rotation of the shaft is intended to be rapid enough to carry the stamps almost to a vertical line before they strike their blow, and each blow will therefore be struck at the point where the ore drops on the dies. The grinding action of the stamp as it moves over the dies is the same as that of the drag of an arrastra, which pulverizes the ore after the first crushing blow. The blow is the same as that of an ordinary stamp. The ore is therefore crushed and pulverized very rapidly.

The shaft is mounted on adjustable journals I, so as to regulate the amount of drop to the stamps.

It will be observed that as the stamps rise up the incline of the bottom of the case they gradually come farther and farther out of the guides until they assume a horizontal position. They are thus far enough back or out of the guides to have plenty of room to fall in striking their blow, some two-thirds of their length being back of the center of motion.

The amount of water fed to the battery may be regulated by a valve in the water-pipe. The ribs on the casing equal the stamps in number, one rib being provided for each stamp. Power is applied to the shaft by the wheel K,

at the opposite end from which the water enters.

In case of dry-crushing, a blast of air may be forced through the hollow shaft instead of water, and the grit kept out of the bushing by that means.

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

1. The case or mortar A, with its dies E set eccentrically to the shaft B, and provided with the ribs H above the grinding-surface, in combination with the stamps D, sliding through the guides, so as to strike the dies with each end alternately, and be carried over the dies and ribs, substantially as and for the purpose herein described.

2. The horizontal shaft B, turning in the case or mortar A, and having the guides C, through which the stamps D slide and operate, as shown, said guides having the removable bushing b, substantially as and for the purpose herein described.

3. The horizontal shaft B, turning in the case or mortar A, and having the guides C, to receive and direct the stamps D, operating as shown, said shaft being made hollow to receive a stream of water or air, and discharge it centrally around the stamp-stems by means of the apertures a, substantially as and for the purpose herein described.

4. The ore-stamp and grinding apparatus, consisting of the case or mortar A, with its feed-hopper F, screens or discharge-openings, and the dies E, as shown, in combination with the horizontal shaft B, with its guides C and double-acting stamps D, and the air or water pipe G, whereby the stems are lubricated and dust or sand is kept out of the guides, substantially as herein described.

In witness whereof I have hereunto set my hand.

C. S. STANCHFIELD.

Witnesses:

GEO. H. STRONG,
FRANK A. BROOKS.