D. H. ANDERSON.

Ore-Feeder for Stamp-Mills.

No. 213,373 Patented Mar. 18, 1879.

Fig. 2.

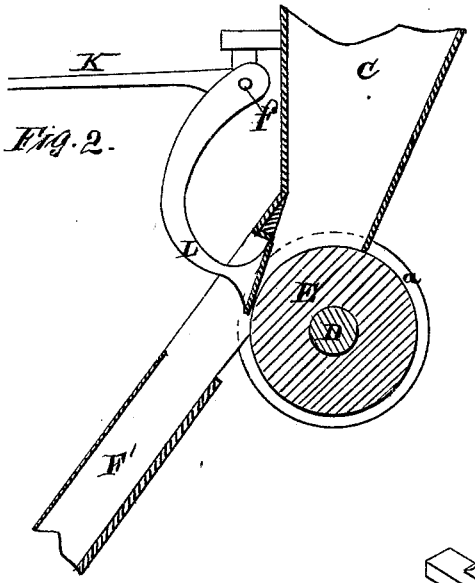
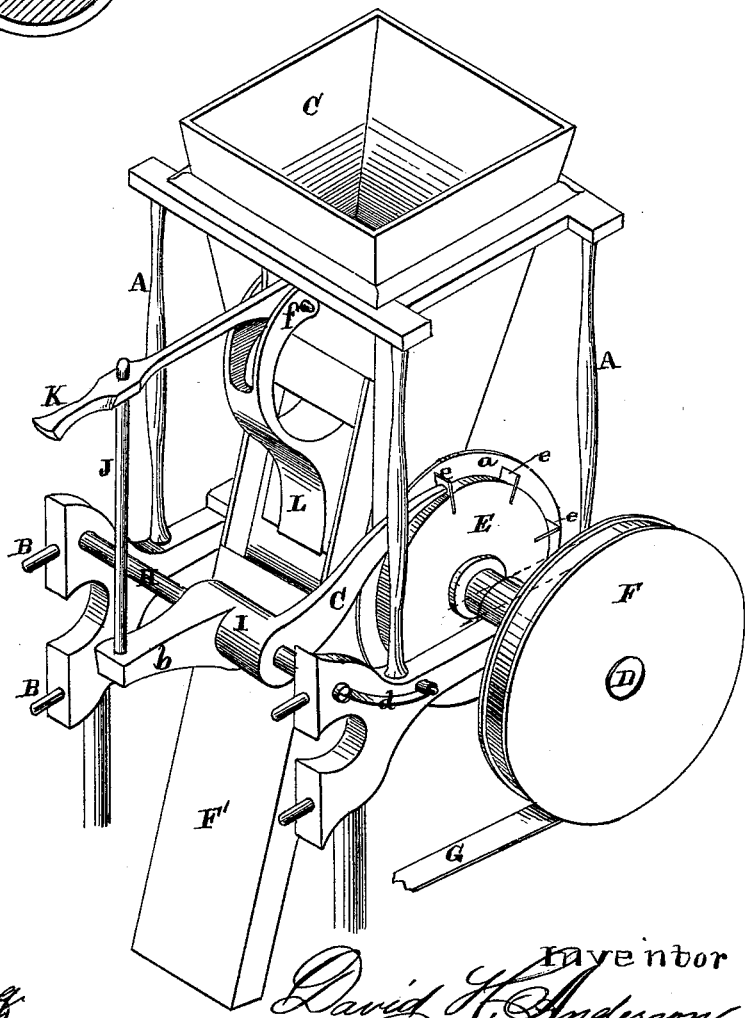


Fig. 1



Witnesses

Geo. H. Strong.

Frank A. Brooks

Inventor

David H. Anderson

By Dewey & Co.

Attys.

UNITED STATES PATENT OFFICE.

DAVID H. ANDERSON, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF HIS RIGHT TO SAMUEL K. GOLDTRAP, OF CENTREVILLE, IDAHO TERRITORY.

IMPROVEMENT IN ORE-FEEDERS FOR STAMP-MILLS.

Specification forming part of Letters Patent No. **213,373**, dated March 18, 1879; application filed December 2, 1878.

To all whom it may concern:

Be it known that I, DAVID HENRY ANDERSON, of the city and county of San Francisco, and State of California, have invented an Ore-Feeder for Stamp-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 that class of feeding devices such as are used for mechanically feeding ore to quartz-mills; and my improvements consist in mounting on a shaft under the hopper a feed-roller, which has flanges coming up on each side of the lower end of the hopper, said roller being rotated by a belt-and-pulley connection. On the edge of the periphery of this feed-roller is a series of radially-projecting lugs or stops, with which a finger or trigger engages to prevent the rotation of the feed-roller, except when a tappet on the stamp-stem strikes a lever suitably connected with the trigger, when the trigger is released from the lug, and the belt rotates the feed-roller and feeds the ore until the trigger strikes the next lug. Every time the stamp falls the feed-roller is allowed to revolve a certain distance and feed a certain amount of ore into a chute leading to the mortar, in which the ore is crushed.

It further consists in the use of a peculiarly-formed automatic gate for closing the opening between the lower end of the hopper and the chute, so that the ore is fed more regularly than when left free to run direct from the feed-roller.

Suitable arrangements are made for regulating the lift of the trigger, so as to clear it of the lugs, and the belt operating the roller is kept slack, so as to slip when the roller is kept stationary by the trigger engaging with the lug.

The peculiar arrangement of the device enables me to feed the ore by a positive motion, and admits of coarse or fine, wet or dry, ore being fed with great regularity and precision as to amount.

Figure 1 is a perspective view of my device. Fig. 2 is a sectional view.

The frame A may be mounted on standards and wheels, or may be attached to the frame-work of the battery by means of the bolts or stays B.

The hopper C is secured to the frame in any suitable manner; and at a proper distance under it, across the frame-timbers, is journaled the shaft D, on which is the feeding-roller E. This feeding-roller has flanges *a* formed on it, and the lower end of the hopper fits between these flanges, the roller fitting snug up to the curved opening in the lower end of the hopper. That portion of the hopper in contact with the rollers is cut rounded to fit to the roller; but an opening is left in the front of the hopper for the ore to pass into the chute F′, which leads it to the mortar, where the ore is crushed.

On the end of the shaft D is a pulley, F, connected by a belt, G, with a pulley on the driving-shaft, so that the feed-roller is rotated toward the battery. This belt is somewhat slack, so that it will slip when necessary, as hereinafter described.

In a suitable position across the frame is placed a shaft, H, on which is keyed an adjustable collar or sleeve, I, having a short arm, *b*, projecting one way, and a long pointed arm, *c*, projecting in an opposite direction. On the end of the short arm is an upright rod, J, which screws into a lever, K, said lever being hinged at one end to that part of the frame supporting the hopper, its outer end projecting past the rod J in a position so that a tappet or lug on the stamp-stem will drop upon it as the stamp drops.

A spring, *d*, is attached to the frame and to the shaft H, so that as the downward pressure on the short arm *b* is released the shaft will rotate back, and said short arm push the upright rod J back, so that the lever K will be in position for the tappet to strike it at the proper point. The object of this part of the mechanism is not to give motion to the feeding-roller, but to check and control its movements, as hereinafter described.

On the periphery of the feeding-roller E, near its edge, are placed a series of radially-projecting lugs, *e*, with which the pointed end of the long arm or trigger *c* engage, except when said

trigger is raised by the short arm keyed on the same shaft being depressed by the tappet on the stamp-stem, forcing it down by means of the lever and rod, as described.

The operation of my device is as follows: The ore is led or shoveled into the feed-hopper, and the belt G on the pulley F placed on the driving-pulley, connected with the line or counter shaft. This belt is intended to be loose, so as to slip on the driving-pulley or driving-shaft when the motion of the pulley F is retarded or stopped. Until the battery is started up this pulley F cannot revolve, as the trigger *c* engages with the lugs on the feed-roller, said roller being secured to the same shaft as the pulley F.

When the battery is started up and the lug or tappet on the stamp-stem drops onto the lever K, the trigger *c* is lifted free of the lug *e* on the feed-roller, and said roller is revolved by the belt G operating the pulley F on the feed-roller shaft. The roller then revolves until the finger strikes the next lug, when it is again stopped.

The feed-roller is thus alternately stopped and allowed to feed, the belt slipping when the finger holds the feed-roller. When there is ore enough under the stamp there is, of course, not so much drop to it, and the tappet does not strike the lever to lift the finger. The roller is at that time kept stationary by the finger engaging with the lug, and no ore is fed. As soon, however, as the ore under the stamp is crushed, the tappet strikes the lever, the roller revolves, and more ore is fed to the stamp.

The lugs on the roller are set at suitable distances apart, and as soon as the finger is lifted over one lug the roller revolves until the finger engages with the next, and so on as long as ore is needed.

To more effectually control the feed, on that part of the frame on which the hopper is mounted is hinged or swiveled, as shown at *f*, a peculiarly-shaped automatic door or gate, L, which closes the opening between the lower front open end of the hopper and the spout. This gate or door is made preferably of metal, and is formed of a curved neck having a broad lower end or head, of suitable size and shape to close the opening between the hopper and spout. The gate is hung on a hinge at *f*, and swings by its own weight and shape, so as to close the opening, but is free to be pressed outward by the ore in the hopper as said ore is pushed against it by the revolving roller.

When the roller is in a state of rest the gate remains against it, and no ore falls into the spout; but as soon as the roller begins to revolve, the ore brought forward by it from the hopper pushes the gate away from the opening, and the ore passes into the chute. The moment, however, the rotation of the roller stops, the gate, by its peculiar form and construction, automatically closes against the roller, and no ore can pass through. This peculiarly-formed gate, in combination with the peculiarly-operating feed-roller, enables the feeder to feed wet or dry, coarse or fine, ore indiscriminately and with equal facility. The gate is hung so as to be properly balanced and always press with a certain amount of force against the roller, which pressure must be overcome by the ore and action of the roller, as described, before any ore can pass from the hopper.

It will be observed that my device operates in an opposite manner from those ore-feeders which receive their motive power by mechanism connected with the lever which the tappet strikes.

In most of the ore-feeders the drop of the stamp gives motion to the feeding-table, roller, or other device.

In my apparatus the motion of the feeding-roller is imparted by belt and pulley, so that this motion is positive, and not dependent on springs, ratchet and pawl, or mechanism requiring care or adjustment. At the same time the control of the feed rests with the stamp, as it should do, in order that ore may be fed or not, as required; but all that the lever on which the tappet strikes has to do is to move the finger from the lug and allow the feed-roller to revolve, but not actuate the feed mechanism, as is usually its duty. There is therefore no jerk or sudden movement of the ore from the feeder to the spout, as there would be if the lever actuated the roller; but when the roller is released, as described, the ore is fed smoothly and regularly in equal quantities.

The ore cannot pile up and come into the battery with a rush caused by the sudden movement of the feeding mechanism, and feed in a large quantity at once; but it feeds slowly and surely in regular quantities, the feed-roller being put in motion gradually by the belt and pulley when released by the finger.

The action of the peculiarly-operating gate is such as to facilitate regular feed with all kinds of ore, and it is so connected with the roller as to control the finest as well as the coarsest ore.

This feeder may be used with stamp-mills of any class; but I have designed it particularly for use with a stamp for which I have applied for Letters Patent, and in that the motion of the stamp is so much more rapid than in those of ordinary construction that the common ore-feeder does not work satisfactorily in combination with it.

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

In a quartz-feeder, a rotating feed-drum having continuously-applied power, in combination with an automatic intermittent detent, for the purpose set forth.

In witness whereof I have hereunto set my hand.

DAVID H. ANDERSON.

Witnesses:
CHAS. G. YALE,
FRANK A. BROOKS.