(No Model.)

2 Sheets—Sheet 1.

P. HINKLE.

ORE FEEDER.

No. 420,424. Patented Jan. 28, 1890.

Fig. 1.

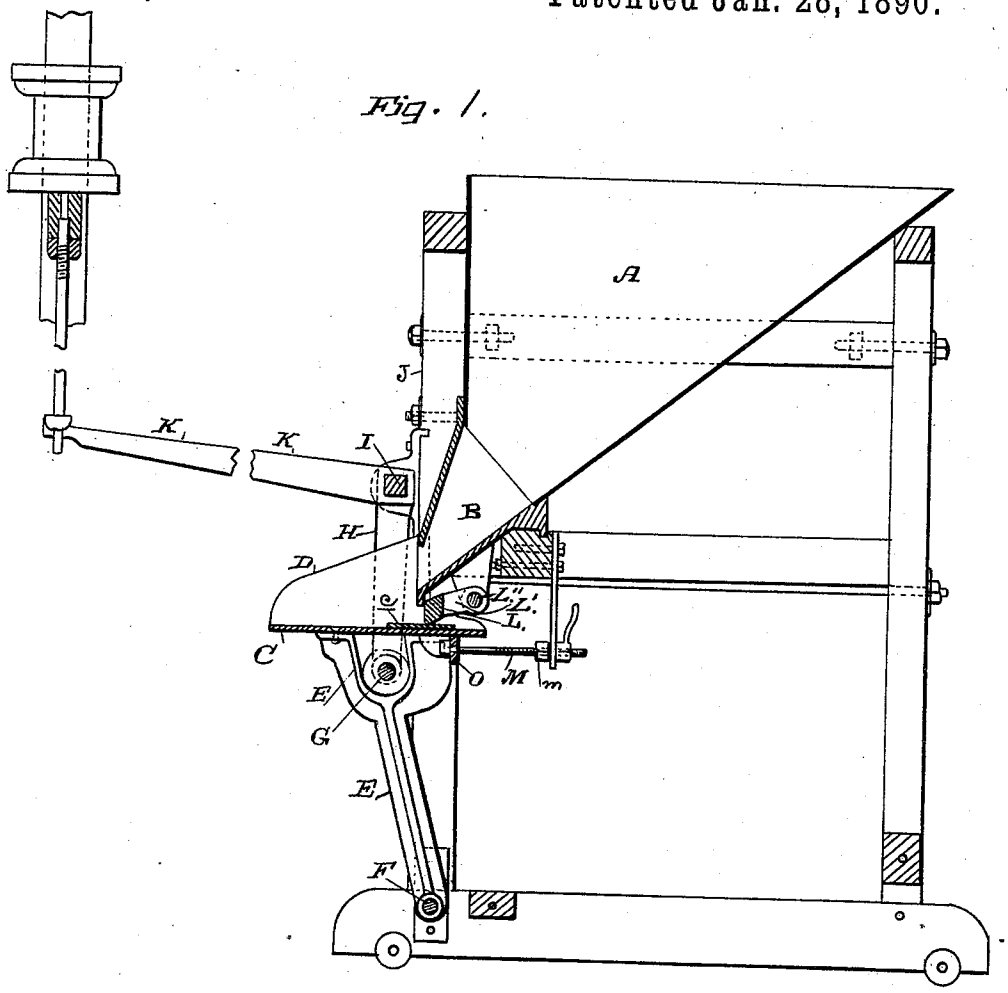
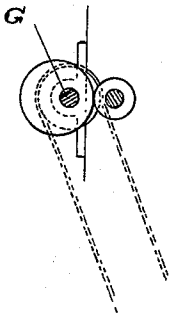


Fig. 3.



Witnesses,
Geo. H. Strong.
J. Bonsall

Inventor,
Philip Hinkle
By Dewey & Co.
Attys

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

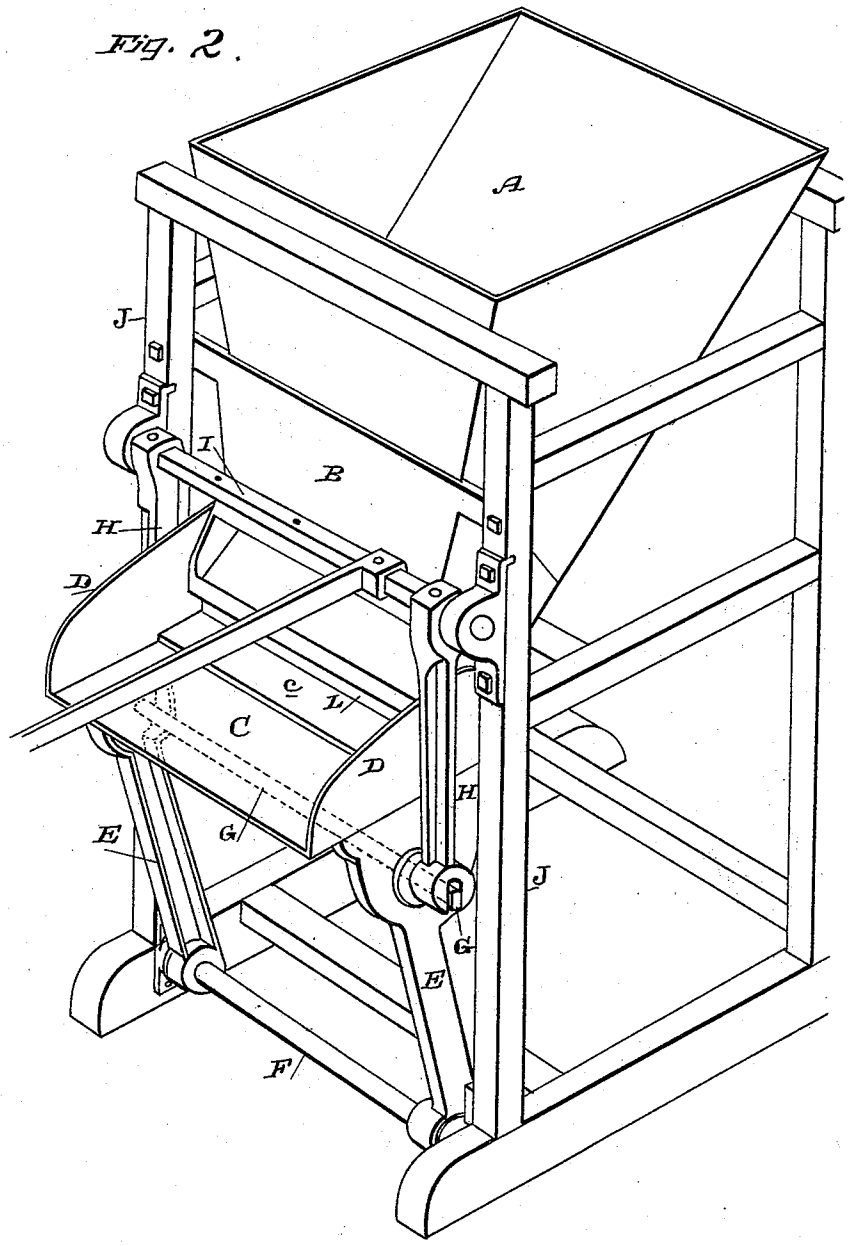
2 Sheets—Sheet 2.

P. HINKLE.

ORE FEEDER.

No. 420,424. Patented Jan. 28, 1890.

Fig. 2.



Witnesses,
Geo. H. Strong.
J. L. Morse

Inventor,
Philip Hinkle
By Dewey & Co.
Attys

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

PHILIP HINKLE, OF SAN FRANCISCO, CALIFORNIA.

ORE-FEEDER.

SPECIFICATION forming part of Letters Patent No. 420,424, dated January 28, 1890.

Application filed October 2, 1889. Serial No. 325,768. (No model.)

To all whom it may concern:

Be it known that I, PHILIP HINKLE, a citizen of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Ore-Feeders; and I hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to an improved ore-feeder; and it consists in certain details of construction which will be more fully explained by reference to the accompanying drawings, in which—

Figure 1 is a longitudinal vertical section taken through the hopper and the feeder. Fig. 2 is a perspective view. Fig. 3 is a detail to be referred to.

A is the hopper or receiver, into which the ore or material to be fed is first placed, and B is a discharge-chute, which is secured to the lower edge of the hopper and through which the ore passes upon the feeding-tray C. This chute or discharge opening B, I form preferably of cast-iron of sufficient thickness and strength, and the thinner sheet-metal hopper A is riveted or otherwise secured to the flanges of the chute. This relieves the hopper itself from wear at the lower or discharge end and obviates the necessity of replacing the entire hopper by reason of the lower end wearing out from the friction of the passing ore.

The feeding-tray C has the upwardly-projecting sides D, which extend up upon either side of the discharge mouth-piece B of the hopper, and from the bottom of this table arms E extend downwardly, the tray being properly bolted or secured to the upper ends of these arms, as shown. The lower ends of the arms are fulcrumed upon a shaft F, so that the arms and the tray may move about this fulcrumed point, as will be hereinafter described. This fulcrum-shaft is set so that the arms E incline backwardly from the tray to the shaft, and the tendency of the tray will always be to fall forward by reason of this construction.

Through the upper part of the arms E and just below the tray holes are made, through which a shaft G passes. The ends of the shaft are fitted in the lower ends of arms H, as shown, and the upper ends of these arms are fixed upon a shaft I, which is journaled across the frame-timbers J of the feeder. A lever-arm K is fixed to this shaft and extends outwardly toward the front of the machine, having its outer end so formed that the falling tappet of the stamp-mill will strike the end of this lever, and thus cause a slight oscillation of the shaft and a corresponding backward movement of the feeding-tray. As soon as the stamp-stem again rises so as to release the end of the lever-arm, the weight of the tray and the ore upon it causes it to fall forward by reason of the angular position of its supporting-arms and the weight being thus thrown forward of the fulcrum.

The tappet-arm K is movable upon its shaft and is adjustable, so that any one of the stamps of the battery will engage it as may be desired.

If the feeder is to be used in conjunction with the rotary or other forms of crushers than stamps, the horizontal shaft G may have eccentrics fitted upon it to rotate in the upper ends of the supporting-arms E, so as to cause the oscillation of the tray, either of these forms of actuating mechanism being employed, according to the kind of crusher which is to be used.

Beneath and slightly behind the discharge-mouth piece B of the hopper I fit loosely a steel bar L, which is shown in the present case as having a rhomboidal cross-section, so that one of its acute angles will rest upon the tray C, behind the discharge-opening of the hopper. This bar has rearwardly-extending arms L′, which are loosely mounted upon a shaft L″, located in the rear of the discharge and in the line of the thrust of the work, whereby the bar is permitted to rise and fall in a substantially-vertical plane, and the lower front edge of said bar rests upon the top surface of the tray just behind the discharge-mouth of the hopper.

The operation of the feeder is as follows: Ore placed in the hopper will fill it and a portion will flow out through the mouth upon the tray C, and when by the swinging or oscillation of the tray it moves forward another portion of ore will move out upon the tray. When the tray has again moved backward,

the transverse bar L will prevent the ore moving backward, and will force it forward a short distance upon the tray, depending upon the amount of oscillation which is given to the tray. The next forward movement of the tray carries this body of ore forward with it and allows another small portion to flow out of the hopper, and when the front portion of the ore has reached the front edge of the tray by these successive movements it will be gradually caused to fall off and drop into the crushing apparatus of whatever description may be employed. The amount of movement of the tray is regulated by the rod M passing through the fixed plate O and the adjusting-nuts *m*. By screwing these nuts one way or the other upon the rod the tray will be drawn back or allowed to fall forward, and thus the amount of motion which is given it will be regulated. A removable steel plate *c* is fixed to the tray below the bar L to take the wear. When the eccentric is used to actuate the tray, the movement of the latter will be a positive one and dependent upon the throw of the eccentric; but if the tray is to be used with a stamp-mill, as first described, the weight of the tray and the ore upon it in front of the fulcrum will cause it to move forward promptly by gravitation as soon as released from the power which draws it back. The loosely-fixed bar, which acts as a stop and pusher upon the tray, being made of steel will be subjected to little or no wear, and will always lie closely upon the tray, so as to prevent any escape of ore to the rear. It can also be easily removed and replaced at any time.

The advantage of the tray supported from below is that moving about a fulcrum-point which is below the tray the tray moves in a small convex arc of a circle, which is more conducive to its prompt return after having been forced back, and also produces a better result in feeding.

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

1. In an ore-feeder, the combination, with a receiving-hopper having a discharge-opening at its lower end, of a horizontally-operating tray, a horizontal bar having rearwardly-extending arms, and having its front lower edge resting upon the tray behind the discharge-opening of the hopper, and a shaft, on which said arms are mounted, in rear of the discharge of the hopper and in line with the thrust of the work, whereby said bar may rise and fall in a substantially vertical plane, substantially as described.

2. In an ore-feeder, the receiver or hopper having a discharge-mouth at its lower end, a horizontal tray having sides projecting upwardly outside of the discharge-mouth of the hopper, and arms secured to the bottom of said tray and extending downwardly therefrom, and a journaled or fulcrumed shaft about which these arms turn, said arms supporting the tray and standing at an angle, so that the tray will fall forward by gravitation, means by which the tray is caused to swing about the fulcrum-points, a loosely-retained bar back of the discharge end of the hopper, having rearwardly-extending arms, and having its lower front edge resting upon the tray, and a shaft in rear of said bar, upon which said rearwardly-extending arms are pivoted, said shaft being in line with the thrust of the work, substantially as described.

In witness whereof I have hereunto set my hand.

PHILIP HINKLE.

Witnesses:
S. H. NOURSE,
H. C. LEE.