

(No Model.)

J. R. RUSSELL.
ORE FEEDER.

No. 466,881.

Patented Jan. 12, 1892.

Fig. 1.

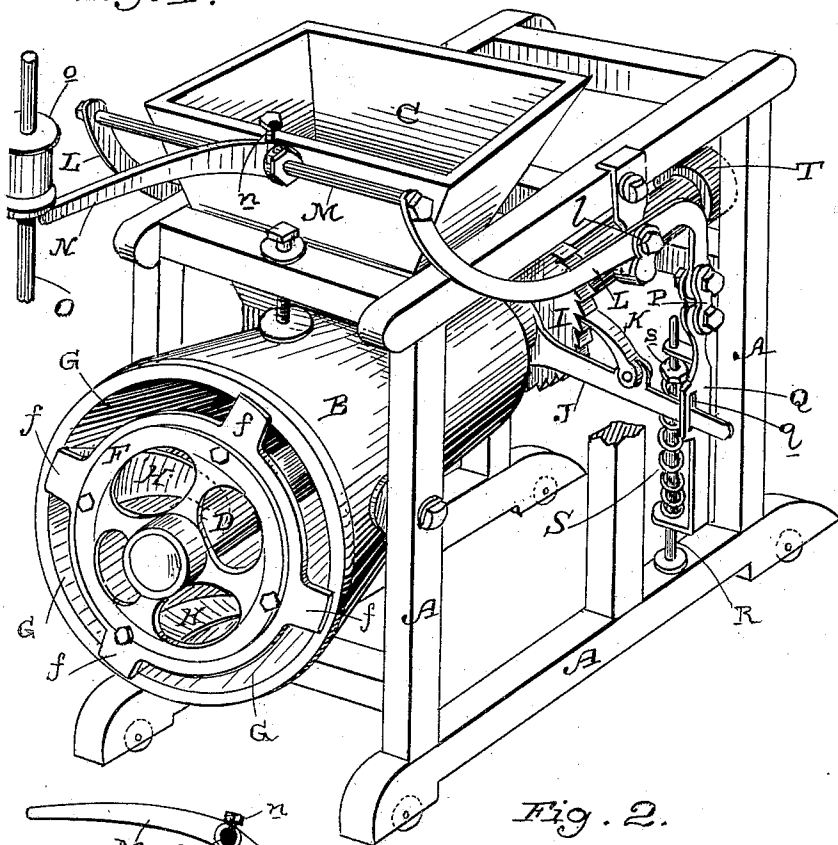
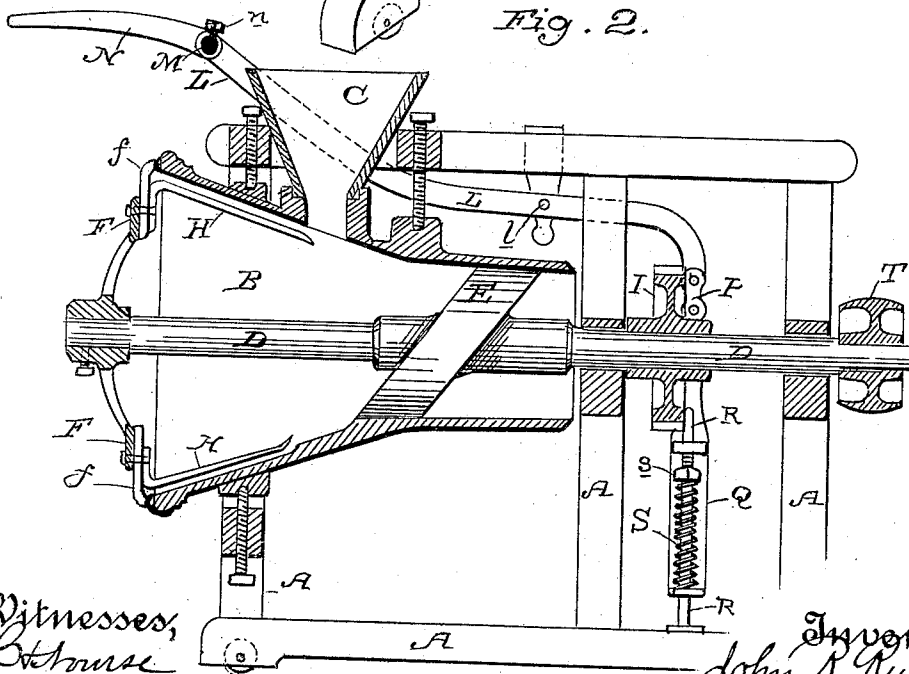


Fig. 2.



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UNITED STATES PATENT OFFICE.

JOHN R. RUSSELL, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR OF ONE-HALF TO FRED C. KELLER, OF SAME PLACE.

ORE-FEEDER.

SPECIFICATION forming part of Letters Patent No. 466,881, dated January 12, 1892.

Application filed September 8, 1891. Serial No. 405,133. (No model.)

To all whom it may concern:

Be it known that I, JOHN R. RUSSELL, 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 do hereby declare the following to be a full, clear, and exact description of the same.

My invention relates to that class of ore-feeders in which the device is placed in communication with the mortar of the stamp-battery and is operated by the drop of the stamps through the contact of the tappet of the stamp-system with suitable power-transmitting connections.

My invention consists in the novel details of construction and arrangement hereinafter fully described, and specifically pointed out in the claims.

The general object of my invention is to provide a simple, effective, and automatic ore-feeder.

Particular objects and advantages will be hereinafter set forth in connection with the description of the several features.

Referring to the accompanying drawings for a more complete explanation of my invention, Figure 1 is a perspective view of my ore-feeder. Fig. 2 is a vertical longitudinal section of same.

A is the frame or stand of the device, adapted to be located in proper position with respect to the mortar of the battery, as usual. Secured to this frame or stand is the fixed feed-barrel B, which is located horizontally and is open at both ends. Though this barrel may have any suitable shape, I have here shown it in the shape which I deem the best and which of itself constitutes an improvement—namely, having its forward portion outwardly flanged or conical, as shown, and its rear end cylindrical.

C is the hopper, supported in the upper portion of the frame or stand and having its lower end in communication with the barrel.

D is a shaft mounted in the frame or stand and extending through the longitudinal axis of the barrel. Upon this shaft and located and operating within the back or cylindrical portion of the barrel is the pusher-plate E, which consists of a band or ring having a hub

by which it is fitted upon and secured to the shaft D and rotates with it. This pusher-plate is mounted with respect to the shaft and the barrel at an inclination, as shown, whereby it acts during its rotation as a screw or propeller for forcing the ore forward in the barrel.

Firmly secured to the forward end of the shaft D is the regulating-plate F, smaller in diameter than the diameter of the front of the barrel and having projecting from its rim arms *f*, which overlap and bear upon the face of the barrel, forming guides and also leaving feed-spaces G between them and around the rim of the plate. When wet or sticky ore is being fed, I secure to the inner side of this regulating-plate the scraper-arms H, which extend inwardly into and play over the inner surface of the barrel, said arms being on a curve, as shown, whereby they act to continually force the wet or sticky ore forward to its discharge. These arms, however, may be readily removed, as they are not required when feeding dry ore or ore which has no tendency to stick.

The connections for operating the shaft D are as follows: I is a ratchet upon said shaft. Pivoted upon the shaft is a pawl-carrier J, to which is connected a pawl K, adapted to engage the ratchet. Pivoted to the sides of the frame A at the points *l* are levers L, which extend forwardly and upwardly and have secured between their forward ends the cross-bar M. Upon this cross-bar is secured the presser-arm N, said arm extending forwardly and lying beneath and in the path of the tappet *o* on the stamp stem O. This presser-arm is mounted upon the cross-bar M adjustably, so that it may be raised or lowered or may be moved sidewise and be set in position by means of a screw *n*. The first adjustment enables it to be regulated to proper position for any height of tappet, and the second adjustment enables it to be set under any of the tappets of the stamp-battery.

The rear ends of the levers L are connected by links P with frames Q, mounted and adapted to slide vertically upon standards R, rising from the stand A. These frames are held down by means of springs S on the standards, which said springs have their upper

ends bearing against adjustable nuts *s* on the standards and their lower ends bearing against the bases of the frames. The springs can have their tensions regulated, as required, by setting the nuts up or down.

The end of the pawl-carrier *J* is slotted through one of the frames *Q*, as shown at *q*. Upon the rear end of the shaft *D*, I have shown a pulley *T*, in order to illustrate the means for applying a belt power to the feeder, if desired.

The operation of the machine is as follows: The ore is placed in the hopper and is fed by it down into the barrel *B*. The rotation of the shaft *D* within the barrel causes the rotation of its pusher-plate *E*, which said plate constantly forces the ore forward in the barrel toward and out through its discharge end into the mortar. At this discharge end the feed of the ore is properly restricted and regulated by the plate *F*, through the rim-apertures *G* of which it passes in proper quantities. When wet or sticky ore is being fed, the scraper-arms *H* are attached to the regulating-plate, and they serve to assist and positively feed the ore forward to its discharge. The rotation of the shaft is an intermittent one when dependent upon the drop of the stamps. The power of the stamps is transmitted through the presser-arm *N*, vibrating levers *L*, vertically-movable frames *Q*, and pawl and ratchet to rotate the shaft. The novelty in these power-transmitting connections is that by means of the springs returning downwardly the presser-arm is kept in a position directly under the stamp-tappet; or, in other words, the arm follows the movement of the tappet up and down and bears against it all the time.

In the ordinary machines of this class the striker-arm does not follow the tappet, but has its own limits of movement, so that the tappet strikes it a blow at every drop; but with my connections the movement is not dependent upon a blow, but the arm follows the tappet up by reason of the springs *S* and moves down under the fall of the tappet. This provides for a strict self-feed for the reason that the mechanism will operate only according to the movement of the stamp and within its limit, so that if the mortar be crowded under said stamp it cannot move the device sufficiently to effect its operation until the ore has been distributed free of the stamp. This construction, by avoiding all striking, prevents the usual jarring and racking of the feeder.

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 of a feed-barrel having an open forward end in communication with the mortar of the stamp-battery, a hopper above the barrel and communicating therewith, a rotary shaft mounted in the longitudinal axis of said barrel, and the inclined pusher-plate mounted upon the

shaft at a point back of the communication between the hopper and the barrel and rotating with said shaft, substantially as herein described.

2. In an ore-feeder, the combination of a feed-barrel having an open forward end in communication with the mortar of the stamp-battery, a feed-hopper located above and communicating with said barrel, a rotary shaft mounted in the longitudinal axis of said barrel, the inclined pusher-plate mounted upon the shaft at a point back of the communication of the hopper with the barrel and rotating with said shaft, and the apertured regulating-plate mounted on the forward end of the shaft and operating over the discharge end of the barrel, substantially as herein described.

3. In an ore-feeder, the combination of a feed-barrel having an open forward end in communication with the mortar of the stamp-battery, a feed-hopper located above and communicating with said barrel, a rotary shaft mounted in the longitudinal axis of said barrel, the inclined pusher-plate mounted upon the shaft at a point back of the communication of the hopper with the barrel and rotating with said shaft, and the apertured regulating-plate mounted on the forward end of the shaft and operating over the discharge end of the barrel, said plate having radial arms extending from its rim and bearing on the forward end of the barrel, substantially as herein described.

4. In an ore-feeder, the combination of the feed-barrel having the outwardly-flaring or conical forward end, a rotary shaft therein, an apertured regulating-plate on the forward end of the shaft, and the curved scraper-arms secured to said plate and operating over the interior of the conical end of the barrel, substantially as herein described.

5. In an ore-feeder, the combination of the feed-barrel having an outwardly-flaring or conical forward end, the rotary shaft mounted longitudinally therein, the inclined pusher-plate on said shaft operating within the rear end of the barrel, the apertured regulating-plate on the forward end of the shaft controlling the discharge end of the barrel, and the curved scraper-arms secured to said plate and operating over the inner surface of said barrel, substantially as herein described.

6. In an ore-feeder, the ratchet, vibrating pawl-carrier, and pawl for operating the feeding mechanism, in combination with the sliding frames operating said pawl-carrier, the springs for holding said frames down, the pivoted levers connected with said frames, and the presser-arm connected with said levers and adapted to bear constantly under the stamp-stem tappet, substantially as herein described.

7. In an ore-feeder, the feed-barrel having the rotary shaft, and suitable feeding devices upon said shaft, in combination with the means for operating the shaft, consisting of

the ratchet on the shaft, the pawl-carrier having the pawl engaging the ratchet, the vertically-movable frames with which the pawl-carrier is connected, the springs for holding said frames down, the levers connected with the frames, the cross-bar between the forward ends of the levers, and a presser-arm on said cross-bar, substantially as herein described.

10 8. In an ore-feeder, the barrel, the shaft passing through it, the inclined pusher-plate on said shaft operating within the rear end of the barrel, and the apertured regulating-plate on its forward end, operating over the
15 forward end of the barrel, in combination with the means for operating the shaft, con-

sisting of the ratchet on the shaft, the pawl-carrier having the pawl engaging the ratchet, the vertically-movable frames with which the pawl-carrier is connected, the springs for holding said frames down, the levers connected with the frames, the cross-bar between the forward ends of the levers, and a presser-arm on said cross-bar, substantially as herein described.

In witness whereof I have hereunto set my hand.

JOHN R. RUSSELL.

Witnesses:

S. H. NOURSE,
J. A. BAYLESS.