(No Model.)

E. C. LOFTUS & E. H. BOOTH.

ORE FEEDER.

No. 429,857. Patented June 10, 1890.

Fig. 1.

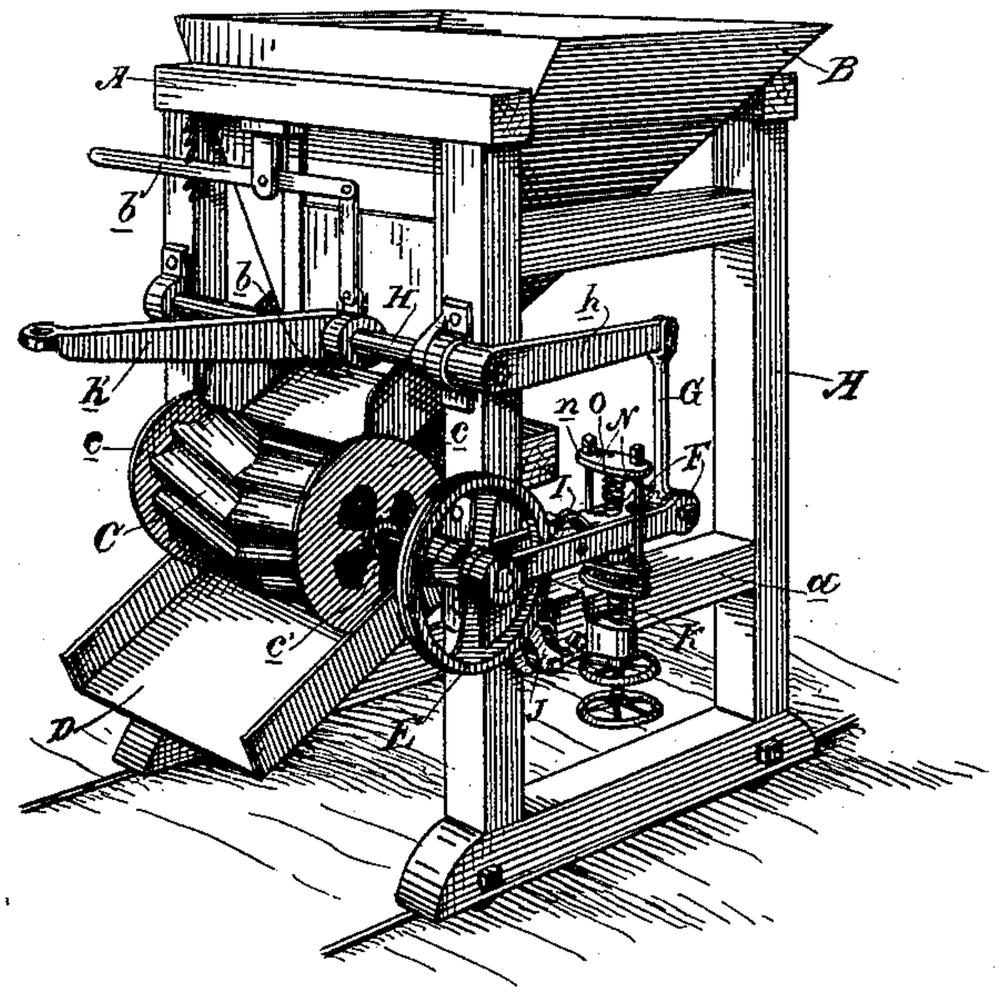


Fig. 3.

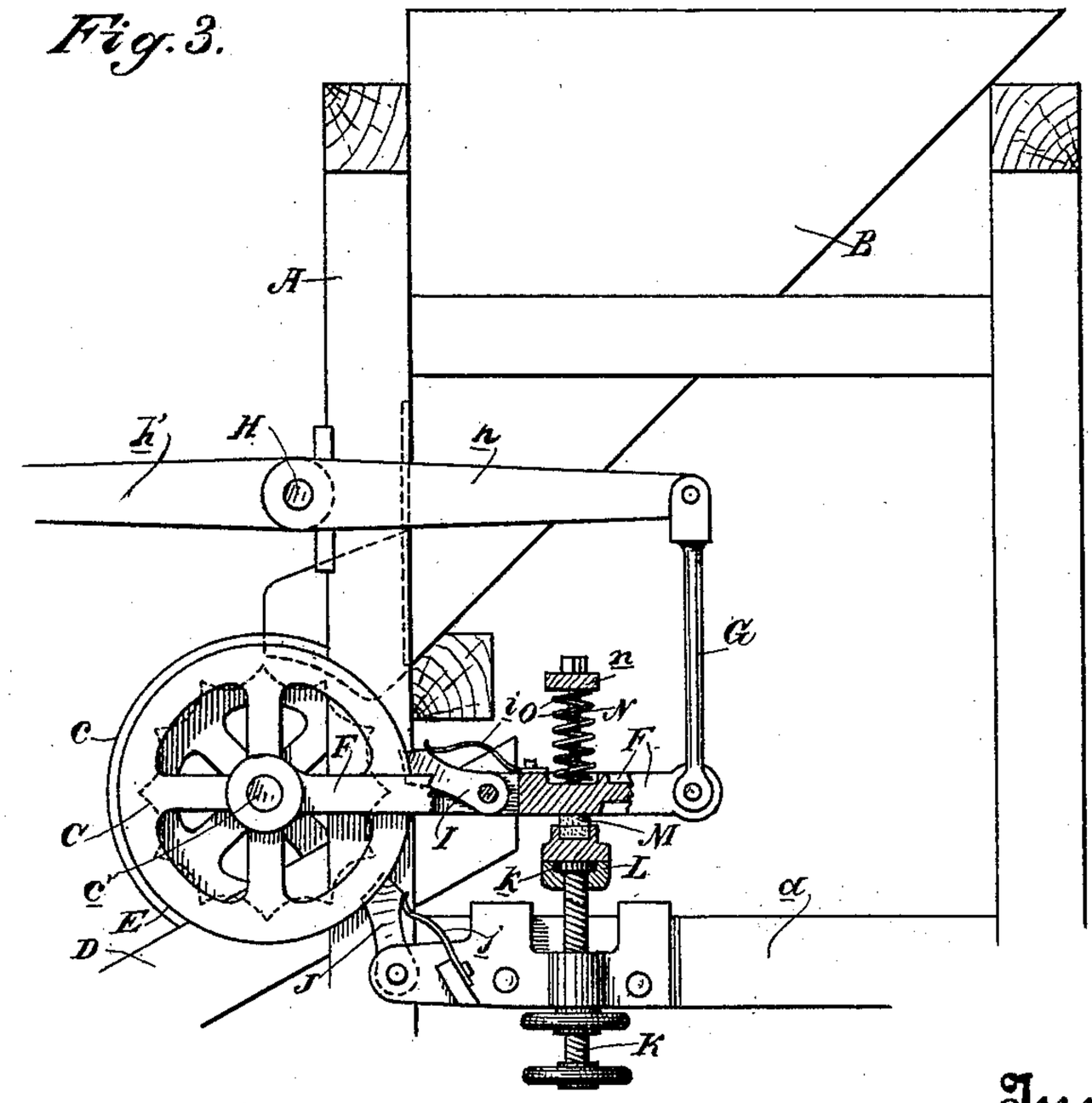
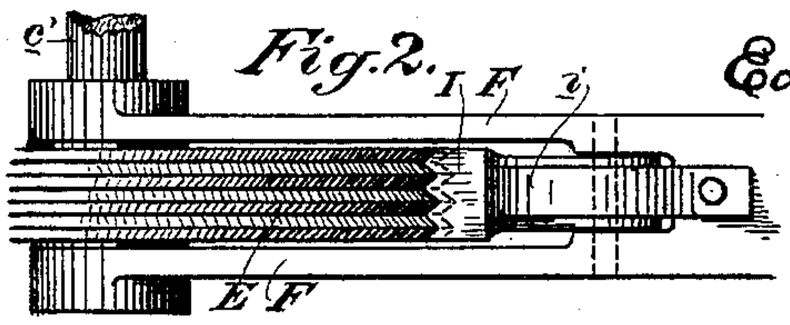


Fig. 2.



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EDWARD C. LOFTUS AND EDGAR H. BOOTH, OF SAN FRANCISCO, CALIFORNIA.

ORE-FEEDER.

SPECIFICATION forming part of Letters Patent No. 429,857, dated June 10, 1890.

Application filed January 27, 1890. Serial No. 338,280. (No model.)

To all whom it may concern:

Be it known that we, EDWARD C. LOFTUS and EDGAR H. BOOTH, citizens of the United States, residing in the city and county of San Francisco, State of California, have invented an Improvement in Ore-Feeders; and we hereby declare the following to be a full, clear, and exact description of the same.

Our invention relates to that class of ore-feeders in which the ore is delivered by a suitable hopper upon a rotating cylinder, by which it is discharged into the mortar of the battery, the motion of said cylinder being derived from and regulated by the drop of the stamps.

Our invention consists in the novel construction of the feed cylinder or roller, and in the mechanism by which it is operated, as we shall hereinafter fully describe, and specifically point out in the claims.

The general object of our invention is to provide a simple and effective ore-feeder of this class. Particular objects will appear in the course of this specification.

Referring to the accompanying drawings for a more complete explanation of our invention, Figure 1 is a perspective view of our ore-feeder. Fig. 2 is a detail showing the engagement of the pawls with the drive-wheel of the feed roller or cylinder. Fig. 3 is a detail of the adjusting and spring mechanism.

A is the frame of the feeder, in which is mounted the usual hopper B, the mouth *b* of which is controlled by a suitable gate (unnecessary herein to show) and operated by the lever and connections at *b'*.

C is the feed roller or cylinder. This is mounted transversely of the front of the frame, and lies directly under the mouth of the hopper, whereby it is adapted to receive the ore therefrom. This cylinder or roller is provided with end flanges *c* to confine the ore, and its peripheral surface is corrugated, as shown. The peculiarity in this portion of the invention rests in the inclined or spiral direction of the corrugations of the peripheral surface of cylinder or roller. These corrugations are preferably spirally directed from each end in opposite directions, meeting and joining in the center, forming apices at this point. They are wide and shallow, so that the ore will not stick in them, and enough pitch is given to each to tend to direct the ore centrally or to each side, according to the position of the roller, whether it is put in, as shown in the drawings, or reversed end for end. We have found this spiral or inclined corrugated surface more positive in its feed with wet or sticky ore, the corrugations insuring more uniform feeding of the ore along the entire face of the roller or cylinder, and their spiral or inclined form allows only a portion of the ore carried forward by them to drop into the mortar at a time, making the feed constant and continuous. It is obvious that if the corrugations on the roller were in the plane of its axis the entire mass of ore in each depression would be delivered at once into the mortar, but by having the corrugations inclined or spirally arranged, as shown, the ore is dropped out gradually by each depression as the cylinder reaches a certain point, and is continuously and evenly distributed.

D is the chute, into which the roller discharges the ore and from which it is delivered into the mortar.

The mechanism for driving the feed roller or cylinder is as follows: Fast upon the end of the shaft *c'* of the cylinder or roller is a drive-wheel E, the periphery of which is grooved or channeled, as shown in Fig. 2. Mounted loosely upon the shaft and on each side of the wheel are the bars F, between the rear ends of which is pivoted the link G, the upper end of which is connected with the crank *h* on the end of a rock-shaft H, mounted on the front of the frame A, and having extending forwardly from it the crank-arm *h'*, which is to receive the stroke of the tappet of the stamp-stem. Carried by the bars F is an actuating friction-pawl I, the frictional face of which is grooved or channeled, as shown in Fig. 2, so as to intimately engage the grooved or channeled face of the wheel. The engagement of this pawl with the wheel is at a point above the horizontal plane of the center of the wheel, so that as the bars F are raised about the center of the wheel the pawl binds upon the wheel-face, and thereby effects its rotation and the consequent rotation of the roller or cylinder. A spring *i*,

bearing on the pawl, serves to make its action positive. In order to prevent the wheel from turning backwardly under the friction of the returning actuating-pawl, we have the brake or retaining friction-pawl J, which is mounted on the frame A below the wheel, and has a grooved or channeled face engaging the corresponding face of the wheel, this engagement being the reverse of that of the actuating-pawl, so that while it allows the wheel to turn in one direction it will hold it from turning back again. A spring *j* acts on the pawl J to hold it to place. This arrangement and construction of frictional pawls renders the operation of the cylinder or roller very sensitive, and at the same time positive. The slightest movement of the crank-arm *h'* is at once responded to by the roller or cylinder.

Mounted on one of the cross-bars *a* of the main frame A is the adjusting-screw K, having a flange or collar *k* upon its upper end, over which fits a bearing-block L, in the top of which is carried a cushion or buffer M, of rubber or other suitable material, which forms the bearing for the bars F, which rest upon it. Secured to the bearing-block are the upright rods N, which pass up one on each side of the bars F, and have between their tops a cross-head *n*. Seated between this cross-head and the bars F is a strong spring O.

The object of the adjusting-screw is to adjust the bars F to regulate the position of the crank *h'*, as the shoes and dies of the stamps and mortar wear.

The buffer-block serves as a cushisn to receive the bars F on their downward stroke and relieve the jar. The spring is to force the bars and pawl I back again quickly to position, and return all the parts to receive the next stroke of the stamp-stem tappet.

We are aware that in feeders of this class feed rollers or cylinders have been used having both a smooth surface and a ribbed surface forming pockets, said ribbed surface, however, being straight with the roller and parallel with its axis. We are also aware that rotary feeding devices have been operated by means of friction clutches and wheels, deriving their power from the stamp-stem, and we do not therefore claim, broadly, any of these as our invention; but

What we do claim as new, and desire to secure by Letters Patent, is—

1. In an ore-feeder, the combination, with the hopper, of a detachable and reversible feed-roller at the mouth thereof, said roller having end flanges and provided with corrugations inclined to the plane of its axis and joining at the center of the roller to form apices at that point, substantially as described.

2. In an ore-feeder, in combination with its feed cylinder or roller, the wheel fast upon the axle of said cylinder or roller and having a grooved or channeled periphery, vibrating bars F, pivoted on the roller or cylinder axle, the actuating friction-pawl carried by the bars F, and having a grooved or channeled face engaging the periphery of the roller above its horizontal central plane, and the brake or retaining friction-pawl having a grooved or channeled face engaging the periphery of the roller below, substantially as herein described.

3. In an ore-feeder, the combination of a feed cylinder or roller, the wheel fast on its axle, the vibrating bars pivoted on the axle on each side of the wheel, the friction-pawl carried by the bars for actuating the wheel, the friction-pawl for retaining or braking the wheel, the adjusting-screw on the frame of the machine, and the cushion block or buffer at the top of the screw for receiving the impact of the vibrating bars, substantially as herein described.

4. In an ore-feeder, the combination of a feed roller or cylinder, the friction-wheel upon its axle, the vibrating bars pivoted on the axle, the friction-pawl carried by the bars for actuating the wheel, and the friction-pawl for retaining or vibrating it, the adjusting-screw on the frame of the machine, having the bearing-block, and the buffer on the block on which the bars rest, the rods secured to the bearing-block and passing up beside the vibrating bars, the cross-head of the rods, and the spring confined between the cross-head and the vibrating bars, whereby the parts are returned to position, substantially as herein described.

5. In an ore-feeder, the combination of the feed roller or cylinder, the grooved or channeled faced wheel upon its axle, the vibrating bars pivoted on said axle, the actuating friction-pawl carried by the bars and having a grooved or channeled face engaging the wheel, the retaining-pawl on the frame of the machine and having a grooved or channeled face for engaging the wheel, the rock-shaft and connections for vibrating the bars, the adjusting-screw having the bearing-block and buffer for supporting the bars, the rods secured to the bearing-block and passing up on each side of the bars, the cross-head of the rod, and the spring seated between the cross-head and the vibrating bars, all arranged and adapted to operate substantially as herein described.

In witness whereof we have hereunto set our hands.

EDWARD C. LOFTUS.
EDGAR H. BOOTH.

Witnesses to Edward C. Loftus's signature:
JAS. W. MILLS,
C. H. BURDEN.
Witnesses to Edgar H. Booth's signature:
S. H. NOURSE,
WM. F. BOOTH.