(No Model.) 2 Sheets—Sheet 1.

G. W. PIERCE.

FEEDING DEVICE FOR ROLLER MILLS.

No. 320,282. Patented June 16, 1885.

Fig 1

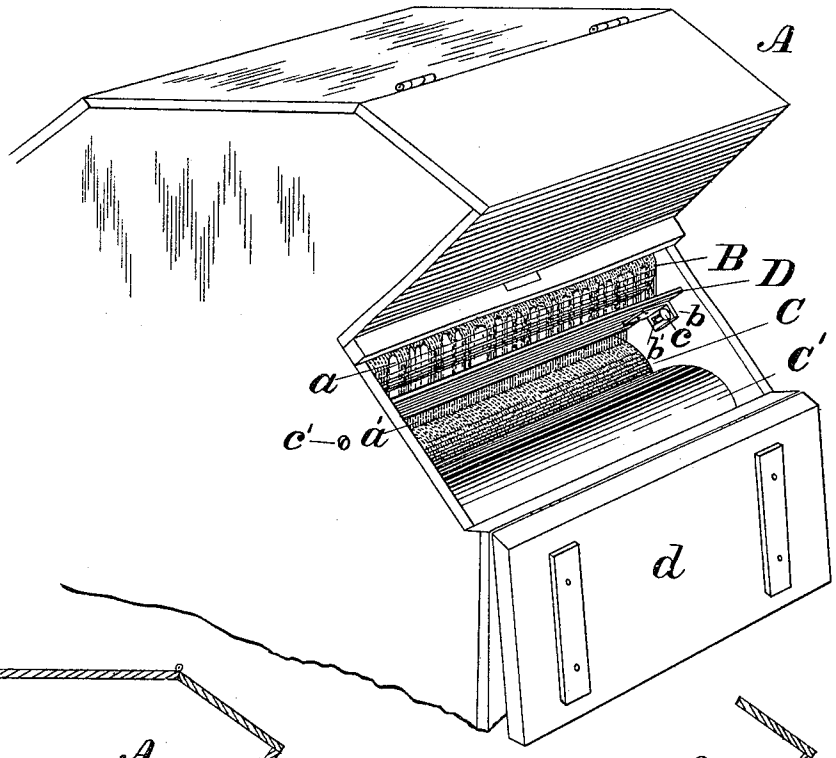


Fig. 2

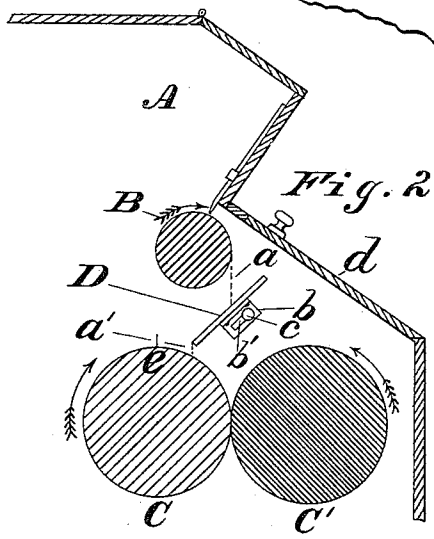
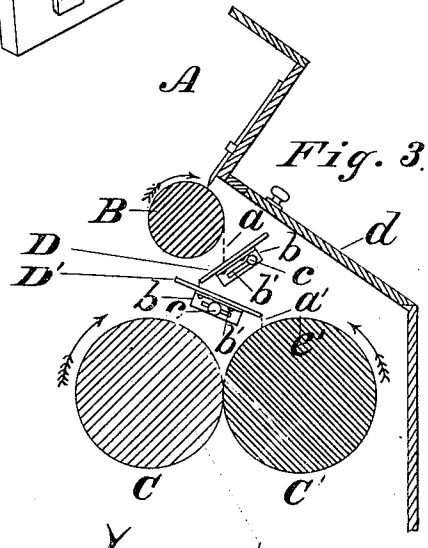


Fig. 3



Attest

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D. L. Croft

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(No Model.) 2 Sheets—Sheet 2.

G. W. PIERCE.

FEEDING DEVICE FOR ROLLER MILLS.

No. 320,282. Patented June 16, 1885.

Fig 4

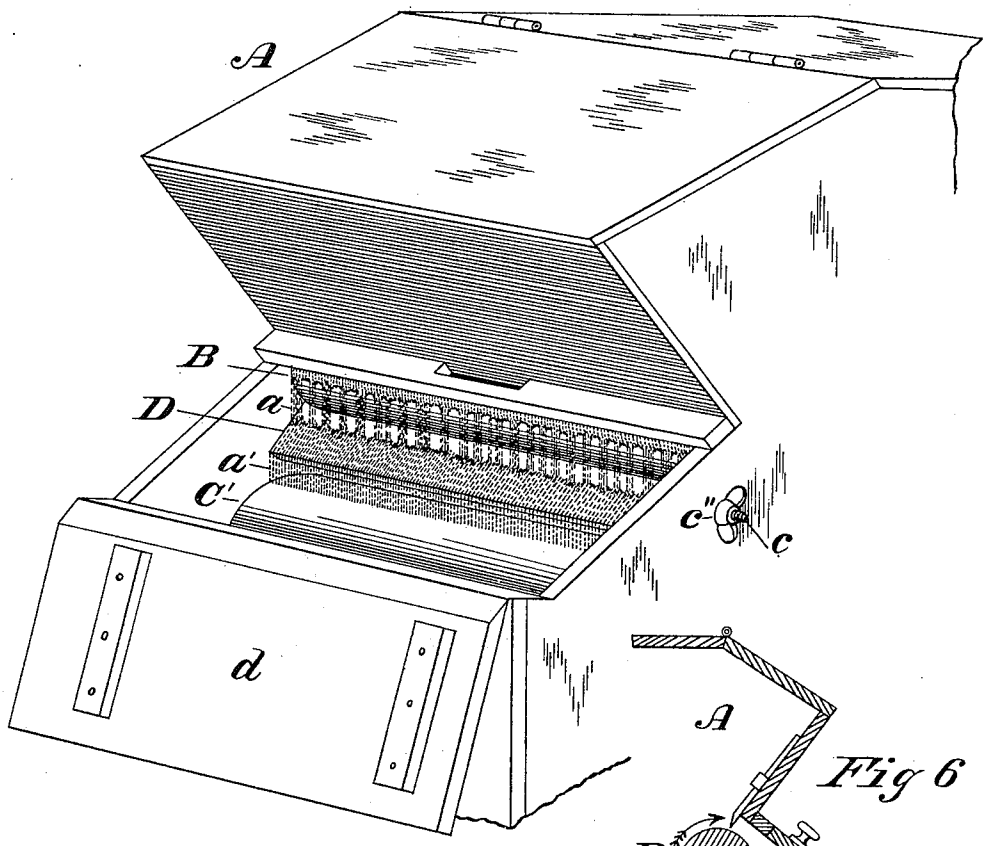


Fig 5

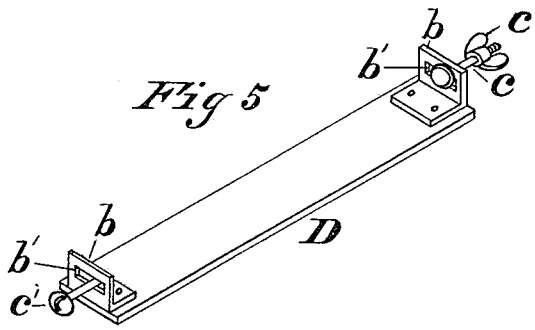
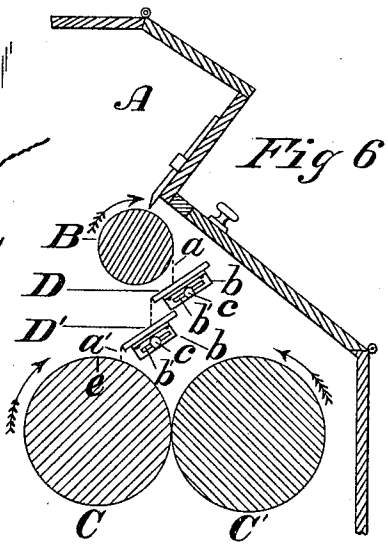


Fig 6



Attest
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UNITED STATES PATENT OFFICE.

GEORGE W. PIERCE, OF SPRINGFIELD, OHIO, ASSIGNOR OF ONE-HALF TO PEARL M. CARTWELL, OF SAME PLACE.

FEEDING DEVICE FOR ROLLER-MILLS.

SPECIFICATION forming part of Letters Patent No. 320,282, dated June 16, 1885.

Application filed August 25, 1884. (No model.)

To all whom it may concern:

Be it known that I, GEORGE W. PIERCE, a citizen of the United States, residing at Springfield, in the county of Clark and State of Ohio, have invented certain new and useful Improvements in Feeding Devices for Roller-Mills; and I do declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

My invention relates to feeding devices for roller grinding-mills used for the reduction of grain; and it applies to that class of roller grinding-mills in which the rolls are arranged in the same horizontal plane.

My invention consists in certain improvements in the feeding device by which the flour material or chop is delivered back onto one of the grinding-rolls instead of between them, the object being to prevent bunching or massing of material at the grinding-point, such massing or bunching causing the flour material to cohere into flakes or scales, which latter are found in the ground product in ordinary roller-grinding mills with the feeding devices at present in use.

Figure 1 is a perspective view of the hopper-case and rolls of a roller-mill with my invention applied thereto. In this view the mill is seen as in operation, and a single deflector is shown as discharging upon the inner roll. Fig. 2 is a vertical section of the same. Fig. 3 is a vertical section of the same with two deflectors, inclined in opposite directions, the discharge therefrom falling upon the outer roll. Fig. 4 is a perspective view of the hopper-case and rolls of a roller-mill in operation, with a single deflector shown discharging onto the outer roll. Fig. 5 is a detail view of the deflector and its attachments. Fig. 6 is a vertical section of a roller grinding-mill in which two deflectors or inclines are used. Both of these deflectors are inclined in the same direction and discharge upon the inner roll, C.

A is the hopper and case of the mill, which is shown in two views, Figs. 1 and 4, with its door *d* open to exhibit the interior operative parts.

B is a feed-roll, seen just under the front edge of the hopper with the chop *a* discharging therefrom. In the feeds now in use the flow of material is of the same irregular and broken form as seen in Figs. 1 and 4, and is made directly to the meeting line or point of contiguity of the rolls. As it here meets the approximating surfaces of both rolls the tendency is to bunch or gather into masses, and these masses being forced through are cohered from the pressure into flakes or scales of greater or less sizes. The production of these flakes and scales necessitates other and more complicated steps in the reduction and lengthens the process. More power is required to operate the mill, and the effect upon the latter is to produce excessive vibration, with straining and breaking of belts.

D is a single deflector, which is shown in Fig. 1 as receiving the chop *a*, falling from the feed-roll B in irregular, uneven, and separated streams. It is carried by the deflector back onto roll C and discharged in a thin, film-like sheet onto said roll at some distance away from the grinding-point, as seen at *a'* in both Figs. 1 and 4. It is caught by the roll on which it falls, and is carried by the latter through the point of contiguity in the same thin, even sheet.

In Fig. 4 the same deflector D is used; but in this view it is shown reversed, being inclined outward and discharging upon the outer roll, C'. I prefer to feed from the deflector onto the inner roll, C, rather than onto the outer roll, C'; and to obtain the best results I therefore adjust the deflector or deflectors so as to cause the discharge to be made back onto the roll, allowing the chop to be carried from thence to the grinding-point (as diffused by the deflector) in a thin, film-like stream. The point of discharge on the roll may be slightly changed to a point approximating thereto, either forward or in rear of the point mentioned, without materially affecting the result.

To provide for the adjustment of the deflecting-board D, it is pivoted on a line parallel with the grinding-rolls by screw-bolts *c* and *c'*, which extend through the walls of the case

and through slots b' in the L-shaped plates b, which are attached to the under side of the board at each end. The slots b' extend lengthwise of the plates and crosswise of the board, and the bolts c and c' extend through these slots and through the side walls of the case, allowing the board to be adjusted edgewise toward or from the grinding-roll. The thumb-nut c'' seen on the outside of the case on the bolt c secures the deflector in adjustment. This may be applied at one or both ends of the deflector. It will be noticed that this adjustment provides also for inclining the board at any desired angle, as well as inward and outward, so that should it be desired to feed from the deflector onto the outer roll, as shown in Fig. 4, this change can be made by simply loosening the thumb-nut and reversing the inclination of the board.

The views exhibit the usual arrangement of the feed-roll with relation to the grinding-rolls in roller-mills.

It will be noticed in Fig. 2 that the feed-roll B sets over roll C far enough to allow its line of discharge to cut the point of contact or grinding-point between the two rolls C and C'.

The deflector D in Figs. 1 and 2 is pivoted so as to receive the discharge from the feed-roll B, and convey it back onto the inner grinding-roll, C, at the top of the latter, near the vertical axial line of the same, from whence it is carried by the roll itself to the grinding-point, at least one-fifth of the surface of roll C being constantly used as a means for thus carrying the flour material to the grinding-point. Were the discharge to be made at the point of contiguity between the rolls, the material would strike the proximate sides of the two rolls, and rebounding would add to the stream and increase its volume so as to mass and bunch at this point, producing irregular grinding and imperfect granulation, as well as causing the formation of flakes or scales.

In Fig. 3 two deflecting-boards are used. The upper board, D, being inclined inwardly, receives the chop from the feed-roll B and discharges it upon a second deflector, D', under the former, which is shown inclined outwardly, discharging in turn upon roll C'. There is no difference between the deflectors D and D' in their construction or means for adjustment.

In Fig. 6 two deflectors are shown, both inclined in the same direction, the lower one discharging upon roll C. Where the distance between the feed-roll and the grinding-rolls is too great to operate with a single deflector, discharging upon either of the latter, two may be used, as shown in Figs. 3 and 6. In fine reductions this arrangement may be preferred.

I claim as my invention—

1. In a roller grinding-mill, the combination, with the feed-roll, the grinding-rolls, and the case, of a deflecting-board, axially pivoted between the walls of the latter, discharging back onto the inner grinding-roll, and having means for adjustment toward and from said grinding-roll, as set forth.

2. In a roller grinding-mill, the combination of the feed-roll, the grinding-rolls, and the case with an axially-pivoted deflecting-board discharging onto the inner grinding-roll, and having means for adjustment toward or from the latter on its pivotal bearings and for inclining the same to any required degree, substantially as and for the purpose set forth.

3. In a roller grinding-mill, the combination of the feed-roll, the grinding-rolls, and the case, of a deflecting-board pivoted at either end to the side walls of the latter and provided with transversely-slotted end plates, and pivot-bolts extending through said end plates, whereby it may be adjusted toward and from the grinding-roll on said pivot-bolts and inclined to any degree, substantially as and for the purpose set forth.

4. In a roller grinding-mill, the combination of the feed-roll, the grinding-rolls, and the case, of a deflecting-board pivoted to the side walls of the latter, transversely-slotted plates at either end of said deflecting-board, and an adjusting-screw whereby said deflecting-board is made adjustable in any direction, and may be reversed on its pivots to allow it to discharge onto either the inner or the outer grinding-roll, substantially in the form described, and for the purpose set forth.

In testimony whereof I affix my signature in presence of two witnesses.

GEORGE W. PIERCE.

Witnesses:

B. C. CONVERSE,

COLLIN FORD, Jr.