(No Model.)

C. L. BUTTERFIELD.

FEED HOPPER.

No. 352,446. Patented Nov. 9, 1886.

Fig. 1.

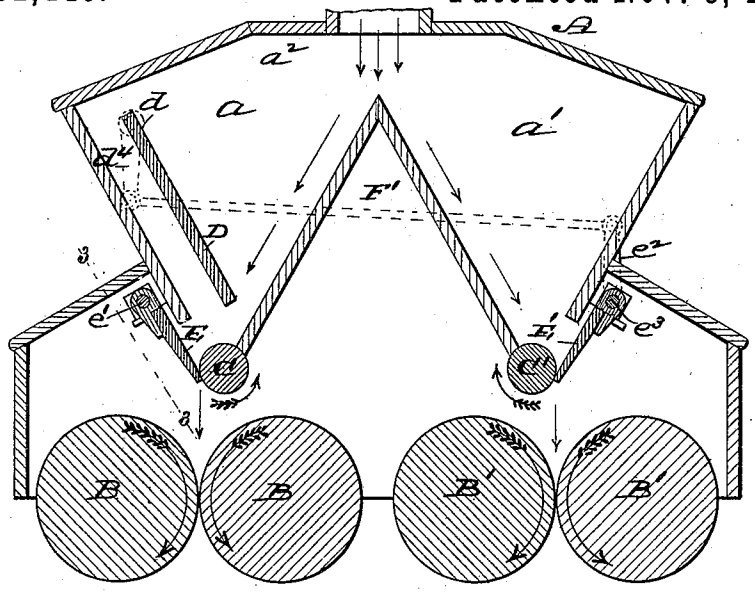


Fig. 2.

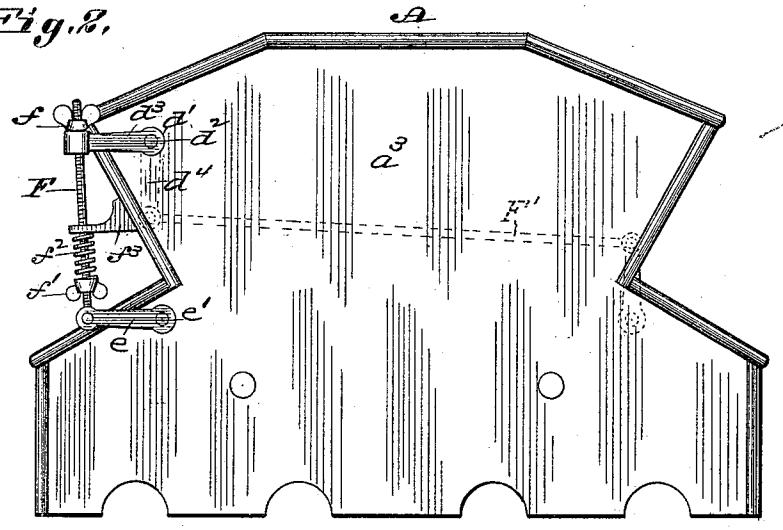
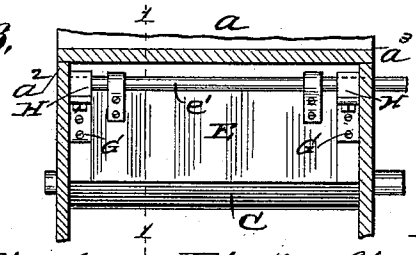


Fig. 3.



Attest;
J. W. Hoke.
D. L. Stoddard

Inventor;
Charles L. Butterfield
by C. Burroody atty

Fig. 4.

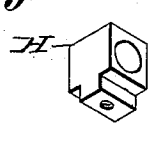
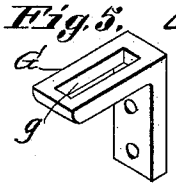


Fig. 5.



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

UNITED STATES PATENT OFFICE.

CHARLES L. BUTTERFIELD, OF ST. LOUIS, MISSOURI, ASSIGNOR OF ONE-HALF TO THE CRESCENT MANUFACTURING COMPANY, OF SAME PLACE.

FEED-HOPPER.

SPECIFICATION forming part of Letters Patent No. 352,446, dated November 9, 1886.

Application filed October 19, 1885. Serial No. 180,341. (No model.)

To all whom it may concern:

Be it known that I, CHARLES L. BUTTERFIELD, of St. Louis, Missouri, have made a new and useful Improvement in Feed-Hoppers, of which the following is a full, clear, and exact description.

The improvement relates to that class of hoppers in which the flow of the grain from the hopper is regulated automatically by the quantity of grain entering the hopper.

The improvement consists in the means used to transmit the movement of the board within the hopper to the gates which operate in connection with the feed-rollers at the bottom of the hopper.

The annexed drawings, making part of this specification, illustrate the improvement. Only that portion of the mill essential to an understanding of the improvement is exhibited.

Figure 1 is a vertical section on the line 1 1 of Fig. 3. Fig. 2 is a side elevation. Fig. 3 is a section on the line 3 3 of Fig. 1, and Figs. 4, 5 are details relating to the feed-roller gate. The same letters of reference denote the same parts.

A represents an ordinary hopper, such as used in roller-mills, the hopper having the compartments *a a'*, from which, respectively, the grain is fed to the two pairs B B and B' B' of crushing-rolls.

C C' represent the feed-rollers at the bottoms of the compartments *a a'*, respectively.

D represents the board within the hopper; but a single board is there used. It is arranged in one of the compartments—say the compartment *a*—in the usual position, and as if the hopper had but one chamber, the compartment *a'* not having any board. The board D is journaled at *d d'* in the ends a^2 a^3, respectively, of the hopper. The board-shaft d^2, at one end, is provided with the arm d^3, Fig. 2, and at the opposite end with the arm d^4, (indicated in broken lines in Figs. 1, 2.)

E represents the gate without the compartment *a*, and operating in connection with the feed-roller C, and E' represents the gate which operates in connection with the feed-roller C'. The arm d^3, by means of the rod F, is connected with the arm *e*, that is fastened to the shaft *e'* of the gate E. The arm d^4, by means of the rod F', (indicated in broken lines, Figs. 1 and 2,) is connected with the arm e^2, that is fastened to the shaft e^3 of the gate E'.

Thus connected, the two gates E E' are operated by the movement of the single board D. As the board D, with the increased weight of a larger amount of grain, is opened wider, the two gates E E' responsively open farther away from the feed-rollers, and as the board D swings the opposite way, by reason of a lesser weight, the gates E E' close toward the feed-rollers and reduce the feed to the crushing-rolls. Not only is the operation effected with a comparatively simple mechanism, but this advantage accrues: The shell of the hopper needs to be perforated only at the points where the shaft d^2 passes through it, and even these perforations are practically closed by the shaft itself. The escape of dust from the hopper is thus more effectually prevented than in the case of feed-hoppers as hitherto made. The mechanism which connects the board D with the gate E is operative irrespective of the connection leading to the other gate, E'; but when the two hopper-compartments and the two pairs of crushing-rolls are employed, it is advantageous to connect the board D with both of the gates E E', as described.

The most desirable mode of adjusting the mechanism is shown in Fig. 2. The rod F is threaded to receive the nut *f*, which, by screwing it upon the rod in the desired direction, lengthens or shortens the connection between the arms d^3 *e* accordingly, and by means of the nut *f'*, spring f^2, and shoulder f^3 upon the hopper the movement of the gates is cushioned and the gates closed, or moved toward the closing-point, when the weight upon the board is diminished.

The present improvement is adapted for regulating the feed not only of grain, but also of any kind of stock that is passed through feed-hoppers.

The bracket G, Fig. 5, and journal-box H,

Fig. 4, are preferably used in journaling the gates E E′. The slot *g* in the bracket enables the journal-box to be properly adjusted.

I claim—

The combination of the hopper A, having the compartments *a a′*, the crushing-rolls B B and B′ B′, the feed-rolls C C′, the board D, gates E E′, the shafts d^2 e' e^3, the arms d^3 d^4 e^2, and the rods F F′, substantially as described.

Witness my hand.

CHAS. L. BUTTERFIELD.

Witnesses:
C. D. MOODY,
HORACE STONE.