(No Model.)

G. W. COMBS.

FEEDER FOR MILL ROLLS.

No. 373,724. Patented Nov. 22, 1887.

Fig. 1.

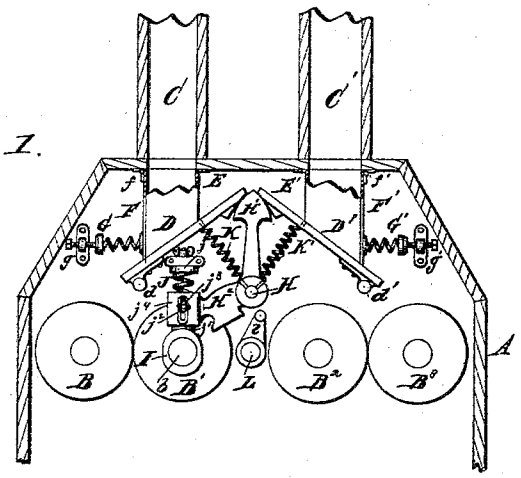


Fig. 2.

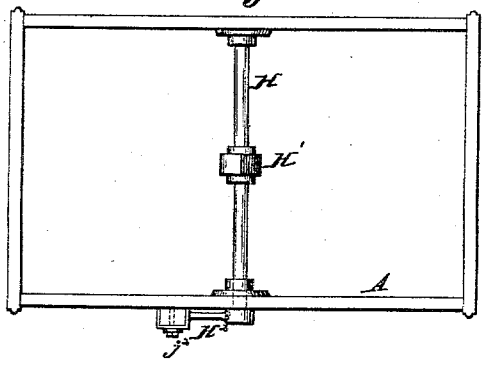


Fig. 3.

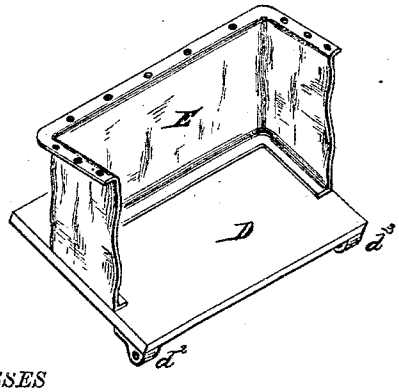
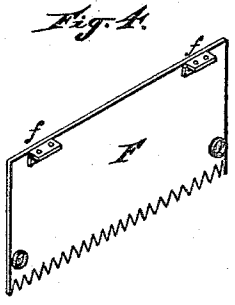


Fig. 4.



WITNESSES

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UNITED STATES PATENT OFFICE.

GEORGE WILLIAM COMBS, OF LEAVENWORTH, KANSAS.

FEEDER FOR MILL-ROLLS.

SPECIFICATION forming part of Letters Patent No. 373,724, dated November 22, 1887.

Application filed September 3, 1886. Serial No. 212,659. (No model.)

To all whom it may concern:

Be it known that I, GEORGE WILLIAM COMBS, of Leavenworth, county of Leavenworth, and State of Kansas, have invented a new and useful Improvement in Feeders for Mill-Rolls; and I do declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use it, reference being had to the accompanying drawings, which form a part of this specification.

My invention has for its objects to provide an improved feeder for mill-rolls, whereby the rolls may be fed equally the full length thereof, the feeding of the rolls being effected by gravitation, in combination with the agitation of the inclined feed-boards, and also to provide means for stopping the feed simultaneously with the spreading of the rolls.

My invention consists of the construction and combinations of devices hereinafter specified, and more particularly pointed out in the claims.

In the drawings, Figure 1 is an end view, partly in section, of my improved feeder, with a portion of the outer case removed. Fig. 2 is a plan view of features of my invention. Fig. 3 is a separate view illustrating my improved feed-board with its flexible case. Fig. 4 is a separate view of my improved feed-gates.

In the drawings, A represents an outer case or housing, in which a series of mill-rolls, B B′ B^2 B^3, are located, the drawings illustrating a four-roller mill.

C C′ represent discharge-pipes communicating with the interior of the case and with inclined feed-boards D D′, said boards being pivotally engaged at their lower edges with the case, as shown at *d d′*, Fig. 1.

I do not limit myself to any particular means of forming this pivotal connection; but it will be convenient to provide the feed-boards with pivots at their lower corners, as shown in Fig. 3 at d^2 d^3, whereby said feed-boards may be engaged with the case, so that their upper edge may have a vibratory motion. Intermediate of the feed-boards and the lower ends of the discharge-pipes C C′, I prefer to locate flexible cases E E′. These flexible cases may be engaged to the top of the case A, as shown in Fig. 2, so as to form, in effect, in connection with the hereinafter-described feed-gates F F′, continuous spouts with the spouts C C′, to control the direction of the feed upon the feed-boards and prevent leakage.

F F′ represent my improved automatic feed-gates, located upon one side of the flexible cases E E′, and having a hinged or pivoted connection at their upper edges, as shown at *f f′*, so that they may be pressed outward by the gravity of the grain or other material, and thereby open the throats of the cases in proportion to the weight of the material in said cases.

To control the movement of said gates I provide springs G G′, engaged upon the adjacent portions of the housing, as shown at *g g′*, said springs bearing against the lower edges of said gates, the construction being such that the gates may be opened by the increased weight of the material in the cases, and be adjusted to their normal positions by said springs. The lower edges of said gates are preferably toothed, as shown in Fig. 4.

The springs may be made adjustable, as shown in Fig. 1, so that the desired amount of pressure may be controlled by the operator.

It will be seen that by thus constructing the gates with a pivoted or hinged engagement with the housing at their upper edges and providing the springs G G′ to bear against their lower edges their operation is made automatic, so that an extra pressure may open the gates wider, the size of the openings being regulated by the pressure of the springs. In this manner any liability of the feeder becoming choked up by the accumulation of material in the spout is effectually prevented, the weight of the material serving to open the gate and the springs to close them.

H represents a rock-shaft having its bearings in the outer case. Said shaft is provided with a vibratory arm, H′, extended between the adjacent upper edges of the inclined feed-boards D D′.

H^2 is a rocking arm engaged at one end upon said rock-shaft and at the other end having contact with a cam, I, of any desired contour, located upon the shaft *b* of one of the mill-rolls, the rocking arm H^2 being held in contact with the cam by means of an adjustable spring, J, the upper end of said spring be-

ing provided with means of engagement upon the adjacent portion of the outer case, as shown at *j*.

I do not limit myself to any particular construction of the free end of the rocking arm H^2 having contact upon said cam; but it may conveniently be provided with a follower, as shown at *j'*, held in place by a bolt, j^2, which works in an elongated slot, j^3, of the spring-seat j^4.

K K' represent springs attached to the under sides of the feed-boards D D', respectively, and also to the rock-shaft H, the construction and object of said springs being to keep said feed-boards in contact with the vibratory arm H'. The operation of these features is as follows: By the rotation of the shaft *b* the end of the rocking arm H^2 upon the rotary cam I occasions a rocking motion of the shaft H, and consequently the vibratory movement of the arm H' between the adjacent upper edges of the feed-boards D D', thereby agitating said feed-boards, the same being held in contact with the vibratory arm by means of the springs K K', this agitation of the feed-boards assisting materially in the proper discharge of the material and in preventing its clogging.

L represents a spreader-shaft located between the rolls B' B^2, which may be of any desired construction, but preferably such as shown in my patent, No. 342,498, dated May 25, 1886.

i is a lifting-arm engaged upon said spreader-shaft, the construction being such that when the spreader-shaft is rotated to throw the rolls apart the end of said lifting-arm will be caused to pass under the rocking arm H^2 and raise said rocking arm off the cam I, thereby stopping the vibratory movement of the arm H' and the agitation of the feed-boards. This action cuts off the feed, as the material will then accumulate behind the gates without passing beyond.

Having thus described my invention, what I claim is—

1. In a feeder for mill-rolls, the combination, with a housing, a feed-spout, and an inclined feed-board hinged or pivoted at its lower edge, of a flexible case secured to the top of the housing above the inclined feed-board and to the upper part and ends of said board, a yielding feed-gate located at the lower edge of said case, and adjustable springs to control the movement of said gate, substantially as shown and described.

2. In a feeder for mill-rolls, the combination, with the housing A, inclined feed-boards D D', hinged or pivoted at their lower edges, the feed-spouts, and flexible cases E E', communicating with said feed-boards, of a cam, I, on the shaft of one of the mill-rolls, a rock-shaft, H, having a vibrating arm, H', extended between the adjacent upper edge of the inclined feed-boards and operating them, an arm, H^2, mounted on the rock-shaft in contact with the cam, and a spring, J, for holding the arm H^2 in contact with said cam, substantially as shown and described.

3. In a feeder for mill-rolls, the combination, with the inclined feed-boards D D', having their lower edges pivoted directly to fixed supports, and the cam I on the shaft of one of the mill-rolls, of the rock-shaft H, provided with a vibrating arm, H', extending between and operating on the adjacent upper edges of the inclined feed-boards, the rocking arm H^2, mounted on said rock-shaft and having one end in contact with the cam, the spring J, the spreader-shaft L, provided with a lifting-arm, *l*, for disengaging the arm H^2 from the cam, and the springs K K', substantially as described.

4. In a feeder for mill-rolls, the combination of the inclined feed-boards D D', pivoted directly to fixed supports at their lower edges, the cam I, mounted on the shaft of one of the mill-rolls, the rock-shaft H, having arm H', operating on both feed-boards, the cam-arm H^2, mounted on said rock-shaft, the spring J, to hold the arm H^2 and cam I in contact, and the springs K K', to hold the feed-boards in contact with the vibratory arm H', substantially as shown and described.

In testimony whereof I sign this specification in the presence of two witnesses.

GEORGE WILLIAM COMBS.

Witnesses:
SAML. H. WILSON,
GEO. W. EARLY.