

(No Model.)

H. H. RING.
FEED MECHANISM FOR GRINDING MILLS.

No. 499,145.

Patented June 6, 1893.

Fig. 1.

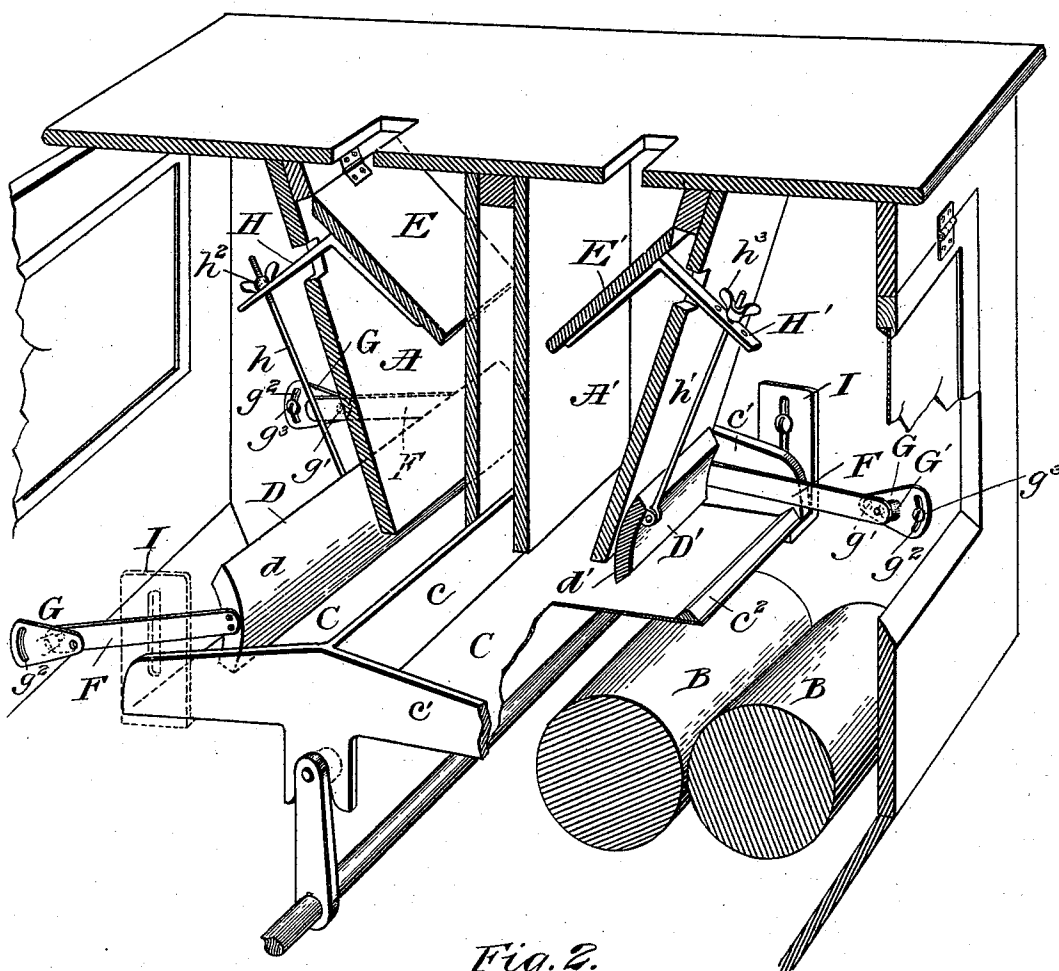
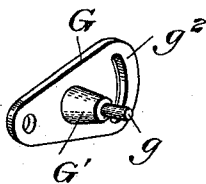


Fig. 2.



Witnesses

L. A. Connerly.
Chas. E. Riordon.

Inventor

Henry H. Ring
By *Butterworth & Dowell*
his Attorney

UNITED STATES PATENT OFFICE.

HENRY H. RING, OF LAIRDSVILLE, ASSIGNOR TO SPROUT, WALDRON & CO.,
OF MUNCY, PENNSYLVANIA.

FEED MECHANISM FOR GRINDING-MILLS.

SPECIFICATION forming part of Letters Patent No. 499,145, dated June 6, 1893.

Application filed February 2, 1893. Serial No. 460,748. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. RING, a citizen of the United States, residing at Lairds-ville, in the county of Lycoming and State of Pennsylvania, have invented certain new and useful Improvements in Feed Mechanism for Grinding-Mills; and I do hereby 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.

This invention relates to a feeding device particularly adapted to roller mills, middlings-purifiers and sieve machinery, also to any machine requiring an even spread of stock or material over a broad surface, and in which the feed is automatically controlled by a feed-gate, which is operated by the weight of the grain to enlarge the outlet opening, and is rendered self-closing by gravity or by means of counterbalancing weights or springs.

The multiplicity of parts usually employed in feeders of the character referred to renders the same more or less complex and expensive in manufacture, and unreliable and unsatisfactory in use, owing to the necessity for frequent re-adjustment of the various parts and the increased liability to get out of order when the mill is in operation. Furthermore, a straight gate of any considerable length, such as is usually employed in roller-mills, middlings-purifiers and analogous machines, is liable to be raised or lowered unevenly or obliquely to the surface of the feed-roller or feed-board, thus permitting the stock or material to be fed unevenly and more rapidly at one end of the hopper than at the other, thereby decreasing the efficiency of the machine and producing poor stock.

The object of my invention is to overcome these several objections and to provide an automatic feed mechanism which shall be simple in construction, inexpensive in manufacture, and efficient and reliable in use.

The invention will first be described with reference to the accompanying drawings, which form a part of this specification, and then pointed out in the claims at the end of this description.

In the drawings, Figure 1 represents a fragmentary sectional view, in perspective, of a

portion of a double grinding mill with my improvements attached; and Fig. 2 is a detail showing a bracket with pivot pin for the attachment of one of the pivoted arms of the adjustable feed-gate.

While I have represented the invention as applied to a double roller-mill, or a mill having two sets of grinding rolls, it will of course be understood that I contemplate its application to other types of mills, middlings-purifiers, &c., and it may be applied to either single, double or multiple mills; the feed mechanism for each set of rolls being adapted to act independently of and unaffected by the corresponding mechanism of another set of rolls, sieves or screens.

Referring particularly to the drawings, A, A', denote parts of a pair of hoppers; B, B, grinding-rolls; C, a shaking-shoe or feed-board; D, D', feed-gates controlling outlet openings which extend lengthwise of each hopper above the surface of the feed-board, and E, E', pressure-boards hinged to the respective hoppers A, A', and connected to the adjustable feed-gates as will be more fully described. These parts may be of the form shown or of any preferred construction, and as thus far described do not differ essentially from contrivances of the same general character heretofore in use, except that the feed-gates, instead of being flat and presenting straight surfaces parallel with the adjacent inclined walls of the hoppers are preferably formed with convex fronts as shown at *d, d'*.

The gates D, D', are each provided with hinged or pivoted supporting bars F, which may extend forward or back from the gate and have their opposite ends pivotally secured upon studs or pins *g*, projecting from pivot plates or brackets G. The brackets G, are preferably provided intermediate their ends with bosses G', from which the pins *g*, project, so as to set the arms off from the side of the hopper or frame a sufficient distance to clear the space between the same and the end of the gate; the length of the hopper being somewhat greater than that of the gate. The brackets G, are pivoted at one end, as indicated at *g'*, and their opposite ends are provided with curved slots *g''*, which are struck upon the arc of a circle concentric with the

pivots g' . Set screws g^3 , passing through the curved slots g^2 , into the side pieces of the frame of the machine serve to secure the brackets in any desired position, and permit the same to be adjusted upon their respective pivots so as to raise or lower the pivots of the bars F, for the purpose of raising or lowering either end of the gate so as to secure a uniform depth of opening between the lower edge thereof and the surface of the feed-shoe or roller beneath the same, and thereby insure a uniform and even feed from end to end of the gate. This feature of the invention is of great importance, especially in feeding flour or other fine material, as it permits a nice and exact adjustment of the gate, and compensates for any unevenness or obliquity in the surface of the feed-board in respect to the lower straight edge of the gate.

The discharge of the material through the throat of the hopper is automatically controlled by the weight of the grain pressing upon the hinged boards E, and E', the latter being provided with arms or bars H, H', which project through openings in the front walls of the hoppers and are adjustably connected with the gates by depending rods h , h' , having thumb nuts h^2 , h^3 , thereon for securing the desired adjustment. By this means the feed-gate is adapted to rise or fall as the weight of the grain upon the pressure-board varies, and thereby automatically regulate the flow through the outlet opening. The feed-gates may also be adjusted and secured at any desired height by means of the adjusting rods h , h' , and thumb nuts h^2 , h^3 . The arms H, H', are provided with a series of perforations, as shown, to permit the connection between the same and the rods h , h' , to be shifted in order to increase or decrease the leverage and thereby vary the amount of pressure required to raise or lower the gate.

I, I, denote adjustable supports for sustaining and guiding the feed-board or shoe C, in its movements. In a double mill, as shown, the shoe may consist of duplicate parts C, C, with intermediate division board c , and side flanges c' , formed integrally or in separable parts, as may be desired.

When feeding sharp stuff such as wheat, oats, &c., in the kernel, I preferably attach to the upper front edge of the shoe a detachable triangular cleat c^2 , which serves to retard or bank the material at this point and produce an even flow over the cleat onto the grinding rolls.

It will be understood of course that the construction and arrangement of parts may be varied more or less without departing from the spirit of the invention, and hence I do not desire to be limited to the exact construction and arrangement shown. I am aware, however, that a feed-gate and an adjustably connected hinged pressure-board, together with pivoted arms projecting from the gate and

pivoted in a plane at right angles to the inner face of the gate are not new, and I make no broad claim to such construction.

Another application of the feeding device described herein is illustrated in an application for a patent of even date herewith, in which this feeder is shown applied to a midlings-purifier.

Having thus fully described my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. The automatic feeder, comprising the hinged pressure-board having the arm projecting therefrom through the wall of the hopper, the feed-gate suspended from said arm and provided with projecting arms or bars which are pivotally supported at their outer ends, and means for shifting the pivotal supports of said bars so as to raise or lower either end of the gate, substantially as described.

2. The automatic feeder, comprising the hinged pressure-board having the perforated arm projecting therefrom through an opening in the wall of the hopper, the feed-gate suspended from said arm in proximity to the outlet from the hopper by an adjusting rod with screw threaded nut thereon for adjusting the same, the pivoted bars projecting from said gate, the pivoted brackets supporting the pivots of said bars, and means for adjusting the brackets so as to raise or lower said pivots, substantially as described.

3. In a feeder for grinding or other mills, the combination with the feed-hopper, of the hinged pressure-board having an arm projecting therefrom through an opening in the wall of the hopper, the adjustable feed-gate, the rod connecting said gate and arm, the brackets each consisting of a flat metallic plate pivoted at one end and provided with a curved slot at its opposite end concentric with said pivot and with an intermediate pivot pin or stud, the pivoted bars having one end secured to said gate and their opposite ends fitted on said pivot pins, and means for securing the brackets in the desired position, substantially as described.

4. In combination with the feed-hopper and shaking-shoe, the adjustable feed-gate, the pivoted bars projecting from said gate, the pivoted plates carrying the pins upon which said bars are pivoted, means for adjusting said plates so as to shift the pivots of said bars, the pressure-board hinged within the hopper and having an arm projecting therefrom through an opening in the side of the hopper, and the rod adjustably connecting said arm and gate, substantially as described.

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

HENRY H. RING.

Witnesses:

G. L. RAMER,
J. RUSSEL SMITH.