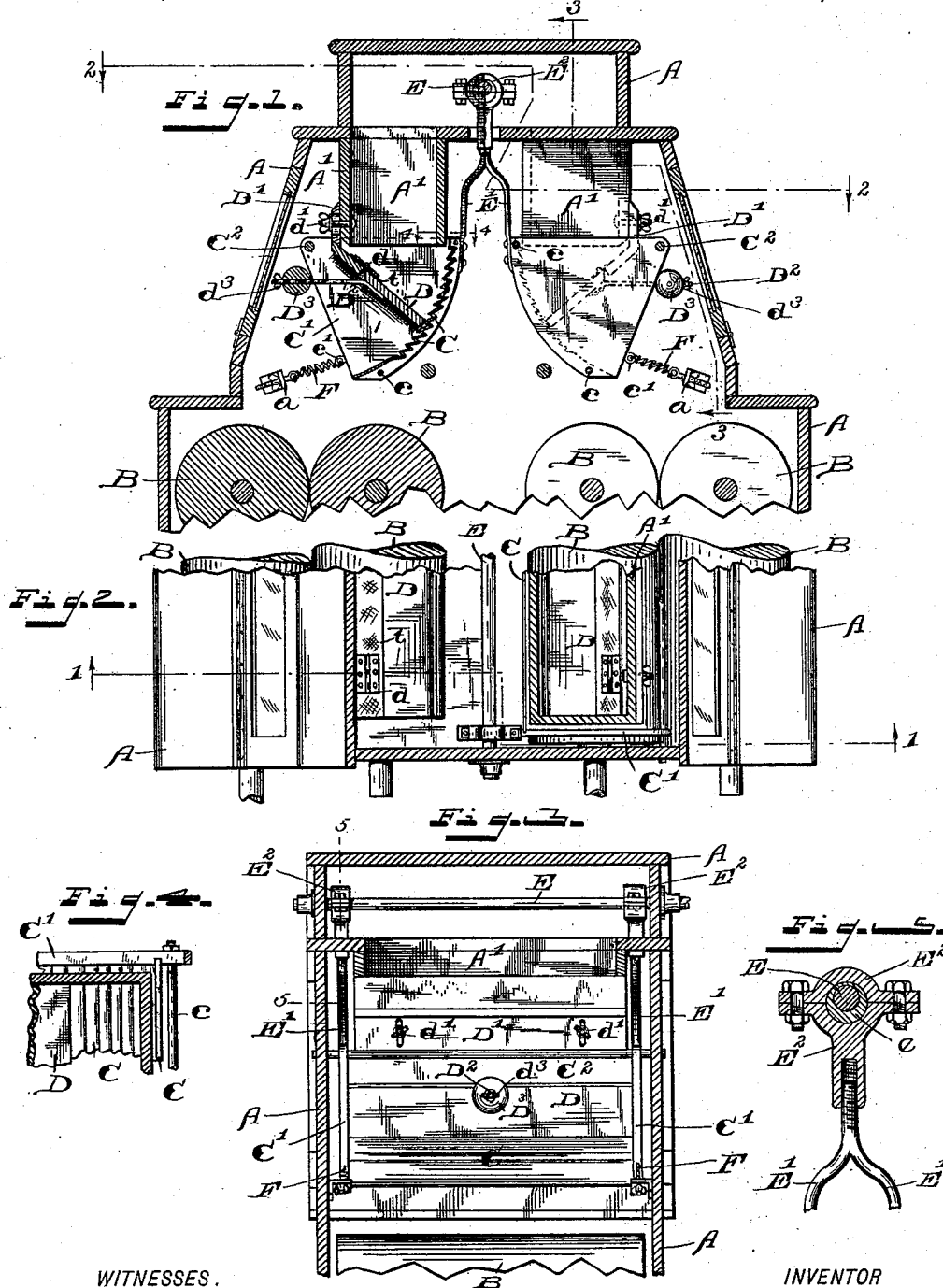


(No Model.)

A. C. BRANTINGHAM.
FEEDER FOR MILLS.

No. 494,188.

Patented Mar. 28, 1893.



WITNESSES.

A. H. Warner
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ALLEN C. BRANTINGHAM, OF INDIANAPOLIS, INDIANA, ASSIGNOR TO THE
NORDYKE & MARMON COMPANY, OF SAME PLACE.

FEEDER FOR MILLS.

SPECIFICATION forming part of Letters Patent No. 494,188, dated March 28, 1893.

Application filed June 28, 1892. Serial No. 438,308. (No model.)

To all whom it may concern:

Be it known that I, ALLEN C. BRANTINGHAM, a citizen of the United States, residing at Indianapolis, in the county of Marion and State of Indiana, have invented certain new and useful Improvements in Feeders for Mills, of which the following is a specification.

The art of milling, when practiced scientifically, is, in its greatest perfection, a sizing of particles, or a reduction of the grain to flour or particles of uniform size. Any operation which results in the reducing of the grain to an impalpable powder, such as pounding the stock at any point between vibrating surfaces, is therefore a serious disadvantage. The reasons are that flour which is ground to different sizes, or which contains this fine impalpable powder, will, in the making of bread, absorb water unevenly, and when yeast is introduced it will act upon such fine powder so much more speedily than it will upon the larger particles, that such powder will be practically decomposed before the yeast has operated properly upon the body of the flour. The more gently the stock can be handled, therefore, during the various operations, the less of the objectionable fine product will result, and the more valuable and perfect the operation as a whole will be.

My present invention relates to that class of feeders which are adapted to feed the grain or chop (elsewhere herein denominated "stock") to the grinding rolls of roller mills or similar machines, or for similar purposes; and it consists in certain construction and arrangements of parts, whereby the objectionable results hereinbefore mentioned are avoided, and other advantages attained, as will be hereinafter more particularly described and claimed.

Referring to the accompanying drawings, which are made a part hereof, and on which similar letters of reference indicate similar parts, Figure 1 is a transverse sectional view, at two points, through the upper portion of a roller mill provided with feed-hoppers embodying my said invention, as seen from the dotted line 1 1 in Fig. 2; Fig. 2 a view partly in top plan and partly in horizontal section, as seen from the dotted line 2 2 in Fig. 1; Fig. 3 a side elevation of the feed-hopper and immediately adjacent parts, the surrounding

frame-work being shown in section, as seen from the dotted line 3 3 in Fig. 1; Fig. 4 a detail sectional view as seen from the dotted line 4 4 in Fig. 1, and Fig. 5 a detail section, on an enlarged scale through one of the operating cams, on the dotted line 5 5 in Fig. 3. The directions of sight from said dotted lines are indicated by arrows at their ends.

In said drawings the portions marked A represent the frame-work or casing of the machine; B the grinding rolls; C the main side of the feed-hopper of my improved device; D a swinging gate or bottom thereto; E the shaft by which the shaking motion is imparted to said feed-hopper, and F springs for taking up lost motion, and steadying and giving elasticity to the movement.

The casing A and rolls B are shown merely for illustration, and may be of any ordinary or desired form or construction. The upper portion of the machine constitutes the receiving hopper, and the vertical chutes A' extend down therefrom to just within the upper open side of the feed-hopper.

The main side C of the feed-hopper is curved, or in the form of a section of the side of a cylinder, and is serrated or corrugated, which corrugations are preferably of a "rip-tooth" form, or having a longer inclination on one side than on the other, with the shorter inclination faced toward the point of discharge, as shown, for the purpose of more effectually feeding the stock forward. It is provided with two heads C' which are grooved to receive the ends of the side C, and the parts are held together by rods c. The whole is pivoted upon a pivot shaft or rod C², preferably at its outer upper corner, and its movement, which is concentric to the pivot, is thus transverse the edge of the gate D, instead of toward and from said gate. Such a movement, as will be readily understood, does not grind or pound upon and disintegrate the stock (which includes the starchy or midlings product of the grain, which is easily powdered or mashed) at all, but shoves it forward, past the edge of the gate, toward the point of discharge, with the least possible friction consistent with a proper spreading or distribution thereof. The stock, therefore, is discharged to the grinding rolls from the feed-hopper in substantially the same

condition in which it enters the machine, which, as above explained, is greatly to its advantage. The stroke or length of the movement is determined by the cam shaft E, as will be presently described.

The gate D is hinged to a board D', which is adjustable vertically by means of screws d' passing through slots therein on the side of the chutes A'. The adjustment thus provided for determines the quantity of the stock which shall pass, as it brings the hinge point nearer to or farther from a direct radial line extending from the pivot C² on which the feed-hopper is hung to its side, and will also accommodate itself to the character of said stock. To prevent leakage between said gate D and said board D' a strip of ticking t is usually laid over the joint and tacked thereon before the hinges d are applied. Below the joint, on the under side, the parts are beveled, thus providing free egress for any dust which might work through the crack. Extending back from the rear sides of the gates where they are hinged are rods D² upon which are weights D³. These rods are preferably screw-threaded, and the holes through the weights are also screw-threaded, so that they can be given a minute adjustment. Winged jam-nuts d³ are preferably placed on the rods behind the weights, for the usual purposes of jam-nuts. As will be readily seen, the farther out on said rods said weights are adjusted, the greater weight of material in the feed-hopper it will take to force down the gates D and permit a discharge, while the lower the boards D' are adjusted, the greater must be the movement of the gates themselves before the opening is widened by the said movement. A very fine and accurate adjustment is thus provided for, which extends through all possible required variations of service.

The shaft E passes through the machine, preferably near the top, and is connected to the feeder by arms E', which are preferably in pairs, at or near the ends of the machine, and terminate in bearings E² which surround said shaft E, and are operated by cams e on said shaft, as shown most plainly in Fig. 5. The movement is very slight, only sufficient to give a shaking motion to the feed-hopper, and therefore it is not necessary to provide any joints on the arms E', as they will easily spring sufficiently for the purpose.

The springs F are secured at one end to clips a on the frame-work, and eyes c' on the feed-hoppers, and operate to hold said feed-hoppers toward the clips, and against the pull of the cam-shaft-operated arms E', thus insuring a quick return and elastic character to the movement of said feed-hoppers, as well as taking up all lost motion between the cams and bearings, or between the feed-hoppers and their pivot shafts.

The invention as a whole is of material value in carrying out the general object and

design of scientific milling, heretofore explained.

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

1. The combination, in a feeding apparatus for roller mills and such like machines, of a feed-hopper mounted on a pivot at one upper corner, and a cam shaft connected thereto at the other upper corner, whereby the same is given a shaking motion concentric to the pivot.

2. The combination, in a feeding apparatus for roller mills and such like machines, of a feed hopper, the upper edge of which incloses the lower end of the main hopper and is mounted on a pivot at a point to one side of said main hopper, a cam shaft upon the other side, arms connecting said cam shaft to said feed hopper, the side of said feed hopper opposite to its pivot being curved and substantially concentric therewith, and an adjustable gate within said feed hopper below the mouth of the main hopper whereby the feed may be regulated, substantially as set forth.

3. The combination, in a feeder for roller mills and such like machines, of the main hopper, the feed hopper arranged below said main hopper to receive the discharge therefrom and pivoted to one side of the mouth thereof, the face of said feed hopper opposite to its pivot being curved substantially concentric with said pivot and serrated as shown, an adjustable board D' rigidly but adjustably secured to said main hopper, a gate D hinged to said board and provided with an adjustable counterbalancing weight, a cam shaft, connections between said cam shaft and said feed hopper, and a spring secured to the frame-work and to said feed hopper and acting oppositely to said cam shaft, substantially as set forth.

4. The combination, in a feeding apparatus for roller mills and such like machines, of the main hopper, a feed hopper arranged below and surrounding the mouth of said main hopper, and pivoted to one side of said mouth, and having a curved inner surface substantially concentric to said pivot against which the material to be operated upon will rest, and a hinged gate attached to the main hopper and extending in an inclined direction from a point substantially in line with said pivot but variable more or less from said line to near said curved surface, and mechanism for shaking said feed hopper while said gate remains substantially stationary and in the inclined relation thereto, substantially as set forth.

5. The combination, in a feeding apparatus for roller mills and such like machines, of a main hopper, a pivoted and a shaking feed hopper arranged to surround the mouth thereof, and a hinged gate extending within said feed hopper, said gate being mounted upon a vertically adjustable board attached to the main hopper, substantially as shown and described.

6. The combination of the main hopper terminating in the vertical chutes A', a hopper C mounted on the pivot rod C² and having a curved and serrated face opposite to said pivot, 5 a hinged gate D extending within said feed hopper substantially at right angles to the general direction of its curved face and mounted on the main hopper, the cam shaft E and rods E' connecting said cam shaft to 10 said feed hopper, and a spring F attached to the frame-work and to the feed hopper, said several parts being arranged and operating substantially as set forth.

7. The combination, of the pivotally mounted shaking feed-hopper, the cam shaft, arms 15 connecting said cam shaft, and said feed hopper, an adjustable board attached to the main hopper or its chute extending to within said feed-hopper, a gate or bottom hinged to said 20 adjustable board and provided with a counterbalancing weight, and a spring connected to said feed-hopper and to the frame-work.

8. The combination, in a feeding apparatus for double roller mills, of two feed hoppers 25 mounted on pivots at their outer corners, a central cam shaft, and arms running from said cam shaft to both said feed hoppers whereby they are simultaneously operated from said single cam shaft, substantially as 30 shown and described.

9. The combination, in a feeding apparatus for double roller mills, of feed hoppers pivoted at their outer corners, a central cam shaft, arms connecting said cam shaft to said feed 35 hoppers, and hinged gates extending into said hoppers, provided with adjustable counterbalancing weights, substantially as set forth.

10. The combination, in a feeding apparatus for roller mills, of a shaking feed hopper mounted upon a pivot at one point and 40 positioned to receive the discharge from the main hopper, and having a curved operating side substantially concentric with the pivot terminating at a point above the grinding 45 rolls, means for regulating the quantity of discharge through said feed hopper, and means for giving the same a continuous vibrating motion, whereby the material is fed evenly 50 through the discharge orifice and caused to flow over the edge of the feed hopper evenly to between the grinding rolls, substantially as shown and described.

In witness whereof I have hereunto set my hand and seal, at Indianapolis, Indiana, this 25th day of June, A. D. 1892.

ALLEN C. BRANTINGHAM. [L. s.]

Witnesses:

CHESTER BRADFORD,
J. A. WALSH.