(No Model.) 2 Sheets—Sheet 1.

W. D. GRAY.

FEED REGULATOR.

No. 459,075. Patented Sept. 8, 1891.

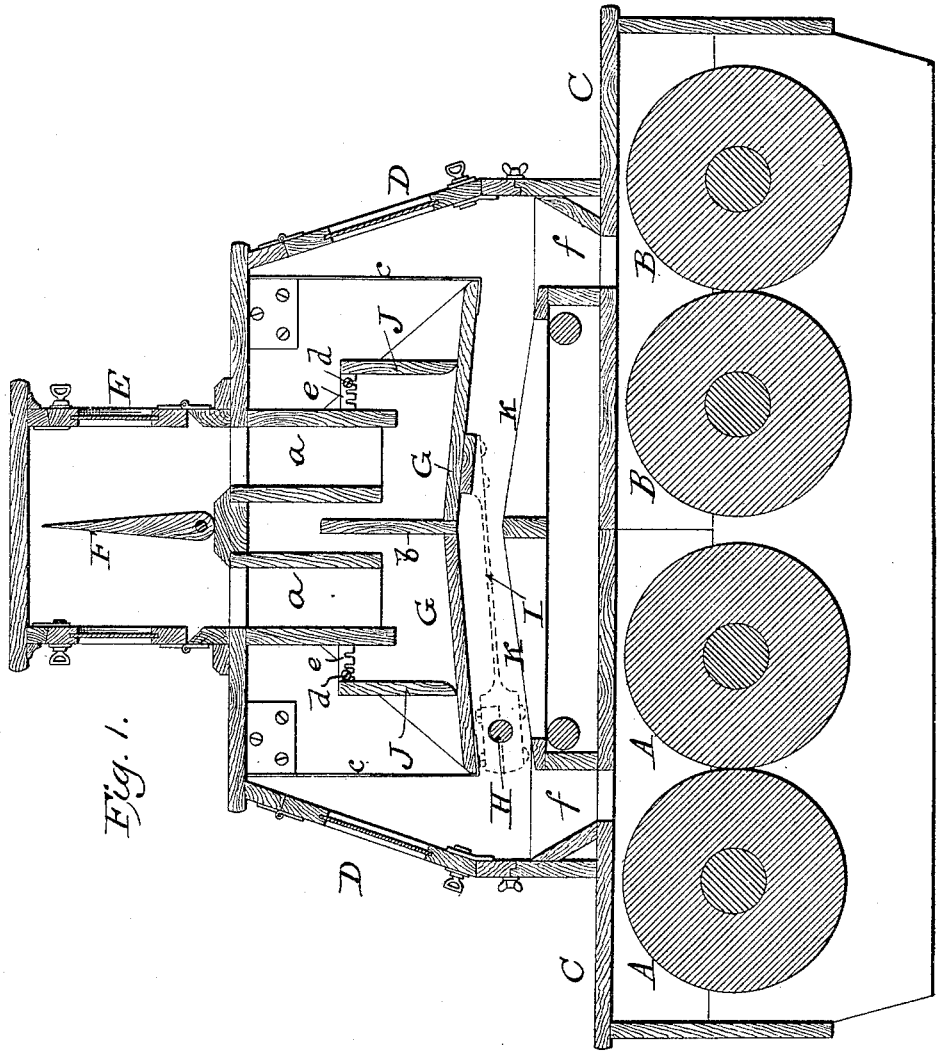

Fig. 1.

Witnesses:
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James L. Duhamel

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Attys

(No Model.) 2 Sheets—Sheet 2.

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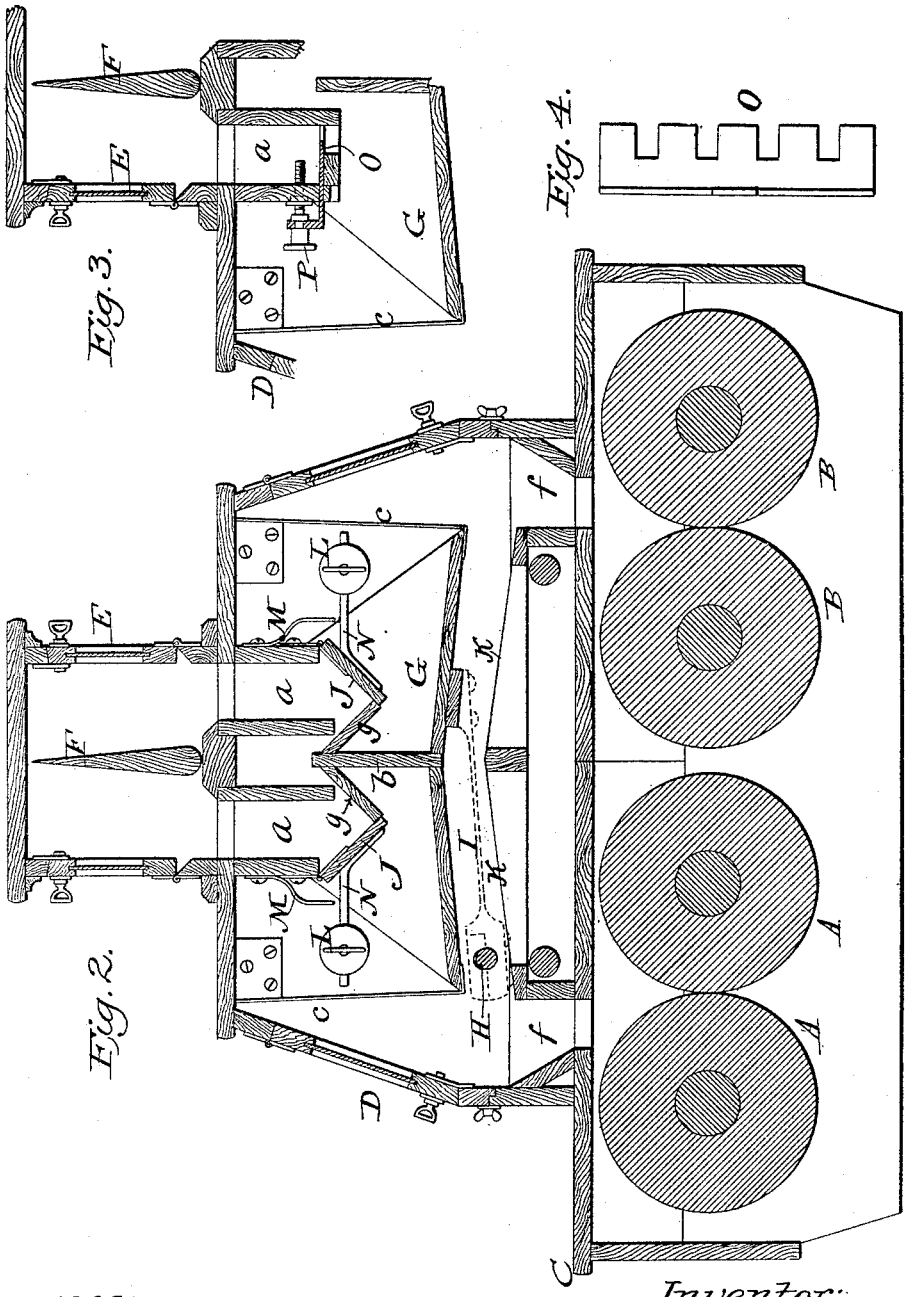

Witnesses:
James F. Duhamel.
Horace A. Dodge.

Inventor:
William D. Gray,
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UNITED STATES PATENT OFFICE.

WILLIAM D. GRAY, OF MILWAUKEE, WISCONSIN.

FEED-REGULATOR.

SPECIFICATION forming part of Letters Patent No. 459,075, dated September 8, 1891.

Application filed March 17, 1890. Serial No. 344,152. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM D. GRAY, a citizen of the United States, residing at Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Feed-Regulators, of which the following is a specification.

My invention relates to feeding mechanism for use in connection with roller-mills and other milling machinery, but is designed more particularly for roller grinding-mills.

The invention consists in a novel construction and arrangement of parts hereinafter explained, whereby I am enabled to secure an exceedingly uniform feed of material and whereby said result is obtained regardless of the character or grade of material being fed.

In the accompanying drawings, Figure 1 represents in vertical longitudinal section my improved apparatus in its preferred form; Fig. 2, a similar view of the same in a slightly-modified form; Fig. 3, a sectional view showing a regulating or cut-off gate applied to the spout through which the material passes to the shaker, and Fig. 4 a detached view of the cut-off gate or slide.

Referring first to Fig. 1, A A and B B represent, respectively, two sets of rolls such as are employed for reducing wheat to flour, and C the upper part of the casing by which said rolls are inclosed.

D represents a casing rising from the top of the main casing C, and E a raised top into which the material first enters by spout or otherwise.

Opening from the bottom of the top section E into the intermediate casing D are two spouts *a a*, between which there is arranged in the upper casing E a valve or cut-off F, which may be placed in an upright position, so as to permit the material to pass freely and equally to the respective spouts *a*, or may be thrown to one or the other side to direct all the material entering the top or casing E into one or the other of said spouts *a*.

G indicates a shaker or shoe upon which the material falls from the spouts *a a*, said shaker being provided at its mid-length with a vertical dividing-board *b*, which extends upward between the spouts *a a* and divides the shaker into two independent parts or sections, each sloping downward away from the division-board *b*. This division-board prevents the mingling of the materials introduced through the respective spouts *a a* and causes it to pass to the particular pair of rolls supplied by the spout through which it enters. The shoe or shaker G is suspended at its ends by straps or hangers *c*, preferably made of metal and sufficiently thin and elastic to permit the free and ready vibration or reciprocation of the shoe, which is effected by means of an eccentric H of short throw through the medium of a connecting pitman or rod I. (Indicated by dotted lines in Figs. 1 and 2.) This pitman, as indicated, is directly connected with the bottom of the shoe or shaker G or with a bar projecting outward therefrom to the exterior of the casing D. The connection, however, may be made inside instead of outside of the casing, if desired.

In order to permit the direct connection or attachment of the pitman and the shaker or shoe, it is made sufficiently thin and elastic to permit a vertical vibration or springing equal to the throw of the eccentric H, thereby doing away with the necessity of joints or couplings such as have hitherto been commonly employed in feeding devices of this class. This direct connection or attachment is important, for the reason that it prevents the loose motion or play incident to a joint or coupling between the pitman and the shaker or shoe and renders the action of the shaker more prompt, certain, and effective.

J indicates a pendulous cut-off, which is conveniently made in the form of a board with a beveled or rounded edge to rest upon the upper face of the shaker or shoe G, and which is hung from a cross-rod or from pins or studs *d* in rear of the gate or between said gate and the spout *a*, from which it is hung. The cut-off or gate J, being carried by the spout A, does not move bodily with the shaker G, but will swing and rise sufficiently to permit the material to pass under it as it is carried forward by the reciprocation of the shoe. The cut-off or gate J is provided on its rear side with a plate *e*, having a series of notches, so that it may be hung at a greater or less distance back from its body, and thereby caused to offer a greater or less resistance to the pas-

sage of material beneath it. The upper face of the shoe or shaker G may be roughened or smoothed, as preferred, this depending somewhat upon the character of the material to be fed.

Beneath the shoe G is a double inclined plate K, of sheet metal or other smooth material, designed to catch any material which may fall upon it and to direct the same to one or the other of two small hoppers *f*, arranged one directly above each pair of rolls A or B and directly beneath the delivery ends of the shoe or shaker G. The material falling from the ends of the shoe or shaker passes into the hoppers *f* and through them to the rolls A or B, the inclined outer walls of the hoppers *f* serving to break the fall of the material if projected any considerable distance beyond the ends of the shaker or shoe.

In Fig. 2 the same construction is represented, with the exception of the cut-off or gate J, which in said Fig. 2 is hinged directly to the lower end of the spout *a* and provided with an adjustable counter-weight L, by which it is thrown up against an inclined board *g*, attached to the dividing-board *b* of the shoe or shaker G. The weighted or counterbalanced gates J in this, as in the other construction, serve to restrict the passage of material, but in this case doing so prior to its delivery upon the shaker G, while in the former case it acted thereon only after its delivery upon said shaker and prior to or in the act of passing from the same.

M indicates an arm or detent pivotally attached to the wall of spout *a* and adapted to be swung over the arm N, on which the counter-balance L is carried, so as to hold the gate or cut-off J against the inclined board *g* in case it be desired to prevent the delivery of any material from the hoppers or spouts *a a;* or this device may be made merely to limit the extent of opening of the gates or cut-offs J, and this latter is the preferred arrangement and ordinary purpose of the arms M.

In feeding different classes of material it is desirable to regulate the size of the openings from the spouts *a*, and to accomplish this result I provide a notched cut-off slide O, which is moved back and forth across the spout by means of an adjusting-screw P, swiveled in an upturned lug or ear of the slide, as represented in Fig. 3. In all respects, except the arrangement of the cut-offs or gates J, the construction represented in Figs. 1 and 2 will be the same, and the gates or cut-offs O will be used or omitted in each case, as circumstances may require. The eccentric H will be carried by or formed upon a cross-shaft mounted in suitable bearings in the casing D or the frame-work of a machine and driven by belt or other suitable connection with the rolls or other part of the machine to which the feed is applied.

Having thus described my invention, what I claim is—

1. The combination, in a feed-regulator, of a longitudinally-reciprocating shoe G, provided with a dividing-board *b*, spouts *a a*, independent of the shoe and serving to deliver material thereto, crank or eccentric H, pitman I, attached to the shoe or shaker and connected with the crank or eccentric, and cut-off gates J, suspended from supports above and independent of the shoe and having their lower ends arranged to rest upon the shoe or upon the material passing over the same, substantially as and for the purpose set forth.

2. In combination with a longitudinally-reciprocating shoe or shaker and means for reciprocating the same, a pendulous gate J, suspended from a support independent of the shoe or shaker and arranged to bear at its lower end upon said shoe or shaker or upon the material passing over the same and thereby to receive motion from said shoe.

3. In a feed-regulator, the combination of a vibrating feed-board, a pendulous gate or cut-off resting loosely upon said feed-board and provided with notched arms, and supports for said arms adapted to enter one or another of the notches of the arms, substantially as shown, whereby the pressure of said gate upon the feed-board may be adjusted.

In witness whereof I hereunto set my hand in the presence of two witnesses.

WILLIAM D. GRAY.

Witnesses:
WM. BANNEN,
EDW. F. BYRON.