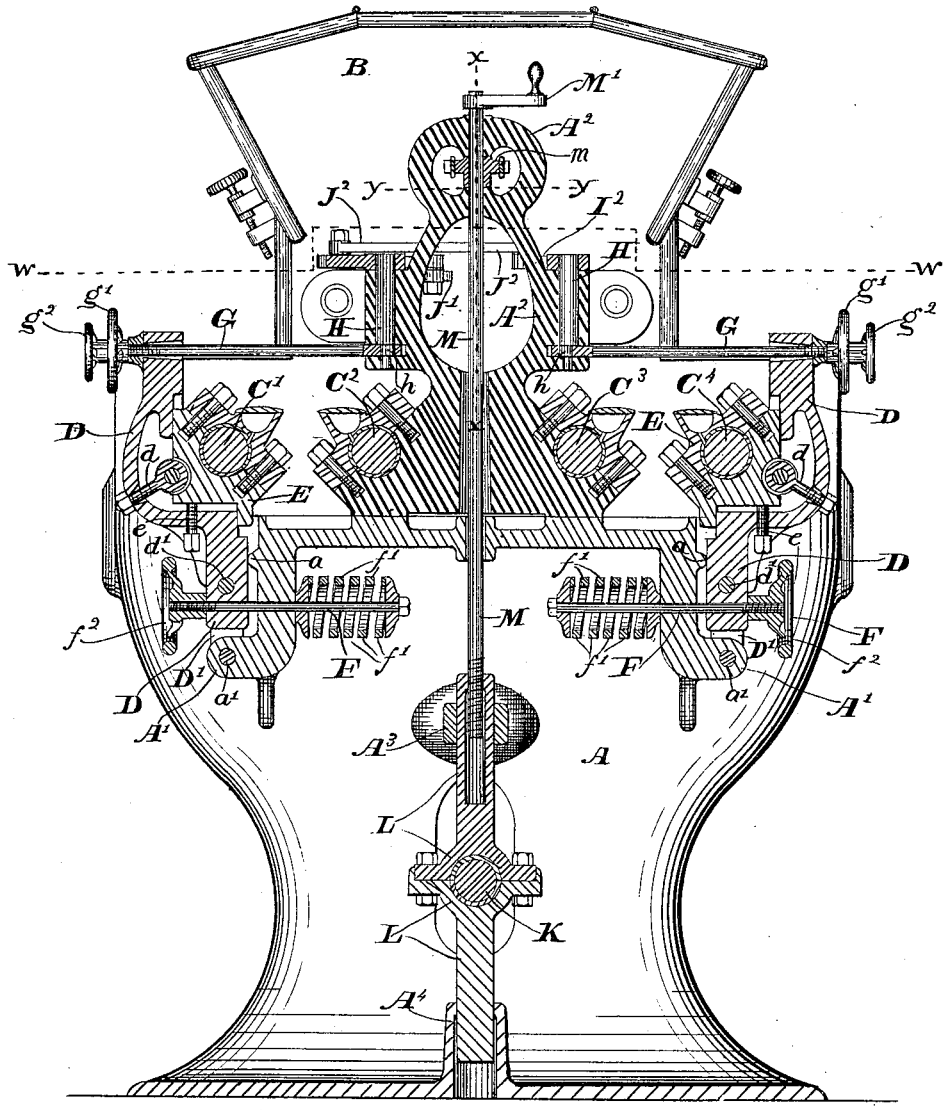
(No Model.) 2 Sheets—Sheet 1.

D. W. MARMON & J. WARRINGTON.

ROLLER MILL.

No. 266,490. Patented Oct. 24, 1882.

Fig. 1.



WITNESSES.

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(No Model.) 2 Sheets—Sheet 2.

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Fig. 2.

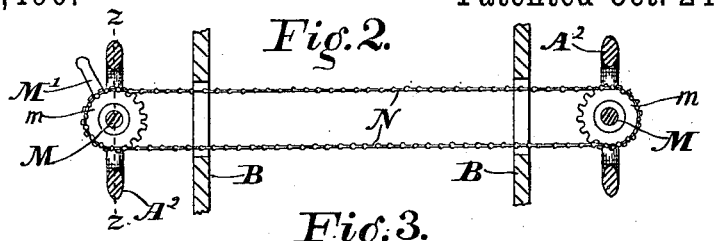


Fig. 3.

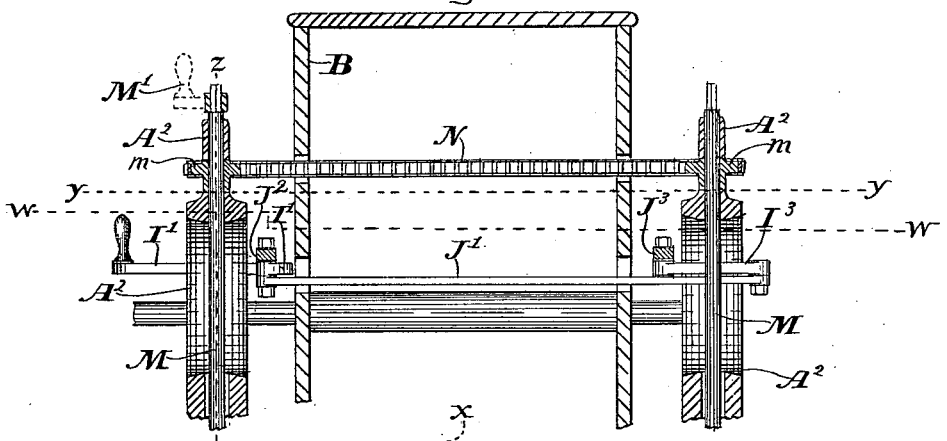
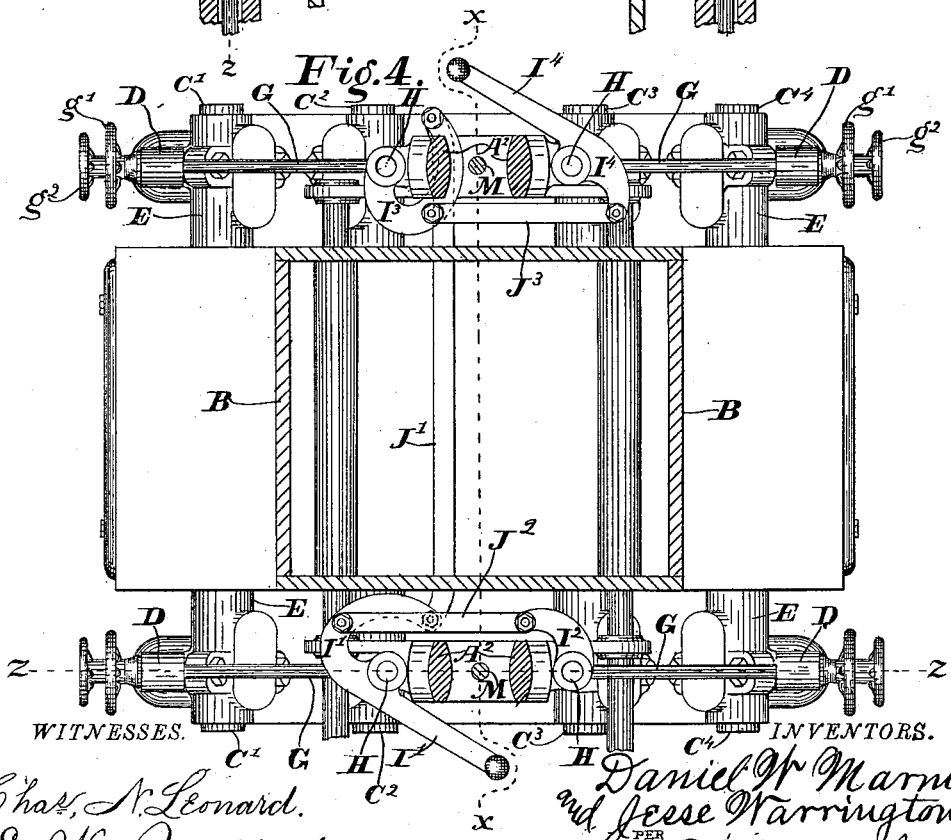


Fig. 4.



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UNITED STATES PATENT OFFICE.

DANIEL W. MARMON AND JESSE WARRINGTON, OF INDIANAPOLIS, INDIANA, ASSIGNORS TO THE NORDYKE & MARMON COMPANY, OF SAME PLACE.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 266,490, dated October 24, 1882.

Application filed August 3, 1882. (No model.)

To all whom it may concern:

Be it known that we, DANIEL W. MARMON and JESSE WARRINGTON, of the city of Indianapolis, county of Marion, and State of Indiana, have invented certain new and useful Improvements in Roller-Mills, of which the following is a specification.

The first object of our said invention is to provide certain new and improved mechanism in that class of machinery for the reduction of grain known as "roller-mills," whereby the movable roll of each set can be temporarily separated from its fellow and then returned to position without varying the regular adjustment; second, to provide a new and improved means for adjusting the boxes of the roll-journals on the supporting arms or bearings therefor; third, to provide a new and improved means for mounting the swinging arms; and, fourth, to provide a new and improved means for adjusting both ends of the counter-shaft simultaneously.

The first object is accomplished by providing vertically-set short shafts having eccentrics upon their ends connecting said shafts by connecting bars or rods, and providing levers for operating the same.

The second object is accomplished by mounting the journal-boxes in slides in the arms or bearings, providing a set-screw to elevate the same, and a bolt to hold the same down and back to position.

The third object is accomplished by mounting the arms on swinging links, and providing suitable stops and operating-rods.

The fourth object is accomplished by providing a screw-shaft at each end of the machine, connecting said shafts, respectively, with the corresponding journal-boxes of the counter-shaft, mounting a sprocket or chain wheel upon each of said screw-shafts, and connecting the same by a chain-belt, the whole to be operated by a crank applied to one or the other of said screw-shafts.

Referring to the accompanying drawings, which are made a part hereof, and on which the same letters of reference indicate the same or corresponding parts, Figure 1 is a transverse vertical sectional view, near one end, of our improved machine, as seen when looking toward the center of the machine from the dotted line *z z* in Figs. 2, 3, and 4; Fig. 2, a horizontal sectional view, looking upwardly from the dotted line *y y* in Figs. 1 and 3; Fig. 3, a vertical sectional view, looking to the left from the dotted line *x x* in Figs. 1 and 4; and Fig. 4, a horizontal sectional view, looking downwardly from the dotted line *w w* in Figs. 1 and 3.

In said drawings, the portions marked A A^2 represent the castings which form the supporting frame-work of the mill; B, the hopper and other covering portions; C' C^2 C^3 C^4, the shafts of the grinding-rolls; D, swinging arms in which one of each pair of rolls is mounted; E, adjustable boxes, preferably mounted on said arms; F, tempering-rods for adjusting the maximum force of the grinding-pressure; G, distance or adjusting rods for regulating the position of the arms; H, short vertical shafts having an eccentric formation at one point, to which point said rods G are attached; I' I^2 I^3 I^4, levers attached to said several vertical shafts, respectively, whereby the same are operated; J' J^2 J^3, connecting bars or rods, by means of which a simultaneous motion is imparted to said several shafts; K, the counter-shaft from which belts pass to the shafts C' C^2 C^3 C^4; L, journal-boxes therefor; M, screw-rods connected with extensions on said journal-boxes, and with some portion of the frame-work of the machine, by which the said boxes and the counter-shaft are raised and lowered; and N, a chain-belt connecting the two shafts M.

The frame-work A is preferably simply a cast-iron shell of appropriate form for the purpose. Its projecting and attached parts A' A^2 will be described so far as is necessary in connection with the mechanism.

The portions B are the ordinary hopper and covering portions of the machine.

The shafts C' C^2 C^3 C^4 are simply the ordinary roll-bearing shafts common to this class of machines.

The arms D are swinging arms located at each end of the machine, to which the boxes for the movable rolls are attached, and by which said rolls are rendered movable toward or from their fellows. They are mounted on links D',

which are connected thereto by the pivots d', and to portions A′ of the frame A by pivots a'. The upper ends of said arms are held to the proper position by the distance-rods G and the lower ends by the tempering-rods F.

The journal-boxes E are seated on the arms D, and are adapted to slide vertically on appropriate faces on said arms, as shown. They are adapted to be adjusted vertically by means of the set-screws e, which pass through screw-threaded holes in the arms D, which are fitted to receive them. The boxes are held firmly down onto these set-screws by bolts d, which are fastened thereto, and pass through suitable holes to the outside of the arms D, where they are provided with suitable nuts. The set-screws and bolts, working substantially oppositely to each other, serve to hold said boxes firmly in place, and at the same time serve as a means of easy adjustment when required. These boxes E may be seated on solid supports instead of the swinging arms, if desired, without departing from our invention in this particular, so long as the means for securing and supporting the same are not materially changed.

The tempering-rods F hold the lower ends of the arms D inwardly against the stops or fulcrums a on the portions A′ of frame A, and, also, as said fulcrums are above said rods, force the upper ends of said arms outwardly, and thus prevent the rolls supported by said arms from coming any nearer their fellows than forced by the rods G. In other words, by this arrangement the rolls are at all times held in that position to which they are naturally forced by the strain of the grinding-pressure, and thus all lost motion is continually taken up by the springs on these rods in the direction of said strain. The springs f', as will be readily seen, through the rods F, draw the arms D forcibly against the stops a, and the hand-wheels f^2, being properly adjusted, hold said arms and the rolls supported thereby inward with all the force needed for a grinding-pressure. When any hard substance passes between the rolls it will part said rolls and still further compress said springs, which will, however, as soon as the hard substance has passed, cause said rolls to resume their normal relation.

The adjusting-rods G are for the purpose of moving the upper ends of the arms D back and forth, and thus bringing the individual rolls of the pair nearer to or farther from each other. Each is pivoted at the inner end to the eccentrically-formed portion of the corresponding vertical shaft H, and is preferably provided at its outer end with a hand-nut, g', and a hand set-nut, g^2. The arms D are adjusted inward or back by turning the hand-nut on the rod G, and the rolls supported by said arms are thus positioned nearer to or farther from their fellows.

The vertical shafts H are set in bearings in the casting A^2, forming the upper portion of the frame-work. Each has an eccentric portion, h, to which a rod, G, is attached, so that when said shafts are turned said rods will be drawn back and forth.

The levers I' I^2 I^3 I^4 are mounted on the shafts H and serve to operate said shafts.

The connecting-bars J' J^2 J^3 connect the said levers together and cause them to move simultaneously. When the invention is used with a single set of rolls, the bar J' is all that is necessary, as it connects the levers on the shafts, which are connected with the opposite ends of the same roll. When the invention is applied to a double mill, as shown, the bars J^2 J^3 are added, and connect the levers on the other shafts to the first ones, so that all can be moved simultaneously, and both movable rolls thus parted from their fellows at once.

The counter-shaft K is mounted in the boxes L. When this shaft is raised or lowered it loosens or tightens the several belts employed to run the grinding-rolls. The arrangement of pulleys and belts being fully shown in the Letters Patent bearing date October 10, 1882, in which we appear as the inventors, will not be shown or described in this application.

The boxes L are combined boxes and slides, as shown, and are adapted to move vertically in bearings in the projections A^3 A^4 on the frame A, the upper and lower halves being extended to rest in said bearings, respectively. The upper extensions are screw-threaded to receive the lower ends of the screw-rods M.

The screw-rods M are mounted in bearings in the frame A A^2, and extend down and enter the upper halves of the boxes L. They are provided upon their upper ends with sprocket or chain wheels m, which are pinned or keyed fast thereto, and thus serve also as collars to prevent any endwise movement of said rods. One or both may be provided with crank-handles M′, by which they are revolved, and the boxes L thus moved up and down.

The chain N connects the wheels m, and thus causes the shafts M to revolve together and raise or lower both ends of the counter-shaft K simultaneously. This is a very simple and convenient means for accomplishing this result.

We do not now claim the mechanism for adjusting the counter-shaft herein shown, as the same is reserved as the subject-matter of another application for Letters Patent which we intend to make.

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

1. The combination, with the movable rolls, the arms supporting the same, and the rods G, of the vertically-set shafts H, having eccentric portions h, to which said rods are connected, and levers for operating the same, substantially as set forth.

2. The combination of the movable roll-supporting arms, the rods G, the shafts H, having eccentric portions, the levers, and the described means of connecting the same, substantially as set forth.

3. The combination of the rolls, the boxes,

the arms, the rods, the shafts H, the levers I′ I^2 I^3 I^4, and the bars J′ J^2 J^3, substantially as set forth.

4. The combination, with the roll-journal boxes E, formed, as shown, to slide vertically on their supports, and said supports formed with vertical slides to receive said boxes, of the set-screws *e*, adapted to impart the vertical movement to said boxes, and the bolts *d*, adapted to hold said boxes downwardly against the set-screws and laterally against the bearings on the supports, substantially as set forth.

5. The combination of the arms D, the links D′, mounted on pivots *d′ a′*, the stops or fulcrums *a*, and the rods F and G, substantially as set forth.

In witness whereof we have hereunto set our hands and seals, at Indianapolis, Indiana, this 31st day of July, A. D. 1882.

DANIEL W. MARMON. [L. S.]
JESSE WARRINGTON. [L. S.]

In presence of—
A. N. DWYER,
AMOS K. HOLLOWELL.