(No Model.)

E. G. DEWALD.

ROLLER MILL.

No. 447,765. Patented Mar. 10, 1891.

Fig. 1.

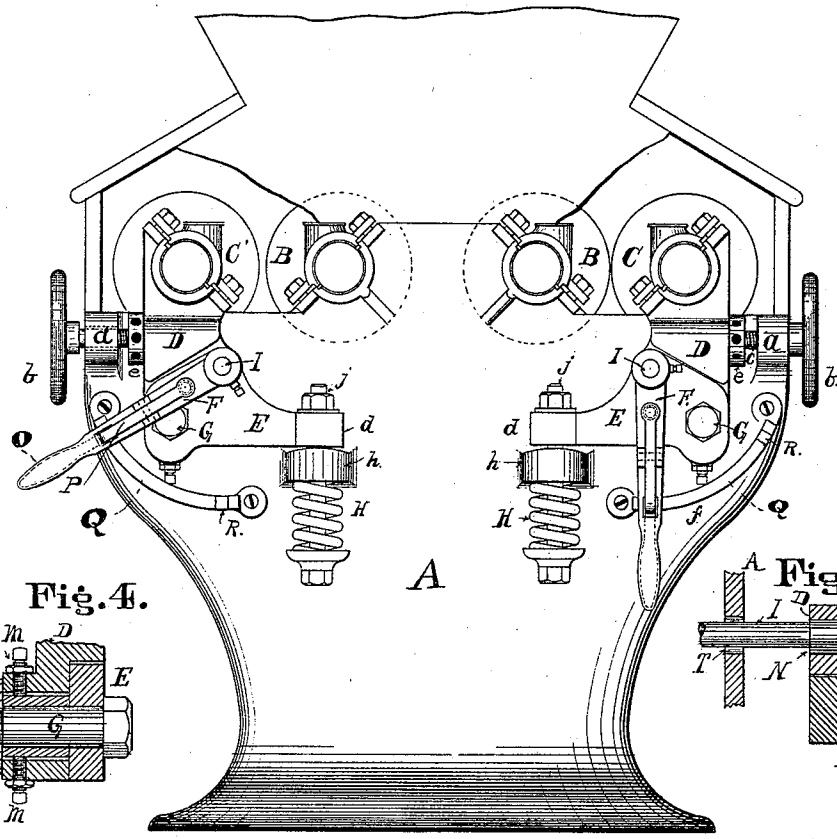


Fig. 4.

Fig. 5.

Fig. 2.

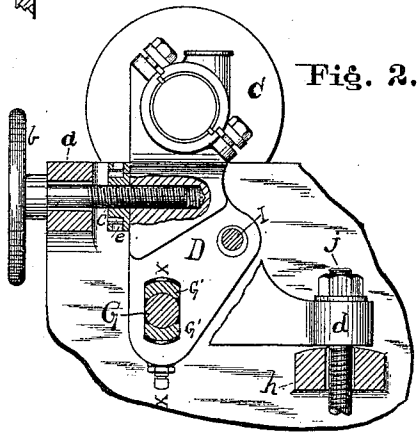
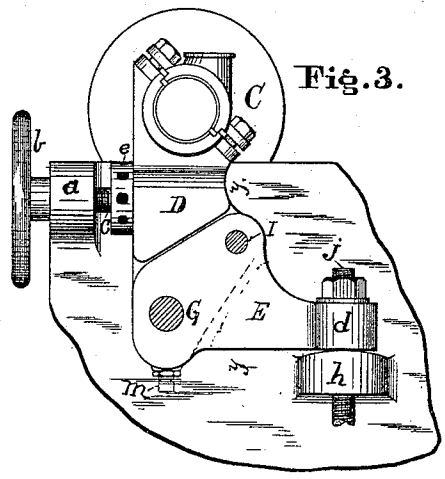


Fig. 3.



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ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 447,765, dated March 10, 1891.

Application filed March 15, 1890. Serial No. 343,955. (No model.)

To all whom it may concern:

Be it known that I, EDWARD G. DEWALD, a citizen of the United States, and a resident of Dayton, in the county of Montgomery and State of Ohio, have invented certain new and useful Improvements in Roller-Mills, of which the following is a specification.

My invention relates to roller-mills.

Its object is to provide a compact and reliable means to hang the movable rolls, hold them with elastic or yielding pressure in working contact with the stationary rolls, throw the movable rolls out of working contact with the fixed rolls, and at the same time relieve the pressure upon the springs.

Its object is also to provide means for adjusting the movable rolls vertically and horizontally, so as to compensate for any unevenness in the wearing of the rolls or roll-bearings and keep the grinding-surfaces in proper alignment.

The invention will be first fully described in connection with the accompanying drawings, and will then be particularly referred to and pointed out in the claims.

Referring to the drawings, in which like parts are indicated by similar reference-letters wherever they occur throughout the various views—

Figure 1 is an end elevation of a roller-mill embodying my invention, a part of the wooden casing being broken away to expose the roll ends. Figs. 2 and 3 are enlarged views, partly in elevation and partly in section, of part of the end framing and movable roll-bearings. Fig. 4 is a transverse vertical section through line *x x* of Fig. 2. Fig. 5 is a similar sectional view through line *y y*, Fig. 3.

I have shown in Fig. 1 my improvements applied to a common roller-mill of double form, the opposite ends of the mill, the roll-bearings, and the roll-adjusting mechanism being the same upon both ends.

The iron frame A of the mill is of ordinary construction, and the stationary rolls B B are mounted in it in the usual manner. The movable rolls C C are mounted in pivoted or swinging bearings, which are constructed in two parts, D and E. These parts are connected by a rabbet-joint. The shoulders formed by the rabbet are rounded to permit a limited movement of the sections one upon the other. The sectional journal-bearings D E are pivoted upon stud-pins G, which are secured in the end of the iron frame A. The perforations in the lower sections E snugly fit the stud-pins G, but the lower parts of the arms or sections D are vertically slotted to receive the journal-boxes G′ and provide for the vertical adjustment of the arms D and the movable rolls C C. The arms D are provided with hubs or bosses surrounding the slots to receive the set-screws *m*, which support the boxes G′. These screws are provided with jam-nuts to hold them and the boxes G′ in the desired position. The sections E terminate at their lower ends in vertically-perforated bosses *d*, through which bosses and the perforated ears *h*, which are cast upon the ends of the machine, pass screw-rods *j*. These rods are provided with enlarged heads or collars between which and the ears *h* are compressed the coiled springs H. These springs are for the purpose of holding the rolls in contact by yielding pressure, and their pressure is adjusted by the nuts upon the upper screw-threaded ends of the rods *j*. The through-shafts I pass from end to end of the mill and through the sectional arms D E of the movable roll-bearings. The extended ends of these shafts are provided with levers O, which are provided with spring-catches P, which engage notches R in segments Q, which are secured to the ends of the mill and hold the movable rolls firmly when adjusted to either position. The shafts I are journaled in the sectional arms E, and the parts of the shafts which pass through the arms D are provided with eccentrics N, which fit corresponding openings in said arms D. It will be seen that any rotary movement of the shafts I will move the sections D E upon each other, and that when the lever O is in the position shown at the right-hand side of Fig. 1 the bosses of arms E are drawn from the ears *h* against the pressure of the springs H, thus holding the rolls in working contact by the force of said springs. To throw the rolls apart, the spring-catch P is released from its notch and the lever O turned upward. The first movement of the lever allows the spring to draw the end of the arm E down upon the lug *h*, which movement releases the tension of the spring. As the upward movement of

the lever is continued (the arm E being now held rigid) the cams N will separate the rolls, and when the spring-catch P enters the upper notch in the segment Q will hold them so separated, as seen on the left-hand side of Fig. 1. It is obvious that in order to permit the arms E to turn upon the pivot-pins G the shaft I must move laterally. For this reason the openings in the casing A are enlarged, as seen at T, Fig. 5.

It will be seen that by means of my invention when it becomes necessary to separate the rolls the tension of the springs is relaxed and remains so relaxed so long as the rolls are held apart. The efficiency of the springs is therefore not impaired by their being subjected to a greater tension when the rolls are separated than they are when in working contact, and the force required to separate the rolls is less, the springs actually assisting the separation when the spring-catches of the levers are released.

I will now describe my improved means for adjusting the rolls horizontally the desired distance apart and holding them when adjusted. Upon the ends of the frame A are cast ears *a*. These ears are pierced to allow the adjusting-screw *c* to pass through them. The perforations are large enough, as seen in Fig. 2, to allow the shaft of the screws to move freely in them as the bearings D are swung out or in to separate or close the rolls. These screws are tapped into the outer edges of the swinging arms D, and are provided with hand-wheels *b* and jam-nuts *e* to adjust the rolls and hold the adjustment.

I have illustrated and described what I believe to be the best form of my invention; but it is obvious that many mechanical changes may be made, both in the form and location of the parts. I do not therefore limit myself to the exact construction shown, but consider all mere mechanical deviations as within the spirit and scope of my invention.

What I claim is—

1. In a roller-mill, the swinging journal-bearings for the movable roll, formed in sections, a common center upon which said sections are pivoted, and means for simultaneously moving said sections in opposite directions for the purpose of spreading or closing the rolls, substantially as shown and described.

2. The combination, as hereinbefore set forth, of the sectional arms D E, the stud G supporting them, means such as shown for simultaneously moving said sections in opposite directions around their common pivot G to separate or close the rolls, and the spring H, pressing the inner end of the arm E.

3. The combination of the sectional journal-arms D E, the studs G, pivoting said arms, the through-shaft I, journaled in the arms E, the eccentrics N upon said shaft and engaging the arms D, and the lever O to rock said shaft for the purpose of moving the arms and separating or closing the rolls, substantially as shown and described.

4. The combination, substantially as hereinbefore set forth, of the swinging sectional arms D E, the adjacent ends of said arms being rabbeted and lapping one upon the other, the pivot-pin G, forming the common pivot for both sections, and the said section E having a boss *d*, the ear *h* upon the end of the frame A, the rod *j* passing through said boss and ear *h*, and the spring H to draw the end of arm E in the direction of said ear, the vertical adjustable bearings G in the arm D, whereby the said arm D is vertically adjustable independent of the arm E, and means for moving the sections D E one upon the other for the purpose of spreading or closing the rolls.

5. The combination of the swinging roll-bearings, for the movable rolls, made in two parts D E, pivoted upon a common center, but capable of moving around said center in opposite directions, the pivot G, supporting the same, the spring pressing the inner end of said bearings to hold the movable roll in working position with the ear *a*, the screw *c*, passing through said ear and tapped into the edge of the swinging roll-bearing, the hand-wheel *b*, and jam-nut *e* to adjust the roll and hold the adjustment.

6. In a grinding-mill, the combination of a movable roll, a swinging arm made in two parts at each end of said roll, a rigid pivot for both of said sections, a spring to urge the bearings inward when said sectional arms are locked as one piece, and devices, substantially as shown, to move the said section of the swinging arm in opposite directions upon said pivot, whereby the tension of said spring is relaxed when the rolls are separated, substantially as shown and described.

7. The combination, in a roller-mill, of the swinging journal-arm D, vertically slotted, as shown, the stud G, secured to the frame of the machine and serving as pivot for said arm, the boxings G′, vertically adjustable in the slot of the swinging journal-arm, and the set-screws *m* for adjusting said boxes and holding the adjustment, substantially as shown and described.

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Witnesses:
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