(No Model.)

W. A. MAHAFFY.

ROLLER FLOUR MILL.

No. 263,927. Patented Sept. 5, 1882.

Fig. 1.

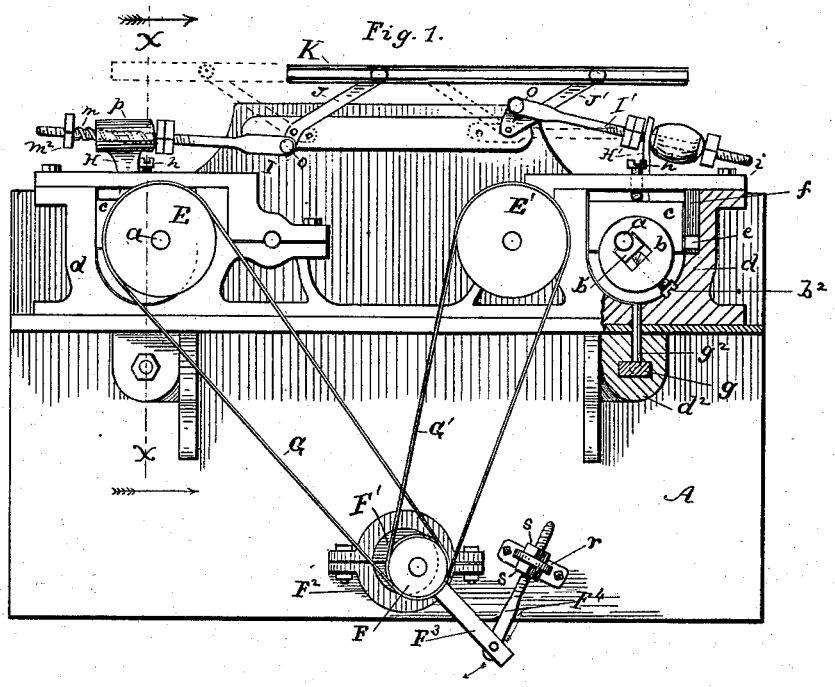


Fig. 2.

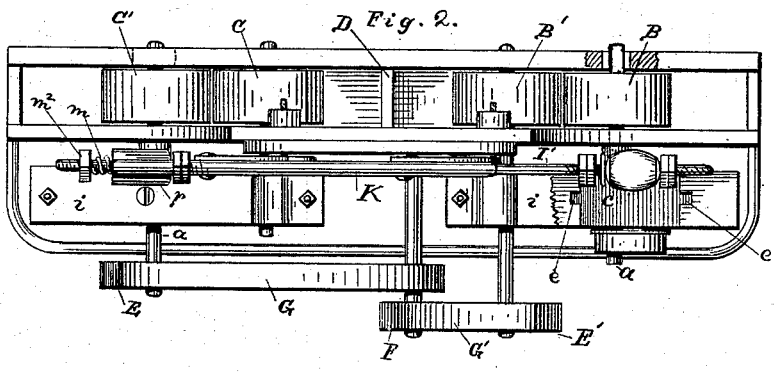


Fig. 3.

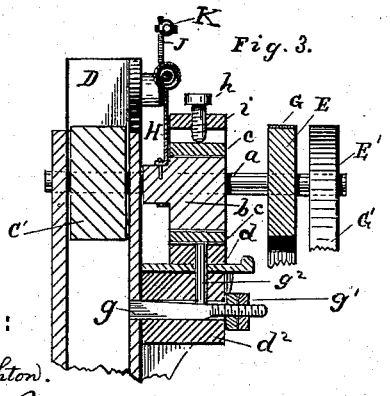
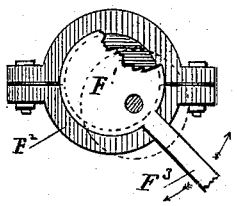


Fig. 4.



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ROLLER FLOUR-MILL.

SPECIFICATION forming part of Letters Patent No. 263,927, dated September 5, 1882.

Application filed January 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MAHAFFY, of Rushford, in the county of Fillmore and State of Minnesota, have invented a new and Improved Roller Flour-Mill; and I do hereby declare that the following is a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming part of this specification, in which—

Figure 1 is a side view from the side opposite the rolls, showing the right-hand bearing of the right-hand set of rolls in section. Fig. 2 is a plan view with one cross-piece *i* removed. Fig. 3 is a cross-section through the line *x x* of Fig. 1. Fig. 4 is a detail of the device for tightening the belts, the pulleys being removed to show the eccentric bearing.

My invention relates to certain improvements in that class of flouring-mills in which rolls revolving in close proximity to each other are employed for reducing the grain.

My improvement consists in the peculiar construction and arrangement of the adjusting devices for the laterally-movable roll, and in the means for locking said movable roll in working position, as will be hereinafter more fully described.

In the drawings, A represents any suitable frame-work, in which are sustained two sets of reducing-rolls, B B′ and C C′, (see Fig. 2,) which sets are separated by a partition, D, so that two separate reductions may be made at one time. Just above these rolls is arranged the usual feed-boxes, (not shown), which may be of the usual form and function. For rotating these rolls pulleys E E′ are arranged on the extension of the journals of the rolls B′ C′, and these are connected with a driving-pulley, F, by belts G G′. The other two rolls, B C, rotate passively from contact with the rolls B′ C′.

The adjustable rolls B and C′ have each a similar or corresponding mechanism for controlling their movements, and a description of one of them will therefore suffice for both. Each of these rolls is fixed upon a shaft, *a*, projecting laterally from and journaled eccentrically in a circular boss or hub, *b*, turning loosely in a box, *c*. This box *c* is arranged in a seat, *d*, so as to slide vertically for a slight adjustment, and has on its sides lugs *e e*, which rest in vertical grooves *f* of the seat *d*. This device prevents any endwise movement of the roll, and yet allows it to be adjusted vertically to raise or lower its point of contact with the other roll. For giving this box its vertical adjustment a tapered wedge-block, *g*, is seated in a notch in the seat *d* immediately below the box *c*, and is arranged to be drawn in a direction parallel with the axis of the roll by a nut, *g′*, on the threaded end of the wedge. This wedge by raising or lowering pin g^2 adjusts vertically the box *c*. For holding the box *c* against any tendency to rise a set-screw, *h*, passes through the cross-piece *i* at the top and bears against the top of the said box.

To cause the adjustable roll to be projected against the other roll, an arm, H′, is rigidly attached to the hub *b*, and is arranged to be swung at right angles to the axis of the rolls to cause the eccentrically-located axis *a* to approach or recede from the axis of the other roll. This arm H′ for the roll B has the same function as H on the other side for roll C′, and it is rigidly connected to hub *b* in same way that H is, as shown in Fig. 3. These arms H and H′ connect respectively with rods I I′, attached by joints to vertically-swinging levers J J′, connected at their tops by a parallel-motioned bar K. In attaching the rods I I′ to the levers J J′ one of the latter is jointed above and the other below the fulcrums of the levers, so that the one movement of bar K produces upon both the rolls B and C′ the same effect of throwing them against their twin rolls by throwing the arms H H′ inward or of throwing them away by throwing said arms outward. In locating the joints *o* of the rods and levers I and J they are so placed that when the bar K has its extreme adjustment for bringing the rolls together, as shown in dotted lines, Fig. 1, these joints will be thrown into line with the fulcrums of the levers, so that the advantages of the lock on the dead-center may be obtained for maintaining this closed adjustment of the rolls.

It may happen sometimes when the rolls are thus locked in close contact that unyielding foreign bodies may get between the rolls. To provide for this, on the top of the arms H H′ may be formed tubes *p*, one of which, as shown

on the left, whose outer ends are open and whose inner ends are closed, with the exception of a central hole through which the rod I passes. In the tube of each arm and around these rods I I′ is arranged a spiral spring, *m*, which at one end bears against the inner end of the tube, and at the other end bears against a nut, m^2, screwed upon the threaded end of the rod I, so that the strain of these rods on the arms H and H′ and their rolls is an elastic strain, which allows the movable rolls to yield slightly to foreign substances. Instead of a tube and spiral spring, a rubber spring, as shown on the right, may be used.

For regulating the tension of the driving-belts G G′ the pulley F is fixed on a counter-shaft below the rolls, and the said shaft is eccentrically located in a hub, F′, which latter turns in a box, F^2, and is provided with an arm, F^3, Figs. 1 and 4, rigidly attached thereto. This arm F^3 is jointed at its end to a screw-rod, F^4, which latter passes through a perforated standard or lug, *r*, and has nuts *s s* on opposite sides of the same, so that by forcing the arm F^3 down by the rod F^4 and nuts *s* the hub F′ is turned on its axis and the pulley drawn down to tighten the belt.

In making use of my invention I do not confine myself to a solid boss or hub, *b*, for carrying the axis *a* of the movable roll, but I may make it with a movable bearing-block, *b*′, Fig. 1, which is held against the shaft *a* by set-screw b^2 to take up wear, the set-screw being arranged outside of the peripheral bearing-surface of the boss, where it comes in contact with the inclosing box.

It will be perceived that I have only described means for adjusting one end of the shaft of the laterally-movable roll. The other end of this shaft in each of the adjustable rolls moves freely in a slot the length of the bearing of the roll-shaft *a* in hub *b*, being long enough to dispense with any separate adjustment of the other end.

Having thus described my invention, what I claim as new is—

1. The combination, with the roll B′, of an adjustable roll B, shaft *a*, the hub *b*, said shaft being eccentrically journaled in said hub, an adjusting-arm, H′, the vertically-adjustable box *c*, inclosing said hub, and the seat *d* for holding said box, substantially as and for the purpose described.

2. The combination, with the laterally-adjustable rolls B C′, the hubs *b*, having the roll-shafts located eccentrically therein, and the arms H H′, attached to said hubs, of the rods I and I′, having an elastic connection with said arms, the levers J J′, jointed to the rods I I′ at *o o* upon opposite sides of their fulcra to form locking-points to hold the rolls to their adjustment, and the connecting-bar K, substantially as shown and described.

3. The combination of the adjustable roll having shaft *a*, the rotary hub *b*, the box *c*, with lug *e*, the vertically-grooved seat *d*, the adjusting-rod g^2, and the subjacent horizontally-adjustable wedge *g*, substantially as and for the purpose described.

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