(No Model.) 2 Sheets—Sheet 1.

A. INGRAHAM.

ROLLER MILL.

No. 453,812. Patented June 9, 1891.

Fig. 1.

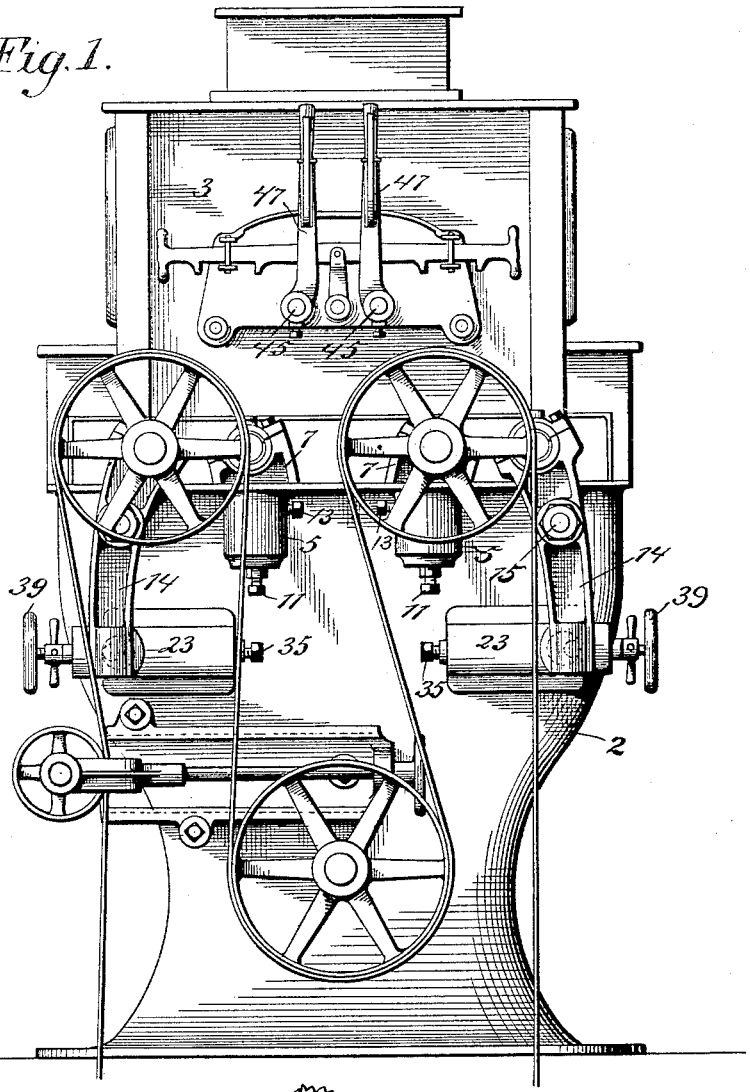
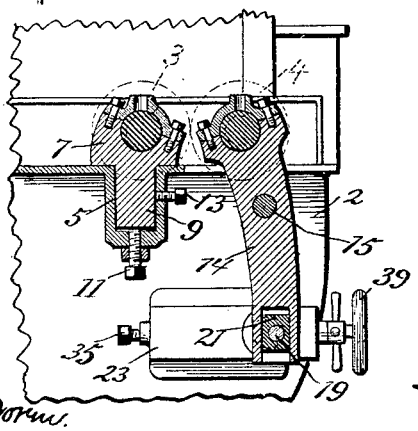


Fig. 2.



Witnesses.
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(No Model.) 2 Sheets—Sheet 2.

A. INGRAHAM.

ROLLER MILL.

No. 453,812. Patented June 9, 1891.

Fig. 3.

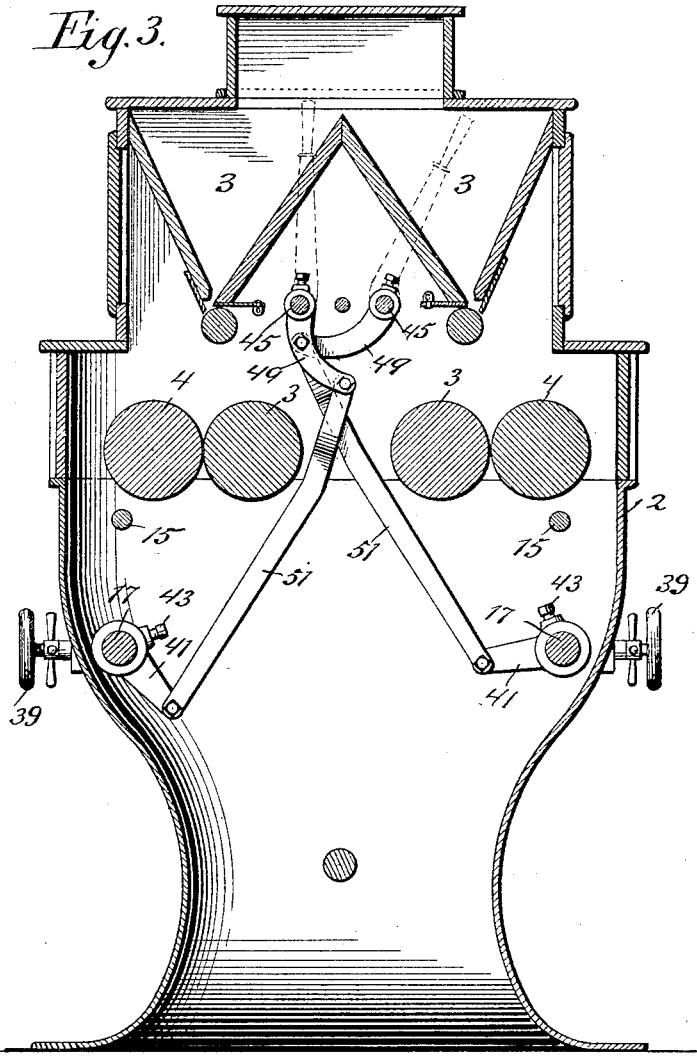
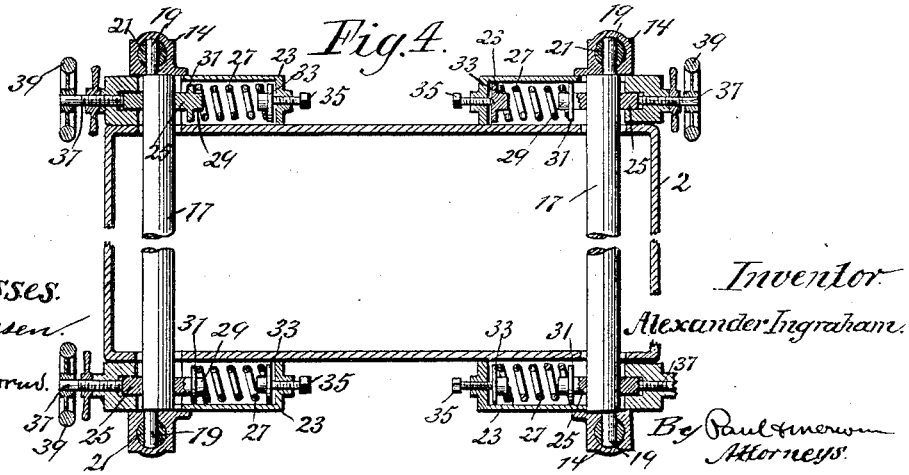


Fig. 4.



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UNITED STATES PATENT OFFICE.

ALEXANDER INGRAHAM, OF MINNEAPOLIS, MINNESOTA, ASSIGNOR TO SMITH & RICHARDSON, OF SAME PLACE.

ROLLER-MILL.

SPECIFICATION forming part of Letters Patent No. 453,812, dated June 9, 1891.

Application filed August 19, 1890. Serial No. 362,435. (No model.)

To all whom it may concern:

Be it known that I, ALEXANDER INGRAHAM, of Minneapolis, in the county of Hennepin and State of Minnesota, have invented certain Improvements in Roller-Mills, of which the following is a specification.

This invention relates to improvements in machines designed for grinding wheat or other grain; and the invention consists, generally, in certain improvements in means for supporting and adjusting the yielding rolls, as hereinafter described, and particularly pointed out in the claims.

In the accompanying drawings, forming a part of this specification, Figure 1 is a side elevation of my improved roller-mill. Fig. 2 is a detail section of the roll-supporting box and arm of one pair of rolls. Fig. 3 is a vertical section of the roller-mill. Fig. 4 is a horizontal section, partly broken away, through the adjusting-shafts and springs.

In the drawings, 2 represents the frame of the machine, the lower part of which is preferably formed as a single casting, and the upper part of which preferably contains the feed-hoppers 3, of any suitable construction and arrangement.

The mill herein shown is what is known as a "double" or "four-roller" mill, being provided with two pairs of rolls 3 3 and 4 4. The rolls 3 3, as here shown, are the non-yielding rolls, being mounted in stationary boxes or bearings, and the rolls 4 4 are the yielding rolls, being mounted in yielding bearings. I mount the non-yielding rolls in bearings that are stationary when the mill is in use, but are capable of being vertically adjusted for the purpose of tramming the rolls. For this purpose I prefer to provide the frame of the machine with the sockets 5, preferably cast in the lower part of the casing and open at the top. The rolls 3 are mounted in bearings or boxes 7, having the depending projections 9, that fit into the sockets 5 and are capable of movement therein. A set-screw 11 is arranged in the bottom of the socket and bears against the lower end of the projection 9, and a locking-screw 13 extends through the wall of the socket and bears against the projection 9. By this means either end of the non-yielding roll may be vertically adjusted for the purpose of tramming the rolls.

The rolls 4 are mounted in boxes upon swinging arms 14. The arms 14 are mounted upon stationary pivots 15 upon the frame of the machine. The boxes or bearings formed on these arms may be of any suitable construction. Arranged in the casing are the adjusting-shafts 17, that pass through openings in the walls of the casing of sufficient size to permit the shafts to move laterally therein. Arranged upon each end of each shaft is an eccentric pin or journal 19. The lower end of each arm 14 is provided with a socket, within which is arranged a block 21, the socket and block being preferably of cylindrical form. Upon each side of the casing is preferably arranged a housing 23, through which the shaft 17 passes. The arms 14 are preferably arranged outside of these bearings. In these housings are arranged the blocks 25 and springs 27, the blocks 25 forming supports for the shafts 17. One end of each block 25 is arranged in a recess in the inner wall of the end of the housing, and its opposite end is provided with a cylindrical projection 29 and collar 31. The spring 27 is arranged in the housing, with one end bearing against the collar on the block 25 and with its opposite end bearing upon a collar 33. The collar 33 is capable of adjustment by means of the screw 35, and the block 25 is capable of adjustment by means of the screw 37, provided, preferably, with a hand-wheel 39. Each shaft 17 is provided with an arm 41, preferably secured thereto by means of a collar and a set-screw 43. Shafts 45 are arranged in the upper part of the mill-casing, and each is provided at its outer end with a handle-lever 47. An arm 49, secured to each shaft 45 within the casing, is connected to the arm 41 by means of the rod or arm 51. By this means, it will be seen, the rolls may be very accurately adjusted, while one roll is always capable of yielding to permit any hard substance to pass between the rolls, and the yielding roll is capable of being moved away from the other roll and returned to its grinding position without any change in the grinding adjustment. Either end of either roll may be

independently adjusted, and by adjusting the non-yielding roll vertically the rolls may be accurately trammed. As the ends of the shafts 17 are connected to the arms 14 by means of the cylindrical blocks 21, arranged in sockets in the ends of said arm, either end of the shaft 17 may be independently adjusted, thereby adjusting the corresponding end of the roll 4, and when this adjustment is made the socket and the cylindrical block 21 act as a vertical axis, the block turning in the socket and thus permitting the independent adjustment of these arms.

I claim as my invention—

1. In a roller-mill, the combination of the non-yielding roll, the yielding roll, swinging arms supporting said yielding roll, the shaft 17, having an eccentric connection with said swinging arms, blocks 25, supporting said shaft, springs 27, engaging said blocks, means for adjusting said blocks, and means for turning said shaft, substantially as described.

2. The combination, with the non-yielding roll, of the yielding roll, pivoted arms 14, supporting said yielding roll, the adjusting-shaft 17, having an eccentric connection with said arms, means for turning said shaft, blocks 25, supporting said shaft, the adjusting-screws 37, moving said blocks, springs 27, engaging said blocks, and the screws 35 for adjusting the tension of said springs, substantially as described.

3. In a roller-mill, the combination, with the non-yielding roll, of the yielding roll supported in swinging arms provided with cylindrical sockets, the blocks 21, fitting in said sockets, and the adjustable shaft 17, having eccentric connection with said blocks 21, for the purpose specified.

In testimony whereof I have hereunto set my hand this 14th day of August, A. D. 1890.

ALEXANDER INGRAHAM.

In presence of—

A. M. GASKILL,

O. G. HAWLEY.