(No Model.) 2 Sheets—Sheet 1.

F. H. BREWSTER.

ROLLER MILL.

No. 422,908. Patented Mar. 11, 1890.

Fig. 1.

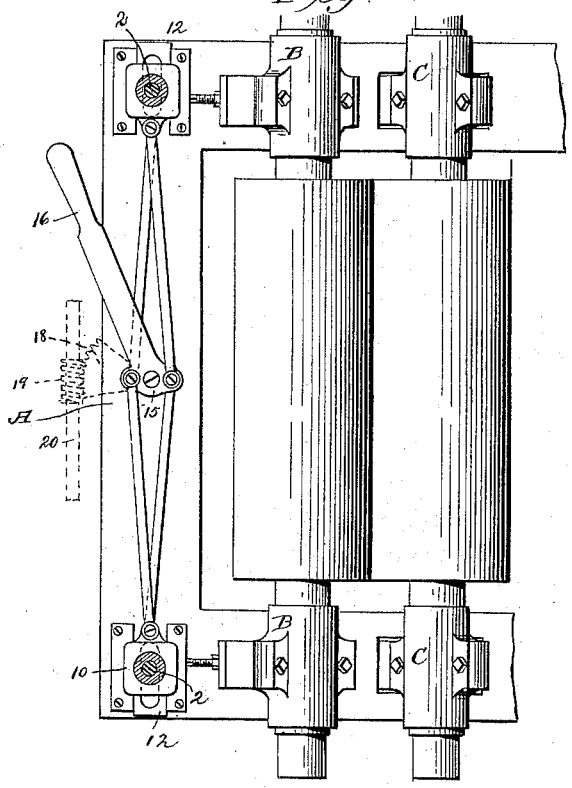


Fig. 2.

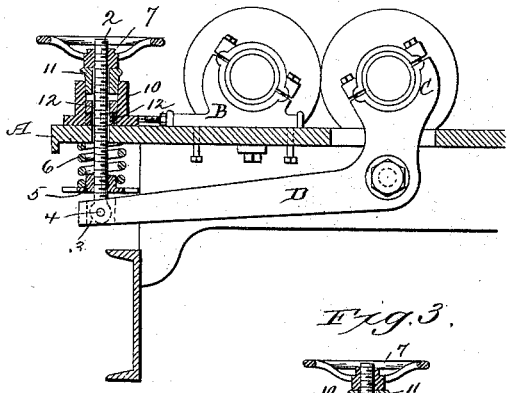


Fig. 6.

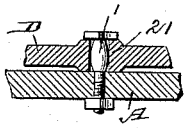
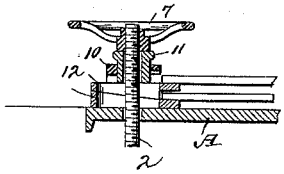


Fig. 3.



Witnesses
E. D. Smith.
Thomas Durant,

Inventor
Frank H. Brewster,
By his Attorneys
Church & Church.

(No Model.) 2 Sheets—Sheet 2.

F. H. BREWSTER.

ROLLER MILL.

No. 422,908. Patented Mar. 11, 1890.

Fig. 4.

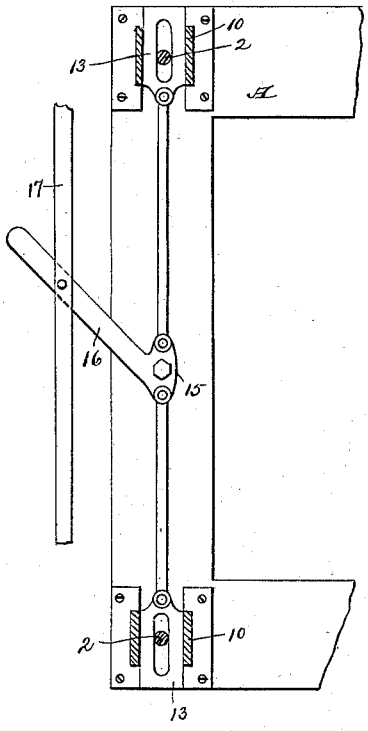


Fig 5

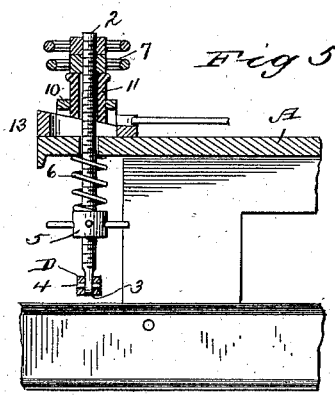
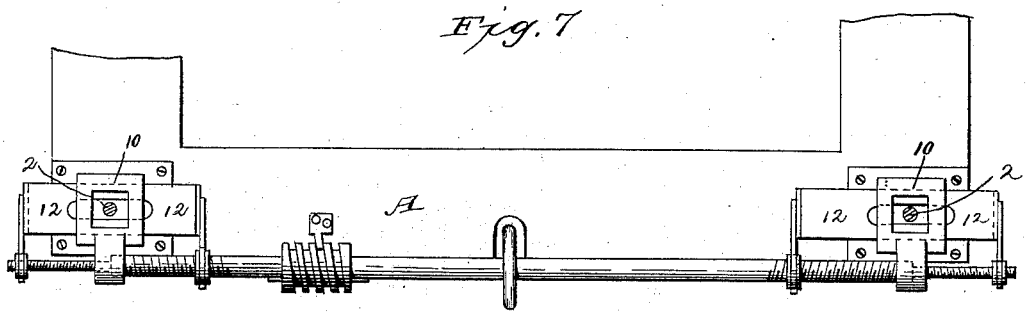


Fig. 7



Witnesses
E. B. Smith
Thomas Durant.

Inventor
Frank H. Brewster
By his Attorneys
Church & Church

UNITED STATES PATENT OFFICE.

FRANK H. BREWSTER, OF ESCANABA, MICHIGAN, ASSIGNOR TO THE COCHRANE ROLLER MILLS COMPANY, OF SAME PLACE.

ROLLER-MILL

SPECIFICATION forming part of Letters Patent No. 422,908, dated March 11, 1890.

Application filed December 5, 1889. Serial No. 332,624. (No model.)

To all whom it may concern:

Be it known that I, FRANK H. BREWSTER, of Escanaba, in the county of Delta and State of Michigan, have invented certain new and useful Improvements in Roller-Mills; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, forming a part of this specification, and to the figures and letters of reference marked thereon.

This invention relates to a new and improved construction and arrangement of adjusting and spreading mechanism for application to the movable rolls of roller-mills, designed more particularly to facilitate the adjustment of the rolls for grinding and the spreading or separating of the rolls in starting or stopping the mill.

The said invention consists in the several novel combinations and arrangements of parts hereinafter described, and set forth in the claims.

In the drawings, Figure 1 is a top plan view, and Fig. 2 an end view, partly in section, representing a portion of a mill with the improvements applied. Fig. 3 is a detail view, partly in section, of the retracting devices applied to one of the lever-bearings. Fig. 4 is a plan view, and Fig. 5 a sectional view, of a slightly-modified form of retracting mechanism. Fig. 6 is a detail illustrating the fulcrum of the lever-bearing. Fig. 7 illustrates a modification of the devices for actuating the spreading-wedges.

Similar letters of reference in the several figures indicate the same parts.

The frame A of the mill may be of any desired or approved construction, adapted to receive and support the boxes B of what is herein designated as the "fixed roll" in contradistinction to the other or companion roll mounted in movable bearings connected to the adjusting and spreading devices and hereinafter referred to as the "movable roll." The movable roll is supported at its ends in boxes C, each connected to or mounted upon a separate lever D, fulcrumed upon the frame.

The boxes B of the fixed roll are formed or provided with suitable devices for effecting vertical and horizontal adjustments of each end of the roll for tramming and setting the rolls parallel, while the boxes of the movable roll are independently controlled by adjusting mechanism connected to the levers D.

In effecting the adjustment of the rolls and at times during the operation of the mill one of the bearings C will or may be forced slightly in advance of the other or out of line, thereby causing the roll to bind in its bearings or canting the levers laterally so that they will bind upon their fulcrum-pins. To obviate this difficulty, the fulcrum-pins 1 are formed with their surfaces curved in the direction of the length of the pins and combined with bearings 21, whose surfaces are in parallel planes or larger arcs, so that the levers will be free to vibrate laterally upon their fulcrum-pins without cramping, and at the same time will permit the levers to vibrate in the direction required for causing the approach or separation of the rolls.

Each lever D is provided with an adjusting-screw 2, pivotally connected thereto so as to accommodate itself to the angular position of the lever. Such a connection may be formed by providing the lever with a slot 3 for the reception of the end of the screw and a cross-pin 4, having its surface curved in the direction of its length and engaging the walls of a recess in the screw. The screw 2 is passed through a fixed portion of the frame—such as the top plate A—and is furnished with an adjustable collar or nut 5, between which latter and the frame is interposed a tension-spring 6, preferably surrounding the screw and held in place thereby. The upper or outer ends of the screw 2 is furnished with an adjustable stop—such as a nut 7—which, by engagement with a fixed abutment, limits the movement of the screw as effected by the spring and determines the position of the movable roll.

Between the frame or support and the adjustable stop on the screw is interposed the active element or elements of the spreading mechanism, the same comprising one or more wedges arranged to reciprocate in or between suitable guides 10.

In order that the adjustable collar 7 may not be disturbed by the movement of the wedge and the adjustment of the movable

roll be changed thereby, a block or collar 11, fitting loosely upon the screw and held from rotation by the guides 10 or equivalent means, is interposed between the said collar and the wedge.

As before remarked, one or more wedges may be employed for each adjusting-screw, although I prefer to make use of two wedges 12, riding the one upon the other, as shown in Figs. 2 and 3, rather than a single wedge 13, as shown in Figs. 4 and 5.

A wedge—double or single—is applied to each lever-bearing D, and the two are connected by suitable mechanism for effecting the simultaneous movement of both, so that the opposite ends of the movable roll will be actuated at the same time.

The preferred mode of connecting the wedges for simultaneous action is shown in Figs. 1 and 4, the former as applied to the duplex wedge and the latter to the single wedge. Thus in Fig. 4 the wedges 13 are connected by links 14 to a lever 15, fulcrumed between them, and in Fig. 1 the same arrangement is preserved, with this addition, that the two wedges 12 of each pair are connected by links to opposite sides of the pivot of the lever, so that as the latter is oscillated the wedges will be moved in relatively opposite directions.

Other equivalent actuating devices may be employed in lieu of the lever and links, of which one example is illustrated in Fig. 7, wherein screws are substituted.

The lever 15 may be oscillated about its axis to effect the reciprocation of the wedges by suitable means—such as a handle 16—and when two or more mills are arranged in line the levers 16 may be connected by a rod 17, whereby all of the movable rolls in the series may be retracted simultaneously.

In lieu of the hand-levers 16 for actuating the wedges, they may be operated from a rotating shaft connected through proper gearing with the lever 15, controlling the wedges, and an arrangement of this kind is illustrated by dotted lines in Fig. 1, wherein 18 designates a segment secured to lever 15 and engaged by a worm 19 on a shaft 20, the latter extending the full length of the mill and being similarly connected to each of the spreading mechanisms in the series of pairs of rolls.

The wedges 12 13 are each formed with a central slot or opening to accommodate the screws.

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

1. In a roller-mill, and in combination with the lever-bearing supporting the movable roll, the pivot-pin passing through said lever and having its periphery curved in the direction of its length, substantially as described.

2. In a roller-mill, and in combination with the independent lever-bearings at the ends of the movable rolls, and independent adjusting and tension devices applied to said levers, the curved-faced fulcra upon which the levers are mounted, substantially as described.

3. In a roller-mill, the combination of the two lever-bearings for the movable roll, the screws pivotally connected to said lever-bearings and protruded through a fixed portion of the frame, the limiting-collars applied to said screws, the wedges supported to reciprocate in guides laterally of the screws and between the collars and the fixed portion of the frame, an actuating-lever, and links connecting said lever to the wedges at opposite ends of the roll, substantially as described.

4. In a roller-mill, and in combination with the bearings of the movable roll, and the adjusting and tension devices applied thereto, a double wedge interposed between a collar or abutment on each adjusting device, and a fixed support, a lever, and links connecting the members of the double wedge on opposite sides of the pivot of said lever, substantially as described.

5. In a roller-mill, and in combination with the adjusting-screws and the limiting-collars applied thereto, wedges guided to reciprocate transversely of the screws and resting upon a fixed portion of the frame, and non-rotating supports interposed between the wedges and the limiting-collars on the screws to receive the thrust of the wedges and transmit motion to the screws, substantially as described.

6. In a roller-mill, the combination, with the independent lever-bearings for the movable rows, the screws flexibly connected to said lever-bearings, and the adjustable collars applied to said screws, of the sliding wedges connected to be moved in unison and mounted in guides on the frame between the lever-bearings and the adjustable collars, and a support or block guided to reciprocate with the screw and held from rotation, said block or support being interposed between the wedge and adjustable collar on the screw, substantially as described.

FRANK H. BREWSTER.

Witnesses:
W. J. ELLIS,
R. K. BREWSTER.