

(No Model.)

2 Sheets—Sheet 1.

J. THOMPSON.
GRINDING MILL.

No. 504,761.

Patented Sept. 12, 1893.

Fig. 1.

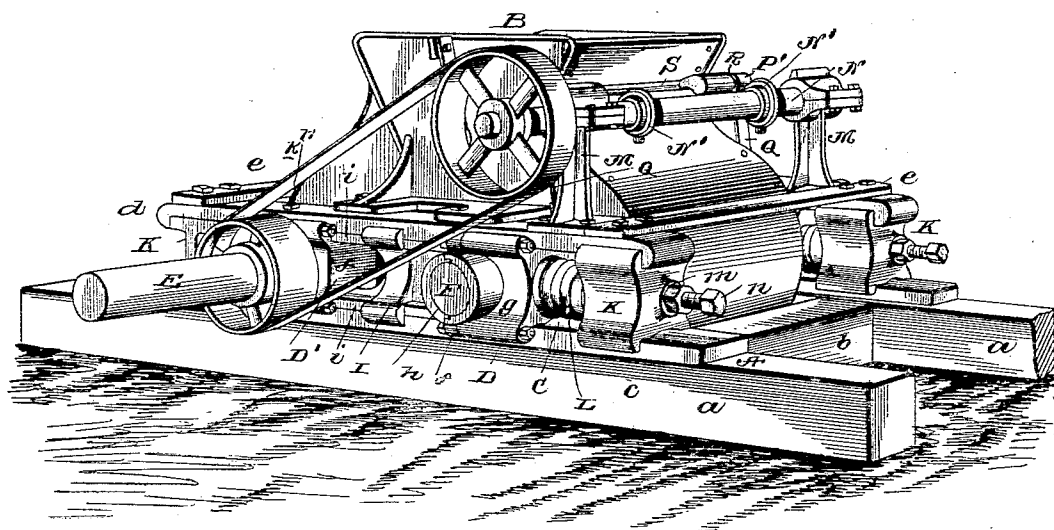
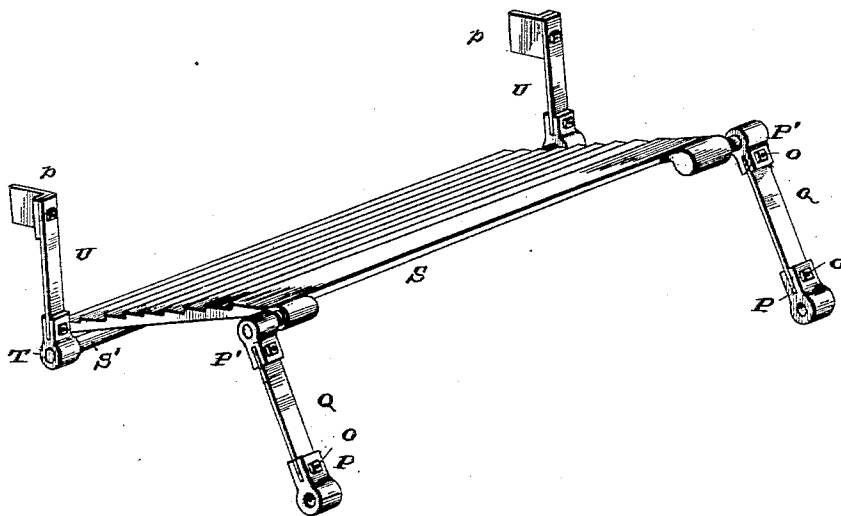


Fig. 3.



Witnesses

John Linnie
Chapman Fowler

Inventor

John Thompson,
by Walter Fowler
Attorney

Attorney

(No Model.)

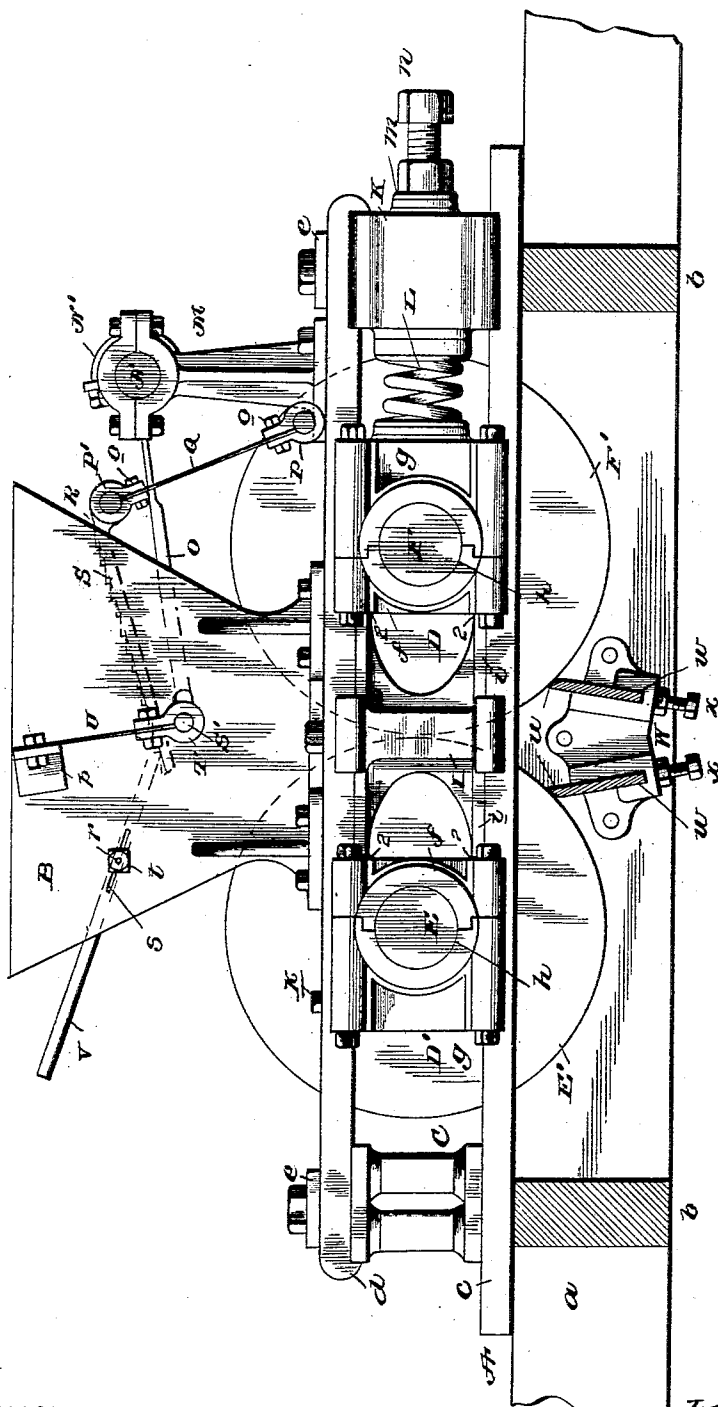
2 Sheets—Sheet 2

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Patented Sept. 12, 1893.

Fig. 2.



Witnesses
John Smith
Chapman Fowler

Inventor
John Thompson,
by *J. Walter Fowler,*
Attorney.

UNITED STATES PATENT OFFICE.

JOHN THOMPSON, OF BUCYRUS, OHIO, ASSIGNOR TO THE FREY-SHECKLER
COMPANY, OF SAME PLACE.

GRINDING-MILL.

SPECIFICATION forming part of Letters Patent No. 504,761, dated September 12, 1893.

Application filed April 5, 1893. Serial No. 469,139. (No model.)

To all whom it may concern:

Be it known that I, JOHN THOMPSON, a citizen of the United States, residing at Bucyrus, in the county of Crawford and State of Ohio, have invented certain new and useful Improvements in Grinding-Mills; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to the letters and figures of reference marked thereon, which form a part of this specification.

Figure 1, is a perspective view of a grinding mill embodying my invention. Fig. 2, is a side elevation of the same. Fig. 3, is a perspective view of the corrugated feed board and its adjuncts.

My invention relates to grinding mills of the class employing crushing rolls and generally known as roller mills, and my invention consists of the constructions and combinations of parts hereinafter fully described and claimed.

In the drawings I disclose a well known form of machine to which I have applied my invention, and wherein a suitable frame or casing A, is mounted upon a base consisting of longitudinal sills *a* and cross sills *b*, the said frame having base flanges *c* by which it may be bolted securely to the base, and having in its upper portion a feed hopper B, of usual form and construction.

Between the base flanges *c* and other flanges *d* on the sides of the frame and joined by transverse tie plates *e*, are formed openings or guides C, by which the boxes of the roller shafts are mounted. These boxes D, D' are made preferably of two sections *f* and *g*, bolted together and have semi-circular hubs or bearings *h* for the journals E and F of the shafts of the rollers E' and F' while within the openings or guides C, and placed about midway between the boxes are castings I, having upper and lower flanges or plates *i* extending therefrom and adapted to be fitted between the flanges *c* and *d* to which they are securely bolted. The journal boxes D' are fixed rigidly in position by means of bolts *k*

passing through the flanges *c* and *d* of the frame or casing, while the other boxes D are adjustable along the guides or openings C for the purpose of adjusting the rolls to compensate for wear of their grinding surfaces.

The construction of the boxes D and the mechanism by which they are adjusted are clearly shown in Fig. 2, wherein the outer face of the inner section of the box is shown as bearing closely against stops 2 formed by the extended ends of the flanges *i* of the casting interposed between the boxes.

A pillar block or casting K bolted between the sills *a* and *b* at the end of the machine nearest the adjustable box D is adapted to furnish a seat for a strongspring L, the inner end of which presses against the adjacent end of the box D or against a wear plate interposed between the two. The pillar block or casting also has a bearing *m*, in which a screw *n* is mounted with its inner end adapted to bear upon the outer end of the spring to compress said spring and thereby hold the journal box with a yielding tension or pressure against the stops formed by the casting I.

In machines of this class, especially when such machines are used for grinding clay, tailings and like material, I have found it desirable to keep the grinding surfaces of the rolls normally out of direct contact, or in other words they should be separated slightly so that the weight of the opposing rolls may be reduced to a minimum. It is also very desirable that one of the rolls should be so mounted that it may yield with its bearings to permit a hard and incompressible object to readily pass between the rolls without unduly straining the roller shafts or bearings. To provide for these desirable results I use the rear ends of the flanges *i*, on the casting I, as stops to limit the inward adjustment of the roll E' and thereby prevent the periphery of this roll from contacting with the like surface of the roll opposing it.

This simple construction affords a positive and secure means for maintaining the rolls in proper relation to each other, and when the grinding surfaces of the rolls wear so as to necessitate the setting up of the roll E, it may be accomplished by cutting away a por-

tion of the surfaces of the stops 2, or, in other words, shortening the length of the forwardly extending flanges *i* of the casting I, thereby permitting the springs in front of the journal boxes D to force the rear faces of the boxes closely against the stops and until the desired distance between the working faces of the rolls is attained.

The second desirable object before mentioned is accomplished by means of the springs L bearing upon the fronts of the boxes D and the adjusting screws bearing against the springs, whereby any desired tension may be given the springs to hold the roll D under suitable pressure, which tension and pressure may be regulated by adjusting the screws and when once obtained may be maintained by means of a nut or other well known means.

The second part of my invention relates to the means for feeding the material to the rolls, and to the devices which I use for this purpose I will now refer. Upon the rear end of the machine suitable standards M are bolted and furnish a support and bearing for a shaft N, which extends transversely across the machine and is formed or provided with eccentrics N' encircled by straps or collars from which bars O project and enter the interior of the hopper.

Upon the frame of the machine suitable clips P are pivotally mounted and have split or bifurcated portions to receive the lower ends of spring plates Q, the upper ends of which are likewise secured by other clips P' and both ends of the springs are secured to the respective clips by means of bolts and nuts *o*. The upper clips P' are secured on short shafts or pintles R cast with or secured on the under rear end of an inclined feed-board or table S, mounted at an incline within the hopper and having mounted in the under side of its forward end a transverse shaft S' whose ends project through slots in the side walls of the hopper and are provided with clips T similar to those before mentioned. These clips T receive the lower ends of spring plates U located on the outside of the hopper and whose upper ends are bolted to lugs or castings *p* on the upper portion of the hopper as shown in Fig. 2, while to the shafts S' which carries the clips T, the forward lower ends of the bars O are suitably connected. From this construction and arrangement of parts it is manifest the feed board is carried by spring or elastic supports and is connected with the eccentrics upon the shaft N so that it may be vibrated back and forth. This feed-board has a width about equal to the width of the hopper from one inner side wall to the other; it is set at an incline, and its upper face is grooved or corrugated in form similar to the teeth of a saw to more effectually feed the material toward its lower end as the board or table is vibrated.

Through the front wall of the hopper is let an inclined gate V which extends entirely

across the interior of the hopper and has its lower end contiguous to the lower inner end of the vibrating table or board, the said gate having pintles *r* passing through elongated slots *s* in the sides of the hopper casing and engaged by nuts *t* whereby the gate may be adjusted to increase or decrease the feed outlet between the contiguous ends of the gate and vibrating board or table, to cause the material to be fed to the underlying rolls in a long thin sheet to be thoroughly ground.

In grinding clay or other materials containing more or less moisture, the material will sometimes adhere to the surfaces of the rolls, and to prevent this and always keep the grinding surfaces clean, I employ suitable scrapers shown in Fig. 2. These scrapers are thin wide blades *u* extending across the machine and are mounted at a slight incline in pockets or grooves *w* formed in castings W bolted to the inner sides of the base sills of the machine as shown, and the blades or scrapers are adjustable to compensate for wear by means of screws *x* or equivalent means.

Except as before explained the operation of the machine is similar to those of a like construction now in use.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a grinding mill having rolls between which the material is fed, a mechanism for adjusting one of said rolls toward and from the opposing roll, comprising movable journal boxes for the shaft of one of the rolls, springs and adjusting screws for forcing the boxes inward whereby the movable roll is adjusted toward and from the companion roll, and stops consisting of castings placed within the sides of the frame between the journal boxes having extended ends for limiting the inward movement of the movable boxes to prevent the grinding surfaces of the rolls coming into direct contact.

2. In a grinding mill, the combination of a frame or casing, a grinding roll having its shaft mounted in stationary boxes therein, a second grinding roll opposing the first named roll, boxes slidably mounted in the frame and receiving the shaft of the second roll, springs bearing upon said slidable boxes and holding them and their roll under a yielding tension, screws bearing against and regulating the tension of the springs, and stops on the frame of the machine for limiting the inward movement of the boxes to prevent the faces of the opposing rolls coming into contact, said stops having extended ends adapted to be cut away to compensate for the wear of the opposing rolls.

3. The combination of the frame with its flanges or plates *c* and *d* separated from each other to form openings or guides along the sides of the machine, journal boxes fixed in said open sides and receiving the shaft of one of the grinding rolls, other journal boxes

mounted to slide in said open sides and receiving the shaft of the opposing grinding roll, means for adjusting the slidable boxes toward the fixed ones, and castings fixed in
5 said open sides having plates extending along the sides of the machine and forming stops for limiting the inward adjustment of the slidable boxes.

10 4. In a grinding mill, the frame, the grinding rolls, the standards arising from said frame, a transverse shaft mounted therein having eccentrics, the bars or rods extending from the eccentrics, the pivotally mounted clips P, the feed board having pintles at its
15 upper end, and a shaft at its lower end ex-

tending through slots in the frame, clips T upon the extended ends of said shaft, and other clips P' pivotally mounted on said pintles, the spring plates connecting the clips P and P' and spring plates connecting the clips
20 T, with a fixed support, and a gate adjustable toward and from the discharge end of the board, substantially as herein described.

In testimony whereof I affix my signature in presence of two witnesses.

JOHN THOMPSON.

Witnesses:

T. W. FOWLER,
CHAPMAN FOWLER.