(No Model.)

F. MESSER.

MACHINE FOR DRESSING ROLLERS FOR GRINDING MILLS.

No. 286,466. Patented Oct. 9, 1883.

Fig. 4.

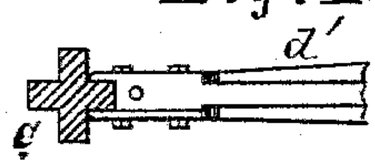
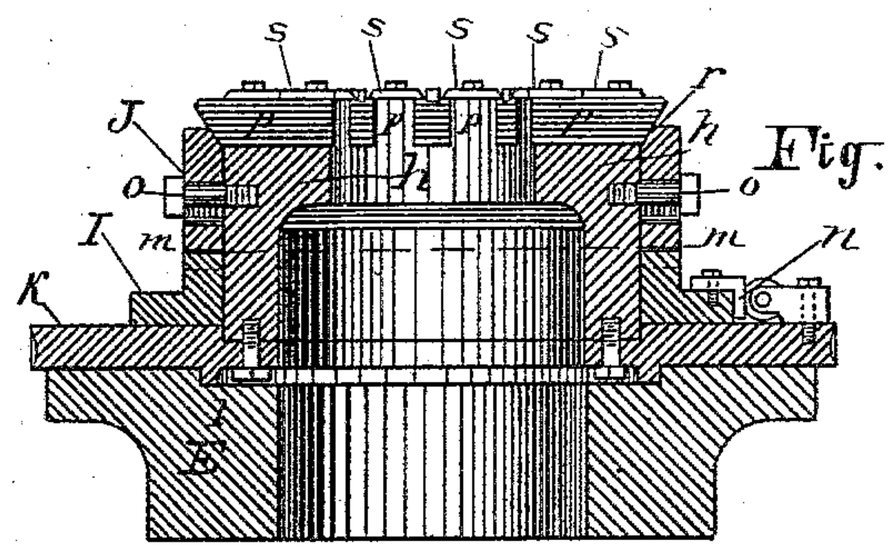


Fig. 2.



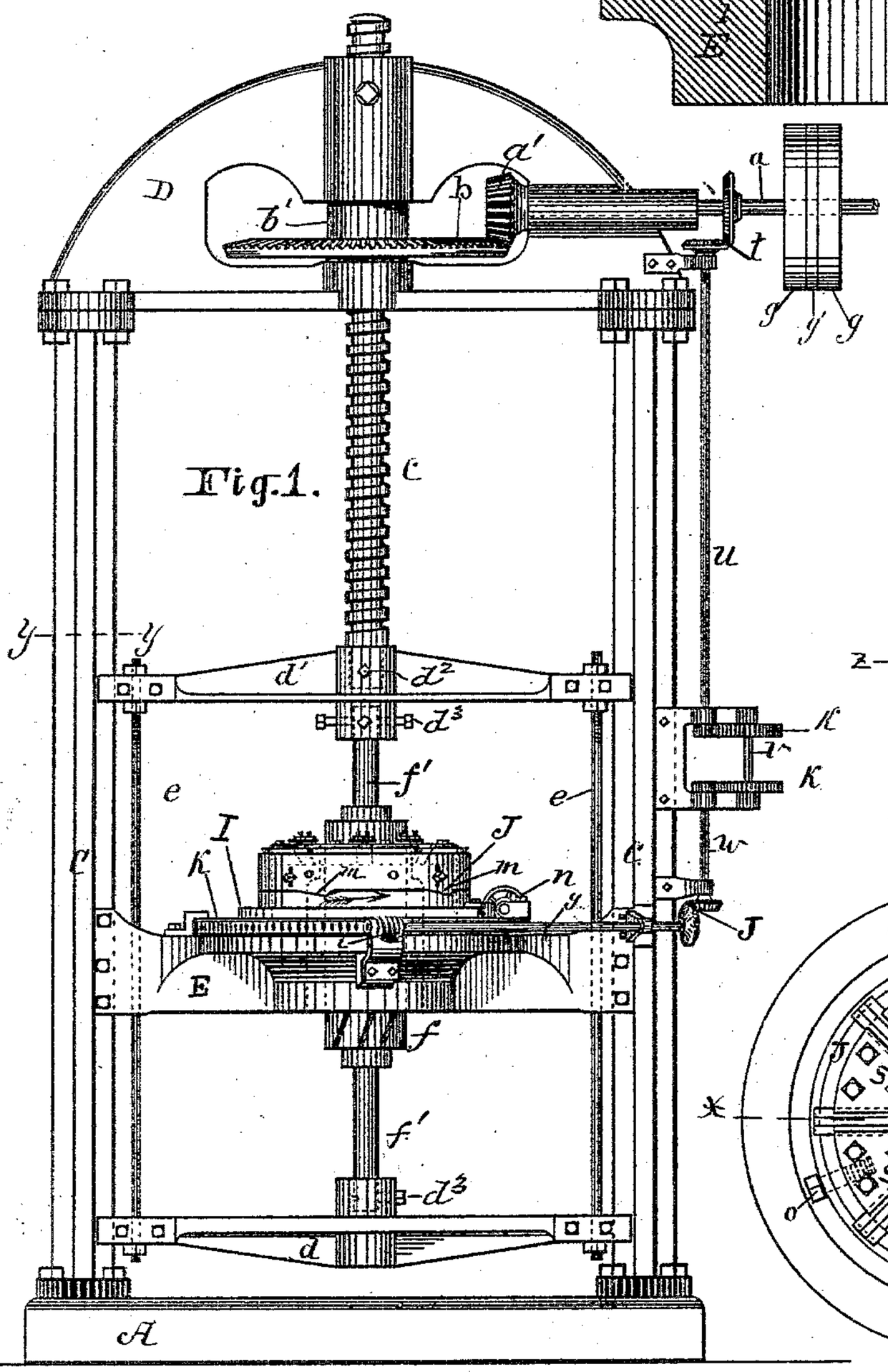


Fig. 5.

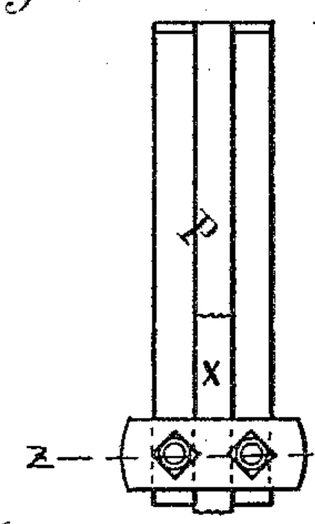


Fig. 6.

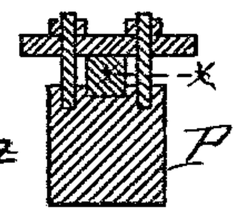
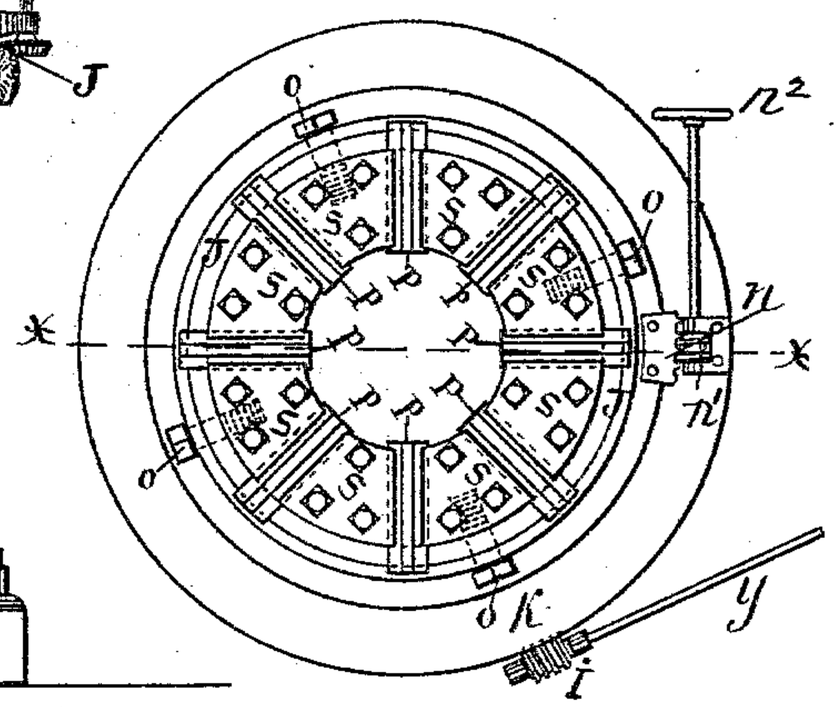


Fig. 3.



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UNITED STATES PATENT OFFICE.

FRED MESSER, OF BELOIT, WISCONSIN.

MACHINE FOR DRESSING ROLLERS FOR GRINDING-MILLS.

SPECIFICATION forming part of Letters Patent No. 286,466, dated October 9, 1883.

Application filed February 21, 1883. (No model.)

To all whom it may concern:

Be it known that I, FRED MESSER, of Beloit, in the county of Rock and State of Wisconsin, have invented certain new and useful Improvements in Machines for Dressing the Rollers of Grinding-Mills; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention relates to a power-machine for forming upon the surface of a metal cylindrical roller the grooves which form the "dress" of the roller.

My invention consists, essentially, of a supporting-frame, in which reciprocates a movable frame carrying the roller to be operated upon. The roller is caused to pass in contact with a series of cutting-tools held in the main frame-work, such tools being so arranged that parallel grooves or spiral grooves of any desired inclination may be cut upon its surface. These constitute the essential features of my invention; but it also consists of peculiar details of construction, all of which will be fully hereinafter described and claimed.

The invention is illustrated in the accompanying drawings, in which Figure 1 is a side elevation. Fig. 2 is a central cross-section of the tool-head. Fig. 3 is a plan view of the tool-head. Fig. 4 is a cross-section of one of the columns of the main frame on line *y y*, Fig. 1. Fig. 5 is a plan view of one of the tool-blocks; Fig. 6, a cross-section of the same on the line *z z* of Fig. 5.

A represents the base of the main frame, C C vertical columns secured thereto, and D the cap-piece, these parts being firmly bolted and secured together. A cross-head, E, is bolted to the side columns, C C, of the frame, such cross-head having a wide central opening, as shown in Fig. 2.

A driving-shaft, *a*, is journaled in the cap-piece D, and has the ordinary tight and loose pulleys *g g' g*, from which open and cross belts run to the power-shafting. On the inner end of the shaft *a* is a bevel-gear wheel, *a'*, which engages with a bevel-gear wheel, *b*, having an internally-threaded hub, *b'*. Into this hub enters a vertical screw-threaded shaft, *c*, which is caused to move up and down by the movement of the gearing described.

The columns C C of the main frame are flanged, and such flange forms a guide for the reciprocating frame which carries the roller. This frame is composed of cross-bars *d d'*, placed, respectively, below and above the cross-head E, and having slotted ends, Fig. 4, to engage with the flanges of the columns. The cross-bars *d d'* are connected by rods *e*. The screw *c* enters a central hub or socket in the cross-bar *d'*, and is held rigidly by set-screws d^2. The vertical movement imparted to the screw by the threaded hub *b'* of wheel *b* will therefore cause the entire frame to move vertically on its guides.

The gudgeons *f' f'* of the grinding-roller *f* are secured within the hubs of cross-bars *d d'* by set-screws d^3, so that the roller *f* proper is carried up and down within the opening in cross-head E, and is acted upon throughout its extent by the cutting-tools, hereinafter described. Of course, the motion of the frame up or down may be changed by alternating open and cross belts from the loose pulleys *g g* to the tight pulley *g'*, while the revolution of the power-shaft remains constant.

The cutting-tools now to be described are adapted to cut grooves upon the roller, either parallel with its axis or in spiral form, of changeable inclination and pitch. The cross-head E forms the bed-plate for the cutting mechanism shown in Figs. 2 and 3.

Referring to Fig. 2, K is a base-ring or flange having a downwardly-projecting flange, 1, which fits into a recess in the cross-head E. Resting upon the base K, and firmly secured to it, is the tool-head proper, *h*, around which fits a ring, I, the lower part of which rests on the base K. The upper edge of the ring I is formed with a series of inclines, *m*, which engage with or bear against corresponding inclines upon a ring, J, which is secured to the head *h* by bolts *o*, which pass through elongated vertical slots in said ring J. The ring J is thereby permitted a direct vertical movement, but cannot rotate independently of the part *h*.

The tool-blocks P have their outer ends beveled, as shown, and are adapted to slide horizontally in guides in the head *h*. To each of the tool-blocks is attached a cutter, *x*. Any desired number of tool-blocks, with their respective tools, may be employed. I have shown

eight in the drawings, which necessarily extend radially, and are adapted to be brought, separately or together, to bear upon the surface of the roller, as hereinafter described. Figs. 5 and 6 show clearly the manner of securing the tool to the tool-block.

Now, if it be desired to cut grooves upon the roller parallel with its axis, the adjustment of the tools required to accomplish that object is accomplished by means of the worm and rack $n\,n'$, Fig. 3. The rack n is secured to the ring I, while the worm is journaled in a standard on the ring K, and operated by the hand-wheel n^2. The movement of the ring I causes a vertical motion of ring J, bringing such ring into contact with the beveled end of the tool-blocks and forcing the latter inward to bear upon the roller. The roller, through the means before described, is now made to traverse the cutters, which form longitudinal grooves upon its surface.

It will be obvious that any one of the tools may be driven up toward the center, independently of the rest, by rapping it with a hammer.

In the formation of spiral grooves upon the roller the entire tool-head is caused to revolve around the roller at more or less speed, according to the desired inclination of the spiral. This movement is accomplished by means of a circular rack formed upon the ring or base K, with which engages a worm, i. The worm i is carried by a counter-shaft, y, which is driven from the shaft a by bevel-gearing $t\,j$, and by shafts $u\,v\,w$ and change-gears $k\,k'$. By substituting larger or smaller wheels for the gears $k\,k'$, the speed of the ring K is varied, and consequently the inclination of the spiral formed by the tools. When operated in this manner, the ring K, head h, and rings I J operate as one part and rotate around the roller.

It will be understood that the operation of the gearing last described is not continuous, since when straight grooves are being formed on the roll it is necessary to stop the rotation of the cutters. This is easily accomplished—for example, by splining the pinion t on the driving-shaft and sliding it out of engagement with the pinion on shaft u, or, preferably, by simply removing one of the change-gears.

What I claim is—

1. In a machine for dressing metallic rolls, the combination of a vertically-sliding frame and roller-carrier, a stationary cross-head, a tool-head supported by said cross-head, a series of sliding tools, and means, substantially as described, for forcing such tools toward the center.

2. Combined with the cross-head E, the tool-head, the radially-set tools, and cam-rings, connected and operated substantially as described, and for the purpose set forth.

3. The cross-head E, in combination with the ring I, having inclines, the ring J, having opposing inclines, the tool-holders P, having beveled ends, and the rack and worm $n\,n'$.

4. The combination of the central head, h, and sliding cutter-holders P, the ring J, having inclines, and the ring I, having opposing inclines, and adapted to be rotated.

5. A machine for forming grooves upon metal rolls, consisting of a sliding frame carrying the roll, a series of cutters, and gearing connected to such cutters, and adapted to be connected to the driving-shaft, the parts being so arranged that the machine may be run either with stationary or moving cutters, for the purposes set forth.

6. The combination, with the cross-head E, of the base-ring K, the tool-head and tool-holders, the worm i, the gears $k\,k'$, and connected shafting, all for the purpose set forth.

FRED MESSER.

Witnesses:
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