(No Model.) 6 Sheets—Sheet 1.

M. E. CLARK.

MACHINE FOR FINISHING STOCK.

No. 570,867. Patented Nov. 3, 1896.

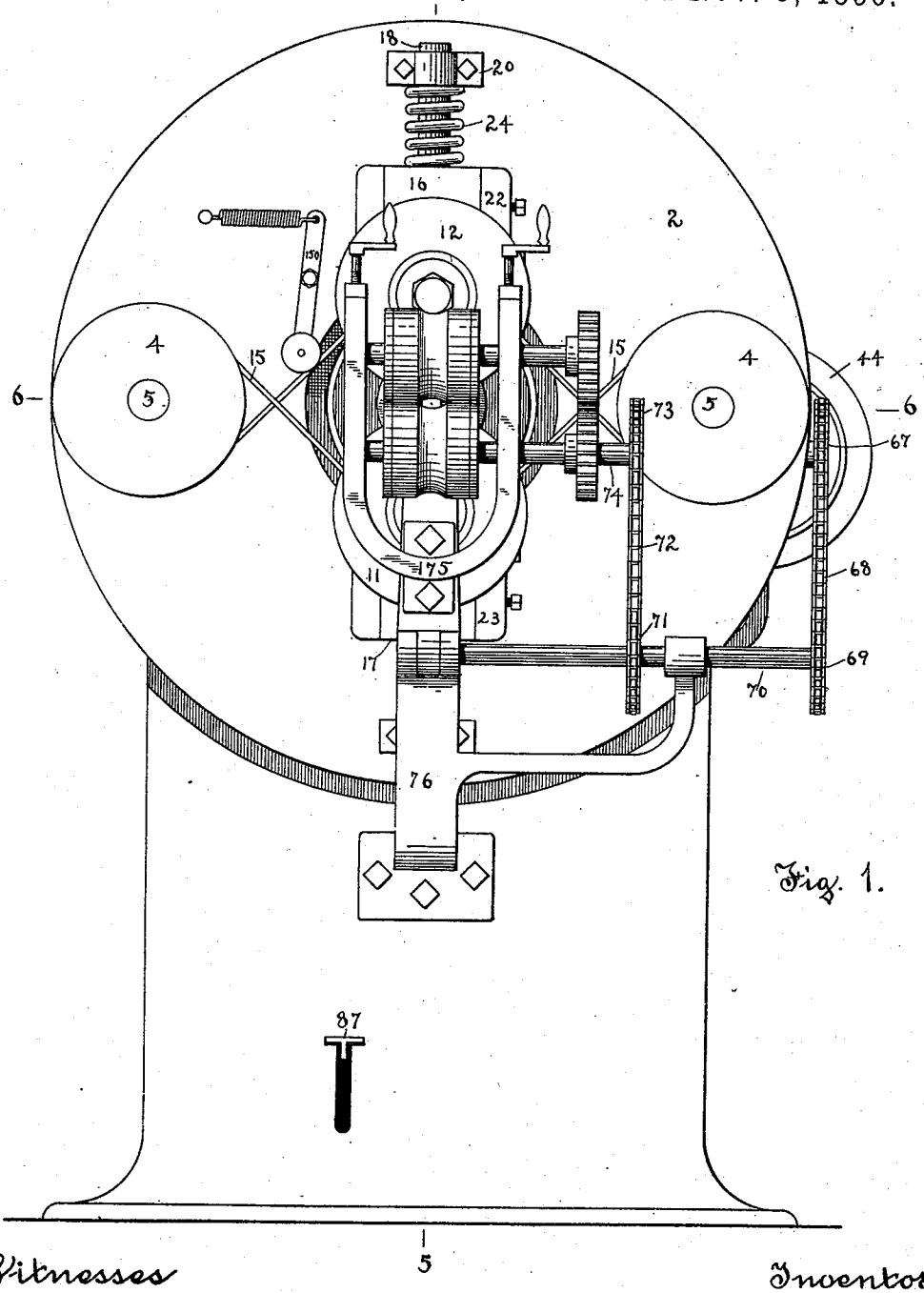

Fig. 1.

Witnesses
R. Washburn.
R. M. Washburn

Inventor:
Merrill E. Clark
by C. J. Washburn
Attorney

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(No Model.)

6 Sheets—Sheet 2.

M. E. CLARK.

MACHINE FOR FINISHING STOCK.

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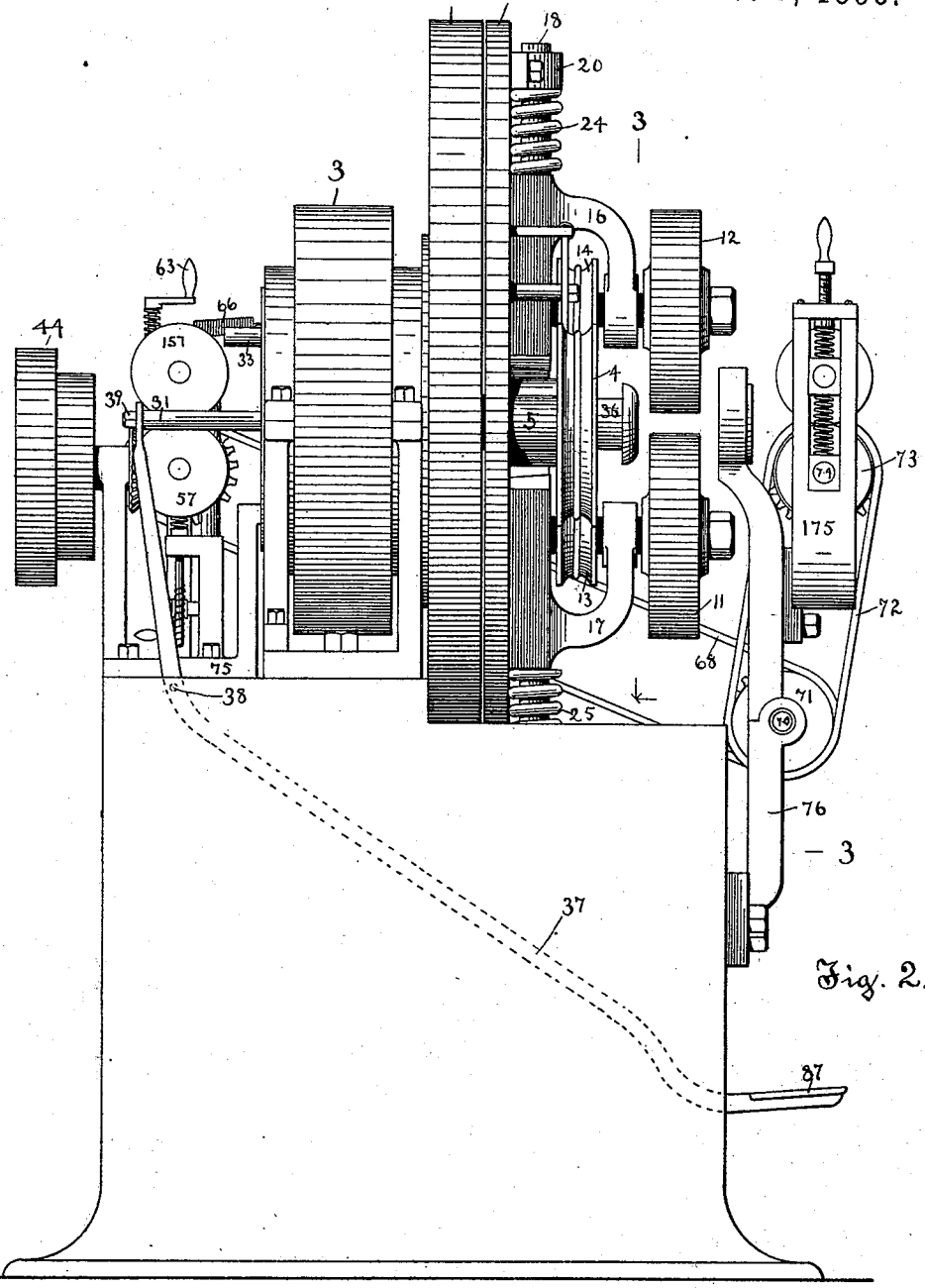

Fig. 2.

Witnesses
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(No Model.) 6 Sheets—Sheet 3.

M. E. CLARK.

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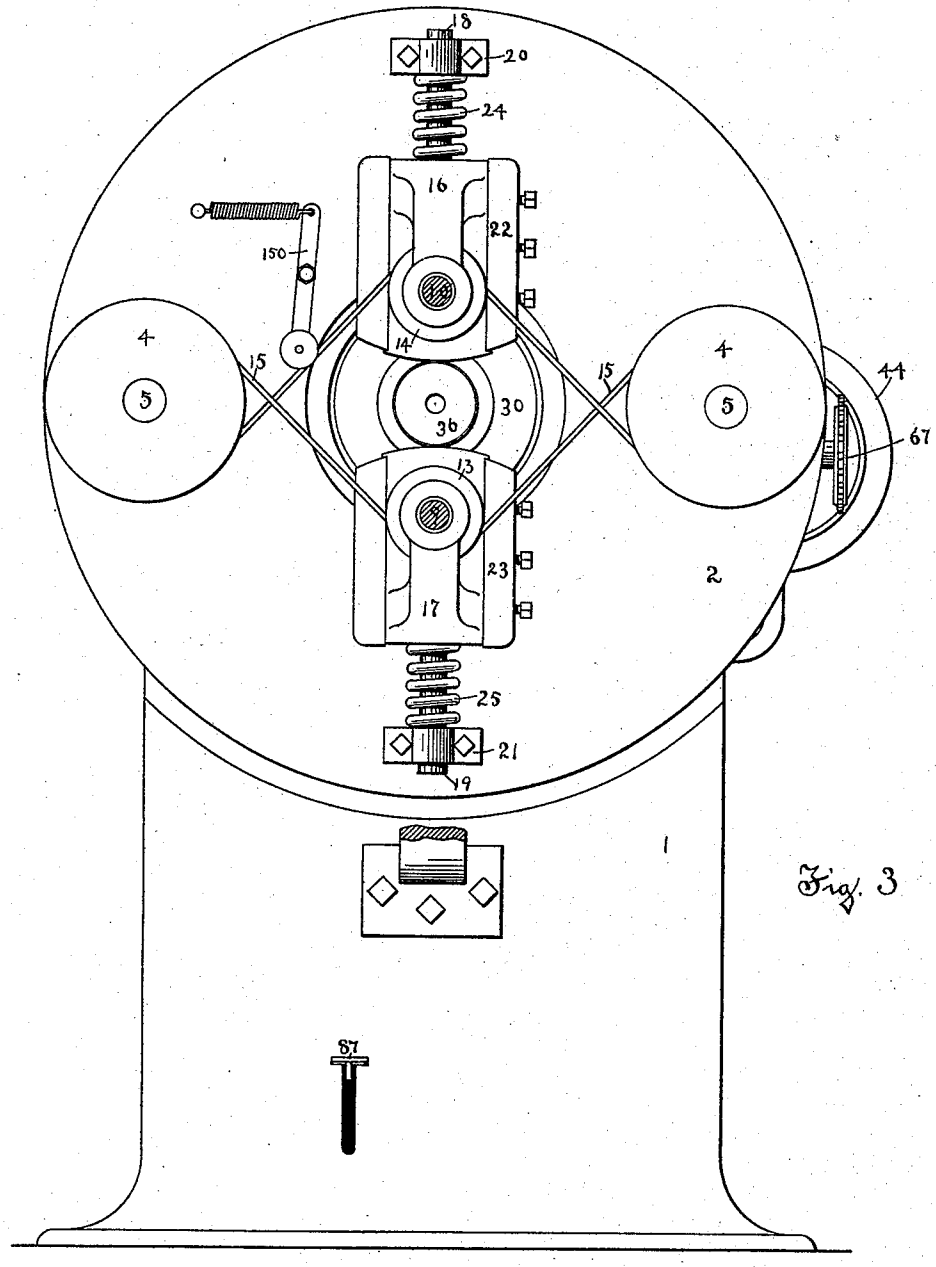

Fig. 3

Witnesses
R. Washburn.
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(No Model.)

6 Sheets—Sheet 4.

M. E. CLARK.

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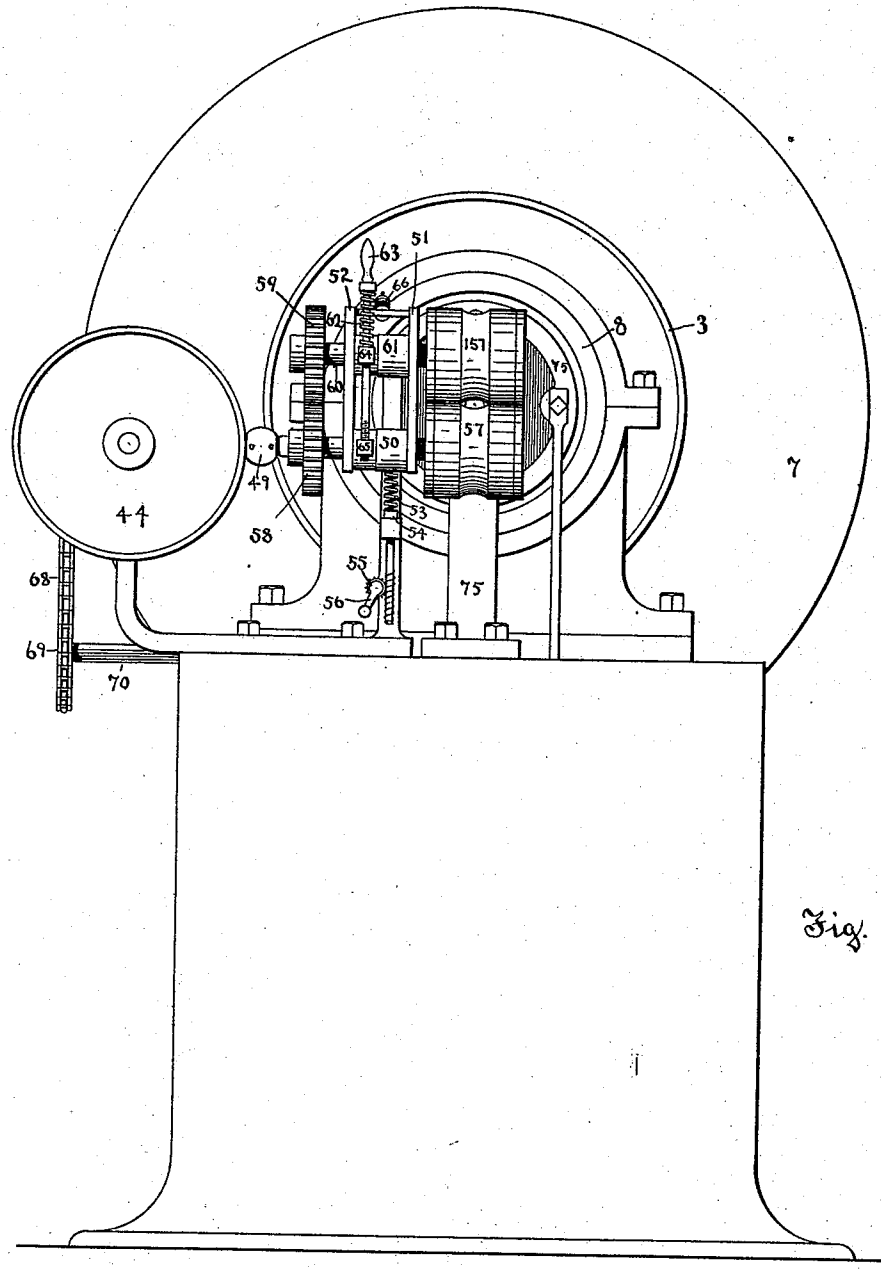

Fig. 4.

Witnesses
R. Washburn
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(No Model.)

6 Sheets—Sheet 5.

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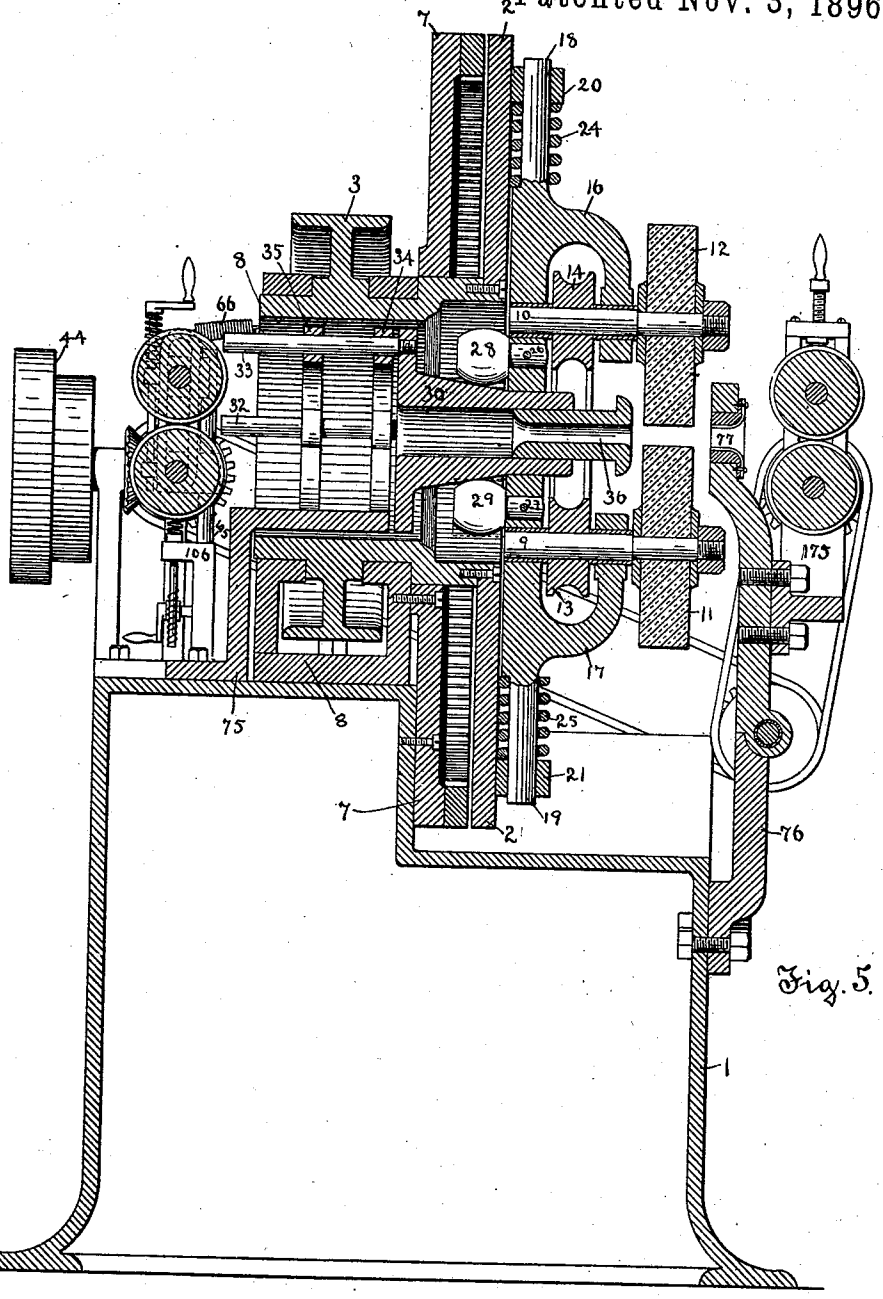

Fig. 5.

Witnesses
R. Washburn.
R. M. Washburn

Inventor
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(No Model.)

6 Sheets—Sheet 6.

M. E. CLARK.

MACHINE FOR FINISHING STOCK.

No. 570,867. Patented Nov. 3, 1896.

Fig. 6.

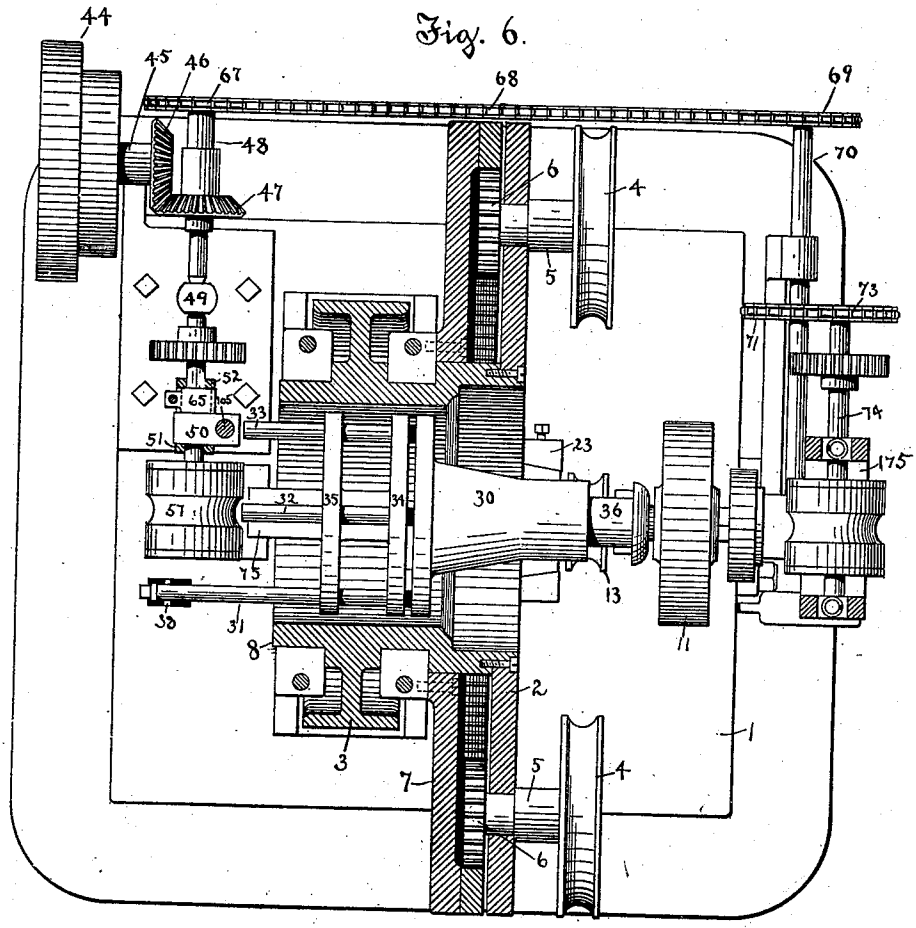


Fig. 7.

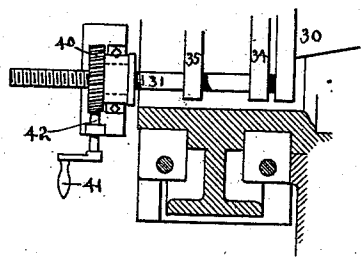


Fig. 8.

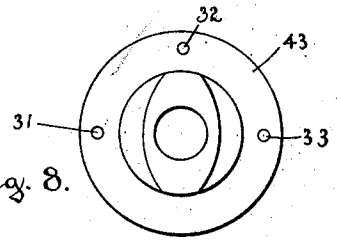
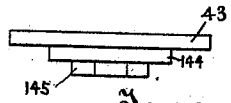


Fig. 9.



Witnesses
R. Washburn
Ronl Washburn

Inventor
Merrill E. Clark
by C. J. Washburn
Attorney

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MERRILL E. CLARK, OF WORCESTER, MASSACHUSETTS.

MACHINE FOR FINISHING STOCK.

SPECIFICATION forming part of Letters Patent No. 570,867, dated November 3, 1896.

Application filed March 4, 1896. Serial No. 581,758. (No model.)

To all whom it may concern:

Be it known that I, MERRILL E. CLARK, a citizen of the United States, residing in Worcester, in the county of Worcester and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Machinery for Finishing Stock, of which the following is a specification.

The object of my invention is to provide a machine in which stock may be finished between two or more revolving belts, or between a plurality of abrading-wheels, where finish to exact size is required, said machine containing mechanism for varying the distance between the finishing-surfaces while the machine is in operation.

My invention is in the nature of an improvement upon a machine for sanding and finishing covered by Letters Patent No. 513, 880, dated January 30, 1894, and is illustrated in the accompanying six sheets of drawings, in which—

Figure 1 is a front view of the machine, including the feeding device. Fig. 2 is a side view. Fig. 3 is a front view with the feeding device omitted. Fig. 4 is a rear view. Fig. 5 is a longitudinal sectional view on the line 5 5, Fig. 1. Fig. 6 is a plan view on the line 6 6, Fig. 1. Fig. 7 is a modification showing a device for actuating the mechanism which regulates the distance between the finishing-belts or abrading-wheels. Fig. 8 is a second modification, in elevation, of a device for regulating the distance between the finishing-belts or abrading-wheels. Fig. 9 is a plan view of the last-named modification.

I do not show any finishing-belts in the drawings, but do show two abrading-wheels, which will serve to illustrate the invention.

In the drawings, 1 is the bed of the machine.

2 is a disk adapted to be revolved with the main drive-pulley 3.

4 4 are drive-pulleys, secured to the disk by means of spindles 5 5, to the opposite ends of which and on the back side of the revoluble disk are gear-wheels 6 6, adapted to mesh with the gear upon the inner side of the face of the stationary disk 7, which is bolted to the bed of the machine and to the frame 8, in which runs the hollow spindle which carries the main pulley 3.

I show the pulley and hollow spindle cast in one piece, to which the revoluble disk is bolted.

Secured in sliding frames upon the face of the revoluble disk 2 are two spindles 9 10. At their outer ends are two abrading-wheels 11 12, and at intermediate points are secured upon the spindles 9 10 the pulleys 13 14, adapted by means of the belt 15 to be actuated by the pulleys 4 4, rotary motion on their axes thus being communicated to the abrading-wheels 11 12 when the disk 2 revolves.

150 is a suitably-located friction device, so that the belt 15 may always be kept sufficiently tight whatever may be the positions of the pulleys 13 14.

The U-shaped sliding frames 16 17, held within the ways 22 23, terminate in the rods 18 19, which have bearings within the projections 20 21, secured to the face of the revoluble disk. The sliding frames are held in and returned to their initial positions by the spiral springs 24 25.

Projecting inwardly from the U-shaped frames 16 17 and rigidly secured to them are the studs 26 27, upon the opposite ends of which are the rolls 28 29. These rolls revolve with the revoluble disk and have a bearing upon the tube 30, which is cone-shaped for part of its length toward the base, which extends into flange-like projections containing the rods 31 32 33, rigidly secured thereto and extending rearwardly, and having bearings in suitably-disposed parts 34 35 of the framework, which are cast with the part 75, which is bolted to the bed of the machine. The office of these rods is to hold the tube 30 in place and at the same time to provide means for moving it longitudinally. Within the outer end of the tube 30 is the bushing 36, the bore of which may be the size to which it is desired to finish the stock being treated, and the bore of the bushings may be varied with the size of the stock.

It will be noted in the drawings, Fig. 5, that the bore of the bushing equals in diameter the distance between the abrading-wheels, the finish size of the stock being treated. I have referred to the fact that the conical tube 30 is adapted to receive longitudinal movement. This is effected by means of the treadle 87 and connecting-rod 37, (shown in Fig. 2,) which is pivoted at 38 and secured to the rod

31 by the bolt 39. When the treadle is depressed, as it may be by the foot of the operator, the rod 31, and with it the conical tube 30, is moved to the right, the rolls 28 29 are pushed away from the central line of action of the machine and carry with them the U-shaped sliding frames in which the abrading-wheels are mounted, and thus increase the distance between the circumference of these wheels and finish to a larger diameter the stock being treated. This adjustment is essential in treating stock which varies in size in cross-section, and the means which I have shown is efficient for this purpose. It may, however, be desirable to secure an adjustment of the abrading-wheels more delicate than that which I have described, and it may also be desirable to quickly secure a wide separation of the abrading-surfaces when stock is being treated which varies greatly and abruptly in cross-section.

Means for securing the more delicate adjustment is illustrated in the modification shown in Fig. 7, in which the rod 31 is threaded at one end and engages with the gear 40, threaded within its bore and adapted to be revolved by the crank 41 and worm 42. A very delicate adjustment is thus secured.

The more abrupt and considerable adjustment is effected by the modification illustrated in Figs. 8 and 9, in which is shown the plate 43, designed to take the place of the conical tube 30 and to be secured upon the rods 31 32 33. This has upon its outer face a circular projection 144 and an elliptical projection 145, extending still farther, as shown in plan in Fig. 9. As the rolls 28 29 revolve they normally move in a plane removed from the plate 43, and hence are not affected by it; but when the treadle is depressed the plate 43 is moved forward within the plane of movement of the rolls, which find a path upon the sides of the ellipse until they reach the apices, when they find a path upon the circle 144, and thus an abrupt and considerable separation of the abrading-wheels is instantaneously effected and continues until the upward movement of the treadle withdraws the plate 43 from the plane of travel of the rolls 28 29, which are thus returned to their normal position by the action of the springs 24 25 upon the sliding frames. When the modification shown in Fig. 8 is used, the rolls 28 29 should have straight faces, as indicated in dotted lines in connection with roll 29.

It remains to describe the feed mechanism at the front and rear of the machine. This is actuated by the pulley 44, mounted on the shaft 45 at the rear of the machine. The miter-gear 46 on the shaft 45 meshes with the miter-gear 47 on the telescope-shaft 48. The telescope-shaft 48 has a universal joint at 49 and runs in the box 50, which is movably mounted upon the rod 105, secured in the frame 106, which is bolted to the bed of the machine. The box is supported by the spiral spring 53, which rests on the rod 54. The rod 54 is threaded at its lower end and engages with the small gear-wheel 55, actuated by the crank 56, thus providing means for the vertical adjustment of the box 50, the joint 49 permitting the telescope-shaft 48 to adapt itself to the varying positions of the box 50.

At the extremity of the shaft 48 is the grooved feed-roll 57. By means of the gear 58 motion is communicated to the gear 59, mounted on shaft 60, which runs in the box 61, mounted in the slotted standards 51 52, which are pivotally mounted upon shaft 48, and the box 61 is vertically adjustable within certain limits by means of the threaded rod 62 and crank 63. At the extremity of the shaft 60 is the grooved feed-roll 157. The threaded rod 62 engages with the projections 64 65, the former connected with box 61 and the latter with box 50.

The standards 51 52 are yieldingly connected with the frame of the machine by the spring 66, so that when curved stock is being treated the rolls will adjust themselves to varying curvatures. At the extremity of the telescope-shaft 48 opposite the feed-rolls is the sprocket-wheel 67, connected by the sprocket-chain 68 with the sprocket-wheel 69, mounted on the shaft 70. The shaft 70 runs in suitable boxes secured to the bed of the machine and carries the sprocket-wheel 71, which is connected by the sprocket-chain 72 with the sprocket-wheel 73, mounted on the shaft 74. The shaft 74 runs in suitable boxes mounted in the frame 175, which is secured to the hinged arm 76, which in turn is bolted to the bed of the machine. This arrangement makes it possible to readily remove the feed-rolls from the front of the machine, when, for example, curved stock is being treated, and to return them as readily to their position.

The hinged arm 76 is provided at its upper end with perforation 77, which acts as a guide for stock being treated. The bushing 36 is removable, and the conical tube 30 is sufficiently large to allow curved stock to pass through the machine. I have only shown one pair of abrading-wheels in the drawings, but if it were desired two pairs of wheels of different degrees of coarseness could be used simultaneously. I have referred in the specification to finishing-belts which can be used in place of the abrading-wheels, the mechanism being shown and described in the former patent referred to, but have only shown in this application the abrading-wheels, which sufficiently illustrate the working of my improvement.

Having described the details of construction of the machine, I will describe the manner in which it operates.

Power is independently applied to the driving-pulley 3, which drives the revoluble disk, and to the pulley 44, which operates the feed-rolls at the front and rear of the machine. The distance between the surfaces of the abrading-wheels is equal to the

diameter to which it is desired to finish the stock, and a bushing of suitable size is inserted in the conical tube. As the stock is passing through the machine the distance between the abrading-wheels can be varied by the treadle and connecting mechanism already described. Where it is not necessary to finish stock to exact size, I can use the finishing-belts shown in Patent No. 513,880, referred to above. Where exact size is required, the abrading-wheels are preferable.

The feed-rolls at the front of the machine may be dispensed with, if necessary, when curved stock is used, as the rolls at the rear of the machine are adapted to adjust themselves to stock of varying curvatures.

What I claim as new, and desire to secure by Letters Patent, is—

1. In a finishing-machine, the combination of a revoluble disk, mechanism, secured to said disk, for finishing stock, and mechanism adapted to be operated while the machine is running, whereby the distance between the finishing-surfaces may be varied, substantially as described.

2. In a finishing-machine, the combination of a revoluble disk, a plurality of abrading-surfaces secured to said disk, and mechanism adapted to be operated while the machine is running, whereby the distance between the abrading-surfaces may be varied, substantially as described.

3. In a finishing-machine, the combination of a revoluble disk, a plurality of abrading-surfaces secured to said disk, means for rotating said abrading-surfaces, and mechanism adapted to be operated while the machine is running, whereby the distance between the abrading-surfaces may be varied, substantially as described.

4. In a finishing-machine, the combination of a revoluble disk, a plurality of abrading-surfaces, radially-movable frames secured to said disk, a roll secured to each of said frames, a suitably-shaped body mounted within the frame of the machine, and adapted to move horizontally between said rolls, and mechanism for moving said body whereby the distance between the abrading-surfaces may be varied, substantially as described.

5. In a finishing-machine, the combination of a revoluble disk, a plurality of abrading-surfaces, radially-movable frames, secured to said disk, a roll secured to each of said frames, a tube with tapering sides suitably mounted within the frame of the machine, between said rolls, and adapted to move horizontally, and mechanism for moving said tube, whereby the distance between the abrading-surfaces may be varied, substantially as described.

MERRILL E. CLARK.

Witnesses:
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C. G. WASHBURN.