No. 625,736. Patented May 30, 1899.

J. E. BERTRAND.

SOLE ROUGH ROUNDING AND CHANNELING MACHINE.

(Application filed Feb. 16, 1899.)

(No Model.) 3 Sheets—Sheet 1.

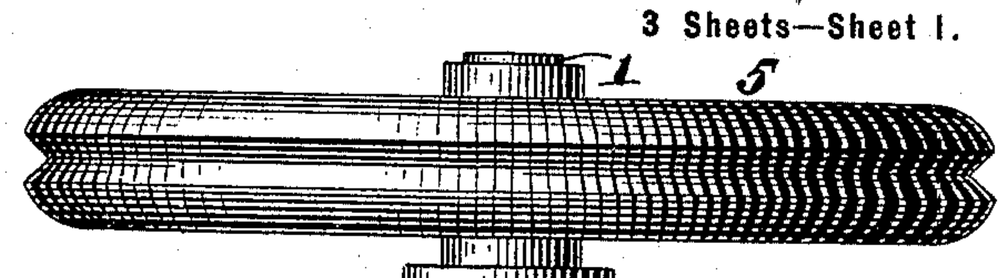


Fig. 1.

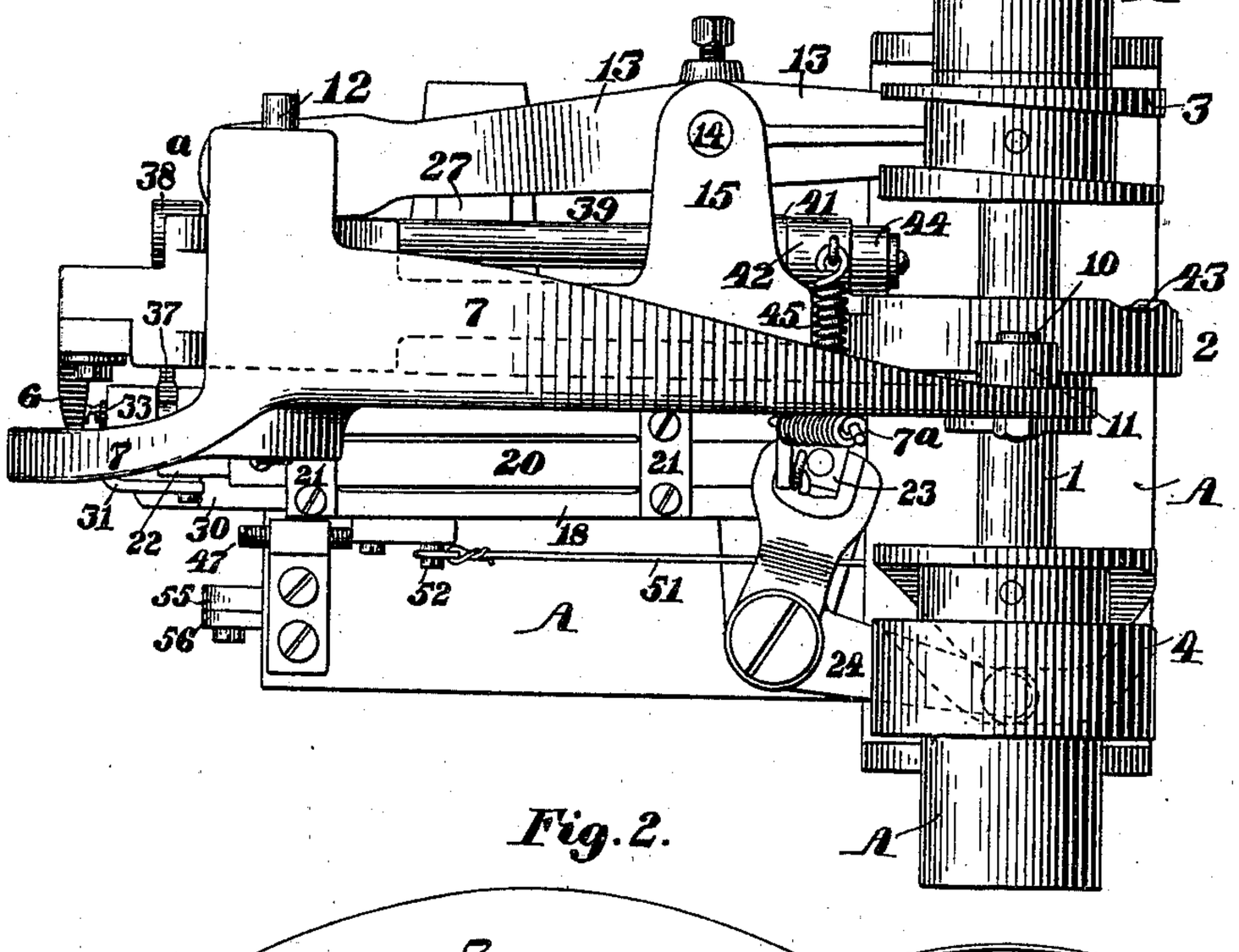
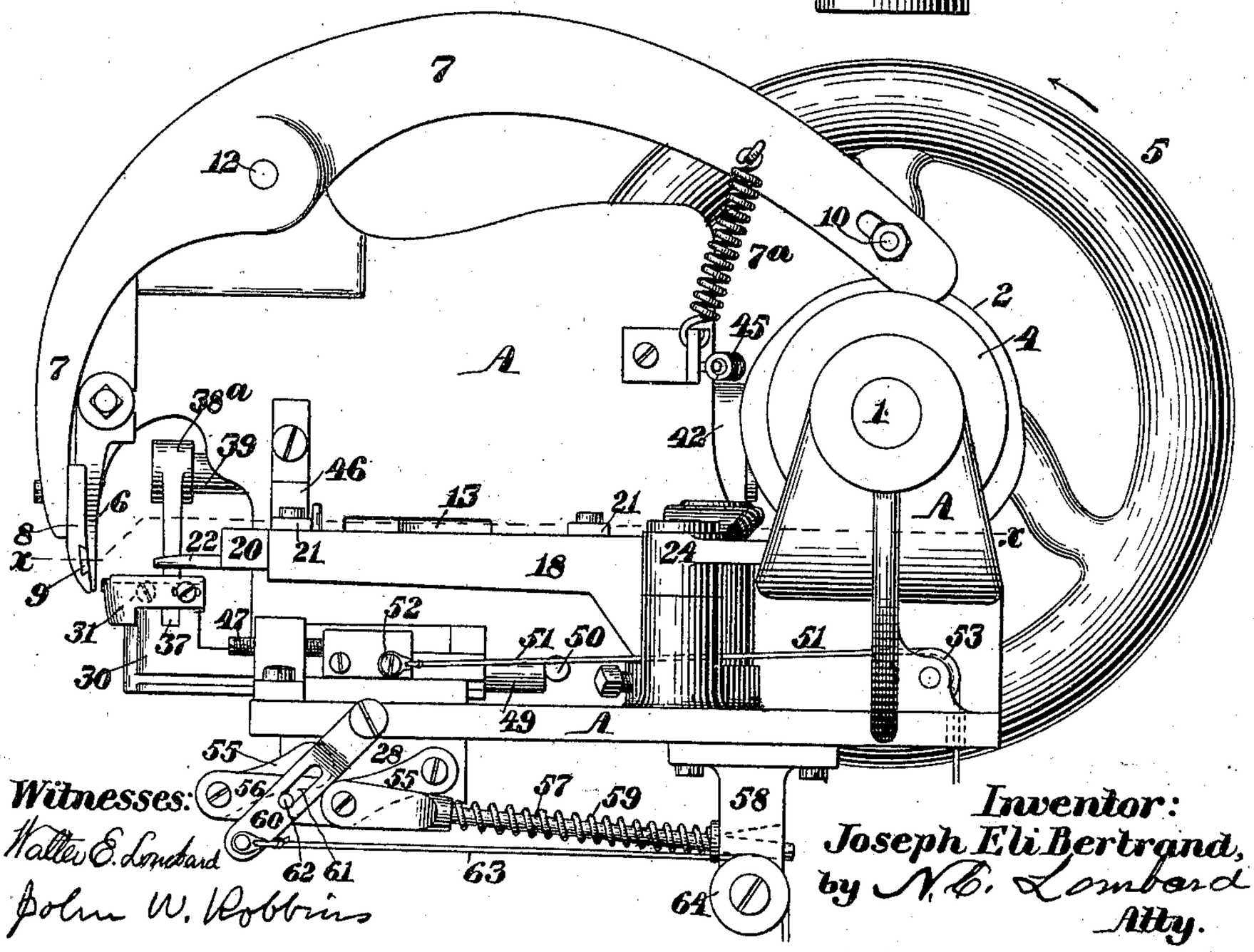


Fig. 2.



Witnesses:
Walter E. Lombard
John W. Robbins

Inventor:
Joseph Eli Bertrand,
by N. C. Lombard
Atty.

No. 625,736. Patented May 30, 1899.

J. E. BERTRAND.

SOLE ROUGH ROUNDING AND CHANNELING MACHINE.

(Application filed Feb. 16, 1899.)

(No Model.) 3 Sheets—Sheet 2.

Fig. 4.

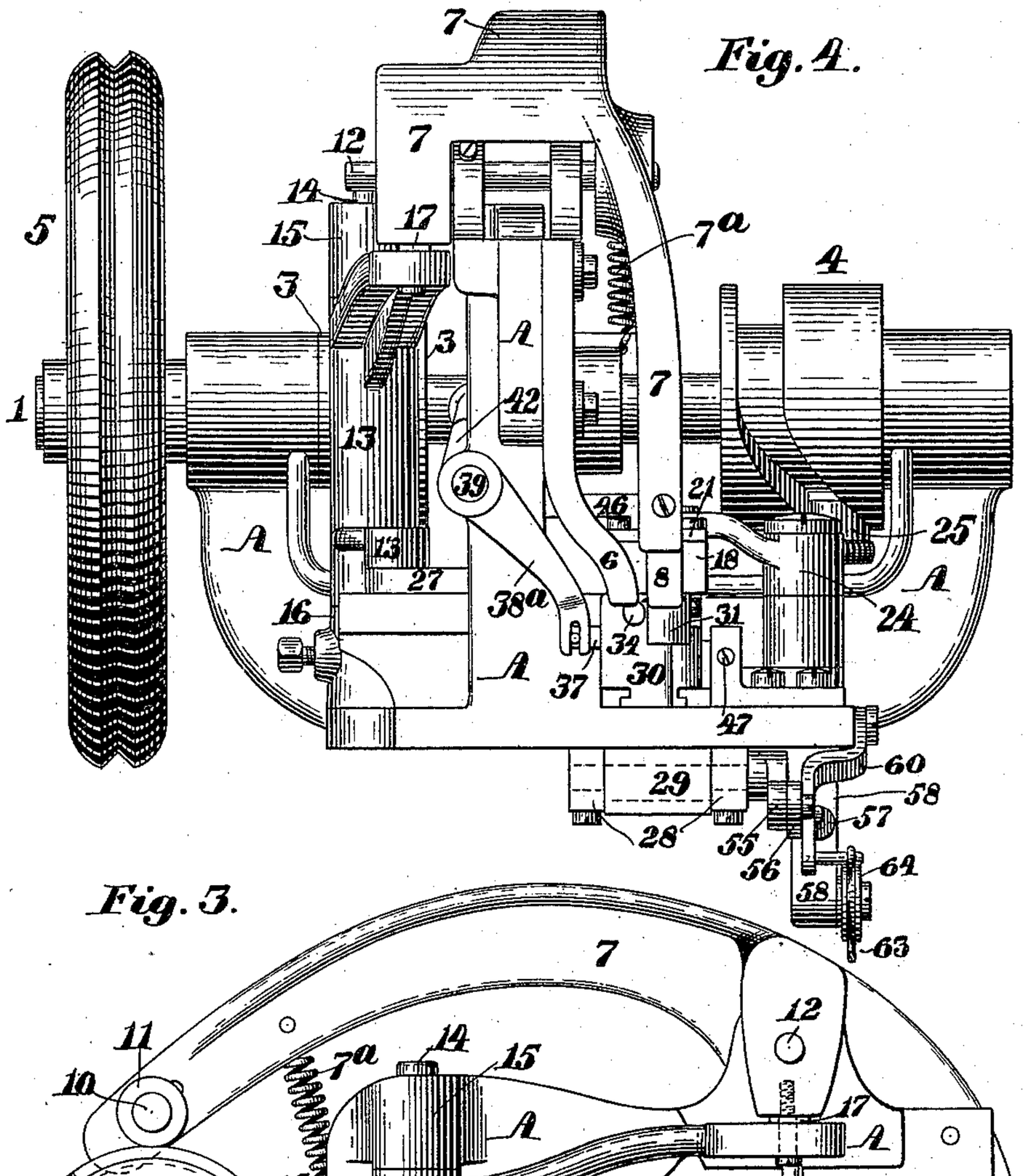
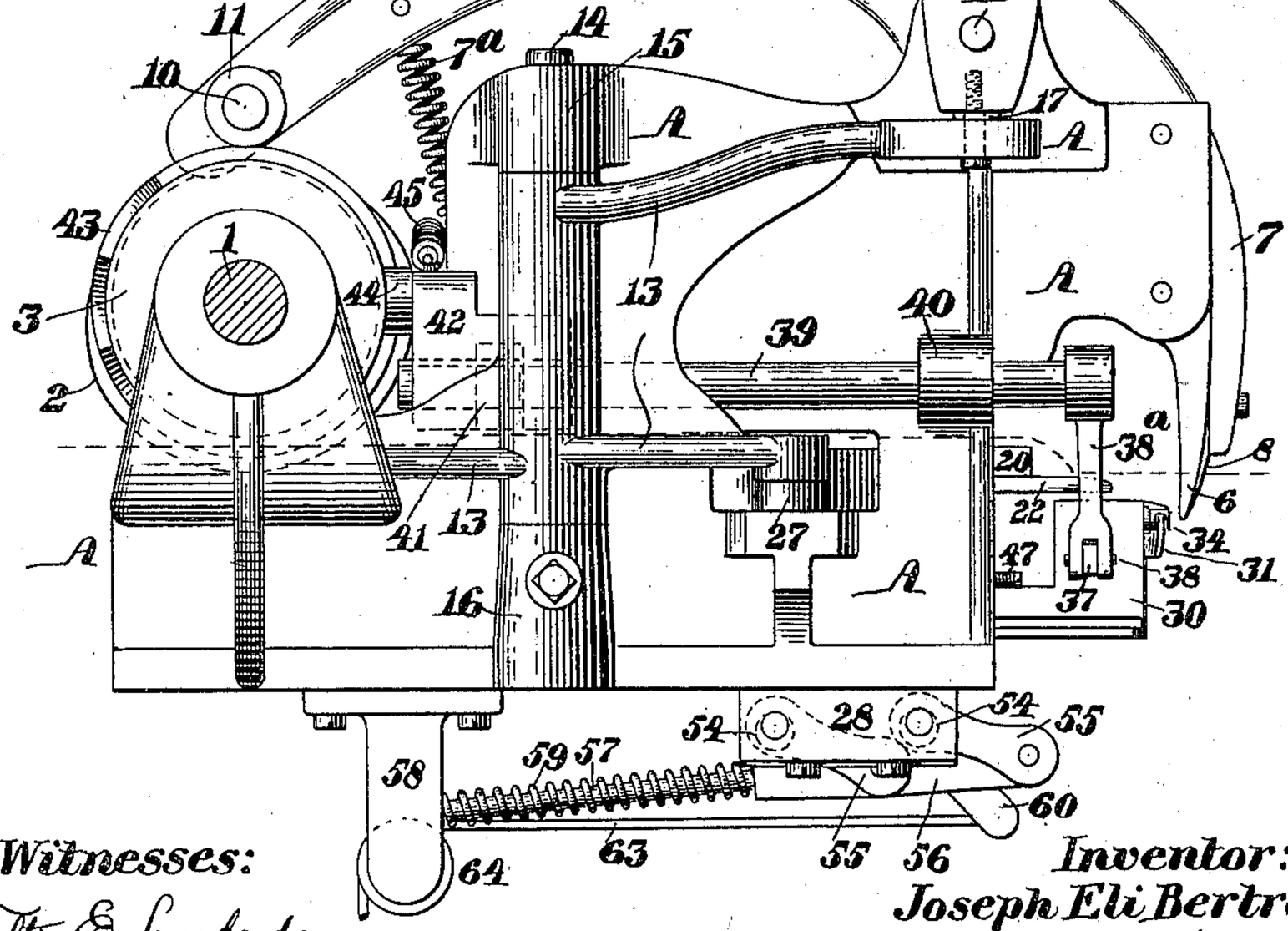


Fig. 3.



Witnesses:
Walter E. Lombard
John W. Robbins.

Inventor:
Joseph Eli Bertrand,
by N. E. Lombard
Atty.

No. 625,736. Patented May 30, 1899.

J. E. BERTRAND.

SOLE ROUGH ROUNDING AND CHANNELING MACHINE.

(Application filed Feb. 16, 1899.)

(No Model.) 3 Sheets—Sheet 3.

Fig. 5.

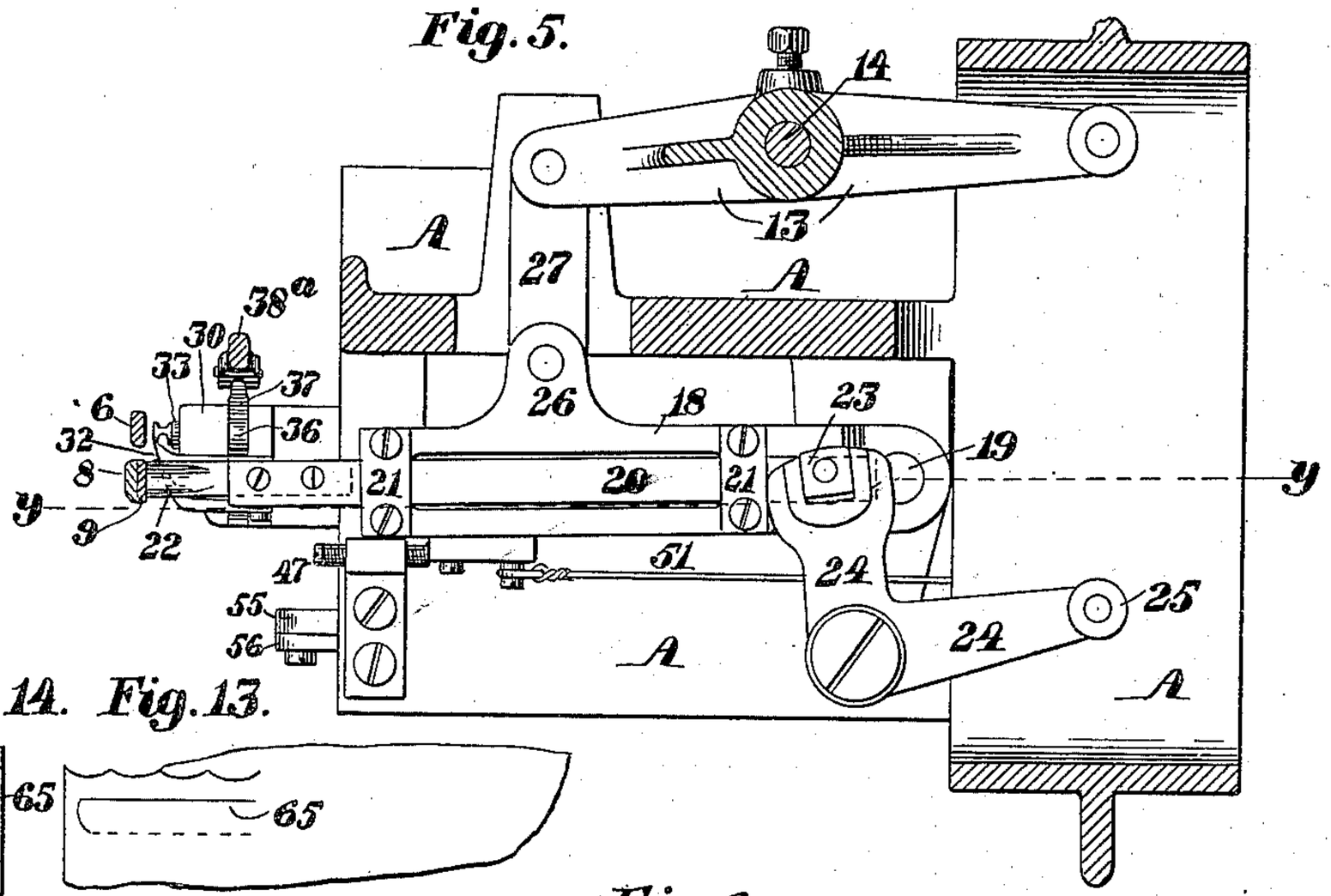


Fig. 14. *Fig. 13.*

Fig. 6.

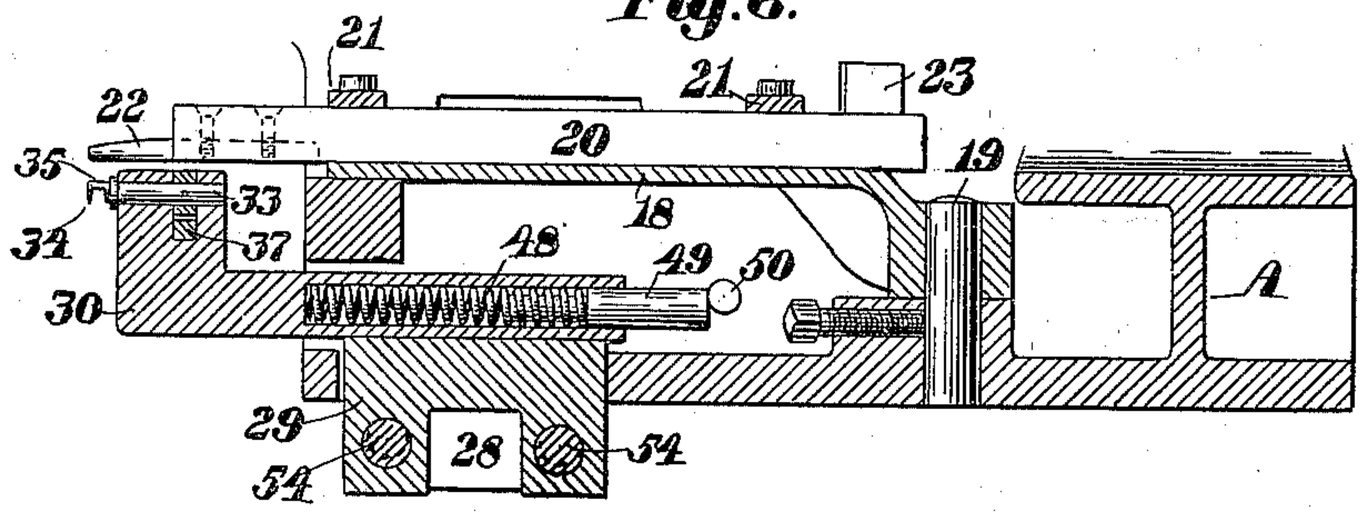


Fig. 8.

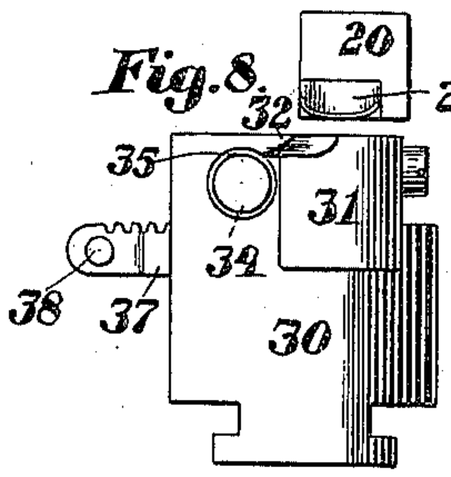


Fig. 7.

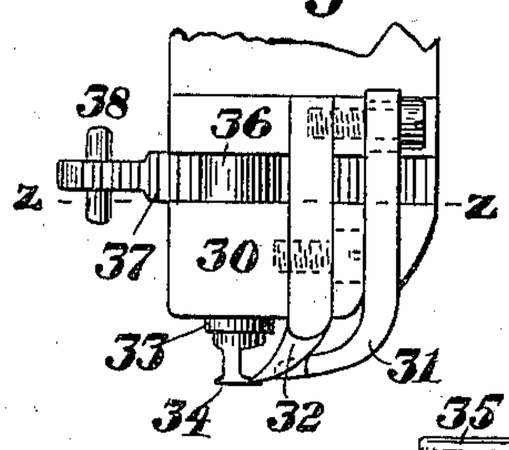


Fig. 9.

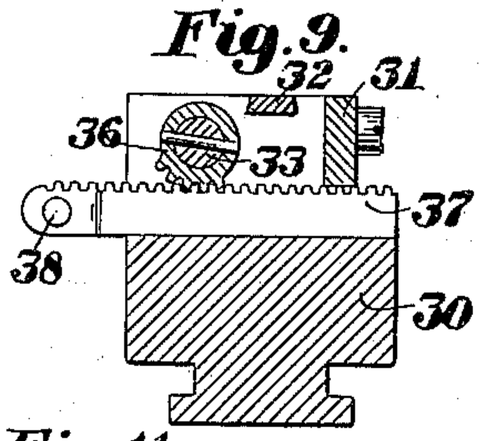


Fig. 12.

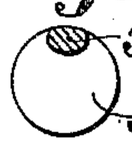
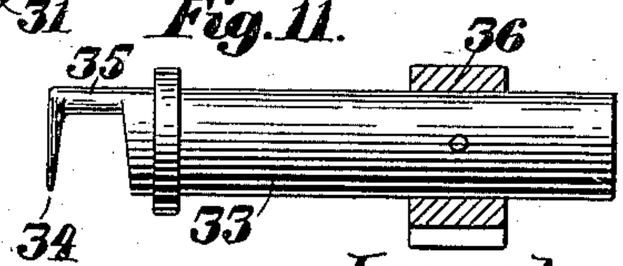


Fig. 10

Fig. 11.



Witnesses:
Walter E. Lombard
John W. Robbins

Inventor:
Joseph Eli Bertrand,
by N. C. Lombard
Atty.

UNITED STATES PATENT OFFICE.

JOSEPH ELI BERTRAND, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO THE BAY STATE SHOE MACHINERY COMPANY, OF SAME PLACE AND PORTLAND, MAINE.

SOLE ROUGH-ROUNDING AND CHANNELING MACHINE.

SPECIFICATION forming part of Letters Patent No. 625,736, dated May 30, 1899.

Application filed February 16, 1899. Serial No. 705,639. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH ELI BERTRAND, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Sole Rough-Rounding and Channeling Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to sole rough-rounding and channeling machines; and it consists in certain novel features of construction, arrangement, and combination of parts, which will be readily understood by reference to the description of the accompanying drawings and to the claims hereto appended and in which my invention is clearly pointed out.

Figure 1 of the drawings is a plan of a machine embodying my invention. Fig. 2 is a side elevation looking toward the lower side of Fig. 1. Fig. 3 is an elevation of the opposite side. Fig. 4 is a front elevation. Fig. 5 is a sectional plan, the cutting plane being on line *x x* on Fig. 2. Fig. 6 is a partial vertical section on line *y y* on Fig. 5. Fig. 7 is a plan of the front portion of the nose of the machine with the channel-cutters and the gage. Fig. 8 is a front elevation of the same parts and the trimming or rough-rounding cutter. Fig. 9 is a vertical section on line *z z* on Fig. 7. Fig. 10 is an elevation of the inner face of the combined feed-arm and cutting plate or anvil against which the trimming-cutter acts. Figs. 7, 8, 9, and 10 are drawn to an enlarged scale. Figs. 11 and 12 are respectively a side elevation and a transverse section of the oscillating channel-cutter drawn to a still larger scale; and Figs. 13 and 14 are respectively an elevation and an end view of a portion of a sole, illustrating the trimming and channel cuts.

In the drawings, A is the frame of the head of the machine, constructed and arranged to be mounted upon a column or bench. (Not shown.) The frame A has mounted in suitable bearings formed therein the shaft 1, upon which are mounted the cam-disk 2 and the cylinder-cams 3 and 4 between said bearings and the driving-wheel 5 on the projecting end thereof, as shown.

The front end of the upwardly-projecting plate-like portion of the frame A has secured thereto the stationary pendent guide-arm 6, and also has pivoted thereto the crescent-shaped lever 7, to the front end of which is secured the feed-plate 8, the inner face of which has set therein the plate 9, of soft metal, and the lower portion of which is serrated or roughened to insure a good hold upon the surface of the rand or sole to feed the work, as shown in Fig. 10. The rear end of the lever 7 has set therein the stud 10, upon which is mounted the truck 11, upon which the face-cam formed upon the periphery of the cam-disk 2 acts to vibrate said lever 7, said truck being kept in contact with said cam by the tension of the spring 7^a. The lever 7 is mounted upon the pivot-pin 12, so as to be movable laterally or lengthwise of said pin to assist in feeding the work.

A three-armed lever 13 is mounted upon a vertical pivot-pin 14, secured in a fixed position in the ears or bosses 15 and 16, formed on the frame A, as shown in Fig. 3. The rearwardly-projecting arm of the lever 13 carries at its rear end a cam-truck which is acted upon by the path of the cylinder-cam 3 to vibrate said lever 13, and the upper forwardly-projecting arm of said lever is connected at its front end with the lever 7 by a swiveling block 17 to impart the necessary lateral movement to said lever 7 for feeding the work.

An arm 18 is pivoted to the frame A by the vertical pin 19 and is provided in its upper side with a longitudinal groove, in which is mounted, so as to be movable endwise therein, the bar 20, which is held in place in said groove by the caps 21 and has secured to its front end the trimming-cutter 22, and to the upper side of its rear end the swiveling block 23, which is engaged by the forked arm of the elbow-lever 24, the other arm of which carries a cam-truck 25, which is acted upon by the path of the cylinder-cam 4 to vibrate said lever and impart to said bar 20 an intermittent reciprocation, as shown in Figs. 4 and 5. The arm 18 is provided with the laterally-projecting ear 26, to which is pivoted one end of the link

27, the other end of which is pivoted to the front end of the lower forwardly-projecting arm of the lever 13, by the vibration of which the arm 18 and cutter-bar 20 have imparted thereto a lateral vibratory motion in unison with the lateral motion of the lever 7 and feed-plate 8 for the purpose of feeding the work.

The base-plate of the frame A has formed upon its under side two downwardly-projecting ears 28, between which said plate has cut through it a rectangular opening, in which is mounted, so as to be vertically movable therein, the block 29, having an inverted-T-shaped groove formed in its upper side, in which is fitted, so as to be movable endwise therein, the nose-piece 30, upon which are adjustably secured in fixed positions the gage-plate 31 and the cutter 32, and also has mounted in a suitable bearing therein the short shaft 33, the axis of which is at right angles to the line of feed of the work and has formed upon its front end the circular cutter 34, concentric with said shaft, but connected thereto by the eccentric neck 35, as shown in Figs. 11 and 12, said cutter having a knife-edge extending from one side of the neck 35 around to the opposite side thereof. The shaft 33 has firmly secured thereon the toothed segment 36, with which the teeth of the rack 37 engage, as shown in Fig. 9. The rack 37 has set in its end the laterally-projecting pin 38, with which the forked end of the lever 38^a, secured upon the front end of the shaft 39 engages, to impart to said rack a reciprocating movement, and thereby cause an oscillating movement to be imparted to said cutter 34 to cut the channel. The shaft 39 is mounted in bearings in the ears 40 and 41, formed upon the frame A, in such a manner that it is free to be moved endwise and oscillated about its axis therein and has fitted upon its rear end the arm 42, the hub of which is divided and embraces the ear 41 to prevent forward and rearward movement of said arm when the shaft 39 is moved endwise in unison with the movements of the nose-piece 30, said arm, however, being connected to said shaft by a spline and groove, so that said shaft is compelled to move about its axis in unison with said arm, to which a series of vibrations is imparted during about one-third of each revolution of the shaft 1 by the face-cam 43, formed upon the side of the cam-disk 2, acting upon the truck 44, carried by said arm 42, as shown in Figs. 1 and 3, said truck 44 being held in contact with said cam 43 by the spring 45.

A block or stand 46 is secured to the frame A above the forward cap-plate 21 to prevent any possibility of the front ends of the arm 18 and bar 20 being forced upward during the cutting or feeding of the material.

The nose-piece 30 is limited in its forward movement by the adjustable stop-screw 47, toward which it is pressed by the spring 48, inclosed in a chamber in said nose-piece and acting against a shoulder on the follower 49, the rear end of which abuts against the pin 50, as shown in Fig. 6. The nose-piece 30 is moved to the rear for the purpose of placing the work in position by means of the cord or chain 51, secured to the screw-stud 52, and after passing over the pulley 53 is connected to a treadle near the floor, but not shown. The block 29 rests upon two eccentrics 54, which have bearings in the ears 28 and have secured thereon the radius-arms 55, the movable ends of which are connected by the link 56, to one end of which is pivoted one end of the rod 57, the other end of which extends through a bearing in the stand 58, between which and a shoulder on said rod is the spring 59, the tension of which moves the lower ends of said arms 55 toward the front of the machine.

A lever 60 is pivoted to the frame A, is provided with a slot 61 to receive the pin 62, and has connected to its lower end one end of the cord or chain 63, which passes to the rear over the pulley 64 and is connected at its other end to a treadle near the floor, but not shown, by means of which the link 56 and the lower ends of the arms 55 may be moved to the rear against the tension of the spring 59, and thus turn said eccentrics, so as to raise the block 29 and nose-piece 30 to reduce the distance of the channel from the rough rounded edge of the sole. The cutter 22 has a concavo-convex cutting edge, with its convex side downward, as shown in Fig. 8.

The guide-arm 6 enters the angular space between the rand and upper of the boot or shoe and serves to guide the same as it is fed through the machine.

The operation of my invention is as follows: The several parts of the machine being in the positions shown in Figs. 1, 2, 3, and 4, the operator retracts the nose-piece 30 by placing his foot upon the treadle connected thereto by the cord or chain 51, then places the tread-surface of the sole against the gage-plate 31, with the lower ends of the guide-arms 6 and feed-plate 8 bearing against the upper in proximity to the rand, and then releases said treadle, when the reaction of the spring 48 causes a forward movement of said nose-piece and a clamping of the sole edge between the guide-arm 6 and said nose-piece. If power be applied to the wheel 5 to revolve it in the direction indicated by the arrow on Fig. 2, the first effect produced is a forward movement of the bar 20 and cutter 22 until its cutting edge has passed through the sole and come in contact with the plate 9, caused by the action of the cam 4 upon the lever 24. When the forward movement of the cutter is completed and while said cutter remains in contact with said plate 9, the forward ends of the arm 18, the bar 20, cutter 22, and the lever 7, with the feed-plate 8, are moved toward the left by the action of the cam 3 upon the lever 13 to feed the work, which being pressed against the cutting edge of the stationary cutter 32 as it is fed forward, a section of a shal-

low incision 65 at right angles to the tread-surface of the sole is formed therein, as shown in Figs. 13 and 14. During the same time that the work is being fed the cam 43 is acting upon the truck 44 to oscillate the shaft 39 and cause a series of rapid reciprocations of the rack 37 and a corresponding series of oscillations of the cutter 34, which cuts an incision 66 parallel, or nearly so, to the tread-surface of the sole and extending from the incision 65 toward the center of the sole, a distance nearly equal to the diameter of said cutter 34, as shown in Figs. 13 and 14. The continuation of the revolution of the cam-shaft 1 causes the cutter 22 to recede to its rearmost position, while the plate 8 moves toward the front, and then the said cutter and feed-plate are moved toward the right to the positions occupied at the start, the work being prevented from being moved backward by being clamped between the guide-arm 6 and the nose-piece 30, these operations being repeated at each revolution of the cam-shaft 1.

The distance of the channel from the rough rounded edge of the sole may be varied by a partial rotation of the eccentrics through the medium of the cord 63, the lever 60, the link 56, the levers 55, and the spring 59.

I claim—

1. In a rough-rounding machine the combination of a yielding nose-piece; a stationary guide-arm coöperating with said nose-piece to clamp the sole edge; a reciprocating and laterally-movable trimming-cutter; and a feed-plate constructed and arranged to move toward and from said cutter and laterally in unison therewith.

2. In a rough-rounding and channeling machine the combination of a stationary guide-arm; a yielding nose-piece coöperating therewith to clamp the work; an endwise-reciprocating and laterally-movable trimming-cutter; a feed-plate constructed and arranged to move toward and from said cutter and laterally therewith; a fixed cutter carried by said nose-piece and arranged to cut a shallow incision in the sole at right angles to the tread-surface thereof as the work is fed past it; an oscillating disk-like cutter also carried by said nose-piece arranged to cut an incision from said shallow incision toward the center of the sole parallel or nearly so to the tread-surface thereof; means for imparting to said disk-like cutter a series of rapid oscillations, during the time that the work is being fed; and means for imparting intermittent reciprocations and lateral movements to said trimming-cutter and the feed-plate.

3. The combination of the pivoted arm 18; the bar 20; cutter 22; elbow-lever 24; cam 4; the lever 13 connected to said arm 18; the cam 3; the lever 7; the feed-plate 8; the cam 2 for vibrating said lever and the swiveling block 17 connecting said lever 7 to an arm of the lever 13 all constructed arranged and operating substantially as described.

4. In a channel-cutting machine the combination of a work-feeding mechanism; a stationary cutter arranged to cut a shallow slit at right angles to the tread-surface of the sole as the work is fed past it; and a circular disk-like cutter constructed and arranged to oscillate about its axis in a plane parallel or nearly so to the tread-surface of the sole and cut an incision from said shallow slit toward the center of the sole as it is fed toward said cutter.

5. In a sole rough-rounding and channeling machine the combination of the eccentrics 54, 54 mounted in bearings in the ears 28, 28; the block 29 supported upon said eccentrics and having an inverted-T-shaped groove formed in its upper side; the nose-piece 30 fitted to and movable endwise in said groove; the spring 48 for pressing said nose-piece toward the front; the fixed combined guide-arm and work-clamping member, coöperating with the movable nose-piece to hold the work; means for partially rotating said eccentrics to raise and lower said nose-piece; and means for retracting said nose-piece away from the fixed work-clamping member 6 against the tension of said spring 48 to enable the work to be placed in position.

6. In a sole-channeling machine the combination of the yielding nose-piece 30; the gage-plate 31, the stationary cutter 32 and the oscillating cutter 34 carried by said nose-piece; the toothed segment 36 fast on the shank of said cutter 34; the rack 37 engaging said segment; the endwise-movable oscillating shaft 39; the lever 38 mounted on said shaft and engaging said rack; the arm 42 connected to said shaft so as to oscillate therewith while said shaft is freely movable endwise therein; the truck 44 carried by said arm 42; and the cam 43, all arranged to operate as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 9th day of February, A. D. 1899.

JOSEPH ELI BERTRAND.

Witnesses:
N. C. LOMBARD,
F. E. BERTRAND.