

F. CHASE.

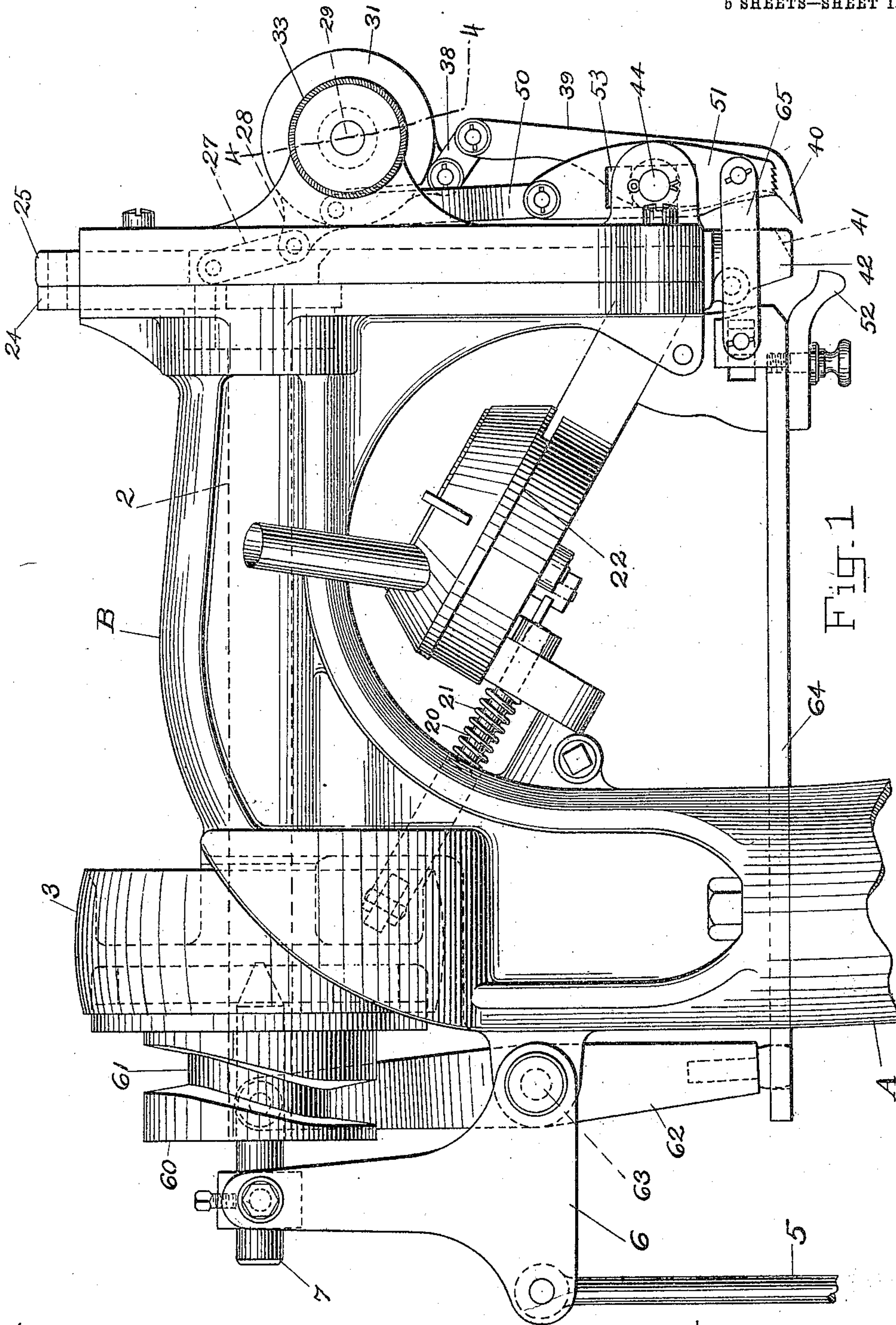
LASTING MACHINE.

APPLICATION FILED JUNE 14, 1899.

935,090.

Patented Sept. 28, 1909.

5 SHEETS—SHEET 1.



WITNESSES:

A. M. Tuttle
M. J. Morse

INVENTOR:

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By C. B. Tuttle
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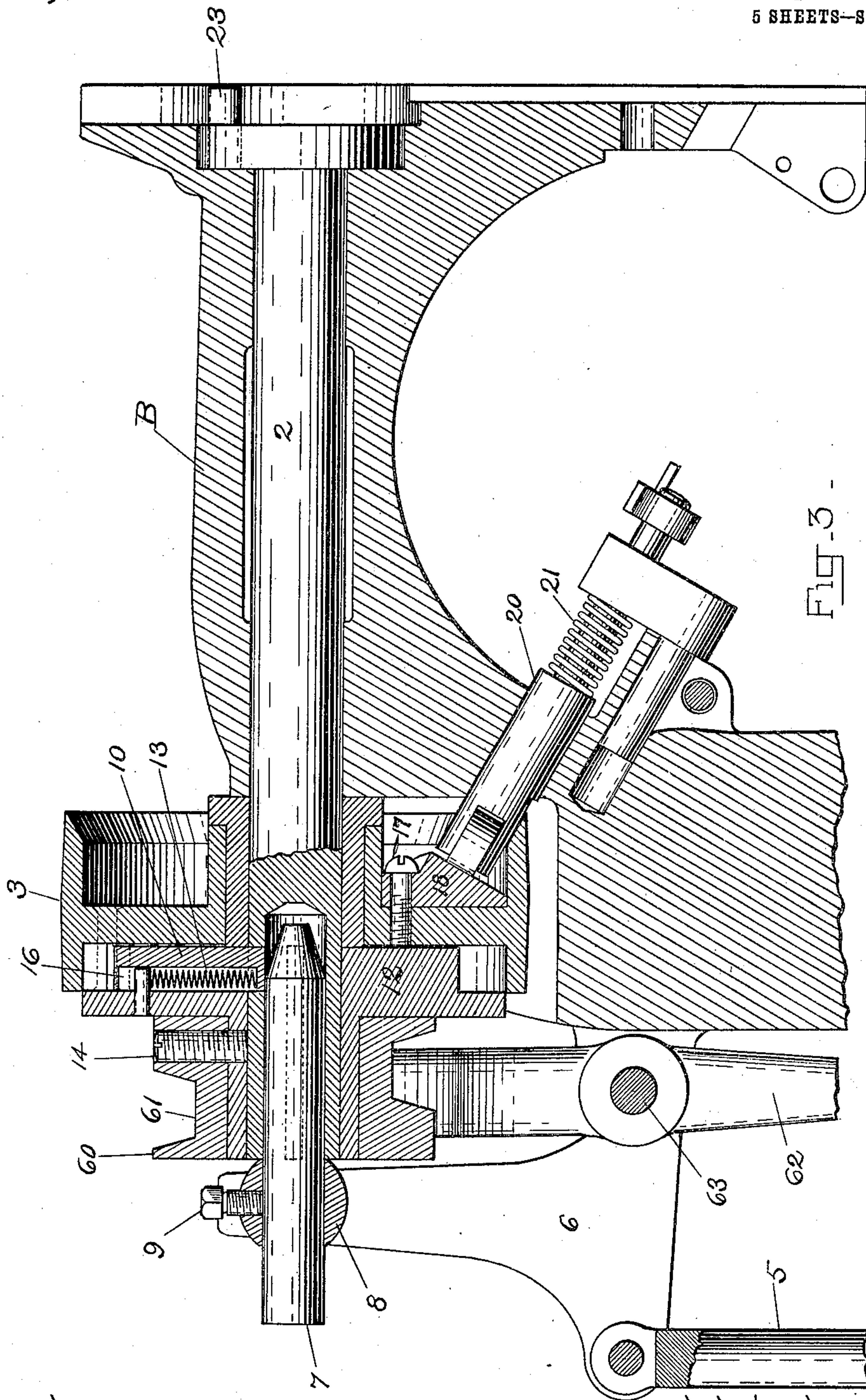
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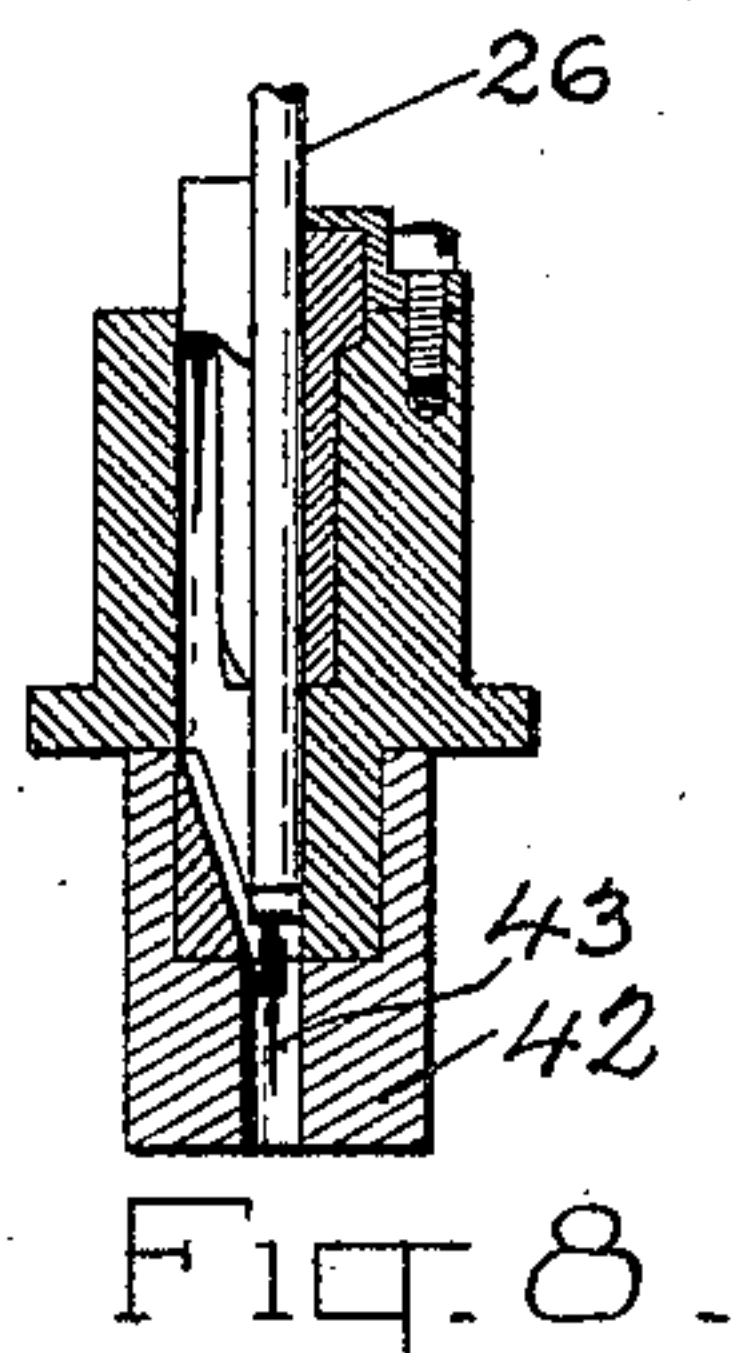
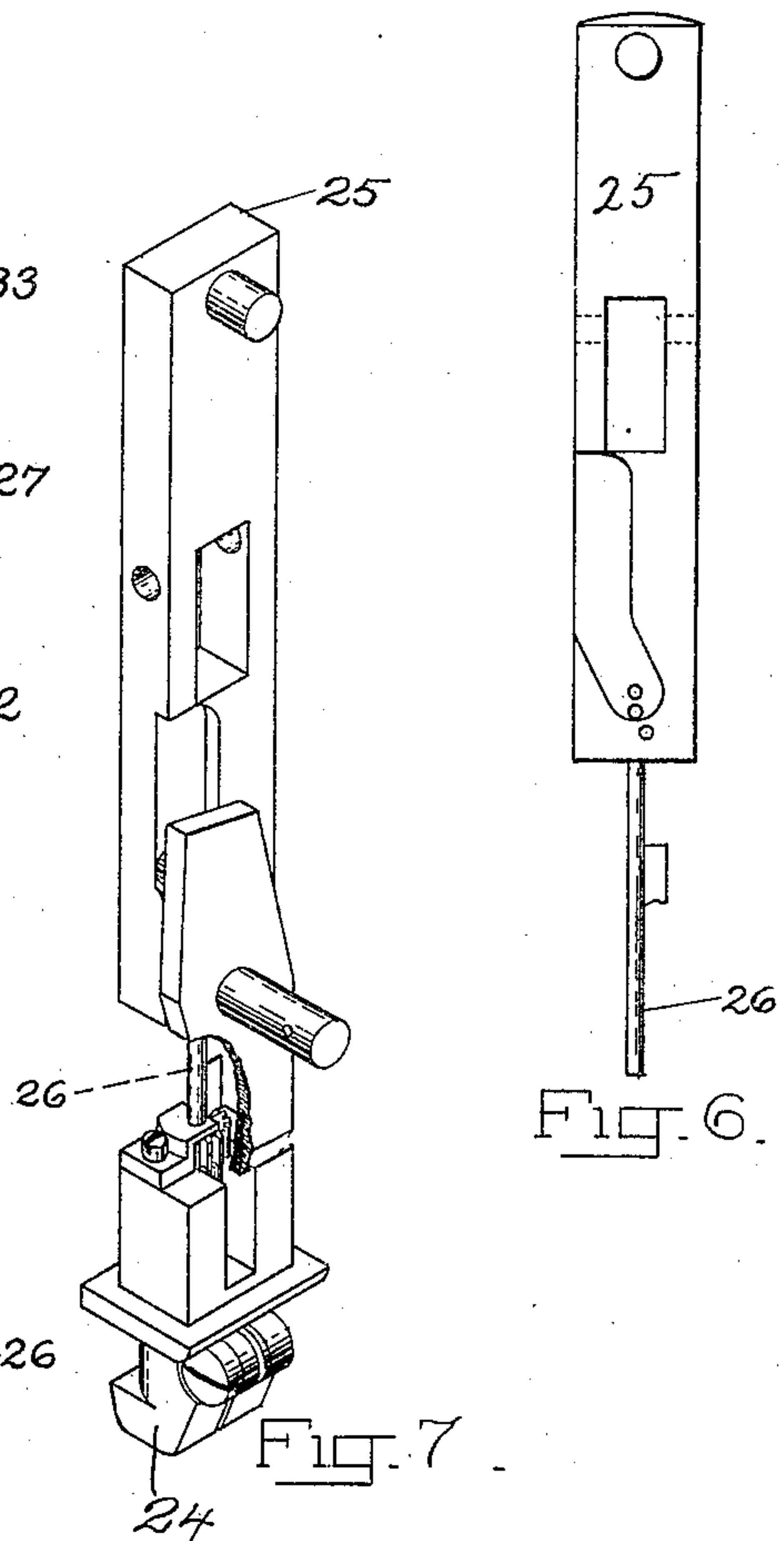
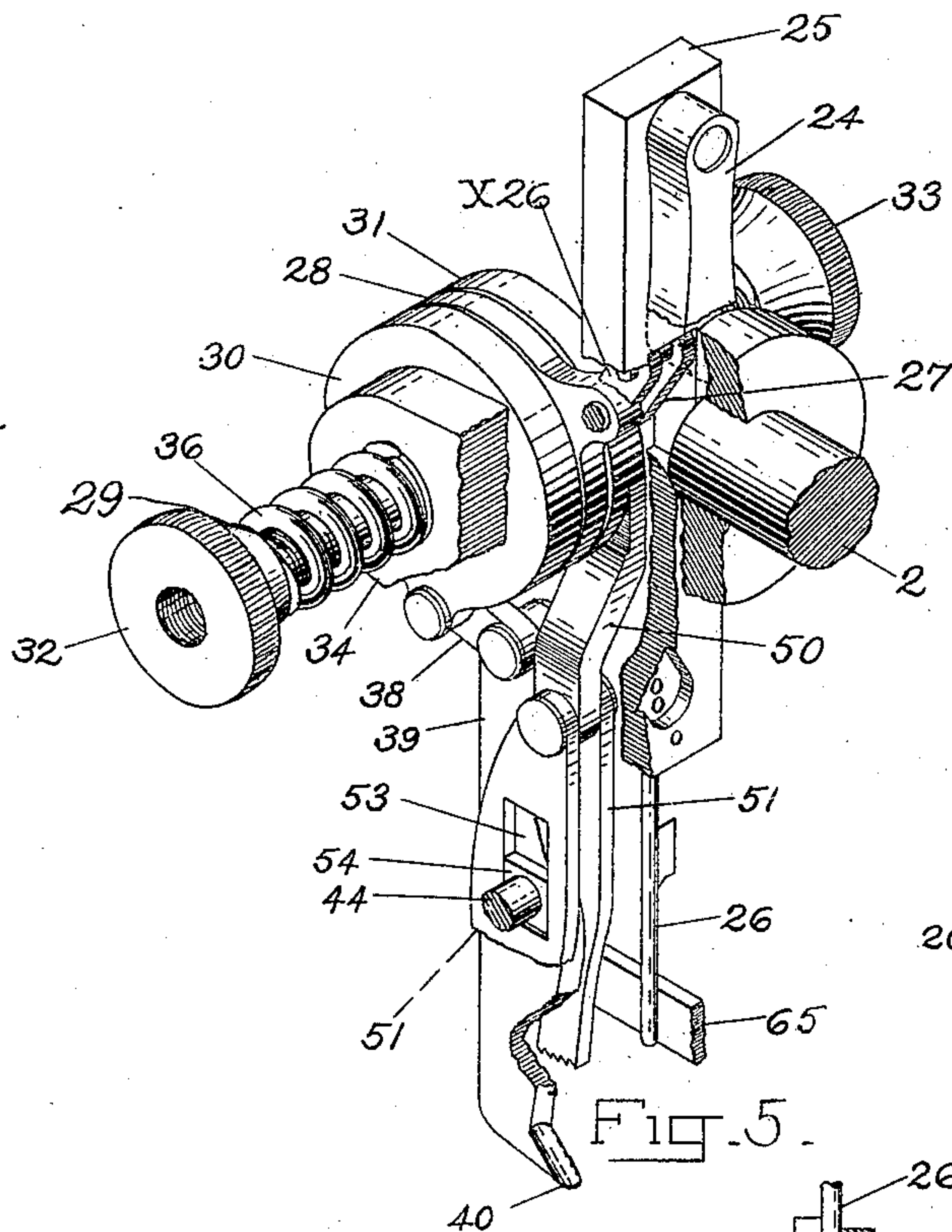
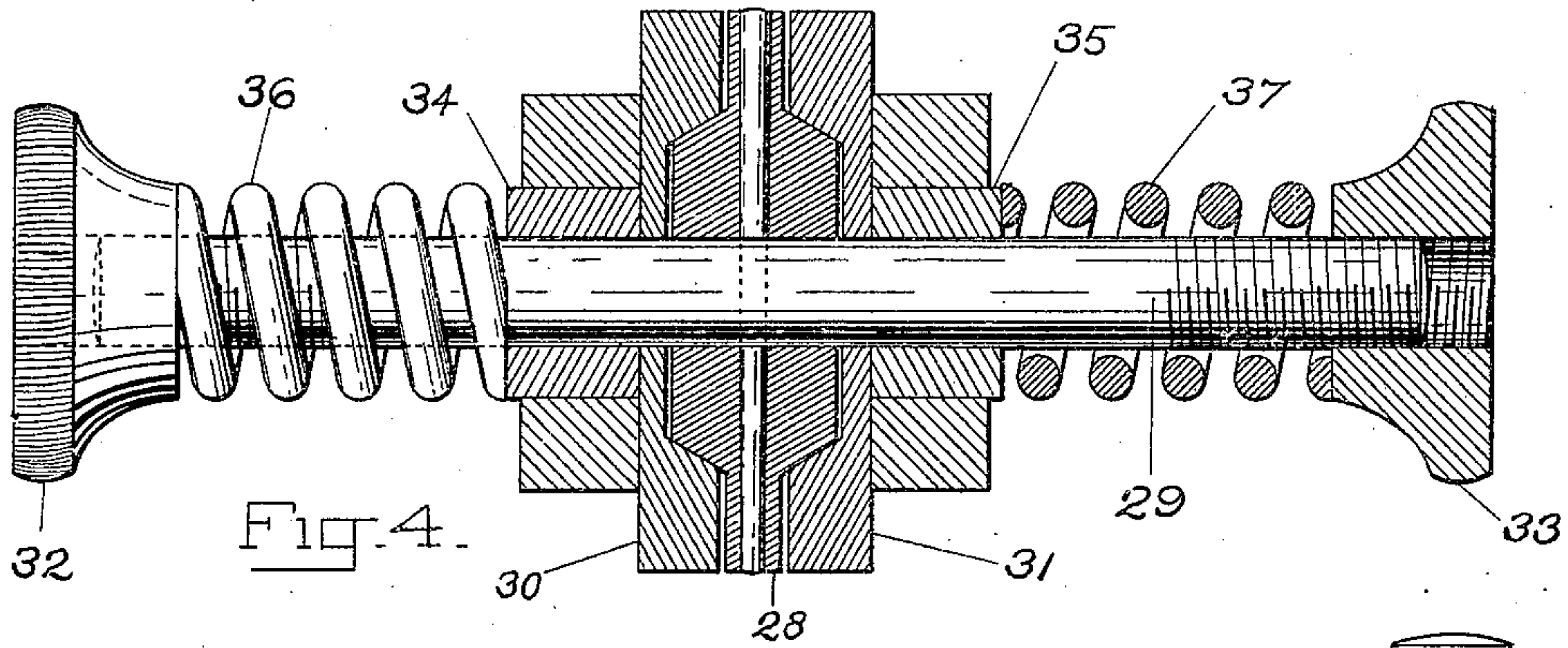
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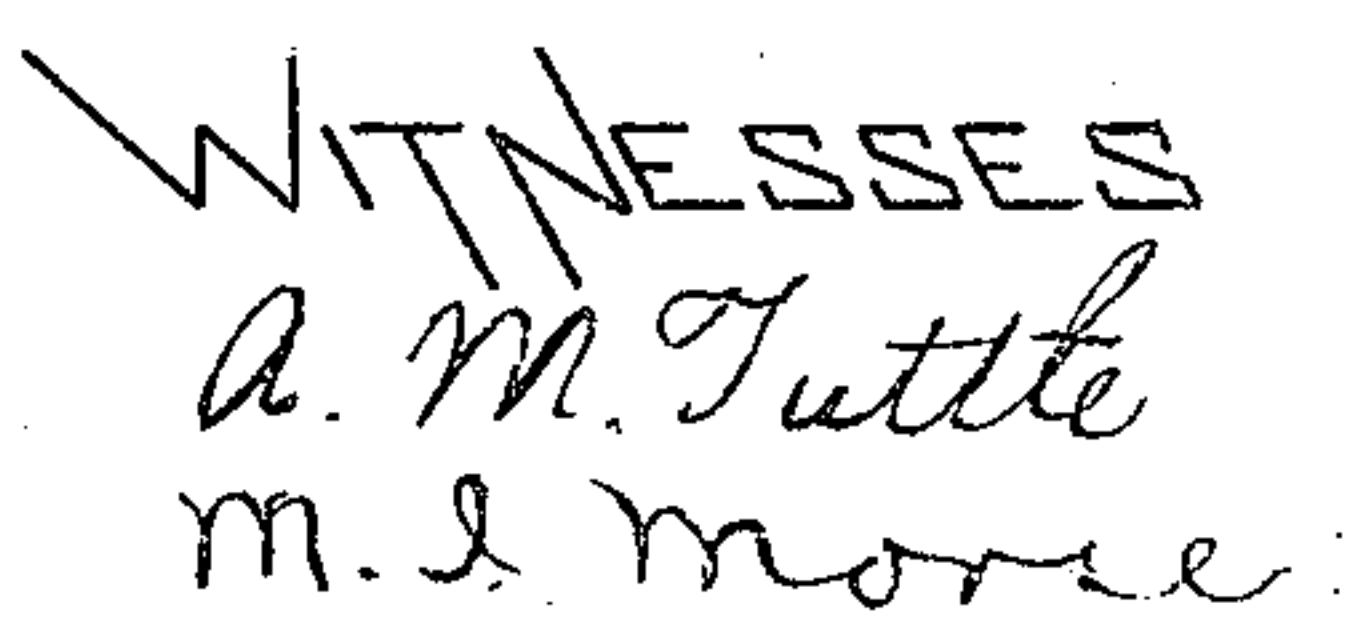
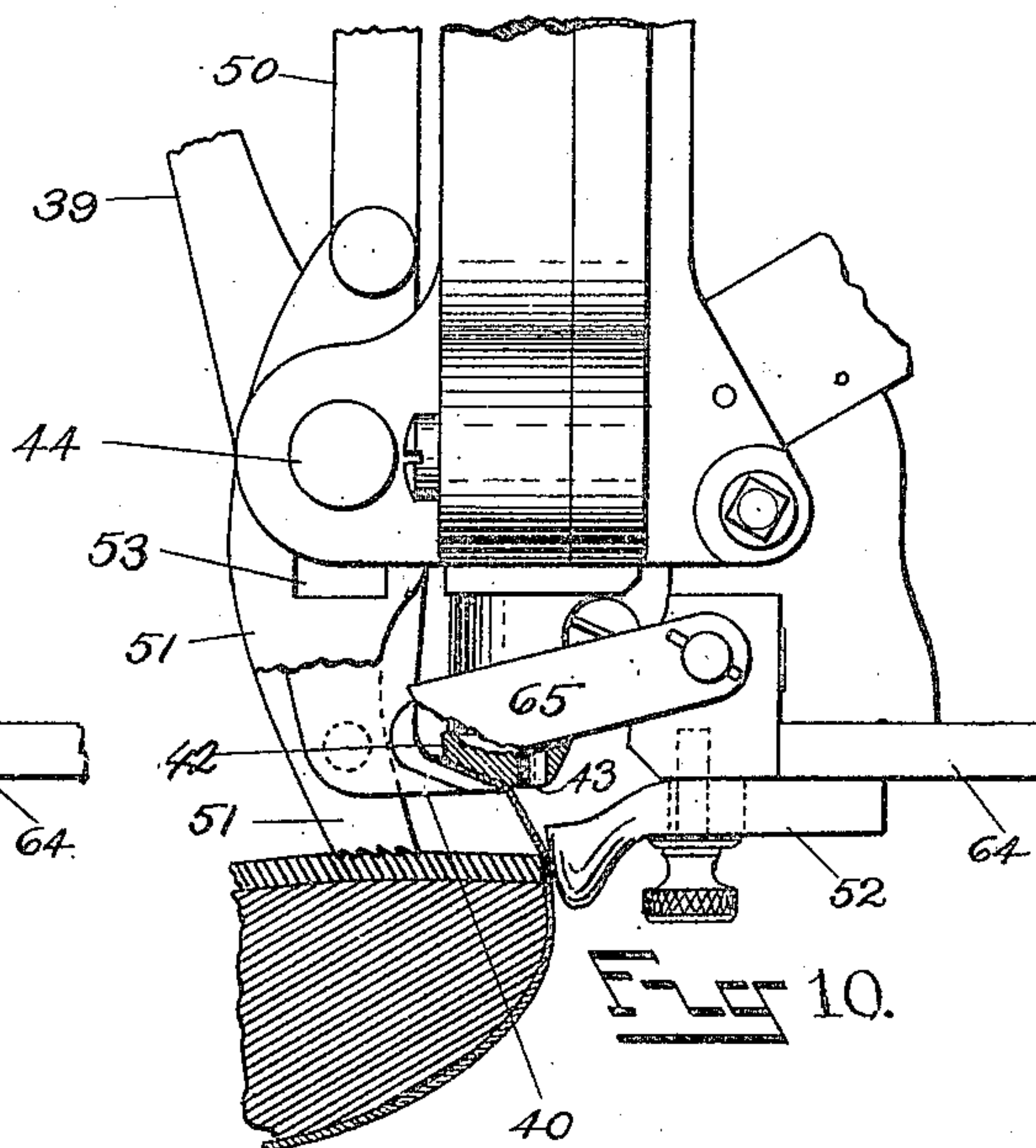
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LASTING MACHINE.

935,090.

5 SHEETS—SHEET 5.



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UNITED STATES PATENT OFFICE.

FRANK CHASE, OF WATERVILLE, MAINE, ASSIGNOR, BY MESNE ASSIGNMENTS, TO THE
UNITED SHOE MACHINERY COMPANY, A CORPORATION OF NEW JERSEY.

LASTING-MACHINE.

935,090.

Specification of Letters Patent. Patented Sept. 28, 1909.

Application filed June 14, 1899. Serial No. 720,442.

To all whom it may concern:

Be it known that I, FRANK CHASE, of Waterville, county of Kennebec, State of Maine, have invented certain Improvements in Lasting-Machines, of which the following, read in connection with the accompanying drawings, is a specification.

This invention relates to lasting machines and particularly to novel means for stretching the upper and laying the edge portion of the upper over on the innersole.

It is one of the objects of the invention to provide mechanism for stretching and overlaying the upper without danger of injury to the upper materials, and to this end a very important feature of the invention consists in providing means for actuating the upper-manipulating devices with constant force during their movements for working the upper into lasted position.

In the embodiment of the invention herein shown the upper-manipulating devices are actuated by frictionally controlled mechanism, and preferably provision is made whereby the force with which said devices are moved may be regulated according to the conditions of the work by adjusting the parts to increase or diminish the friction.

Another feature of the invention consists in providing novel means for stretching the upper and laying it over the innersole in position to be secured thereto. As herein shown, this means includes grippers for gripping the upper and means for relatively moving the last and the grippers for pulling the upper over and down toward the innersole of the shoe. The means for effecting this relative movement is shown as including a shoe-engaging means adapted to be actuated for carrying the shoe downwardly away from the grippers and then laterally and upwardly toward the grippers, said two movements effecting the stretching of the upper and the overlaying of the edge portion of the upper on the innersole. Preferably the grippers will be closed to grip the upper by the novel actuating means above referred to by which all danger is avoided of the grippers grasping the upper with too great force so that the upper will be cut or otherwise injured. Preferably also the shoe-engaging means is moved for effecting the stretching of the upper by similar novel actuating means, whereby the upper is pulled by a constant or uniform force, the friction-

ally engaged members of the actuating means slipping when the resistance to further stretching exceeds the force produced by the adjustment of the friction-developing means. A movable edge rest is preferably employed, said rest being adapted to position the shoe while the upper is being stretched and to be retracted or withdrawn for permitting the lateral movement of the shoe for laying the upper over upon the innersole.

Means is herein shown for automatically retracting the edge rest and for automatically actuating the shoe-engaging means for carrying the shoe laterally under the grippers to cause the upper to be overlaid on the innersole, although both the edge rest and the shoe-engaging means might be manually moved for the purposes stated if desired. As illustrated, the shoe-engaging means comprises a pivoted member which is arranged to turn about its axis for carrying the shoe in a curved path laterally and upwardly whereby the edge portion of the upper is carried over and laid down on the innersole in position to be secured thereto. As herein shown, one of the gripper members is formed with a driver passage and the shoe-engaging means is arranged to carry the shoe under said gripper member into position for a fastening to be driven from the driver passage into the overlaid upper and innersole for securing the upper in lasted position.

The movable edge rest and the shoe-engaging means serve to position the shoe in operative relation to the grippers and then in operative relation to the mechanism for inserting fastenings, and when the shoe-engaging means is mechanically actuated for moving the shoe laterally, as herein shown, it carries the shoe inwardly a predetermined distance at each operation and insures the positioning of the shoe to receive the fastenings a uniform distance from the edge of the shoe. This feature of the invention which consists in providing means for insuring that the shoe shall be moved inwardly with the movable edge rest to insure the insertion of fastenings at a predetermined distance from the edge of the shoe may obviously be of use in other machines for inserting fastenings.

Other features of the invention, including certain details of construction and combina-

tions of parts, will be explained in the following description and pointed out in the claims.

Figure 1 is a side elevation of the upper 5 portion of a lasting machine embodying this invention. Fig. 2 is a front elevation of a portion of the machine shown in Fig. 1. Fig. 3 is a central longitudinal section of the head of the machine, showing the driv- 10 ing mechanism. Fig. 4 is a sectional view on the line 4—4 of Fig. 1 through the frictionally controlled actuating mechanisms for the grippers and shoe-engaging means. Fig. 5 is a perspective view showing the fric- 15 tionally controlled actuating mechanisms and the connections between said mechanisms and the parts operated by them. Fig. 6 is an elevation of the driver bar detached. Fig. 7 is a perspective view of the driver 20 bar and tack block. Fig. 8 is a sectional view showing the driver and tack block. Fig. 9 is a detail view showing the position ing the position of the parts after the upper is gripped. Fig. 10 is a similar view show- 25 ing the position of the parts after the upper has been gripped and the last has been moved downwardly by the shoe-engaging means. Fig. 11 is a similar view showing the position of the same parts after the last has 30 been moved laterally for carrying the shoe under the grippers for laying the upper over on the innersole.

The machine herein shown as embodying the invention comprises a head B mounted 35 on a suitable standard A and provided with bearings for a shaft 2 upon which is loosely mounted the driving pulley 3 adapted to be connected to and disconnected from said shaft by a manually controlled clutch. As herein 40 shown, the pulley comprises a relatively wide flange and a thin web arranged to provide chambers in either side of the pulley. A circular block 12 is adapted to fit into and partially fill the recess in the rear side of 45 the pulley, said block being provided with a hub and secured to the driving shaft by a screw 14. The block is provided with a radial slot in which is guided a slide 10 normally pressed inwardly by a spring 13, but 50 adapted to be forced outwardly into engagement with a projection 16 on the inner wall of the pulley for causing the block and the shaft to which it is secured to be rotated by the pulley. The slide 10 is arranged to be 55 actuated outwardly into engagement with the pulley for starting the machine by a longitudinally movable spindle 7 mounted in an axial recess in the shaft and having a beveled inner end adapted to be forced into 60 engagement with and to actuate the slide. The outer end of the spindle 7 is connected by a binding screw 9 to a swiveled block 8 in the upper end of a rocking arm 6 to which is attached a rod 5 connected with a foot 65 treadle not shown. Downward movement

of the rod 5 by means of the foot treadle effects the withdrawal of the spindle 7 from engagement with the slide 10 and permits the spring 13 to force the slide out of en- 70 gagement with the projection 16 on the pulley whereby the shaft is disconnected from the pulley and allowed to come to rest. Reverse movement of the several parts effects the starting of the machine. Any other 75 usual or suitable form of clutch mechanism might be substituted for that above described for starting and stopping the machine. The machine is provided with mechanism for supplying and driving tacks for 80 securing the upper to the innersole after it has been stretched and overlaid on the inner-sole.

The hopper 22 for containing the tacks and the means for presenting them in position to be driven is or may be substantially the same 85 as that shown in my prior United States Letters Patent No. 547,662, of October 8, 1895. The hopper of that patent contains a feed table which requires to be oscillated for 90 facilitating the delivery of the tacks. As herein shown, a rod 20 is operatively connected with said feed table and is arranged for longitudinal movement in bearings 95 formed in or connected to the head B. The inner end of the rod 20 is provided with a roll adapted to be engaged by a cam 18 secured by a screw 17 to the web of the pulley 3, as shown most clearly in Fig. 3. The rod 100 is acted upon by a spring 21 which holds the roll normally against the cam and effects the movement of the rod and its connected feed table in one direction. Any other suitable connection between the feed table and a mov- 105 ing part of the machine may be employed for oscillating the table.

The shaft 2 on its outer end is provided with a head located in a suitably formed recess in the frame and with a crank pin 23, 110 see Fig. 3 and dotted lines in Fig. 1. The crank pin is connected by a vertical link 24 with the driver bar 25 which is arranged to reciprocate in a guideway formed between the outer face of the head and a cap plate suitably secured thereto. The driver bar 115 supports the hammer rod 26 by means of which the tacks fed from the hopper are inserted for securing the upper to the inner-sole. The cap plate above referred to is pro- 120 vided with forwardly extending lugs in which are formed bearings for a shaft 29 to which is secured a friction disk 28. The friction disk has a laterally extending lug, see dotted lines in Fig. 1 and full lines in 125 Fig. 5, which is connected by links X26 and 27 to the driver bar 25, whereby the friction disk and shaft are oscillated by the move- 130 ments of the driver bar up and down. Mounted upon the shaft 29 at opposite sides of the friction disk 28 are disks 30 and 31 normally pressed against the friction disk 28 135

by springs 36 and 37 located between collars 34 and 35 and adjustable nuts 32 and 33 on the ends of the shaft 29. The force with which the disks 30 and 31 are pressed against the friction disk 28 may be independently varied by adjusting the nuts 32 and 33. The disks 30 and 31 are thus mounted for rotative movement with the friction disk 28, but either of them will slip with relation to the disk 28 whenever the resistance to its movement overcomes the friction between that disk and the disk 28.

The upper is adapted to be gripped by grippers comprising a fixed member or jaw 41 and a movable member or jaw 40. The member 40 is formed on the lower end of a lever 39 fulcrumed on a pivot pin 44 mounted in suitable lugs projecting from the cap plate before mentioned. The disk 30 above described forms a frictionally controlled actuator for rocking the lever 39 to open and close the grippers, and to this end said actuator disk 30 is connected by a link 38 with the upper end of the gripper lever 39 as shown in Figs. 1, 2, and 5. The means herein provided for closing the grippers has the advantage that the grippers will grip with the same force stock differing to any extent in thickness, the actuator disk slipping with relation to the friction disk 28 after the grippers have closed upon the stock, so that the force with which the upper is gripped is constant and uniform, whatever the thickness of the stock.

As herein shown, the gripper member or jaw 41 is formed on the block 42 which is notched or recessed, as indicated in Figs. 1 and 9, and the cooperating gripper member or jaw 40 has a relatively narrow gripping face which is adapted to be received in the notch or recess of the other gripper member, whereby the stock gripped between the jaws is bent or crimped so that it is firmly held by the grippers without being clamped with sufficient force to cut the stock or to indent it to an objectionable extent.

In the embodiment of the invention herein shown, the upper is stretched, after having been gripped, by a movement of the last or shoe downwardly away from the grippers, and to this end the machine is provided with shoe-engaging means comprising preferably a plurality of bars 51 arranged upon opposite sides of the gripper lever 39, as shown in Figs. 1, 2, and 5. The two bars engage the shoe bottom at points separated from each other far enough to avoid liability of the shoe being canted while being depressed, thus insuring that the upper shall not be pulled laterally out of place. The disk 31 forms a frictionally controlled actuator by means of which the bars 51 are moved longitudinally for depressing the last or shoe, and to this end said disk is connected by a link 50 to the upper ends of said bars, as shown in

Figs. 1 and 5. The actuator disk 31 is adapted to slip with relation to the friction disk 28 whenever the tension on the upper being stretched exceeds the frictional grip of said actuator disk upon the disk 28, and this may be determined and regulated by adjusting the nut 33 to increase or diminish the force of the spring 37. It is to be noted that with this construction the upper is acted upon for stretching it by a constant and uniform force throughout the stretching operation, thus avoiding all danger of the stock being torn by excessively straining it.

The stretched upper is laid over upon the innersole in position to be secured thereto preferably by a movement of the shoe laterally and upwardly under the grippers, and as herein shown, the bars 51 are pivotally mounted and are arranged for turning movement to carry the shoe engaged by them under the grippers. To this end the bars are slotted, as indicated at 53 in Fig. 5, and receive a slide block 54 mounted on the pivot pin 44 about which the gripper lever 39 turns, as heretofore described. This construction permits the bars 51 to be moved longitudinally for forcing the shoe downwardly to stretch the upper and allows said bars to be turned for carrying the shoe under the grippers to overlay the edge portion of the upper upon the innersole. An edge rest 52 is preferably employed for determining the lateral position of the shoe with relation to the grippers and bars 51 during the stretching of the upper. In order to permit the shoe to be moved under the grippers for overlaying the edge portion of the upper on the innersole, the edge rest requires to be retracted or withdrawn. This may be done manually or automatically.

As herein shown, I have provided means for automatically withdrawing the edge rest to permit the shoe to be carried by the bars 51 under the grippers, and to this end a cam block 61 is secured to the shaft 2 by the binding screw 14 before mentioned. A lever 62 pivoted at 63 carries upon its upper end a roll which stands in the groove of the cam block. The lower end of the lever 62 is connected to the slide 64 which is longitudinally movable in guideways in the machine frame and to the front end of said slide 64 the edge rest 52 is secured. The cam 61 is so formed that the edge rest will be retracted immediately after the shoe-engaging bars have forced the shoe downwardly for stretching the upper. The shoe-engaging bars may be turned for carrying the shoe under the grippers either simultaneously with the withdrawal of the edge rest or after the rest has been retracted. The turning movement of the bars may be effected manually, as by the operator forcing the shoe laterally toward the machine, or the bars may be turned by mechanism actuated from some moving part

of the machine. As herein shown, the connection between the upper ends of the bars and the actuator disk 31 tends to turn the bars after they have been moved longitudinally, and I have also shown means connected with the lower ends of the bars for effecting their turning movement. This means includes a connection, by means of links 65, between the lower ends of the bars 51 and the front end of the slide 64 by means of which the edge rest 52 is actuated. This connection causes the bars to be turned in the direction for carrying the shoe under the grippers at the same time that the edge rest is retracted. The means connected with the lower ends of the shoe-engaging bars for turning said bars is shown as positively actuated and this arrangement has the advantage that the shoe is caused to follow the edge rest in its inner movement, being carried laterally to approximately the same position at each operation whereby all the securing tacks will be inserted at substantially the same distance from the edge of the shoe. In the inward movement of the shoe under the grippers the edge portion of the upper between the edge of the last and the grippers is carried under tension into substantial alignment with that portion which is engaged by the grippers, as may be seen from Fig. 11. In the event that this lateral movement of the shoe is in excess of the length of the upper between the edge of the last and the grippers, as it might be if an upper were particularly inelastic, the upper will slip between the grippers to permit the full amount of lateral movement provided for by the throw of the cam 61, if that cam is employed for effecting lateral movement of the shoe.

It will be seen that with the construction above described the shoe is moved by the bars 51 first downwardly away from the grippers for stretching the upper and the shoe is then moved laterally and upwardly in a curved path toward the grippers whereby it is carried under the grippers and at the same time moved toward the grippers and the upper is overlaid upon the innersole in position to be secured thereto. It is of course not essential that the bars 51 be mounted to turn about a pivot and thus carry the shoe inwardly and upwardly in a curved path, as obviously the movement of the shoe for overlaying the upper upon the innersole might be in a straight line and be controlled by any desired arrangement of the bars or other suitable means. Preferably and as herein shown, the driver passage 43 is formed in the fixed gripper member, as indicated in Fig. 11, so that the shoe in being moved into position for overlaying the upper is carried under the driver passage in position to receive the securing tack which is inserted in the final descent of the driver bar.

The positive movement of the shoe inwardly as described insures that it shall follow the edge rest in the inward as well as in the outward movement of the latter and be accurately positioned alternately in two relations to the tack driver passage and also to the grippers.

Specific claims are not herein made to the combination with fastening inserting mechanism of means for positively moving the shoe both inwardly and outwardly to insure the insertion of fastenings in any predetermined position. The right is reserved to claim this feature of the invention in a separate application.

In using the machine the shoe is prepared for lasting by placing the upper materials about the last and the innersole upon the last bottom and then drawing the upper over at the toe and sides in each of which places it may be secured to the innersole for holding it in position upon the last. The shoe is then supported in the hands of the workman and rested bottom upwardly against the gripper member 40, as shown in Fig. 9, the side of the shoe bearing against the edge rest 52 and the edge portion of the upper being located between the two gripper members, the machine having been stopped in such position that the grippers are open. The machine is now put into operation by actuating the rod 5 to effect the engagement of the clutch members for turning the shaft 2 and the driver bar 25 begins to descend. During the first portion of its descent motion is imparted thereby through the links X^{26} and 27 to the friction disk 28 and through said friction disk to the actuator 30 for swinging the lever 39 to close the grippers, the gripping tension being applied yieldingly through said frictionally controlled actuator. During the continued downward movement of the driver bar 25 and the rotation of the friction disk 28 the actuator 31 effects the downward movement of the bars 51 and consequently of the last or shoe, whereby the gripped upper is stretched or strained over the last upwardly, the shoe being ultimately depressed preferably to a position where said strain exceeds the tension between the friction disk 28 and the actuator 31, so that the upper is stretched with a force predetermined by the adjustment for the frictionally controlled actuator. The edge rest 52 is next retracted and the shoe moved laterally and upwardly under and toward the grippers, this lateral movement of the shoe being effected in any one of the ways described or in any other suitable way whereby the shoe is carried inwardly and upwardly for overlaying the upper upon the innersole and positioning the shoe to receive the fastening tack, which in the final descent of the driver bar is driven by the hammer rod 26. In the further move-

ment of the driving shaft after the tack has been inserted the driver bar is lifted and the several parts are restored to their initial positions ready to repeat the operation for lasting another section of the shoe, the lasting operation as a whole being carried out by repeated operations of the machine applied to different portions of the upper at different times.

10 Having set forth the nature of my invention and having described a preferred form of mechanism embodying the same, I claim as new and desire to secure by Letters Patent of the United States:—

15 1. A machine for working an upper over a last by repeated operations, comprising grippers and a shoe rest, in combination with actuating mechanism therefor constructed and arranged to actuate the grippers to grip the upper and to actuate the rest to effect a pull upon the gripped upper substantially perpendicular to the plane of the last bottom, said mechanism having provision for imparting a yielding quality to the said movement of the rest.

25 2. A machine for working an upper over a last by repeated operations, comprising grippers for gripping the upper, a shoe rest, and means for moving said rest to effect a pull of the gripped upper, said means including a friction-controlled device for imparting a yielding quality to the pulling strain.

30 3. In a machine for working an upper over a last, grippers for engaging the upper and actuating mechanism therefor, including a friction-controlled device whereby the grippers are actuated with a constant force and said mechanism is adapted to slip when excessive resistance is encountered.

40 4. A machine for working an upper over a last by repeated operations, comprising grippers, and mechanism for actuating the grippers to grip the upper, said mechanism including a friction-controlled device whereby a yielding quality is imparted to the gripping force, in combination with means to move the last and grippers relatively for pulling the section of gripped upper.

45 5. A machine for working an upper over a last by repeated operations, comprising grippers for gripping the upper, mechanism co-operating with the grippers for effecting a pull of the section of gripped upper, said mechanism including a friction-controlled device whereby a yielding quality is imparted to the pulling strain, and mechanism for securing the pulled upper.

60 6. In a lasting machine, grippers, a shoe rest, and friction-controlled actuating mechanism for moving the rest to carry the shoe from the grippers for pulling the upper.

7. A machine for working an upper over a last by repeated operations, comprising grippers for gripping the upper, a shoe rest, and mechanism for shifting the relative positions

of said grippers and said shoe rest to effect pulling of the gripped upper, said mechanism including a friction-controlled device imparting a yielding quality to the pulling strain.

8. In a lasting machine, grippers, a shoe rest, mechanism for moving the rest to carry the shoe from the grippers for pulling the upper, and means for moving the rest to carry the shoe under the grippers for placing the pulled upper over the innersole.

9. A lasting machine, comprising grippers, a shoe rest, and mechanism for moving the rest to carry the shoe from the grippers for pulling the upper, said machine having provision for thereafter moving the shoe under the grippers whereby the upper is carried over the innersole of the shoe.

10. A machine for working an upper over a last by repeated operations, comprising a fixed and a movable gripper, and yielding actuating mechanism for causing the grippers to grip the upper, combined with means to move the last and grippers relatively for pulling the section of upper gripped thereby, said means including a friction-controlled device whereby a yielding quality is imparted to the pulling strain.

11. In a lasting machine, in combination, grippers for gripping the upper, means for engaging the shoe, and mechanism for actuating said shoe-engaging means whereby the shoe is carried from the grippers and then in a curved line theretoward, said movements operating to pull the gripped upper and then to place it over the innersole.

12. In a machine for working upon shoes, the combination with means for gripping the upper and means for inserting fastenings, of an edge rest movable to position the shoe with relation to said two means alternately, and positively actuated means for moving the shoe with the rest.

13. In a lasting machine, in combination, grippers for gripping the upper, mechanism adjacent to the grippers for inserting fastenings, a shoe-engaging mechanism, and means to actuate the shoe-engaging mechanism whereby the shoe is carried from the grippers and the inserting mechanism and then inwardly and upwardly theretoward, said movements operating to pull the gripped upper and to lay it over the innersole and simultaneously position the shoe in the plane of the inserting mechanism.

14. In a lasting machine, grippers for gripping the upper, a rest for engaging the shoe bottom, a pivot for the rest located at a point distant from the plane of the shoe bottom, and means for swinging the rest on said pivot in a direction to carry the shoe in a curved line toward the grippers, substantially as described.

15. In a lasting machine, in combination, grippers comprising a fixed member and a

relatively movable member, a rest for engaging the shoe bottom, a pivot upon which said rest is fulcrumed, means for actuating said movable gripper member, and means
5 for swinging the rest on said pivot.

16. In a lasting machine, in combination, grippers for gripping the upper, a rest for the shoe bottom, means for depressing the rest whereby the shoe is carried to a point
10 below the plane of the grippers, and means for thereafter moving the rest whereby the shoe-engaging end thereof is carried in a curved line toward the plane of the grippers, substantially as described.

17. In a lasting machine, in combination, grippers for gripping the upper, means for engaging the shoe, and mechanism to actuate said shoe-engaging means whereby the shoe
15 is carried from the grippers and then in a curved line theretoward, said movements operating to pull the gripped upper with a yielding tension and then to place it over the innersole.

18. In a lasting machine, grippers, a shoe
25 rest, means to change the relative positions of said grippers and said rest for pulling the upper, and means becoming operative after the upper is pulled and while the grippers retain their hold upon the upper whereby the
30 shoe is moved with relation to the grippers to carry the upper over the innersole and downwardly toward the innersole.

19. In a lasting machine, grippers, a shoe
35 rest, means for shifting the relative positions of said grippers and said rest for pulling the upper, means becoming operative after the upper is pulled whereby the shoe is moved with relation to the grippers to carry the
40 pulled upper over the innersole, means for securing the upper to the innersole, and means for actuating the grippers to hold the upper continuously until the upper is secured.

20. In a lasting machine, mechanism for
45 securing the upper to the innersole, means for pulling the upper over a last and holding the upper continuously until it has been secured to the innersole, and means becoming operative after the upper is pulled for moving
50 the last into a position for the securing operation.

21. In a lasting machine, grippers, a pivot, a shoe rest on said pivot, means for moving the rest to carry the shoe from the grippers
55 for pulling the upper, and means for thereafter swinging the rest on said pivot whereby the shoe is moved for carrying the pulled upper over the innersole.

22. In a lasting machine, grippers having
60 fixed location, a stationary upper securing mechanism, a shoe rest, mechanism for moving the rest to carry the shoe from the grippers for pulling the upper, and means for thereafter actuating the rest to move the
65 shoe for placing the pulled upper upon the

innersole and for positioning the shoe in operative relation to the securing mechanism.

23. In a machine for working an upper
70 over a last, grippers for engaging the upper, and means for moving the last with relation to the grippers whereby the upper is pulled over and down toward the innersole of the shoe.

24. In a machine for working an upper
75 over a last, grippers for gripping the upper, a shoe rest, and means for actuating the shoe rest to move the last away from the grippers whereby the upper is stretched, said rest having also provision for movement to
80 carry the shoe laterally and upwardly toward the grippers for laying the upper over the innersole.

25. In a machine for working an upper
85 over a last, grippers for gripping the upper, a shoe rest, and means for actuating the shoe rest and grippers relatively for stretching the upper, said shoe rest being pivotally mounted whereby it may be moved for carrying the shoe in a curved line laterally and
90 upwardly under the grippers to lay the upper over the innersole.

26. In a machine for working an upper
95 over a last, grippers for gripping the upper, a pivoted shoe rest, means for actuating the grippers and shoe rest relatively for stretching the upper, an edge rest for positioning the shoe while the upper is being stretched, and means for retracting the edge rest to permit the shoe rest to be turned about its
100 pivot to carry the shoe under the grippers.

27. In a machine for working an upper
105 over a last, grippers for gripping the upper, a shoe rest, means for actuating the shoe rest to move the last away from the grippers for stretching the upper, and means for relatively moving the grippers and shoe rest laterally for drawing the upper over the innersole.

28. In a machine for working an upper
110 over a last, grippers for gripping and holding the upper, means for relatively moving the grippers and the last for putting the upper under tension, fastener inserting mechanism, and means for moving the shoe with
115 the upper still held under tension into position to receive a fastening from said inserting mechanism.

29. In a machine for working an upper
120 over a last, grippers for gripping and holding the upper, means for relatively moving the grippers and the last for putting the upper under tension, and fastener inserting mechanism, said machine having provision for permitting the shoe to be moved under
125 the fastener inserting mechanism in position to receive a fastening while the upper is still held under tension.

30. A machine for working an upper over
130 a last having grippers for seizing the upper,

means for engaging the shoe bottom, and means for relatively actuating said engaging means and grippers to stretch the upper between the last and the grippers characterized by a construction and arrangement of the engaging means to present a plurality of members disposed relatively to the grippers to engage the shoe bottom at opposite sides of the point where the upper is pulled and to leave the shoe bottom unobstructed in front of the grippers.

31. In a machine for working an upper over a last, the combination with grippers, a shoe rest, means for relatively moving the grippers and rest for stretching the upper, and fastener inserting means, of means for moving the shoe laterally through a predetermined distance to position it for receiving the fastening.

32. In a machine for working an upper over a last, the combination of grippers, a shoe rest, yielding means for relatively moving the grippers and rest to stretch the upper, and fastening inserting means, of positively actuated means for moving the shoe laterally with relation to the inserting means to position it for receiving fastenings at a predetermined distance from the edge of the shoe.

33. In a machine for working an upper over a last, grippers for gripping the upper, and means for relatively moving the grippers and last, combined with actuating mechanism therefor, comprising a driven disk and actuators frictionally controlled by said disk for closing the grippers and for relatively moving the grippers and last.

34. In a machine for working an upper over a last, grippers for gripping the upper and means for relatively moving the grippers and last, combined with actuating mechanism therefor, comprising a friction disk, a plurality of actuators arranged upon opposite sides of said disk, means for pressing said actuators against said disk, means for independently varying the pressure of the different actuators against the disk, and operative connections wherethrough the actuators may effect the closing of the grippers and the relative movement of the grippers and last.

35. A lasting machine having in combination grippers for seizing an upper, means for engaging the shoe, mechanism for actuating the shoe engaging means to carry the shoe away from the grippers, and means for then moving the shoe engaging means in a curved line toward the grippers.

36. In a machine for working an upper over a last, grippers comprising a jaw provided in its gripping face with a groove or recess extending lengthwise of the direction of the pull of the upper and increasing in

depth from the lower end of the face toward the end which engages the edge of the upper, combined with a cooperating jaw formed to crimp the upper into the groove in the opposed jaw.

37. In a machine for working an upper over a last, a gripper comprising cooperating jaws having a rib and an opposed groove extending lengthwise of the pull of the upper and formed to produce a crimp or plait in the gripped upper increasing in depth toward the edge of the upper.

38. A shoe lasting machine having, in combination, grippers, a tacker, and mechanism for relatively moving the shoe and the grippers to strain the upper and for then moving the shoe into the field of operation of the tacker while the grippers maintain the pulling strain.

39. A shoe lasting machine having, in combination, grippers, a tacker, and mechanism for relatively moving the shoe and the grippers to strain the upper, and, while holding the upper under tension, moving the shoe laterally and upwardly in a curved path into position for the tacker to insert a fastening through the gripper held upper.

40. A shoe lasting machine having, in combination, grippers, and a tacker relatively immovable laterally of the shoe, and mechanism for relatively moving the shoe and the grippers to strain the upper and then, while the grippers continue to hold the upper, moving the shoe to position it for receiving the operation of the tacker.

41. A shoe lasting machine having, in combination, grippers, a tacker working through one jaw of the grippers, and mechanism for relatively moving the shoe and the grippers to strain the upper, and then, while holding the upper under tension, moving the shoe obliquely to the first movement to position the shoe for receiving the tack in the pulled upper.

42. A machine for working an upper over a last having, in combination, grippers to seize the upper and lay it inwardly over the edge of the last, a tacker associated with the grippers, means for actuating the grippers to seize the upper, means for relatively actuating the last and the grippers and tacker together to overlay the upper and position the shoe and the tacker for a tack to be inserted to secure the upper, and means for actuating the tacker to insert the tack.

Signed by me at Waterville this 3rd day of May 1899, in the presence of two witnesses.

FRANK CHASE.

Witnesses:

HENRY L. CORSON,
LILLIAN M. SMALL.