

No. 886,604.

PATENTED MAY 5, 1908.

J. S. HANSEN.
SHOE FINISHING MACHINE.
APPLICATION FILED MAR. 21, 1908.

3 SHEETS—SHEET 1.

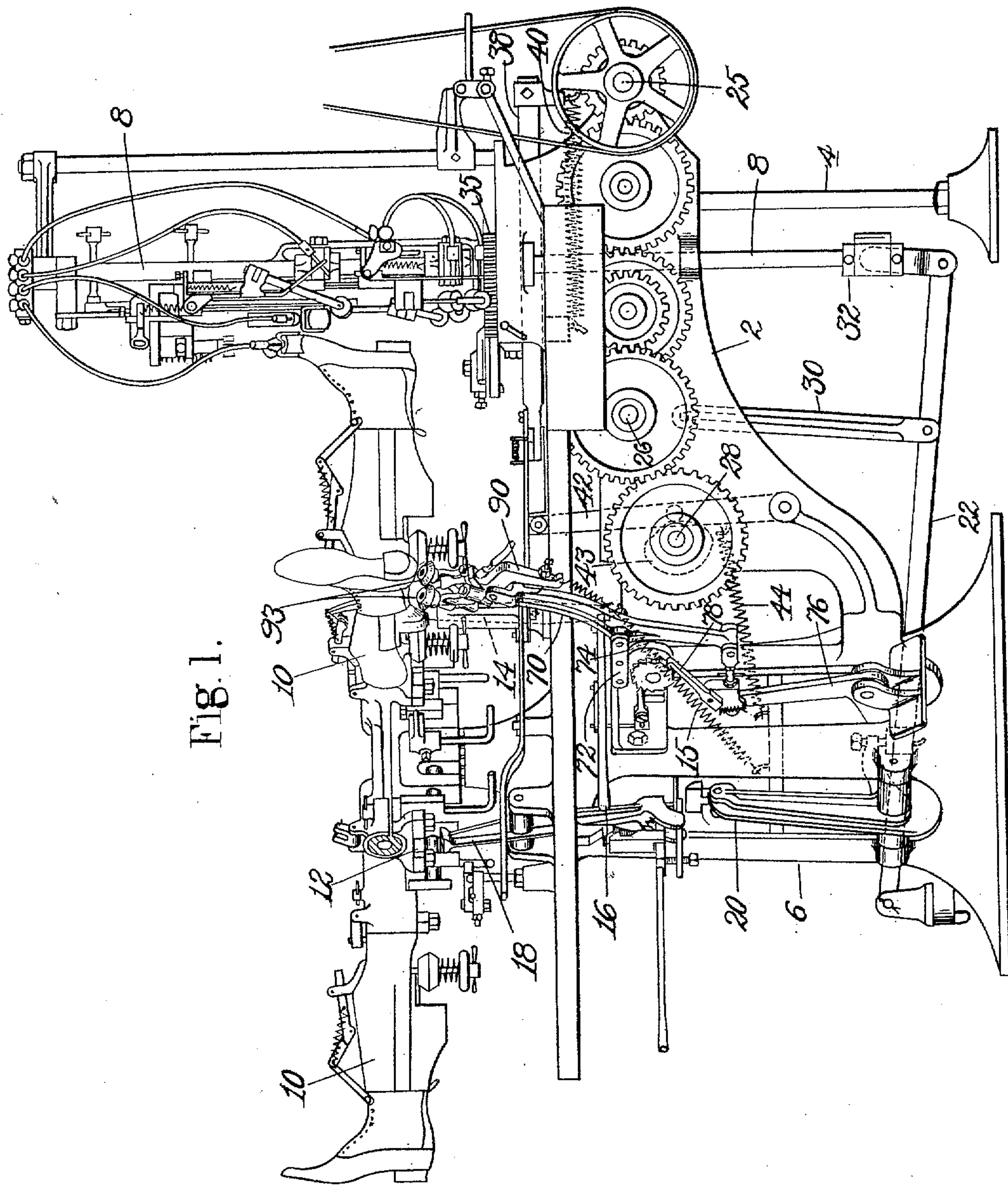


Fig. 1.

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3 SHEETS—SHEET 2.

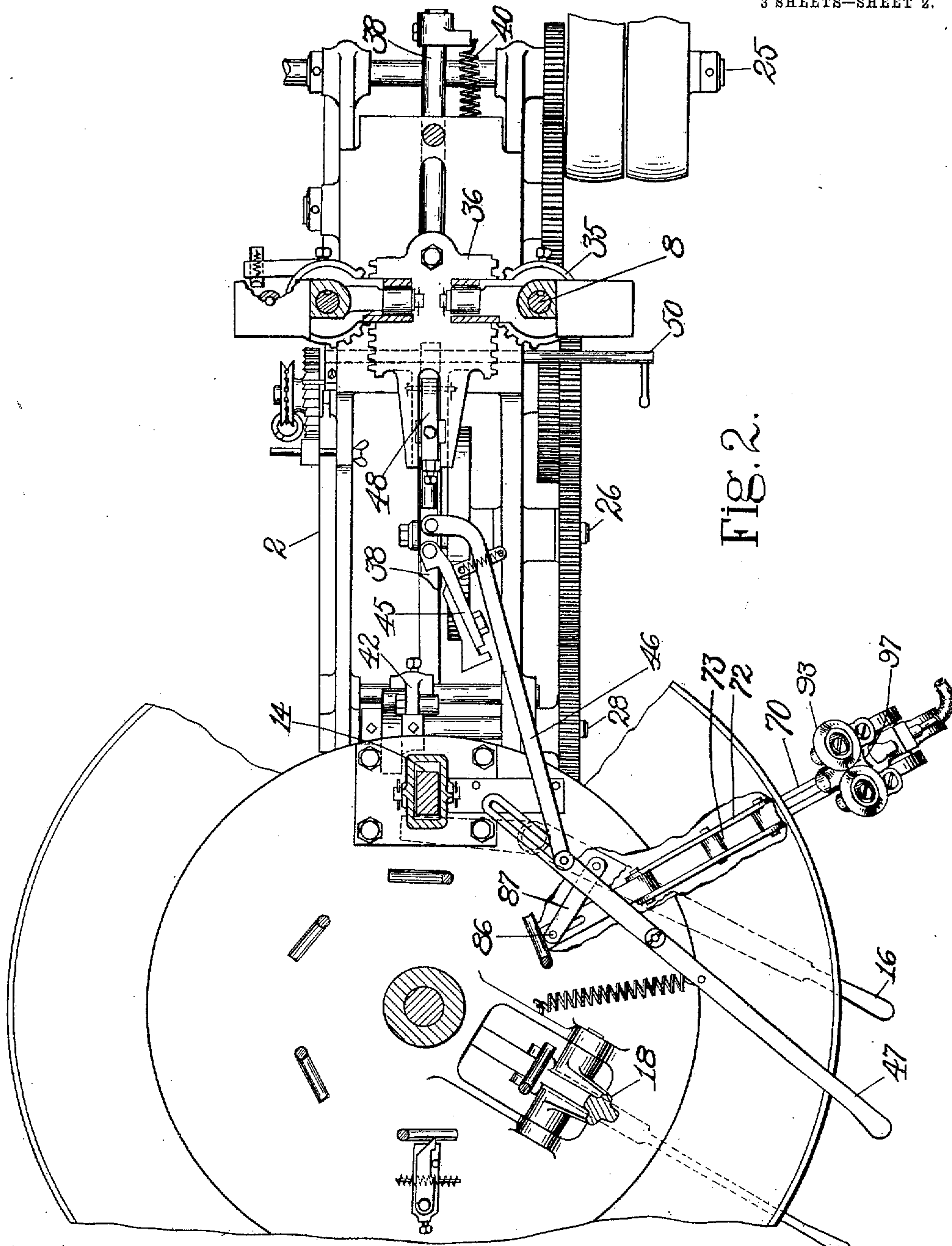


FIG. 2.

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3 SHEETS—SHEET 3.

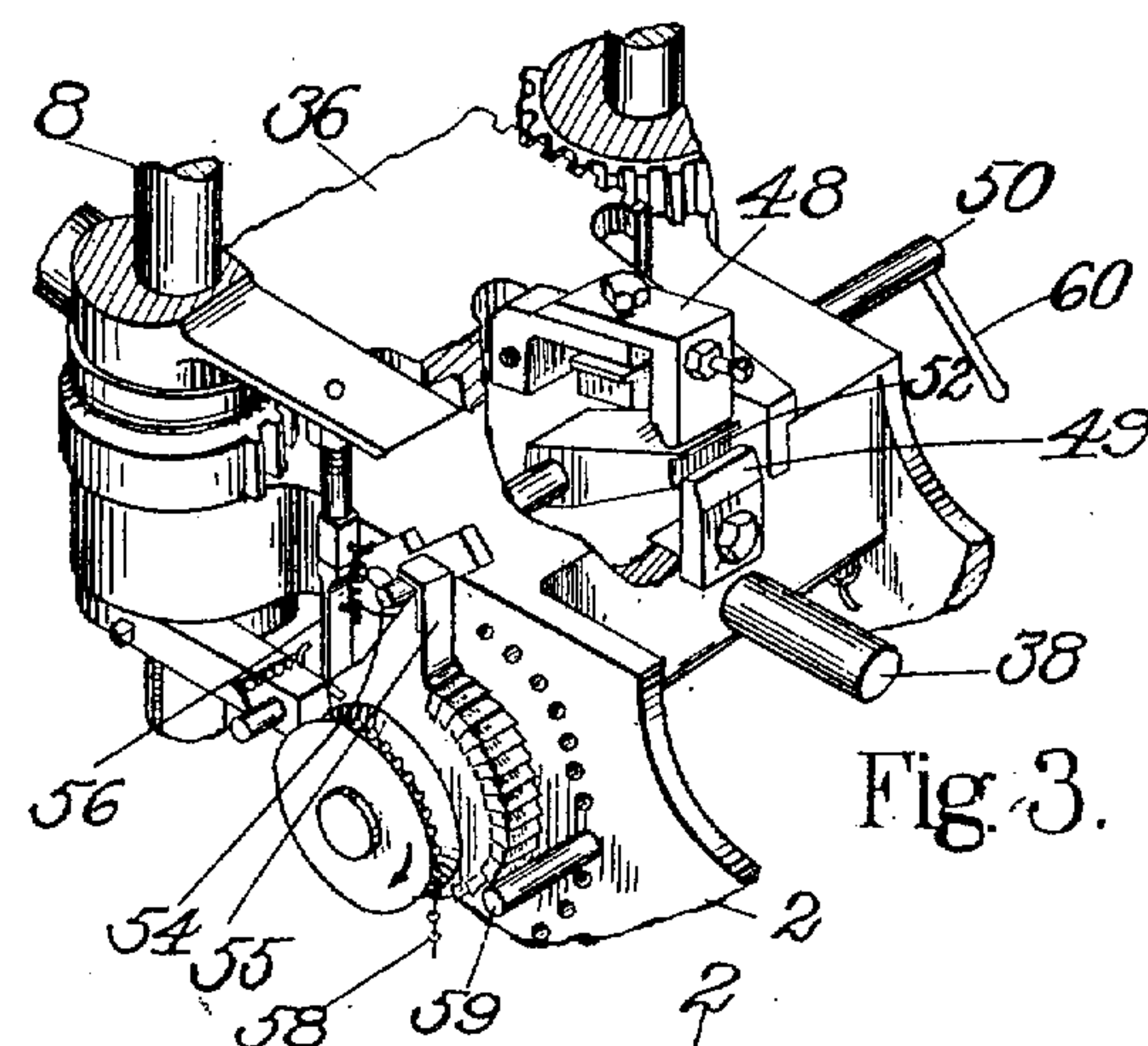


Fig. 3.

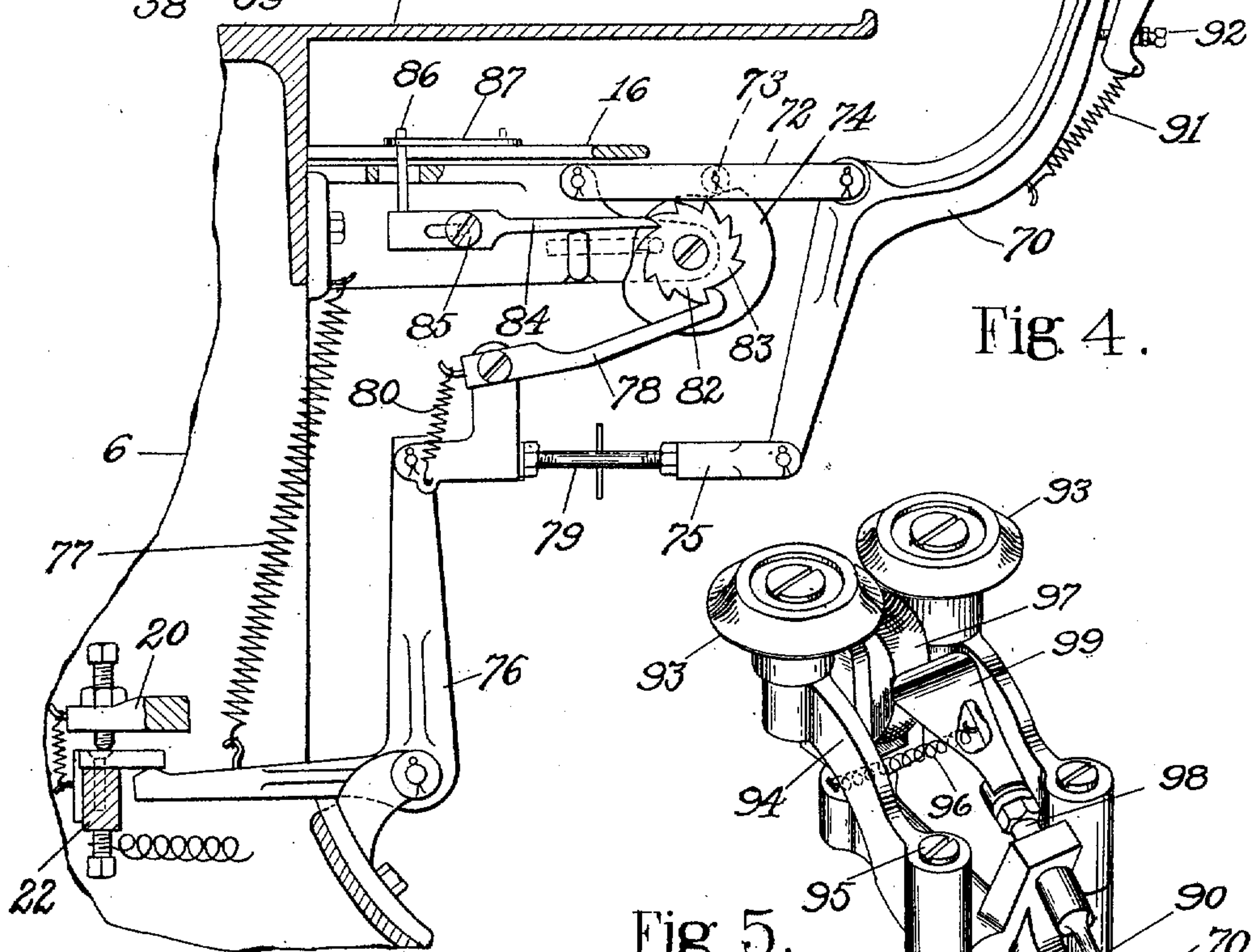


Fig. 4.

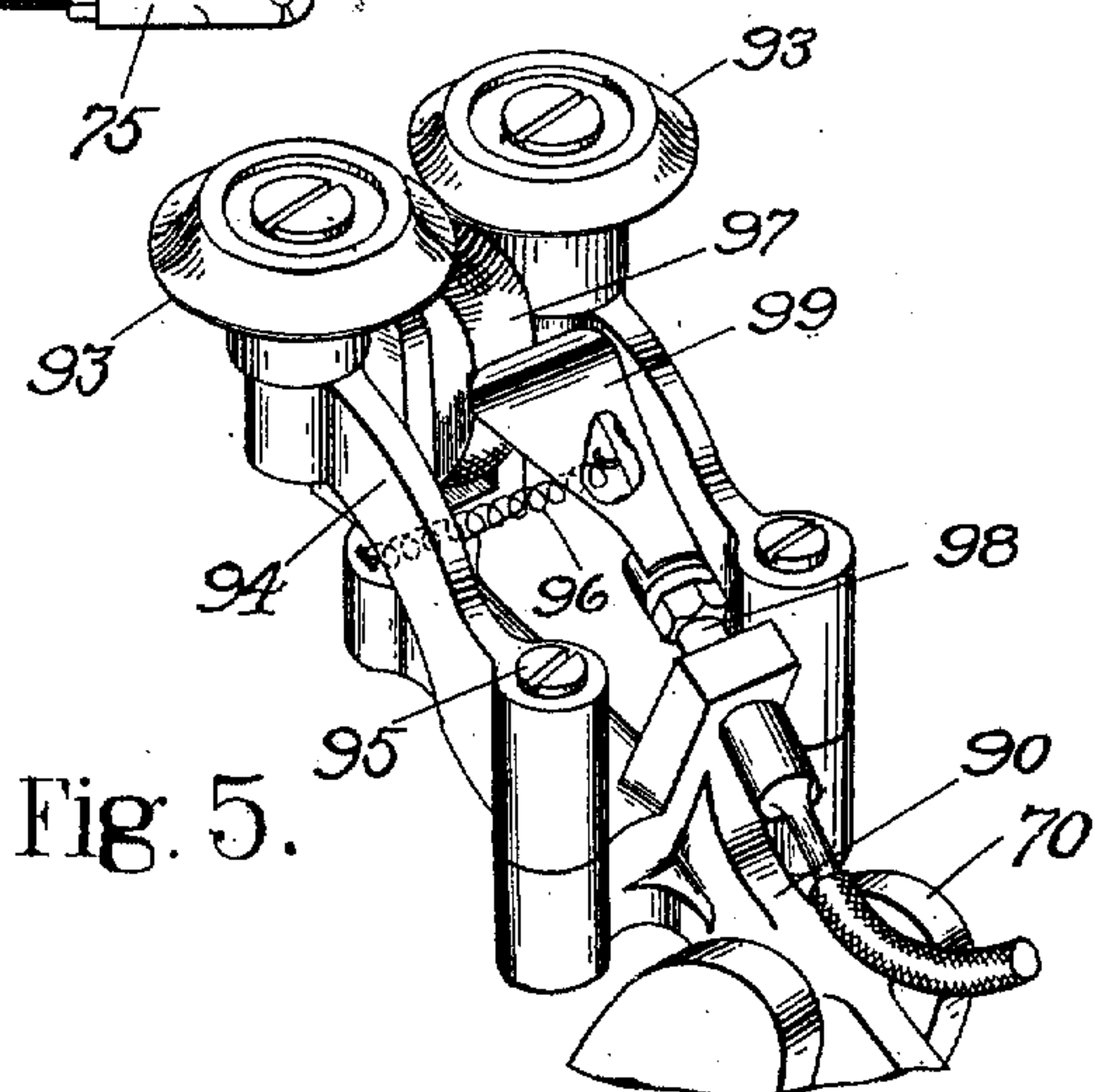


Fig. 5.

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UNITED STATES PATENT OFFICE.

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SHOE-FINISHING MACHINE.

No. 886,604.

Specification of Letters Patent.

Patented May 5, 1908.

Application filed March 21, 1908. Serial No. 422,501.

To all whom it may concern:

Be it known that I, JOHN S. HANSEN, a citizen of the United States, residing at Brockton, in the county of Plymouth and Commonwealth of Massachusetts, have invented certain Improvements in Shoe-Finishing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like reference characters on the drawings indicating like parts in the several figures.

This invention relates to machines for finishing shoes and particularly to machines for treeing or ironing shoes.

The invention is herein shown as an improvement upon the shoe ironing machine shown in a prior application for Letters Patent made by me February 1, 1905, Serial No. 243,690.

An important feature of this invention consists in providing in an organized machine means for treating successively different portions of a shoe. It has heretofore been attempted to tree or to iron all the portions of a shoe at the same time. It appears, however, to be impractical to give simultaneously to the several tools that are required for treating the whole shoe the movements which enable them to cover the shoe without interfering with one another or else leaving parts of the shoe imperfectly finished. In accordance with this feature of the present invention an ironing machine is provided with means for treating the sides and fore part of a shoe at one time and with means for treating the back or rear part of the shoe at another time.

Another feature of the invention consists in providing means for finishing the back of a shoe by tools which reciprocate over the shoe in the direction of its height. This has the great advantage that the tools move lengthwise of the back seam of the shoe, or the back stay with which shoes are generally provided at the present time, instead of across this seam or stay. By so doing the tools rub down the seam and finish the stay without any tendency to open the seam or displace the stay, as is liable to be done by tools moving transversely across the back of the shoe. Preferably rolling tools are employed for finishing the back of the shoe rather than rubbing tools, as the former have less tendency to pull the seam.

A further feature of the invention consists

in the combination of tools arranged to treat the fore part and sides or the vamp of a shoe by moving over the upper lengthwise of the shoe, with other tools arranged to treat the back stay or similarly located rear portion of a shoe by moving over it in the direction of the height of the shoe. These tools or groups of tools preferably engage the shoe at different times so that no interference results from operating them in different directions.

Another feature of the invention consists in the construction and arrangement of the tools for treating the back stay or rear part of the shoe. These tools will be herein referred to as the "back stay" tools for convenience in distinguishing them from the tools which treat the fore part and sides of the shoe. These tools preferably include rolling members arranged to engage the shoe at either side of the middle of the back and are supported to enable them to separate more or less for adapting their position to the varying shape of the different portions of the surface of the shoe and to the shape of differently formed shoes. These tools are herein shown as saucer-shaped disks having work-engaging faces formed on their inclined marginal portions. The tools are mounted to turn on supports which maintain them normally with their adjacent edges substantially together, but permit them to be separated or wedged apart by the work against the tension of the spring. These tools preferably also include a member, shown as a roll arranged between and overlapped by the first-mentioned tools to engage the upper along the middle line when they are spread apart. This roll is yieldingly supported so that engagement of the three members with the work may take place throughout substantially the width of their acting faces and the back stay or similarly located rear part of the shoe be smoothed. These tools, like the tools acting on the fore part of the shoe, are preferably heated when used for finishing leather that is not greasy, and when heated they serve to iron the shoe.

A further feature of the invention consists in novel mechanism for controlling the operation of the back stay tools by moving them into and out of operative relation to the shoe in time relation with other movements of the machine and without requiring special attention from the workman.

These and other features of the invention,

including certain details of construction and combinations of parts, will be fully explained in the following description of the preferred construction embodying the invention and then will be particularly pointed out in the claims.

Figure 1 is a side elevation of the machine. Fig. 2 is a plan view, partly in section. Fig. 3 is a perspective view of a mechanism to be described. Fig. 4 is a side elevation of the back stay ironing mechanism. Fig. 5 is a perspective view of the back stay ironing devices.

The construction embodying the present invention is herein shown as applied to an ironing machine illustrated in my prior application and as cooperating with certain mechanisms of that machine. The complete machine is therefore shown in the general views and will be sufficiently described to make plain the relation of the new mechanism to the entire machine.

The frame 2 of the machine is supported at the front end by a post 4 and at the rear end by a large tubular column 6. The frame has bearings at the front end for the vertically reciprocating shafts 8 which carry the tools for operating upon the vamp of the shoe. The column 6 supports a turret carrying a plurality of trees 10 to which the shoes are applied for presentation to the devices for treating the upper. Each tree-carrying arm of the turret is notched as at 12 for engagement with a latch 14 that locks the turret with each of the trees in a predetermined angular position. The latch is acted upon by a spring 15 to hold it in engagement with the notch 12 and a lever 16 is provided for rocking the latch in the direction to release the turret and permit it to be rotated. One of the trees is stopped by the latch in operative relation to a lever 18, by which the tree is expanded. This lever is actuated by a bell crank 20 pivoted near the base of the column 6 and having its horizontal arm overlying a lever 22 in position to be rocked by it. The driving mechanism comprises a pulley shaft 25 connected by intermediate gears with a crank shaft 26 and a cam shaft 28. The crank shaft is connected by a link 30 with the lever 22. This lever is flexibly connected with a cross head 32 to which are fastened the lower ends of the shafts 8. By this arrangement the shafts are continuously reciprocated upwardly and downwardly for giving to the tools carried by them the movements required for treeing or ironing the shoe. The shafts 8 are arranged to turn from the position shown in Fig. 1, wherein the tools are out of contact with the shoe, to swing the tools laterally toward and into contact with a shoe positioned between them. This turning movement of the shafts for swinging the tools toward and from operative position is effected by the engagement

of pinions 35 carried by the shafts with rack teeth formed on the opposite edges of a rack bar 36, see Fig. 2. This rack bar is fastened to a rod 38 that is movable endwise of the machine, being actuated to the left in Figs. 1 and 2 by the spring 40. The rod and rack bar are reversely actuated for swinging the tools into operative position by the lever 42, which is rocked forwardly and backwardly by the cam 43 and spring 44. The end portion 45 of the rod 38 adjacent to the lever 42 is pivotally connected to the main portion of the rod and is normally held, as shown in Fig. 2, in a position out of alignment with the lever.

A pair of levers 46, 47 is arranged for moving the end piece 45 into alignment with the lever 42 when it is desired to swing the tools into operative relation to the shoe. A catch 48 fastened to the rack bar, as shown in Fig. 3, engages with a catch 49 on the frame to maintain the rack bar and the tools in the position to which they are moved by the lever 42. Provision is made for lifting the catch 48 and thus permitting the movement of the rack bar under the influence of spring 40 to swing the tools away from the shoe after the tools have made a predetermined number of reciprocations over the shoe. To this end a shaft 50 has a projecting arm 52 underlying the catch 48 and a crank 54 on its outer left-hand end, as shown in Fig. 3. This crank stands in the path of an arm 55 on a ratchet having its toothed periphery in the path of a plunger 56 that is carried by one of the shafts 8. A weight or suitable spring, connected to the chain 58, normally moves the ratchet and its arm 55 in the direction of the arrow thereon until the arm rests upon the stop pin 59, which may be positioned in any one of a series of holes in the side of the frame, according to the desired number of the reciprocations of the tools in contact with the shoe. It will be understood that when the tools are swung into their inoperative position the plunger is carried away from the ratchet and that after the tools have been moved into their operative position the plunger turns the ratchet through a predetermined distance for each reciprocation of the tools until the arm 55 has engaged the crank 54 and through the action of the arm 52 has lifted the latch 48, whereupon the shafts 8 and the tools are swung into their inoperative position by the spring 40. The spring or weight attached to the chain 58 then returns the ratchet into its initial relation to the stop pin 59. The shaft 50 has a hand piece 60 by which the latch 48 may be lifted to permit the movement of the tools away from the shoe at the will of the operator.

The mechanism for treating the back stay or similarly located portion of the shoe is arranged in an angular position to treat the

shoe that is between the one being finished by the fore part tools above described and the tree which is in position to be expanded by the lever 18. The back stay treating mechanism is supported on a lever 70 fulcrumed on a bar 72 pivotally connected to the frame of the machine. This bar carries a roll 73 that rests upon a cam 74 which determines the vertical position of the mechanism. The lower end of the lever 70 is connected by the link 75 with a bell crank lever 76, the horizontal arm of which extends into position to be engaged by the vertically reciprocating lever 22 or a plate carried by that lever. A spring 77 holds the bell crank in contact with lever 22 and together with that lever produces an oscillation of lever 70 about its connection with the bar 72. This oscillation of lever 70 carries the back stay treating tools forth and back lengthwise of the back stay between the top and bottom of the shoe, as shown in Fig. 4. The link 75 supports a block on which is mounted a pawl 78 which is held by a spring 80 in position to engage ratchet teeth on a disk 82 fast to a cam 74. The ratchet wheel has one tooth 83 which is longer than the extent of movement imparted to the pawl 78 so that while the pawl is in engagement with tooth 83 it will slide forth and back without turning the ratchet or the cam. This tooth is in position to be engaged by the pawl while the roll 73 rests in the low part of the cam 74 and the back stay treating mechanism is therefore in inoperative relation to the shoe and below the plane in which the trees travel in the movement of the turret. A pawl 84 holds the ratchet against backward movement. This pawl is slidingly supported on the stud 85 and by means of the pin 86 and link 87 is arranged to be moved forwardly by the hand lever 16. This lever, it will be recalled, is the device for moving the latch 14 out of the notch 12 to permit the turning of the turret. The forward movement of the pawl 85 turns the ratchet to carry the long tooth 83 past the pawl 78 and thereafter with each reciprocation of the pawl 78 the cam 74 will be advanced one step and by its engagement with the bar 72 it will raise the back stay treating tools into operative relation to the shoe to be treated by them. The cam 74 raises the tools a definite distance and if it is desired to vary this elevation for different sizes of shoes or to vary the pressure of the tools on the work the link 75, which is extensible, is adjusted by the part 79.

The back stay treating tools are yieldingly supported on the lever 70 by means of a carrier 90 pivotally connected to the upper end of the lever and yieldingly held by the spring 91 in a position determined by the adjusting screw 92. These tools comprise three members, the outer ones, 93, 93, being shaped somewhat like inverted saucers and mounted

to turn upon axes arranged substantially perpendicular with relation to the adjacent surface of the shoe, as shown in Fig. 4. These axes or pivots are carried on the rear ends of arms 94 mounted on studs 95 that project upwardly from the carrier 90. A spring 96 yieldingly draws the tools 93 together, holding them normally with their edges in contact or substantially in contact, as shown in Fig. 5. The third tool, 97, is arranged between the tools 93 and is mounted to turn on an axis substantially parallel with the adjacent surface of the shoe. When the back stay treating tools are to be used upon dry upper stock or upper leather that is not too greasy they will be heated from a gas burner 98 provided with a shaft 99. The construction and arrangement of the back stay treating tools as described is such that when they are lifted by the cam 74 into contact with the shoe the tools 93 are forced apart and exert a lateral spreading action on the back stay or other portion of the shoe engaged by them, and as they are reciprocated forth and back over the stay the movement of their marginal acting surfaces is in the direction to exert an outward smoothing action upon the edge portions of the back stay. The spreading of the tools 93 permits the engagement of the tool 97 with the middle portion of the back stay, or in the treatment of shoes having a single seam at the back this tool 97 engages and smooths this seam while the tools 93 exert a more vigorous smoothing action upon the portions of stock adjacent to the seam.

In the use of the machine, the trees on the turret having been provided with shoes and expanded, the turret is moved to position one shoe opposite the forepart treating tools and another shoe opposite the back stay treating tools. At the same time a third shoe will be brought into position adjacent to the expanding lever 18. In order to effect this movement of the turret the latch 14 is retracted by the hand lever 16, the lever holding the latch out of the notch 12 in the tree while the turret is being rotated. This same movement of the lever 16 which withdraws the latch also shifts the pawl 84 for turning the ratchet to carry the long tooth 83 past the pawl 78. The low part of the cam 74 will preferably be so formed and positioned that the back stay treating tools will not be lifted immediately after the cam is started but time will be allowed to insure that the shoe to be treated will reach operative position before the tools are lifted. At the next oscillation of lever 22 the cam 74 will be turned in the direction to lift the back stay treating tools into operative relation to their shoe. The lever 47 will be shifted for putting the end piece 45 of rod 38 into position for that rod to be actuated and the shaft 8 thereby turned for moving the fore part

treating tools into operative relation to the fore part of the shoe. Thereafter during successive oscillations of the lever 22 the two sets of tools will be moved forth and back over the shoe, the fore part treating tools moving in the direction of the length of the shoe and the back stay treating tools moving in the direction of the length of the back stay. These movements will continue until the fore part treating tools are returned to their inoperative position by the tripping mechanism shown in Fig. 3 and the back stay treating tools are lowered out of operative relation to their shoe by the arrival of the low part of the cam 74 under the roll on the bar 72. The sets of tools will then be positioned out of the path of travel of the trees so that the turret may move for presenting other shoes in position to be treated. It will be observed that the arrangement is such that each shoe is treated successively first by the back stay ironing tools and then by the fore part ironing tools. The back stay ironing tools are caused to become operative by shifting the lever 16, while the fore part ironing tools are caused to become operative by shifting the lever 47. This provision enables one set of tools to be used without the other when that is desired. This is of advantage in starting work with the machine for at that time it is desirable to iron the first shoe with the back stay treating tools before any shoe is put into position to be treated by the fore part ironing tools. Therefore in the first use of the machine the back stay ironing tools only are used. Of course in finishing the last shoe the fore part ironing tools only will be used, the back stay ironing tools remaining idle.

Having explained the nature of this invention and described a preferred construction embodying the same, I claim as new and desire to secure by Letters Patent of the United States:—

1. In a shoe finishing machine, means constructed and arranged to smooth the rear part of a shoe, mechanism for imparting to said means a predetermined number of work smoothing reciprocatory movements in the direction of the height of the shoe, and means for holding the shoe against rotation during the operation of said smoothing means.

2. In a machine of the class described, a plurality of tools relatively arranged for smoothing the back stay or similarly located portion of a shoe, means for reciprocating the tools a predetermined number of times in the direction of the length of the back stay to smooth the back stay, and means for supporting the shoe to present the same portion of the shoe for consecutive operations of said tools.

3. In a machine of the class described, means for supporting a shoe in stationary position, and back stay smoothing means

comprising a tool adapted to engage yieldingly the middle portion of the stay, tools arranged to engage at either side of the middle, and means for actuating the tools lengthwise of the stay.

4. In a machine of the class described, means for supporting a shoe in stationary position, and back stay smoothing means comprising tools arranged to engage the shoe at either side of the middle of the back, and means for actuating said tools lengthwise of the back stay, said means being constructed and arranged to impart to said tools a predetermined number of reciprocations.

5. In a machine of the class described, means for supporting a shoe, and back stay smoothing means comprising tools arranged to engage the shoe at either side of the middle of the back stay, means for yieldingly holding said tools toward each other, and means for actuating them lengthwise of the stay, for a predetermined number of operations.

6. In a machine of the class described, means for supporting a shoe, and back stay smoothing means comprising tools arranged to engage the shoe at either side of the middle of the back stay, means for yieldingly holding said tools toward each other, a tool located therebetween to be uncovered for engagement with the shoe when the side tools are separated, and means for actuating the tools.

7. In a machine of the class described, two saucer-shaped disks arranged edge to edge and having inclined marginal work-engaging faces, and means for actuating said disks to smooth the rear portion of a shoe in the direction of the height of the shoe.

8. In a machine of the class described, two saucer-shaped disks arranged edge to edge and having inclined marginal work-engaging faces, means for supporting said disks to permit rotation thereof, means for yieldingly holding them in proximity to each other, and means for reciprocating their supports to move the disks over the rear part of a shoe from top to bottom.

9. In a machine of the class described, smoothing means comprising two saucer-shaped disks having inclined work-engaging faces, a roll mounted between the disks and approximately perpendicular thereto, means for yieldingly holding said parts toward each other, and means for actuating them.

10. In a machine of the class described, means for supporting a shoe, means for operating upon the shoe, a lock for the shoe support, and manually controlled means operatively connected with the lock for manipulating it and with the means for operating upon the shoe whereby the operating means is automatically set in motion after the lock has been manipulated.

11. In a machine of the class described, a shoe support, smoothing means, a lock for

the support, manually-controlled means operatively connected with the lock and the smoothing means to cause the smoothing means to become operative at a predetermined time after the lock has been manipulated.

12. In a machine of the class described, means adapted to be rendered operative or inoperative for smoothing a shoe, a support for a plurality of shoes arranged for movement to present one shoe or another in position to be smoothed, and a lock for holding the support against movement during the smoothing operation, combined with means for manipulating the lock to permit the support to be moved for withdrawing one shoe and presenting the next in position to be operated upon and for automatically rendering the smoothing means operative after an interval which permits the next shoe to be brought into place.

13. In a shoe finishing machine, a shoe support, a smoothing tool, and automatically operating means for actuating the tool a predetermined number of times longitudinally of the back stay of the shoe in yielding contact therewith, said shoe support being constructed and arranged to hold the shoe stationary during the operation of said tool.

14. A shoe finishing machine having a shoe support, a smoothing tool, and means for imparting a predetermined number of reciprocations to the smoothing tool lengthwise of the back stay of the shoe, said support and tool being held against relative rotative movement.

15. In a shoe finishing machine, a shoe support and smoothing means comprising a plurality of members for engaging the back stay of a shoe, and means for actuating said members lengthwise of the back stay for a predetermined number of operations, said parts being constructed and arranged to cause a lateral rubbing action on the back stay as the members are moved over it.

16. In a machine of the class described, the combination with suitable actuating mechanism of a tool arranged to apply rolling pressure perpendicularly against the stock and other tools arranged to apply rubbing pressure laterally on the stock at either side of the first-mentioned tool.

17. In a machine of the class described, the combination with rotatable saucer-shaped rubbing tools arranged edge to edge of a support for a shoe, and means for reciprocating said tools bodily in the direction of the height of the shoe.

18. In a machine of the class described, the combination with rotatable saucer-shaped tools arranged edge to edge and having work rubbing surfaces on their inclined marginal faces, of a support for a shoe, and means for reciprocating said tools bodily in the direction of the height of the shoe.

19. In a machine of the class described, the combination with rotatable saucer-shaped tools arranged edge to edge and having work rubbing surfaces on their inclined marginal faces, of a carrier for the tools and means for actuating the carrier to move the tools over the work with said rubbing faces in rolling contact with the work.

20. In a machine of the class described, the combination with rotatable disk-shaped rubbing tools arranged edge to edge, of a carrier on which the tools are yieldingly mounted for movement from and toward each other, and means for reciprocating the carrier with the tools.

21. A machine of the class described having a pair of rotatable disk-shaped tools arranged edge to edge with work rubbing faces formed on their marginal surfaces, and means for moving the tools bodily over the shoe and thereby effecting a rotating movement in opposite directions of the work rubbing faces of adjacent portions of the tools.

22. A machine of the class described, having tools for treating the fore part of a shoe, tools for treating the back stay of the shoe, and actuating mechanism with which said tools are connected, said machine having provision whereby either or both of said tools may be caused to operate at a given time.

23. A shoe finishing machine having a shoe support, a pair of rotary smoothing tools having adjacent work rubbing faces inclined toward each other to adapt them to engage opposite sides of the back of a shoe, and means for reciprocating the smoothing tools lengthwise of the back of the shoe.

24. A shoe finishing machine having a shoe support, a pair of rotary smoothing tools having adjacent work rubbing faces inclined toward each other to adapt them to, engage opposite sides of the back of a shoe a carrier for the tools, means for reciprocating the smoothing tools lengthwise of the back stay of the shoe, means for yieldingly pressing the support and carrier together, and means for yieldingly holding the tools with their adjacent work rubbing faces in close proximity.

25. In a shoe finishing machine, a shoe support, and back stay smoothing means, comprising a roll arranged on an axis substantially parallel with the surface engaged by the roll, rotary tools at opposite sides of the roll and arranged on axes at an angle to that of the roll to adapt them to engage the edge portions of the stay, and means for moving said tools bodily with relation to the shoe.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

JOHN S. HANSEN.

Witnesses:

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FRANCIS HANNIGAN.