G. F. STEWART.

BOOT AND SHOE CHANNELING MACHINE.

APPLICATION FILED AUG. 7, 1908. RENEWED NOV. 22, 1909.

958,027. Patented May 17, 1910.

3 SHEETS—SHEET 1.

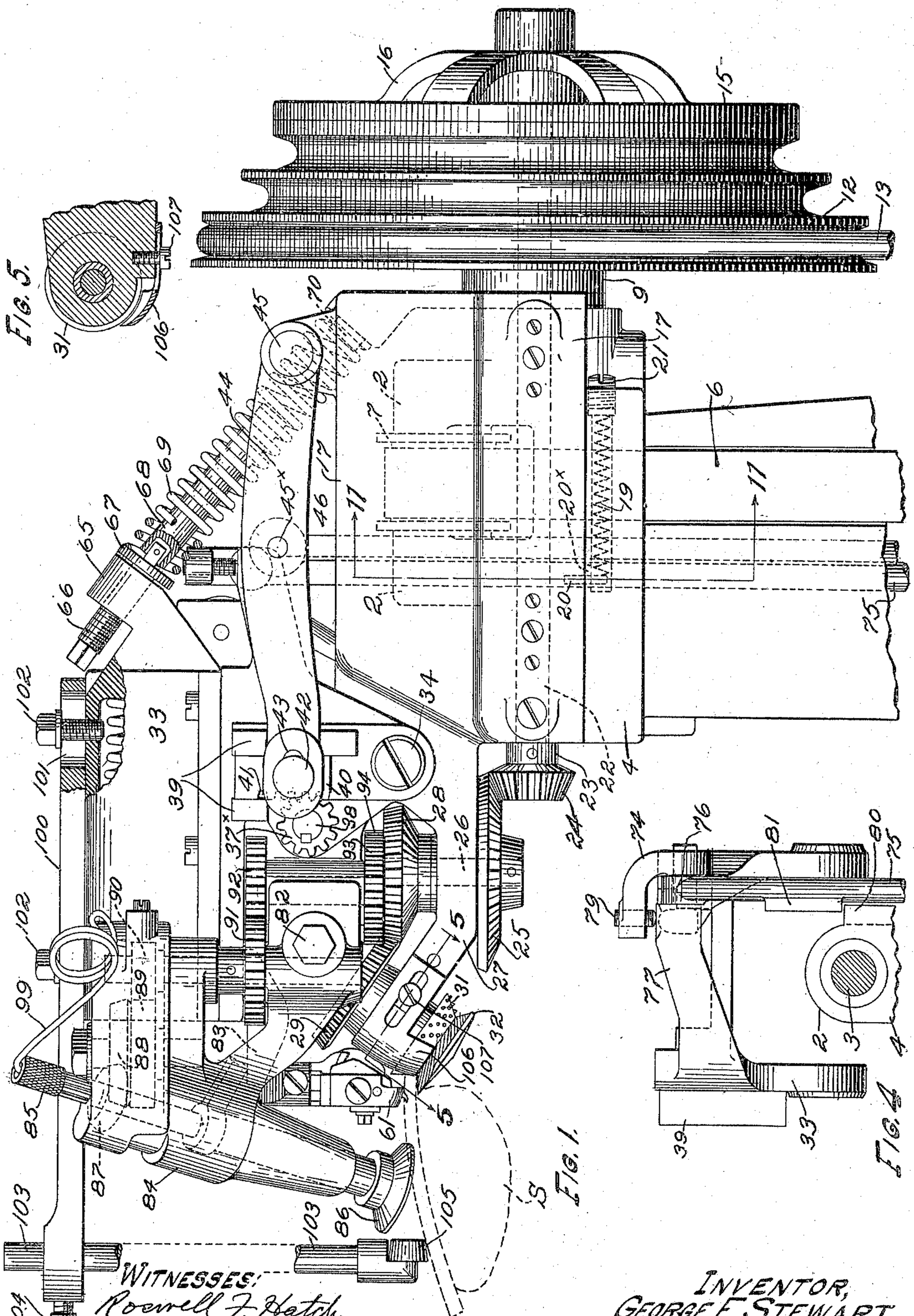

Fig. 5.

Fig. 1.

Fig. 4.

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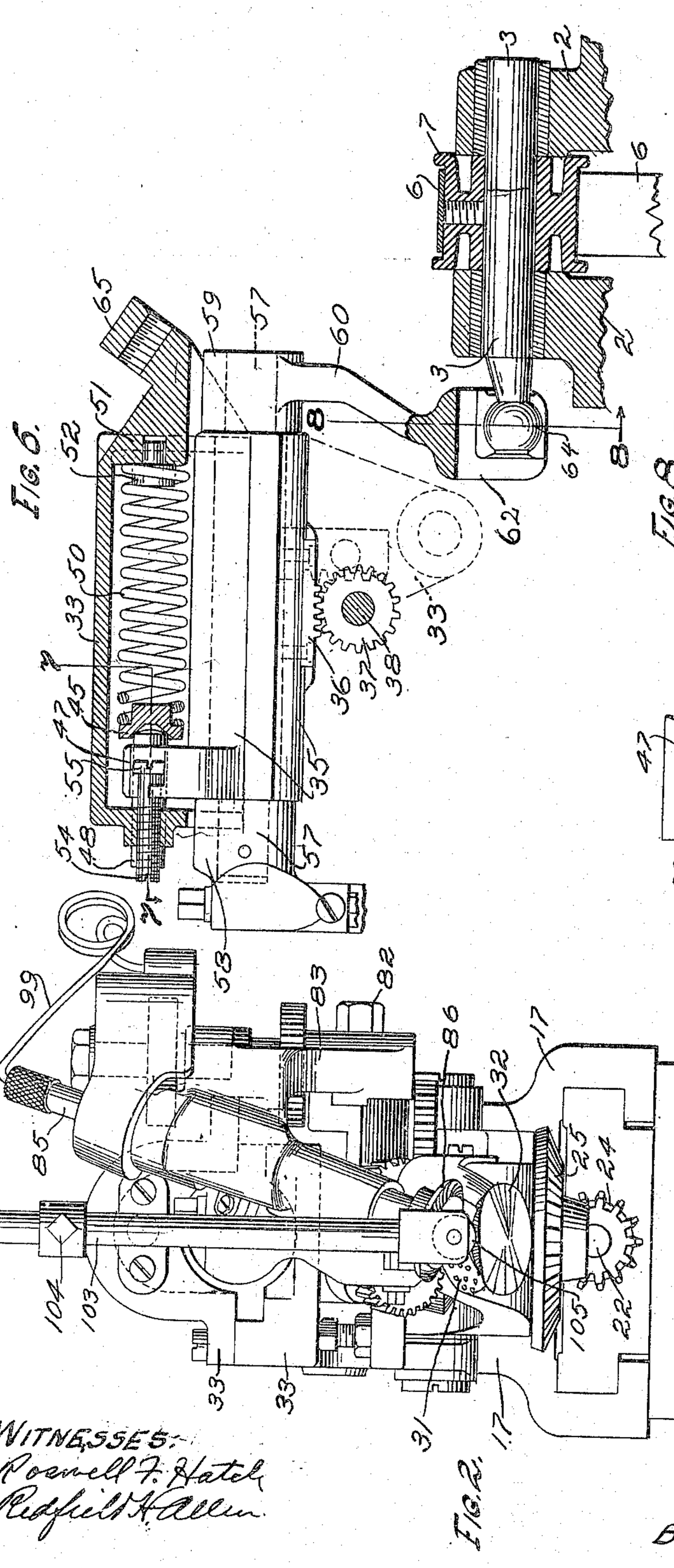

FIG. 6.

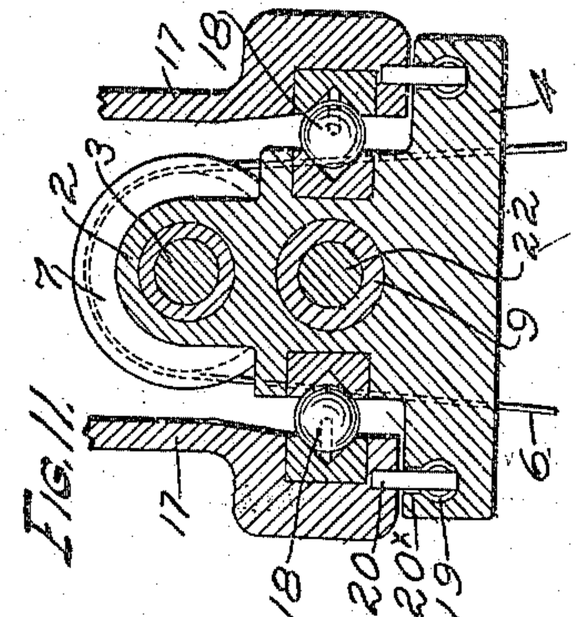

FIG. 11.

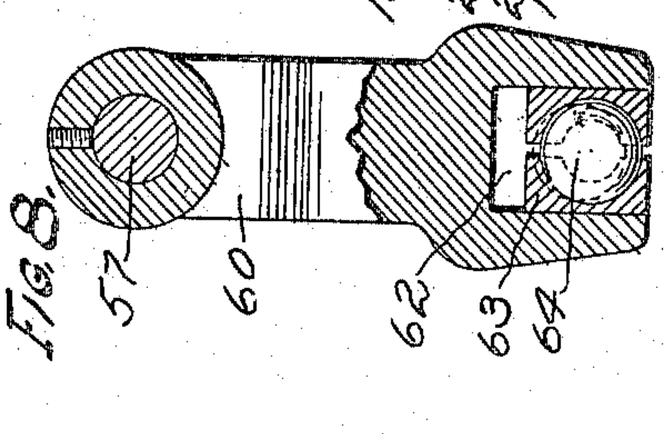

FIG. 8.

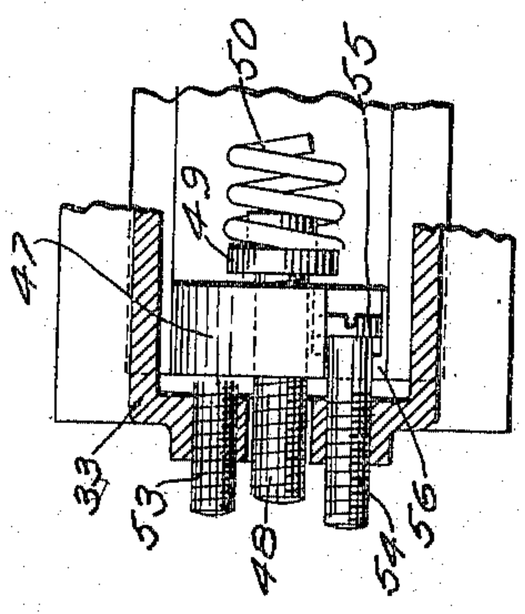

FIG. 7.

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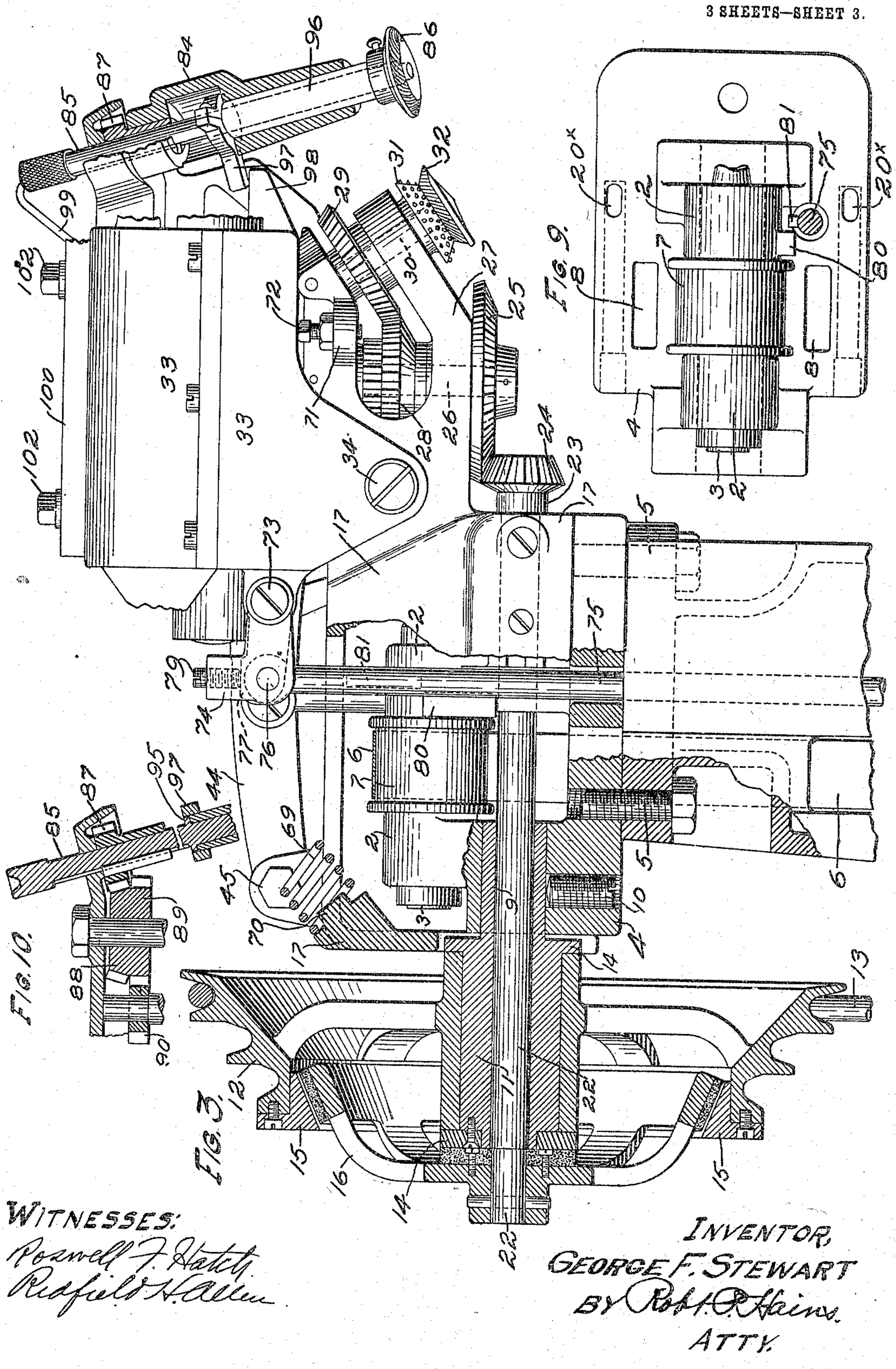

FIG. 9.

FIG. 10.

FIG. 3.

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UNITED STATES PATENT OFFICE.

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BOOT AND SHOE CHANNELING MACHINE.

958,027. Specification of Letters Patent. **Patented May 17, 1910.**

Application filed August 7, 1908, Serial No. 447,376. Renewed November 22, 1909. Serial No. 529,311.

To all whom it may concern:

Be it known that I, GEORGE F. STEWART, a citizen of the United States, residing at Swampscott, in the county of Essex and State of Massachusetts, have invented an Improvement in Boot and Shoe Channeling Machines, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

The invention to be hereinafter described relates to machines for channeling the soles of boots and shoes, commonly known as "channeling machines," and more particularly to such machines as act upon the sole to produce a channel therein after the sole and upper have been assembled. As well known by those skilled in the art such channel, whether formed by an incision and the production of a channel flap, or by a depression or groove in the sole, is intended to receive the stitches which unite the sole to the upper portion or welt, and since around the sole, forward of the shank, it is desirable to have the stitches symmetrical with the channel or depression and sole edge, and generally closely adjacent thereto, it becomes of importance that the channel or depression, in which the stitches are laid, be properly disposed not only with relation to the edge but also in inclination with respect to the sole surface. Around the shank, however, the line of stitches and perforce the channel depression are preferably carried well back from the edge.

The present invention aims to improve this class of machines to the end that more accurate and satisfactory operations shall be secured and the resultant product be improved, all as will be explained at large and clearly understood from the following specification and drawings disclosing one form or embodiment of the invention, which in its true scope will be definitely pointed out in the claims.

In the drawings: Figure 1 is a side elevation of the machine embodying the essentials of the present invention, the lower portion of the frame or supporting standard being omitted, and a portion of the head being broken away to show the devices beyond; Fig. 2 is a front view of the machine with the lower portion of the frame or supporting standard omitted; Fig. 3 is a side view of the machine opposite that of Fig. 1, parts being broken away to show other parts beyond; Fig. 4 is a detached detail showing the means for locking the supporting head from sliding movement when the tool is raised from its operative position; Fig. 5 is a detached sectional detail view of the guard for the work feeding wheel taken on the line 5—5, Fig. 1; Fig. 6 is a side and part sectional view of the tool carrier and its actuating means detached; Fig. 7 is a detail sectional view on line 7—7 of Fig. 6; Fig. 8 is a like detail on the line 8—8, Fig. 6; Fig. 9 is a plan view of the fixed head for the tool actuating shaft with the main supporting head removed, showing the treadle rod for tilting the movable head in section and the locking device to prevent sliding movement of the main supporting head when the movable head is raised or tilted; Fig. 10 is a sectional detail showing the general arrangement of gearing for driving the bearing wheel; and Fig. 11 is a section on line 11—11, Fig. 1, showing the fixed and main supporting or sliding head and the ball bearings between.

The supporting standard 1 may be of any usual or desired construction and has fixed rigidly to the upper portion thereof the supports or bearings 2, 2, for the tool actuating shaft 3, Fig. 6; said bearings 2, 2, being preferably formed as part of a fixed head 4, Figs. 1, 3, 9 and 11, secured to the top of the supporting standard 1, by suitable means, as by the screw bolts 5, 5, Fig. 3. The tool actuating shaft 3 is driven continuously by means of a belt 6 passing over a pulley 7 on said shaft and driven from suitable means preferably at the lower portion of the supporting standard 1, the two runs of said belt passing from the pulley 7 downward through the slots 8, 8, Fig. 9, formed in the fixed head 4.

Extending rearward from the fixed head 4, Figs. 1 and 3, is a hollow bearing or sleeve 9 secured rigidly to said fixed head 4 in any desired manner, as by the clamp screw 10, Fig. 3, extending upward through the rear web of the fixed head and having its end seated against said bearing or sleeve 9. The bearing or sleeve 9 projects to the rear of the fixed head and is formed with a bearing 11, Fig. 3, for a pulley 12, continuously driven by a belt 13 from a suitable source of power, said sleeve 9 being provided with collars 14, or other means, to confine the

loose pulley 12 to its bearing, as will be clear from Fig. 3. To the pulley 12 is connected a friction ring 15 constituting one member of a clutch, the other member whereof is formed by the part 16, secured to the shaft 22, mounted and operating in a manner to be presently described.

Mounted on the supporting frame and, in the construction shown, arranged to slide a short distance with respect thereto, toward and from the front of the machine, is the main supporting head 17, Figs. 1, 2, 3 and 11, carrying directly or indirectly the main features of the channeling devices. This supporting head 17 is preferably formed as a casing, Figs. 1 and 11, embracing the fixed head 4 and slidably connected thereto at its lower portion, as by the ball bearings 18, Fig. 11, which not only serve as anti-friction sliding connections for the main supporting head 17, but prevent it from being lifted or unseated, as will be obvious. The main supporting head is normally pressed forward or toward the front of the machine by suitable means, as by a spring 19, Fig. 1, carried by the fixed head 4 and engaging a projection 20 on the main supporting head which extends into a slot $20^{\times}$ in said head 4, Figs. 1 and 9, the active tension of the spring being adjustable by a screw 21.

Mounted in the main supporting head and adapted to slide back and forth therewith, as by means of the collar 23, is the driving shaft 22, having a clutch member 16, Fig. 3, secured thereto. In the construction shown this shaft 22 passes through the fixed head 4 and the fixed sleeve 9 which affords a bearing therefor and with relation to which it may freely slide longitudinally as the head 17 is moved.

From the construction thus far described it will be noted that while the tool actuating shaft 3 is mounted on the fixed head and is rotated continuously through the belt 6 or other driving means, and the pulley 12 is continuously driven by its belt, the main supporting head 17 is normally maintained pressed toward the front of the machine by the spring 19 and, consequently, the clutch member 16 is normally maintained out of engagement with its co-acting clutch member 12, with the result that shaft 22 remains at rest. If, however, the main supporting head be pushed to the rear slightly against the tension of spring 19, Fig. 1, the clutch member 16 will engage the clutch member 12 and the driving shaft 22 will be rotated for the purpose hereinafter described.

Secured to the driving shaft 22 is a bevel gear 24 engaging a bevel gear 25 secured to a shaft 26 (see dotted lines Figs. 1 and 3) mounted in a bracket 27 extending from the main supporting head 17. The shaft 26 also carries a bevel gear 28 which engages a bevel gear 29 carried by the work feeding and supporting shaft 30 (see dotted lines Fig. 1). The shaft 30 carries the work feeding and supporting wheel shown as having the beveled portions 31 and 32, and as this shaft is inclined, as shown, the work supporting portion 32 of the wheel serves to sustain the work, and feed the work in conjunction with the portion 31, which is preferably provided with pin points or similar means to engage the edge of the work S, all as indicated in Fig. 1. Thus when the main supporting head 17 is in normal or forward position and the clutch members consequently disengaged, the work supporting and feeding means is inactive, but when the work is pressed against the said means and the head is thereby forced to the rear, the clutch members become engaged and the said means becomes active to feed the work, the rate of feed being obviously dependent upon the degree of pressure of the work upon the supporting and feeding wheel upon which the degree of engagement of the clutch members depends.

The channeling or grooving tool in the illustrated form of the invention is mounted for vibratory movement in the line of work feed and is normally maintained in operative position with respect to the work supporting and feeding wheel. It is desirable at times that the tool be moved from this position to permit the work to be properly engaged with the work supporting and feeding wheel, after which it should be again moved into its operative position.

As well known by those skilled in the art, the channeling or grooving operation is usually commenced at a point on the sole adjacent to or back of the heel breast, and obviously, if the work supporting and feeding wheel were operative during the time the tool is out of its operating position, the work would be at once fed forward while the tool would be inactive with respect thereto, so that when the tool was again brought into its active position, it would commence the channeling or grooving operation at a point forward of that which marks its correct commencing position. The present invention contemplates means for obviating this action.

Mounted on the main supporting head 17, so as to have movement relative thereto, is the part 33, Figs. 3 and 4, which, for identification, will be referred to as the movable head. In the present form of invention this movable head 33 is pivoted to the main supporting head at 34 and carries the channeling or grooving tool, said head being capable of oscillating around its supporting pivots by suitable means, all of which will be now described. Mounted in the movable head 33 is the tool carrier comprising a slide 35 having a series of rack teeth 36 which engage a pinion 37 mounted upon a stud

shaft 38 mounted in a movable head. Movable in guides 39, Fig. 1, on the movable head 33 is a slide 40 provided with rack teeth 41 and having a stud 42 engaged by the slotted end 43 of a tool controlling lever 44, Fig. 1, pivoted to the main supporting head at 45, the said rack teeth of the slide 40 engaging the pinion 37* secured to the stud shaft 38. The tool controlling lever 44 is pivoted at 45*, Fig. 1, to a treadle rod 46 depending through a slot in the main supporting head whereby said controlling lever may be actuated from a suitable treadle to move the tool carrier, as will be readily understood.

Projecting upward from the tool carrier 35 is a lug 47 carrying an adjusting screw 48, the inner end of which is provided with an enlarged head 49 which affords a seat for the end of a spring 50, the opposite end of said spring bearing against a portion 51 formed as part of the movable head, said spring being preferably held to its bearing by a pin 52, Fig. 6. By adjustment of the screw 48, it will be readily seen that the tension of the spring 50 may be regulated at will, the action of the said spring being to normally force the tool carrier to the left, Fig. 6. Screw-threaded in the end of the movable head and bearing against the projection 47 of the tool carrier is an adjusting screw 53 which adjustably limits the forward movement of the tool carrier under the actuation of the spring 50, Fig. 7. Screw-threaded into the movable head is another screw 54, the head 55 of which, Fig. 7, engages a countersunk recess in the projection 47, said head being adapted to contact with the shoulder 56 of said countersunk portion to limit movement of the tool carrier to the right, Fig. 6, in opposition to the tension of the spring 50, such movement being derived from the tool controlling lever 44 which by depression of the treadle rod 46 moves the slide 40 thereby turning the pinion 37 and through it the tool carrier.

Mounted to oscillate in the tool carrier 35 is the tool carrier shaft 57 to one end of which is secured the tool support 58 and to the opposite end of which is secured a hub 59 of the tool vibrator arm 60, the said carrier 35 being confined between said parts 58 and 59. Adjustably secured to the tool support 58 is the part 61, Fig. 1, which in the illustrated form of the invention is shown as a channel cutting knife, although it will be obvious that any other form of tool might be employed. The lower portion of the vibratory arm 60 is provided, see Figs. 6 and 8, with a bifurcated end 62 which embraces a block 63 carried by the eccentrically mounted end 64 of the tool actuating shaft 3, said eccentricity being clearly shown in Fig. 8.

From the construction thus far described, it will be apparent that the spring 50 normally holds the tool carrier and tool in their forward position and that the tool actuating shaft 3 by its continuous rotation gives vibratory movement to said tool regardless of whether it be in its forward or more or less retracted position, the latter position being assumed under the control of the tool controlling lever 44 in order to vary the position of the channel or groove with respect to the edge of the sole.

Projecting upwardly and rearwardly from the movable head 33 is an arm 65 provided with the adjusting screw 66, whose head 67 has connected thereto a guide pin 68 contained within a spring 69, whose upper end seats itself upon the enlarged head 67 of the screw 66 and whose lower end rests upon a seat 70, Fig. 3, projecting from the main supporting head 17. Projecting from the main supporting head 17, Fig. 3, and disposed on the opposite side of the pivotal supports 34 of the movable head from the spring 69 is the bracket 71 having a stop screw 72 which limits the downward swinging movement of the movable head under the influence of the spring 69.

Pivotally connected to the movable head at 73 is a bell crank or angled lever 74 to which is connected the treadle rod 75 at 76, Figs. 1, 3 and 4, and extending rearward from the movable head is an arm 77, Fig. 4, and dotted lines, Fig. 3, a portion whereof is disposed below an adjusting screw 79 carried in the arm of the bell crank or angled lever 74 as more clearly shown in Figs. 3 and 4. By the construction indicated it will be obvious that the movable head 33 may be readily tilted upon its supports to carry the tool from its operative position to its inoperative position.

As hereinbefore mentioned, the channeling or grooving tool is continuously actuated from its actuating shaft 3 through the belt 6 and when in its inoperative position it is desirable that the feeding action of the work feeding means may be interrupted so that when the knife is brought into contact with the work or into its operative position, it may find the work properly adjusted for location of the channel or groove end. In other words, should the work be positioned on the work supporting and feeding wheel and pressed thereagainst so as to move the main supporting head rearwardly and engage the clutch members, while the tool is in its raised or inoperative position, the work would be moved so that when the tool was brought into action, it would commence its channeling or grooving operation at a point too far in advance of its proper position. Means are therefore provided to lock the work supporting and feeding wheel against connection with its actuating means during the time that the tool is in its inoper-

ative position, one form of such means being illustrated in the accompanying drawings.

Having reference more particularly to Figs. 4 and 9, the fixed head 4 is provided with a projection 80, and the treadle rod 75, by which the movable head is moved or tilted is provided with a coöperating projection 81 adapted to move into position to engage the projection 80 when the treadle rod 75 is depressed. From this construction it will be apparent that when the movable head 33 is moved about its supports 34 by the treadle rod 75, as hereinbefore described, the projection 81 on the treadle rod will be placed in a position to contact with the projection 80 on the fixed head 4 and thereby prevent rearward movement of the main supporting head should the work be pressed against the work supporting and feeding wheel when the tool is in its inoperative position, and thus prevent engagement of the clutch members 15 and 16 and consequent operation of the work feeding and supporting means.

Obviously, the locking means for preventing operation of the work supporting and feeding means while the tool is in its inoperative position may be varied, the essentials being that the work feeding means shall be rendered ineffectual until such time as the tool is brought into operative position. By this means, as will be clearly understood by those skilled in the art, it is obvious that the work may be accurately positioned on the work supporting and feeding wheel without liability of its being fed thereby, and that the tool may be brought into accurate position for commencing the channeling or grooving operation.

The work which is to be treated by a machine obviously may vary in thickness, in consequence of which the tool when moved into operative position will meet the work sooner when it is thick or heavy than when it is relatively thinner, and for this reason it is desirable, in the particular form of locking means hereinbefore described, that the locking action of said locking means may be adjusted or varied. This adjustment for variation in the locking action of the locking means by depression of the treadle 75 is secured by the adjusting screw 79 which by adjustment up or down will vary the position of the locking members 80 and 81 and, consequently, the time at which they will be brought into co-acting relation by movement of the treadle rod. Secured to the main supporting frame by the suitable bolt 82, Fig. 1, is a bracket 83 having a supporting "sleeve" portion 84 for the shaft 85 of the bearing wheel 86, said bearing wheel 86 having its face diagonally disposed to contact with the surface of the work as indicated in Fig. 2. By this diagonal arrangement of the working face of the bearing wheel, it will be apparent that its work contacting portion will tend to move the work toward and in line with the feed. Splined to the inclined shaft 85 of the bearing wheel is a gear 87, Figs. 1, 2 and 10, which is driven from the shaft 26 through a train of gearing 88, 89, 90, 91, 92, 93 and 94, so that as the work supporting and feeding wheel is driven, as hereinbefore described, the bearing wheel likewise receives positive rotation and serves to maintain the work pressed toward the work supporting and feeding wheel.

In order that the work may be properly placed upon the work supporting and feeding wheel, it is desirable that the bearing wheel 86 be raised from its work engaging position and thereafter be lowered in a manner similar to that of the channeling tool. To this end, the shaft of the bearing wheel has a collar 95 which engages interiorly a sleeve 96 having clamped thereto a toe 97, said toe projecting through a slot of the sleeve portion 84 and into the path of a lifting finger 98 projecting from the head 33. From this construction it will be apparent that as the head 33 is moved or tilted the lifting finger 98 will engage the toe 97 and raise the bearing wheel at the same time that the knife or channeling tool is raised, so that the work may be freely placed in position. When the movable head 33 is moved to carry the knife into its operating position, the bearing wheel will be simultaneously lowered into contact with the work by means of a spring 99 secured to the bracket 83 and bearing upon the top of the bearing wheel shaft 85, Figs. 1 and 3. Obviously, various means may be employed for lifting the bearing wheel in the manner described and for the purposes stated.

It is desirable that the inclination of the channel formed by the channeling tool be maintained substantially constant with reference to the surface of the work throughout the forepart of the sole, and that at the shank portion such inclination of the channel may be varied so as to throw the line of stitches which are to pass through the work in the line of the channel well back from the edge of the work. To this end the present invention contemplates means for controlling the incline of the channel around the forepart of the sole, such means in the form of invention illustrated comprising a support 100, having an adjustable connection with the movable head 33 as by means of slots 101, Fig. 1, and screw bolts 102, whereby such support 100 may be adjusted. Passing through the outer portion of the support 100 is an arm 103 adjustably secured thereto by a screw bolt 104, said arm 103 carrying at its lower end a roller 105 adapted to bear upon the surface of the boot or shoe sole at a point beyond the channeling tool, as will be

evident from Fig. 1. This device, which may be identified as the channel incline controller, is thus adjustable with relation to the tool and work supporting and feeding means, so that it may be brought to bear upon the surface of the sole at the forepart and thereby define or control the inclination of the work with respect to the channeling knife with which it co-acts. Such adjustment of the channel incline controller may be made as to permit the controller to free its contact with the work when the shank portion thereof is reached, so that the work around the shank portion may be given greater inclination if desired.

From the construction thus far described, it will be apparent that the work supporting and feeding means will be maintained inactive while the channeling tool, the bearing wheel, and the channel incline controller are in their inoperative positions, and that after the work has been properly positioned upon the work supporting and feeding wheel, the said tool, bearing wheel and channel incline controller may be moved to their active or operative positions and the work feeding and supporting means be then automatically freed for action.

During the operation of the machine, if the work should be improperly positioned, horizontally with respect to the work supporting and feeding wheel, as, for instance, if the work should be moved horizontally or laterally to cause the sole to meet the work supporting and feeding wheel at a point along its side forward of the channeling tool, the said work would be moved outwardly so as to cause the channeling tool to approach the edge or in some cases to run from the sole entirely. To obviate this objectionable action, there is provided on the feeding side of the work supporting and feeding wheel a guard 106, which is secured to the arm 27 of the main supporting head by a screwed and slotted connection 107, the guard 106 preferably extending some distance over and covering the pins or other projections on the forward or advancing side of the work supporting and feeding wheel, as indicated in Figs. 1 and 5, so that if the work should be laterally deflected, its edge would contact with the guard and its forward or feeding movement be thereby interrupted.

The details and mechanical devices illustrated comprise a good practical form of the invention, but it is to be understood that these may be varied in form, disposition, and arrangement and still be within the invention as pointed out in the claims.

Claims:

1. In a channeling machine, the combination of a supporting head, work feeding means carried thereby, a movable head mounted on the supporting head and carrying a channeling tool, means for moving the movable head to carry the tool into and out of operative position with respect to the work engaged by the feeding means, and means to render the work feeding means inoperative while the tool is out of operative position.

2. In a channeling machine, the combination of a supporting head, work feeding means carried thereby and rendered operative by pressure of the work against said work feeding means, a channeling tool movable into and out of coöperating relation with the feeding means, and means to render said feeding means ineffectual while the channeling tool is out of coöperating relation therewith.

3. In a channeling machine, the combination of a supporting head, working devices carried thereby, driving means for said working devices, means for relatively moving the working devices to permit the work to be placed in the machine and to then relatively move them to work engaging position, and means for locking one of the working devices in inoperative condition while the said devices are in position to permit the work to be placed in the machine.

4. In a channeling machine, the combination of a supporting head, feeding and working devices carried thereby, operating means for said devices when in relative position for acting on the work, means for relatively moving said devices to permit the work to be placed in the machine and for relatively moving them to work engaging position, and means for rendering one of said operative means ineffectual when said devices are in position to permit the work to be placed in the machine.

5. In a channeling machine, the combination of a movable head, feeding means for the work and a channeling tool, one of which parts is movable with said head, means for moving the head to separate the feeding means and channeling tool and permit the work to be placed in position and for then moving them into coöperative relation with the work, and means to render one of said parts inoperative until they are brought into such coöperative relation.

6. In a channeling machine, the combination of a supporting head, a movable head movable with respect to the supporting head, work feeding means and a channeling tool one of which is carried by the supporting head and the other of which is carried by the movable head, means for moving the movable head to place the feeding means and channeling tool out of and into coöperating relation with respect to the work, and means to render the work feeding means inoperative while the said feeding means and tool are out of coöperative relation.

7. In a machine of the character described, the combination of a frame, a supporting

head mounted thereon, work feeding means rendered operative by pressure of the work against the same, a tool for acting upon the work, means for moving the tool toward and from the work engaged by the feeding means, and means for rendering the work feeding means inoperative while the tool is moved out of coöperating relation with the work.

8. In a machine of the character described, the combination of a supporting column, a supporting head movable on said column, work feeding means carried by said head, driving means comprising coöperating parts one held by the column and the other by and movable with said head, a working tool, means for moving it into and out of operative relation with the work, and means for locking the head against movement and the members of the driving means out of effective engagement while the tool is out of operative relation with the work.

9. In a channeling machine, the combination of a supporting head, means for feeding the work, operating mechanism for said work feeding means, a channeling tool movable into and out of coöperating position with relation to the work engaged by the feeding means, means for continuously vibrating said tool in the direction of the channel or groove to be formed, and means for interrupting the operation of the work feeding means when the vibrating tool is out of coöperating position with respect to the work.

10. In a channeling machine, the combination of a supporting head, work feeding means mounted thereon, a tool carrying member pivotally connected to said head, means for moving the tool carrying member about its pivot to move the tool into and out of operative relation with the work, and a lock actuated by said means when the tool is moved out of operative position with respect to the work to prevent operation of the work feeding means.

11. In a channeling machine, the combination of work feeding means, a tool for acting upon the sole of a boot or shoe, an inclined rotary bearing wheel constructed and arranged to engage the work and tending to move it in and at an angle to the line of feed, and means to raise the tool and bearing wheel out of operative position.

12. In a channeling machine, a feeding and supporting wheel for the work, a channel forming tool, a bearing wheel for engaging the surface of a shoe sole, said bearing wheel having its face disposed oblique to the work and acting to move the work toward the feeding and supporting wheel, and means for moving the channel forming tool and bearing wheel to permit the work to be placed in position.

13. In a machine for operating on the soles of boots and shoes, the combination of work supporting and feeding means, a tool, and means to control the angle at which said tool engages the sole, said machine having provision whereby said controlling means becomes automatically operative when said tool is operating upon one portion of the sole and automatically inoperative when said tool is operating upon another portion of the sole.

14. In a machine of the class described, the combination of a supporting head, work supporting and feeding means, a channeling tool to form a channel or groove in the sole of a boot or shoe as it is presented sole uppermost to said machine, and a channel incline controller constructed and arranged to bear upon the sole of the shoe to determine the inclination of the sole with respect to the plane of action of the channeling tool when said tool is operating on one portion of the sole and to become automatically inoperative when said tool is operating on another portion of the sole.

15. In a machine for acting upon the soles of boots and shoes, the combination of work supporting and feeding means, a tool to act upon the sole of a boot or shoe as it is presented sole uppermost to said machine, a work incline controller to bear upon the sole of the shoe to determine the inclination of the sole with respect to the plane of action of the tool while the tool is acting on one part of the sole and to become ineffectual while the tool is acting on another part, and means for moving said controller out of operative position to permit the shoe to be readily placed in the machine.

16. In a channeling machine, the combination of a supporting head, work supporting and feeding means, a channeling knife to cut a channel in a boot or shoe sole as it is presented to said machine, a channel incline controller to bear upon the sole of the boot or shoe to determine the inclination of the sole with respect to the cutting plane of the knife while the channeling knife is acting on one part of the sole and to become automatically ineffectual in channeling another part, a movable support for said controller and channeling knife, and means to move the support to carry the knife and controller out of the path of the work as it is placed in the machine.

17. In a channeling machine for boots and shoes, the combination of a supporting head, work supporting and feeding means, a channeling knife to cut a channel in a sole as it is presented thereto, and a channel incline controller constructed and arranged to bear upon the sole at the forepart and to pass automatically from contact with the sole at the shank to enable a uniform incline of channel to be cut at the forepart and a different incline at the shank.

18. In a channeling machine for boots and shoes, the combination of a supporting head, work supporting and feeding means, a channeling knife to cut a channel in a sole as it is presented thereto, a channel incline controller constructed and arranged to bear upon the sole at the forepart and to pass automatically from contact with the sole at the shank to enable a uniform incline of channel to be cut at the forepart and a different incline at the shank, a support common to the channeling knife and controller, and means for relatively adjusting the knife and controller on the support to determine the angle of channel incline.

19. In a channeling machine, the combination of a supporting head, work positioning means arranged to engage the edge of a sole, a channeling knife to cut a channel in a sole as it is presented thereto, and a channel incline controller mounted on said head to bear upon the sole at a distance from said work positioning means less than the width of the forepart of the sole but greater than the width of the shank thereof, whereby said incline controller engages the sole at the forepart thereof and is free from contact therewith at the shank thereof.

20. In a machine of the character described, the combination of work supporting and feeding means, a channeling knife, means for moving the knife in the line of feed as the channel is being cut, and a channel incline controller adjustable with respect to the knife to determine the plane of cut thereof, said incline controller being constructed and arranged to become automatically inoperative during a portion of the operation of channeling a sole.

21. A machine of the character described comprising, in combination, a work supporting and feeding wheel, driving means therefor, a channeling tool, a bearing wheel having its engaging face disposed oblique to the surface of the work and tending to move the work in and at an angle to the line of feed, gearing connections between the bearing wheel and said driving means, and a spline connection between the bearing wheel and said gearing to permit the said bearing wheel to be moved relative to said gearing while remaining in operative engagement therewith.

22. In a machine for channeling the soles of boots and shoes, the combination of a work supporting and feeding wheel, a channeling tool disposed adjacent thereto, and a guard extended over the feed side portion of the work supporting and feeding wheel and acting to prevent the work from being moved by the said feed side portion in a direction away from the correct line of feed.

23. A machine of the class described comprising, in combination, a main supporting head, a movable supporting head carrying a tool, means for moving the movable head with respect to the main supporting head to carry the tool out of operative position, a bearing wheel having an oblique work engaging face and supported from the main supporting frame, and a toe and coöperating finger for raising the bearing wheel from operative position when the tool is moved from operative position.

24. A machine of the character described comprising, in combination, a channel or groove forming tool, means for moving the said tool toward and from the edge of the work to properly locate the channel or groove, and means for continuously vibrating said tool in the line of work feed.

25. In a channeling machine, the combination of a channel or groove forming tool, means for moving the tool toward and from the edge of the work, means for continuously vibrating said tool in the line of feed for forming the channel or groove, and means for moving said tool into and out of operative position with respect to the work.

26. In a channeling machine, the combination of a channel or groove forming tool, means for moving the tool toward and from the edge of the work, means for continuously vibrating said tool in the line of feed for forming the channel or groove, means for moving said tool into and out of operative position with respect to the work, work feeding means, and devices to render the work feeding means ineffectual while the tool is out of operative position.

27. In a channeling machine, a tool carrier, a tool carried thereby, a spring normally tending to move the tool carrier and tool in one direction with respect to the edge of the work, means under control of the operator for moving them in the opposite direction, and devices for adjustably determining the movement of the carrier and tool under the action of the said spring and said means.

28. In a channeling machine, the combination of a supporting standard, a fixed head secured thereto, a tool actuating shaft supported by said fixed head, a main supporting head comprising a casing overlying said fixed head and slidable with respect thereto, work feeding means carried by said main supporting head, a channeling or grooving tool connected to said tool actuating shaft, and means rendered effective by sliding movement of the main supporting head to actuate the work feeding means by pressure of the work thereagainst.

29. In a channeling machine, the combination of a main frame, a main supporting head slidably mounted with relation thereto, feeding devices carried by said head, means rendered effective by sliding movement of said sliding head to feed the work,

a movable head carried by the sliding head, a channel or groove forming tool carried by said movable head, treadle means for moving the movable head with respect to the main supporting head, and means to lock the main supporting head from sliding movement when the movable head is moved in one direction.

30. In a channeling machine, a frame, a main supporting head mounted to slide with respect thereto, a main driving shaft movable with the main supporting head, means rendered effective to operate said shaft by movement of the said head, a head 33 movably mounted with respect to the main supporting head, treadle means for so moving it, a lock for preventing sliding movement of the main supporting head when the head 33 is moved by said treadle means, and means for adjusting the locking action of said lock.

31. In a channeling machine, the combination of a main supporting head, work feeding means carried thereby, a movable head, a channel or groove forming tool, a bearing wheel, and a channel incline controller, said parts being movable with the movable head, and means to move the movable head with respect to the main supporting head.

32. In a channeling machine, the combination of work feeding and channeling means, a channel incline controller comprising an arm 100 adjustable with respect to the work feeding and channeling means, and an arm 103 adjustable with respect to the said arm 100, said adjustable arms 100 and 103 supporting said channel incline controller to bear upon the sole of a shoe in channeling the forepart and to become automatically inoperative in channeling the shank part.

33. In a channeling machine, the combination of a work supporting and feeding wheel comprising the parts 31 and 32, the former of which carries a work engaging surface to engage the edge of the work, and the latter of which affords a support for the work, and a guard having its guarding portion extending over the feeding side of the part 31 to protect the edge of the work from contact with the feeding surface when improperly positioned with respect thereto, whereby movement of the work in a direction away from the correct line of feed is prevented.

34. In a channeling machine, the combination of a supporting standard, a main supporting head slidingly supported with respect thereto and carrying work supporting and feeding means, devices for rendering the said means effective by sliding the main supporting head with respect to the supporting standard, a movable head pivotally mounted on the main supporting head and slidable therewith, a channeling tool carried by said movable head, and means to tilt the movable head on the main supporting head.

35. In a channeling machine, the combination of a tool carrier and channeling tool, means for continuously vibrating the channeling tool in the direction of work feed, means for moving the channeling tool toward and from the edge of the work while being vibrated, and means for moving the tool into and out of operative relation with the work during the vibratory movement of the tool.

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

GEORGE F. STEWART.

Witnesses:

REDFIELD H. ALLEN,

WILLIAM J. BRENNAN.