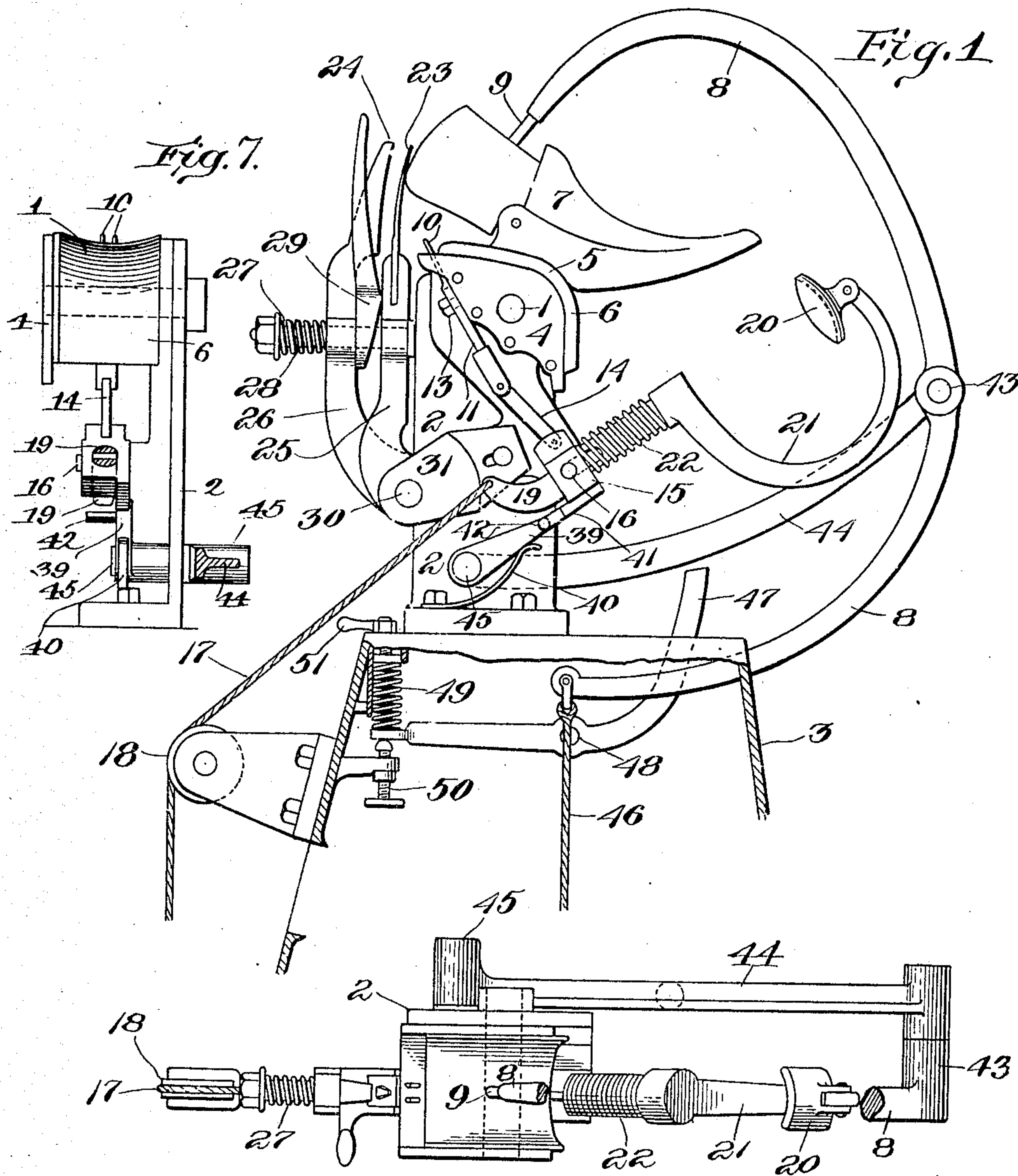


No. 872,317.

PATENTED NOV. 26, 1907.

C. F. PYM.
RELASTING MACHINE.
APPLICATION FILED JULY 18, 1906.

3 SHEETS—SHEET 1.



Witnesses:
M. J. Spalding
Wm. J. Pike.

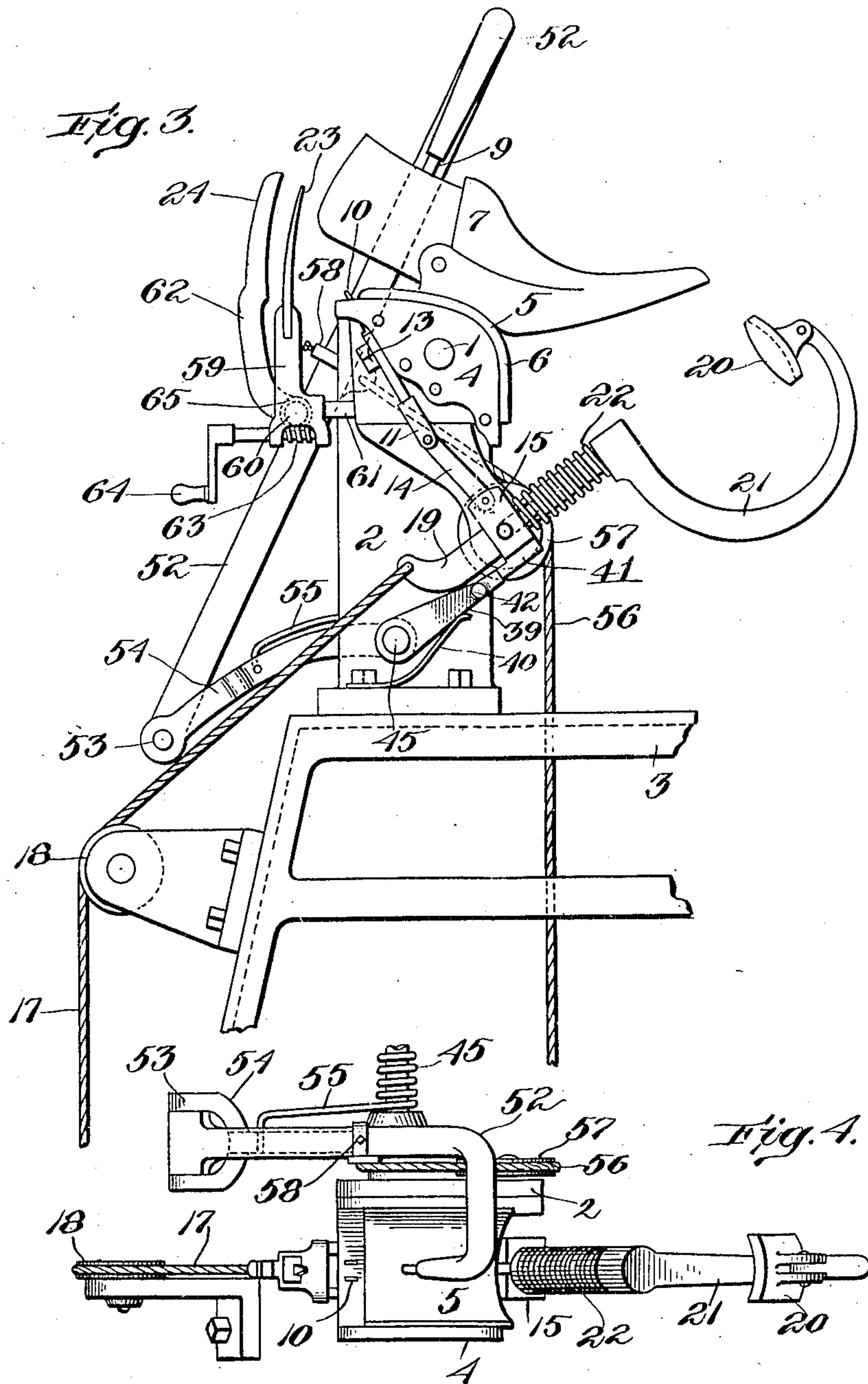
Inventor:
Charles F. Pym,
by Geo. H. Maxwell,
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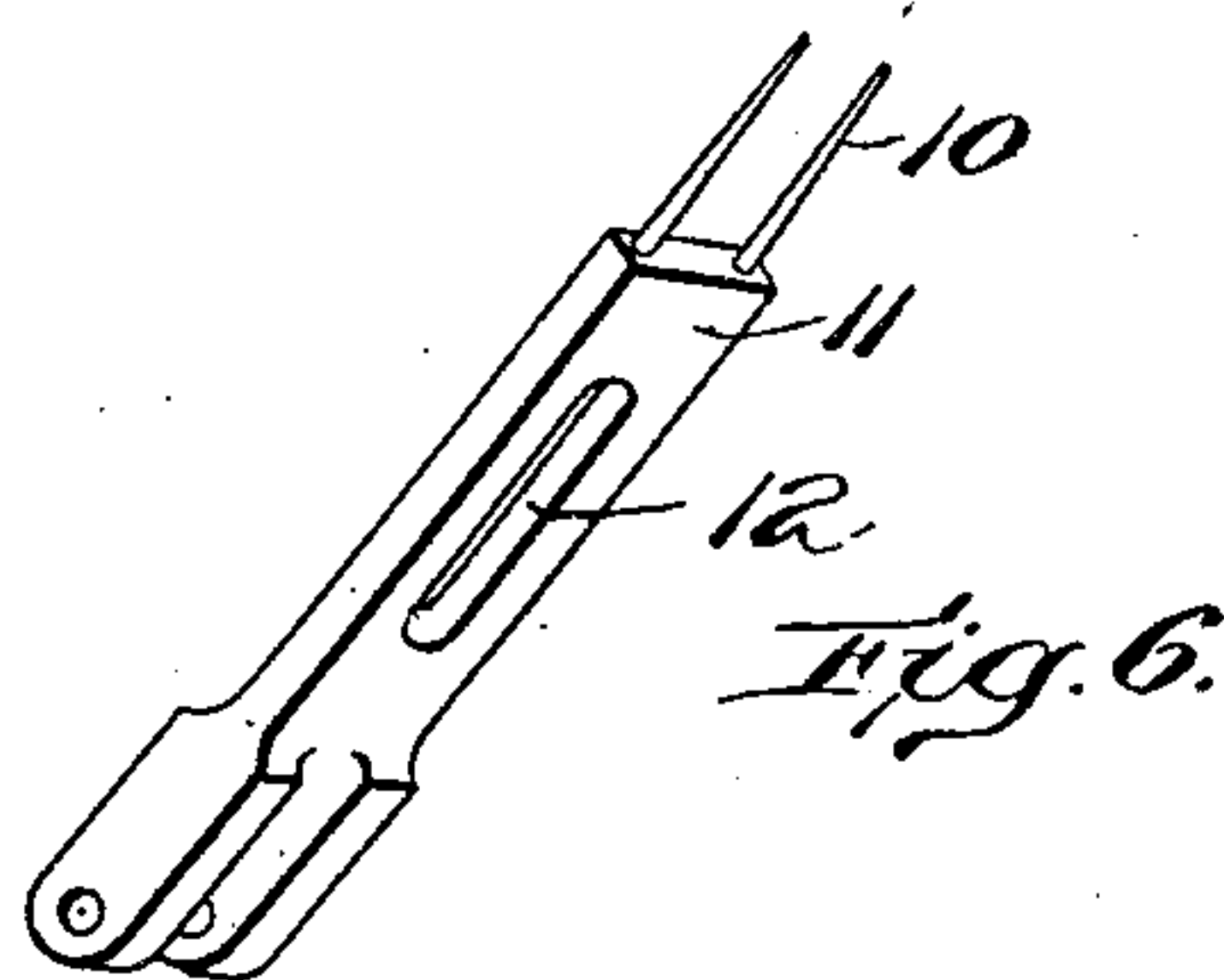
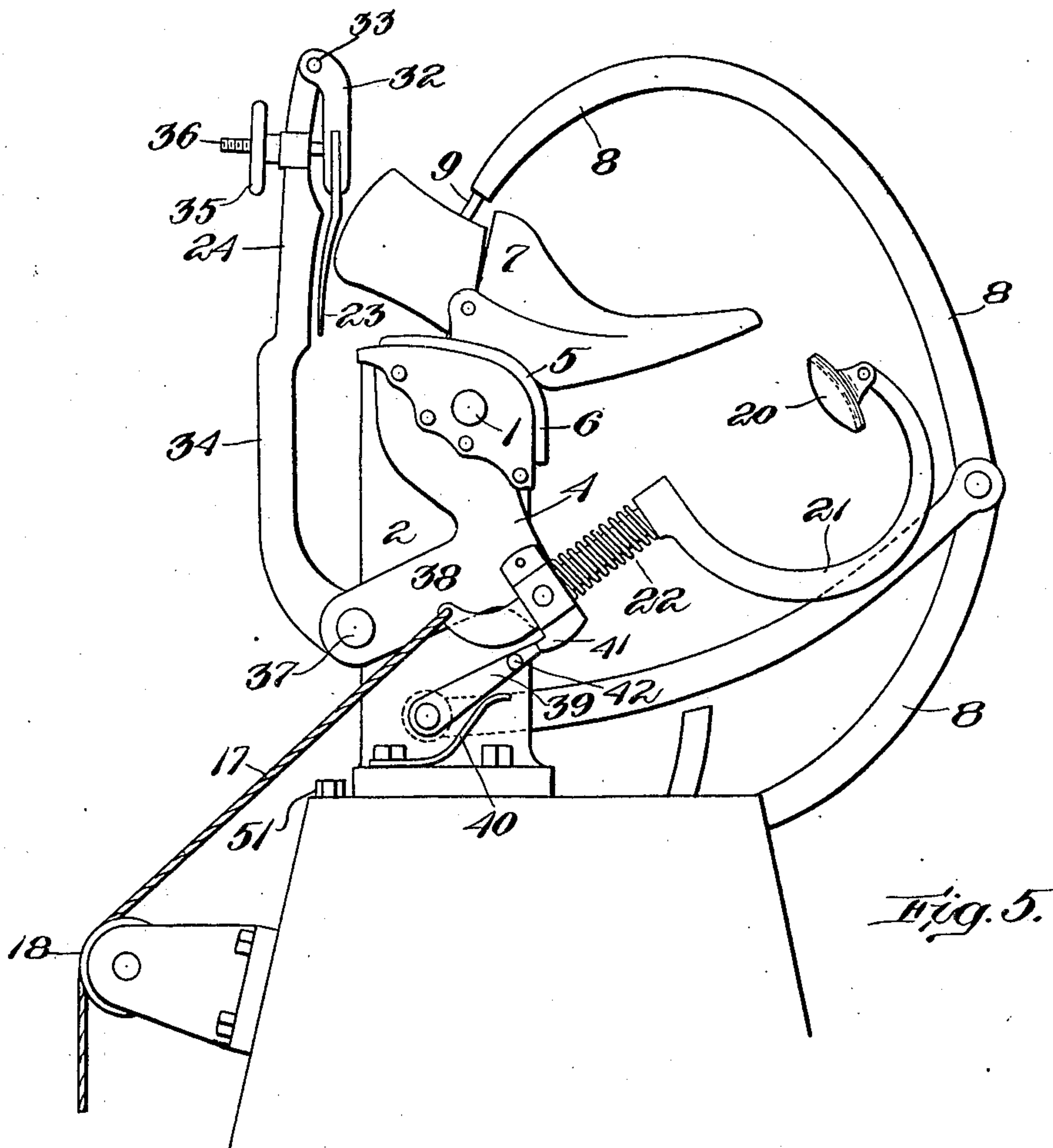
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RELASTING MACHINE.

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3 SHEETS—SHEET 3.



Witnesses.
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Wm. J. Pike

Inventor:
Charles F. Pym,
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UNITED STATES PATENT OFFICE.

CHARLES F. PYM, OF ESSEX, ONTARIO, CANADA, ASSIGNOR TO KRENTLER-ARNOLD HINGE LAST COMPANY, OF DETROIT, MICHIGAN, A CORPORATION OF WEST VIRGINIA.

RELASTING-MACHINE.

No. 872,317.

Specification of Letters Patent.

Patented Nov. 26, 1907.

Application filed July 18, 1906. Serial No. 326,685.

To all whom it may concern:

Be it known that I, CHARLES F. PYM, a citizen of Canada, residing at Essex, in the Province of Ontario, Canada, have invented an Improvement in Relasting-Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

After a turned shoe has been lasted, the last is commonly removed for certain operations and is then put back into the shoe, the latter operation being termed "relasting". With the exception of the machine shown in Patent No. 649,879, relasting has, so far as I am aware, been invariably accomplished heretofore by hand, the shoe and last being both manipulated entirely by hand, or the last is mounted bottom upward upon the pin of a jack or post and then the shoe is pulled and worked over the last until the latter has been thereby properly replaced in the shoe. Relasting by hand is done well or poorly, according to the skill of the operator, and it is quite common for the shoe to receive more or less injury therefrom.

Accordingly the aim of my present invention is to accomplish deftly and uniformly the relasting of a shoe by a machine in the same manner as nearly as possible, as it would be done by the most skilled workman. In view of the fact, however, that no two shoes are exactly alike in leather, stitching, etc., it is desirable that the machine should not be relied upon for accomplishing the entire result, but that the machine should proceed in such a manner as to leave the workman free to use his hands and skill to the best advantage wherever his judgment indicates the desirability thereof. To this end, I provide means for forming and retarding the bottom of the shoe, preferably at the region of the shank, while at the same time other mechanism engages a last (which the operator has partially inserted by hand) and quickly but cautiously moves said last forward with a combined downward and forward movement, thereby cooperating with the said shaping and retarding means, and at the critical moment a toe presser finishes the relasting operation by engaging the top of the shoe and quickly bending the shoe downward so as to bring the heel of the last into final position.

In connection with the foregoing I provide suitable retaining means for holding the shoe back at the beginning of the relasting operation and also for enabling the heel of the last to move downwardly into the shoe without injury to the shoe or tendency to move the lining, and also provide means for enabling the operator quickly to straighten or arrange the back seam and counter portions of the shoe upper.

My invention is adapted to relast nail-seat shoes as well as sewed shoes, the latter differing from the former in having the sole originally sewed to the upper about the heel, and the former having the sole left detached from the upper at the heel until after the relasting.

My machine is adapted to use with all kinds of lasts, but is particularly serviceable in connection with hinged lasts.

In the drawings, Figure 1 represents in side elevation, partly broken away, a machine embodying my invention as arranged for relasting nailed heel seat shoes; Fig. 2 is a top plan view thereof; Figs. 3 and 4 are views similar to Figs. 1 and 2, showing a modified construction for the same work; Fig. 5 is a view in side elevation of a machine especially constructed for sewed heel seat work; Fig. 6 is a perspective view of the sole holder; Fig. 7 is an end view of the bracket or standard, head, and adjacent parts looking at Fig. 1 from the right, parts being broken away and others omitted, for clearness of illustration.

Pivotally mounted at 1 upon a bracket or standard 2 projecting from a base 3 is a swinging head 4 which is provided at its upper end with a retarding surface, preferably in the form of a heavy block of rubber 5, shaped transversely and longitudinally to conform to the shank portion of a shoe bottom, being curved downwardly at its forward end 6 so as to still conform to the shank portion of the shoe when the latter is being shifted more or less forcibly along said retarding surface 5. For convenience of illustration I have simply shown a last 7 in operative position in the machine, it being understood, however, that a shoe is first put in position on the retarding surface 5 and then the last is inserted in the shoe to occupy the position shown in the drawing. Cooperating with the last is a last-shifting device, herein shown in the form of a curved arm 8 having a spindle or pin 9 for entering the

usual spindle hole of the last, the purpose of this part of my invention being merely to provide suitable means capable of grasping or engaging the available portion of the last when the latter is in the shoe, and forcing the last forward in the shoe or holding the last with proper resistance to the sliding movement of the shoe backward on the last. One of my objects is to provide means for holding and manipulating both the shoe and the last, said means being preferably operated by the foot of the operator, whereby both hands are left free to manipulate the leather or otherwise aid with a rub or a push or movement here or there wherever required on the shoe or on the last as the machine is proceeding in its work. To the end also of affording the operator room for unrestricted movement I have bent the arm 8 outwardly in a long curve, as clearly shown in Figs. 1 and 5.

The shoe may be held by any suitable means, and is preferably held at the very beginning of the relasting operation positively, by pins 10 projecting diagonally upwardly and rearwardly through holes which are provided for receiving said pins in the heel end of the sole (said holes being subsequently covered by the heel, and hence not injuring the shoe in any way). These pins are carried by a slide 11 slotted at 12, Fig. 6, and retained by a bolt 13 against the face or rear side of the head 4 and operated by any convenient means, as by a link 14 connected to a bearing 15 pivoted at 16 to the head 4 and operated at the proper moment by a cable or chain 17 passing over a fixed pulley 18 to a treadle not shown, and secured at its upper end to the stem 19 of a padded toe presser 20, which for the convenience of the operator is mounted on a curved neck 21, said stem 19 being normally held upward by a spring 22.

Aside from the retaining means 10 my invention includes as a prominent feature thereof a heel inserter and straightener 23, adapted to enter between the heel of the shoe and the heel of the last for enabling the last to slide down into the shoe along the surface of this part 23 without endangering the leather of the shoe and also for enabling the heel of the shoe to maintain proper upright formation. This latter object is also aided by a cooperating part 24, which presses against the outer surface of the heel portion of the shoe in opposition to the part 23, which presses against the inner surface thereof.

The part 23 or heel inserter and straightener consists of a thin curved strip of steel or other material, somewhat similar to the tool known as a "back seam straightener", and is carried, as shown in Fig. 1, at the upper end of a lever 25 while the part 24 is carried at the upper end of a similar lever 26, said two parts 23, 24 constituting jaws for clamping

the heel of the shoe between them, being normally moved toward each other by a spring 27 on a bolt 28 secured to the lever 25 and passing through the lever 26 against which said spring engages. The jaws are moved in opposition to said spring by a cam-shaped lever 29 mounted on said bolt 28 and are themselves pivoted at 30 to a bracket 31 secured to the head 4. The part 24 is spoon-shaped or hollowed toward the shoe, so as to engage the shoe firmly adjacent the back seam, the special point of engagement being determined by the special shoe under treatment.

It sometimes happens, especially with turned shoes, that the special character of the leather or formation of the seam causes the latter to be deflected from proper position, and accordingly the member 24 serves as a back-seam straightener inasmuch as the operator can quickly straighten the seam simply by turning the last slightly one way or the other after the last has been inserted and while the parts are properly engaged by the machine.

The knife-like heel inserter and straightener 23 is most conveniently inserted from the bottom in a nailed heel seat shoe, inasmuch as the bottom is left open, the heel end of the sole not being fastened until after the relasting, whereas in a sewed heel seat the bottom is not left open and hence it is most convenient to insert said member 23 from the top in a sewed heel seat shoe, and for this reason I have shown in Fig. 5 said heel inserter and straightener 23 as mounted at the lower end of a lever or jaw 32, which is pivoted at 33 to the upper end of a lever or jaw 34, the latter being provided opposite said member 23 with a spoon-shaped surface or member 24 to cooperate therewith the same as in the previously described construction. Said two jaws are moved toward and from each other by a hand wheel 35 and screw 36, and the jaw 34 is pivoted at 37 to a projecting end 38 of the head 4. Otherwise the two machines are the same.

The toe presser 20 and its pivoted bearing 15 are normally held in the position shown in Fig. 1 by a dog 39 held by a spring 40 against a stop 41 on the rear side of said bearing next to the bracket or upright 2, said dog 39 having a pin 42 projecting in the path of the lower end of the stem 19 of said toe presser 20. When the latter is swung to the left in Fig. 1, either by hand or by a pull on its cable 17 so as to be above the toe of the shoe, its first movement, *i. e.* as long as the dog 39 engages the stop 41, is compelled to be a swinging and downward movement, thereby withdrawing the pins 10 from the sole of the shoe and bringing the presser 20 over the shoe. The stem 19 then comes in contact with the pin 42 and releases the dog from

engagement with said rotary bearing 15. This permits the subsequent movement of the presser which is brought about by a continued pull on cable 17 to be a straight downward pressing movement against the top of the toe of the shoe for the purpose of straightening the last and aiding in forming and shaping the shank portion of the shoe, etc.

When the dog 39 engages the stop 41 which is on the bearing 15, the latter being mounted on the head 4, it thereby prevents both the bearing 15 and the head 4 from turning on their centers. After the cable 17 is pulled into approximate alinement with the center 16 against the resistance of its spring 22, a further pull on the cable 17 moves the stem 19, by reason of its slot, in a straight line over the center 16, and, the head 4 having been released from dog 39, is then also free to rotate by reason of the pull of cable 17, and will be brought toward a vertical position by such pull when 16 comes to the end of the slot in stem 19.

The arm 8 is bodily movable, being pivoted at 43 to the free end of a supporting arm or link 44, which is mounted on a stud 45 in the standard 2, as clearly shown in Figs. 1, 2 and 5. At its lower free end the arm 8 is connected by a cable or chain 46 to a foot treadle not shown, and its movement is further modified by a stop 47 in the path of the arm 44, said stop being pivoted at 48 to the base of the machine and engaging a spring 49 at its rear end, which offers considerable resistance to downward movement of the lever 8 so that the last and shoe are forced together with gradually increasing pressure. The normal position of lever 47 is further controlled by a hand screw 50, which bears against the underside of the rear end of said lever. The tension of the spring 49 is controlled by a hand nut 51, as shown clearly in Fig. 1.

The mechanism shown in Figs. 1, 2 and 5 leaves the operator abundant room for working on the shoe, especially when standing at the rear of the machine or heel end of the shoe. For some purposes it is desirable however to leave the toe portion of the shoe entirely unrestricted, and accordingly in Figs. 3 and 4 I have shown a different arrangement of last shifter, the pin 9 being carried at the depending curved end of an arm 52, which projects over at the left hand side of the operator and thence downwardly and rearwardly, as shown in Figs. 3 and 4, where it is pivoted at 53 to an arm 54 normally held yieldingly upwardly by a spring 55, said arm 54 and spring being secured to the stud 45. The arm 52 is operated in this case by a cable or chain 56 passing over a guide pulley 57 and thence to an adjustable clamp 58 on the upright portion of the arm 52. By shifting this connection 58 along the arm the movement of the pin 9 can be accurately

regulated and the pressure distributed. If the connection be moved upward, the tendency of the cable is to draw the pin 9 and shift the last forward with greater force or with a greater proportion of the force employed, than when the connection is located further down on the arm 52. The force of the draft cable or chain 56 is resolved into a motion that swings the spindle or pin 9 forward and also downward, and a motion that simply pulls the pin 9 downward by swinging the pivot 53 and arm 54 about 45 as a center, and the relative proportion of the two components of this movement is regulated by shifting the connection 58 along the jack stem or arm 52. In the construction shown in Figs. 3 and 4 I have also shown a modified form of clamping jaws for the heel, the heel inserter and straightener 23 being mounted on the upper end of an arm 59 pivoted at 60 to a stud 61 projecting from the head 4 of the machine and adjacent thereto is a jaw 62 carrying the spoon-shaped seam straightener 24. The jaw 59 carries a worm 63 operated by a handle 64 to engage a worm wheel 65 on the jaw 62, whereby said two members 23 and 24 may be readily moved together or separated for performing the same function as already described for the same parts in the previous constructions.

The manner of using my relaster is as follows: Let it be supposed that a nailed heel seat shoe is to be relasted, this being the kind of shoe in which the rear end of the sole is left loose so that the bottom of the shoe is still open at this stage of its manufacture. The operator first inserts the prong-like or knife-like member 23 up through the bottom of the shoe against the inside of the rear part of the counter, and inserts the prongs 10 of the holding device into the holes provided therefor in the heel end of the sole. He then swings down the cam lever 29 so as to permit the cooperating member 24 to engage the heel seam and clamp the shoe firmly against the member 23, or, in the construction shown in Figs. 3 and 4, he causes the same pinching action of the jaw-like members 23 and 24 by operating the handle 64. The shoe being thus firmly held and placed in proper position on the friction retarding surface 5 of the head of the machine, with its shank held down firmly at the proper curvature on the rubber pad or top portion 5 of said head, the operator then inserts by hand a last 7 in the position shown in the drawings. He then pulls over the arm 8 and inserts the spindle 9 in the spindle hole or thimble of the last, the last being then in position with the forepart partially forward in the shoe and the rear lower corner of the heel part resting against the metal surface of the heel inserter and straightener 23. He then presses downwardly upon the foot lever which controls the cable 46 until it is caught by a pawl (not

shown in the drawings), and a compound movement results, which is as nearly like the best hand operation as possible; forcing the toe-part of the last entirely into the shoe. The very first portion of this movement causes the arm 8 to swing upon the pivot 43 as a center, thereby pressing the last downwardly and holding the shoe firmly under pressure against the resisting rubber surface of the block 5. This movement is followed almost instantly by a downward swinging of the pivot 43 and the arm 44, which causes the last to be pulled bodily forward in the shoe. Thereupon the stop 47 engages the lever 44 and causes the pin 9 of the arm 8 to move in a direction between the two previous directions, being a combination of the downward swing on 43 as a center and the forward swing on 45 as a center, with the result that the last is delicately and yet positively forced forward into the toe of the shoe. The proportion of the force applied (through the agency of the cable 47) to a forward movement, and the proportion thereof applied to downward movement is regulated by the spring 49. Adjusting the screw 50 regulates the initial position of the stop 47 to suit different sizes of lasts and shoes. The strictly downward pressure of the arm 8 on the last forces the shoe into the curved bearing surface 5 and tends to form the shank of the shoe, while at the same time coöperating with the friction of the rubber surface to aid in the forward movement of the last into the toe of the shoe. The shape of the shank and final positioning of the last are accomplished by the toe presser 20. As soon as the foot lever which controls the arm 8 has been moved to its final position and locked therein by its dog, the operator lowers the foot treadle which controls the cable 17. This withdraws the holding pins 10, and causes the pad 20 of the toe presser to swing instantly over the toe of the shoe, said shoe having meanwhile been slid forward to some extent on the surface 5 so that it is in a somewhat more inclined position than shown in the figures, and then the toe presser is brought straight down forcibly against the top of the toe portion of the shoe, thereby bending the toe part in opposition to the resistance of pin 9 in the heel-part of the last, with the result that the forepart of the last is turned downwardly upon its hinge, thereby straightening or lengthening the last in the shoe by forcing the heel-part down along the smooth metal surface of the heel inserter 23 until the heel of the last is firmly seated in proper lasting position in the shoe. The coöperating bending pressure of the toe presser 20 and the last shifter or arm 8 on the opposite ends of the shoe and last, serve also to shape the shank of the shoe and pull it up snugly and properly about the waist of the last, this movement also taking place to some

extent on the upper portion of the shoe by reason of the fact that the head 4 of the machine is pivoted and is caused to swing forward slightly under the pulling action of the toe presser, the latter being also free to swing slightly rearwardly at its pressing end 20 because of its pivoted bearing 15. At the very beginning of its movement the dog 39 compels the toe presser to swing rearwardly by reason of the engagement of said dog with said pivoted bearing, so that as the bearing is caused to swing bodily rearward by reason of the pulling strain on the cable 17 it is compelled to turn on its pivot by the unyielding engagement of the dog 39. This turning movement serves not only to bring the pad end 20 of the toe presser into proper operative position, but also serves simultaneously therewith to withdraw the pins 10 from engagement with the sole of the shoe and permits the latter to slide and yield more or less on the friction surface 5, as required by the more severe shank shaping and last straightening pressures just described. It is my object to provide means capable of yielding throughout the entire operation, wherever undue strain is liable to be imparted, this yielding preventing tearing of the leather or other injury to the shoe.

The foregoing operation of the various parts is substantially the same in the three constructions shown in the drawings.

Having relasted the shoe, the operator first straightens the back seam in case the same is crooked, by simply shifting the toe portion of the shoe one way or the other, thereby straightening up the back seam which is clamped between the members 23 and 24. The swinging of the head 4 on its pivot 1 serves to bring the shoe finally into vertical position, where the workman can readily inspect the back seam. He then instantly releases the shoe from clamped position between the members 23 and 24, lifts the arm 8 out of engagement with the last, and then slides the shoe and last off from the prong or knife-like member 23 and the relasting is thereupon completed.

As already stated, I regard this invention as practically a pioneer in machine relasting, it being new, so far as I am aware, to force the last downwardly and forwardly in a shoe by power, and also new to form the shank and straighten the last by power, as well as new to straighten the back seam and accomplish the various other operations and results already pointed out more at length, and which will be hereinafter more particularly defined in the claims.

Having described my invention, what I claim as new and desire to secure by Letters Patent is,

1. A relasting machine, comprising a support for engaging and retaining the shoe bottom, and means coöperating therewith to

press a last downwardly and forwardly into the shoe.

2. A relasting machine, comprising a support for frictionally engaging and retaining the shoe bottom, and means cooperating therewith to press a last downwardly and forwardly into the shoe.

3. A relasting machine, comprising a shoe support having a contour to mold the shank of the shoe to the proper transverse and longitudinal curvature, and means to force the last forwardly and downwardly in the shoe on said support.

4. A relasting machine, comprising a shoe support provided with a yielding frictional block having a shape to conform the shank of the shoe to the proper transverse and longitudinal curvature, and means to force the last forwardly and downwardly in the shoe on said support.

5. In a relasting machine, a frictional support for the shoe having means for shaping the shank surface, and last inserting means cooperating therewith to mold and shape the shank of the shoe.

6. A relasting machine, comprising a support for holding the bottom of a shoe, a last-engaging device for holding a last in said shoe, means for causing a relative movement to said two parts for positioning the forepart of the last in the toe of the shoe and means cooperating with said device to bend the last out straight in the shoe.

7. In a relasting machine, a frictional support for the shoe having a shank-shaped surface, last inserting means cooperating therewith to mold and shape the shank of the shoe as the latter is being relasted, and means cooperating with the aforesaid parts for positioning the heel-part of the last in the heel of the shoe.

8. A relasting machine, comprising a support for holding the bottom of a shoe, a device for unyieldingly holding the shoe fixed, means for shifting the last forward in the shoe, means for releasing said device, and means for straightening the last into final position in the shoe.

9. A relasting machine, comprising a support for holding the bottom of a shoe, and a jack pin for engaging the heel of the last, combined with mechanism for imparting a relative pressing movement and shifting movement of one of said parts vertically toward the other part transversely of the shoe or last, capable of relatively shifting the last and shoe longitudinally for relasting the shoe.

10. A relasting machine, comprising a support for holding the bottom of a shoe, means for engaging the heel of a last in said shoe, and operating mechanism therefor to force said last and shoe together including means for gradually increasing the forcing pressure.

11. A relasting machine, comprising a support for holding the bottom of a shoe, means

for engaging the heel of a last in said shoe, and means operating with downward pressure on the toe of the shoe in opposition to said heel engaging means to straighten the last within the shoe.

12. In a relasting machine, holding means for supporting a shoe, means adjacent thereto for entering the shoe vertically against the back inside of the counter to sustain and guide the last-heel into place, and means for forcing the last-heel and shoe together.

13. In a relasting machine, holding means for supporting a shoe, clamping jaws for engaging the counter of the shoe between them, and means for inserting the last in the shoe.

14. A relasting machine, comprising means for supporting the shoe in position to receive the last, and means for positively gripping the shoe with substantially uniform gripping pressure lengthwise along the back arranged to aid in straightening the back seam of the shoe.

15. A relasting machine, comprising means for supporting the shoe in position to receive the last, and rearwardly extending prongs for entering the heel-end of the sole and retaining the shoe on said support to be operated upon.

16. A relasting machine, comprising means for supporting the shoe in position to receive the last, rearwardly extending prongs for entering the heel-end of the sole and retaining the shoe on said support to be operated upon, mechanism for forcing the last and shoe together, and means for withdrawing said prongs from the sole before the relasting is finished.

17. A relasting machine, comprising means for supporting the shoe in position to receive the last, means for turning said supporting means to raise the heel of the shoe into view, and clamping means for the back seam of the shoe capable of shifting the seam straight.

18. In a relasting machine, in combination with means for supporting a shoe, a clamp to engage the rear of the shoe, an arm mounted to oscillate carrying a pin adapted to engage the last, and means whereby said arm may be oscillated.

19. In a relasting machine, in combination with a rest to engage the under part of a shoe, means for holding the shoe, an arm provided with means for engaging the last, a link pivoted to the frame and supporting said arm, and actuating connections whereby the arm is adapted to be swung on the link and the link on its pivot pin in the frame.

20. In a relasting machine, in combination with a pivoted rest to engage the under part of a shoe, a clamp for the upper, a link pivoted to a fixed part of the machine, an arm pivoted to said link provided with means to engage the last, a draft appliance connected to said arm to turn the arm on its pivot whereby said arm may be swung on

either or both of said pivot connections, and means for regulating the resistance to motion of said link.

21. In a relasting machine, a clamp for the heel-part of a shoe, having in combination a thin member adapted to be inserted inside of the shoe and a concave member adapted to engage in opposition thereto outside of the shoe, a member adapted to engage the forward top of the shoe, and actuating means connected with said top-engaging member.

22. In a relasting machine, in combination with a rest adapted to engage the under side of a shoe, an arm pivotally connected thereto, a toe presser carried by said arm, and a draft appliance for actuating said toe presser.

23. In a relasting machine, in combination with a pivoted rest adapted to engage the under side of a shoe, an arm provided with means to engage the last, a toe presser pivotally connected to the rest, and a draft appliance whereby said toe presser may be actuated.

24. In a relasting machine, in combina-

tion with a rest to engage the under side of a shoe, a prong to engage through a portion of the sole of the shoe, a toe presser to engage the upper, means whereby the toe presser may be actuated, and connections between said toe presser and said prong whereby the latter is withdrawn as the toe presser engages the shoe.

25. In a relasting machine, in combination with a rest adapted to engage the shank of a shoe, an arm arranged to push a last into the shoe, means for actuating said arm, a toe presser adapted to engage the toe of the shoe, and means for actuating said toe presser whereby it co-acts with the arm to straighten the last and to insert the heel thereof into the shoe.

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

CHARLES F. PYM.

Witnesses:

STELLA KARRER,
AGNES M. KARRER.