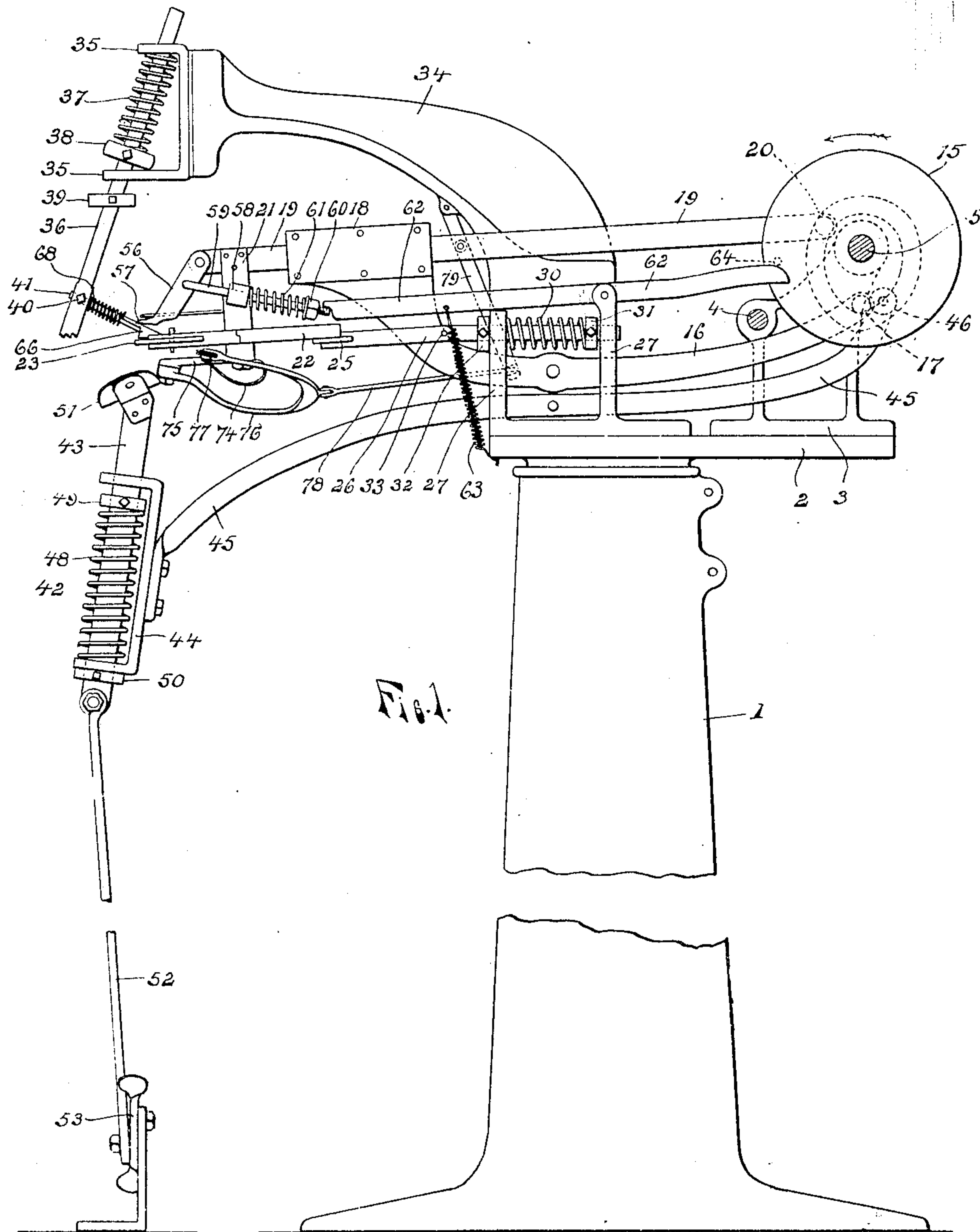


No. 882,018.

PATENTED MAR. 17, 1908.

C. F. PYM.  
LASTING MACHINE.  
APPLICATION FILED MAR. 28, 1907.

6 SHEETS—SHEET 1.



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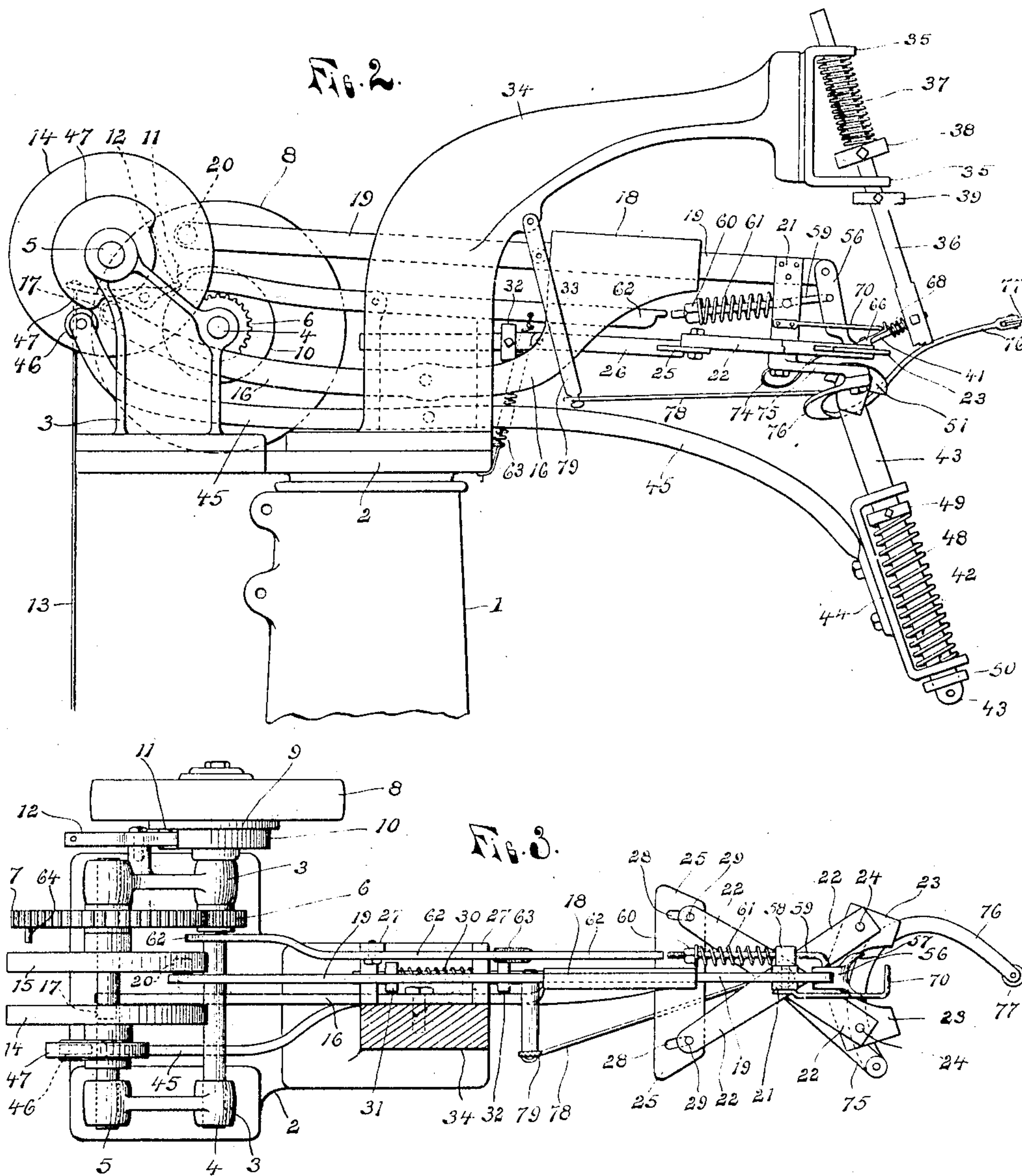
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6 SHEETS—SHEET 2.



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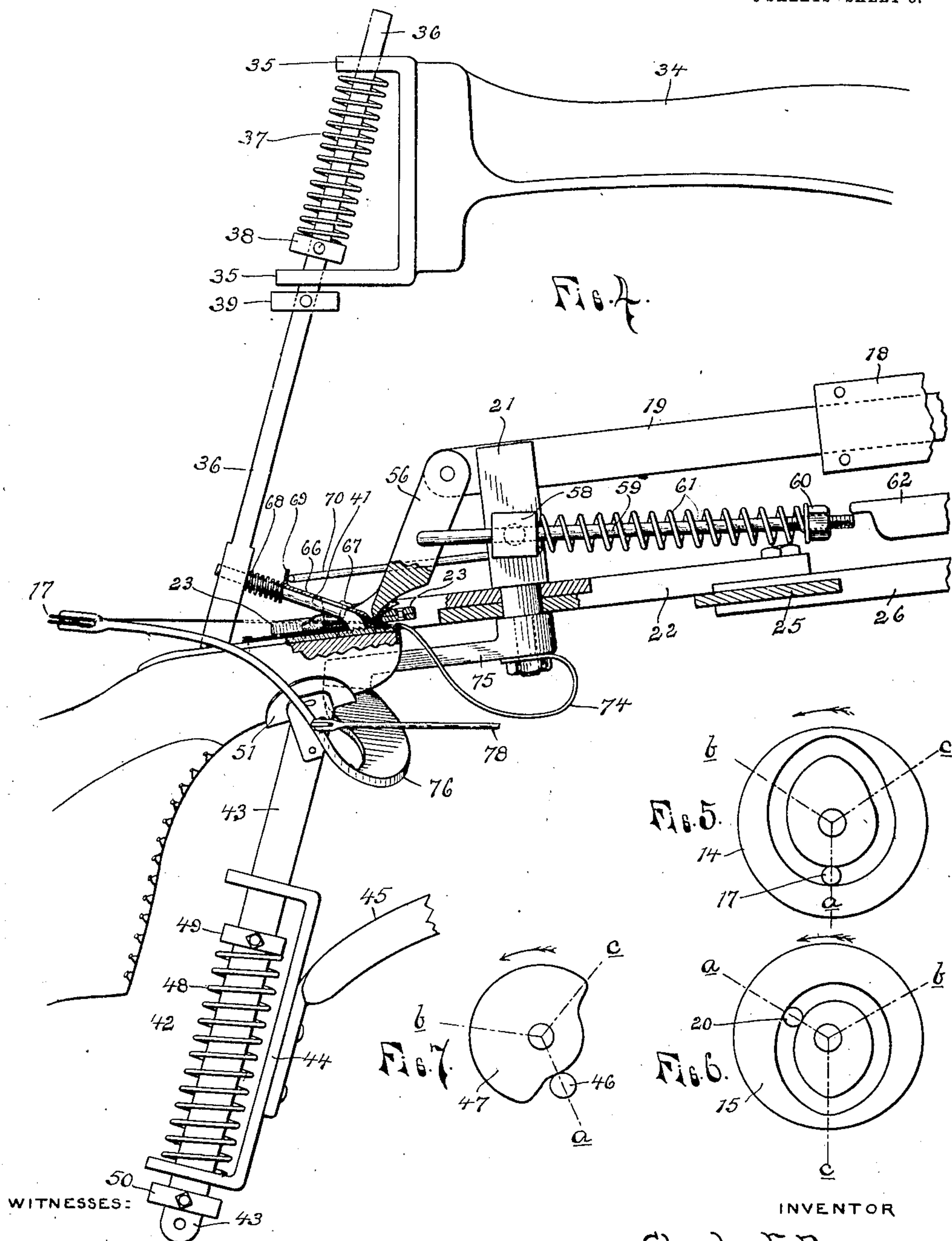
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6 SHEETS—SHEET 3.



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6 SHEETS—SHEET 4.

Fig. 8.

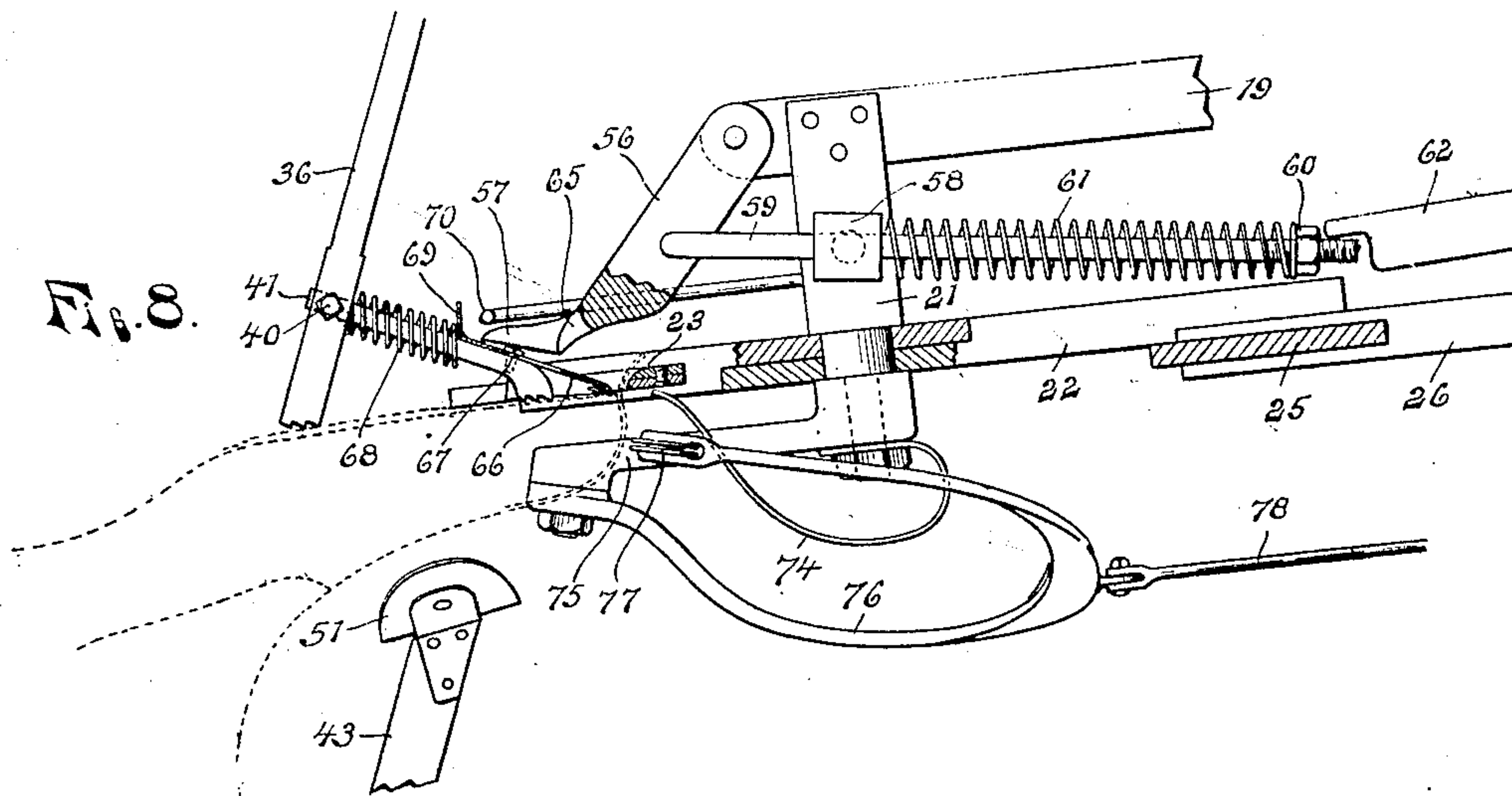
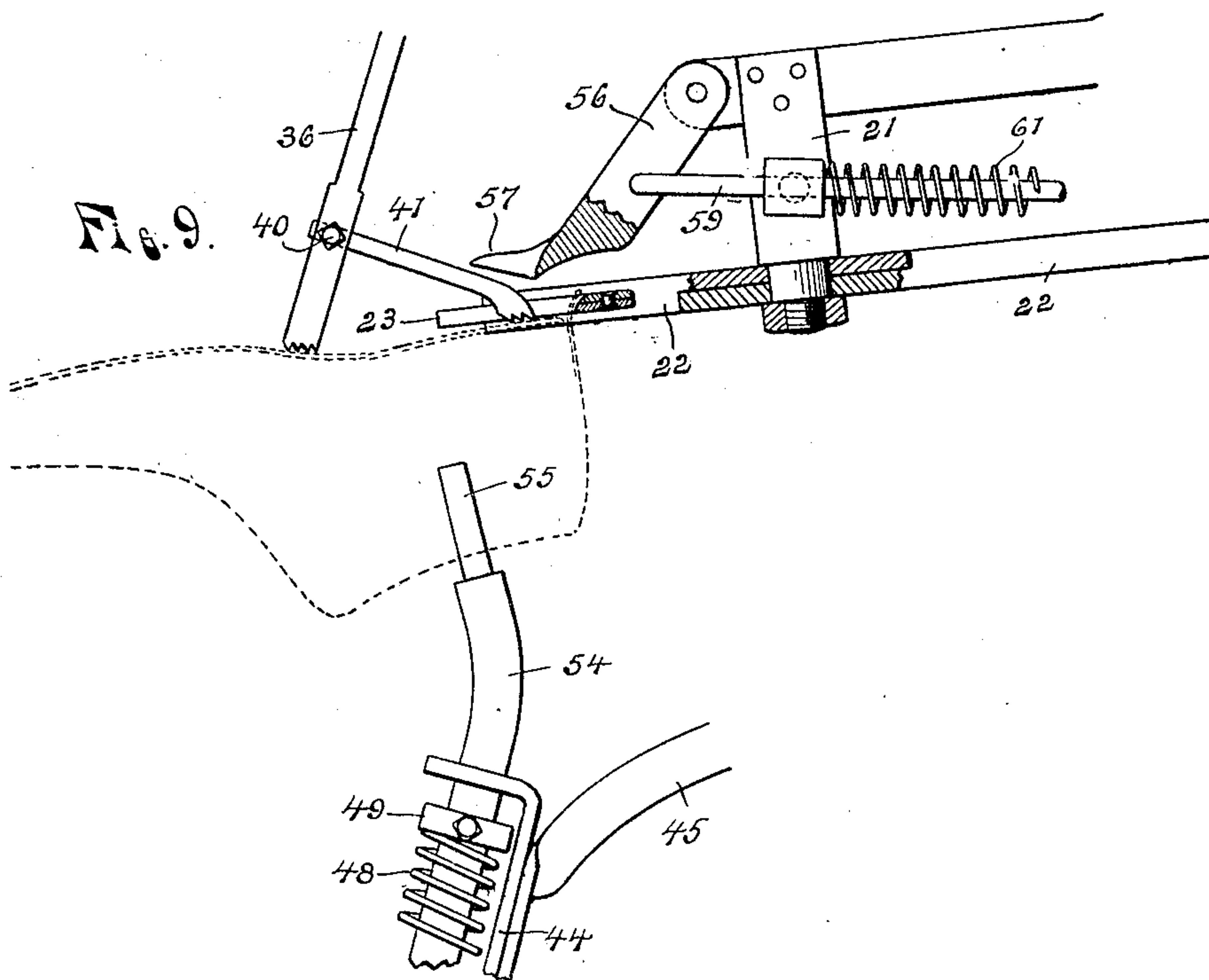


Fig. 9.



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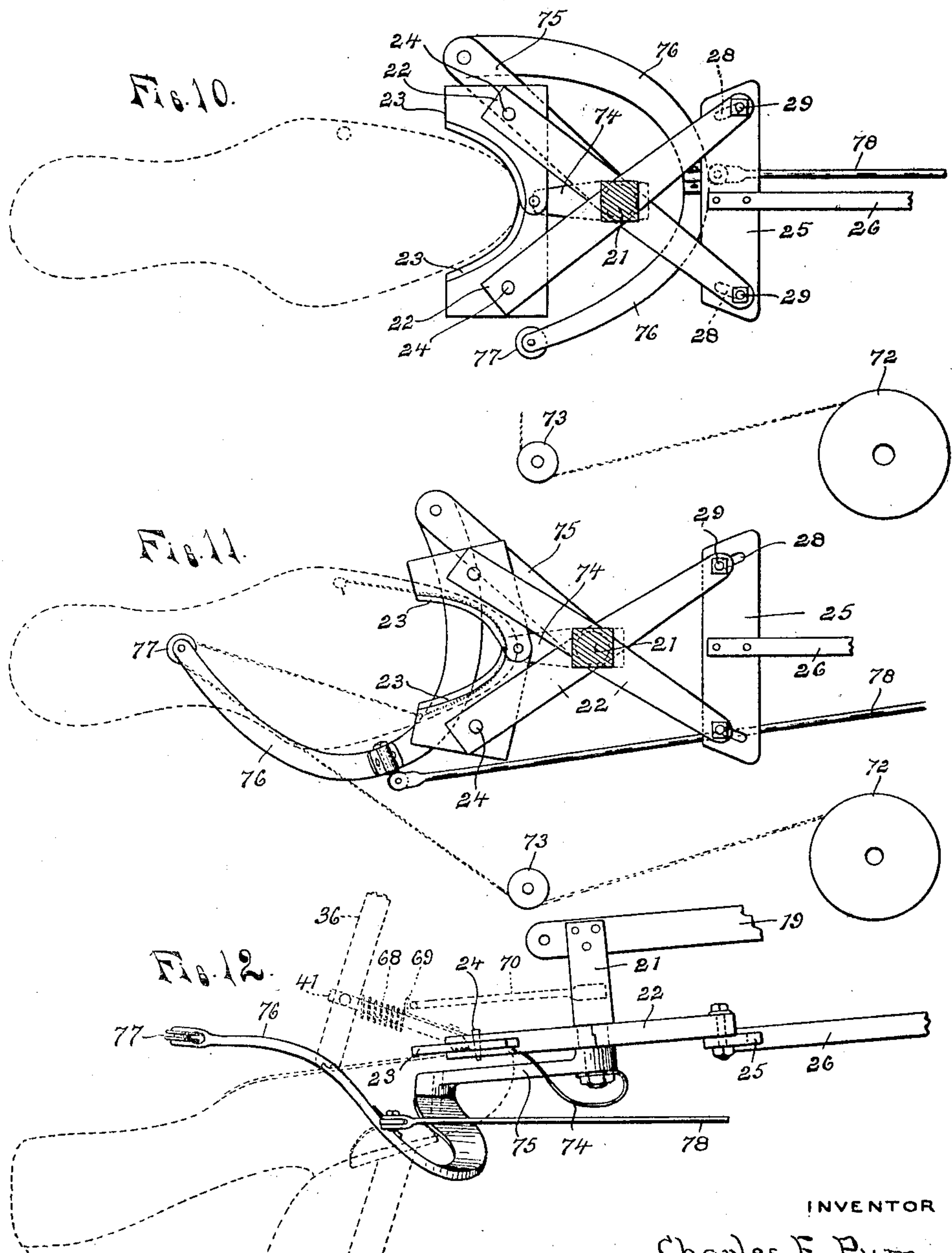
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LASTING MACHINE.

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6 SHEETS—SHEET 6.



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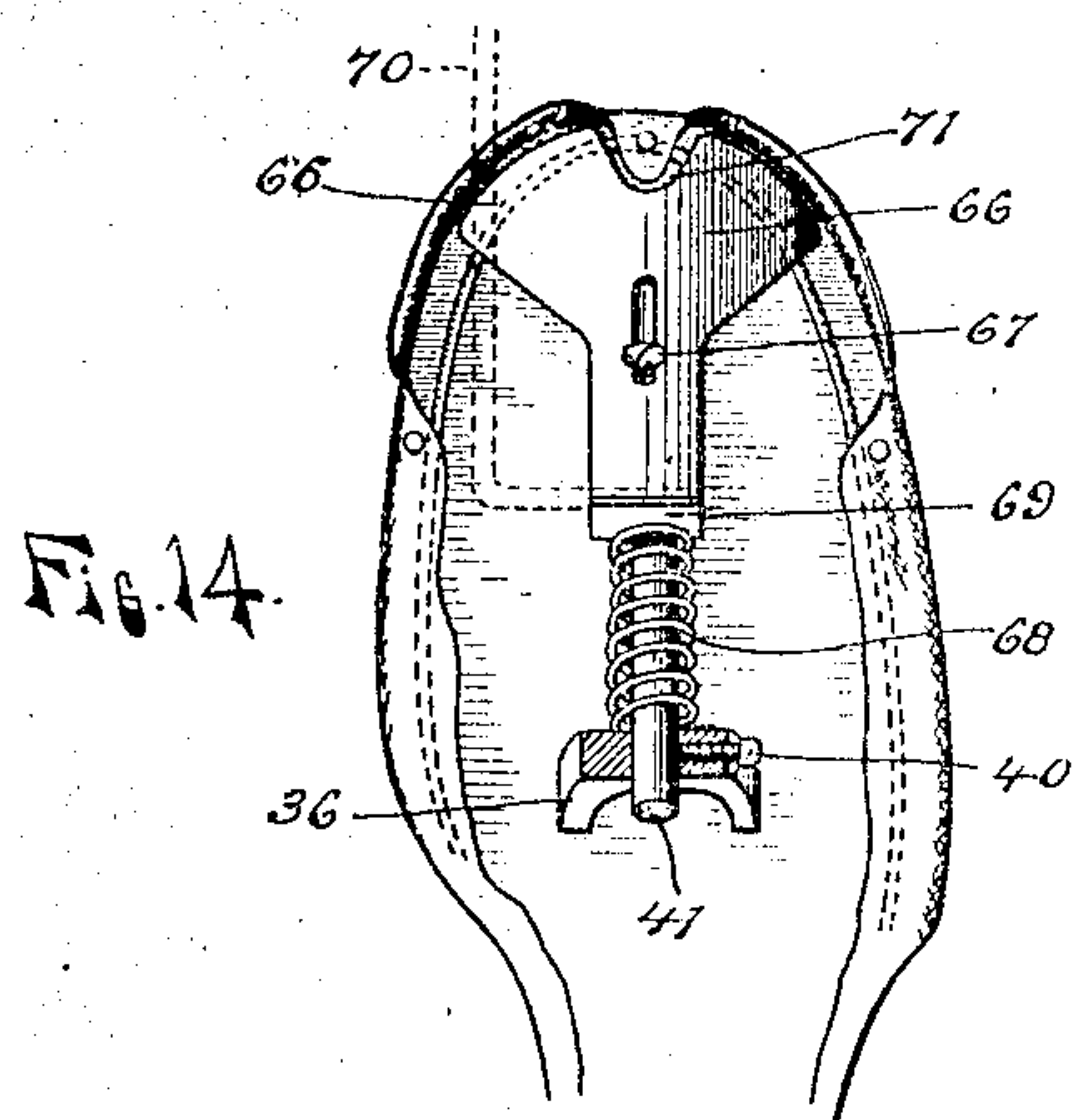
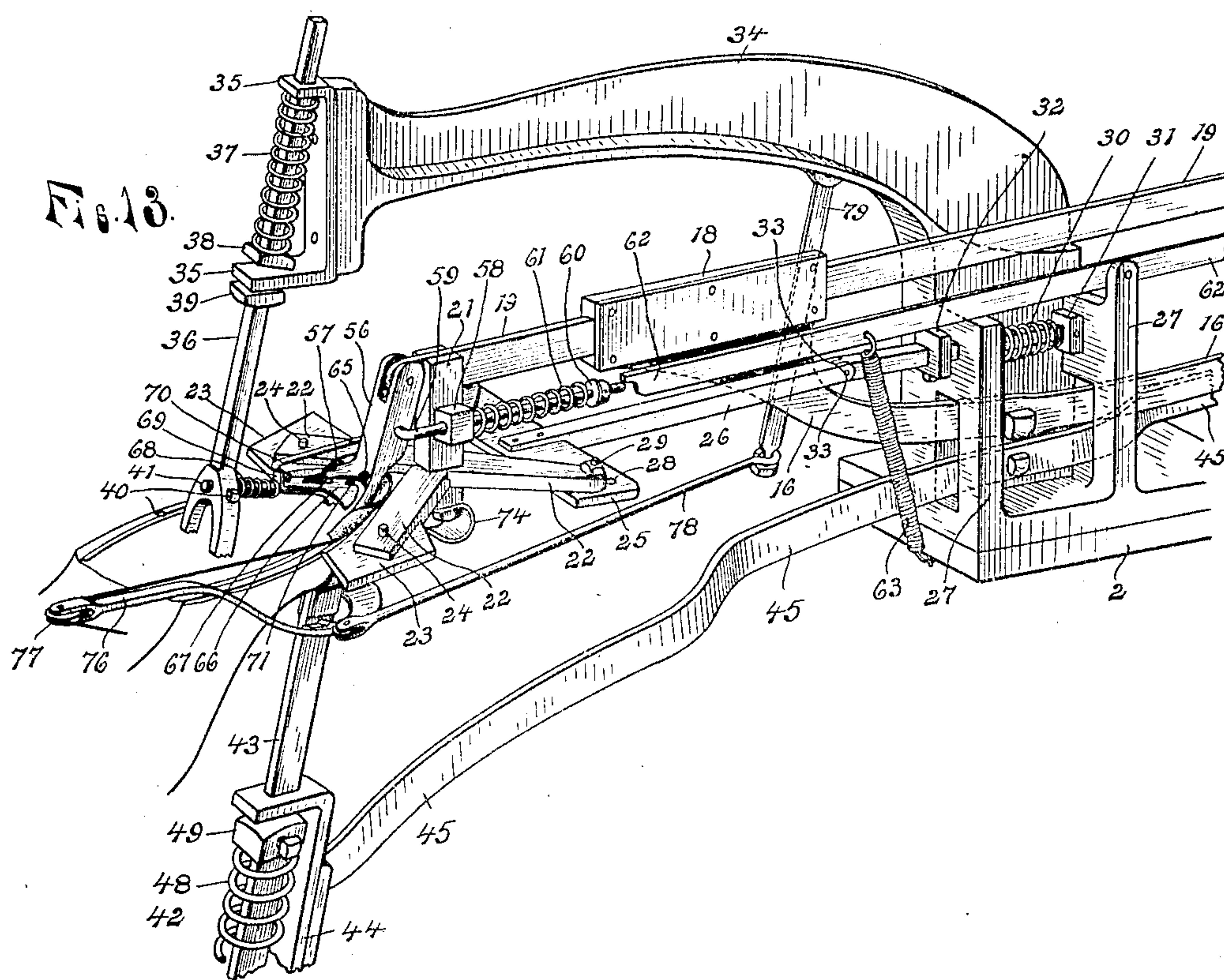
No. 882,018.

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6 SHEETS—SHEET 6.



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# UNITED STATES PATENT OFFICE.

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## LASTING-MACHINE.

No. 882,018.

Specification of Letters Patent.

Patented March 17, 1908.

Application filed March 28, 1907. Serial No. 364,960.

*To all whom it may concern:*

Be it known that I, CHARLES F. PYM, a subject of the King of Great Britain, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Lasting-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 This invention relates to improvements in lasting machines and more especially to machines of that class in which "wipers" are employed to last the heels and toes of boots and shoes.

15 One of the objects of the said invention is to provide a machine adapted to automatically perform the several successive steps in the operation of lasting the heel or toe of a boot or shoe, in an expeditious and most efficacious manner and a further object is to provide means for automatically clamping and yieldingly holding the last during the lasting operation and also to provide means for permitting the wipers to yieldingly engage the work, whereby lasts of and swing  
20 heels may be used without any change or adjustment of the machine.

In lasting machines employing wipers for forcing the upper inward over the edge of the sole, it has been found that especially at the toe of the shoe, the thin edge of the sole over which the upper is being lasted is very liable to be "wiped" or turned upward or inward and a further object of this invention  
30 is to provide a machine having means for effectually preventing the displacement of the edge of the sole, and also to provide such machines with efficient means for automatically and yieldingly clamping the edge of the upper in such a manner that said edge is held against wrinkling as the upper is drawn and stretched up around the heel or toe of the last.

45 My invention also produces a machine which is very simple, compact and durable in construction and adapted to be actuated by mechanically derived power. I have also herein shown and described means for automatically drawing around the toe of the last a wire or other binding means for holding the upper in place after being lasted, this feature, and the parts coöperating with it, not

however, being claimed herein, but duly claimed in a divisional application Ser. No. 413,430, filed January 30, 1908.

To this end the invention consists in providing means for so carrying and automatically operating the wipers that they are first given an upward movement to stretch the vamp or upper up around the toe or heel of the last, then a forward and downward movement to form the leather over the edge of the sole and press it down hard, said means also operating to yieldingly close the wipers as they are moved forward.

The invention also consists in providing a spring pressed, automatically operated clamping foot to engage the upwardly projecting edge of the leather of the upper and clamp the same between it and the forming edge of the wipers, said foot being shaped to conform substantially to the curve of said wiper edge so that the upper will be yieldingly held during the upward movement of the wipers against possibility of wrinkling and stretched smoothly up around the toe or heel of the last.

This invention also consists in providing a toe guard or plate having an outline substantially the same as that of the toe of the last and adapted to engage and press down upon the sole close to the edge over which the upper is to be lasted so that said edge will be firmly held down upon the last, means being provided to automatically move said top plate out of the path of the wipers as they are moved over and down upon the edge of the sole.

The invention also consists in providing a vertically yielding jack which is automatically raised to clamp the last between it and vertically yielding means engaging the sole which is secured upon the last so that lasts of various thicknesses and swing may be used, and in providing means for yieldingly closing and moving the wipers forward into contact with the shoe, so that the movement of the wipers may vary to conform to variations in the size and form of the toes or heels of shoes, said means being adjustable to regulate the force with which the wipers will engage the work.

Referring to the accompanying drawings in which like reference characters refer to like parts, Figure 1 is a side elevation, partly in



section, of a machine embodying the invention; Fig. 2 a side elevation of the reverse side of the machine; Fig. 3 a plan view partly in section; Fig. 4 an enlarged detail of the last holding and lasting devices, with parts broken away to show the construction; Fig. 5 is a detail showing, in elevation, the cam for operating the rocker-bar; Fig. 6 is a similar view of the push-bar cam; Fig. 7 a like elevation of the jack operating cam; Fig. 8 is a view similar to Fig. 4 showing the parts in position to receive the shoe; Fig. 9 is a similar view showing the machine as modified for lasting heels; Fig. 10 is a detail plan view of the wipers in open position and their operating levers, and also showing the wire carrying arm; Fig. 11 a similar view showing the position of the parts at the end of the lasting operation; Fig. 12 is a side elevation of Fig. 11; Fig. 13 is a perspective detail of the wipers and adjacent operating and clamping parts of the machine shown in the same position as in Fig. 4; and Fig. 14 is a plan view of a last showing an insole and upper secured thereon, and the toe plate in operative position.

As shown in the drawings 1 is a suitable supporting pedestal upon the upper end of which is secured a bed or table 2 having suitable bearing brackets 3 each having two bearings, one for a driving shaft 4 and the other for a driven or counter shaft 5, motion being transmitted from the driving to the driven shaft by gears 6 and 7 which are in the proportion of three to one so that one revolution of the driving shaft will turn the counter shaft but one-third of a revolution.

8 is a suitable belt pulley mounted loosely on the driving shaft and having a suitable roller clutch mechanism of any well known construction located in its hub casing 9 to connect the pulley to the shaft. A suitable wheel 10 secured on the driving shaft is formed with a notch or shoulder 11 adapted to be engaged by a dog 12 pivoted upon the bearing bracket and operated by a rod 13 attached to a suitable foot pedal (not shown) to throw the dog out of engagement with the notch and permit the clutch to turn the shaft. The driving shaft is thus stopped by the dog at the end of each revolution and the driven or counter shaft is stopped at three certain positions during each revolution, the operator controlling the starting of the machine each time by the actuation of the dog.

Secured upon the counter shaft 5 are two wheels formed with cam grooves which wheels I will call for convenience of description the rocker-cam 14 and the push cam 15. 16 is a rocker-bar pivoted intermediate its ends and carrying on its tail end a roll 17 engaging the cam groove of the rocker-cam, and at its forward end provided with an extended supporting guide way 18 for a push bar 19 which is adapted to slide longitudinally in said way and is carried and rocked vertically by said rocker bar. This push-bar is also provided with a roll 20 which engages the cam groove in the push-cam 15 and rigidly secured to it near its forward end is a depending post 21 to the lower end of which are pivotally attached the crossed levers 22 at their point of intersection. To the forward ends of these levers 22 are pivotally attached the wipers 23 which consist of two hinge connected plates formed at their adjacent edges to conform approximately to the outline of either the heel or the toe of the shoe and these wipers turn freely within slots cut in the ends of said levers upon pivot pins 24 extending through said levers and wipers and are thus held so that they may be quickly and easily removed and other wiper plates having a different form inserted to more nearly conform to the particular shape of toe or heel to be lasted. In this machine it is not, however, necessary as will be hereinafter more fully set forth, to change these wipers in lasting the different sizes of substantially the same form but only when there is a radical change in the form, as from a round to a very pointed toe or from toe lasting to heel lasting or from ladies' to gents' shoes, etc.

The rear ends of the crossed levers are connected by a plate 25 secured to the forward end of a bar 26, which extends rearwardly through bearings 27 secured upon the table 2. The said plate is provided near its ends with forwardly converging slots 28 through which the pins or bolts 29 connecting the levers to said plate pass and slide freely, and sleeved upon the bar 26 between the bearings is a coiled spring 30 engaging the forward bearing at one end and a collar 31 on that bar at its opposite end to normally resist the forward longitudinal movement of said bar in its bearings, a second collar 32 on said bar forward of its first bearing serving to limit the rearward movement of said bar in its bearings. A joint 33 in said bar is provided to permit the up and down movement of the wipers, which movement is caused by the rocker-bar.

When the push cam 15 moves the push-bar forward, the pivotal point of the crossed-levers is moved forward by the post 21 and this movement by reason of the forwardly converging slots in the plate 25 causes the ends of the levers to move toward each other and close the wipers inward, the spring 30 on the bar 26 holding said plate against any forward movement unless the resistance to the closing of the wipers, caused by their contact with the shoe, is sufficient to overcome the resistance of said spring, when the spring will yield and permit a slight forward movement of said plate, which movement by lessening the movement of the pins 29 in their slots, will lessen the distance which the wipers will be closed by a given forward

movement. When the push cam 15 moves the push-bar forward, the pivotal point of the crossed-levers is moved forward by the post 21 and this movement by reason of the forwardly converging slots in the plate 25 causes the ends of the levers to move toward each other and close the wipers inward, the spring 30 on the bar 26 holding said plate against any forward movement unless the resistance to the closing of the wipers, caused by their contact with the shoe, is sufficient to overcome the resistance of said spring, when the spring will yield and permit a slight forward movement of said plate, which movement by lessening the movement of the pins 29 in their slots, will lessen the distance which the wipers will be closed by a given forward



movement imparted to the push-bar by its cam. The wiping force of the wipers is thus regulated by the tension of said spring which may be adjusted by the collar 31 and will be the same regardless of variations in the toes or heels of the shoes operated upon.

Secured upon the table 2 is an upwardly and forwardly extending bracket-arm 34 the forward end of which is provided with guide lugs 35 through square openings in which a presser-bar 36 slides. For convenience in operating the machine this bar is set in a downwardly and forwardly inclined position and is normally held against movement in its bearings by a coiled spring 37 sleeved thereon between said guide lugs and engaging the upper lug at one end and a collar 38 adjustably secured upon the bar at its opposite end. A second collar 39 on said bar below the lower guide lug is provided to limit the upward movement of said bar. The lower end of said presser bar is roughened or formed with teeth to engage the sole over which the upper is to be lasted, at some distance from the toe or heel of the last, and adjustably secured in a transverse hole in said bar by a set screw 40, is a presser arm 41 extending rearwardly of the machine and formed with a downwardly curved and toothed end to engage the shoe sole at a point near the end of its toe or heel. The adjustment by means of the set screw 40 permits the operator to vary the angle or plane of engagement of the presser bar and presser arm upon the shoe bottom.

To hold the last upon which the shoe is secured in position for lasting, up against these two points of contact, namely the ends of the presser bar and presser arm, an automatically operated jack 42 is provided consisting of a bar 43 guided in openings in bearing ears on a bracket 44 secured to the end of a supporting and operating bar 45 which is pivoted intermediate its ends to a convenient stationary part of the supporting frame of the machine and is provided at its extreme rear end with a roll 46 to engage the cam surface of an outside cam 47 secured upon the countershaft 5. Between the bearing ears of the bracket 44 a coiled spring 48 is sleeved upon the bar 44 and engages the lower end at one end and a collar 49 adjustably secured upon the bar, at its opposite end, to yieldingly support the bar in its bracket, and a second collar 50 is secured upon the bar below the lower ear to limit the upward sliding movement of the bar in its bearings. On the upper end of the bar is a curved seat 51 for the last, shaped to conform to the surface thereof just forward of the instep and support the said last at a point intermediate the points at which the presser bar and arm engage the sole and thus firmly clamp the last between said bar and arm above, and the jack below, said jack being raised to so clamp

the last, in timed relation to the movement of the wipers and other parts, by the jack-cam 47.

The toe of the last is thus firmly clamped and held between three points of contact in position for lasting and when placed in the machine by the operator it may be adjusted laterally thereon to bring the toes of lasts having various lines of swing in the proper relation to the wipers, and by providing the springs 37 and 48 to yieldingly hold the presser bar and jack, respectively, the last is clamped between members which will yield vertically to accommodate lasts of various thicknesses and to permit the wipers to swing downward a fixed distance regardless of the thickness of the last. The spring 37 is made lighter than the spring 48 so that when the last is clamped between the jack and presser-bar with the wipers out of contact with the last, the spring 48 will overcome the spring 37, moving the presser bar upward until the collar 39 engages the lug 35 which collar is adapted to be adjusted so as to stop the last in its upward movement in the proper relation to the wipers to permit said wipers when raised, to be projected over the edge of the sole.

A rod 52 is attached at its upper end to the lower end of the bar 43 of the jack and at its opposite end to a double foot lever 53, the rod being pivoted to the foot lever at one side of the pivot of said lever so that the operator by placing his foot upon one end of said lever may draw the said bar downward against the action of its spring to release the last at any time during the lasting operation, and by placing his foot upon the opposite end of said lever the jack may be lifted to increase the clamping pressure.

In lasting the heel of a shoe, a form of jack shown in Fig. 9 is used, the upper end of the bar 54 being provided with a spindle or stud 55 to engage the socket ordinarily provided in lasts.

In order that the leather of the shoe upper which is being lasted may be stretched tightly over the heel or toe of the last and at the same time held against any possibility of wrinkling during the lasting operation, a clamping foot 56 is provided to engage the inner curved side of the projecting edge of the upper at the heel or toe of the shoe and clamp said edge between it and the forming or wiping edges of the wipers. This foot is pivoted at its upper end to the forwardly projecting end of the push-bar 19 and at its lower end is provided with laterally extending curved portions 57 so formed on their outer side as to substantially conform to the outline of the heel or toe of the shoe and thus firmly hold said edge against the wipers without altering the curve which the leather naturally takes when tacked upon the last in the usual manner. Pivotaly attached to one



side of the post 21 is a guide block 58 having a transverse hole in which a rod 59 is adapted to slide freely. This rod is pivotally attached at one end to the foot 56 intermediate its ends, and sleeved thereon between said block and an adjusting nut 60 on its opposite end is a coiled spring 61 which normally acts to swing the foot down against the formed edge of the wipers and clamp the edge of the leather between. By adjusting the nut 60 the tension of the spring is increased or diminished to increase or diminish the clamping power of the foot. A latch-bar 62 is pivoted intermediate its ends upon the top of the rearmost bearing 27, the forward bearing serving as a stop to limit the falling of the forward end of said latch-bar which is normally held against the stop by a coiled spring 63, and said forward end is adapted to engage the rear end of the rod 59 upon the rearward and downward movement of the forward end of the push-bar to which the clamping foot 56 is attached and cause said rod to slide through its bearing block against the action of said spring, turning the foot on its pivot and swinging it upwardly and forwardly away from the wipers, as shown in Figs. 1, 8 and 9. Upon the large gear wheel 7 on the counter-shaft 5, is a pin 64 projecting from the side thereof, shown in Fig. 3, and this pin is so set that at the proper moment it will engage the rear end of the latch bar and, tilting the same, raise its forward end out of engagement with the rod 59, releasing said rod and permitting the spring to act to throw the foot into clamping position. In certain kinds of work, the edge of the upper is held in place at the center of the toe by a tack, as shown in Fig. 14, and as it is not desirable to remove this fastening, the foot 56 may be cut away or provided with a notch 65 at its center if so desired, to permit of thus fastening the upper at the toe of the last.

To hold the edge of the sole over which the upper is being lasted, firmly down upon the last so that it will not be displaced by the wipers when they are forced over and upon said edge, a toe plate 66 is slidably attached to the pressure arm 41 by a screw 67 extending through a longitudinal slot in said plate, and the lower end of this plate is broadened out and curved in such a manner that its edge is adapted to engage the sole close to the edge thereof around the toe, and, being attached to the presser-arm, presses firmly down upon said edge. The plate is projected downwardly to engage the sole, by a coiled spring 68 sleeved on the presser-arm between the presser-bar and the forward end of said plate which is turned upwardly to form a lug 69 adapted to be engaged by the laterally bent end of a stop-arm 70 carried by the post 21, when said post is moved forward by the push-bar to carry the wipers over and down

upon the edge of the shoe sole. Said toe plate is thus moved on the arm against the action of the spring 68 out of the way of the wipers as they move forward. A notch 71 may be provided in the toe plate, as shown in Fig. 14, to permit the upper to be tacked to the insole at the center of the toe, if so desired.

To effectually secure the edge of the upper in place after the lasting operation is completed, a wire is stretched tightly around the toe in contact with the lasted edge, its ends being made fast to tacks driven into the sole, and to automatically so place the wire and draw it tight, said wire, which is supplied from any suitable spool indicated at 72 in Figs. 10 and 11, is passed through any suitable tensioning device 73, then through the loop formed by the curved guide finger 74 and its end fastened to a tack driven into the sole near the left hand edge thereof. A supporting arm 75 is rigidly secured at one end to the lower end of the post 21 below the wiper levers, and to the free end of this rigid arm is pivoted a curved arm 76 having a grooved roll 77 at its free end which engages the wire midway between its secured end and the tension device. To the curved arm is pivotally attached at one end, an operating rod 78, and the opposite end of said rod is attached to the lower end of a lever 79 which is pivoted at its upper end to the stationary bracket 34 and connected intermediate its ends to the push-bar 19, so that upon the forward movement of said push-bar the lever 79 is swung on its pivot and turns the curved arm 76, carrying its roll upward and over the last forward of the presser bar to stretch the wire around the toe, the wire being guided to place close up beneath the wipers at their forward edges by the guide finger 74 which is rigidly secured to the supporting arm and curved downward therefrom thence upward to form a loop, with its free end close beneath the wipers and adjacent to their formed or wiping edge. Any desired number of these guide fingers may be used or the form may be changed as desired.

As already stated, the above mentioned features of my improved lasting machine are not herein claimed, but are duly claimed in the divisional application previously mentioned.

In Figs. 1, 8, 9 and 10, the parts are shown in position to receive the shoe to be lasted and Figs. 5, 6 and 7 are diagrammatic illustrations of the actuating cams showing their relation to each other and to the other parts when said parts are in the position shown in the first named figures or when the rolls engaging said cams are in position *a* as illustrated in said Figs. 5, 6 and 7.

When the parts are in the position shown in said Figs. 1, 8, 9 and 10, they are at rest with the jack 42 down, the roll 46 being in



contact with the small part of the jack-cam; the wipers in their lowest position, the roll 17 on the rocker-bar being in contact with the concentric inner part of its cam groove; and the push-bar carrying said wipers, in its rear-most position, the roll 20 being in the inner-most portion of its cam groove. As illustrated in Fig. 8, the operator places the last with the shoe sole firmly up against the presser-bar and presser-arm, and the toe plate engaging said sole close to its edge with the projecting edge of the upper, extending up adjacent to the wiping edge of the wipers. As shown in dotted lines in Fig. 1, the pin 64 is just in contact with the rear end of the latch-bar 62 and when the operator starts the machine by actuating the dog 12 to release the member 10 and permit the clutch to operate to turn the driving shaft, the first movement will rock said latch-bar and release the clamping foot 56 to clamp the edge of the upper to the edge of the wipers. At the same time the jack is raised by the turning of the jack-cam and the last is firmly clamped between the jack and the presser-bar and presser-arm. When the driving shaft has made one revolution, it is again stopped by the dog 12, the cams having been turned one-third of a revolution or to position *b* which turning has raised the wipers slightly and projected them forward a short distance, the cam grooves in the rocker and push cams being slightly farther from the center of the cam at this point.

While the machine is at rest in position *b* the operator threads the securing wire over the grooved pulley on the curved arm 76 and through the loop of the guide finger 74 and secures its end to a tack in the shoe sole. The wire may however be secured to the tack before the last is placed in the machine. The machine is then again started by releasing the dog 12 and during this revolution of the power shaft and the turning of the cams from position *b* to *c* the jack is firmly held up to place by the large concentric side of the jack-cam; the push-bar is projected to the forward limit of its stroke carrying the wipers forward and at the same time closing them, carrying the rear end of the actuating rod for the clamping foot past the forward end of the latch-bar, engaging the stop arm 70 with the lug on the toe-plate and moving said plate out of the path of the wipers, and turning the curved arm on its pivot to stretch the wire around the toe and carry it forward over the last; and the rocker-bar is rocked to the upper limit of its stroke and then to its lower limit, raising the wipers to stretch the upper up around the toe and then pressing its edge down hard upon the sole as said edge is carried over and upon said sole. In Figs. 2, 3, 4, 11, 12 and 13 the parts are shown in position at the end of the lasting operation or position *c*.

While the parts are at rest in position *c*, the operator severs the securing wire and makes it fast to a tack driven into the sole near the right side thereof, and upon again starting the machine by releasing the dog 12, the jack at once falls, releasing the shoe; the push-bar is retracted causing the latch-bar to raise the clamping foot, moving the wipers to their rearmost position, moving the stop-arm out of engagement with the toe-plate, and swinging the wire-arm backward; and the rocker-bar is held in its lowered position. The cycle of operation is thus completed and the parts are again in position to receive another last.

The stopping mechanism permits the machine to stop automatically at each critical point.

It is obvious that if the operator holds the dog 12 out of engagement, the operation of the machine will be continuous and when he has become very proficient in the manipulation of the machine it will be necessary for him to stop the machine only to remove the lasted shoe and put another last in position.

Having thus fully described my invention what I claim is:—

1. In a lasting machine, the combination with means for forming or wiping the upper of a boot or shoe in the process of lasting, and means for actuating said forming means, of a member adapted to yieldingly engage the sole of the shoe from above, a member to yieldingly support said shoe and its last from below, and means for moving one of said members toward the other to yieldingly clamp the last.

2. In a lasting machine, the combination with means for forming or wiping the upper of a boot or shoe in the process of lasting, and means for actuating said forming means, of a member adapted to yieldingly engage the shoe from above, a jack to support the shoe and its last from below and means for automatically lifting said jack in timed relation to the movement of the wiping means to clamp the last between it and said member.

3. In a lasting machine, the combination with wipers and means for actuating the same, of a member adapted to engage the sole of the shoe secured to a last, a spring to yieldingly press said member toward the shoe sole, adjustable means for limiting the movement against the action of said spring of said member, a jack having a member to support the last and shoe, a spring to yieldingly hold said jack member and of a strength sufficient to overcome the action of the spring of the sole member, and means for actuating the jack.

4. In a lasting machine, the combination with means for holding a last and shoe upper in position to be lasted and wipers having formed edges adapted to wipe forwardly the edges of the upper about the end of the last



simultaneously on the opposite sides thereof with a sliding wiping movement, of automatically intermittent power mechanism for automatically actuating said wipers to last the toe or heel of the shoe while the last and shoe upper are so held and stopping before the lasting is completed to enable the operator to inspect the partly lasted shoe.

5. In a lasting machine, the combination with horizontally extending wiper plates vertically pivoted together and capable of yielding in the plane of the sole, and automatic operating means therefor, of means for automatically supporting the last and shoe upper in position to be lasted.

6. In a lasting machine, the combination with horizontally extending wiper plates vertically pivoted together and capable of yielding in the plane of the sole, and automatic operating means therefor, of yielding means for automatically supporting the last and shoe upper in position to be lasted, including means to automatically move the last into proper lasting position throughout the lasting operation.

7. In a lasting machine, the combination with wipers and means for actuating the same, of a presser-bar adapted to engage at its lower end the sole of a shoe secured upon a last, a guide bearing for said presser-bar, a spring to yieldingly hold said bar from moving in its bearing, an adjustable stop on said presser-bar to limit the movement of said bar against the action of said spring, a jack consisting of an operating bar provided with a guide bearing and a supporting bar in said bearing having means at its upper end for engaging the sole or last, a spring to yieldingly hold said supporting bar raised, an adjustable stop to limit the movement of said bar in its bearings, and means for actuating the jack.

8. In a lasting machine, the combination with wipers and means for operating the same, of a yielding presser-bar adapted to engage the sole of a shoe secured upon a last, means carried by said bar for engaging the sole adjacent to its edge around its toe portion, and a jack adapted to support the last and clamp the same between it and said presser-bar and the toe engaging means.

9. In a lasting machine, the combination with wipers and means for operating the same, of a yielding presser-bar adapted to engage the sole of a shoe secured upon a last, a presser-arm carried by said bar for engaging the sole near its toe portion, a toe plate attached to said arm to engage the sole at its edge around the toe portion, and a yielding jack to raise the last and clamp the same between said jack and said presser-bar, presser-arm and toe plate.

10. In a lasting machine, the combination with yielding wipers having formed edges adapted to engage the heel or toe of the upper

of a boot or shoe secured on a last, of automatic means for imparting to the wipers a rising and falling movement, and yielding means adapted to engage the upper and clamp the same to the formed edges, whereby the upper is held and stretched up around the last when the wipers are raised, and means for automatically holding and moving the last to cooperate with the lasting mechanism.

11. In a lasting machine, the combination with wipers and yielding automatic means for yieldingly supporting and moving in cooperation with the lasting mechanism a last to which a shoe upper and sole are adapted to be secured for lasting, of power operated means operating in timed relation to said last moving means whereby an upward movement is imparted to said wipers to stretch the upper up freely above the last and then a movement down onto the last and forward to form the edge of the upper over the edge of the sole and press it down thereon.

12. In a lasting machine, the combination with wipers and means for supporting a last to which a shoe upper and sole are adapted to be secured for lasting, of upwardly and downwardly movable carrying means for the wipers, forwardly and rearwardly movable operating means for the wipers, and means for actuating said carrying means and operating means in timed relation to each other.

13. In a lasting machine, the combination with wipers and means for supporting a last to which a shoe upper and sole are adapted to be secured, of a vertically movable member, a longitudinally movable member carried by and movable with the vertically movable member and to which the wipers are attached, and means for actuating said members in timed relation to each other.

14. In a lasting machine, the combination with wipers and means for supporting a last upon which a shoe is adapted to be secured for lasting, of a bar pivoted to rock vertically, a guide way on said bar extending in a horizontal direction a push-bar slidable longitudinally in said guide and carrying said wipers, and means for rocking the rocker-bar and moving the push bar in timed relation to each other.

15. In a lasting machine, the combination with wipers pivoted together to close upon the heel or toe of a last, of crossed levers pivoted together at their point of intersection and each pivotally attached at one end to one of the wipers means engaging the opposite ends of said levers to move said ends toward each other to close the wipers when said levers and wipers are moved from said means, and means for so moving the levers and wipers.

16. In a lasting machine, the combination with wipers pivoted together to close upon the heel or toe of a last, of crossed levers piv-



oted together at their point of intersection and each pivotally attached at its forward end to one of the wipers, a member having inwardly and forwardly extending guides to  
 5 guide the rear ends of said levers, means for yieldingly preventing the forward movement of said member, and means for moving forward the levers with their attached wipers.

17. In a lasting machine, the combination  
 10 with wipers pivoted together to close upon the heel or toe of a last, of means for opening and closing said wipers, a member having a fixed movement to actuate said means, and a yielding member to vary the effect of the  
 15 fixed movement of said member according to the resistance offered by the work to the closing of said wipers.

18. In a lasting machine, the combination  
 20 with wipers pivoted together at their adjacent sides, of crossed levers pivoted together at their point of intersection and to the wipers at their forward ends, a member held against forward movement and having forwardly and inwardly inclined slots to guide  
 25 the rear ends of said levers, and a forwardly movable member attached to the pivot of said levers at their crossing point.

19. In a lasting machine, the combination  
 30 with pivoted wipers adapted to be closed upon the heel or toe of a last in the lasting operation, of a forwardly and rearwardly movable member, crossed levers pivoted to said member at their point of intersection and pivotally attached at their forward ends  
 35 to the wipers, a member having forwardly and inwardly inclined guide slots to guide the rear ends of said levers, a spring to yieldingly resist the movement of said member having said slots.

40 20. In a lasting machine, the combination with pivoted wipers adapted to be closed upon the heel or toe of a last in the lasting operation, of a forwardly and rearwardly movable member, means carried by said

member to operate the wipers and actuated 45 by its forward movement to close the wipers, a clamping foot carried by said member to clamp the upper of a boot or shoe to the forming edges of the wipers, and means for actuating the foot operated by the rearward 50 movement of said member to release the upper.

21. In a lasting machine, the combination  
 with pivoted wipers, of a forwardly and rearwardly movable actuating member, means 55 for opening and closing the wipers carried by said member and actuated by the forward movement of said member to close the wipers, a support for a last upon which last a shoe upper and sole are adapted to be secured for 60 lasting, a toe plate adapted to engage the sole adjacent to its edge at the toe and hold said edge down upon the last, and means carried by said actuating member to engage and move said plate out of the path of the wiper. 65

22. In a lasting machine, means for holding and clamping a last and upper in position to be lasted, means for lasting the upper, power operating mechanism for the aforesaid parts, and means within the control of the 70 operator enabling the operator to stop the machine at will after the last and upper have been clamped.

23. In a lasting machine, means for holding and clamping a last and upper in position 75 to be lasted, means for lasting the upper, power operating mechanism for the aforesaid parts, and means within the control of the operator enabling the operator to stop the machine at will after the last and upper have 80 been clamped, and also after the upper has been lasted.

In testimony whereof I affix my signature in presence of two witnesses.

CHARLES F. PYM.

Witnesses:

OTTO F. BARTHEL,

LA VERNE F. GILLET.