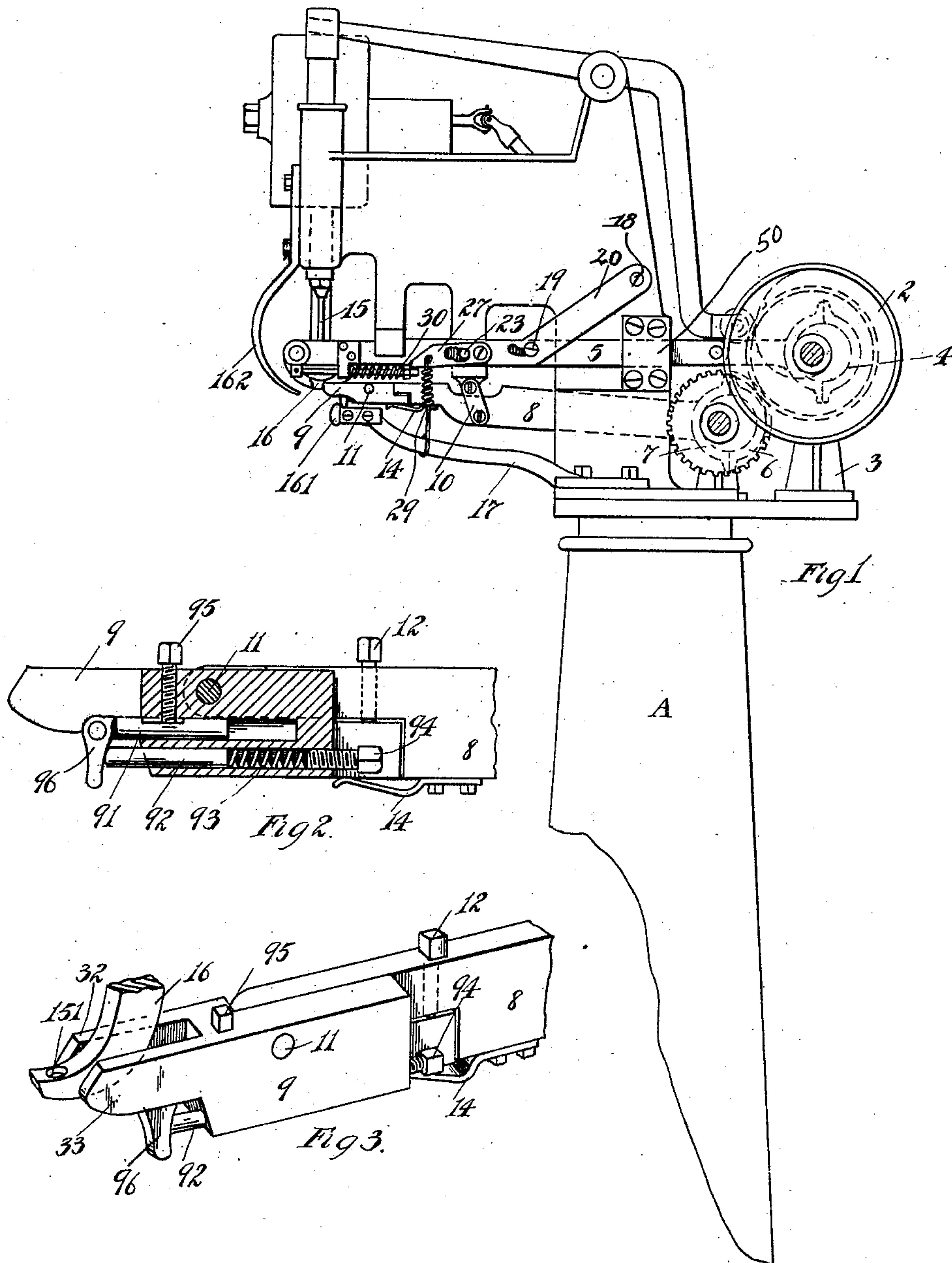


No. 865,936.

PATENTED SEPT. 10, 1907.

C. F. PYM.
LASTING MACHINE.
APPLICATION FILED MAY 25, 1903.

3 SHEETS—SHEET 1.



WITNESSES
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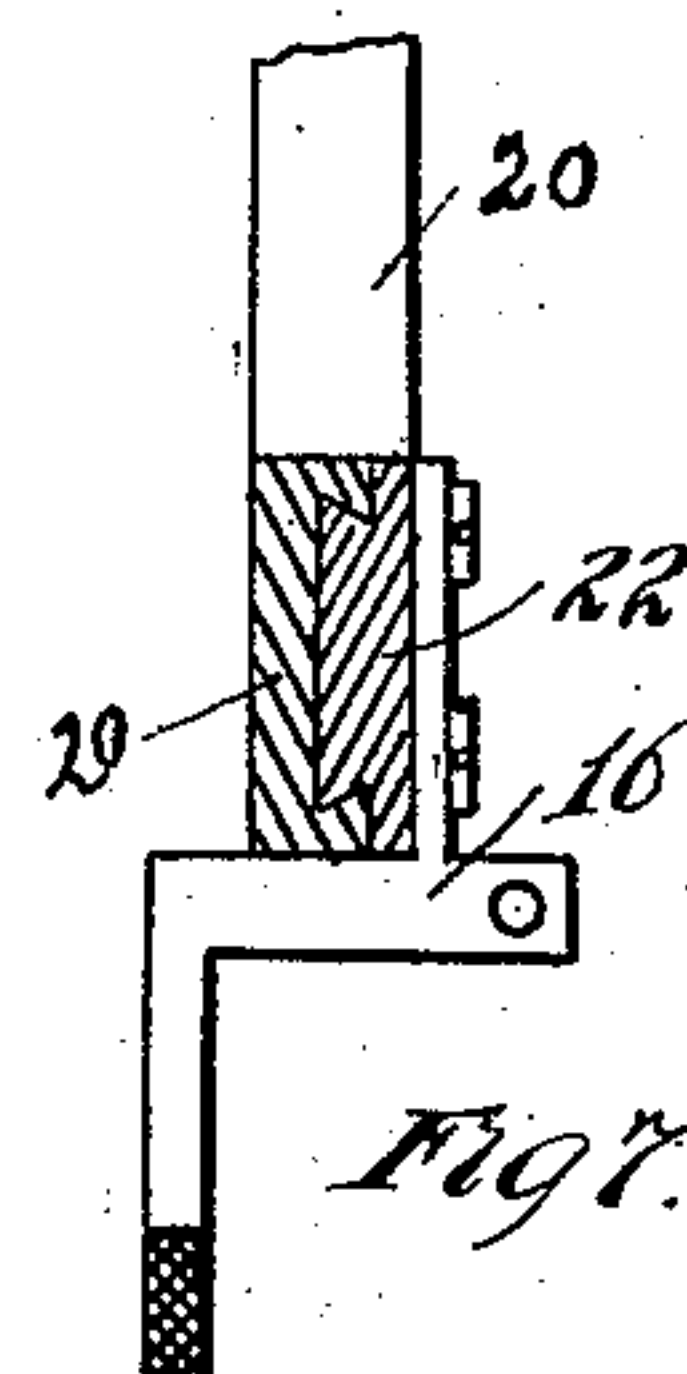
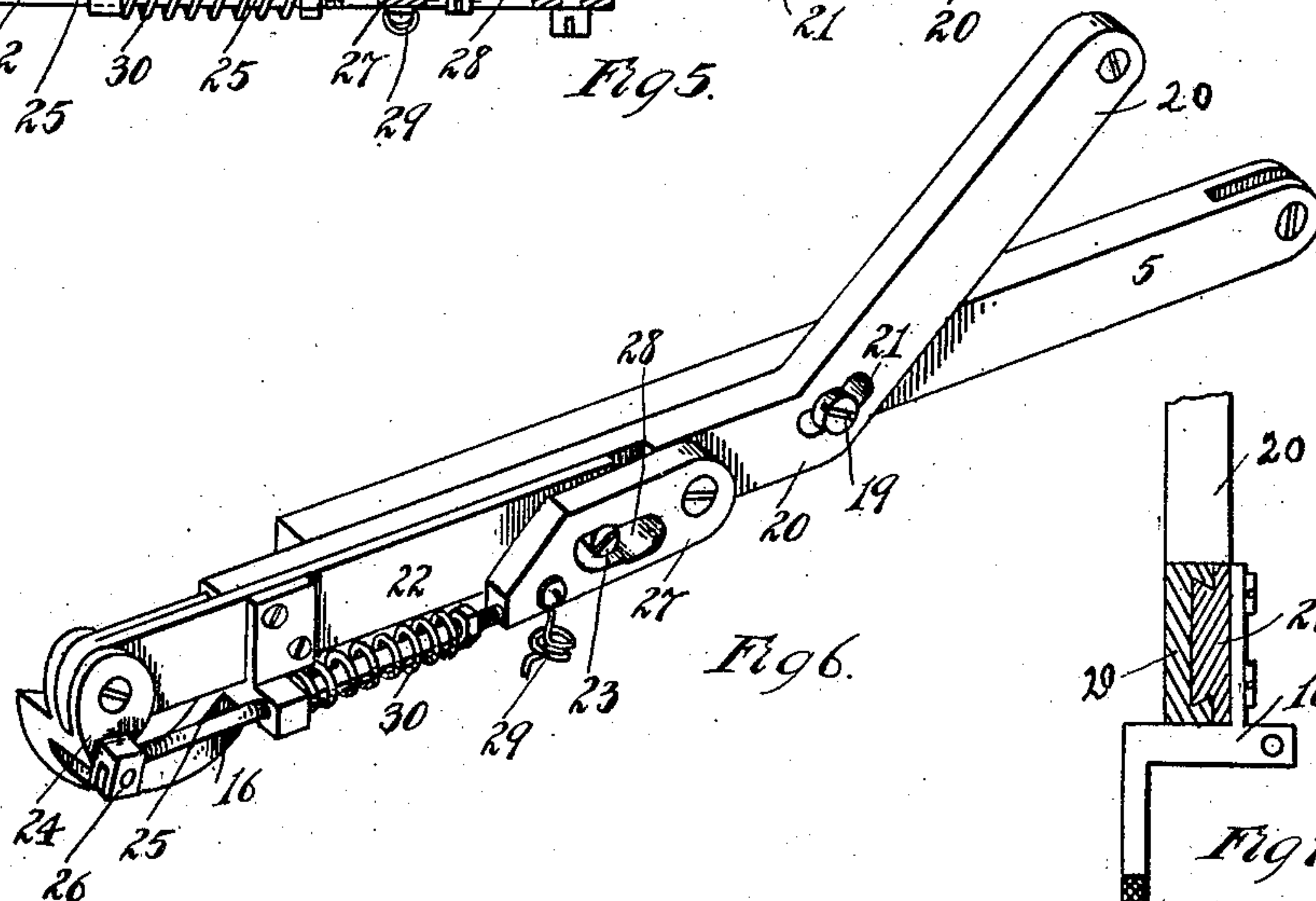
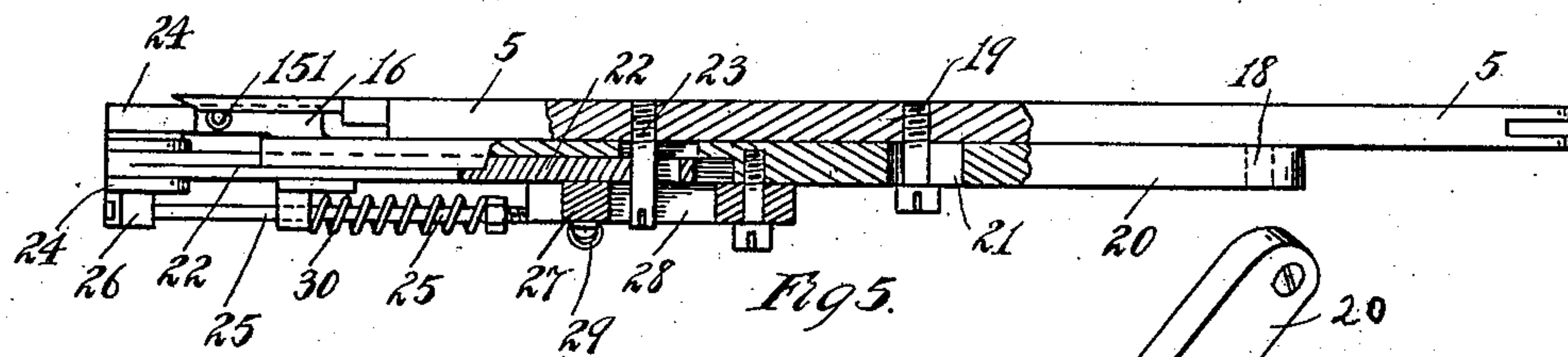
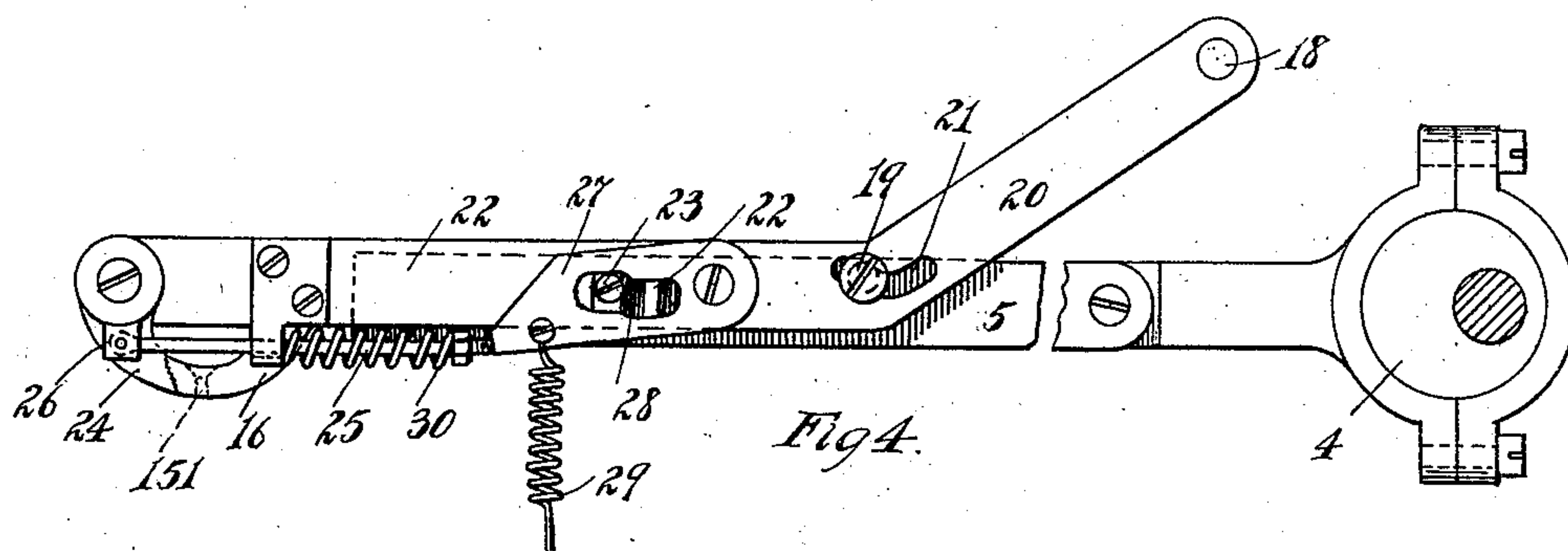
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3 SHEETS—SHEET 2.



WITNESSES

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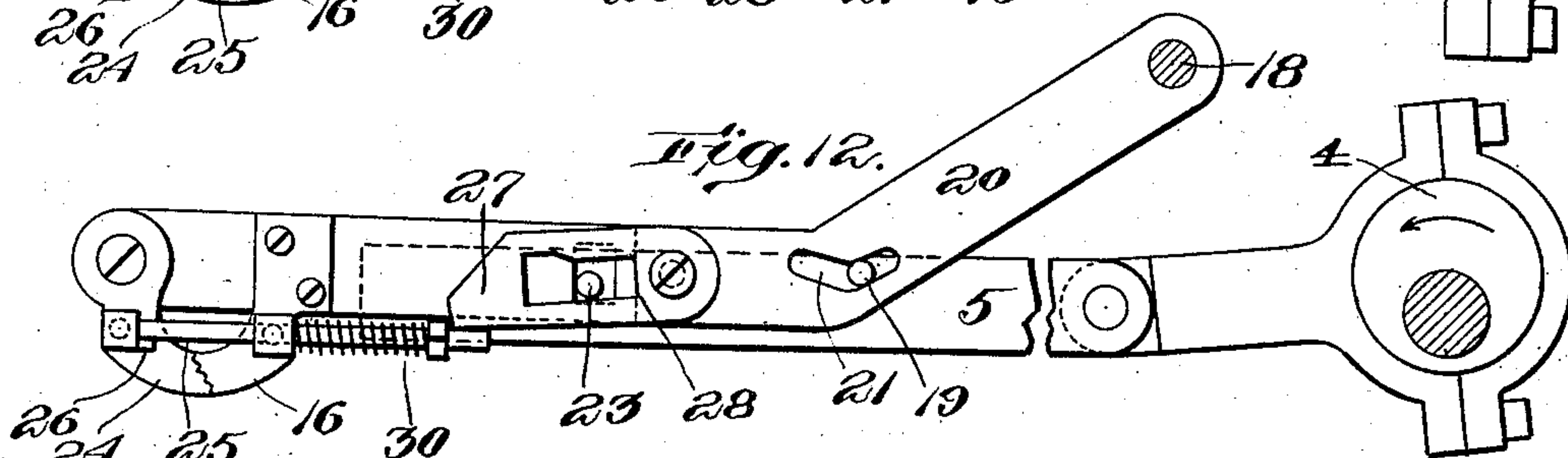
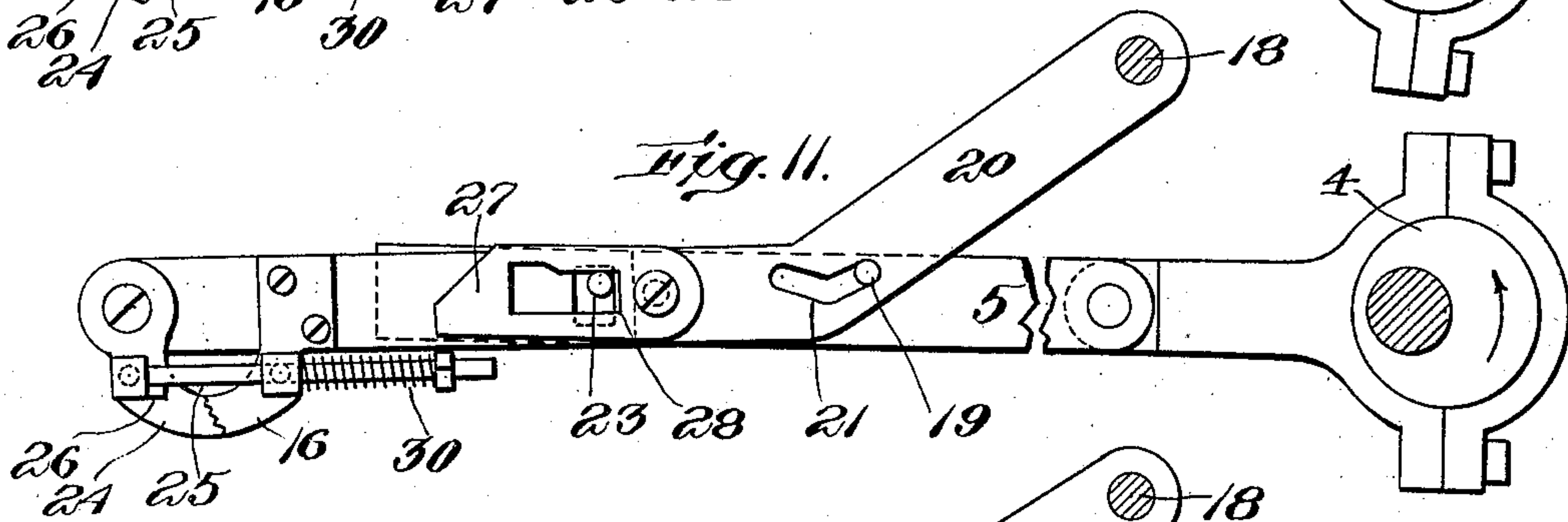
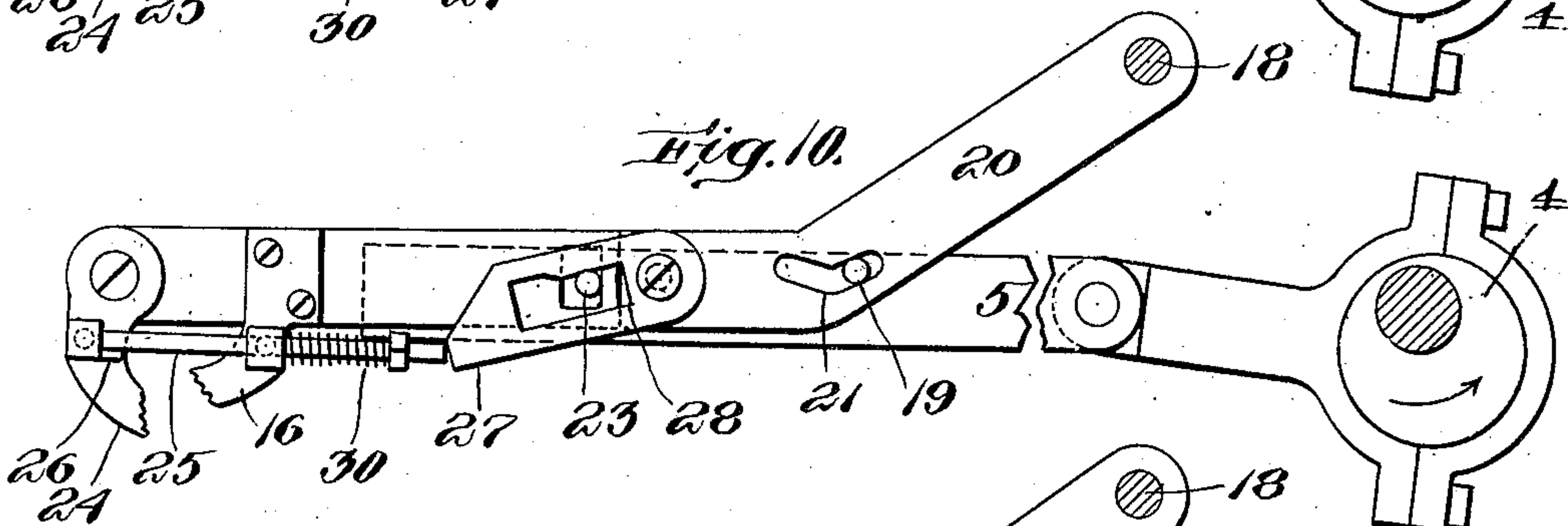
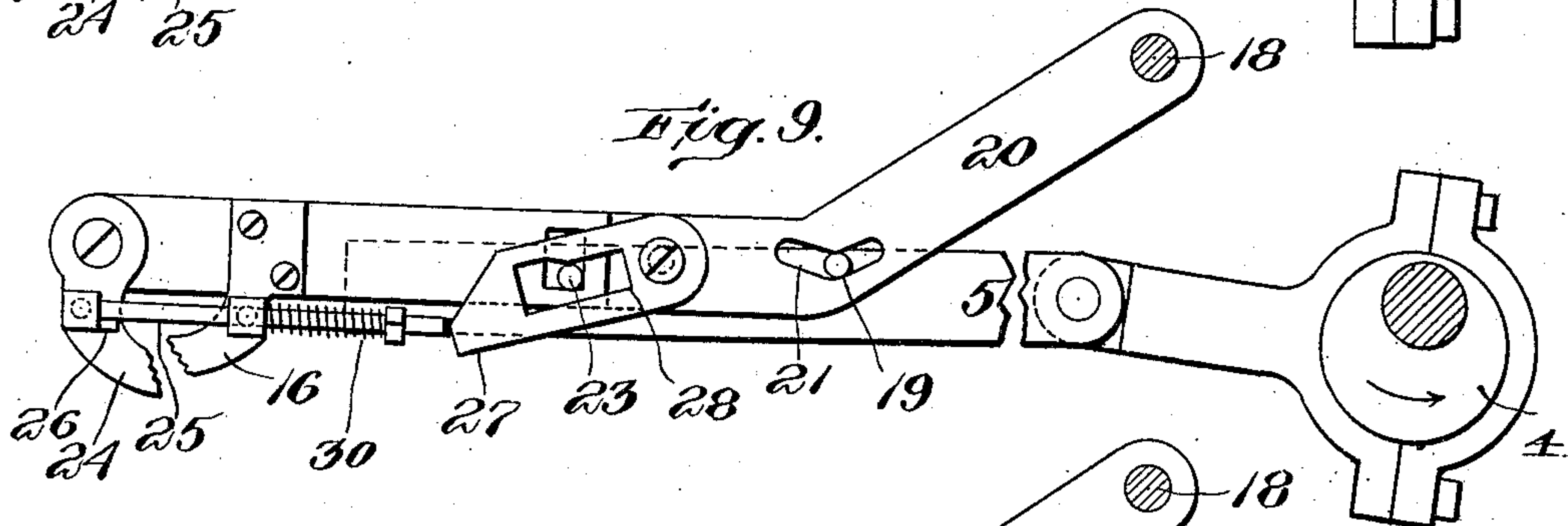
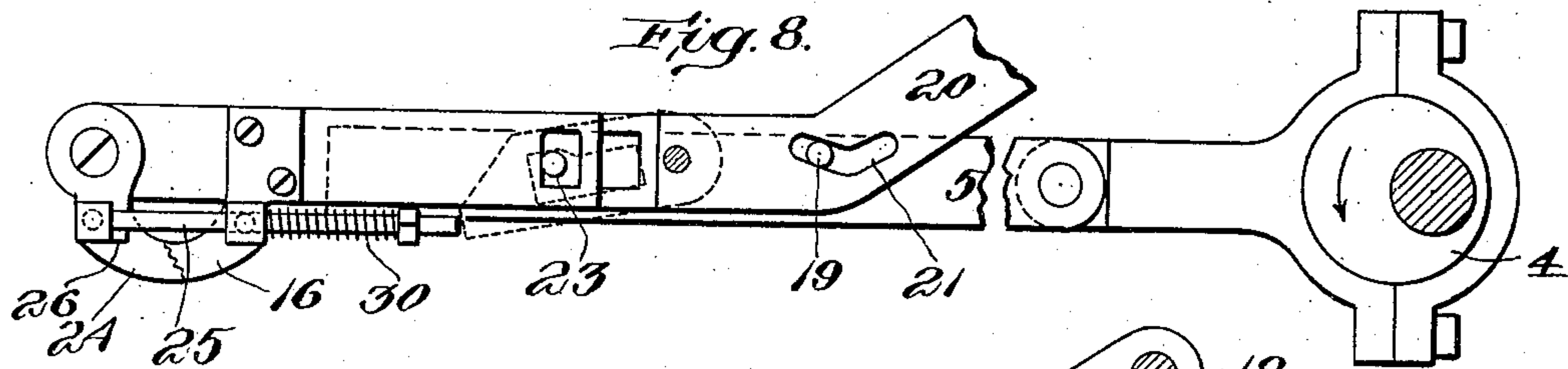
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C. F. PYM.
LASTING MACHINE.
APPLICATION FILED MAY 25, 1903.

3 SHEETS—SHEET 3.



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UNITED STATES PATENT OFFICE.

CHARLES F. PYM, OF ESSEX, ONTARIO, CANADA, ASSIGNOR OF ONE-HALF TO KRENTLER BROTHERS COMPANY, OF DETROIT, MICHIGAN.

LASTING-MACHINE.

No. 865,936.

Specification of Letter's Patent.

Patented Sept. 10, 1907.

Application filed May 25, 1903. Serial No. 158,660.

To all whom it may concern:

Be it known that I, CHARLES F. PYM, a subject of the King of Great Britain, residing at Essex, county of Essex, Province of Ontario, Canada, have invented a certain new and useful Improvement in Lasting-Machines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a shoe or boot lasting machine, and has for its object an improved machine that is used to properly pull and fold the edge of the upper over the sole at the time that the shoe is lasted.

In accordance with my invention, I provide a slow stretching movement in connection with a rapid wiping and crimping movement, and drive the tack before the pincers let go of the upper. The pincers get a low hold on the upper; then travel straight up, then over forward and down, the tack being driven at the extreme end of the pulling movement before the leather is released. This action taken together with the yielding of the pincers makes it practically impossible to tear the leather. The leather is pulled, and worked forward by the incessant wiping action of the smoothing devices and at the same time is gently hammered along the side of the last; so that after the pincers have taken hold of the leather and while they are slowly stretching the leather into place, the leather is being thereby caused to stretch uniformly and quickly, and just as it is fully stretched the tack is driven.

In the drawings:—Figure 1, is a side elevation of the entire machine, showing both the lasting part and the nailing part. Fig. 2, is a detail of the creasing and smoothing finger. Fig. 3, is a perspective of the finger. Fig. 4, is a side elevation showing in detail an automatic pincers used to pull the leather. Fig. 5, is a plan view partly in section of the pincers shown in Fig. 6. Fig. 6, is a perspective of the pincers. Fig. 7, is a cross-section near the front end of the arm 22. Figs. 8—12 are views similar to Fig. 4, showing the parts in the various positions assumed by them through a cycle of movement the slot 28 being enlarged, and parts omitted, for clearness of illustration.

A indicates a pedestal which supports the working parts of the machine.

2 indicates the main driving wheel supported on a pillar 3, and having on its shaft an eccentric 4, which actuates a reciprocating pitman 5, and the reciprocating pitman 5, carries at its forward end the jaws of a pair of pincers which will be more fully hereinafter described.

On the shaft of the wheel 2, is a spur gear that meshes with the smaller spur gear 6 whose shaft carries a sec-

ond eccentric 7 that actuates a reciprocating pitman 8; and the reciprocating pitman 8 carries at its forward end the finger 9 shown in detail in Figs. 2 and 3. The pitman 8 is supported intermediate its ends by means which allow reciprocation, but limit other motion, as by a hanger 10 pivoted to a fixed part of the machine and pivoted to the pitman. At its forward end there is pivoted to the pitman a finger 9 by pin 11, and this finger 9 is adjustably limited in its oscillation on the pin 11, by a screw 12, that is inserted vertically through a part of the pitman 8, which overhangs the finger or a part thereof; the screw 12 engages near the rear end of the finger 9. The rear end of the finger 9 is pressed by a leaf spring 14, that is secured to the pitman 8. The finger 9 has a reciprocating motion in connection with the reciprocation of the pitman 8 and it is capable of a slight oscillatory motion on the pin 11. The forward end of the finger is forked and the fork straddles a jaw of the pincers, and the nail spout 15 of the nailer hangs immediately in front of the openings. Underneath the finger is an adjustable, but otherwise stationary rest 16, supported on bracket arm 17.

Underneath the forked part of the finger 9 and in the main part of the finger, are inserted two short plungers, 91 and 92; the lower of these plungers is pressed forward by a spring 93 which is adjustable as to tension by a pressure screw 94; the upper plunger 91, is retained by a screw 95; this plunger has pivoted to its forward end a hanger 96 that bears against the side of the shoe under treatment; the hanger 96 has the compound action resulting from the reciprocation of the arm 8, the oscillation of the finger on the pin 11 and the sliding and swinging motion of the hanger due to the motions of the plungers 91 and 92 and because of this rapid motion and the fact that it moves perpendicularly against the side of the last, it pounds and hammers the leather with a series of blows, following each blow with a rapid, sliding movement over the leather, as the smoothing finger continues forward.

The fork at the front end of the finger straddles what I will term the "fixed jaw" 16, of the pincers; this jaw 16 of the pincers is fixed to the slide 22, which reciprocates with respect to the arm 20; the arm 20 itself swings from a pivot 18 that holds it to the body of the machine. The arm 20 is connected by a pin 19 to the pitman 5, the latter being guided in a rectilinear motion by a fixed guide 50. The arm 20 is given a peculiar swinging movement by a slot 21 through which the pin 19 passes, said arm carrying at its free end a slide 22 that is connected by a pin 23 which projects from the pitman 5 and engages the extremities of a slot 28 in the slide 22 and thereby reciprocates the latter. The slot 28 through which the pin 23 passes is larger than

the pin, there being a clearance between the pin and the walls of the slot. The forward and rearward ends of the slot 21 are higher than the middle, the slant of the rear part of said slot being more abrupt than the slant of the front part. The slide 22 is reciprocated by the pitman 5 and swings with the arm 20, but as the motion of the arm 20 is itself produced by the arm 5, and is not a regular swinging motion, because of the irregular shape of the slot 21, in which the pin 19 engages, the motion of the slide is compound to a considerable degree. The eccentric 4 turns over to the left and serves simply to impart the forward and backward movement, and because of the arrangement of the arm 20 and the peculiar shape of the slot 21 and the construction already explained, the pincers are caused to take a low hold of the stock and then travel straight up, then over forward and down upon the last in the same plane with the smoothing finger, the tack being driven at the extreme end of this movement, whereupon the pincers are released from the leather, rise and then retreat, and move downward for a new hold upon the leather. The cycle of these movements is shown in Figs. 8—12.

The jaw 16 is fixed to the slide 22, and the same slide 22 has pivoted to its front end a pivoted jaw 24. The pivoted or oscillatory jaw 24, is actuated by a push rod 25 that is pivotally connected to a crank arm 26 on the hub of the jaw. A swinging stop 27 is pivoted to the arm 20 at the rear of the slide 22, and is controlled in its swinging motion by the pin 23, which projects through a slot 28 in the stop, and the stop is also controlled by a spring 29, which constantly strains it downward against the motion which it has in unison with the swinging arm 20, and against a further oscillatory motion which it has in addition to that of the swinging arm; the further motion is due to the interaction of the pin 23, and the top wall of the irregular slot 28. The rear part of the slot 28, is on a lower plane than the forward part, and when the pitman 5 is drawn back, drawing back the pin 23, the pin 23, enters the lower part of the slot 28 and lifts the forward end of the swinging stop 27, at the same time that its normal action due to its connection with the arm 20 has brought it down. But this described upward swing of the forward end of the stop 27 swings it clear from the end of the rod 25, and the end of the rod slips under, and the spring 30 closes the jaws 16 and 24, tightly together; this takes place at about the close or somewhat before the end of the backward stroke of the pitman 5, and the jaws remain closed while the pitman makes its forward stroke, and until the pitman has nearly completed its forward stroke and carried the rod forward until its rear end passes beyond the end of the swinging stop 27. As soon as the rear end of the rod has passed beyond the forward end of the swinging stop 27, the spring 29 acts to pull the forward end of the stop down into the path of the rod which is about to return on its back stroke, and the rod in returning, abuts against the end of the stop and the jaw is forced open and remains open until the pitman nears the end of its back stroke when it is again closed. The fixed jaw 16 works between the prongs 32 and 33 of the forked finger 9.

The nail is driven through the nail spout 15 and through a hole 151 in the jaw 16 at a time when the

jaw 16 is for an instant at rest between the close of the forward stroke and the beginning of the retreat of the slide, on the return stroke, provision for such temporary cessations of the movement of the slide is made by the clearance that is allowed around the pin 23, and between it and the slide; the nailing mechanism is not herein described, as any kind of nail or tack driving mechanism may be used. In action it is of course made to register with the moving parts contained in this lasting machine so that the nail may be driven at the proper instant of time.

The shoe is held against the rest 161 and against a curved rest 162, that hangs from the hammer guide.

The movement of any particular part of the various structures is highly complex, but the movement of the pincers as a whole may be considered as orbital in a path determined by the location of the several centers of motion, so also the movement of the smoothing finger may be considered as orbital, in each case the part leaves the last during the latter part of its forward stroke rising therefrom and returns free from contact therewith.

What I claim is:—

1. In a lasting machine, tack-driving mechanism, in combination with pincers and pincer-operating mechanism, and a smoothing finger and its operating mechanism, constructed and arranged to move the pincers and smoothing finger into holding engagement with the leather and into position to operate on the leather in stretching it down flat on the bottom of the last and to maintain said engagement while the leather is being tacked, the pincer-operating mechanism serving to hold the pincers down hard upon the last and leather during the tack driving.
2. In a lasting machine, tack-driving mechanism, in combination with pincers and pincer operating mechanism, and a smoothing device and its operating mechanism, the smoothing device being located adjacent the pincers, constructed and arranged to move the smoothing device rapidly a plurality of times adjacent and during one slow movement of the pincers, previous to the operation of the tack-driving mechanism to drive a tack.
3. In a lasting machine, tack-driving mechanism, pincers for positively gripping and pulling-over the upper, and operating mechanism causing said pincers to retain their positive pulling grip upon the upper leather until the tack is driven, combined with auxiliary rubbing means constructed and arranged to reciprocate rapidly a plurality of times to one pulling movement in smoothing and pressing the leather forward as it is being pulled by the pincers previous to said tacking operation.
4. In a lasting machine, tack-driving mechanism, pincers for positively gripping and pulling-over the upper, operating mechanism causing said pincers to retain their positive pulling grip upon the upper until the tack is driven, auxiliary means operating just behind said pincers for smoothing and pressing forward the leather as it is being pulled by the pincers, and means for imparting to said auxiliary means a high speed in rubbing contact with the leather while the pincers are pulling the leather slowly forward ahead of said smoothing means.
5. In a lasting machine, pulling-over pincers, operating means therefor, a smoothing device, and means operating during the pulling movement of the pincers to cause said smoothing device to engage the leather repeatedly with a pushing movement faster than the pulling movement of said pincers.
6. In a lasting machine, pulling-over pincers for gripping and pulling the upper over the last, means for imparting to said pincers a slow pulling movement, smoothing mechanism for working said pulled leather forward, including a side-pounding device, and operating means for said mechanism causing the latter to engage the leather rapidly with a sliding, rubbing movement.
7. In a lasting machine, the combination of slow-moving

pulling-over pincers, a quick-moving smoothing device, and a quick-moving side pounding device, all three parts being capable of independently yielding in their engagement with the upper, and actuating mechanisms for said three parts constructed and arranged to permit a plurality of movements of the smoothing device and pounding device to a single pulling movement of the pincers.

8. In a lasting machine, pulling-over pincers, and operating mechanism constructed and arranged to move said pincers upwardly and then forwardly and into pressing engagement with the upper-leather and last, said pincers and operating mechanism being constructed and arranged to press the leather flat down upon, and in contact with, the last from the edge of the last to the pincers.

9. In a lasting machine, tack-driving mechanism, pulling-over pincers, and operating mechanism constructed and arranged to move said pincers upwardly and then forwardly and into pressing engagement with the upper-leather and last, said pincers and operating mechanism being constructed and arranged to press the leather flat down upon the last at the nailing point, including means for maintaining said pincers closed on the leather until the tack is driven.

10. In a lasting machine, a tack-driver and its operating mechanism, combined with pulling-over pincers and their operating mechanism, constructed and arranged to move said pincers with a stretching upward-and-forward movement terminating in a stationary pressing contact against the last and against the shoe upper, said pincers being constructed to force the shoe upper in a downward direction against the last at the point receiving the tack, while the tack is being driven.

11. In the smoothing finger of a lasting mechanism, in combination with a finger provided with forked prongs adapted to rest over the last, and a hanger carried by said finger, a sliding stem pivotally supporting said hanger and extending along the underside of said finger and its supporting means, and a sliding abutment behind said hanger.

12. In a lasting machine, in combination with a smooth-

ing finger, means for producing an orbital movement thereof, a hanger, a yielding stem for said hanger, and a yielding abutment behind said hanger.

13. In combination with a smoothing finger for a lasting machine, a hanger, a yielding stem for said hanger, a yielding abutment behind said hanger, and means whereby the resistance of said abutment may be adjusted.

14. In a lasting machine, the combination of a reciprocating arm, a finger pivoted to the end of said arm, a spring retainer limiting the movement of the finger with respect to said arm, an abutment carried by said finger, but arranged to yield with respect thereto, a pivoted hanger, and a yielding stem for said hanger.

15. In a lasting machine, the combination of a reciprocating arm, and means for actuating the same, a swinging arm pivotally connected to said arm, a sliding pincer support carried on the swinging arm and means for producing actuation of the pincer support by the reciprocating arm, a pincer jaw fixed to the slide, a second pivoted pincer jaw, a pivoted abutment carried on the swinging arm arranged to engage the jaw actuator, and means whereby the pivoted abutment may be swung.

16. In a lasting machine, the combination of a nailing mechanism, a smoothing finger having a forked end, means for causing the same to reciprocate horizontally, pincers having a fixed and a movable jaw, said fixed jaw engaging between the forked ends of said smoothing finger and containing a nail-passage to guide a nail into position for driving before the material is released from engagement between the two jaws, and actuating means for said pincers, including means for actuating one of the jaws of said pincers and means for thereafter causing the contemporaneous actuation of both jaws.

In testimony whereof, I, sign this specification in the presence of two witnesses.

CHARLES F. PYM.

Witnesses:

MAY E. KOTT,

CHARLES F. BURTON.