

945,770.

W. E. ELLIOTT.
TREADLE OPERATED MACHINE FOR SETTING STAPLES.
APPLICATION FILED MAR. 12, 1907. RENEWED APR. 26, 1909.
Patented Jan. 11, 1910.
3 SHEETS—SHEET 1.

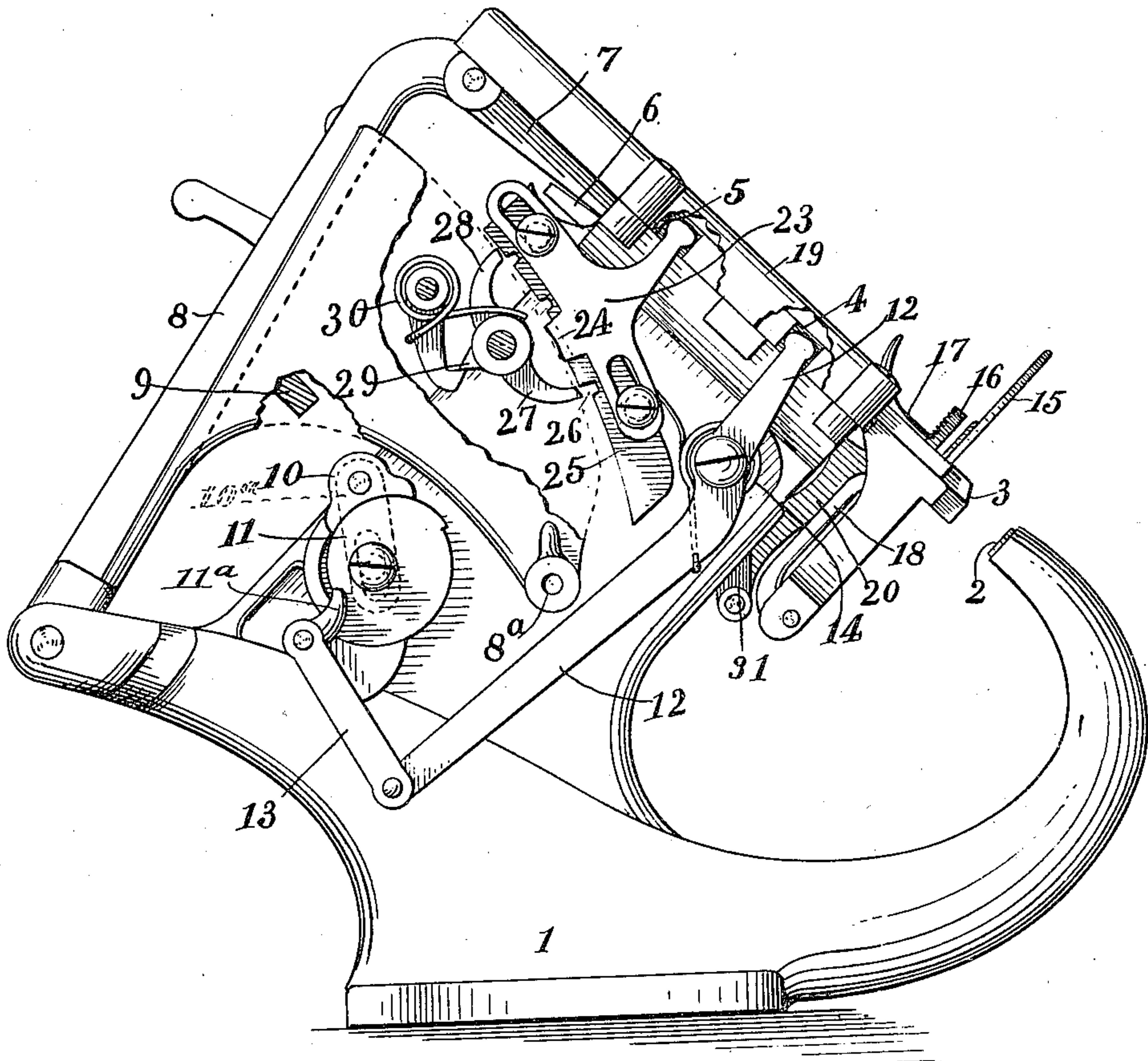


Fig. 1.

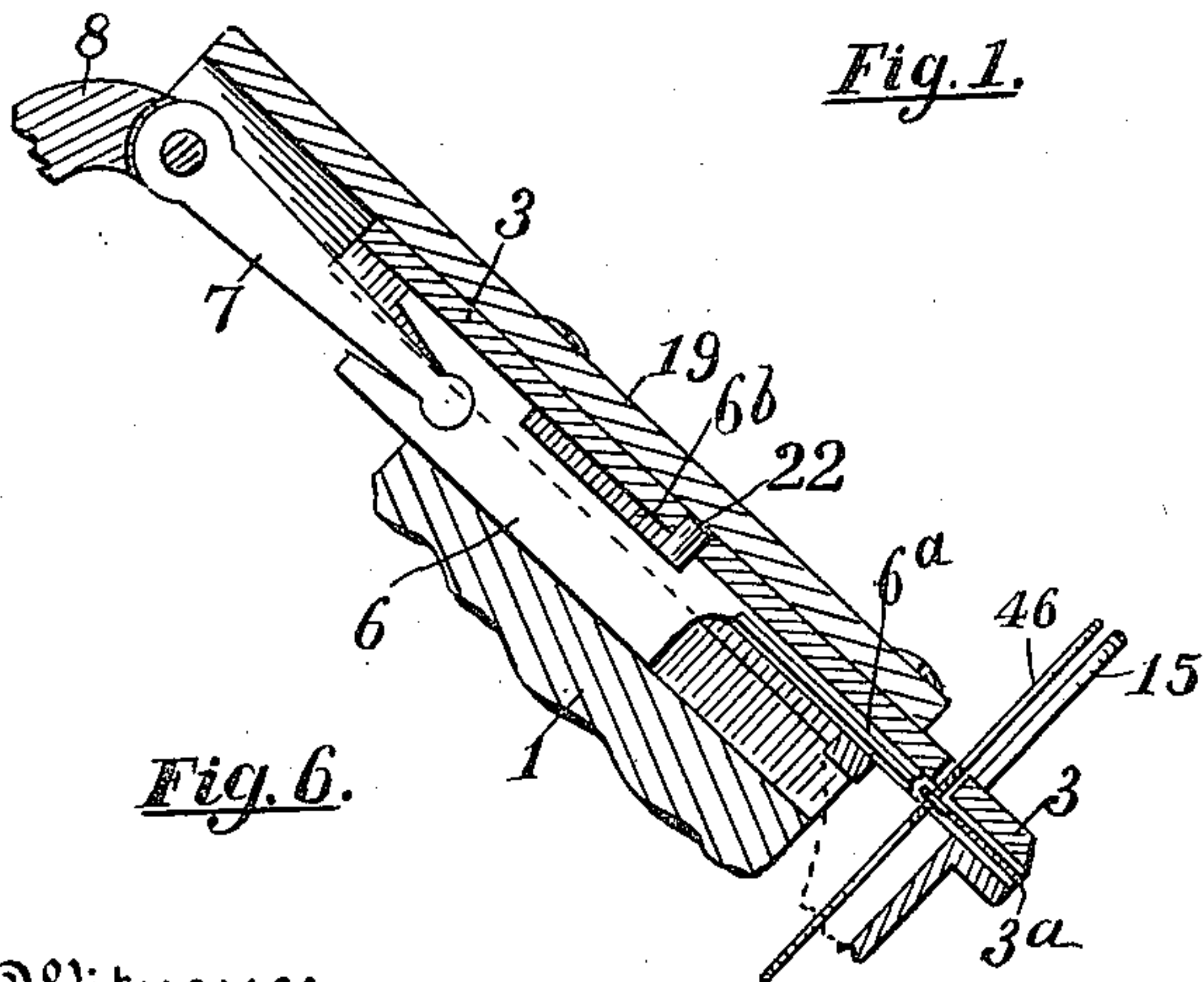


Fig. 6.

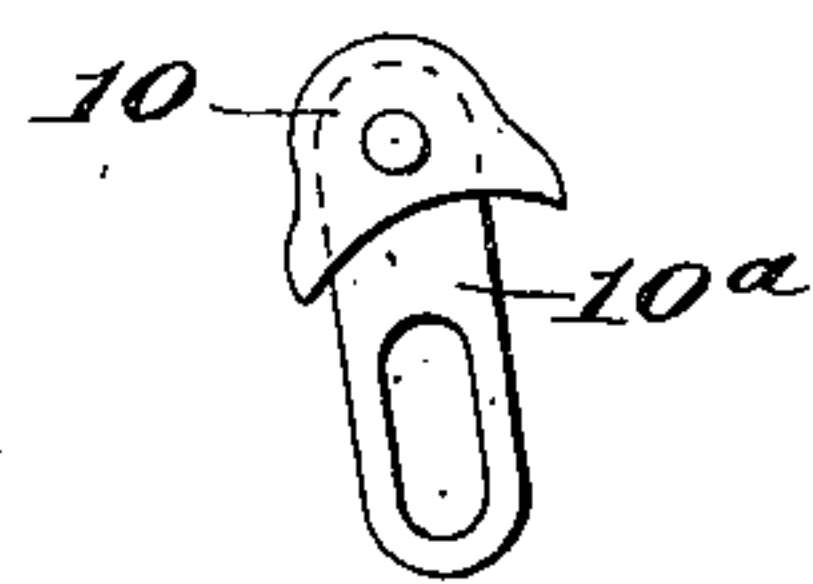


Fig. 7.

Witnesses
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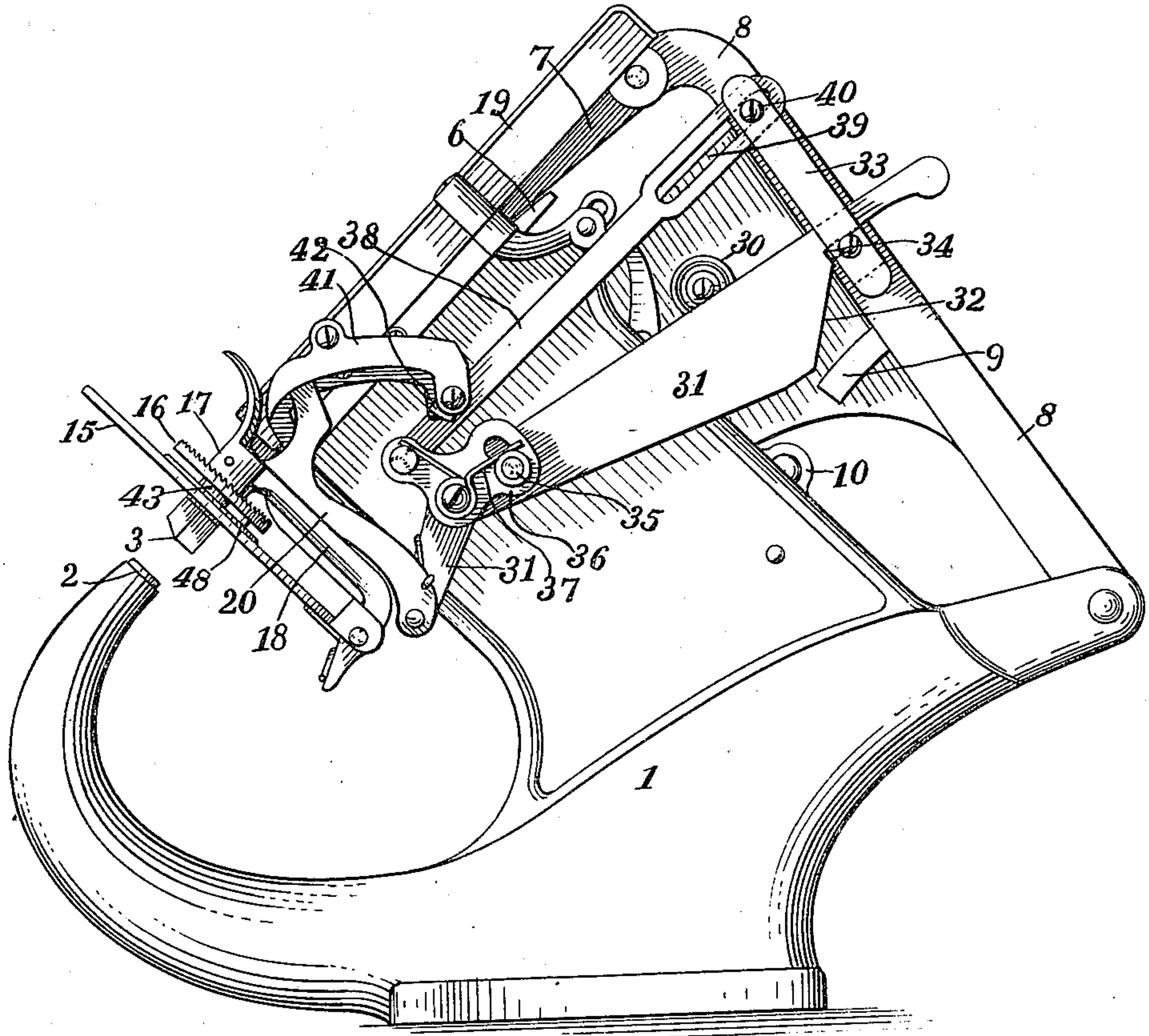


Fig. 2.

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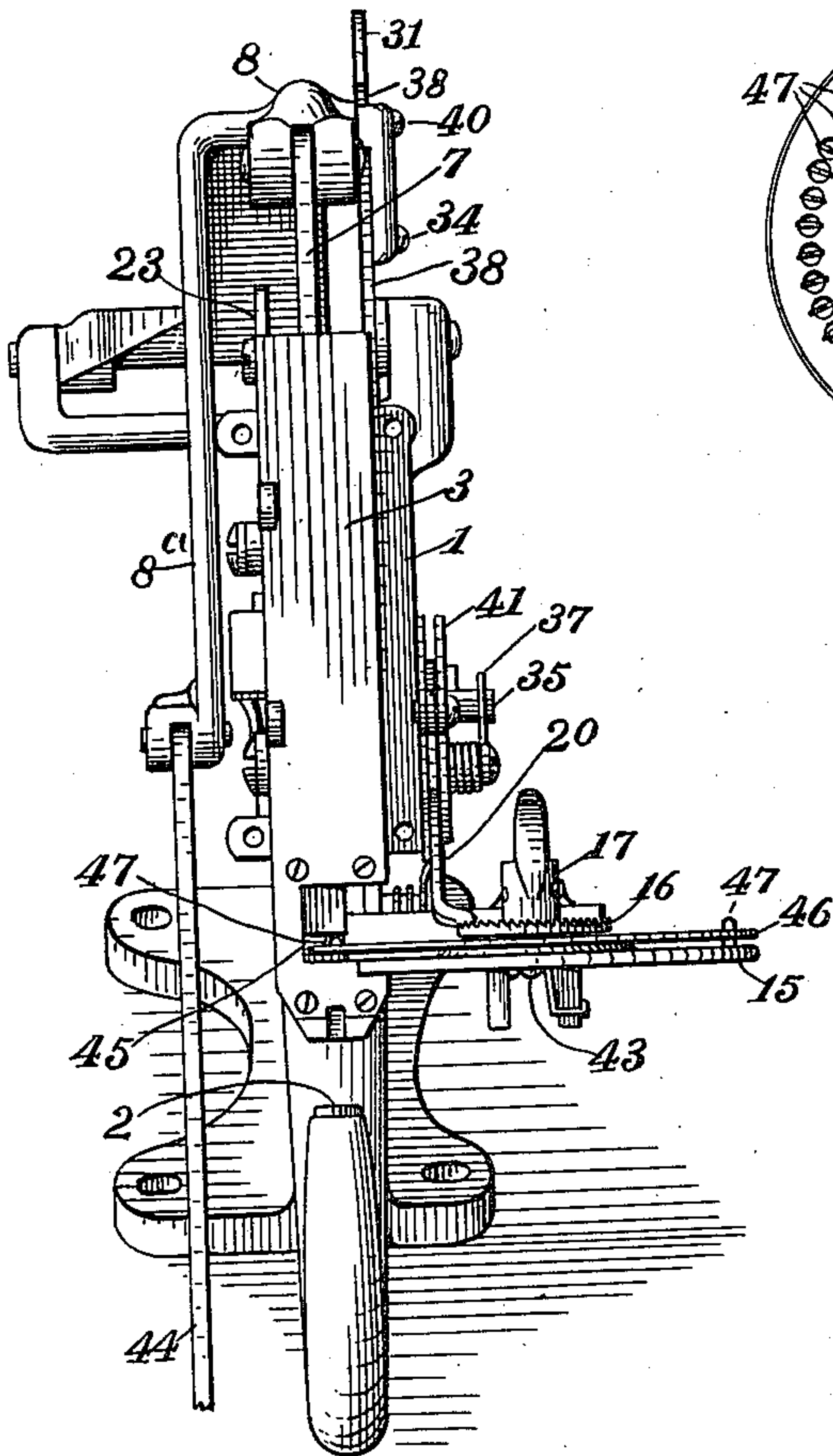


Fig. 3.

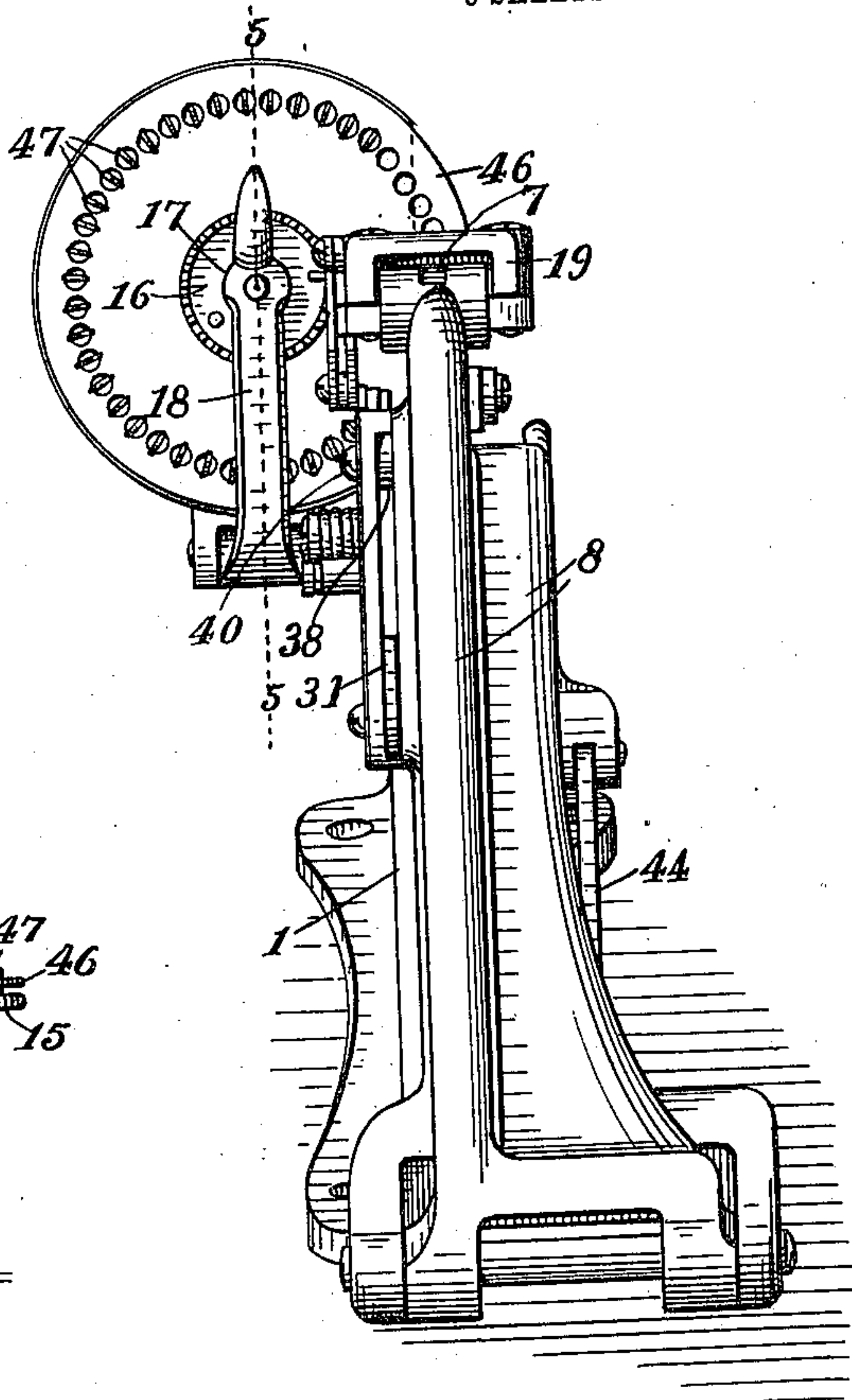


Fig. 4.

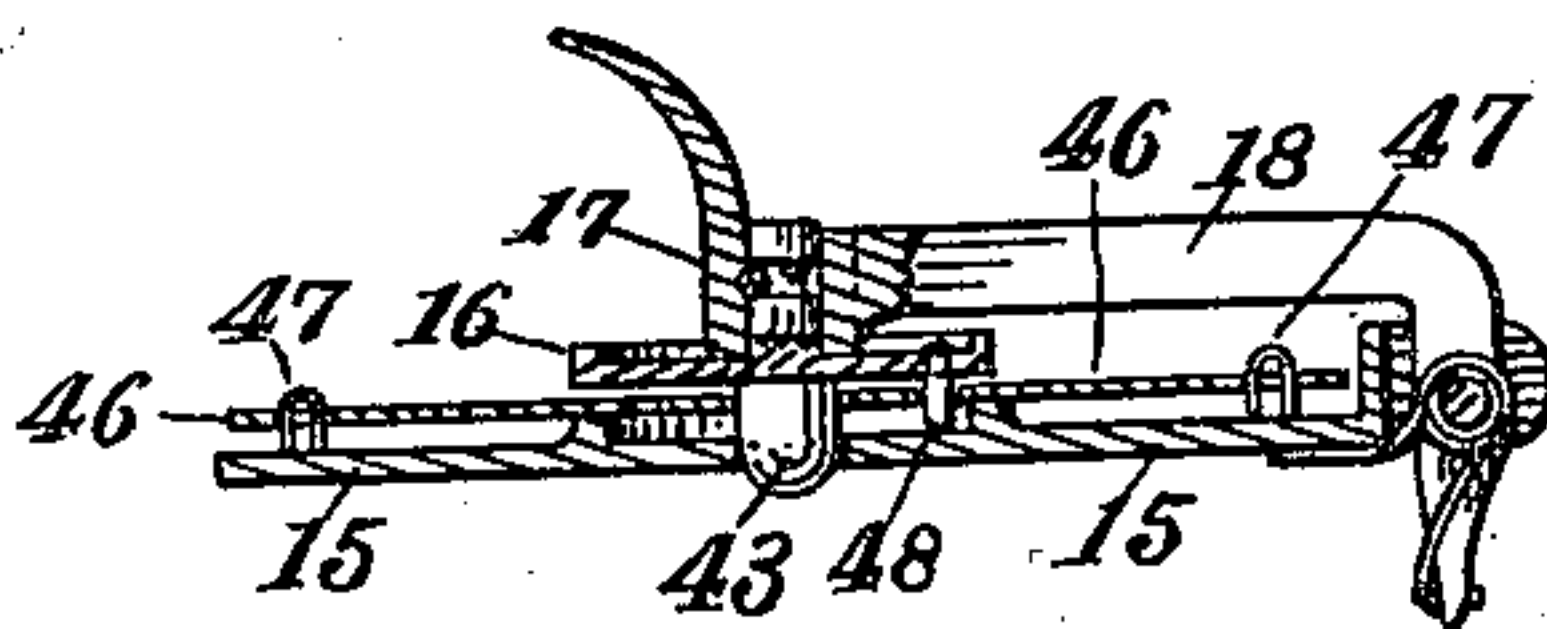


Fig. 5.

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UNITED STATES PATENT OFFICE.

WILLIAM E. ELLIOTT, OF GRAND RAPIDS, MICHIGAN.

TREADLE-OPERATED MACHINE FOR SETTING STAPLES.

945,770.

Specification of Letters Patent.

Patented Jan. 11, 1910.

Application filed March 12, 1907, Serial No. 361,897. Renewed April 26, 1909. Serial No. 492,316.

To all whom it may concern:

Be it known that I, WILLIAM E. ELLIOTT, a citizen of the United States of America, residing at Grand Rapids, in the county of Kent and State of Michigan, have invented certain new and useful Improvements in Treadle-Operated Machines for Setting Staples; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in treadle operated machines for setting staples, rivets, and other analogous fastenings, and its object is to provide the same with automatic means for adjusting and limiting the stroke of the driver, to provide improved means for preventing an incomplete operation of the machine before returning to starting position, and to provide the device with various new and useful features hereinafter more fully described and particularly pointed out in the claims.

My invention consists essentially of an unyielding and adjustable stop separate from the guide to limit the stroke of the lever that operates the driver and means for connecting the stop with the guide of the machine, whereby the guide adjusts the stop according to various thicknesses of material placed between the guide and die; in a pawl adapted to prevent any return stroke until the working stroke is completed; a stop to prevent operating the machine when there is no staple in the guide and in the various combinations and arrangement of parts, substantially as illustrated in the accompanying drawings, showing a staple setting machine embodying my invention, in which drawings:

Figure 1 is a side elevation of the machine showing the adjustable stop; Fig. 2 an elevation of the other side of the machine. Fig. 3 a front view of the machine with the cap removed to show the guide; Fig. 4 a plan at right angles to Fig. 3; Fig. 5 a sectional detail on the line 5—5 of Fig. 4; Fig. 6 a detail of the driver and guide; and Fig. 7 a detail of the adjustable stop and slide.

Like numbers refer to like parts in all of the figures.

1 represents the frame of the machine provided with a rigid curved arm terminat-

ing in a clenching die 2 located opposite a longitudinally movable staple guide 3. Slidable in this guide is a driver 6 to drive the staple through the material and against the clenching die 2.

7 is a rod connecting the driver with the movable end of a pivoted arm 8 provided with a downward extension 8^a to which is pivotally attached a rod 44 operated by a treadle (not shown) to depress the arm and operate the machine.

9 is a shoulder on the arm 8, which shoulder engages an adjustable stop 10 pivotally mounted on a longitudinally movable slide 10^a and having a concave surface engaging an eccentric 11, which eccentric adjusts the stop. To rotatively adjust the eccentric 11, a lever 12 is provided which is pivoted on the frame intermediate its ends, and connected at one end to a rigid arm 11^a on the eccentric, by means of a rod 13. The other end of said lever engages a recess 4 in the guide 3, whereby the guide serves to move the lever and adjust the stop according to the thickness of the material engaged by the guide, the lever thus turning the eccentric and lowering the stop 10 as the guide descends.

14 is a spring which engages the lever 12 and turns the same on its pivot to yieldingly move the guide 3 toward the die 2. In the guide is a pin 22, which engages the lower end of an elongated recess in the driver to raise the guide away from the die, and traverse said recess to permit the driver to descend after the guide engages the material placed on the die.

15 is a bed plate fixed on the guide 3. Above this plate is a crown ratchet wheel 16 mounted on a stud 43 rotative in a head 17 on the movable end of an arm 18 pivoted at the other end to one edge of the bed plate 15. The stud 43 extends through the axis of a detachable disk 46, and the ratchet wheel is provided with a pin 48 to engage an opening in said disk and rotate the same simultaneously with said wheel. The disk 46 is preferably of paste-board or like material and is provided with a series of perforations equi-distant from its axis and adapted to receive and detachably hold staples 47 or other fastening devices to be set. The guide is recessed as at 45 to receive the edge of the disk carrying the staples, whereby the

staples are successively carried to place in the guide as the disk rotates. To rotate the disk, the ratchet 16 is provided with teeth equal in number to the openings for the staples in the disk 46, and is engaged by a pawl 20 operated by an intermediately pivoted lever 31 extending through a recess in a bar 33 on the arm 8, and laterally and longitudinally movable in said recess, a shoulder 34 on the lever engages the bar and locks the machine when the lever is in the extreme lower end of the recess.

32 is an incline on the lever which slidably engages the bar and moves the lever to retract the pawl 20 as the arm 8 descends. As the lever 31 returns, it moves the pawl 20 forward, turns the disk, and brings the next staple into the guide. The described parts are so proportioned that the pawl has a throw in excess of the space between the points of the ratchet teeth on the wheel 16, and thus the staple engages the guide before the pawl completes its stroke. The lever is thus stopped by the staple contacting the guide before it descends far enough to engage the shoulder 34 with the bar. Should there be no staple in this opening in the disk, the disk will rotate further and the lever 31 will descend the full limit and lock the machine. The lever must now be manually operated until the disk feeds a staple to place in the guide, when the regular operation of the machine can proceed. To return the lever to lowered position it is connected to the arm 8 by a rod 38 having a slot 39 traversed by a screw 40 in the arm 8. The engagement of this screw with the end of the slot pulls on the rod and thus moves the lever 31 downward. To permit the lever to stop short of full movement as described, and also to permit of manually operating the same, the rod 38 is connected to a bell crank 36 pivoted on the lever and having one arm slotted concentric to its pivot. A stud 35 inserted in the lever traverses this slot being yieldingly held in engagement with the end of the slot by a spring 37. This spring will yield and permit the stud to move in the slot whenever the lever is stopped by the staple engaging the guide or when the lever is manually raised.

41 is a guide for the pawl, and 42 a stop to limit the upward movement of the pawl and arm when removing or replacing a disk 46.

27 and 28 are the opposing members of an oppositely projecting pawl, which is oppositely held by the oppositely inclined end of a spring actuated dog 30 engaging an oppositely inclined projection 29 on the pawl. This pawl and dog are mounted on the extension 8^a of the arm 8 and control the movement of said arm by engaging a ratchet 25 fixed on the frame and provided with a shoulder 26 to shift the dog and recesses en-

gaged by the dog. This shoulder throws the dog 27 back sufficient to move the projection 29 past the point on the pawl 30 and thus bring the dog 28 into action. If now the arm is moved downward, the dog 28 will hold it from returning by engaging the recesses in the ratchet. To permit the return stroke of the arm when fully depressed, the dog 28 must be tripped out of action and the dog 27 thrown into action. This movement must occur when the stroke of the arm is completed, which stroke is variable, due to the action of the adjustable stop described and according to thickness of material in the machine. To provide an automatic and adjustable trip, a slide 23 is provided which has a shoulder 24 to engage the dog 28 and throw it out of action by moving the point of the projection 29 past the point of the pawl 30, as before described. This slide is automatically adjusted by the guide 3 by means of an arm on the slide engaged with a recess 5 in the guide. Thus the thicker the material the earlier the shoulder 24 will engage and trip the dog 28, which movement will thus at all times occur at or before the contact of the shoulder 9 with the stop 10. When near the end of the upstroke of the arm 8, the dog 27 will engage a recess in the ratchet 25 shown just below the shoulder 26 and prevent return or down stroke of the arm while feeding the staple until the upstroke is completed and the dog tripped by the shoulder 26, which shoulder can be fixed for the reason that the termination of the upstroke is fixed. During all of the other part of the upstroke, it is not necessary to restrain the movement of the arm, and thus the stroke upon a staple may be repeated if necessary to further clench the same.

What I claim is:

1. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide, an unyielding and adjustable stop separate and apart from the guide to limit the stroke of the driver, and means for connecting the stop and the guide, whereby the guide automatically adjusts the stop.

2. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide, an arm to operate the driver, an adjustable stop to limit the movement of the arm, and means for connecting the guide and the stop, whereby the guide automatically adjusts the stop.

3. The combination of a clenching die, a guide movable toward and from the die, a spring to yieldingly move the guide toward the die, a driver slidable in the guide, a stop to limit the stroke of the driver, a cam to adjust the stop, and means for connecting the cam and guide, whereby the movement of the guide rotates the cam and adjusts the stop.

4. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide, an adjustable stop to limit the movement of the driver, a pivoted lever connected at one end to the guide and connected at the other end to the adjustable stop, and a spring connected to the lever to yieldingly move the guide toward the die.

5. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide and having an elongated recess, a pin in the guide and engaging the end of the recess to raise the guide, a pivoted arm to operate the driver, an adjustable stop to limit the movement of the arm, a cam to adjust the stop, a pivoted lever connected to the guide at one end and connected to the cam at the other end, and a spring to yieldingly move the guide toward the die.

6. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide, a spring to yieldingly move the guide toward the die, a pivoted arm connected to the guide and driver to operate the same and having a shoulder, a stop engaged by the shoulder and pivoted on a slide, a rotative cam engaging the stop, a lever connecting the cam and guide, whereby the guide adjusts the cam and stop to limit the stroke of the driver, and a spring engaging the lever.

7. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide, reciprocating means for operating the driver, a double acting pawl to control said means, means for reversing the pawl at each end of the stroke of the driver, one of said reversing means being adjustable, and means for connecting the reversing means to the guide, whereby it is adjusted thereby.

8. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide, a pivoted arm to operate the driver, an alternately and oppositely acting pawl mounted on the arm to control the same, a ratchet alternately and oppositely engaged by the pawl, a fixed shoulder and an adjustable shoulder to alternately shift the pawl and reverse its action, and means for connecting the adjustable shoulder and the guide whereby the guide adjusts the said shoulder.

9. The combination of a clenching die, a guide movable toward and from the die, a driver slidable in the guide, an arm connected to the driver to operate the same, an oppositely and alternately acting pawl pivoted on the arm, a ratchet engaged by the pawl, a shoulder on the ratchet to shift the pawl at the end of the return stroke of the arm, a slide on the ratchet and having a shoulder to shift the pawl at the end of the

down stroke of the arm, and means for connecting the slide and guide, whereby the guide adjusts the slide.

10. The combination of a clenching die a reciprocating guide having a recess in its side, a driver slidable in the guide, a pivoted arm connected to the driver to reciprocate the same, an alternately and oppositely acting pawl pivoted on the arm and having an oppositely inclined projection, a dog having opposite inclines engaging said projection to hold said pawl in two positions, a ratchet oppositely engaged by the dog and having a shoulder to shift the dog, a slide adjustable on the ratchet and having a shoulder to oppositely shift the dog, and an arm on the slide engaging the recess in the guide.

11. The combination of a guide, having a lateral recess, a driver slidable in the guide, an arm to operate the driver, a disk having its edge rotative in the recess and adapted to carry staples or fasteners in succession into the guide, an arm to operate the driver, a pawl to intermittently rotate the disk, a lever to operate the pawl and having a shoulder to hold the arm when the disk fails to place a staple or fastener in the guide.

12. The combination of a guide having a lateral recess, a driver slidable in the guide, an arm to operate the driver, a disk having its edge rotative in the recess of the guide and having a series of openings equi-distant from its axis to retain staples or fasteners, a ratchet connected to the disk and having teeth equal in number to the said openings, a pawl engaging said ratchet and having a stroke greater than the distance between said teeth, a recess bar on the arm, and a lever to operate the pawl and having a shoulder and an inclined surface to engage the bar.

13. The combination of a guide having a lateral opening, a bed plate attached to the guide, an arm pivoted to the edge of the bed plate and extending over the center of the same, a stud rotative in the arm, a crown ratchet wheel attached to the stud, a driver in the guide, an arm connected to the driver to operate the same, a pawl engaging the ratchet wheel, a pivoted lever on which the pawl is mounted, said lever also having a shoulder and an incline, a bar on the arm and having a recess in which the lever is longitudinally and laterally movable, a bell crank pivoted on said lever and having a slotted arm, a stud in the lever and traversing the slot in the bell-crank, a spring on the bell crank engaging the stud, and a rod connected to the other arm of the bell crank and movably connected to the arm.

14. The combination of a staple guide, having a lateral recess, a disk rotative in the recess and having openings to receive and retain the staples, a ratchet connected to the disk, a pawl engaging the ratchet, a lever on which the pawl is mounted, said lever

having a shoulder and an incline, a driver
in the guide, a pivoted arm to operate the
driver, a bar on the arm and having a re-
cess to receive the lever and also engaged by
5 the shoulder and incline of the lever, a bell
crank pivoted on the lever and having a slot
in one arm, a stud in the lever and traversing
the slot, a spring on the bell crank engaging
the stud and yieldingly holding it in one end

of the slot, a slotted rod attached to the bell 10
crank, and a screw in the arm and traversing
the slot in the rod.

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

WILLIAM E. ELLIOTT.

Witnesses:

GEORGIANA CHACE,
LUTHER V. MOULTON.