

(No Model.)

5 Sheets—Sheet 1.

S. W. LADD.
LASTING MACHINE.

No. 584,741.

Patented June 15, 1897.

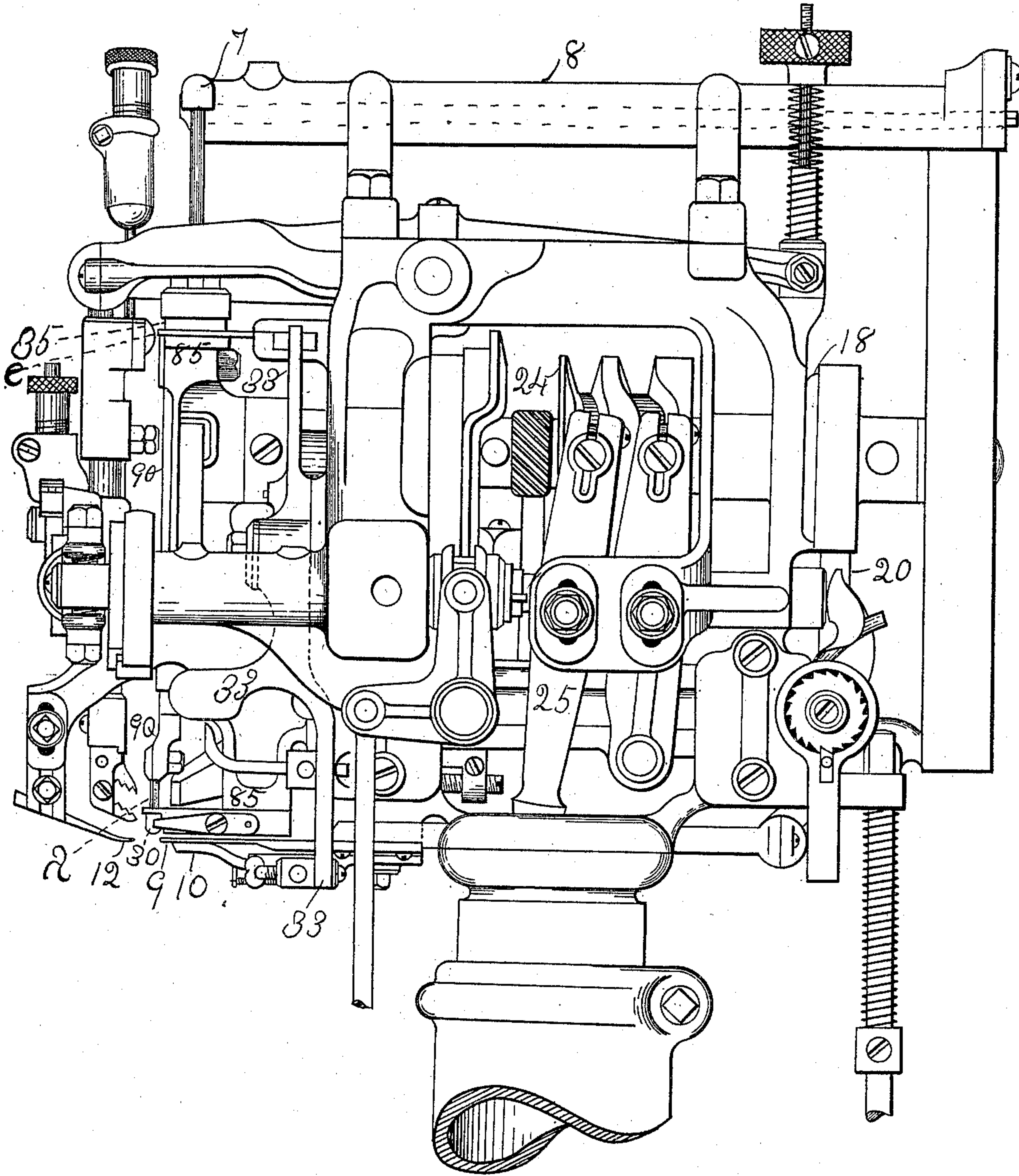


Fig. 1.

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(No Model.)

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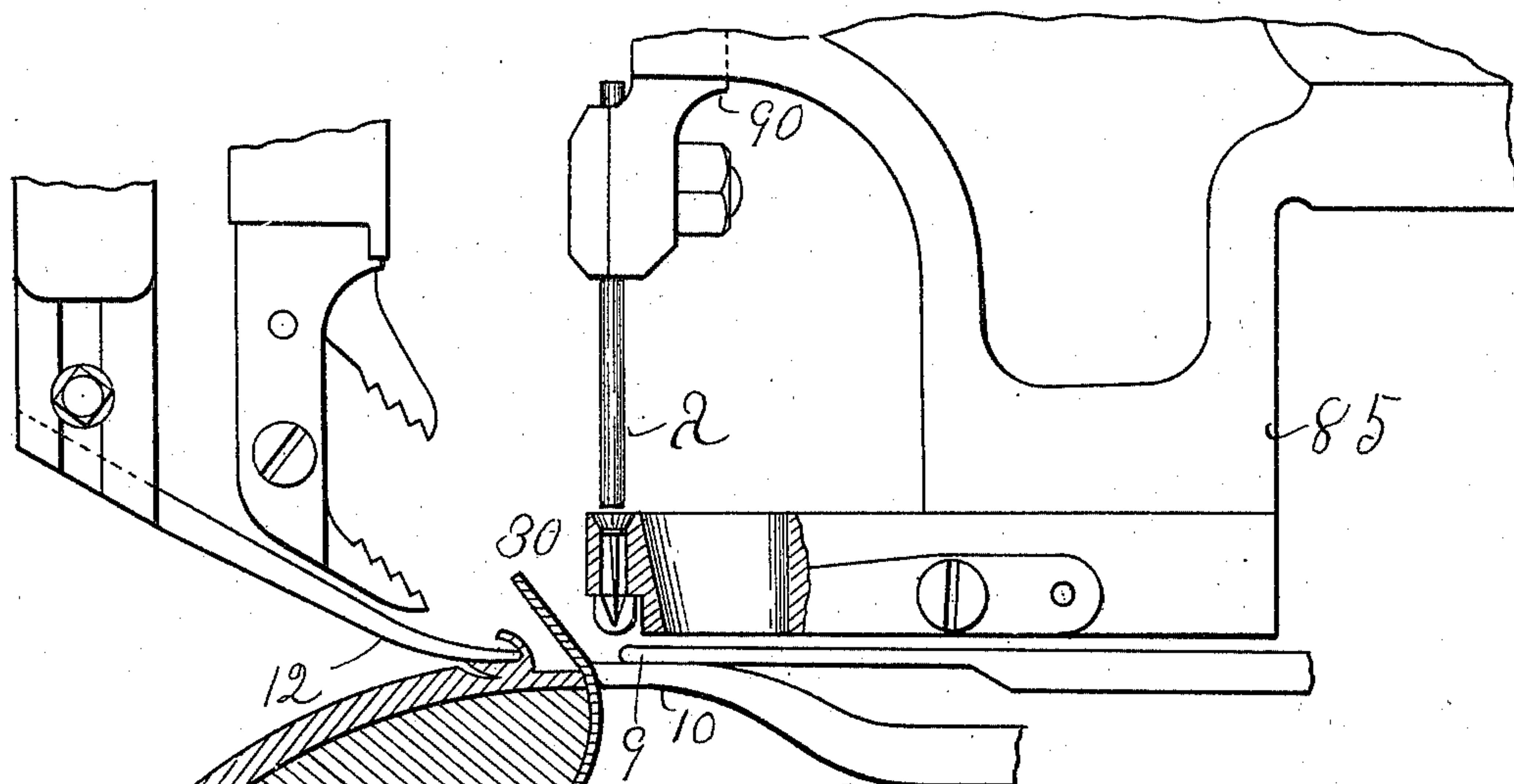


Fig. 2.

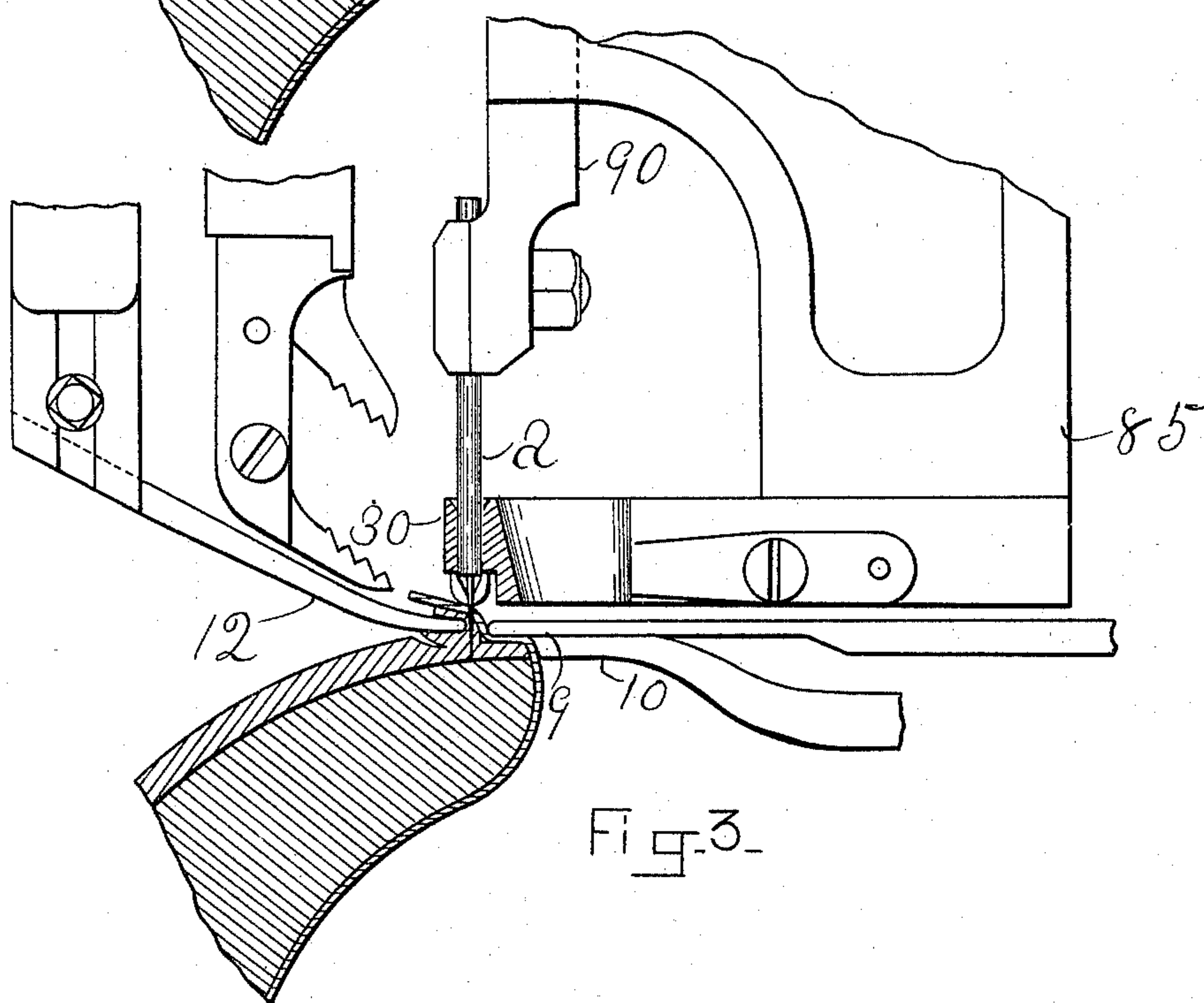


Fig. 3.

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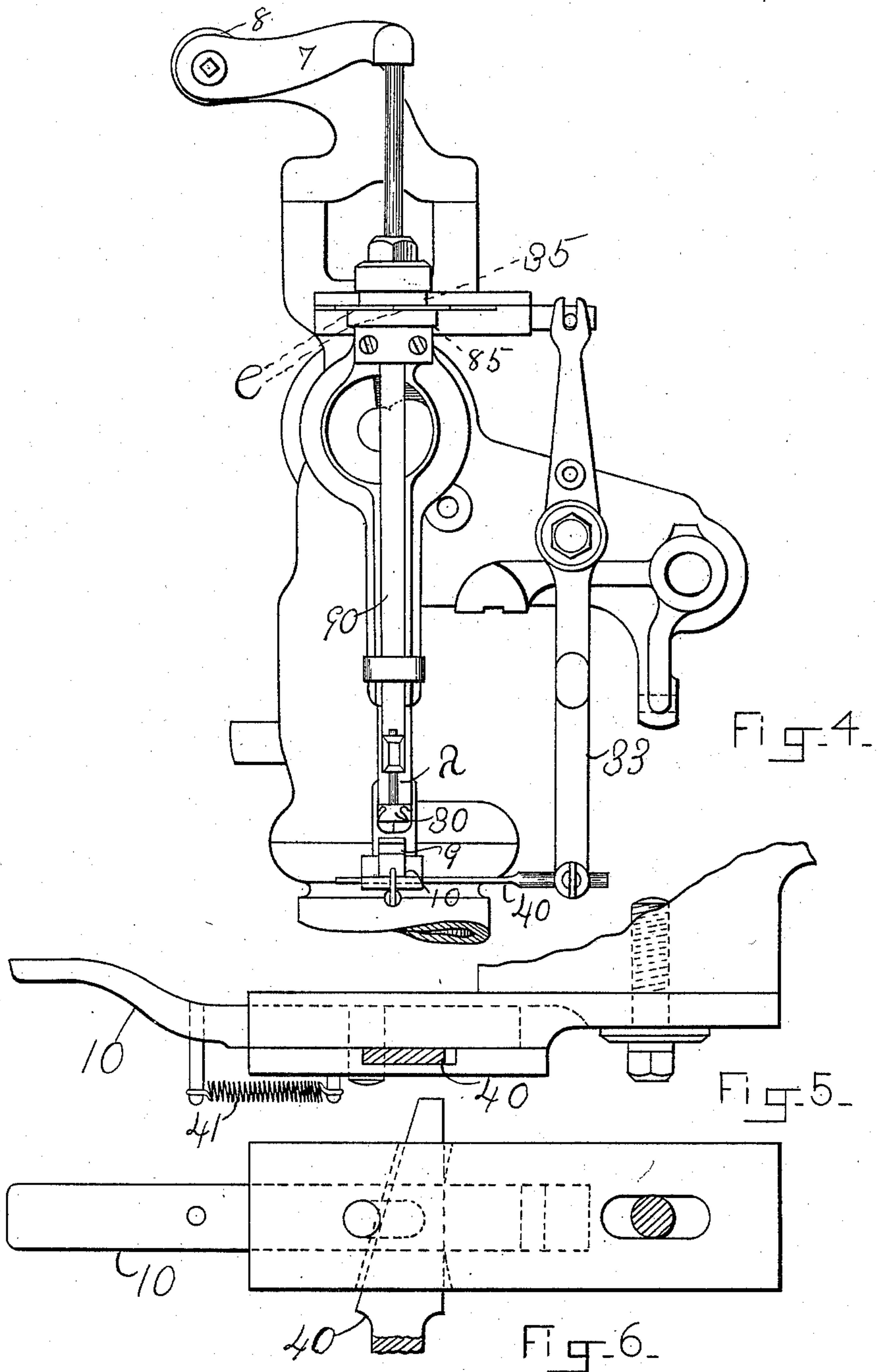
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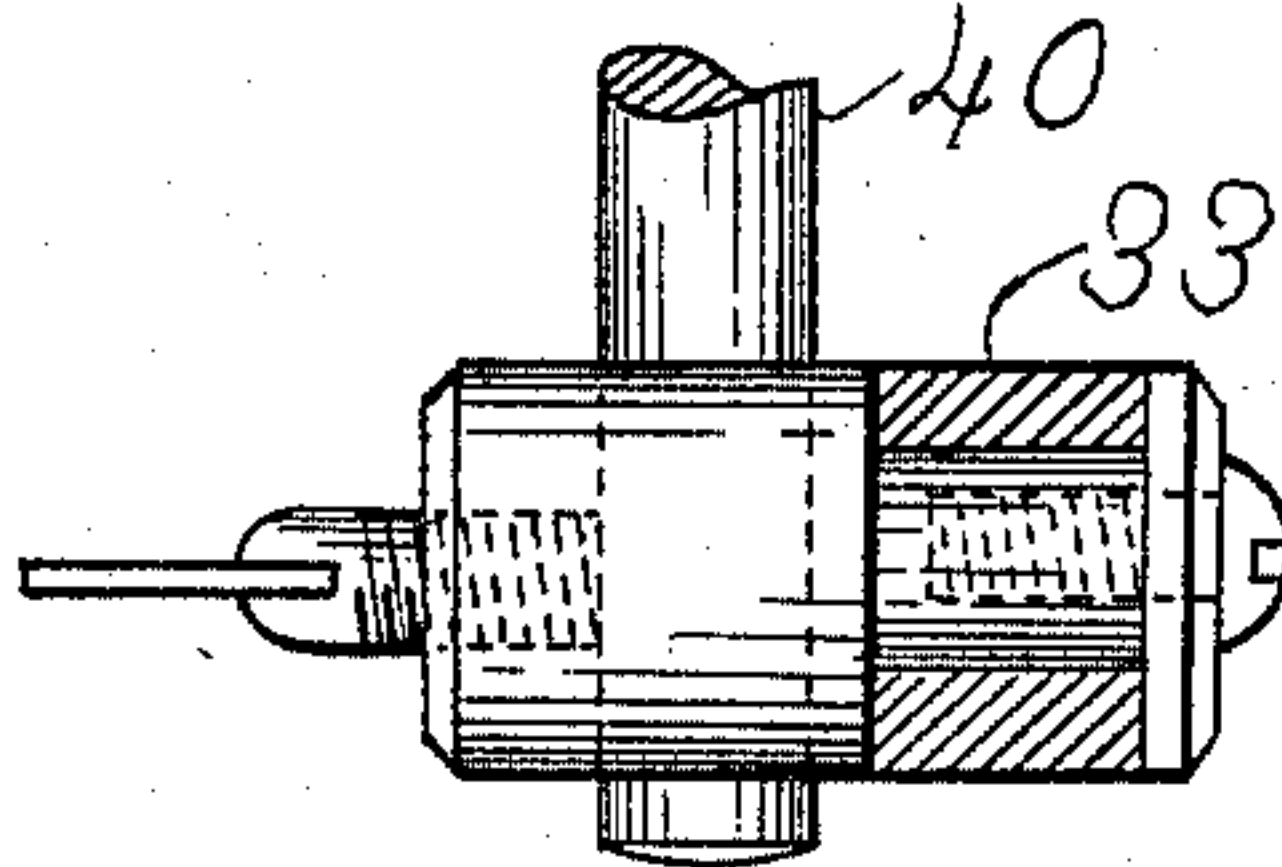
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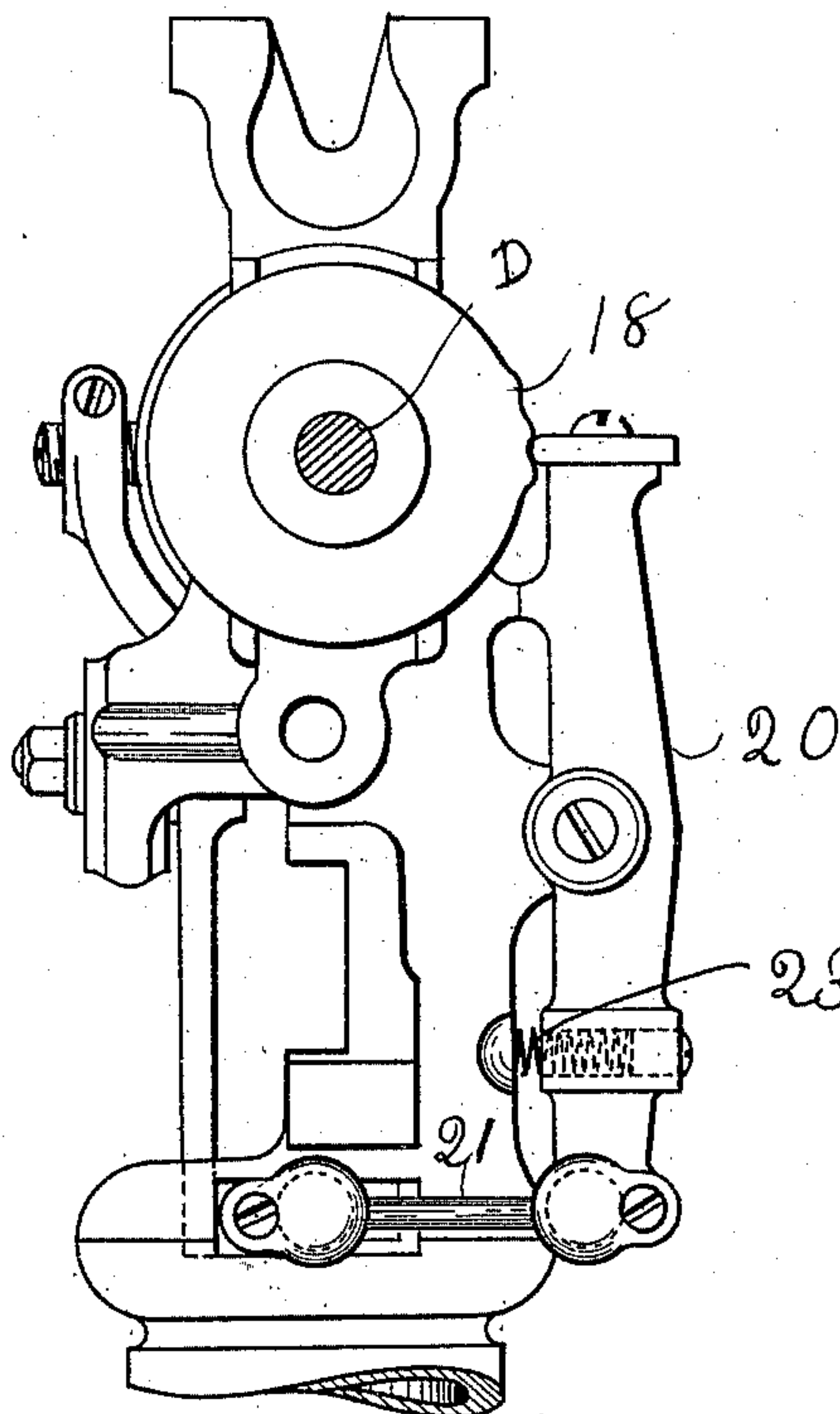


Fig. 7.

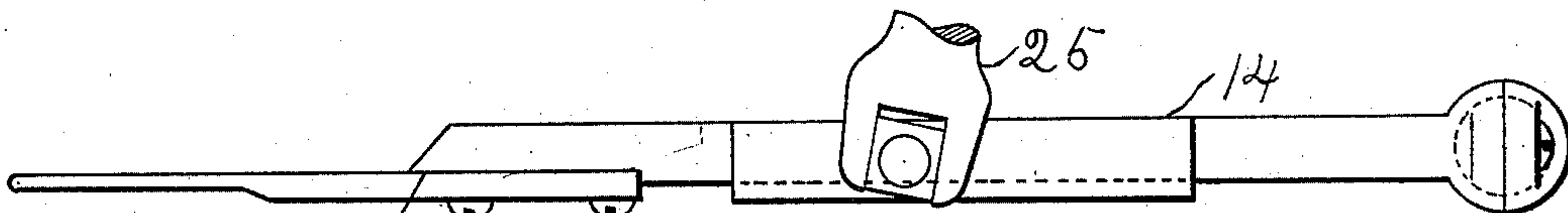


Fig. 8.

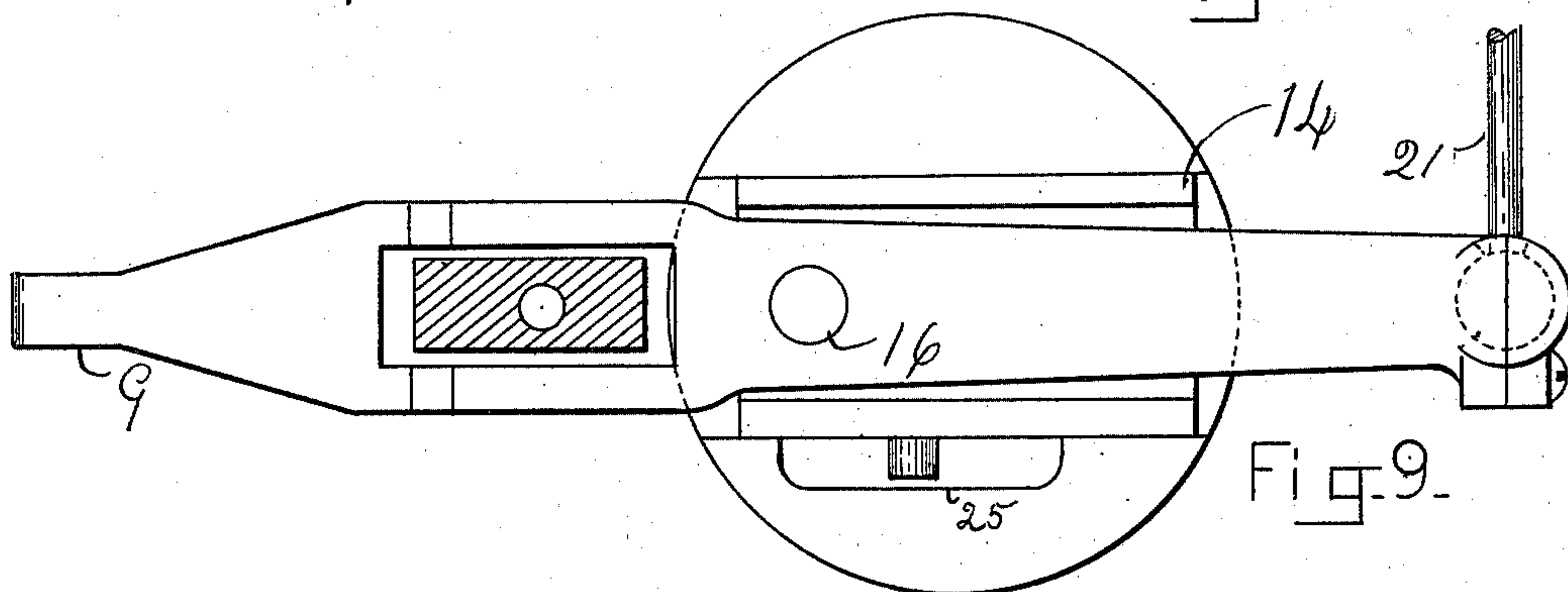


Fig. 9.

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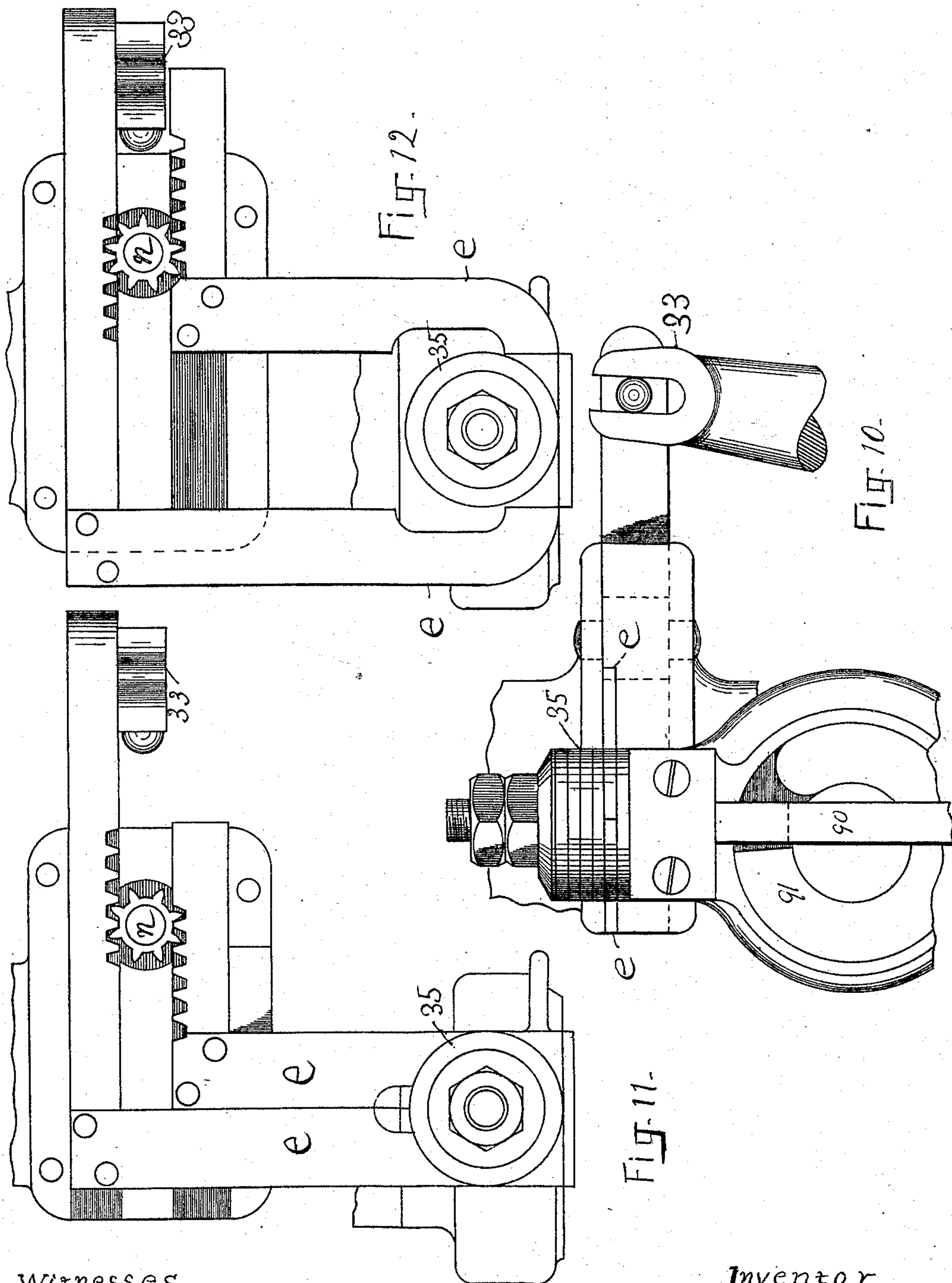
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UNITED STATES PATENT OFFICE.

SHERMAN W. LADD, OF SOMERVILLE, MASSACHUSETTS.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 584,741, dated June 15, 1897.

Application filed February 27, 1894. Serial No. 501,689. (No model.)

To all whom it may concern:

Be it known that I, SHERMAN W. LADD, of Somerville, in the county of Middlesex and Commonwealth of Massachusetts, have invented certain Improvements in Lasting-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

This invention has for its object to provide mechanism adapted for lasting that class of boots and shoes known as "Goodyear" or "welted work." In the present instance my invention is represented as forming a component part of the lasting-machine described in Letters Patent of the United States No. 423,922, modified as described in United States Patents Nos. 510,973 and 510,977.

Figure 1 of the accompanying drawings is a side elevation representing such a machine embodying this invention. Fig. 2 is a sectional side elevation representing the devices employed for laying and securing the upper over the last and inner sole. Fig. 3 is a similar view representing the parts shown in Fig. 2 as positioned in a more advanced stage of the lasting operation. Fig. 4 is a front elevation representing a portion of the fastener-inserting mechanism and connections interposed between the fastener-inserting mechanism and edge-gage. Fig. 5 is a side elevation, partly in section, showing the edge-gage. Fig. 6 is a plan, partly in section, showing the edge-gage, its operating-wedge, and a portion of its operating-lever. Fig. 7 is an elevation representing the parts employed to give a vibrating motion to the work-presser. Fig. 8 is a side elevation of said work-presser and a section of the lever employed to impart a reciprocating movement thereto forwardly and backwardly. Fig. 9 is a plan view of the edge-gage and connections. Fig. 10 is a side elevation of a section of the fastener-inserting mechanism on an enlarged scale. Figs. 11 and 12 are sectional plan views representing details pertaining to Fig. 10.

Only so much of the machine proper is represented and will be described in the present instance as is considered necessary for a complete understanding of this invention and its combination and coöperation with the coördinating lasting devices of a lasting-machine.

For a description of the parts not shown

reference will be had when desired to the Letters Patent of the United States herein-after mentioned.

It may be here stated that the shoe is prepared for lasting by first putting the upper and its inner sole onto the last, drawing the upper over at the toe and preferably at the sides also, and securing it in each of said places to the inner sole by tacks or other suitable fastening devices. It is then held up to the machine, supported and turned by the hands of the workman, during the completion of the lasting process.

The machine, it will be understood, comprises a pincers or gripping mechanism and actuating devices therefor, whereby in the operation of the machine the pincers are made to seize, stretch, and draw the upper over the last, and a tacking mechanism, whereby the upper is tacked to the inner sole. A single pair of gripping devices is employed, and it will be understood that a section only of the upper is being acted upon by the machine at one time, and that to complete the lasting process the shoe is moved by the operator to bring such portions of the upper successively to the machine as the lasting process may require.

For a description of the pincers mechanism and the mechanism to open and close the same, as also for a description of the mechanism to lift and depress the same when constructed as shown in Fig. 1 of the accompanying drawings, see in addition to the Letters Patent of the United States above referred to the Letters Patent of the United States Nos. 510,974 and 510,975, respectively.

In order that the shoe may be easily supported in position while the upper is being stretched over the last, a rest or downhold is provided, against which the last, having the inner sole thereupon, is pressed upwardly by the operator, and to further assist the workman an edge-guide is employed, against which the shoe is pressed laterally. Said rest is held by suitable connections to the machine-head or other support and drops down to a position of work relation to the edge-guide, so that when the shoe is held upwardly against the last-rest and the edge thereof is pressed against the edge-guide the upper will be in position for the pincers

to come forward and grip the edge thereof for drawing, stretching, and otherwise manipulating it over the last in the lasting process.

In the operation of lasting "welted" boots and shoes the last-rest 12 is located in position to bear against the inner sole adjacent to the inner face of the welt-lip of said inner sole, as shown in Figs. 2 and 3. In this class of work it will be understood that the upper is drawn over the inner sole and secured temporarily by tacks or similar fastening devices passed through the upper into the inner sole, generally into the welt-lip of the inner sole, at all events in advance of the rearward or outer face of said welt-lip. The upper and welt are then permanently secured to the inner sole by a series of stitches and drawn tightly to the outer surface of said welt-lip, after which the devices by which it was secured temporarily are withdrawn, and the upwardly-projecting marginal edges of said welt-lip and inner sole are removed by cutting or other suitable means to make proper basis for the outer sole. It is desirable to have that portion of the upper which is turned over the inner sole rearwardly of the welt-lip lay smooth and free from wrinkles. To that end a work-presser 9 is employed to bear against said overturned portion of the upper, particularly against that portion of the same which lies adjacent to the outer surface of the welt-lip. As represented in the present instance said presser is located directly over the edge-guide 10 and in line of draft produced upon the upper by the stretching devices. It is preferably supported to permit movement forwardly and backwardly from a position adjacent to the welt-lip, as shown in Fig. 3, to a position rearwardly, as shown in Fig. 2. It also permits vibrating movements laterally. To this end it is connected with a slide 14, Fig. 9, by means of the connecting-pin 16, on which it is supported to turn loosely for accommodating lateral vibrations, while the slide 14 is mounted to slide in suitable grooves formed in the machine-base for accommodating the movements forwardly and backwardly. The lateral vibrations are communicated to the presser from a cam 18, Fig. 7, on the main shaft D of the machine through mechanism composed of pivoted lever 20, the link 21 and spring 23 being employed to retain the lever in bearing contact with its cam 18. The arrangement of said parts is fully shown in Fig. 7.

The movements forwardly and backwardly are communicated to the presser from a cam 24, Fig. 1, on the main shaft D of the machine through a suitably-pivoted lever 25. The arrangement of said parts is such that the presser moves backward to permit the pincers' jaws to seize the marginal edge of the upper and move for straining it over the last, whereupon the presser moves forward to bear against that portion of the overturned upper laid adjacent to the welt-lip and is then vibrated laterally to wipe said upper smooth.

Said movements of the presser forwardly and backwardly, as also the vibrations thereof laterally, I do not consider absolutely necessary to the attainment of a practical result, as, instead, the presser may be stationary, while the shoe is pressed upwardly thereto and moved thereagainst by the workman. A more satisfactory result, however, is obtainable when the presser is moved as stated. Particularly is this true in lasting certain kinds of material.

The marginal edge portion of the upper, it is to be observed, is at all times left free for manipulation in advance of the foremost bearing end of the work-presser. At the toe and other places when desired this marginal edge portion is laid in plaits by the pincers devices, which to that end are actuated laterally by mechanism, for a description of which see Letters Patent of the United States No. 510,975.

In connection with the devices for manipulating the upper a securing mechanism is employed for securing the marginal edge portion of the upper to the inner sole in advance of the work-presser. Said securing mechanism comprises means for separating and distributing tacks or similar fastening devices to a suitable receptacle, for a description of which see Letters Patent of the United States No. 423,921; also, a mechanism whereby said tacks or fastening devices are received from the distributor mechanism, moved to the driving-point, and inserted through the upper into the inner sole, for a description of which see Letters Patent of the United States No. 423,920. It is observed that this latter mechanism comprises a driver mechanism movable first to a point for driving the tack and then backward to allow the pincers devices opportunity for manipulating the material to be next tacked, and a tack-carrying block adapted to receive the tack from the distributing devices advances it to a point for driving and supports it in position under the driver mechanism. To this end the driver-bar 90 is supported to permit vertical reciprocation in a carriage 85, which is supported in the machine-frame and connected with operating mechanism, whereby it is moved forward and backward to carry the driver-bar up to and away from the point for driving the fastening devices. The driver-bar is lifted by a cam and is depressed by a spring. Said spring consists of a steel rod located in the sleeve 8, Fig. 1, as shown by dotted lines, and is provided on one end with the arm 7, whereby it is connected with the top end of said driver-bar. For a detailed description see Letters Patent of the United States No. 441,482. The uplifting movement of the driver-bar operates to twist said rod and imparts thereto a torsional spring tension which operates to force downwardly the driver-bar when the cam allows it, and thereby to insert the tack, which to that end is supported in the tack-carrying block 30, beneath the terminal end of the driver *a*.

Under the arrangement shown in the pres-

ent instance another function is performed incidentally by the carrier-block 30. In the lasting operation the work-presser having advanced its foremost end, folding and pressing the upper material against the welt-lip of the boot or shoe sole, a marginal edge of the material remains standing above the work-presser and requires to be carried over the welt-lip to a point in advance of the work-presser in position for receiving the fastening device. To this end the carrier-block 30 is advanced in line suitably for engaging the upwardly-projecting edge of upper material and carry it over the welt-lip in position for the fastening-tack to be driven therethrough.

It will be understood that the tack-carrier block 30 is provided with a vertical chamber in which the tack is supported in position to penetrate the upper and inner sole when pressed upon from above by the driver *a*. In this operation the tack is moved downwardly through the carrier-block, the sections whereof separate to permit its passage therethrough. The shoe-upper being pressed upwardly and thus made to bear against the bottom of the carrier, it is only necessary in order to effect a complete insertion of the tack that the driver *a* should be carried downwardly through the carrier-block to the bottom face thereof. Such is the arrangement and relation of the driver to its operating mechanism and said carrier 30 so long as the buffer 35 is allowed to come down in contact with the carrier 85. Obviously if the driver *a* is made to stop its downward movement with the terminal end face thereof above the bottom of said tack-carrier block 30 then the fastening device or tack will remain with a portion of its length projecting above the shoe-bottom after the inserting process shall have been completed. To this end the plates *e* are interposed, when desired, beneath the buffer 35. The thickness of said plates determines the distance by which the downward or inserting movement of the driver is shortened, and consequently measures the limit of projection allowed to the fastening device above the surface of the upper. The plates *e* are supported movably in suitable guideways on the machine-frame (see Figs. 10 and 11) and engage, by means of toothed projections, the opposite sides of gear *n*, by which arrangement the movement of one plate operates to effect a counter movement of the other plate for placing it under and removing it from under the buffer, as required. Connected with the end of one of the plates is a lever 33. Said lever is pivotally supported on the machine-frame and has a handle in close proximity to the place where the shoe is supported. The workman has only to move said lever in one or the other direction to interpose the plates beneath or withdraw them from the buffer and thereby shift the mechanism from causing a complete to producing a partial insertion of the fastening devices, and vice versa, as desired.

It will be understood that in the operation of lasting welted work the fastening devices are inserted for a portion of their length only along that portion of the shoe-bottom which is forward of the heel, while at the heel a complete insertion of the tack is made. Around the heel portion of the shoe the fastening devices are set a farther distance inwardly from the edge than is allowed between the shoe edge and the fastening devices set around that portion of the shoe from the heel forward. To accommodate this variation, the edge-guide 10 is arranged to permit movement forwardly and backwardly, being for that purpose supported in a suitable groove or path formed in the machine frame or bed. It is further provided with a groove to receive the wedge 40, Figs. 4, 5, and 6, whereby the guide is supported and moved forwardly and backwardly as the wedge is withdrawn. Said wedge has its upper end pivotally connected with the lever 33, Fig. 4, the arrangement being such that a movement of said lever by the workman to shift the fastener-inserting instrument from producing a complete to effecting a partial insertion of the fastening devices operates to effect a forward movement of the guide, and vice versa, whereby the guide is maintained in position conformably to the operations of the fastener-inserting mechanism, as required for giving the desired position to the shoe for receiving said fastening devices.

The extent of vibration or lateral movement imparted to the work-presser and the continuity thereof, it will be understood, is dependent upon the formation of the cam 18, and by a suitable variation of the cam the work-presser may be caused to vibrate for a time after the fastening device has been inserted through the shoe-upper into the inner sole. In certain classes of work this is especially desirable, as it operates to establish the material in a folded condition adjacent to the welt-lip preparatory for receiving the permanent fastening-stitches.

I claim and desire by Letters Patent to secure—

1. A lasting-machine of the character indicated, having in combination, a work-presser having at its work-bearing end an angular or corner formation for bending the overturned upper inwardly to the angle of junction between the inner sole and vertical edge face of the welt-lip thereof, and actuating connections for moving the work-presser laterally and forwardly and backwardly, substantially as described.

2. In a lasting-machine of the character indicated, in combination, a work-presser and actuating connections having provision to move the presser laterally and forwardly and backwardly, substantially as described.

3. A lasting-machine of the character indicated, having in combination, devices for straining the upper over the last, a work-presser, for pressing the overturned upper

and actuating connections for moving the work-presser crosswise of and along the line of strain upon the upper, substantially as described.

5 4. In a lasting-machine of the character indicated, in combination, devices movable for straining the upper over the last, and plaiting the marginal edge thereof at times, a work-presser having at its work-bearing end an angular or corner formation, for pressing the
10 upper crosswise of the line of said plaits, and actuating connections for moving the presser backwardly and forwardly, and laterally, substantially as described.

15 5. A lasting-machine of the character indicated, having in combination, a last-rest, supported to bear against the inner sole, adjacent to the welt-lip thereof, a work-presser having at its work-bearing end an angular or
20 corner formation, and actuating connections for moving the work-presser forwardly and backwardly, opposite to the last-rest, and laterally, substantially as described.

25 6. In a lasting-machine of the character indicated, a fastener-inserting mechanism having in combination a work-rest against which the shoe is made to bear for receiving the fastening device, a driver, movable toward and
30 from the work-rest against the fastening device, to effect insertion thereof, a connection adapted for movement to change the distance between the work-rest and terminal end of the driver-path, an edge guide or rest, against
35 which the shoe is positioned laterally for receiving the fastening device, a connection adapted for movement to change the distance horizontally between the guide-rest and driver-path, and connections, wherethrough a
40 movement of the parts for changing one of said distances operates a movement of the parts for changing the other of said distances, substantially as described.

45 7. In a lasting-machine of the character indicated, a fastener-inserting mechanism having in combination a work-rest against which the shoe is made to bear for receiving the fastening device, a driver, movable toward and
50 from the work-rest against the fastening device, to effect an insertion thereof, a connection adapted for movement to change the distance between the work-rest and terminal end of the driver-path, an edge guide or rest, against which the shoe is positioned laterally
55 for receiving the fastening device, a connection adapted for movement to change the distance horizontally between the guide-rest and driver-path, and connections, wherethrough a movement of the parts for changing one of
60 said distances operates a movement of the parts for changing the other of said distances, and means to be actuated by the workman, at will, for moving the said movable connections, substantially as described.

65 8. In a lasting-machine of the character indicated, a fastener-inserting mechanism, including a driver, movable against the fastening device, to effect insertion thereof, a stop

mechanism for stopping the movement of the driver, said stop mechanism permitting movement for stopping the driver at different altitudes, a guide-rest permitting movement horizontally toward and from the driver-path and suitable connections wherethrough a movement of the stop mechanism for shifting the altitude of the driver-path operates a movement of the guide-rest for shifting the position thereof, horizontally, substantially as described.

9. In a machine of the character indicated, a fastener-inserting mechanism having in combination a support for holding the fastening device, a driver device movable against the fastening device to effect insertion thereof, a driver-holding carrier and actuating mechanism for moving the same to carry the driver
8 backwardly and forwardly over the shoe, to and from the driving position and a stop mechanism engageable with the driver mechanism, permitting movement for stopping the driver at different altitudes, substantially as
9 described.

10. In a lasting-machine of the character indicated, mechanism adapted for feeding and delivering tacks, mechanism for driving the tacks to different planes or altitudes relatively to the surface penetrated by the body parts thereof, and mechanism for resting the shoe in position for receiving the tacks, combined with means for changing the relative positions of said resting and tack-delivering mechanisms, and means for shifting the driving mechanism, whereby the tacks driven to different altitudes are also located at different distances from the edge of the shoe-sole, substantially as described.

11. A lasting machine adapted for working on different parts of the upper successively in repeated operations of the machine, having a work-presser combined with means for repeatedly moving the presser, whereby a movement of the presser over the upper is repeated a number of times during each operation of the machine, substantially as described.

12. A machine of the character indicated, having a rest against which the shoe is positioned for support, also a presser arranged for movement above the bearing-face of the rest and means to actuate the presser movably over the shoe-bottom, whereby to press the upper material over the inner sole to the welt-lip thereof, and a part arranged for movement above the work-presser, combined with means to move said part over the shoe-bottom to a point in advance of the work-presser, whereby the upper is pressed upon the welt-lip of the sole for receiving a tack or fastening device, substantially as described.

13. A lasting-machine of the character indicated, having in combination, a work-presser having at its work-bearing end an angular or corner formation for bending the overturned upper inwardly to the angle of junction between the inner sole and vertical edge face of

the welt-lip thereof, substantially as described.

14. A lasting-machine of the character indicated, having in combination, a work-presser 5 having at its work-bearing end an angular or corner formation for bending the overturned upper inwardly to the angle of junction between the inner sole and vertical edge face of the welt-lip thereof, and actuating connections 10 for moving the work-presser forwardly and backwardly, substantially as described.

15. A lasting-machine of the character indicated, having in combination, a work-presser 15 having at its work-bearing end an angular or corner formation for bending the overturned upper inwardly to the angle of junction between the inner sole and vertical edge face of the welt-lip thereof, and actuating connections 20 for moving the work-presser laterally, substantially as described.

16. A lasting-machine of the character indicated, having a work-presser and actuating 25 appliances for moving the presser to press the upper, said presser having its end or bearing face adapted for pressing the upper inwardly to the angle of union of the shoe inner sole and welt-lip thereof, combined with a securing 30 mechanism having provision for securing a section of upper to the inner sole, the combination operating for securing the upper to the inner sole, while the presser is positioned for bending it into the said angle, substantially as described.

17. A lasting-machine of the character indicated, having appliance for holding a section 35 of the upper material, and means for pulling the material held thereby, and a work-presser, and means for moving the presser to press the said material, said presser having its end or 40 bearing face adapted for pressing the upper

inwardly to the angle of union of the inner sole and welt-lip thereof, combined with a securing mechanism having provision for securing a section of upper to the inner sole, the combination operating for securing the upper 45 to the inner sole while the presser is positioned for bending it into the said angle, substantially as described.

18. A lasting-machine of the character indicated, having a work-presser and actuating 50 appliances for moving the presser to press the upper, said presser having its end or bearing face adapted for pressing the upper inwardly to the angle of union of the shoe inner sole and the welt-lip thereof, combined with a securing 55 mechanism including means for feeding and delivering loose tacks, and tack-driving appliances adapted for causing a limited or partial insertion of said tacks, whereby the same are left with their head ends at a 60 distance above the surface penetrated by the body parts thereof, the combination operating for securing the upper to the inner sole while the presser is positioned for bending it into 65 said angle, substantially as described.

19. A lasting-machine of the character indicated, having a work-presser and actuating 70 appliances for moving the presser to press the upper, said presser having its end or bearing face adapted for pressing the upper inwardly to the angle of union of the shoe inner sole and welt-lip thereof, substantially as described.

Signed at Lynn, Massachusetts, this 5th day of February, A. D. 1894.

SHERMAN W. LADD.

Witnesses:

E. E. HAMILL,
C. B. TUTTLE.