

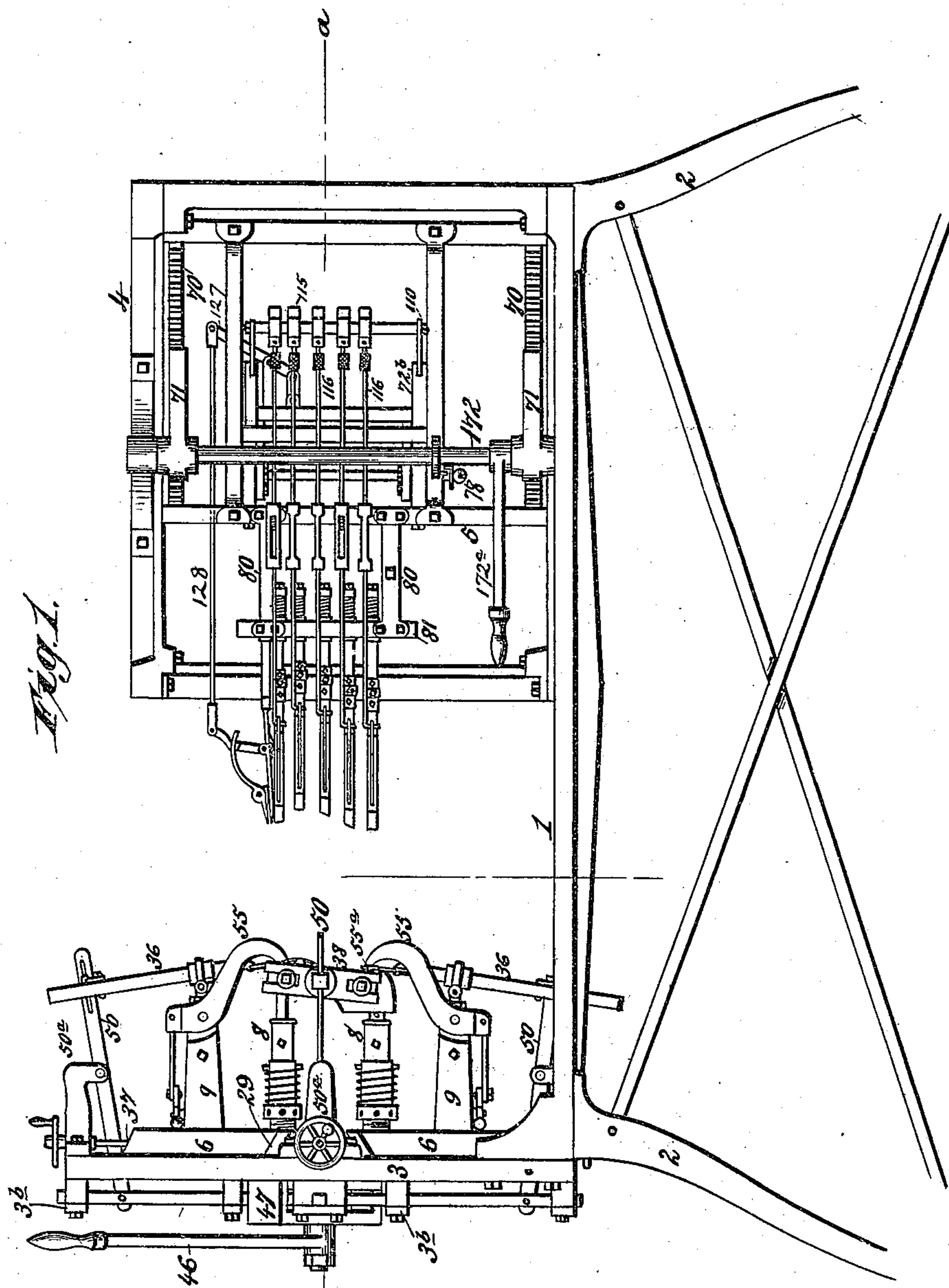
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6 Sheets—Sheet 1.

S. W. PAINE & E. S. COMBS.
LASTING MACHINE.

No. 355,786.

Patented Jan. 11, 1887.



Witnesses.

Robert Everett,

J. A. Rutherford

Inventors.

S. White Paine.

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By

James L. Norris,

Att'y.

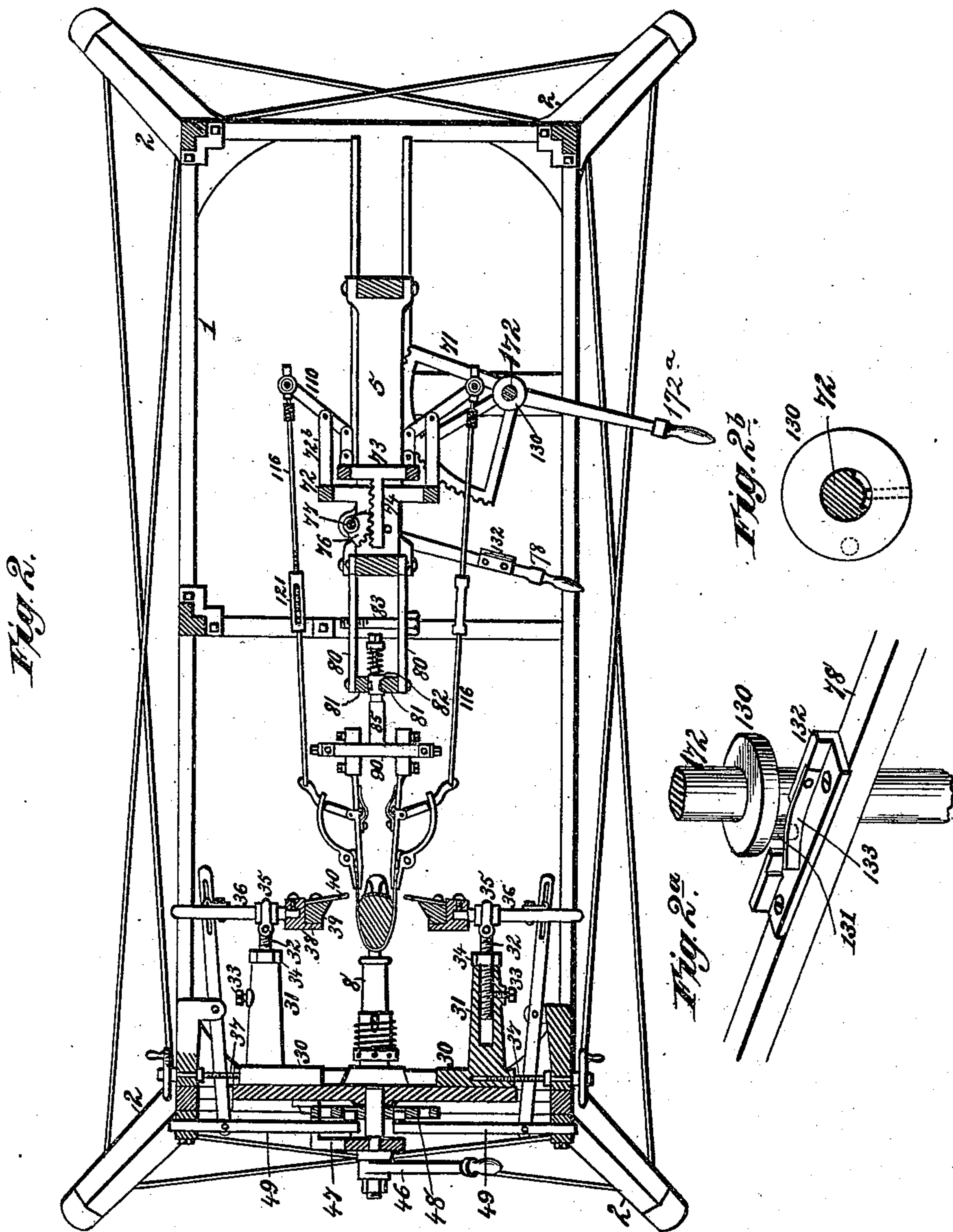
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(No Model.)

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Fig. 3.

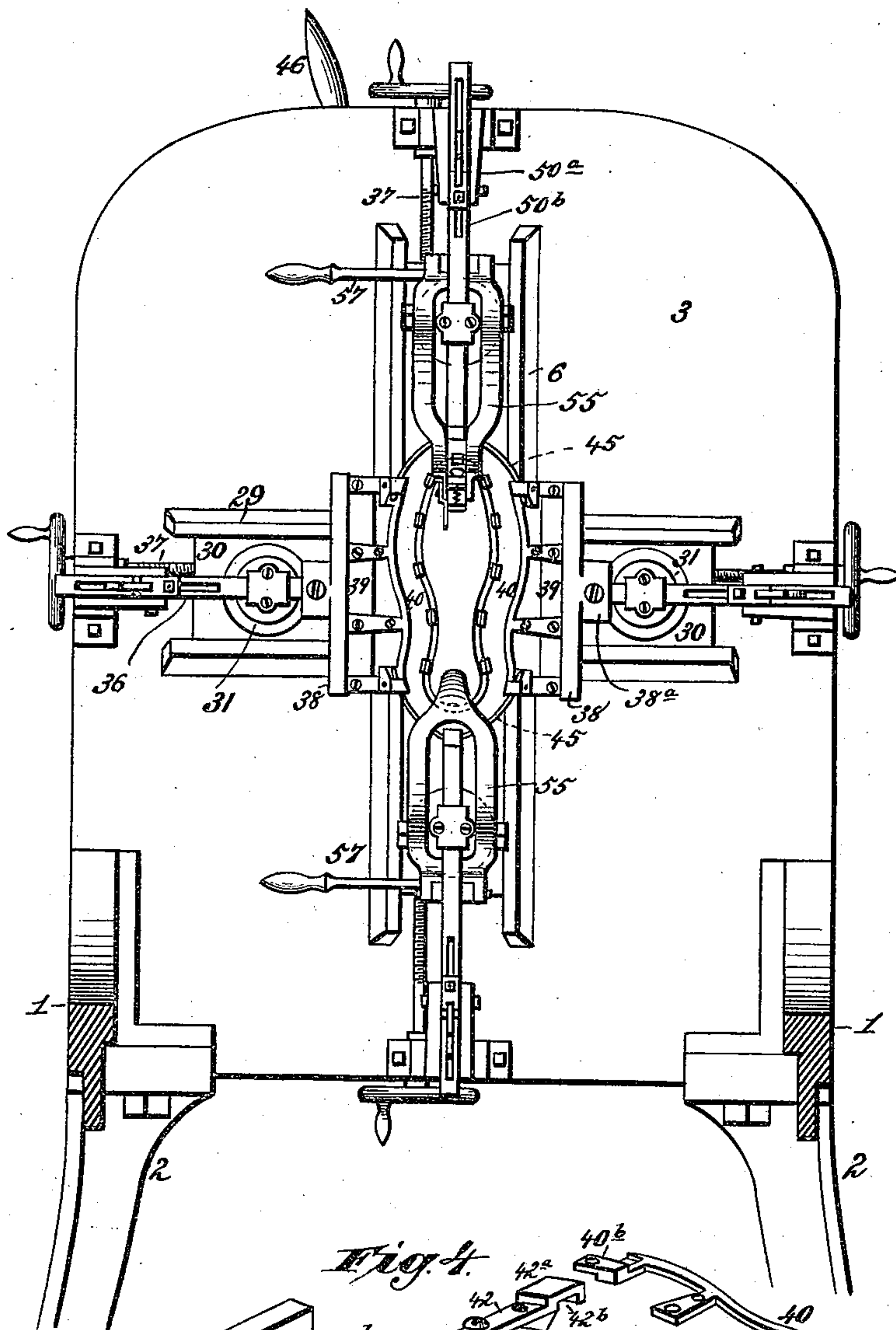


Fig. 4.

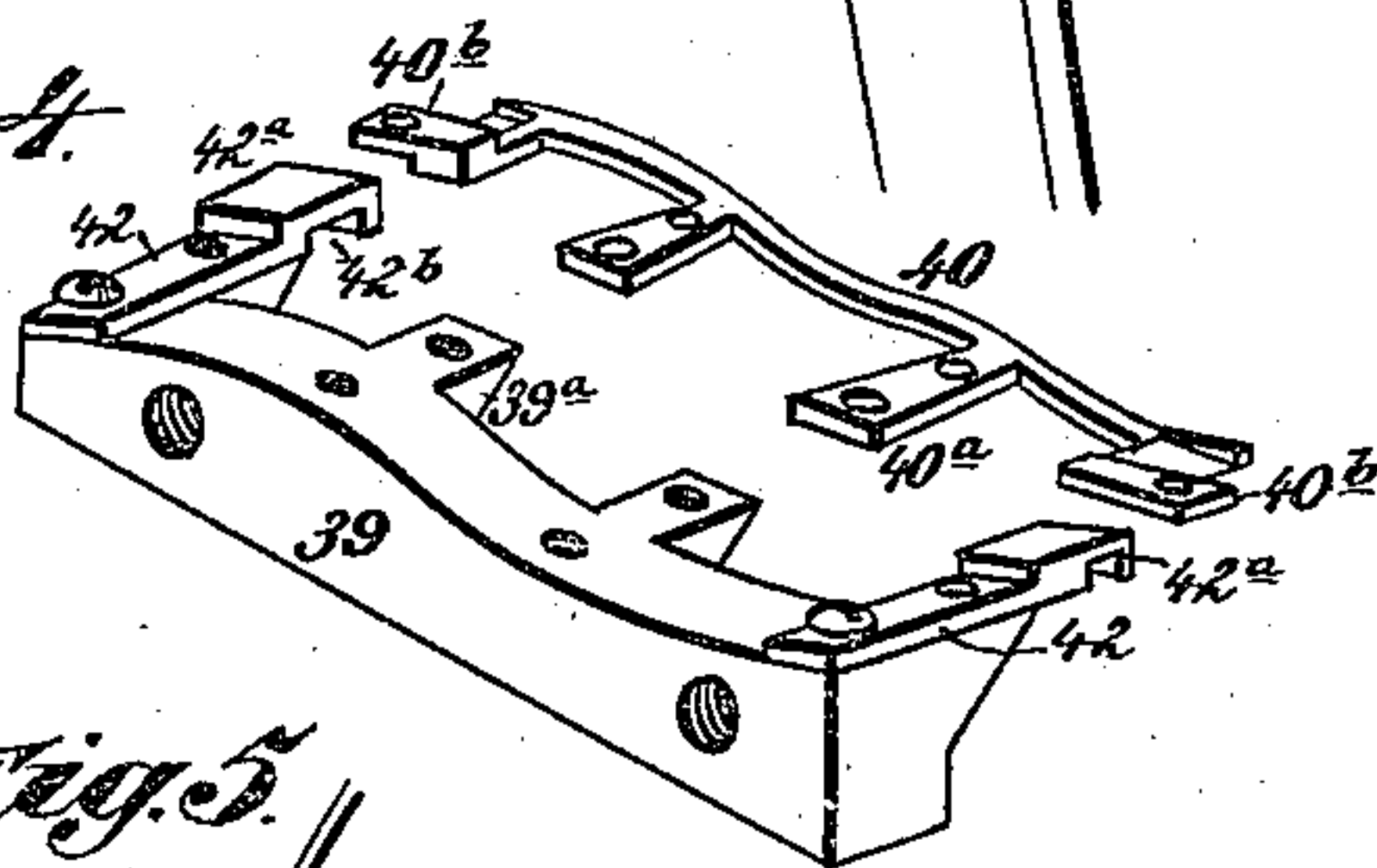


Fig. 5.

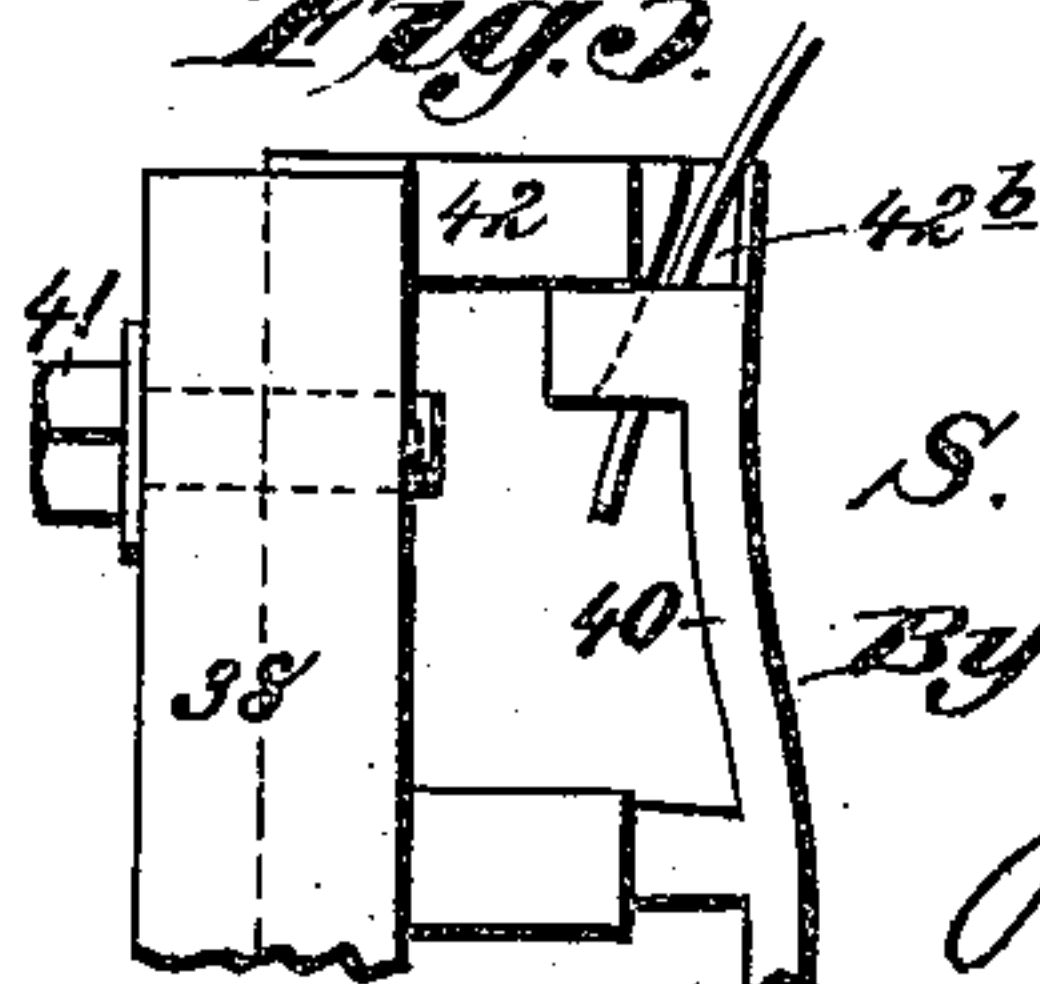
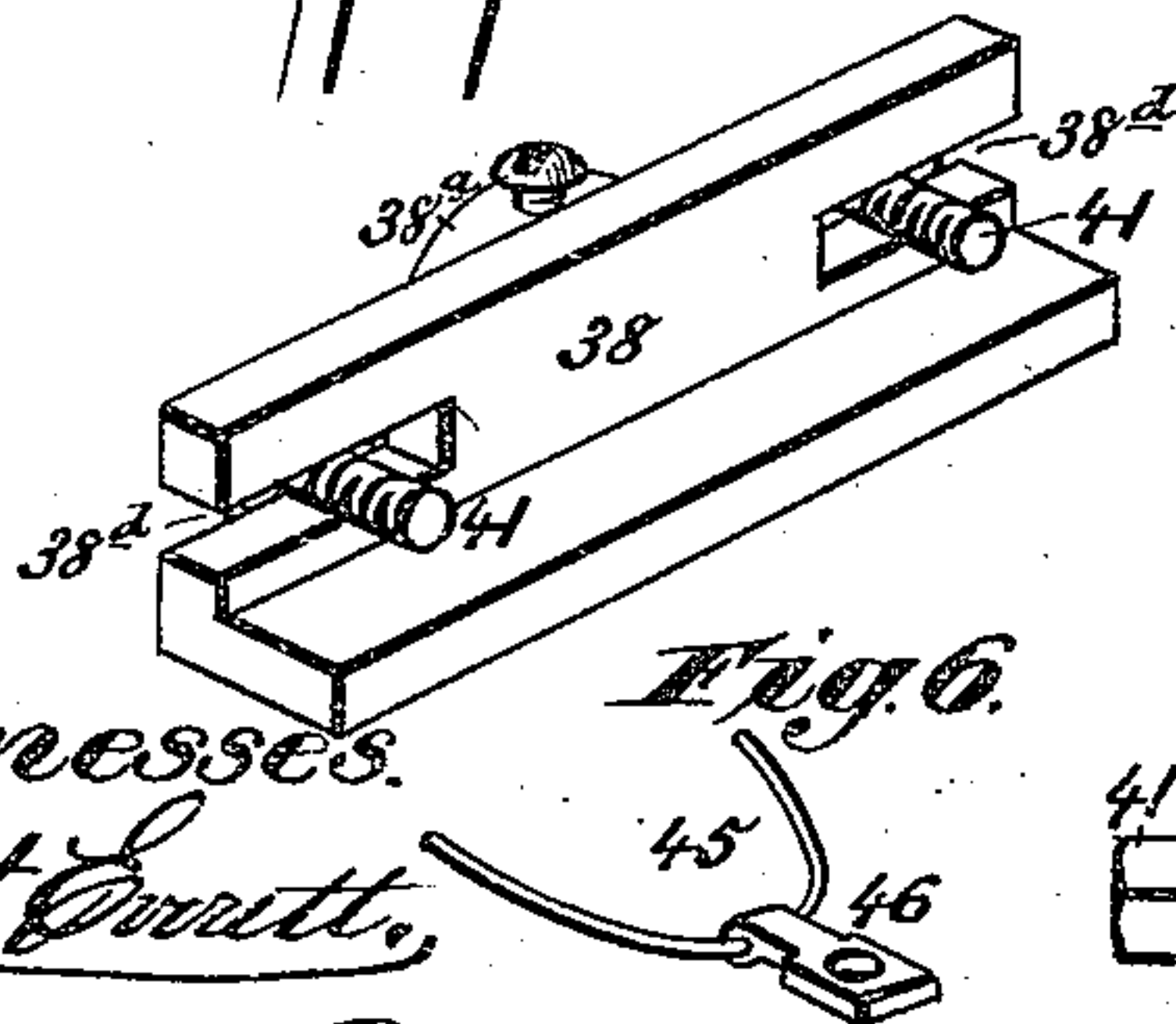


Fig. 6.



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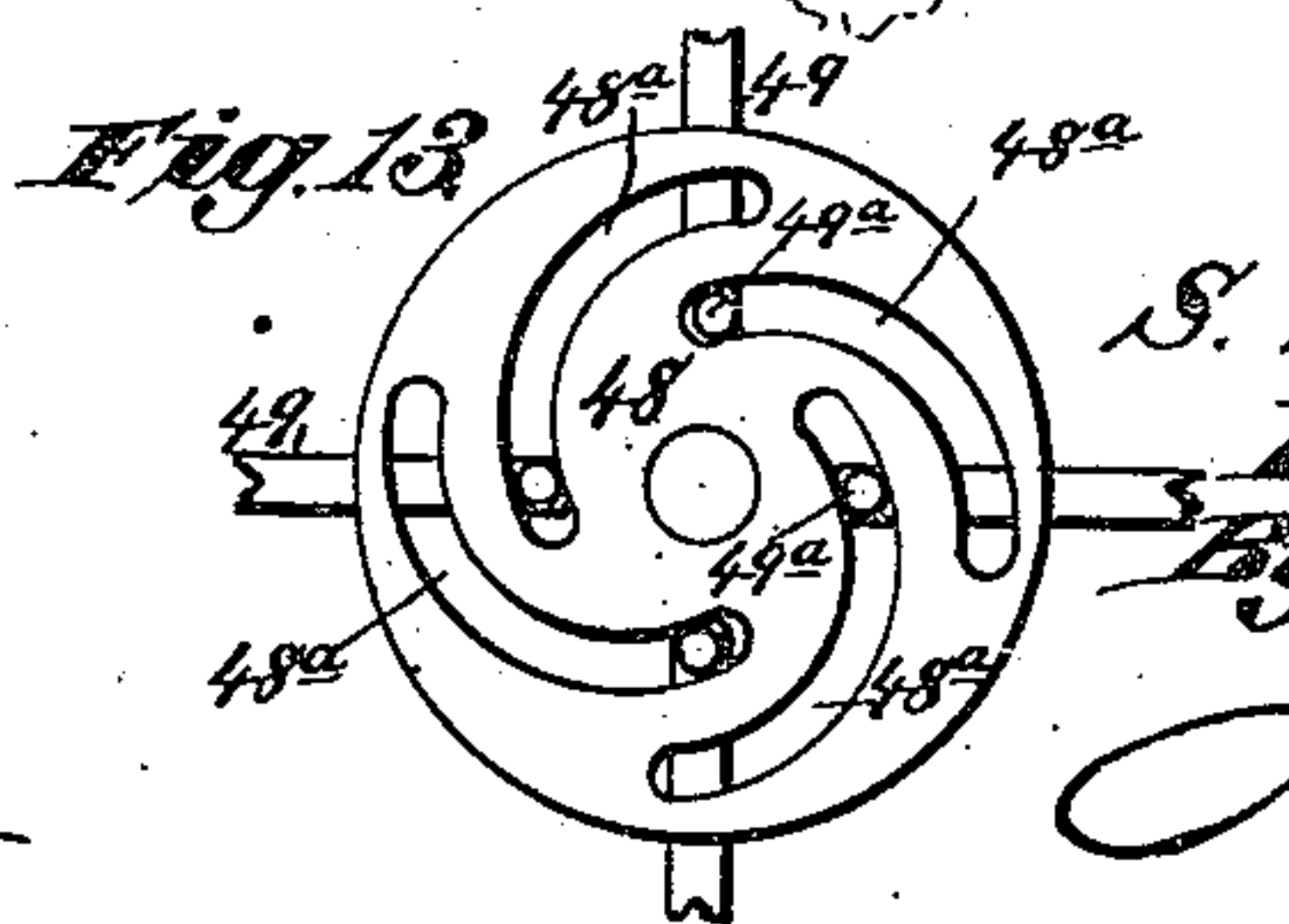
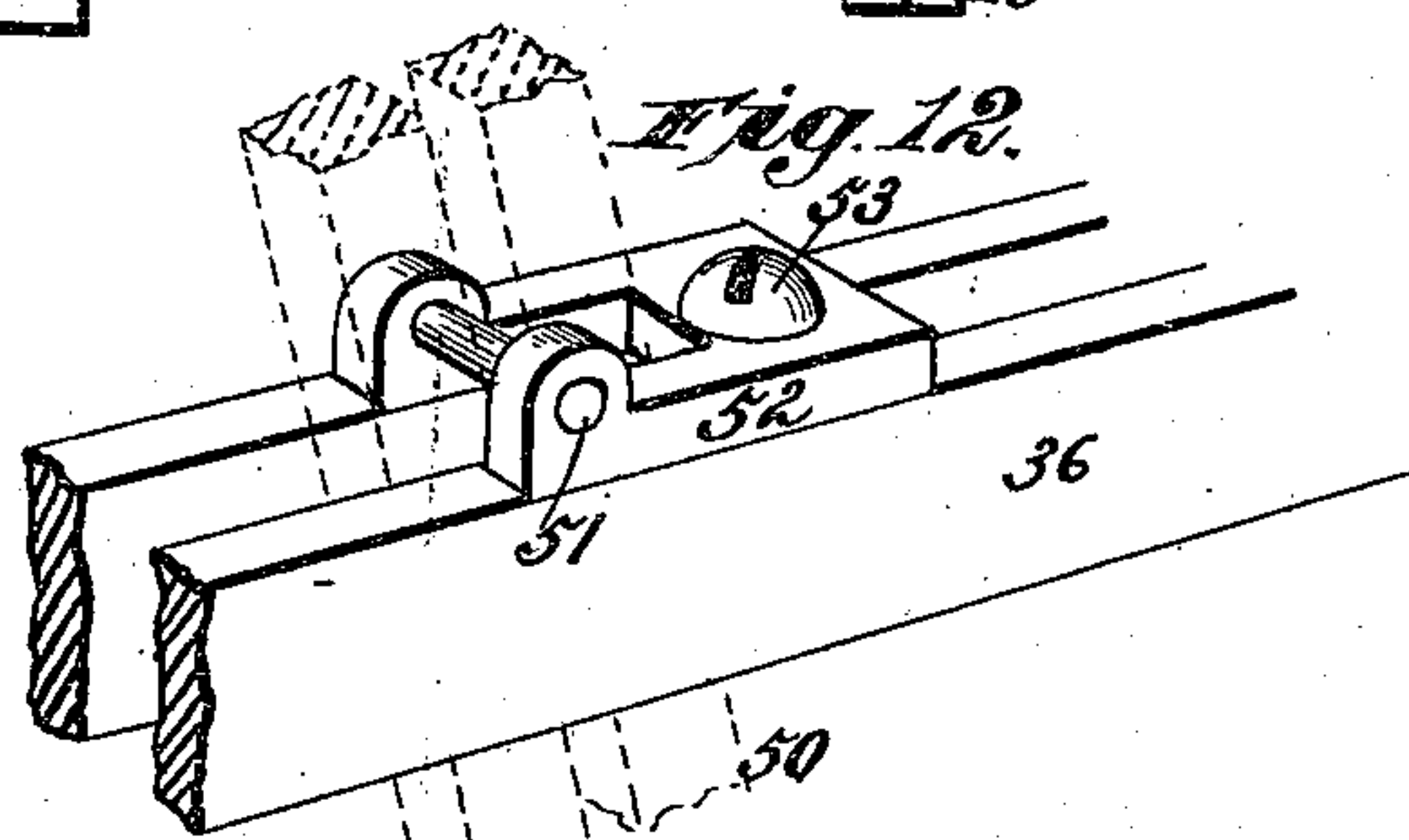
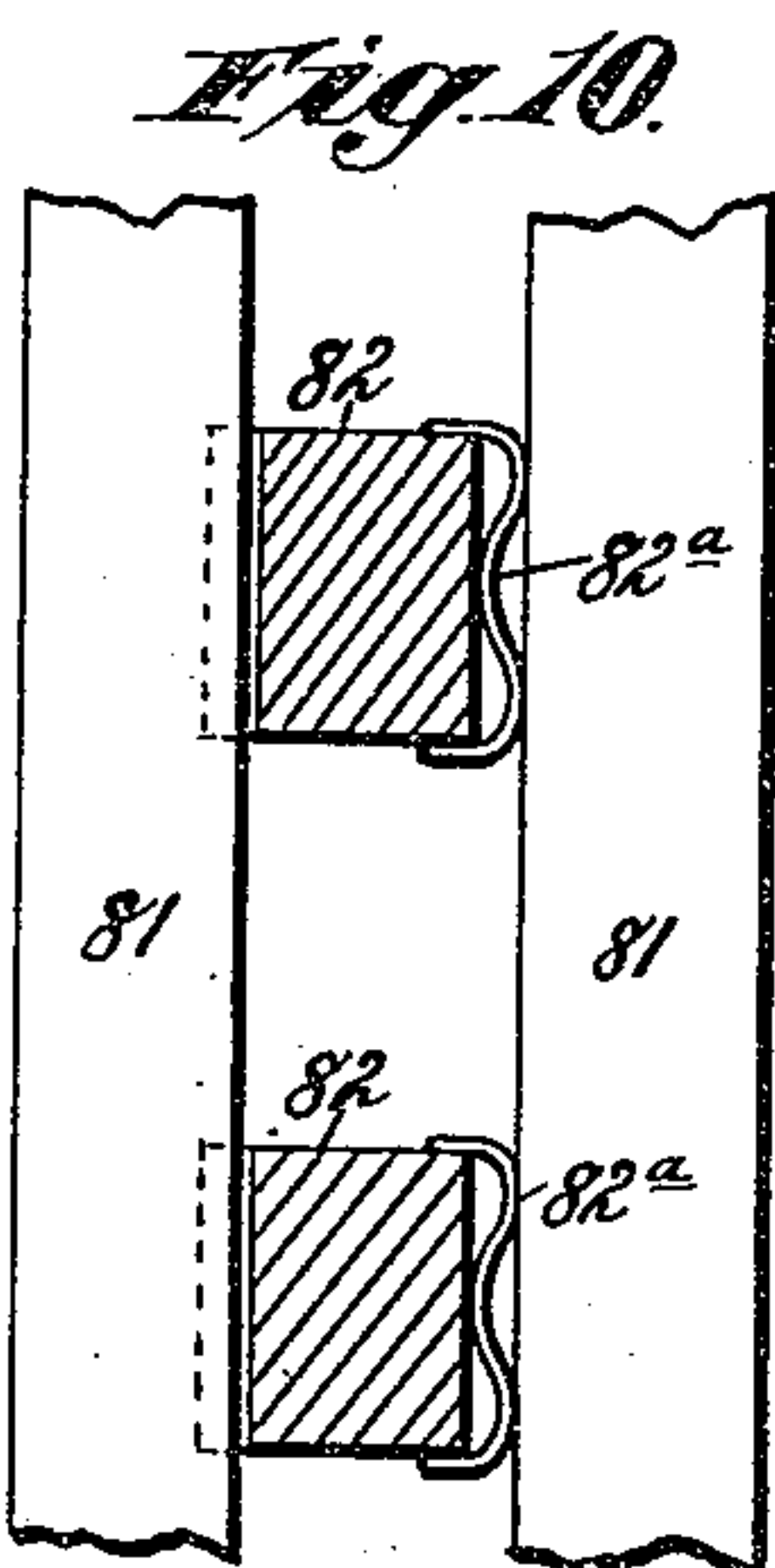
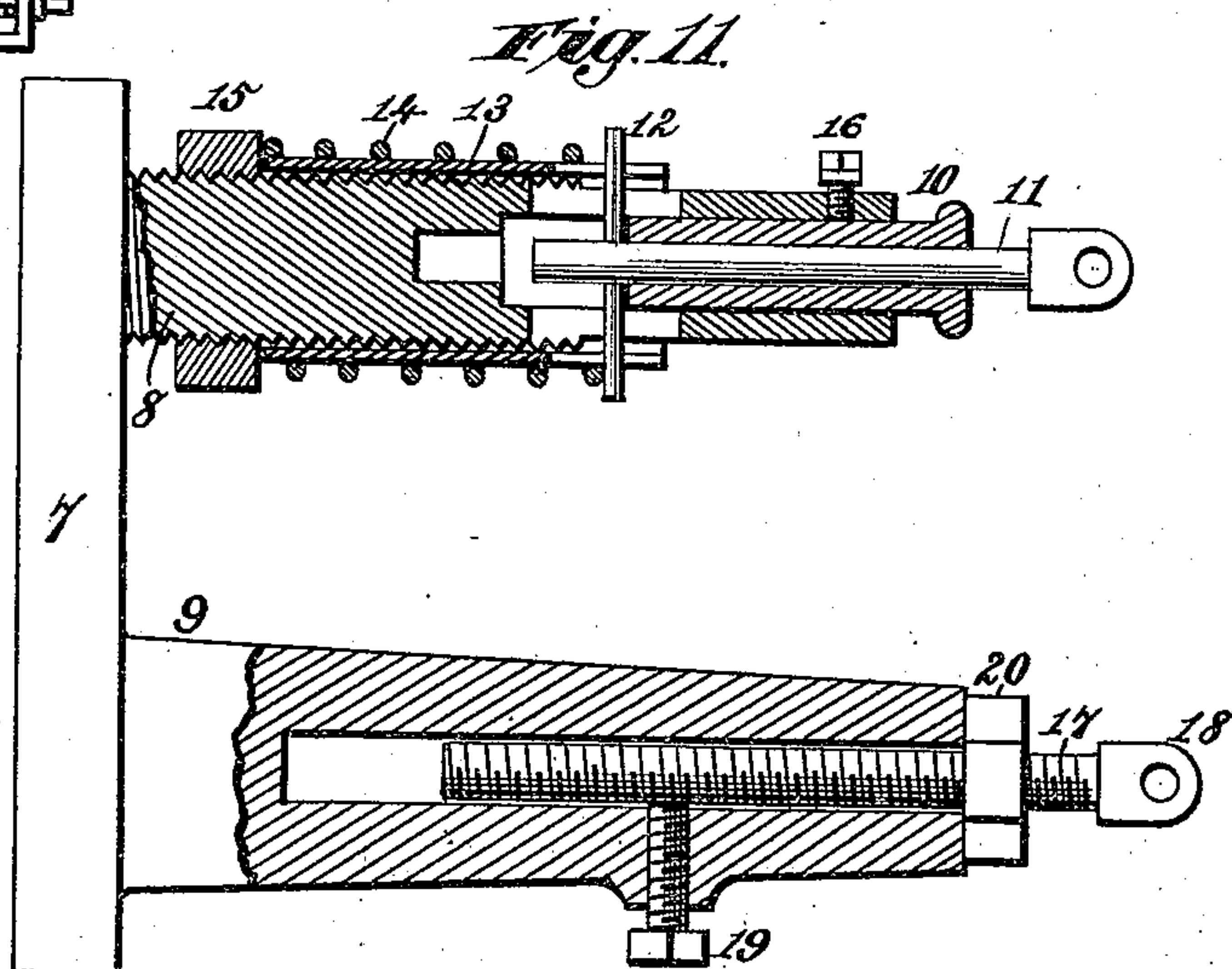
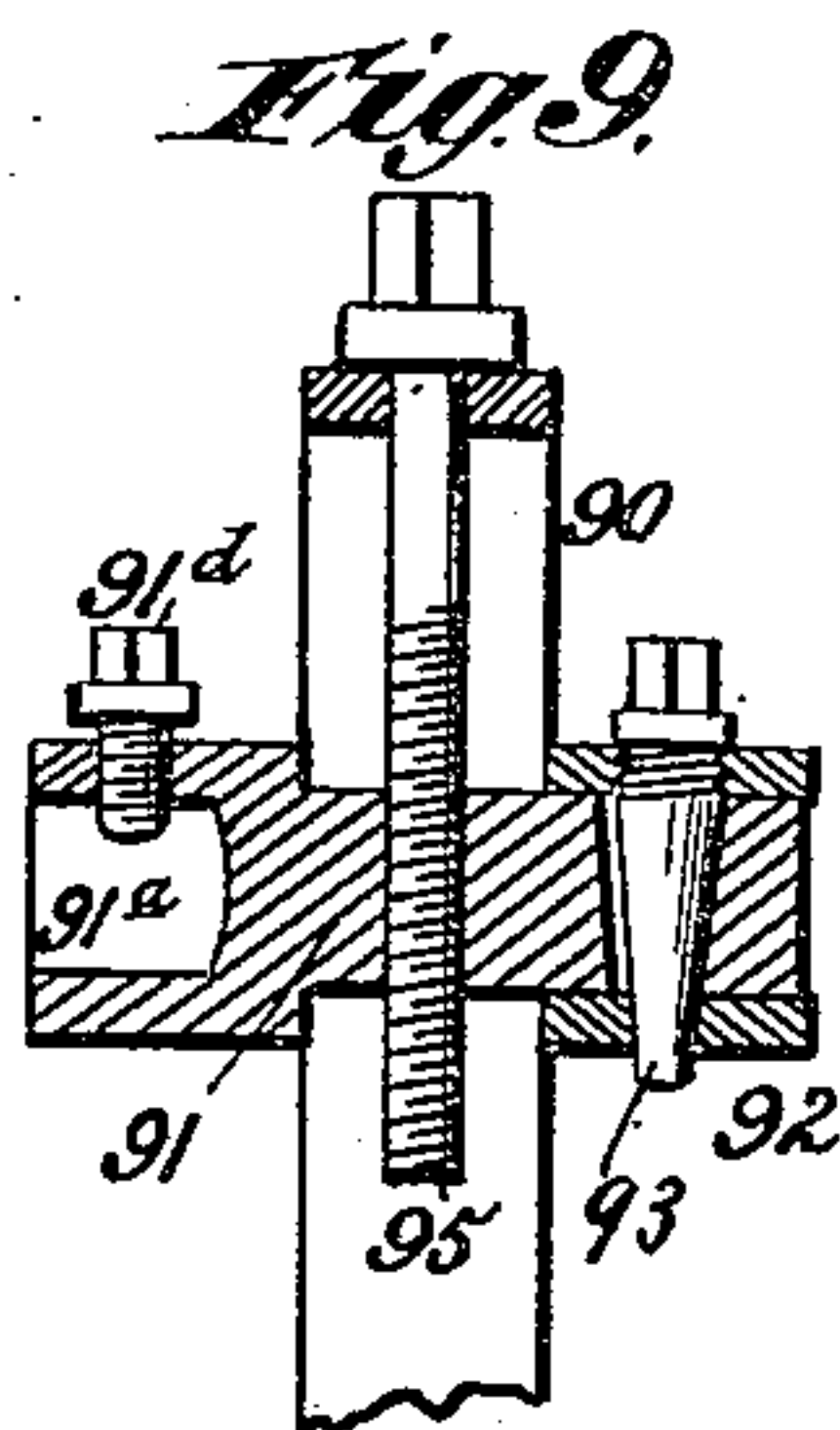
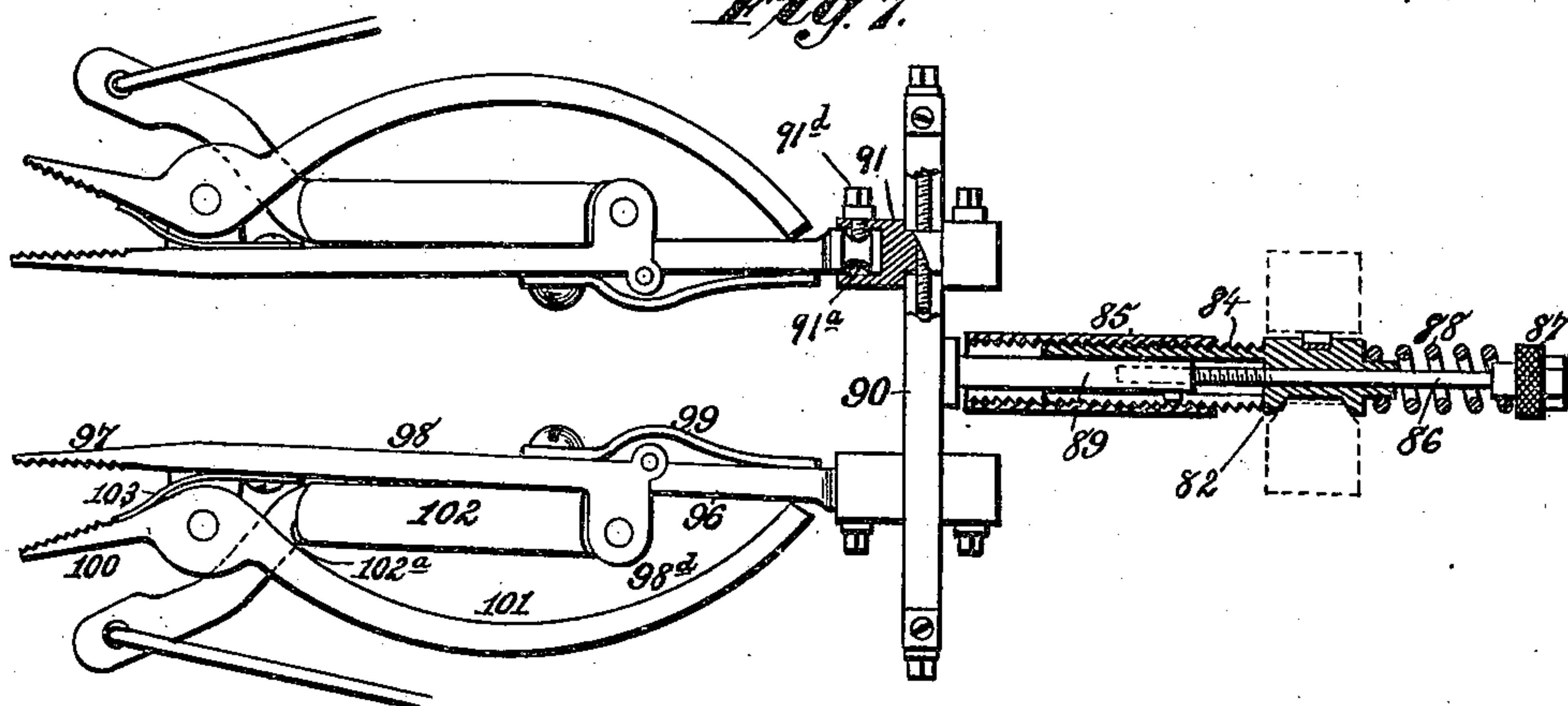
(No Model.)

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LASTING MACHINE.

No. 355,786.

Patented Jan. 11, 1887.



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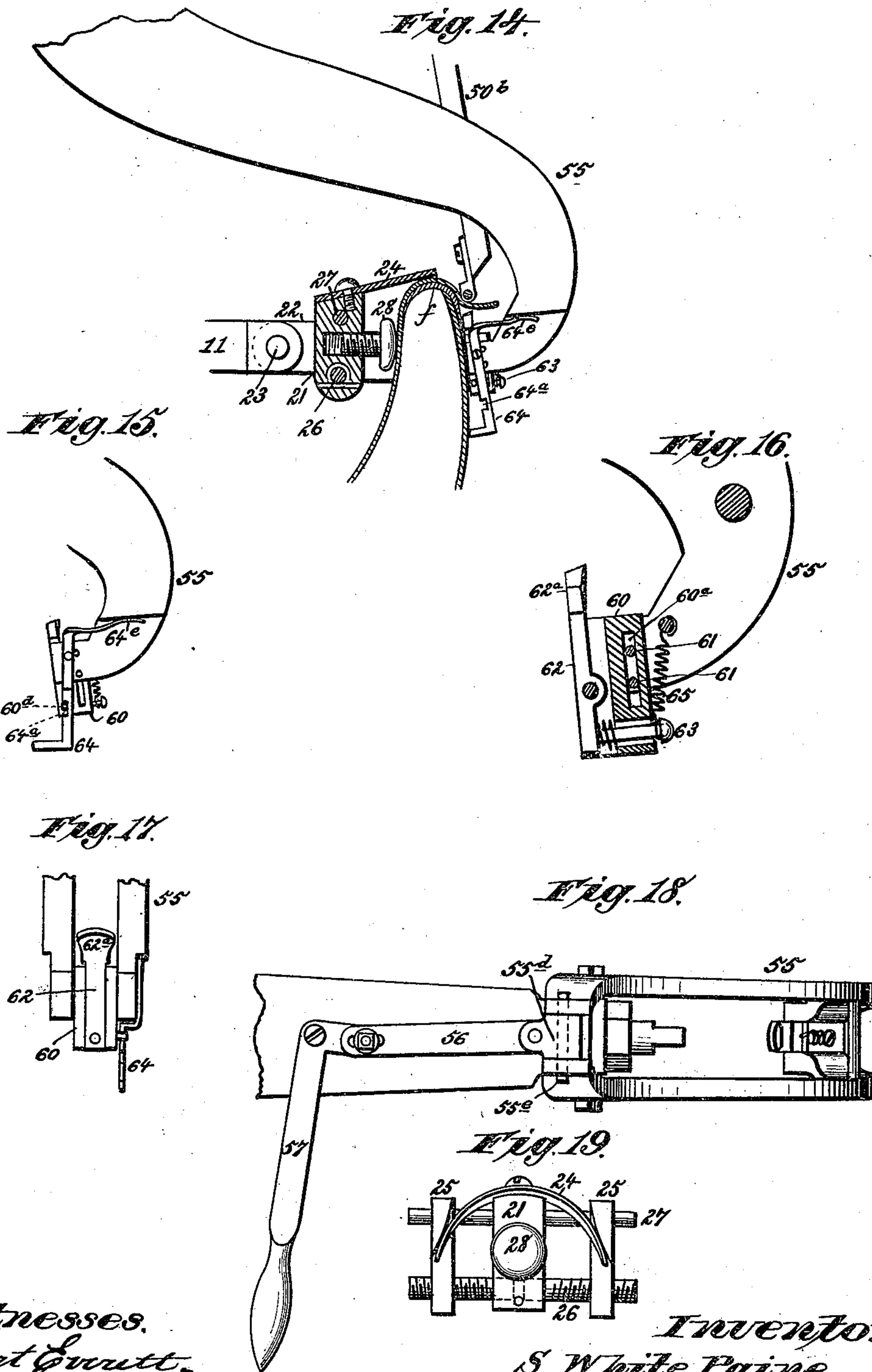
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6 Sheets—Sheet 5.

S. W. PAINE & E. S. COMBS.
LASTING MACHINE.

No. 355,786.

Patented Jan. 11, 1887.



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(No Model.)

6 Sheets—Sheet 6.

S. W. PAINE & E. S. COMBS.
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No. 355,786.

Patented Jan. 11, 1887.

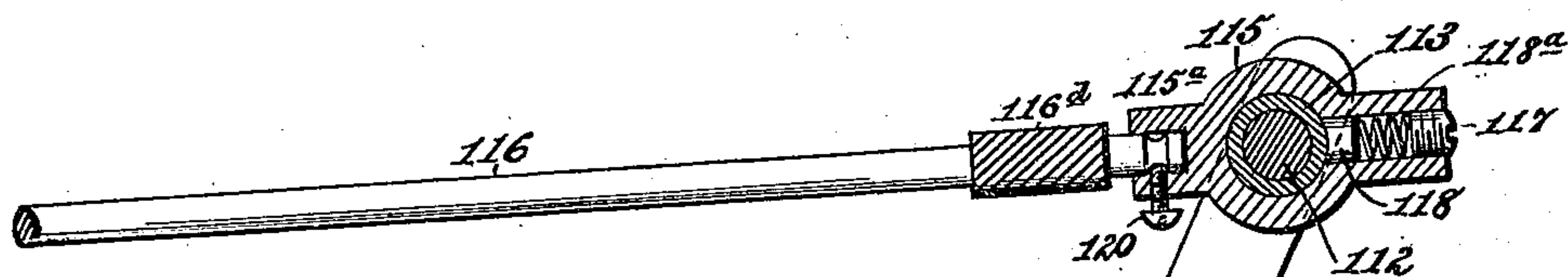
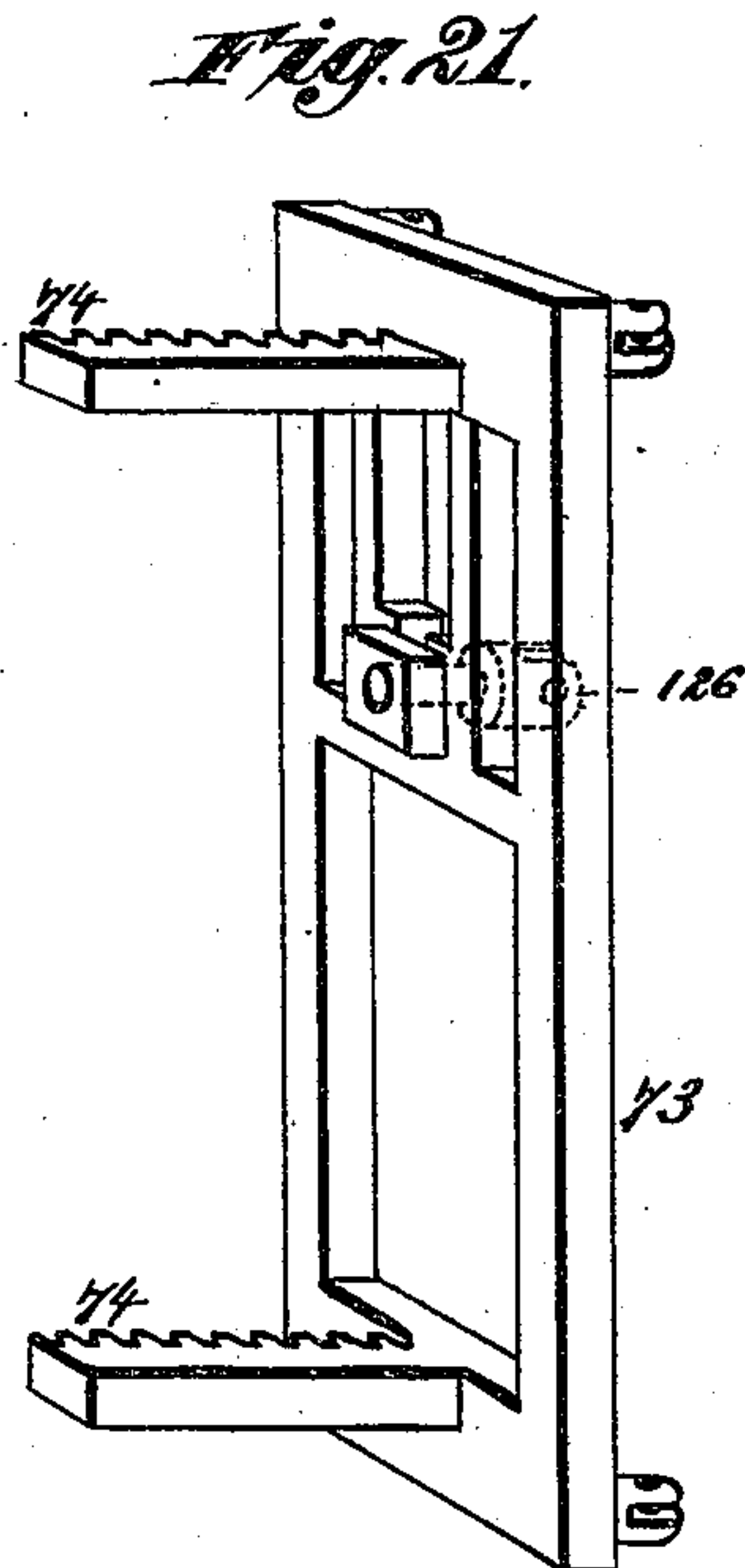
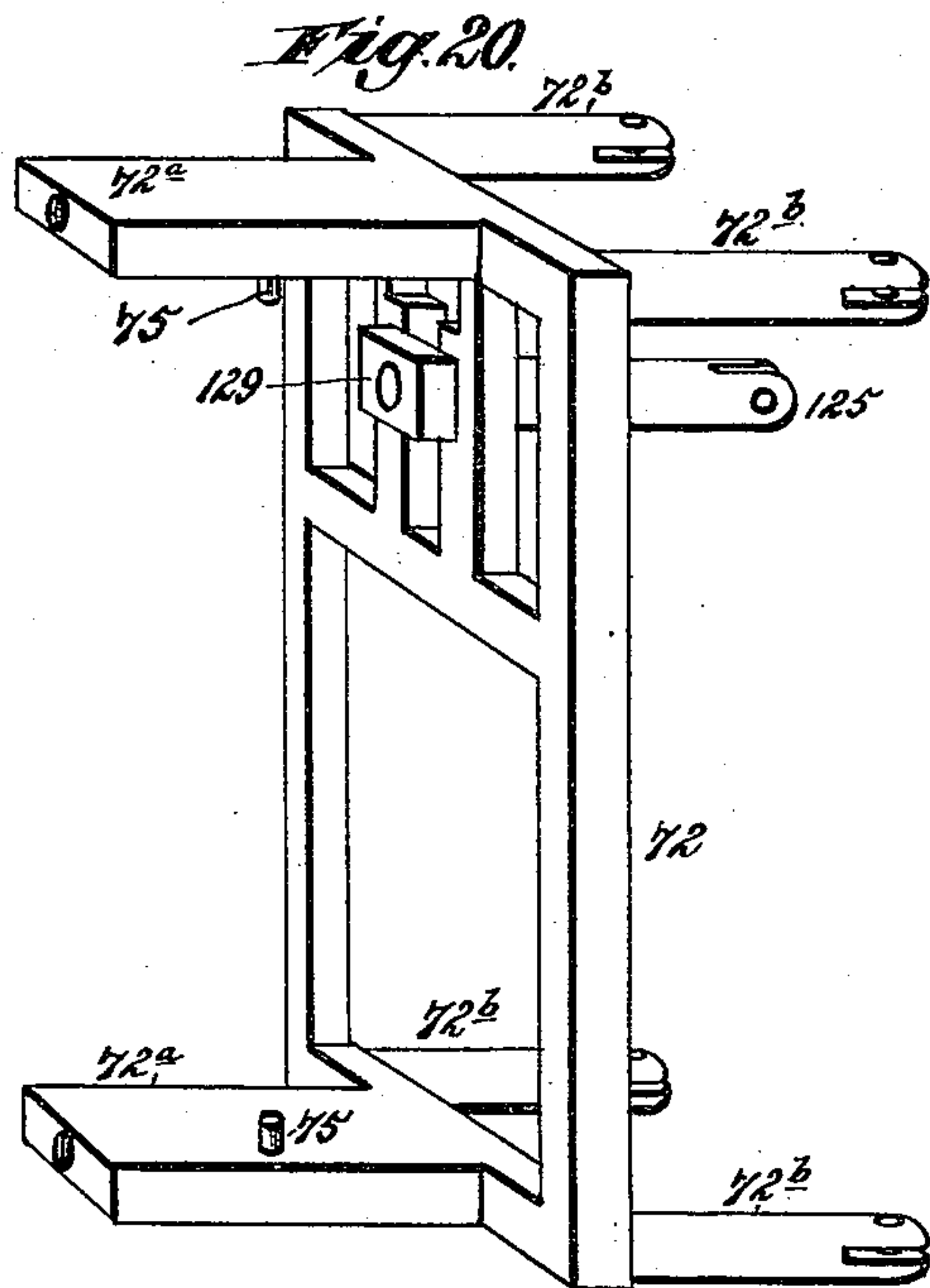
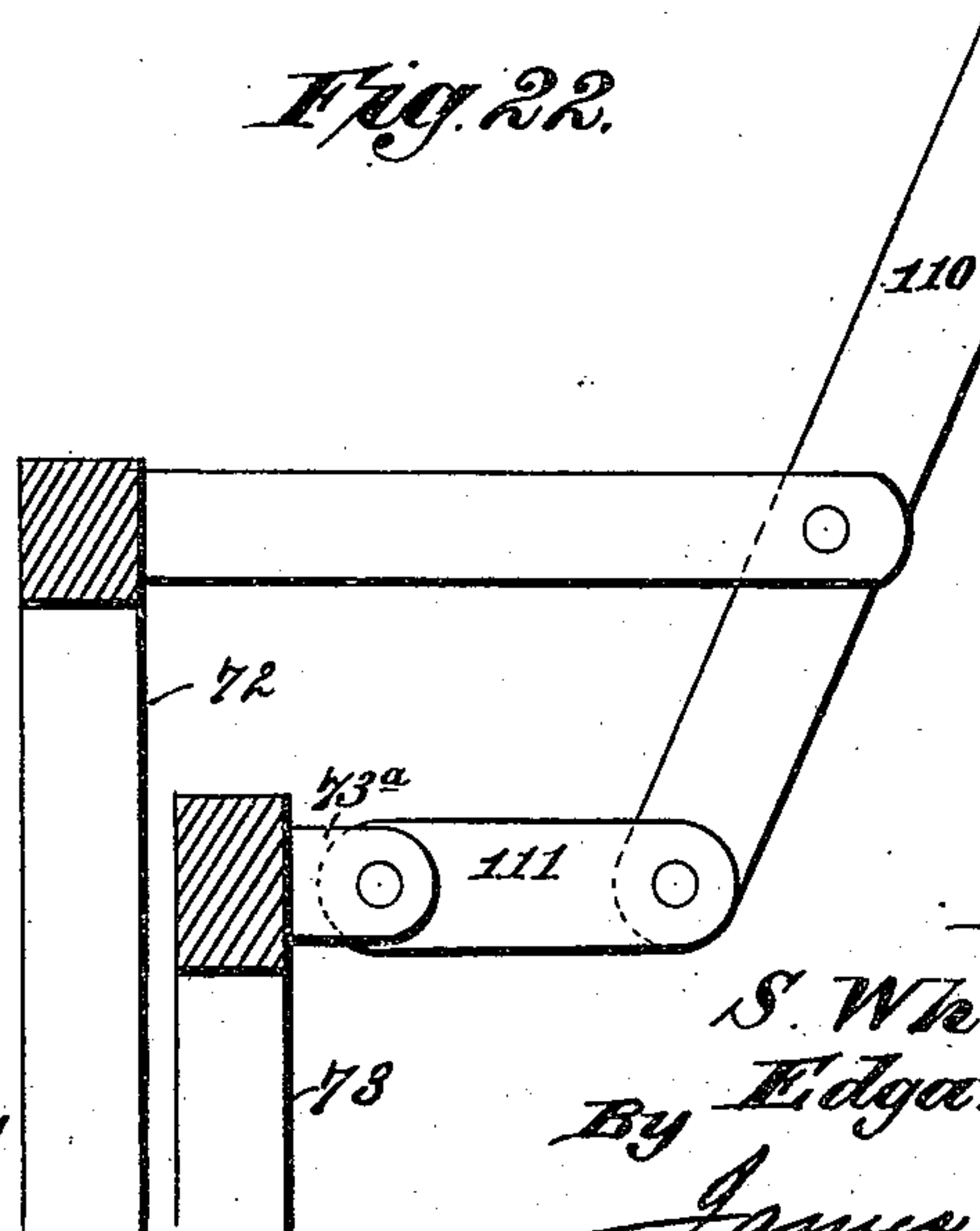


Fig. 22.



Witnesses.
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UNITED STATES PATENT OFFICE.

S. WHITE PAINE AND EDGAR S. COMBS, OF ROCHESTER, NEW YORK; SAID
COMBS ASSIGNOR TO SAID PAINE.

LASTING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 355,786, dated January 11, 1887.

Application filed February 1, 1886. Renewed November 29, 1886. Serial No. 220,223. (No model.)

To all whom it may concern:

Be it known that we, SETH WHITE PAINE and EDGAR S. COMBS, citizens of the United States, residing at Rochester, in the county of Monroe and State of New York, have invented new and useful Improvements in Lasting-Machines, of which the following is a specification.

In lasting-machines of the special type to which our invention pertains it has been customary to employ a series of overhanging pinchers in connection with last-supporting devices and means for turning the edges of the upper down upon the insole placed on the last. In such machines the arrangement of the pinchers above the lasting devices necessitates the employment of counterbalancing mechanism and places the pinchers in such position that they cannot readily be reached and manipulated for purposes of adjustment or otherwise. Furthermore, in machines possessing overhanging pinchers the last and the lasting-jaws, with their operating mechanism, must be placed in such a position that they cannot be operated with facility, and when repairs or any adjustment is necessary the parts are not easily accessible.

It is the object of the present invention to provide a lasting-machine in which the pinchers are carried by a frame which moves in a horizontal plane to and from the lasting devices carried by a vertical plate on a base-frame. Upon posts projecting from this vertical plate are mounted the means for supporting the last, the jaws for turning the edges of the upper down upon the insole, and means for holding the last while the longitudinally-movable pinchers are pulling upon the upper to stretch the same and allow it to be properly seized by the lasting-jaws. These jaws are of a sectional construction, so that proper adjustments can be made for using the same upon different-sized lasts, and positive adjusting devices are also provided for varying the sweep or throw of the devices which actuate the jaws. Furthermore, the movable arms which hold the last against the pull of the stretching-pinchers are fulcrumed on horizontal posts projecting from the vertical head-plate, and are swung to and from the last by lever mech-

anism within easy reach of the operator. One of these last holding-arms carries devices for holding down the boxing-strip upon the insole until such time as the upper has been properly stretched, and the jaw at the toe of the last operates to turn down the edge of the upper when said device for holding the boxing is automatically released or pushed out of the way and placed in the proper position for the next operation. The horizontally-operating stretching-pinchers are, in our present invention, mounted upon a frame which allows them to be brought toward the lasting devices for seizing the upper and moved in an opposite direction for stretching the latter and freeing them from the upper when the lasting-jaws have properly seized the same. Pinchers of a special construction are employed, and novel devices are resorted to for adjusting said pinchers to suit different-sized lasts or special kinds of work. Furthermore, the present machine is so constructed that the seizure of the upper is always insured by the act of moving the pincher-carrying frame toward the lasting devices.

The invention briefly outlined in the foregoing statement will be hereinafter more fully described, and specifically pointed out in the claims.

In the accompanying drawings, Figure 1 is a side elevation of a lasting-machine embodying our improvements. Fig. 2 is a horizontal longitudinal section through the line *a a* of Fig. 1. Figs. 2^a and 2^b show means for connecting the main lever shaft with the templet-lever. Fig. 3 represents in elevation the lasting devices, last-holder, and mode of mounting the same upon a vertical head-plate. Fig. 4 is a detail view of one of the side lasting-jaws, the component parts being shown dissected. Fig. 5 is a detail view of a side jaw and part of the flexible end jaw engaging therewith. Fig. 6 is a detail view of a flexible end jaw. Fig. 7 represents the construction of the pinchers and means for connecting the same with the carrying-frame. Fig. 8 shows the manner of adjustably holding the shanks of said pinchers in a slotted holder. Fig. 9 is a sectional view showing said slotted holder, adjustable pincher-block, and means for locking

the latter. Fig. 10 is a detail view of friction holding-blocks for the pinchers. Fig. 11 is a detail view of a slide-block with posts and other devices for supporting the last and lasting-jaws. Fig. 12 is a detail view of portion of the lever and slide-bar concerned in the operation of the lasting-jaws. Fig. 13 represents a plate with scroll-slots for engaging with the arms which communicate motion to the different lasting-jaws. Figs. 14 to 18, inclusive, represent in detail the device for holding the last against the pull of the pinchers and preventing the displacement of the boxing-strip. Fig. 19 is a detail view of the toe-rest of the last. Fig. 20 is a perspective view of a fixed frame mounted, having fulcrumed posts for the pincher-operating levers. Fig. 21 represents a movable frame co-operating with the fixed frame, and also having fulcrum-posts. Fig. 22 is a detail view of the fixed and movable frames, lever, and bar upon which the operating-rods of the pinchers are mounted.

The reference-numeral 1 designates a horizontal frame or table, which is mounted upon suitable legs, 2, and carries at one end a vertical plate, 3, which, for the sake of convenience, will hereinafter be termed the "head-plate." At the other end of the table is mounted a fixed supplementary frame consisting of top and bottom and vertical connecting-bars. This frame 4 serves as a support and guide for a movable frame or sash, 5, which carries the devices concerned in the operation of stretching the upper, as will be hereinafter fully explained.

Referring first to the devices mounted upon the head-plate 3, which may be defined by the term "lasting mechanism," it is seen that the last is held in a vertical position, and that the toe and heel lasting-jaws move horizontally to and from the last.

The reference-numeral 6 represents guide-ways formed in or upon the head-plate for the reception of movable blocks 7, carrying straight horizontally-projecting posts or arms 8 and 9, as is clearly indicated in Fig. 11. The post 8 is provided with an external screw-thread, and is made hollow throughout nearly its entire length for the reception of an elongated collar, 10. The latter receives a shank or pin, 11, carrying a vertical pin, 12, which moves in a horizontal slot made in the post 8. The latter has an encircling sleeve, 13, through a slot in which the pin 12 projects, and this sleeve is surrounded by a coiled spring, 14, which bears upon the pin 12 and upon an adjustable nut, 15, applied to the screw-threaded portion of the post 8. By means of said nut the tension of the spring can be adjusted, and the presence of the collar 10 will allow the pin 11 to be projected more or less from the post 8, a set-screw, 16, being provided to hold the collar 10 in place. This pin 11, in connection with a similar one arranged in line therewith, serves to support the last, as will be hereinafter set forth. The post 9 is also made hollow, and receives a screw-threaded stem, 17, the outer

end of which has an eye, 18, constituting the point of support for a lasting device. A set-screw, 19, projecting into the bore of the post 9 bears upon the screw-stem 17, and serves to prevent the same from dropping out, and a nut, 20, is the medium for adjusting the screw-stem in and out of the post. The slide-blocks 7 and their two posts are the same at the top and bottom of the head-plate 3, and, as already stated, the posts 8, or rather the pins 11, mounted therein, carry the means for supporting the last.

The device for supporting the toe portion of the last consists of a block, 21, which is connected by a tongue, 22, and pintle 23 with the pin 11. An outwardly-projecting flexible shield or curved spring-plate, 24, is secured at the middle of one end to the block 21, and its free sides are received between oblique lugs or adjustable plates 25. These plates are fitted on a right-and-left-hand screw, 26, and are guided in their movement by a pin, 27, upon which they can slide. By means of the screw the spring-plate 24 can be expanded or contracted, to permit the toe portion of different-sized lasts to be clamped between the same. A padded button or screw, 28, fitted to the block 21 can be adjusted to suit the size of the last. The heel portion of the last is secured directly on the end of one of the pins 11, the latter entering a hole in the last provided for such purpose. Horizontal guide-ways 29, arranged at the sides of the head-plate 3, receive adjustable blocks 30, carrying each an outwardly-projecting post, 31, as is shown in Fig. 2. These posts are made hollow, and have screw-stems 32, set-screws 33, and nuts 34, of the same construction as has been described in connection with the posts 9. These screw-stems 32 carry pivoted blocks 35 at their outer ends, through which move the arms 36, carrying the side lasting-jaws.

It should be observed that the various movable blocks upon which the above-described posts are mounted are adjusted in their guide-ways by means of screw-shafts 37, having their bearings in the frame 1 and entering screw-sockets in the blocks.

The side lasting-jaws (fully illustrated in the detail, Fig. 4) consist of the angular plate or holder 38, the block 39, and the jaw portion proper, (marked 40.) The part 38 has a socket, 38^a, for making the connection with the arm 36, a screw or other device serving to hold these parts together. In one of the walls of the part 38 are made vertical slots 38^b, which receive screws 41, that project into screw-sockets in the block 39, and serve to hold it firmly upon the part 38. The block 39 has lugs or projections 39^a formed thereon, and at its top and bottom it carries two narrow plates, 42, which project beyond the face of the block and have enlargements 42^a, with oblique grooves 42^b made therein. The narrow strip of steel 40, which constitutes the surface that seizes the upper and turns it down upon the insole, is provided with apertured projections

40^a, which fit upon the projections 39^a, and are secured thereto and to the body of the block by rivets or screws. Projections 40^b at the ends of the strip 40 are fitted in rear of the enlargements 42^a, so as to bring the ends of said strip in line with the oblique grooves 42^b.

In practice it is the intention to use blocks 39 and strips 40 of different sizes and lengths, according to the kind of work to be performed, and it is apparent that the necessary changes can be made without removing the holders 38 from the arms 36. This is due to the fact that the presence of the slots 38^a in the part 38 will allow the screws 41 to be shifted up and down to engage with the screw-openings in blocks 39, varying in length or size. Furthermore, the strip 40 is also attached to the block 39 in such a way that it can be readily removed and replaced by a new one when it becomes broken or is not adapted to the particular kind of last to be operated upon.

The device located at the heel and toe portions of the last for operating upon the upper at these points and turning it down upon the insole is shown in Figs. 3 and 6. It consists of a U-shaped spring arm or piece of wire, 45, the middle portion of which is fitted in a small plate or holder, 46, while its free ends are entered into the oblique recesses 42^b of the plates 42 on the side lasting-jaws. During the lasting operation these heel and toe lasting devices receive a positive sliding movement for causing them to glide upon the upper and turn the same upon the insole, and simultaneously with such positive sliding movement the side jaws will, by virtue of their connection with the end jaws, cause a contraction of their spring-arms and cause the latter to act in unison with the side jaws. By such operation it is evident that a continuous or unbroken line of engaging or contact surfaces exists all around the upper, and the latter is thus turned smoothly and uniformly upon the insole.

The mechanism for operating the various lasting-jaws consists of the hand-lever 46, which is mounted on a horizontal axis having its bearings in the head-plate 3, and in a bracket, 47, fixed to the rear of the latter. This axis carries a disk, 48, in which are made four scroll-shaped or curved slots, 48^a, which receive lugs or projections 49^a on a corresponding number of slide-bars, 49, the movement of which is guided by suitable supporting-brackets, 3^b. These slide-bars 49 communicate motion to horizontal levers 50, which extend through slots in the head-plate 3, and are fulcrumed in brackets 50^a on the front side of the latter. The levers 50 are connected with the arms 36, carrying the respective lasting-jaws, and hence it is evident that a proper manipulation of the single hand-lever 46 will, through the intervention of the slotted disk, slide-bars, and co-operating devices, cause the lasting-jaws to be moved simultaneously up to their work or away from the same. Since it is necessary to vary the degree of movement of the lasting-jaws to suit the requirements of

the work, or the size of the last or lasting-jaws, we provide an adjustable connection between the levers 50 and bars 36.

Referring specially to the detail, Fig. 12, it will be seen that the bar 36 is slotted longitudinally for the reception of the end of the lever 50, and likewise, as is seen, this end in Fig. 12. Said lever is slotted and receives a transverse pin, 51, carried by an adjustable plate, 52. This plate is adjustably fitted on the bar 36, so that it can be moved back and forth thereon, and it is combined with a clamping bolt or screw, 53, passing through the slot in the bar 36, and having a set-nut on under side of the latter. By loosening the bolt 53 the latter can be moved or adjusted in the slot of the bar 36 to suit the changed position of the lasting-jaw, due to the adjustment of its supporting-stem in the post 31.

It is obvious that by providing the plate 52 and its adjuncts in connection with the slotted bar and lever the necessary adjustments of the latter can be quickly and easily made in the most exact manner.

The devices above described are directly concerned in the operation of turning down the edges of the upper upon the insole placed on the last; and before entering into a description of the devices for stretching the upper on the last, in order to permit its edges to be properly seized by the lasting-jaws, it is necessary to mention other devices mounted upon the head-plate 3 and co-operating with the lasting devices.

In order to hold the last firmly in position while the operation of stretching the upper is taking place, we provide the curved arms or goose-necks 55, which are fulcrumed upon the posts 9, and have beaks 55^a bearing, respectively, upon the toe and heel portions of the last, or, more precisely speaking, upon the insole placed on the last. These arms 55 are furcated and extend on opposite sides of the posts 9, so as not to interfere with the movement of the arms 36 of the heel and toe lasting-jaws, which, as is shown in Fig. 3, pass through the furcated or open portions of said arms 55.

The heel portion of each arm 55 beyond the fulcrum-point carries a vibrating block, 55^d, which is hung upon a pin, 55^e, and to this block is jointed a link, 56, connected at its other end with the short arm of an elbow-lever, 57. These levers are mounted upon the posts 9, and by their manipulation the curved arms or goose-necks 55 are turned on their fulcrums and swung toward or away from the last, according to the direction in which the levers are moved. When the arms 55 are bearing upon the last to hold it in position against the pull of the stretching devices, the levers 57 are in such positions against the head-plate 3 that the firm retention of the arms is insured. A simple outward pull upon the levers, however, will, through the intervention of the links and vibrating blocks, cause the arms 55 to be swung away from the last. We combine with the arm

55, operating upon the toe portion of the last, means for holding the customary boxing in position during the operation of stretching the upper.

5 As seen in Figs. 14 to 16, inclusive, a sliding block, 60, mounted on the arm 55, has a slot, 60^a, for the passage of guide-pins 61, which serve as a limit or define the degree of movement of said block between the bifurcations or
10 branches of the beak portion of the arm 55. This block is hollowed out on its inner side and receives a pivoted dog, 62, one end of which terminates in a presser-foot, 62^a, adapted to glide over the boxing-strip and hold the
15 same. This dog 62 is hung upon a pivot, so that it can easily glide over the insole without catching the same, and it has a spring-encircled stem, 63, playing in an opening of the block 60, for holding it in a proper working
20 position. On the outside of the arm 55, and pivoted thereto, is located a trigger or releasing-arm, 64, which has a notch, 64^a, adapted to engage with a pin or lug, 60^a, on the block 60 and hold the latter in a retracted state, as is
25 seen in Fig. 15. A spiral spring, 65, connected with the block 60 and arm 55, is the medium for projecting the block when the trigger is released, and when thus projected the presser-foot of the holding-dog slips over the boxing-
30 strip and holds the same in position during the operation of stretching the upper and the beginning of the turning down of the latter upon the insole. When the beak of the arm 55 is first brought down upon the last or insole,
35 the bent point of the trigger 64 comes in contact with the insole, and is vibrated sufficiently to liberate the trigger from the projection on the sliding block and cause the spring 65 to project the presser-foot over the strip of leather, *f*,
40 employed for forming the box-toe. When the toe-lasting device has commenced to turn the upper upon the boxing-strip and the retention of the same is insured, the onward movement of said lasting device will cause it to press
45 down the block 60 and cause its pin 60^a to engage again with the notched trigger 64, for holding said block in its normal position. The trigger-arm terminates in a spring-tongue, 64^b, which bears upon an exterior shoulder on the
50 arm 55, and serves to hold the block 60 in engagement therewith.

The mechanism for stretching the upper and holding the same tightly stretched until such time as the lasting jaws have commenced their
55 operation of turning the edges of the upper upon the insole is all located at one side of the machine, within easy reach of the operator, and the various parts move horizontally or longitudinally, and not vertically, as in other
60 machines heretofore devised.

The frame or sliding sash 5, carrying all the devices concerned in seizing and stretching the upper, is provided with top and bottom rack-bars, 70, into which mesh spur-segments 71 on
65 a vertical shaft, 172. The latter is journaled in boxes on the fixed frame 4 and carries a horizontal hand-lever, 172^a, by means of which

motion is communicated to the sliding frame through the intervention of the rack-bars, segments, and shaft. At the front of the sash 5, or
70 the end nearest the lasting devices, we attach a fixed frame, 72. A movable frame, 73, arranged in rear of the fixed frame carries two rack-arms, 74, which pass through the fixed frame and move in contact with guide pins or rollers
75 on branches or elongations 72^a of the fixed frame. Spurred segments 76 on a vertical shaft, 77, engage with the rack-arms 74, and by manipulating a lever, 78, mounted on shaft
80 77 the movable frame is moved to or from the fixed frame, for the purpose hereinafter mentioned. The branches 72^a of the fixed frame are secured to the front vertical bar of the sash or frame 5. Horizontal arms or plates 80,
85 also secured to this frame 5, carry at their opposite ends vertical strips 81, which face each other, as is shown in Fig. 2, and serve to clamp adjustable blocks 82 between the same. These blocks (specially shown in Figs. 7 and 10) have
90 one flat face provided with a friction spring, 82^a, while the other face is grooved and fits on a correspondingly-beveled strip, 81. A screw-bolt, 83, passing through the plates 80, serves to bring the strips 81, carried by said plates,
95 close together for firmly clamping the blocks 82 between said strips. By loosening the bolt 83 the plates 80 are sufficiently sprung apart to permit the blocks 82, with their attached devices, to be shifted up or down, the springs
100 82^a on said blocks being sufficient to hold the blocks by friction until they are moved by hand. Each block 82 has an external screw-threaded tubular extension, 84, which is encircled by an internally-threaded sleeve, 85.
105 Furthermore, a screw-stem, 86, having a milled head, 87, and encircled by a spiral spring, 88, passes through said block into the tubular extension 84, and is received by a socket-post, 89, projecting from what may be termed a
110 "pincher-holder," 90. The latter is arranged in a horizontal plane, and the socket-post 89 projects from its rear side and enters the tubular extension of the block 82, as is clearly indicated in Fig. 7.

By turning the screw-stem 86 by means of
115 its milled head, the socket-post is moved in or out of the tubular block-extension 84, thus providing means for causing the pinchers carried by the holder 90 to be adjusted longitudinally to suit the size of the last. The
120 pincher-holder 90 is a transverse bar having a slot for the reception of laterally-adjustable blocks 91, the front ends of which terminate in sockets 91^a, while their rear portions are extended and constitute necks for the recep-
125 tion of locking-collars 92. These necks projecting beyond the holder 90 are each provided with a tapering opening, in which is fitted a tapering plug, 93, having an angular
130 outer portion for applying a key and a screw-threaded portion for locking it to the collar 92. Each block has a screw-threaded opening for the passage of a screw, 95, which is journaled in the end of the holder 90, and has

a squared portion to permit it to be turned by a key or wrench. By loosening the taper plugs and collars 92 the pinchers carried by the blocks 91 can be adjusted laterally to suit
 5 lasts of varying width, and when the plugs are again tightened up and screwed to the collars 92 the pinchers are firmly held in their proper positions relatively to the last.

The construction of the pinchers is as follows, viz: A straight shank, 96, has a circumferentially-grooved round end portion, which is received in the socket 91^a of the block 91, and is held therein by a set-screw, 91^a, in
 10 such a way that said shank can have a slight axial or rotary motion to allow the pincher-jaws to conform to the curvature or contour of the last. The shank 96 is the point of attachment of the stationary or fixed jaw 97 of the pinchers, and for this purpose the body 98 of
 15 the jaw and the shank 96 have knuckle-plates for making the connection by a pintle in the manner of a rule-joint. A spring-tongue, 99, carried by the fixed jaw bears against the face of the shank 96 and holds these parts in
 20 proper alignment with each other until such time as the jaw 97 and its body portion are to yield or move inwardly to adapt themselves to the hollowed-out or curved portions of the last. The movable jaw 100 is pivoted to an
 30 ear or lug projecting from the body of the other jaw, and it has a curved arm, 101, which extends in the direction of the shank 96 of the fixed jaw. When the pincher-jaws are open, the parts are in the position seen in Fig. 7,
 35 and for closing the jaws we employ an arm, 102, which is pivoted at one end between ears 98^a of the body of the stationary jaw. The other end of the arm 102 projects through a slot in the arm 101, and at the junction of the
 40 portion passing through said slot and the part which is disposed between the curved arm and body of the stationary jaw we form cam or curved surfaces 102^a, so that a pulling force is applied to the arm 102. These cam-surfaces will
 45 move in contact with the inner surface of the curved arm and close the jaws more or less, according to the degree of movement of the arm 102. A plate-spring, 103, connected with the body of the fixed jaw and bearing upon
 50 the head of the movable jaw, serves to keep the jaws separated until they are closed by the action of the movable arm.

It is to be understood that the above description relates specially to the pairs of pinchers adapted to be disposed on opposite sides
 55 of a last, as is shown in Figs. 2 and 7, or at all points of the last where double sets of pinchers are to be directly opposite each other. At the toe and heel portions it is obvious that
 60 single pairs of pinchers only are required, and particularly at the toe portion we find it necessary to use pinchers which can receive every possible form of adjustment.

The means for operating the pinchers—that
 65 is, opening the same to receive the upper, closing the same upon the latter to stretch it, and again releasing said upper—may be de-

scribed as follows, viz: On the fixed frame 72 are mounted horizontal posts 72^b, which constitute the fulcrum-points of horizontal levers 70
 110, the inner ends of which are also connected by pivoted links 111 with ears 73^a on the movable frame 73. These levers 110 are located
 75 in pairs at both sides of the machine, as is shown in Figs. 1 and 2, one lever being at the top of the frames and the other at the bottom, and a vertical shaft, 112, is firmly bolted to each pair of levers. This shaft 112 is encircled
 80 by a sleeve or tube, 113, which extends the entire space between each pair of levers. On these sleeves are mounted as many collars or
 85 hubs 115 as there are pinchers at the sides of the last, and rods 116, extending from these collars, are connected with the opening and closing arms of the pinchers, as is seen in Fig. 1. The collars 115 can be moved up and down
 90 on the sleeves 113, and are held in position by spring-pressed friction-plugs 118, bearing upon the sleeve, as seen in Fig. 22. Each collar has at one side an opening for the introduction of
 95 the plug 118 and its pressure-spring 118^a, this opening being closed by a screw, 117. On the other side of the collar 115 is a socket, 115^a, which receives the end of the pincher-operating
 100 rod 116, the latter being swiveled in said socket by providing it with an annular groove capable of receiving a holding-screw, 120, passed through the socket 115^a. Each rod 116
 105 has a milled surface, 116^a, and it is made in two parts, which are connected with each other by an ordinary turn-buckle, 121. The portion
 110 of the rod connected with the pincher-operating arm is incapable of turning; but the other portion can be rotated by means of the milled surface, and thus it is apparent that the vari-
 115 ous rods can be lengthened or shortened to conform to the adjustments given to the pincher-holding devices. It will also be seen that the adjustable collars 115 on the encircling sleeve
 120 of the shaft 112 will permit the rods 116 to be moved up and down in unison with the vertical adjustment imparted to the pincher-holding devices.

The pinchers arranged at the toe portion of the last, being in a different plane from the
 115 others, cannot be mounted on collars like the others, and for this reason we provide specially-adjustable fulcrum-posts on the two templets, as is indicated by the numerals 125
 120 and 126 in Figs. 20 and 21. The operating-lever 127 of these toe-pinchers is fitted on these fulcrum-blocks, and is, by means of a rod, 128, connected with the operating-arm which closes the jaws. The fulcrum-posts 125 and
 125 126 are fitted in slots made in the templets, and have screw-shanks and clamping-nuts 129 for holding the same in the desired position.

In the operation of lasting boots and shoes it is a consideration to save as much time as
 130 possible, and to insure the seizure of the upper by the pinchers whenever the latter are brought toward the upper for such purpose. We have in the present machine embodied devices whereby the operation of the lever re-

quire to move the pincher-carrying frame toward the lasting devices will also act upon the pinchers and cause the same to properly receive the edges of the upper, after which the special lever employed for closing the pinchers can be separately operated.

Referring to Figs. 1, 2^a, and 2^b, it will be seen that the vertical shaft 172, upon which the lever 172^a is mounted, carries a horizontal disk, 130, from the under face of which projects a pin, 131. This pin serves to connect the vertical shaft 172 with the lever 78, through the medium of an angle-plate, 132, fitted on this last-named lever, this plate having an opening or passage, which is guarded by a spring-gate, 133. When the parts are in the position seen in Fig. 1, the pin 131 has passed through the opening in the angle-plate and rests in rear of the spring-gate. Now by operating the lever 172^a it is evident that the sash carrying the pinchers can be brought toward the lasting mechanism, and simultaneously with such movement the lever 78 is also vibrated to cause the pinchers to be opened ready for presentation to and reception of the edges of the upper. The pinchers are thus properly opened by one lever movement, and immediately thereafter the two levers are again disconnected by the passage of the pin 131 along the rear of the spring-gate and off at the end of the angle-plate. The lever 78 can then be manipulated for closing the pinchers upon the upper, and thereafter the stretching is performed by moving the sash and pinchers away from the lasting devices through the medium of the lever 72 and the rack and segment devices.

We do not claim herein what is claimed in our application for Letters Patent, Serial No. 220,222, filed November 29, 1886.

What we claim is—

1. In a lasting-machine, a series of horizontal gripping devices, a last-holder or jack, a last mounted vertically thereon, with its face or sole portion presented toward the pinchers, and mechanism for operating the gripping devices in order to cause them to grasp and stretch the upper prior to folding its outer edge over the insole, and said gripping devices arranged to move to and from the face or sole portion of the last in a horizontal direction, substantially as described.

2. In a lasting-machine, the combination, with horizontally-movable side lasting devices, vertically-movable toe and heel lasting devices, and means, substantially as described, for holding a last vertically in relation to said lasting devices, of a group of pinchers arranged at the side of the lasting devices and adapted to move toward or away from the same horizontally, substantially as described.

3. In a lasting-machine, the combination of the bed-frame, the vertical head-plate having guides or ways, and the adjustable blocks fitted in said ways and carrying pivotal posts, with the last and lasting-jaws supported on said posts, substantially as described.

4. In a lasting-machine, the combination of the curved arms or goose-necks 55, the supporting-posts 9, upon which they are pivotally mounted, and the lever and connecting devices 57, 56, and 55^a, for operating and locking said curved arms, with lasting mechanism and a last adapted to be held by said curved arms, substantially as herein set forth.

5. In a lasting-machine, the combination of the slotted bar 36 and the adjustable block 52 with the lasting-jaw carried by said slotted bar and the operating-lever 50, connected with the latter by the adjustable block, substantially as herein set forth.

6. In a lasting-machine, the combination of the adjustable block 52, having a clamping-bolt, and the transverse pin 51, with the slotted slide-bar 36, carrying a lasting-jaw, and the slotted operating-lever 50, substantially as described.

7. In a lasting-machine, the combination of the angular plate 38, having slots 38^a and screws 41, the block 39, having projecting lugs, and the strip 40, with means for operating said parts to and from a last-holder, substantially as described.

8. In a lasting-machine, the combination of the side lasting-jaws having end plates, 42, formed with oblique grooves or seats 42^b, with the flexible U-shaped heel and toe lasting jaws, having their free ends fitted in said oblique grooves, substantially as described.

9. In a lasting-machine, the combination, with a movable last and insole holding arm, of an adjustable mechanism, substantially as described, carried by said arm for holding a box-toe piece in position during the operation of turning down the upper, substantially as described.

10. In a lasting-machine, the combination of the block 60, spring 65, pivoted dog 62, having presser-foot 62^a and spring-pin 63, and the trigger 64, having the spring-tongue 64^a, with the swinging arm 55 and a lasting-jaw adapted to co-operate with the block 60 and its adjuncts, substantially as described.

11. In a lasting-machine, the combination, with a horizontally-sliding frame carrying a fixed frame, 72, and a movable frame, 73, both provided with projecting posts, of the levers fulcrumed on said posts, the vertical rods connected with said levers, the adjustable collars fitted on said rods, and pincher-operating rods connected with said blocks, substantially as described.

12. In a lasting-machine, the combination of a series of horizontally-movable pinchers, adjustable longitudinal rods connected with their movable jaws, and lever and link devices, substantially as set forth, for opening and closing the pinchers, substantially as described.

13. In a lasting-machine, the combination of the slotted pincher-holding arm 90, the adjustable blocks 91, fitted therein, and the screws 95, for adjusting said blocks, with the pinchers carried by said adjustable blocks and the mova-

ble frame upon which the holder is mounted, substantially as described.

14. In a lasting-machine, the combination of the pincher-holding arm, the adjustable block having a neck with tapering slot, the collar encircling said neck, and the tapering plug provided with a screw-neck, with the frame upon which the pincher-holder is mounted, substantially as described.

15. In a lasting-machine, the combination of the vertical clamping-strips, the horizontal arms carrying the same, and the transverse bolt with the pincher-holder adjustably fitted between said clamping-strips, substantially as described.

16. In a lasting-machine, the combination of the spring friction-blocks 82, and the pincher-holders carried by the same, with the clamping-strips and the movable frame carrying the latter, substantially as described.

17. Pinchers for lasting-machines, consisting of the fixed shank 96, the stationary jaw 97, having a body portion, 98, pivoted to said shank, the spring carried by said body portion and bearing upon the fixed shank, the movable jaw pivoted to the fixed jaw and having a curved arm, and the opening and closing lever co-operating with said curved arm, substantially as described.

18. In a lasting-machine, the combination of the pincher-operating levers, the rods connecting the latter, the sleeves fitted on said rods, and the adjustable blocks encircling said sleeves and having spring-pressed friction-plugs, with the pincher-operating rods connected with said blocks, substantially as described.

19. The combination of the block having a front socket for the reception of a pincher-operating rod and a rear socket inclosing a spring-pressed plug, and provided with a closing-screw, with a rod encircled by said collar and operating devices connected with said rod to actuate the pinchers, substantially as described.

20. In a lasting-machine, the combination of the sliding frame and its operating-lever shaft, having a disk with projecting pin, with the pincher-operating lever having an apertured angle-plate and a spring-gate, substantially as described.

In testimony whereof we affix our signatures in presence of two witnesses.

S. WHITE PAINE.
EDGAR S. COMBS.

Witnesses:

E. DARROW,
E. S. DARROW.