

No. 839,896.

PATENTED JAN. 1, 1907.

W. E. SMALL & R. CAMPBELL.  
SHOE SOLE TRIMMING AND CHANNELING MACHINE.

APPLICATION FILED NOV. 9, 1905.

4 SHEETS—SHEET 1.

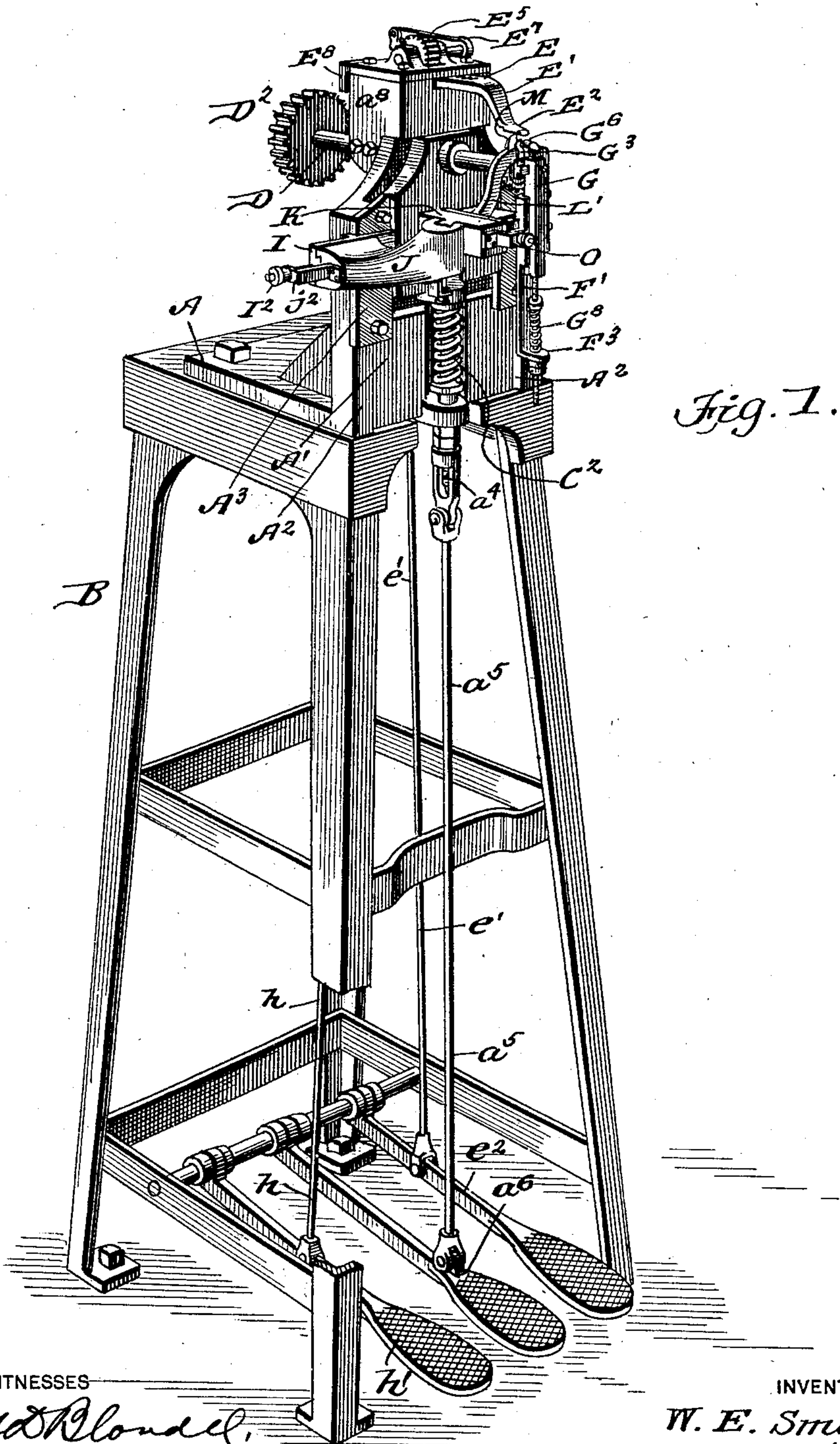


Fig. 1.

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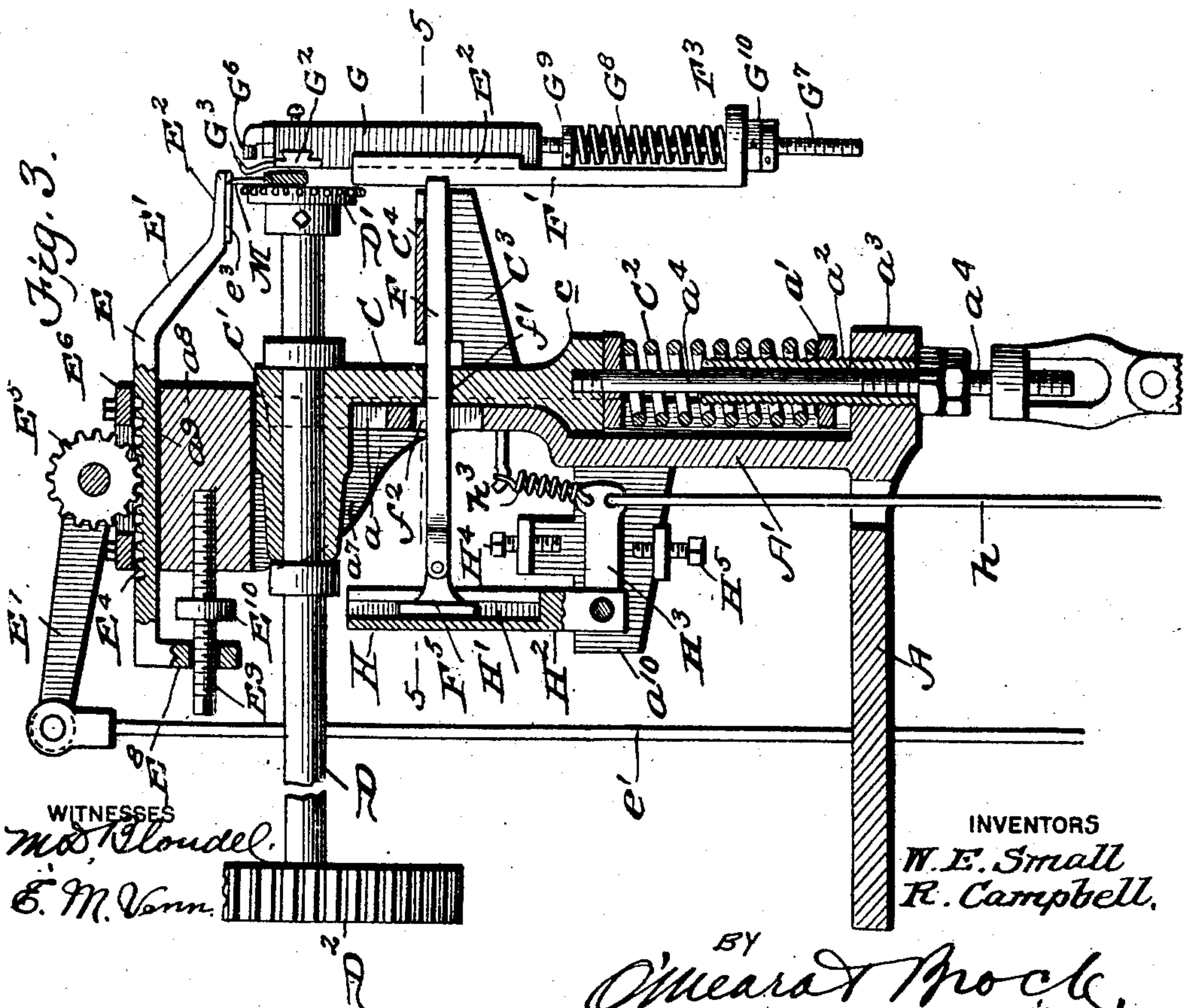
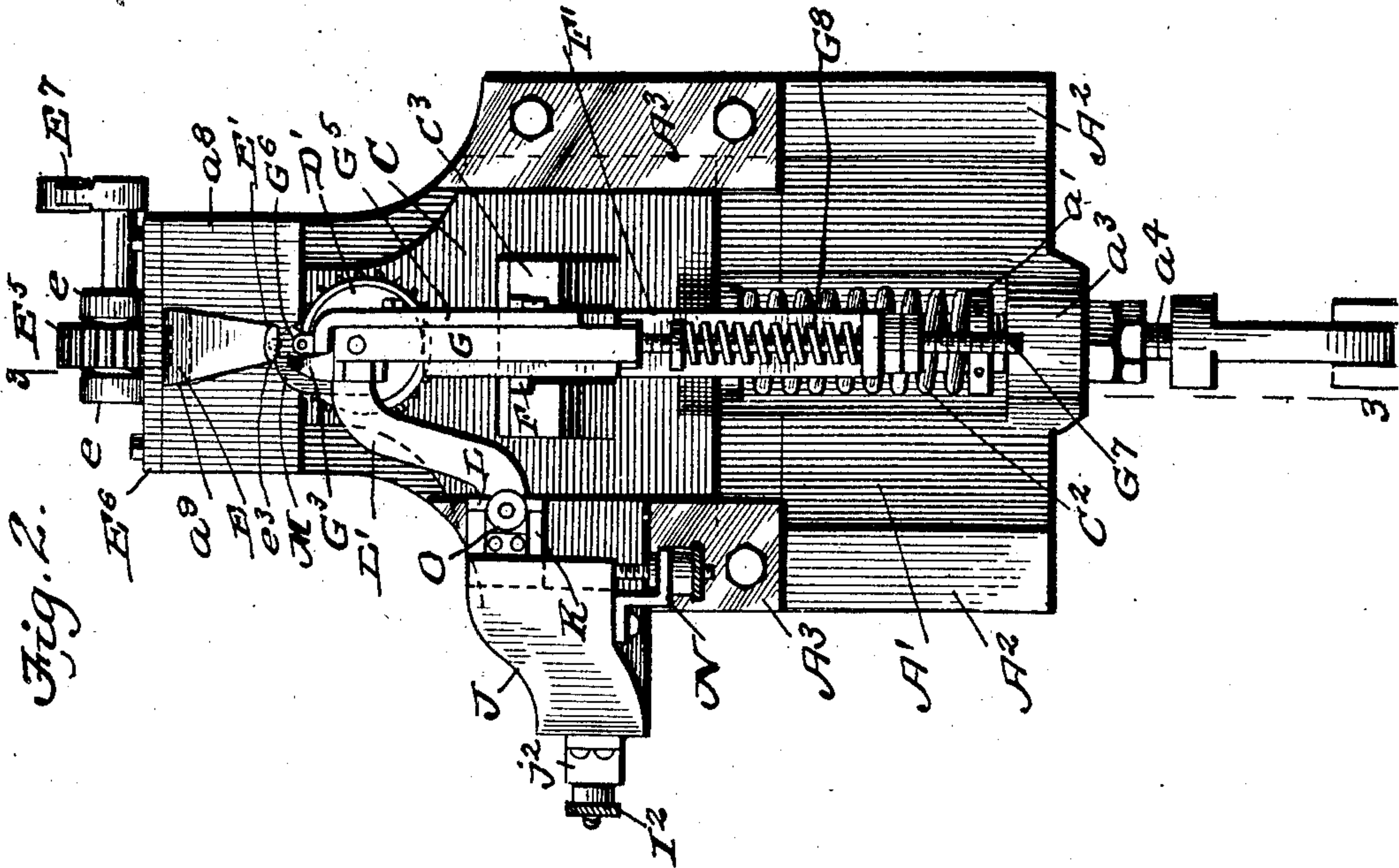
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4 SHEETS—SHEET 2.



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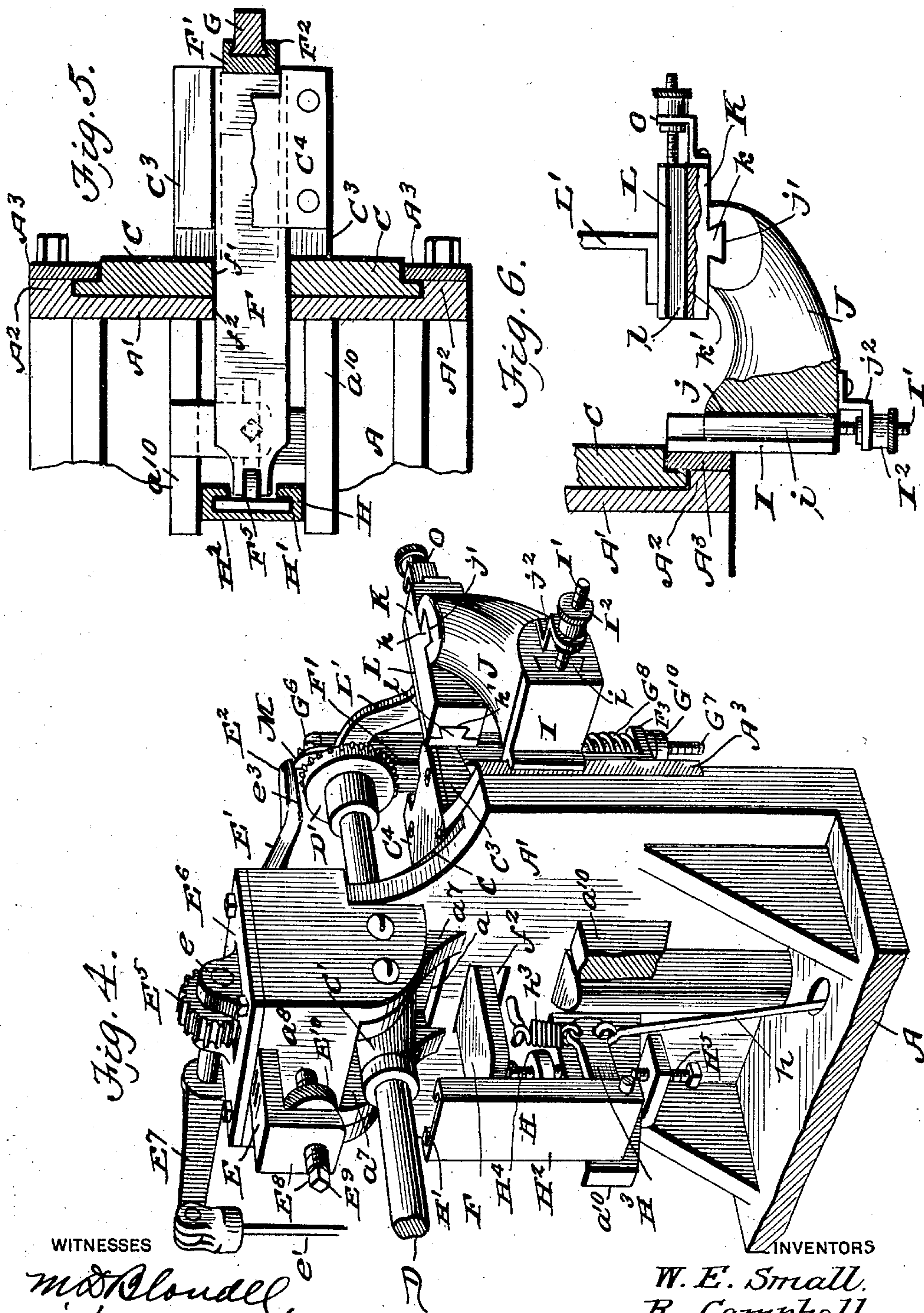
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4 SHEETS—SHEET 3.



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4 SHEETS—SHEET 4.

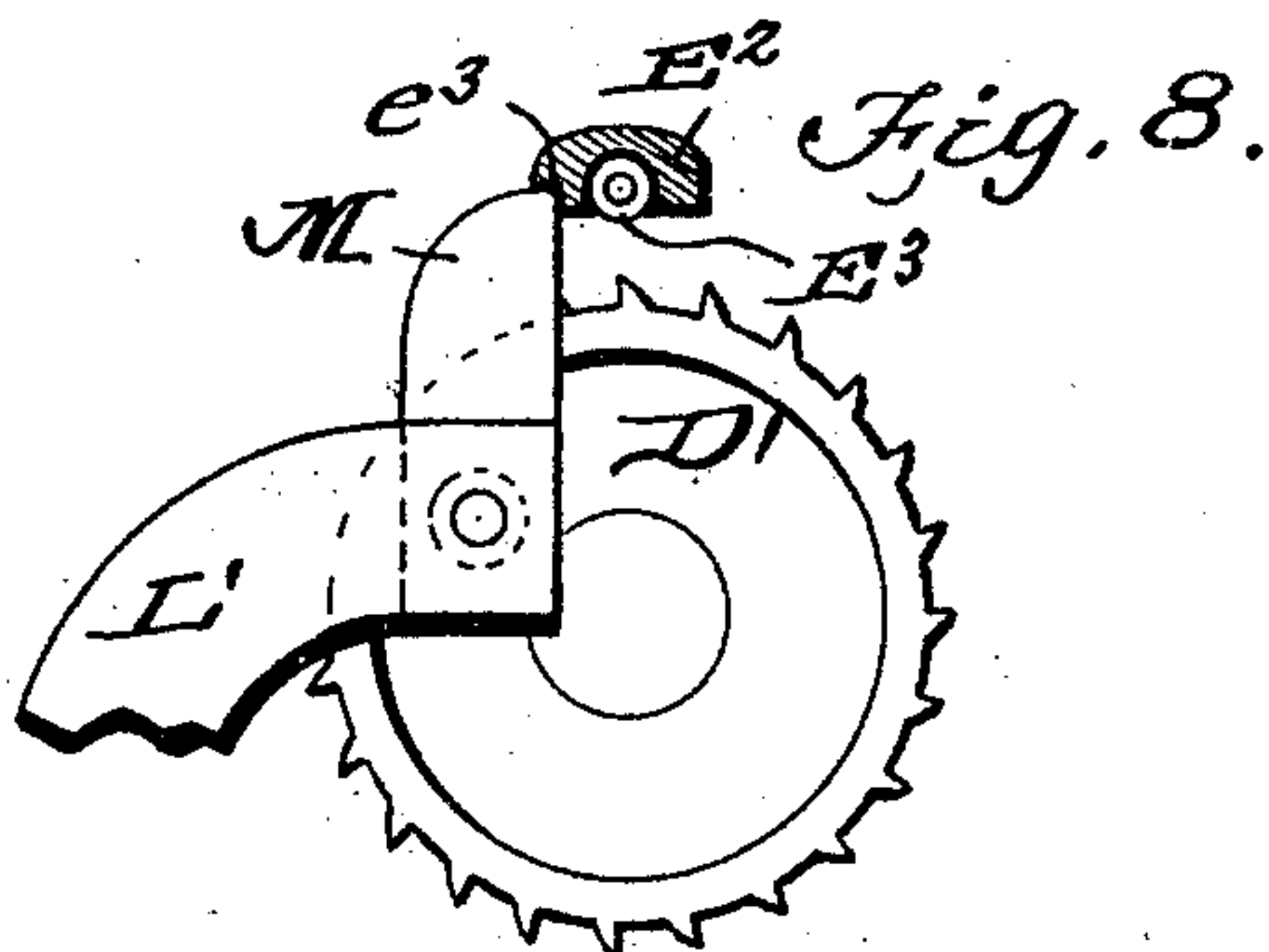
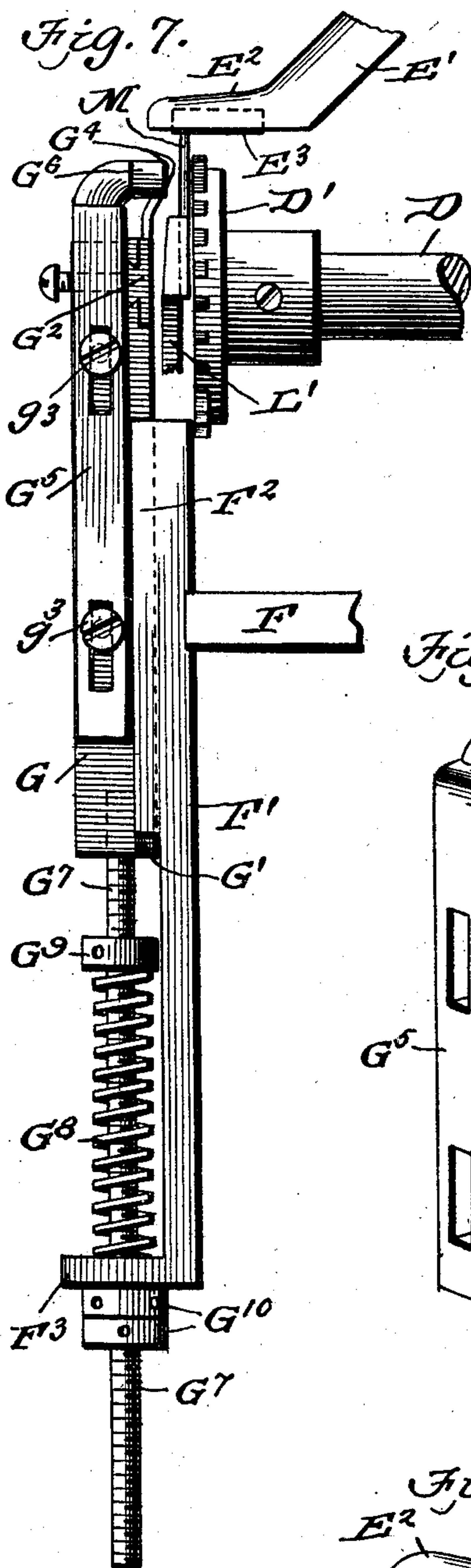


Fig. 9. Fig. 10

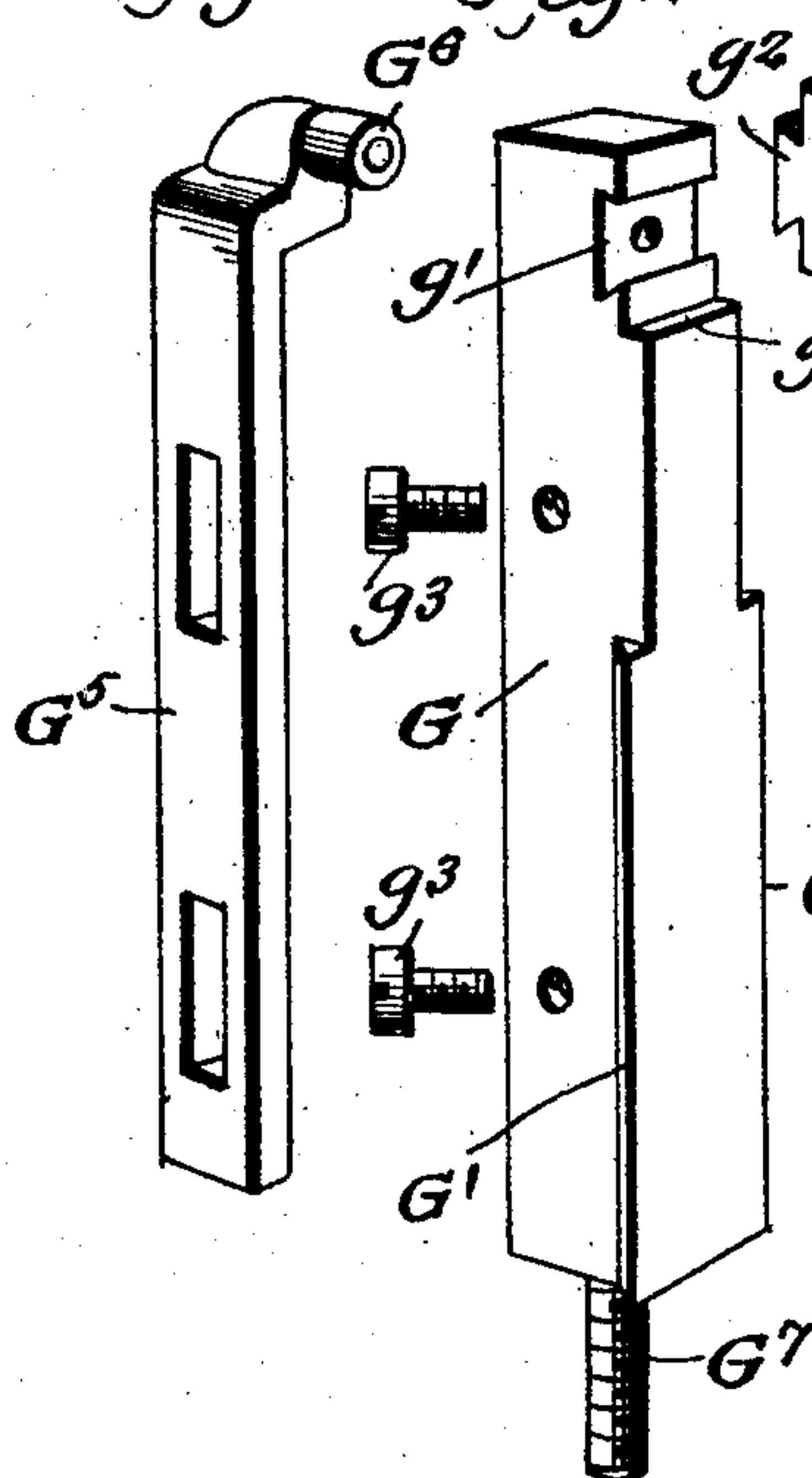


Fig. 13.

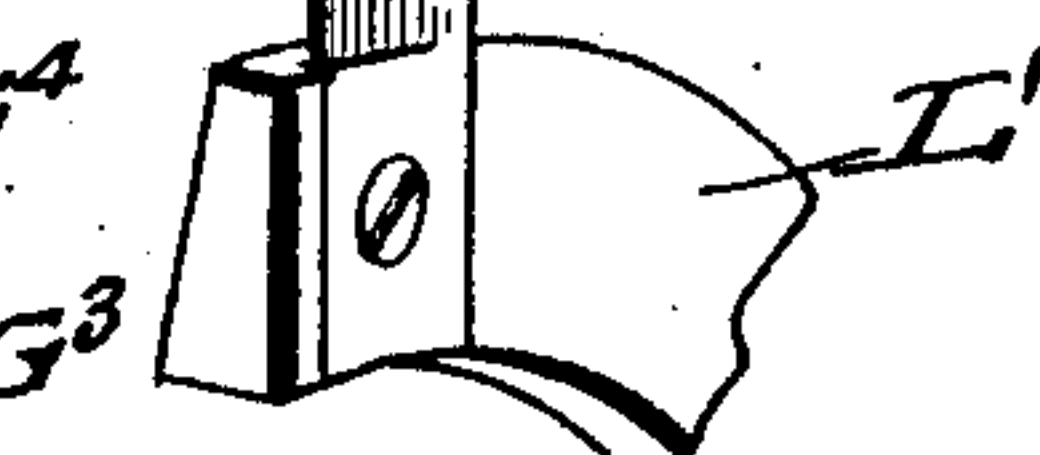


Fig. 17

Fig. 12.

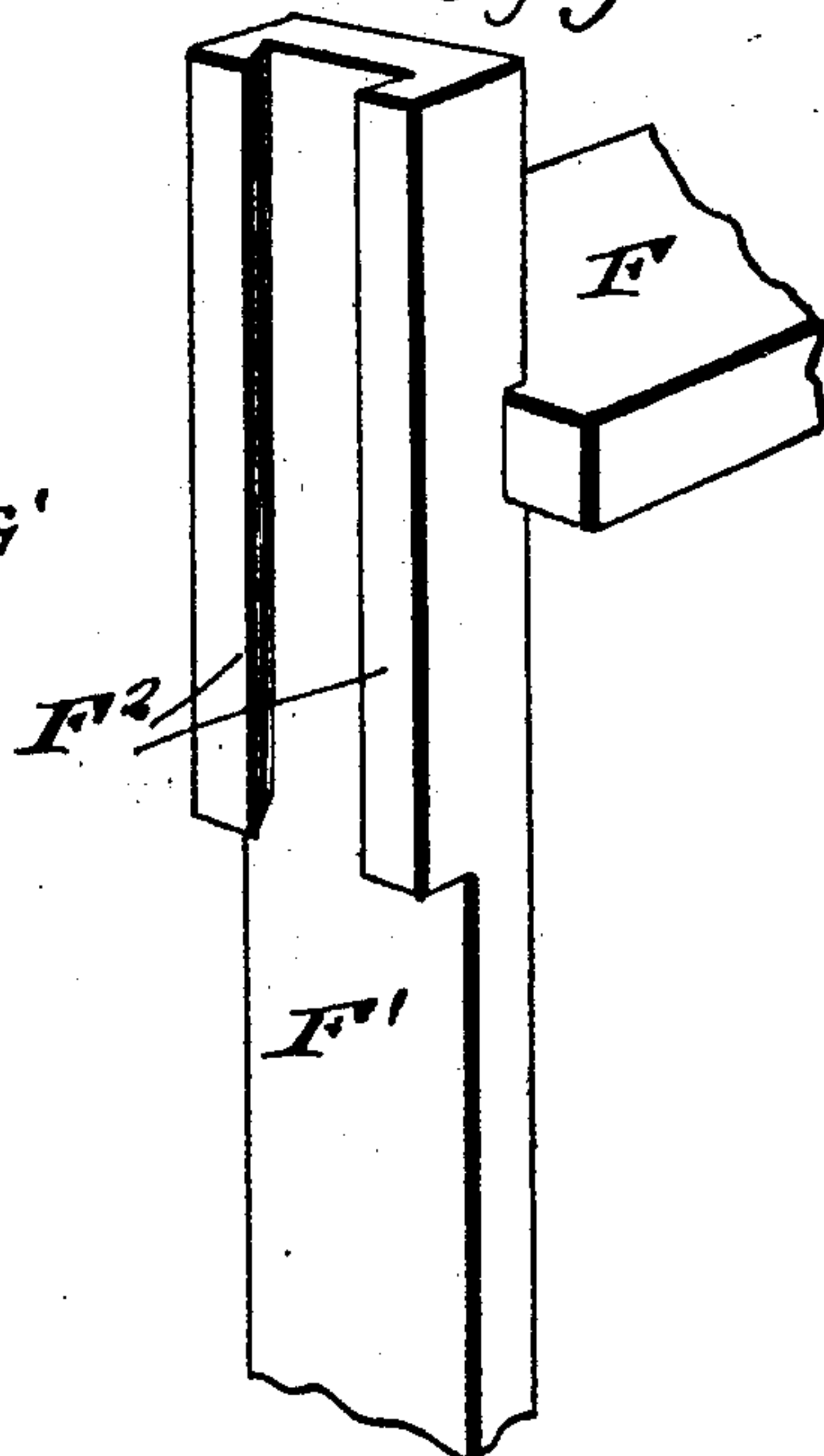


Fig. 14.

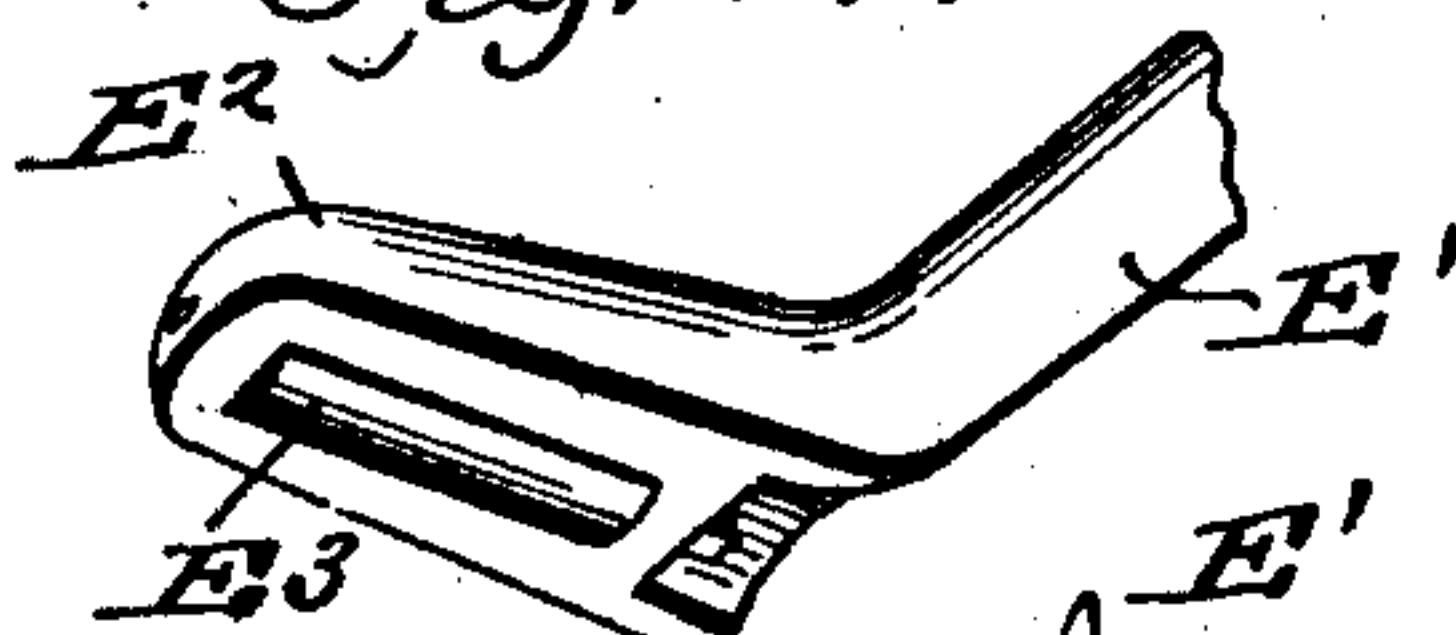
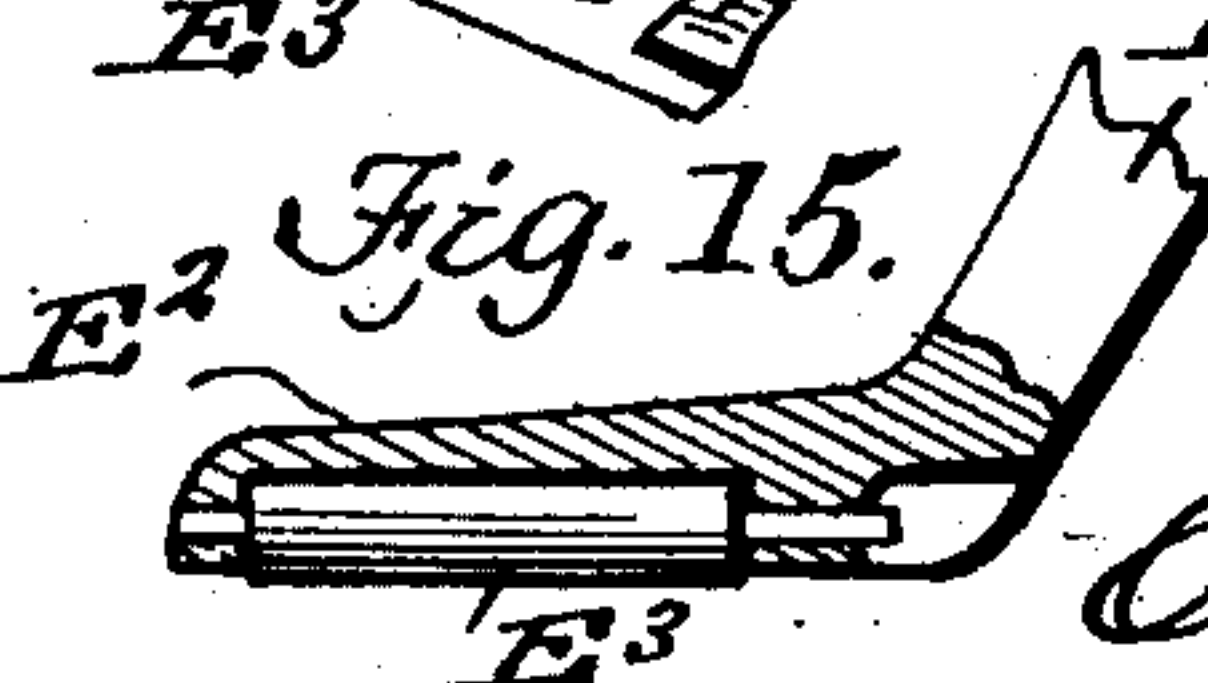


Fig. 15.



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# UNITED STATES PATENT OFFICE.

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## SHOE-SOLE TRIMMING AND CHANNELING MACHINE.

No. 839,896.

Specification of Letters Patent.

Patented Jan. 1, 1907.

Application filed November 9, 1905. Serial No. 286,546.

*To all whom it may concern:*

Be it known that we, WILLIAM EDWARD SMALL and ROBERT CAMPBELL, citizens of the United States, residing at Brooklyn, in the county of Kings and State of New York, have invented a new and useful Improvement in Shoe-Sole Trimming and Channeling Machines, of which the following is a specification.

Our invention relates to an improved machine for trimming and channeling the soles of boots and shoes, its objects being to provide a simple and highly-efficient device in which the knives may be independently and easily and quickly adjusted to adapt the machine to various designs or styles of boots or shoes while the machine is in motion and the boot or shoe is being operated upon, to increase or diminish the width of the "extension" or projecting edge of the sole as is required in different designs and shapes and also as is necessary for the reason that the extension upon most boots or shoes is greater upon one side than the other, and, further, to permit the correct shaping of the sole in the shank.

Another object of the invention is to provide a feeding device for feeding the sole against the cutters and which operates upon that portion of the sole that is afterward severed from the body portion, thus leaving the latter perfectly solid and free from unnecessary abrasions or cuts.

Still a further object of the invention is to provide for a quick adjustment of the guard to permit the ready insertion and removal of the boot or shoe; and still a further object is to provide an adjustable guard to facilitate both rapidity in cutting and as a guard against mishaps due to quick work or carelessness on the part of the operator.

With these briefly-stated objects in view the invention also comprises certain details of construction and peculiar combination and arrangement of parts, as will be fully set forth in the following specification and pointed out in the claims, reference being had to the drawings, in which—

Figure 1 illustrates in perspective our invention complete. Fig. 2 is a face view. Fig. 3 is a central sectional elevation drawn on about the line 3 3 of Fig. 2. Fig. 4 is a

detail perspective view looking at the rear of the machine. Fig. 5 is a detail horizontal section drawn on the line 5 5 of Fig. 3. Fig. 6 is a detail sectional plan view of the bracket-arm carrying the knife for trimming or cutting the edge of the sole. Fig. 7 is a detail side view of the feed-wheel and the bracket to which the channeling-knife is secured. Fig. 8 is a detail face view of the feed-wheel and knife for cutting or trimming the edge of the sole and illustrating its position in relation to the foot. Fig. 9 is a detail view of the bar carrying a presser-roll that holds the sole of the shoe against the foot. Figs. 10, 11, and 12 are detail views of the arm carrying the channeling-knife, the channeling-knife, and the bracket in which the said arm operates. Fig. 13 is a detail view of the knife for trimming the edge of the sole and the arm to which it is connected, and Figs. 14 and 15 are detail views of the presser-foot.

In the manufacture of boots and shoes the uppers are first sewed to the welts, and the soles are then cemented upon the welts and after being allowed to thoroughly dry are turned over to the operator to be stitched, after which the heels are secured in position. Then the shoe is ready for polishing and the final touches necessary to a finished article; but before the heels are secured in position the soles are trimmed and channeled preparatory to stitching, it being understood that the channels are cut exteriorly to provide a recess for the loops of the stitches, and the lip produced by the channel is bent down over the stitches, completely covering them, which leaves the bottom perfectly smooth and flat, and to facilitate this work is the purpose of our invention.

A complete understanding of the mechanism of the machine by which we attain the aforesaid results will be readily understood from the following description, taken in connection with the drawings, in which like reference characters indicate corresponding parts in all figures, and by reference to the drawings it will be seen the frame comprises a base A, that is supported upon a suitable stand B, and A' is a front or face plate projecting vertically from the forward edge of the base, the vertical edges of which are increased in thickness, as at A<sup>2</sup>, and upon the upper ends of the



said portions are bolted plates  $A^3$ , which with the front plate and the edges of the thickened portions provide guideways in which is slidably retained a head C, having a hub  $C'$  projecting rearwardly from the upper end thereof and through an opening  $a$  in the face-plate, and journaled in the hub is a shaft D, having at its forward end a toothed feed-wheel  $D'$  and at its opposite end a gear  $D^2$ , which is meshed by a suitable drive-gear. (Not shown.)

The head C is normally held at the upper end of the face-plate by means of a spring  $C^2$ , held between a lug  $c$  at the base of the head and a tension-nut  $a'$ , held upon a threaded sleeve  $a^2$ , projecting up into the spring, and from a lug  $a^3$ , extending from the base A at the lower end of the face-plate and projecting through the spring and sleeve, and connected at its upper end to the lug  $c$  is a bolt  $a^4$ , to the lower end of which is connected a link to which is secured a rod or chain  $a^5$ , whose lower end is connected to a treadle  $a^6$ , and it will be understood that by depressing the treadle the face-plate and the parts carried thereby will be drawn downwardly for the purpose as will appear later on.

Projecting rearwardly from the upper end of the face-plate and upon each side of the opening  $a$  are brackets  $a^7$ , upon which and the upper end of the face-plate is held a block  $a^8$ , having a channel  $a^9$  in its upper surface in which operates a bar E, whose forward end projects downwardly, as at  $E'$ , and then forwardly in a horizontal plane to provide a presser-foot  $E^2$ , which extends over the periphery of the feed-wheel. In the lower side of the foot is journaled an antifriction-roller  $E^3$ , against which the upper portion of the sole that projects from the shoe-upper engages. The extreme end of the foot being rounded forms a smooth contacting surface against which the shoe-upper engages. The upper face of the bar E is provided with rack-teeth  $E^4$ , that are meshed by a pinion  $E^5$ , carried by a shaft journaled in lugs  $e$ , projecting upwardly from a plate  $E^6$ , that is bolted to the top of the block. One end of the shaft projects beyond the end of the block and carries a crank-arm  $E^7$ , to which is connected a chain or rod  $e'$ , whose opposite end is connected to a foot-treadle  $e^2$ . The rear end of the bar terminates in a downwardly-extending apertured portion  $E^8$ , through which projects a threaded bolt  $E^9$ , carried by the block, and upon the bolt is a regulating-nut  $E^{10}$ , that is engaged by the downwardly-extended portion to limit the forward movement of the bar when the treadle is operated.

Extended forwardly from the sliding head are parallel brackets  $C^3$ , having channels along their upper inner edges in which operates a slide-bar F, that is securely held in place by a plate  $C^4$ , bolted to the brackets, and to the front edge of the bar is secured a vertically-disposed bracket-arm  $F'$ , having

undercut flanges  $F^2$ , forming guides designed to receive flanges  $G'$ , carried by an arm G and by which the arm is slidably held to the face of the bracket-arm. The rear upper end of the arm is cut out to provide a shoulder  $g$ , and in the cut-out portion is formed a dovetail groove  $g'$ , in which operates a correspondingly-shaped tongue  $g^2$ , formed upon a slide or plate  $G^2$ , to which is held a channel-cutting knife-blade  $G^3$ , said blade projecting upwardly at a slight angle from the plate and has its free cutting end bent upwardly and forwardly, as at  $G^4$ . A slotted bar  $G^5$  is adjustably held to the side of the arm G by screws  $g^3$  and has its upper end provided with a lateral extension projecting over the top of the bar and to which is journaled a presser-roller  $G^6$ , which projects under the presser-foot and is disposed directly in front of the cutting edge of the channel-knife.

To the lower end of the arm G is connected a threaded bolt  $G^7$ , which extends down through a foot  $F^3$ , projecting forwardly from the lower end of the bracket-arm, and surrounding the bolt is a spring  $G^8$ , which bears at one end against the foot and at its opposite end against a tension-nut  $G^9$ , threaded upon the bolt. This spring is designed to normally hold the arm G upwardly, so that the roller  $G^6$  will engage the lower side of the sole to press and hold it into engagement with the presser-foot, and in order to limit the upward movement of the arm I employ set-nuts  $G^{10}$ , which engage the under side of the foot  $F^3$ .

The bar F projects through an opening  $f'$  in the head and through an elongated opening  $f^2$  in the face-plate, and to its rear end is pivotally connected a plate  $F^5$ , the vertical edges of which are retained in grooves  $H'$ , formed in the vertical portion H of an L-shaped lever crank-arm  $H^2$ , that is pivotally held between brackets  $a^{10}$ , projecting rearwardly from the face-plate of the frame, and connected to the horizontal member  $H^3$  of the crank-arm is a rod or chain  $h$ , that is also connected to a foot-treadle  $h'$ . To the member  $H^3$  is connected a spring  $h^3$ , that is designed to hold the arm in its normal position and to return it to its normal position when pressure on the treadle is released.

$H^4$  and  $H^5$  indicate stop-screws carried by extensions of the brackets  $a^{10}$  and are designed to engage the horizontal member of the crank-arm to limit the movement when the arm is operated by the treadle.

Connected to one of the plates  $A^3$  is a plate I, having a dovetail tongue  $i$  upon its front face which operates in a similarly-shaped groove  $j$  formed in the rear end of a forwardly-projecting bracket-arm J, and in the side of the bracket-arm J and at its forward end is arranged a dovetail groove  $j'$ , in which is held a dovetail rib  $k$ , formed upon an elongated block K, the side of which opposite the arm



having a dovetail groove  $k'$ , in which fits a similarly-shaped rib  $l$ , formed upon a plate  $L$ , to the face of which is bolted or otherwise secured an upwardly and outwardly extending arm  $L'$ , that extends over the peripheral edge of the feed-wheel, and to the free end of the arm is secured a knife-blade  $M$ , that is designed to engage and cut or trim the edges of the sole. As shown in the drawings, the upper end of the cutting edge of the knife-blade rests within a recess  $e^3$ , produced in one edge of the foot  $E^3$ . Projecting from the plate  $I$  is a threaded stem  $I'$ , upon which operates a thumb-nut  $I^2$ , held in a bracket  $j^2$ , carried by the bracket-arm  $J$ , and by turning the nut the bracket-arm, and consequently the knife-blade  $M$ , will be moved away from the presser-foot  $E^2$ . A similar adjustment  $N$  is provided to regulate the vertical movement of the block  $K$ , and a similar arrangement  $O$  is also provided for adjusting the plate  $L$  horizontally, and it will be understood by these various adjustments we are enabled to adjust the knife-blade  $M$  to any desired position with relation to the presser-foot and feed-wheel that may be desired according to the work to be done.

The operation of our machine is as follows: The shoe-sole after having been cemented to the welt is readily inserted between the presser-foot and the feed-wheel by pressing down upon the treadle  $a^6$ , which draws the head and the parts carried thereby downwardly to increase the space between the feed-wheel and the foot, and when the treadle is released the spring  $C^2$  will elevate the head and throw the feed wheel or disk into engagement with the sole, which being constantly revolved will immediately begin to draw or feed the sole against the knife-blade  $M$ , which trims the edge of the sole, and also into engagement with the channeling-blade  $G^3$ , which makes an incision in the lower face of the sole and immediately adjacent the edge. The sole is thus guided through the machine until the entire surface is operated upon, and as it is often desired to increase the width of the extensions upon one side of the shoe and also decrease it at the shank the bar  $E$  is forced outwardly at the desired points by pressing upon the treadle  $e^2$ , which throws the foot against the side of the shoe-upper, and consequently forces the shoe away from the cutters, thereby increasing the distance between the end of the presser-foot and the cutting-blades, consequently leaving a larger projection or extension upon the side of the shoe. It may be stated that the sole is first inserted in the machine at the shank and the presser-foot is left in the position shown in the drawings, which may be termed its "normal" position; for the reason that the extension of the sole is always narrowest at the shank; but as the sole is being fed through the machine the operator presses

upon the treadle  $e^2$ , throwing the foot outwardly, which engages the side of the shoe-upper and forces it away from the cutters, thereby increasing the width of the extension, and as the channels of the shank of the sole are cut farther from the edge than at the fore part it is necessary to provide arrangement for adjusting the bracket-arm carrying the channeling-knife we employ the crank-arm, which is connected to the bar that supports the bracket-arm, as shown and described, and it will be readily understood that by pressing upon the treadle  $h'$  the crank will be tilted and the bar  $F$  projected through the head, which, carrying the bracket-arm, will draw the channel-knife away from the trimming-knife  $M$ , and thereby increase the distance of the channel from the edge of the sole.

In practice we propose to make the top part of the face-plate of the frame much narrower than the lower portion, so that the boot or shoe may be readily guided through the machine without contacting therewith.

From the foregoing it will be seen we provide an exceedingly simple device for the purpose hereinbefore stated, and it will be particularly noted that any style or shape of shoe or boot may be trimmed or channeled without any special adjustment of the machine other than the bracket-arm  $J$  and the parts carried thereby, as it will be understood that other adjustments may be accomplished while the machine is in motion and the sole operated upon by merely operating the treadles.

Having thus fully described our invention, what we claim as new, and desire to secure by Letters Patent, is—

1. In a machine of the kind described, the combination with a frame having an adjustable presser-foot and an adjustable trimming-knife, of a head slidably carried by the frame and having a feeding device movable therewith, and a trimming-knife and presser-roller carried by the head and adapted for independent adjustment irrespective of the movement of the head, and independent means for operating the head, channeling-knife and presser-roller, and also means for operating the presser-foot.

2. In a machine of the kind described, the combination with a frame, of a sliding head mounted therein, a shaft carrying a feed-wheel journaled in the head, a presser-foot adjustably mounted in the frame and projecting over the feed-wheel, a trimming-knife adjustably supported by the frame, a channeling-knife adjustably carried by the said head, a presser-roller arranged adjacent the channeling-knife and operable therewith, means for operating the presser-foot, and common means for lowering the channeling-knife and presser-roller, for the purpose specified.



3. In a machine of the kind described, the combination with a frame, of a head slidably mounted therein, a shaft journaled in the frame and having a feed-wheel secured thereto, a presser-foot adjustably mounted in the frame, a trimming-knife adjustably connected to the frame, a bracket-arm adjustably connected to the said head, a spring-actuated bar carried by the bracket-arm, a channeling-knife connected to the said bar, a presser-roller also carried by the said bar, independent means for controlling the movement of the presser-foot and bracket-arm, and also means for limiting the movement of the said presser-foot and bracket-arm.

4. In a machine of the kind described, the combination with a frame, of a head slidably mounted therein, means for controlling the position of the head, a shaft journaled in the head and having a feed-wheel secured thereto, an adjustable presser-foot carried by the frame and extending over the feed-wheel, a trimming-knife adjustably carried by the frame, a bracket-arm carried by the head, a channeling-knife and presser-roller adjustably connected with the arm, and independent means for operating the presser-foot and bracket-arm.

5. In a machine of the kind described, the combination with a frame, of a head slidably connected thereto, a spring carried by the frame and engaging the head, means for moving the head against the tension of the spring, a shaft carrying a feed-wheel journaled in the head, a presser-foot carried by the frame, a trimming-knife connected with the frame, said knife being disposed adjacent the feed-wheel and presser-foot, a channeling-knife adjustably carried by the head, a presser-roller arranged adjacent the channeling-knife, and common means for adjusting the channeling-knife and roller independent of the means for moving the head.

6. In a machine of the kind described the combination with a frame, of a head slidably mounted therein, a feeding device carried by the head, a trimming-knife supported by the frame, a channeling-knife supported by the head and held adjacent the trimming-knife, a presser-foot carried by the frame and extending above and transversely to the feed-wheel and a presser-roller carried by the head and in a plane below the presser-foot.

7. A device of the kind described comprising a frame, a vertical movable head therein, a shaft journaled in the said head, a feed-wheel at one end of the shaft, a recessed presser-foot carried by the frame and parallel with the shaft and extending above and beyond the wheel, a trimming-knife carried by the frame in advance of the wheel and extending into the said recess of the presser-foot, and a curved channeling-knife arranged in advance of the trimming-knife and supported from the head.

8. A machine of the kind described comprising a frame having a head slidably mounted therein, a shaft carried by the head and having a feed-wheel mounted thereon, a presser-foot adjustably mounted in the frame, a bracket-arm adjustably carried by the head, said bracket-arm supporting a channeling-knife and presser-roller, a trimming-knife adjustably carried by the frame, and independent means for operating the bracket-arm and presser-foot, and also means for operating the said head.

9. A machine of the kind described, comprising a frame consisting of a base and a face-plate, said face-plate having guideways, a head operating in the guideways, a shaft journaled in the head and extending through the face-plate, and having a feed-wheel at one end and a gear at its opposite end, a block mounted upon the upper end of the face-plate, said block having a channel in its upper surface, a bar operating in the channel-way, one end of the bar terminating in a downwardly and forwardly extending portion, the extreme end of which terminates in a horizontal foot portion, a roller journaled in the under side of the foot portion, a bracket-arm adjustably carried by the frame, a block adjustably connected to the arm, a knife-carrying arm supported by the block and adjustable therein, a bar slidably carried by the said head and having a vertical disposed bracket-arm connected thereto, a bar yieldingly held by the bracket-arm and having a plate adjustably connected thereto, to which is connected a channeling-knife, a presser-roller adjustably connected to the said bar, independent means for operating the bar having the presser-foot and the bar carrying the bracket-arm, and also means for operating the head.

10. A machine of the kind described comprising a frame, consisting of a base and a face-plate, guide-plates secured to the face-plate, a sliding head held in position upon the face-plate by the said guide-plates, a spring carried by the frame and engaging the head to hold the latter at the upper end of the face-plate, a block mounted upon the face-plate and having a channel in its upper surface, a toothed bar slidably retained in the channel and having one end terminating in a presser-foot, a pinion engaging the teeth of the bar, the shaft of the pinion having a lever connected thereto, to which is connected a rod or chain whose opposite end is connected with a treadle, a shaft journaled in the head and having a feed-wheel mounted thereon, a bar adjustably carried by the head, said bar having one end terminating in a bracket-arm in which is yieldingly supported a bar, a channel-knife adjustably connected to the bar, a plate hingedly connected to the opposite end of the bar, a crank-arm connected to the plate, a treadle-rod connected to the



crank-arm, a spring connected to the arm and adapted to hold the said arm in its normal position, an adjustable bracket-arm carried by the frame and having an elongated block adjustably held at its free end, a plate adjustably held to the block, said plate having an arm extending outwardly therefrom to the upper end of which is connected a trimming-knife blade, and a bolt connected to the said head and extending through the frame and having its lower or free end connected with a rod or chain whose opposite end is connected to a treadle, all for the purpose set forth.

11. In a machine for trimming and channeling the soles of boots and shoes, the combination of a frame having an adjustable trimming-knife and an adjustable presser guide-foot, a movable head mounted upon the frame and having an adjustable channeling-knife and a yielding presser-roller connected thereto and coacting with the presser-foot and trimming-knife, a feeding device carried by the head and adapted for feeding the sole against the knives, said feeding device engaging the sole slightly in advance of the trimming-knife and that portion which is afterward severed by the knife, and means

for adjusting the presser guide-foot for the purpose of regulating the trimming of the edge of the sole, substantially as specified.

12. A machine for trimming and channeling the soles of boots and shoes, comprising a frame that consists of a base and face-plate, a head movably mounted upon the face-plate, a presser-foot adjustably mounted upon the frame and projecting over in front of the movable head, a feeding device carried by the said head and operating under the presser guide-foot, a trimming-knife carried by the frame and adjustably held in front of and immediately adjacent the feeding device, a channeling-knife and presser-roller yieldingly mounted in a bracket that is adjustably carried by the head, said channeling-knife being also capable of independent adjustment, and independent means for operating the presser-foot, movable head and the channeling and trimming knife for the purpose specified.

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