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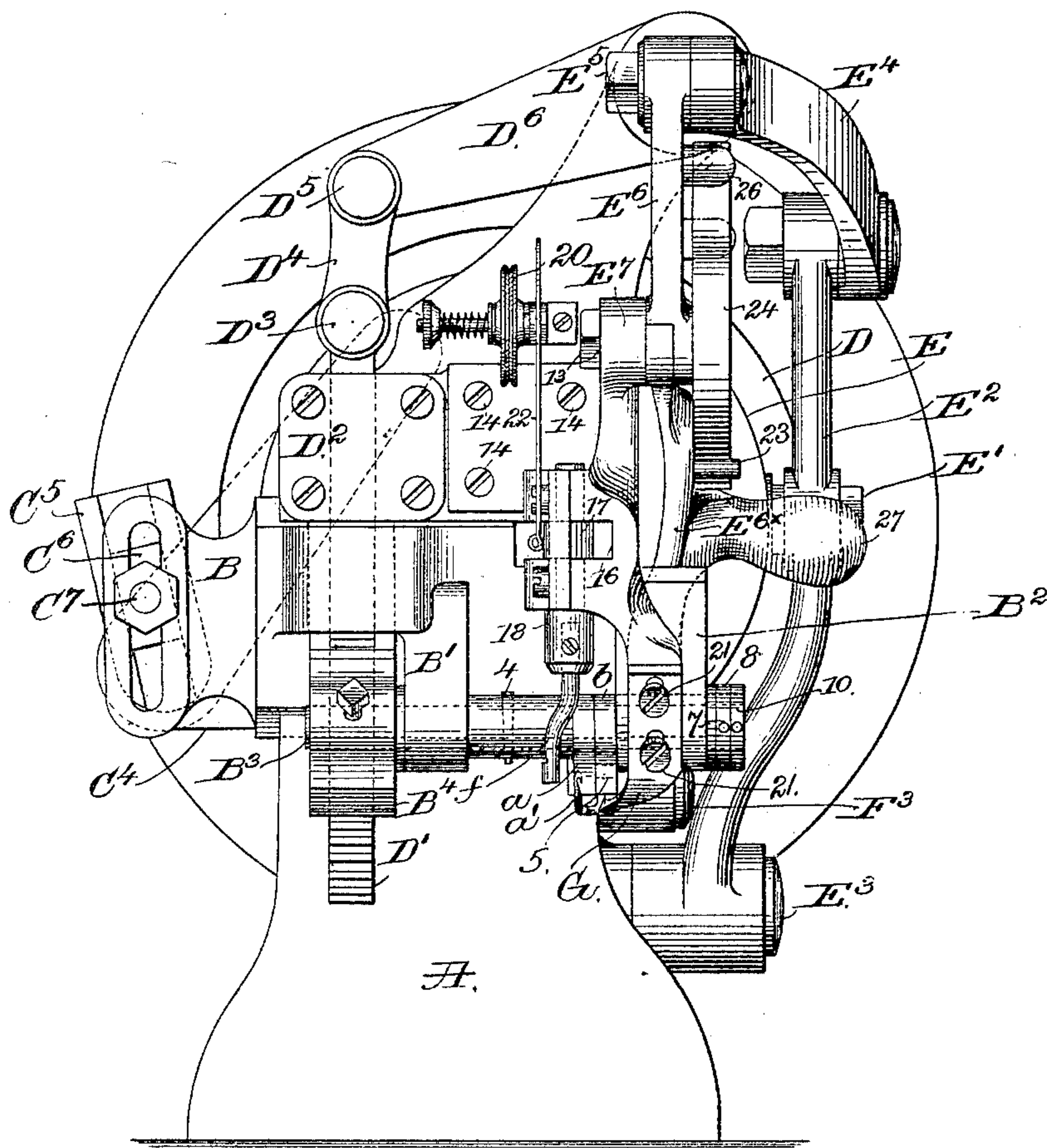
G. A. STILES.
SOLE SEWING MACHINE.

4 Sheets—Sheet 1.

No. 453,568.

Patented June 2, 1891.

Fig. 1.



Witnesses,
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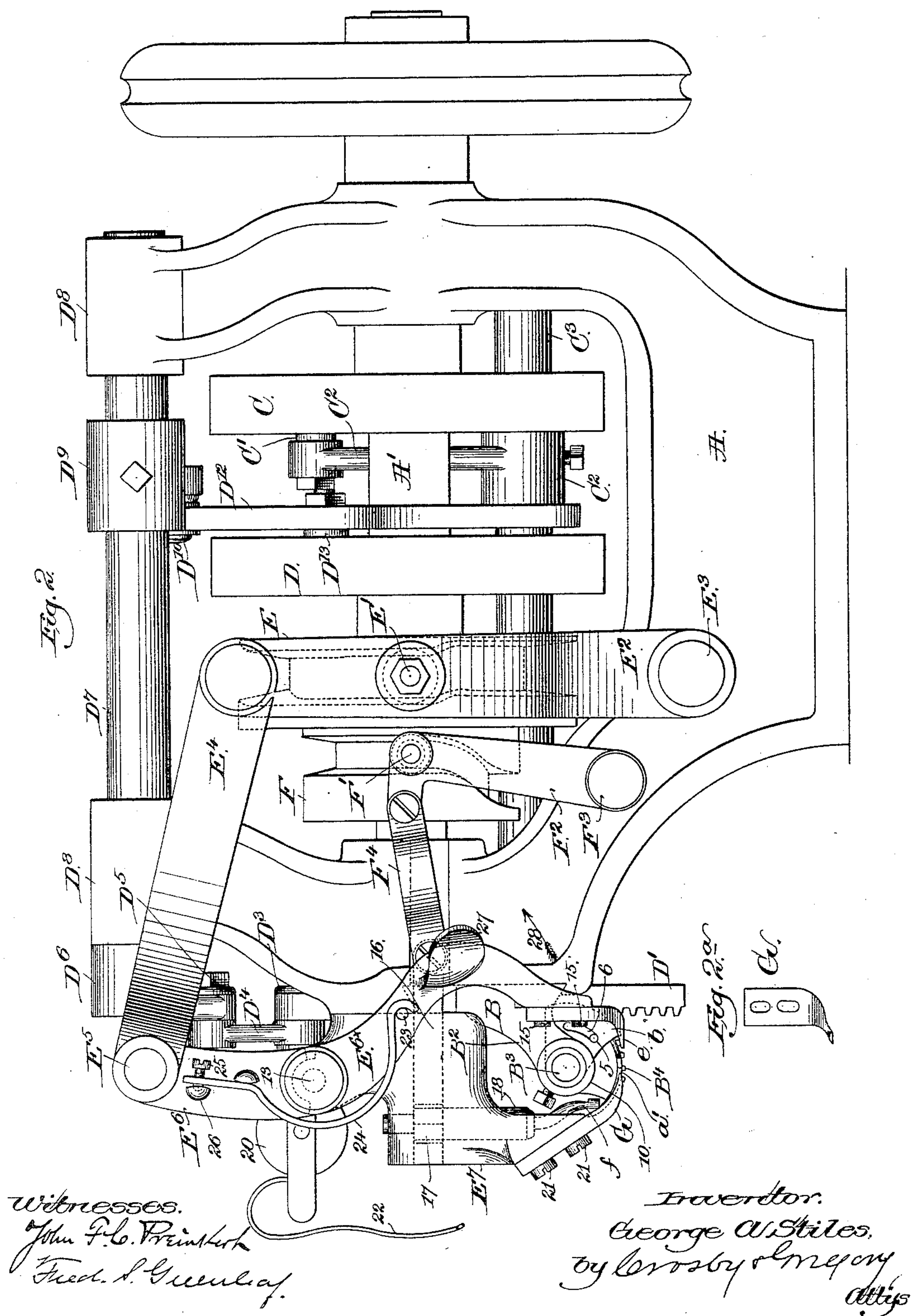
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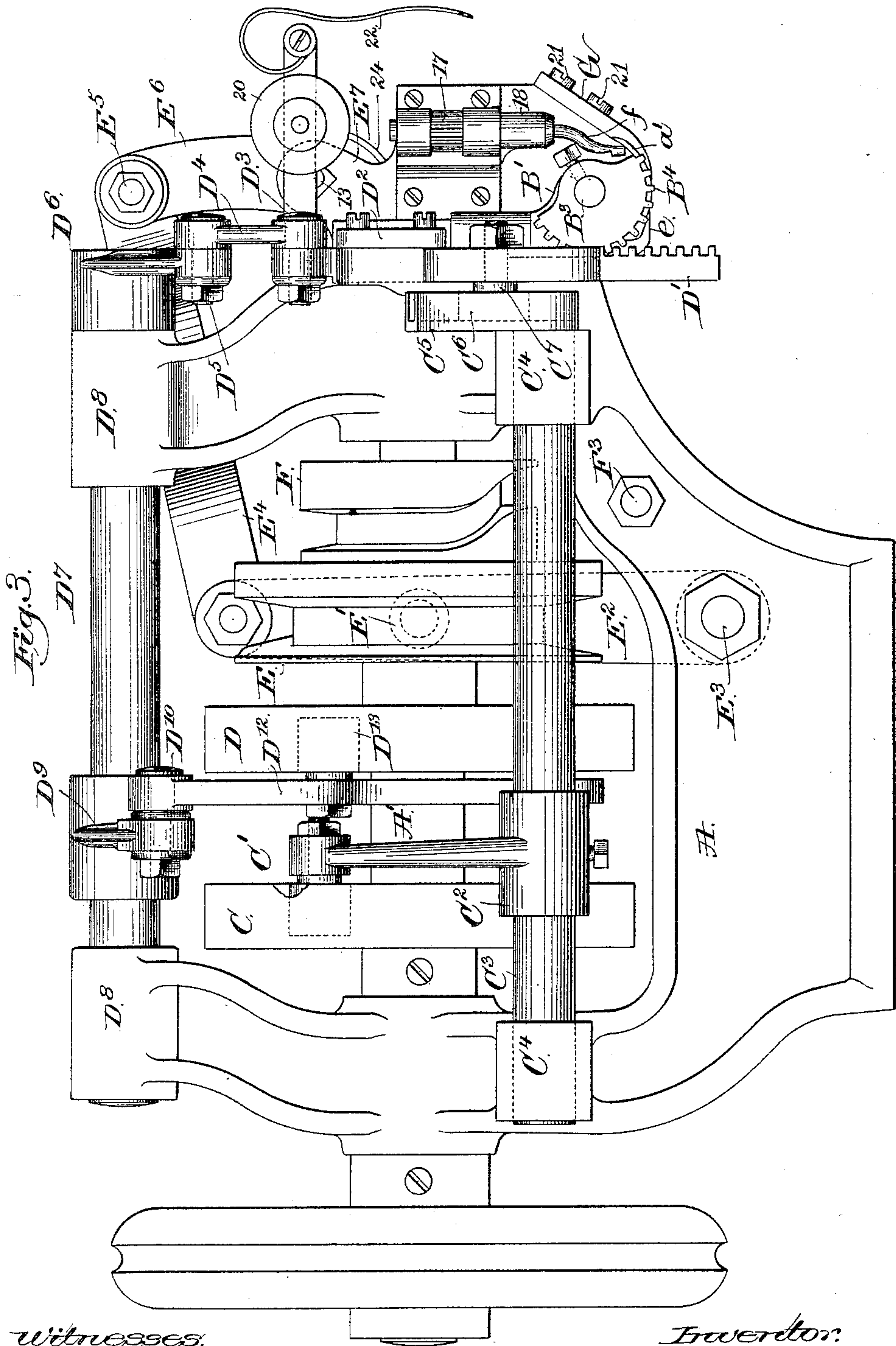
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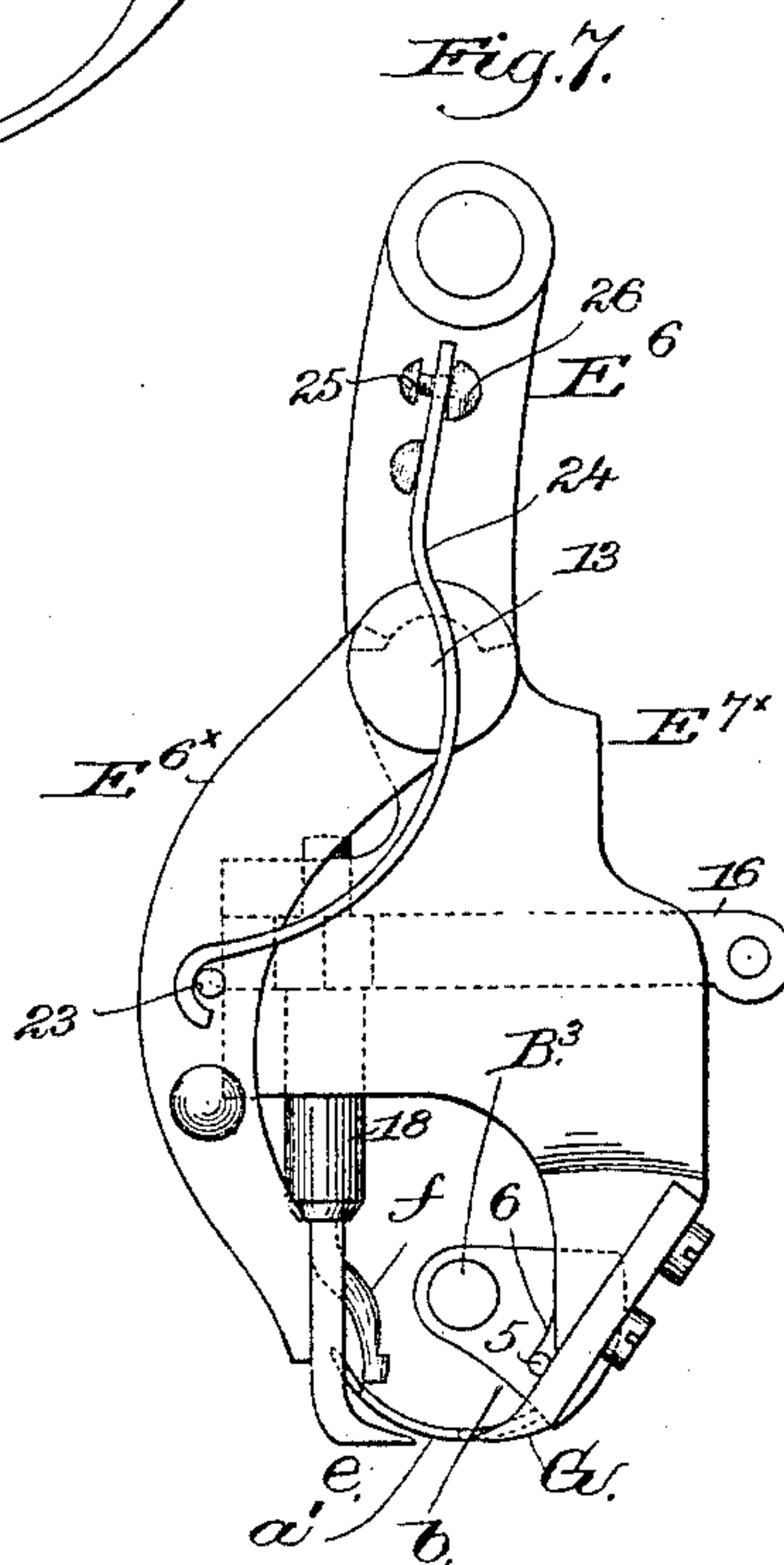
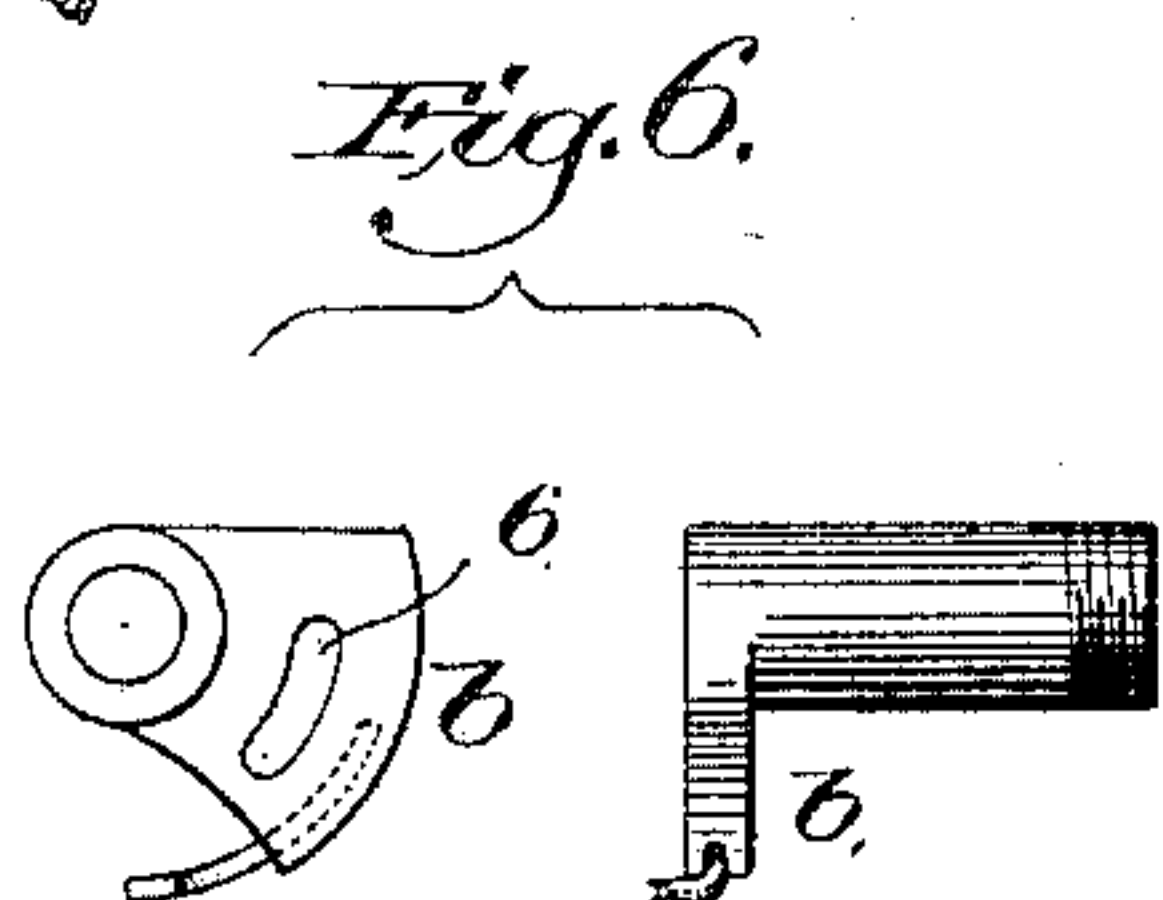
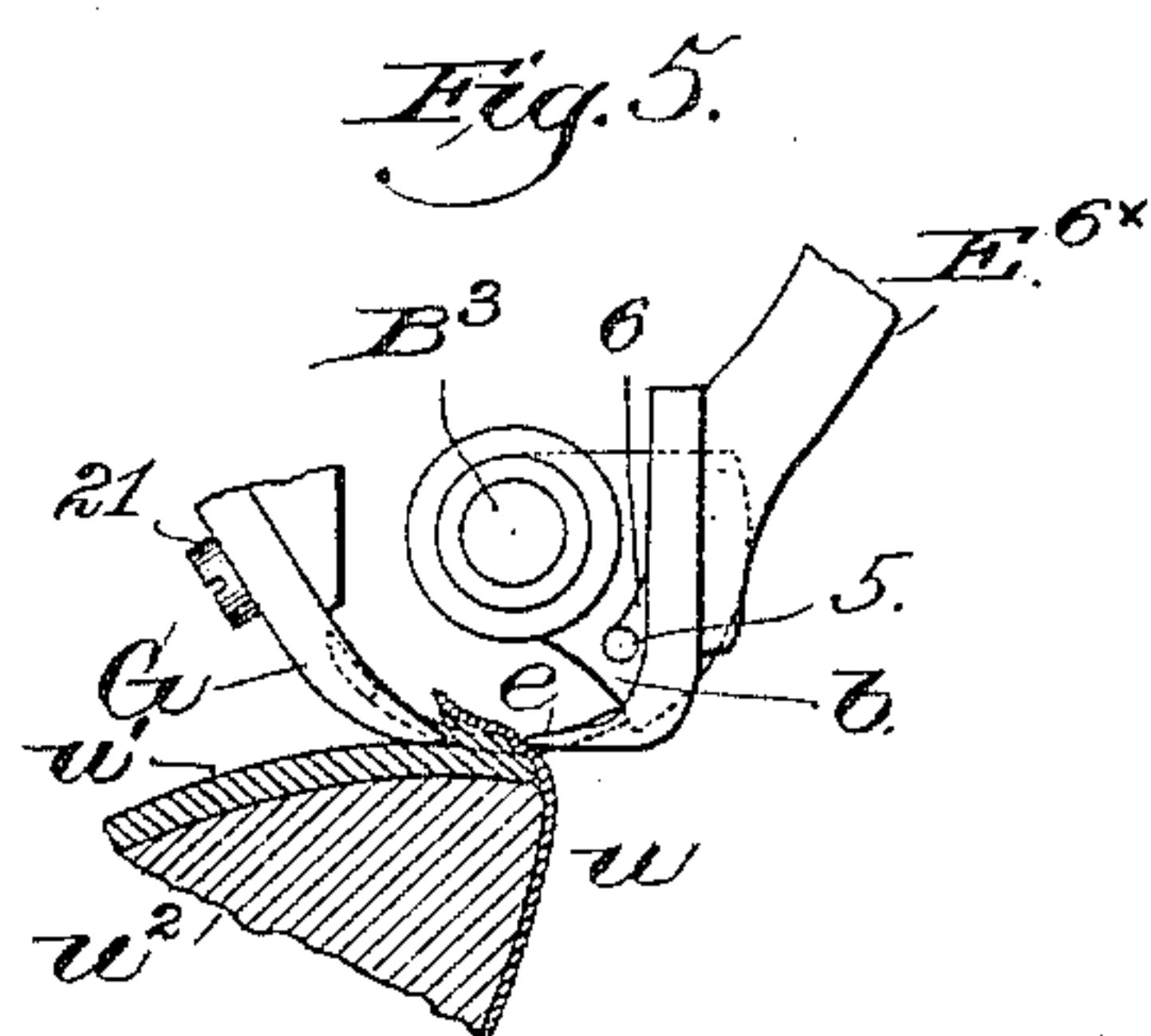
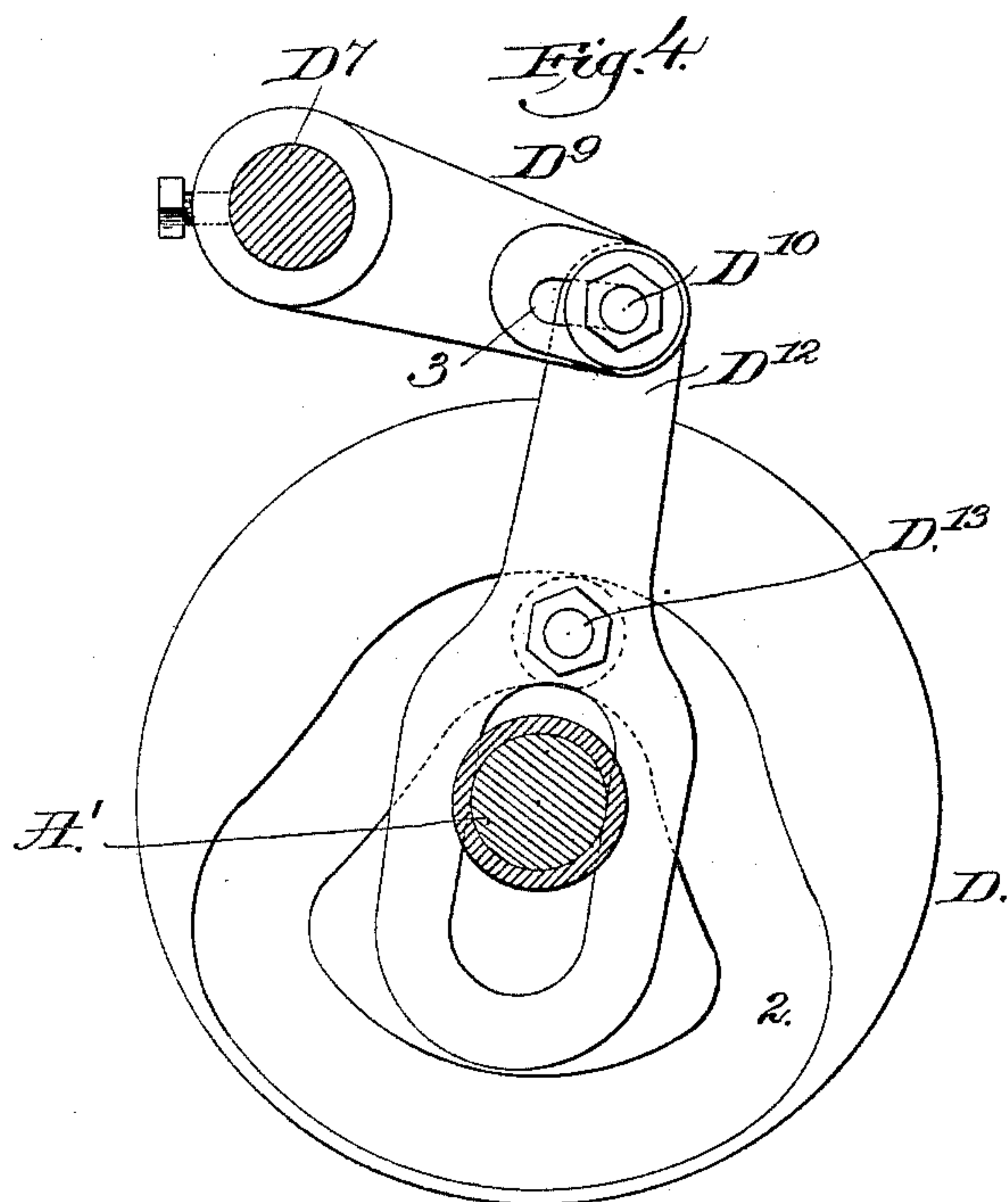
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UNITED STATES PATENT OFFICE.

GEORGE A. STILES, OF BROOKLINE, ASSIGNOR TO GEORGE H. P. FLAGG, OF BOSTON, AND CHARLES K. BRADFORD, OF LYNNFIELD, MASSACHUSETTS.

SOLE-SEWING MACHINE.

SPECIFICATION forming part of Letters Patent No. 453,568, dated June 2, 1891.

Application filed August 7, 1890. Serial No. 361,366. (No model.)

To all whom it may concern:

Be it known that I, GEORGE A. STILES, of Brookline, county of Norfolk, State of Massachusetts, have invented an Improvement in
5 Sole-Sewing Machines, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention has for its object to improve
10 that class of sole-sewing machines having a curved hooked needle, and in my improved machine I have so constructed the parts that it may with slight changes be quickly adjusted to draw the chain out through the
15 channel or through the upper, as may be desired.

In my improved machine the hooked needle is fastened to a needle-carrier attached to a horizontally-arranged rock-shaft provided
20 with a toothed surface which is engaged by a sliding rack-bar, the movement of the said rack-bar oscillating the said needle rock-shaft, the actuating devices for the rack-bar being provided with means for adjusting the extent
25 of the receding motion of the needle to thereby adapt it to the particular material being stitched, the more soft and spongy the material of the sole or the greater the length of the stitch the greater the receding movement
30 of the needle and the longer the loop of the chain-stitch drawn out by it. I have also provided the machine with a stationary channel-guide, which rides in the channel in the inner sole, and opposed to the same I have
35 employed a positively-vibrated finger, which engages the lining and upper when the shoe is being made as a turn, and which, when the upper is a welted shoe, engages the upper near the edge of the sole and impinges the
40 same firmly upon the sole while the needle enters the material to make the stitch, the said finger being released from the material while the latter is being fed the length of the stitch.

45 Figure 1 is a front elevation of the upper end or head of a sole-sewing machine embodying my invention. Fig. 2 is a right-hand elevation thereof; Fig. 3, a left-hand elevation; Fig. 4, a sectional detail chiefly to show
50 the cams and some of the parts employed to move the rack-bar employed to actuate the

needle rock-shaft; Fig. 5, a detail showing part of a turned shoe in position to be stitched. Fig. 6 is a detail showing the cast-off carrier and its attached cast-off, and Fig. 7 is a detail
55 to illustrate a modification of my invention.

The head A of the machine will in practice be mounted upon any suitable column or base. This head is and may be of suitable
60 shape to support the bearings for the working parts. The front end of the head is represented as provided with a dovetailed groove (shown best in Figs. 1 and 2) for the reception of a carriage B, to be described.

The main shaft A' of the machine, which
65 may be driven in any suitable manner, is provided with a series of cams C D E F. The cam C has at one side thereof a suitable groove, in which is entered a roller or other stud C' of an arm C², fast upon the feed rock-shaft C³,
70 mounted in the bearings C⁴, the said shaft being provided at its front end with a grooved arm C⁵, which receives within it a block C⁶, (shown by dotted lines in Fig. 3 and partially by full lines in Fig. 1,) the said block being
75 free to turn upon a bolt C⁷, made adjustable in the slot (best shown in Fig. 1) made in an ear fast to or forming part of one end of the carriage B. This carriage, represented as having
80 dovetailed upper and lower edges to fit the dovetailed groove referred to in the front end of the head A, has suitable bearings B' and B², through which is extended the needle rock-shaft B³, the latter having fast upon it
85 near one end a toothed surface B⁴, herein represented as a partial gear or sector, the teeth of which are engaged by the teeth of a rack-bar D', adapted to slide vertically in a suitable guide D², the upper end of the said rack-bar being jointed at D³ to a link D⁴, in turn
90 jointed at D⁵ to one arm D⁶ of a rock-shaft D⁷, mounted in suitable bearings D⁸ of the frame, the said rock-shaft having a second arm D⁹ fast thereto and provided with a pin D¹⁰, which receives loosely the upper end of
95 a link D¹², slotted at its lower end to embrace the main shaft A, the said link having a suitable roller or other stud D¹³, which enters the groove 2 in one side of the cam D, the rotation of the said cam effecting the oscillation
100 of the rock-shaft D⁷ and the reciprocation of the rack-bar.

The arm D⁹ (see Fig. 4) is provided with a curved slot 3, struck from the center of the shaft A while the needle is fully in the work. Into this slot is extended the stud D¹⁰, which thus connects the link D¹² with the said arm in an adjustable manner, and owing to the shape of the slot and the arc in which it is formed it results that the hooked point of the needle always passes through the material to a certain point, no matter what may be the position of the stud in the said slot. This stud is adjusted in the slot in order to adapt the needle to the requirements of the material and the length of the stitch, it being necessary at times to adjust the said stud, for when the material is soft or spongy the receding movement of the needle is greater than when the material of the sole is hard and firm, and so, also, it is necessary to adjust the stud to provide for the length of the loop, which always slightly exceeds the length of the stitch.

The needle-carrying rock-shaft B³ has secured to it by a pin 4, as herein shown, near the center of its length, the hub of the needle-carrier *a*, the said carrier having secured to it in usual manner a curved hooked needle *a'*, the carrier having a pin 5 extending therefrom at one side, which enters a curved slot 6, made in the cast-off carrier *b*, of segmental shape and having a sleeve-like hub which surrounds the needle rock-shaft B³ forming a bearing for it, the said hub, however, entering and turning in the bearing B².

The hub of the cast-off carrier at the right of the bearing B² (see Fig. 1) receives upon it a washer 7, which may be of leather, and a nut 8 and a check-nut 10, the rotation of the nut 8 causing it to bear with more or less force upon the washer, so as to hold the hub of the cast-off in the bearing with greater or less friction, so that the said cast-off will be moved only when the pin 5 meets one or the other end of the slot 6, as is well understood in the working of a cast-off in connection with a hooked needle.

The width of the toothed surface engaged by the teeth of the rack-bar D' is greater than that of the rack-bar, so that the said teeth remain in engagement during the time that the carriage B is slid horizontally, as it is when the needle is in the material, to feed the material the length of the stitch, different lengths of stitch being provided for by adjusting the bolt C⁷ in the slot of the carriage.

The cam E, having a peripheral groove, receives in it a roller or other stud E', projecting from a lever E², having its fulcrum at E³, the upper end of the said lever being jointed to a link E⁴, in turn jointed at E⁵ to the upper end, as shown in Figs. 1, 2, and 3, of a lever E⁶, pivoted at 13 (see Fig. 2) on a bracket E⁷, suitably attached to the front of the head by screws 14, the lower end of the said lever being provided with a yielding presser toe or finger *e*, attached thereto by suitable screws 15, the said finger acting against the lining

or the inside of the upper near the edge thereof and outside the edge of the sole *u'*, laid upon the last *u*², (see Fig. 5,) which shows part of the last and upper, the said finger by its action upon the upper aiding to stretch and tighten the same preparatory to forming the stitch and holding the upper firmly in the shoulder or groove formed in the sole while the needle passes into the material to form the stitch.

The cam F, having a peripheral groove, receives in it a suitable roller or other stud F', attached to a lever F², pivoted at F³ upon the head, the said lever near its upper end being jointed to a link F⁴, in turn jointed to a rack-bar 16, which engages a pinion 17, fast on the shank of the bar 18, to the lower end of which is attached the thread-guide *f*, which in its oscillation lays the thread extended through an eye at its lower end into the hook of the needle, the thread coming to the said thread-guide from any usual or suitable tension device 20, thread being supplied to the tension device from any usual or suitable spool, ball, or cop. The rod 18, to which the thread-guide *f* is attached, has its bearings in part of the bracket E⁷, before referred to, and the said bracket also serves to sustain the channel-guide G, which enters the channel in the sole, as represented best in Fig. 5, the said channel-guide being adjustably secured in place by means of screws 21.

In practice the thread between the tension device and the thread-guide will be passed over a suitable take-up spring or device 22.

The lever E⁶, before referred to, is in two parts, it being separated where mounted upon the pin 13. The lower part E^{6x} of the said lever has a stud 23, which is engaged by a strong spring 24, having, as represented, at its opposite end an adjustable screw 25, which abuts against a projection 26 on the upper part of the lever E⁶, the said spring normally acting to keep the finger *e* pressed strongly but yet with a yielding pressure toward and against the upper, the lower part of the lever having, as represented in Fig. 2, a thumb-piece 27, which may be engaged by the operator and moved in the direction of the arrow 28, Fig. 2, when it is desired to remove the work or to introduce the work in position to be stitched.

The parts so far described are adapted to draw the chain of the stitch out through the upper, the hooked needle taking the loop at or near the bottom of the channel in which the channel-guide runs. This class of work is desired by some manufacturers, and there are others that desire to place the chain of the stitch in the channel. To do this I remove the bracket E⁷ (shown in Figs. 1, 2, and 3) and in place of it substitute the bracket E^{7x}, (shown in Fig. 7,) where it will be seen that the channel-guide G is located at the right rather than at the left, and that the finger *e* points in a direction opposite the point of the needle; or, in other words, the finger

and the channel-guide are placed in reverse positions from those shown in Fig. 2, leaving the needle and the thread-guide without change, and with this modification the point
5 of the needle will enter the channel of the sole and emerge from the upper, at which point it will be supplied with thread, drawing the thread through from the upper into the channel, as is well understood, thus leaving
10 the chain in the channel.

To actuate the lever $E^6 E^{6x}$ in its changed position (shown in Fig. 7) it is necessary only to remove the cam E from the main shaft and turn it end for end and put it back on the
15 said shaft, thus changing its time of motion to correspond with the changed position of the parts.

In the operation of the machine the cam E vibrates the compound lever $E^6 E^{6x}$ about its
20 pivot, so as to hold the shoe firmly upon the channel-guide while the stitch is being made, removing the finger e from pressure upon the material while the feed is taking place, the needle being then in the stock and holding
25 the upper and sole together, at which time the finger e may be removed without allowing the upper and sole to slip apart.

Prior to my invention I am aware that the material being stitched in a sole-sewing machine has been supported against a movable
30 rest in opposition to the pressure put upon the material while the needle enters the same, and that such machines have had a channel-guide; but prior to my invention I am not
35 aware that a finger having its point directed in a direction opposite that of the channel-guide has been positively moved backward and forward to engage and release the material, as and for the purposes provided for in
40 this my invention.

I claim—

1. In a sole-sewing machine, the head, the movable carriage mounted therein and having bearings $B' B^2$, the rock-shaft B^3 , made movable with the said carriage, means to slide
45 the said carriage longitudinally, the toothed surface B^4 , connected to the said rock-shaft, the needle-carrier and curved hooked needle, combined with a rack-bar, a guide for the same, the rock-shaft D^7 , connections be-
50 tween it and the said rack-bar to move the same vertically, the arm D^9 , the cam D, and the adjustable link D^{12} , connected to the said arm D^9 and made adjustable thereon, substantially as described, whereby the length
55 or return-stroke of the needle may be varied at pleasure, substantially as described.

2. In a sole-sewing machine, the head, the carriage B, having bearings, means to reciprocate the said carriage horizontally, the rock-
60 shaft B^3 , mounted in said carriage and made movable therewith and provided with a needle-carrier attached thereto, a curved hooked needle, and means to rock the said shaft, combined with a cast-off carrier, its cast-off
65 and stationary channel-guide G, a presser-finger e , arranged opposite the said channel-guide, the two-part lever $E^6 E^{6x}$, a spring to control the pressure of the finger e , and connections to actuate positively the part E^6 of
70 the two-part lever, the combination being and operating substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

GEO. A. STILES.

Witnesses:

GEO. W. GREGORY,
EMMA J. BENNETT.