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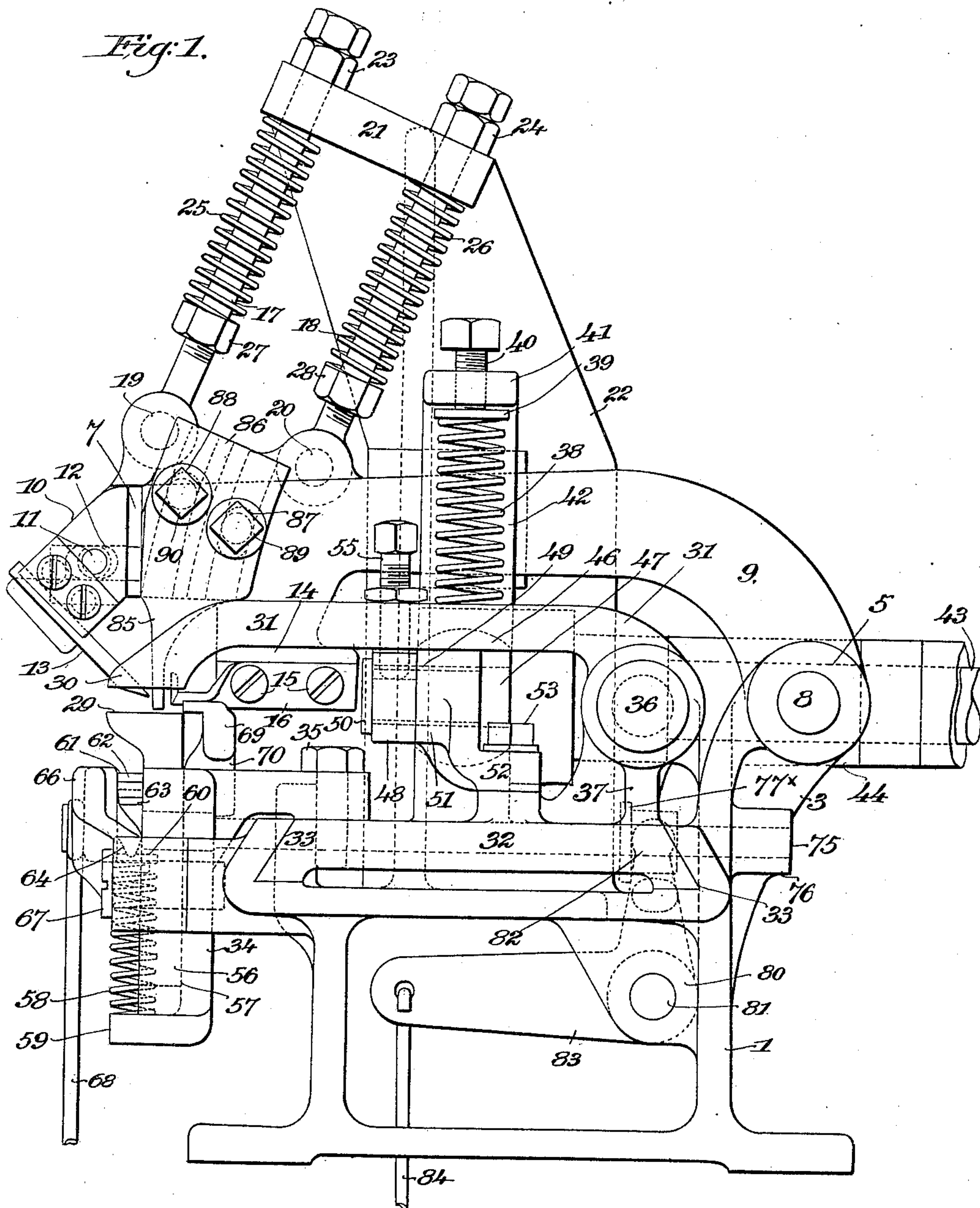
Patented May 28, 1901.

F. E. BECKMAN.
CHANNELING MACHINE.

(No Model.)

(Application filed Sept. 6, 1899.)

3 Sheets—Sheet 1.



Witnesses:

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Inventor:

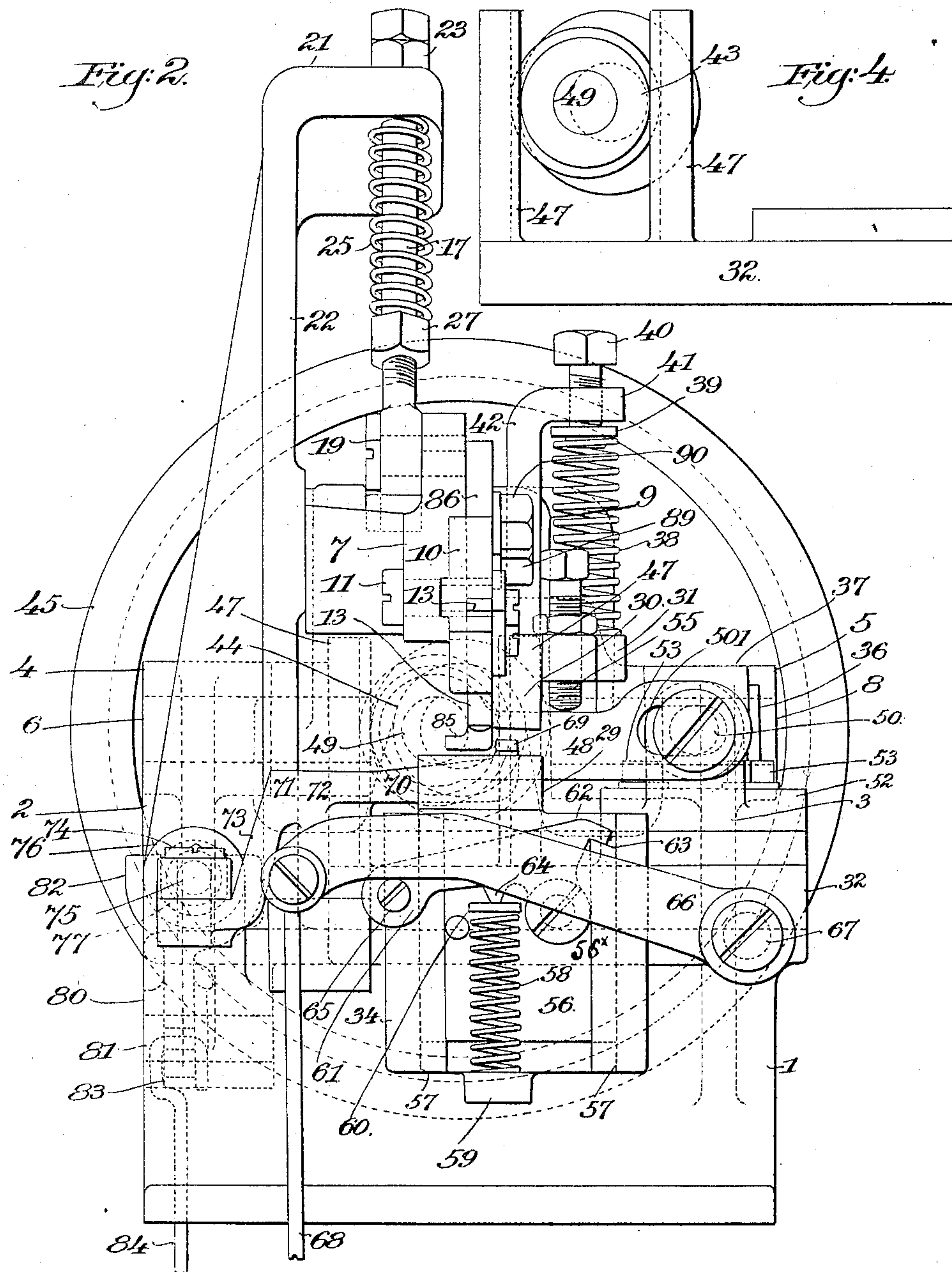
Frank E. Beckman,
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F. E. BECKMAN.
CHANNELING MACHINE.

(Application filed Sept. 8, 1899.)

(No Model.)

3 Sheets—Sheet 2.



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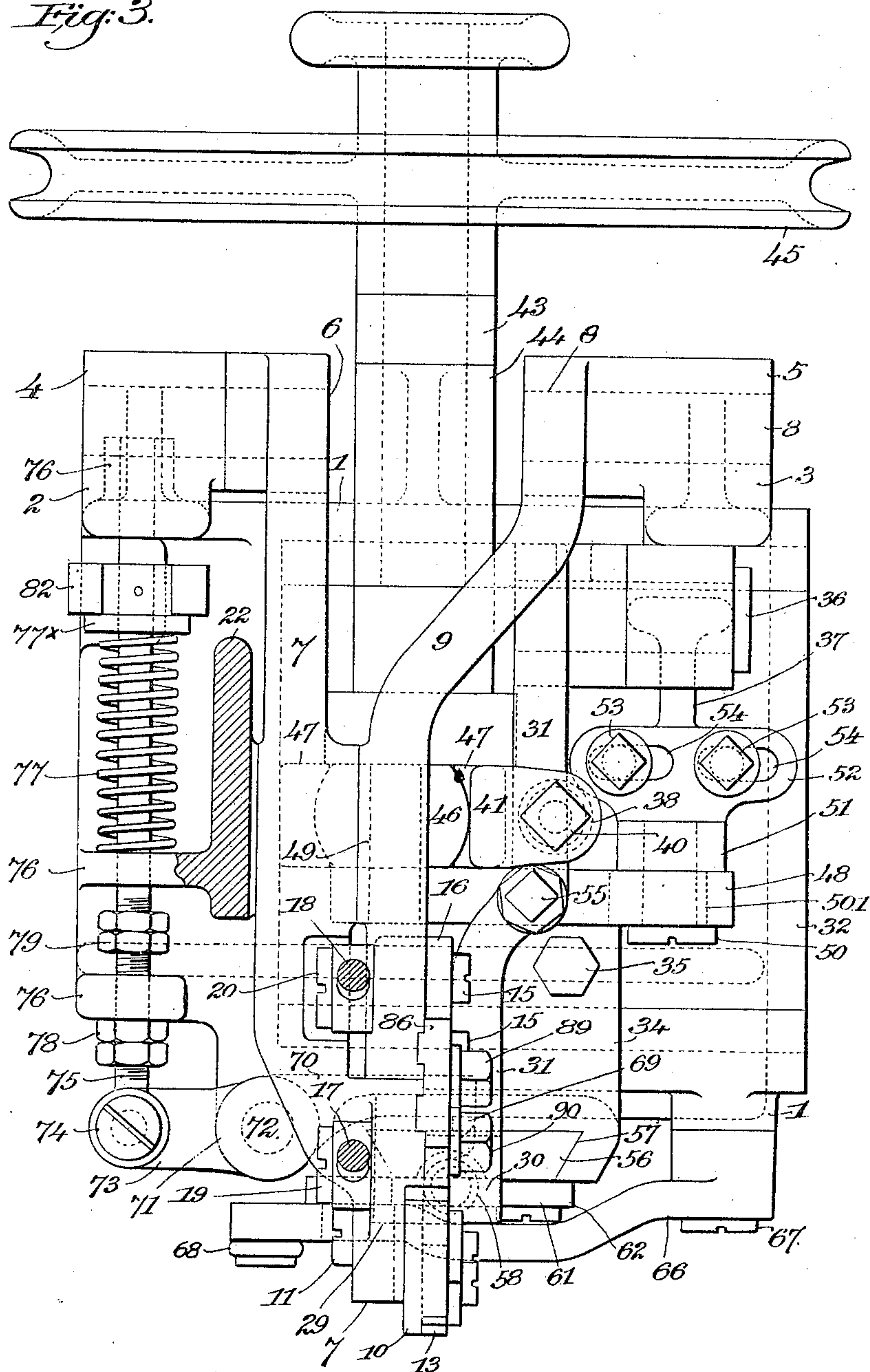
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3 Sheets—Sheet 3.

Fig. 3.



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UNITED STATES PATENT OFFICE.

FRANK E. BECKMAN, OF HAVERHILL, MASSACHUSETTS.

CHANNELING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 675,082, dated May 28, 1901.

Application filed September 6, 1899. Serial No. 729,665. (No model.)

To all whom it may concern:

Be it known that I, FRANK E. BECKMAN, a citizen of the United States, residing at Haverhill, in the county of Essex and State of Massachusetts, have invented certain new and useful Improvements in Channeling-Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The present invention relates to machines for channeling the soles of boots and shoes, and more particularly to a machine for channeling insoles and soles of turn boots and shoes before such soles are incorporated in the boots or shoes.

It is usual in preparing insoles for welted shoes and soles for turn-shoes to cut a channel in the flesh side of the sole and also to cut a groove or rabbet along the edge of the sole or a lip, and between these two marginal cuts there is a narrow portion of stock termed in the art the "between substance," in which the stitches of the seam uniting the upper and sole are received.

In channeling-machines of the present type of the prior art the sole to be channeled is fed to the cutters or knives by a toothed feed-wheel which engages the marginal edge of the sole along a line between the two cuts forming the channels or coincident with the between substance, and the line of indentations formed in the between substance by the teeth of the feed-wheel tends to mar the appearance of the sole, at the same time greatly weakening that part of the sole which receives the stitches. Again, it has been found that in those machines embodying the feed-wheel great difficulty is experienced in turning the shoe-sole at the toe, more particularly in soles having extremely-pointed toes.

One object of the present invention is to produce a channeling-machine having a feed mechanism so constructed that its operation will not damage the sole, as above indicated, and also so that the turning of the sole will be greatly facilitated.

Another object of the present invention is to produce a channeling-machine having a feed mechanism arranged to feed the stock

to the knife and to vibrate the stock in the direction of the line of feed, whereby the stock is intermittently withdrawn from the knife and then brought into contact with the knife while in motion.

Another object of the invention is to greatly simplify and improve the construction and mode of operation of machines of the type set forth.

To the above end the present invention consists of the devices and combinations of devices which will be hereinafter described and claimed.

The present invention is illustrated in the accompanying drawings, in which—

Figure 1 shows a side elevation of a machine embodying the same with the belt-pulley broken off. Fig. 2 shows a front elevation of the machine shown in Fig. 1. Fig. 3 shows a top plan view of the machine, parts being shown in section; and Fig. 4 shows a detail of the feed-slide and its actuating mechanism.

In the drawings, 1 represents the supporting frame or base, which may be formed of a single casting, if desired, and of a suitable size and shape to support the working parts. The frame 1 carries at its rear two upwardly-projecting standards 2 and 3, provided with bearings 4 and 5, the bearing 4 receiving the fulcrum or shaft 6 of the overhanging channel-knife-carrying lever 7 and the bearing 5 receiving the shaft or fulcrum 8 of the overhanging edge-knife-carrying lever 9. To the outer end of the lever 7 is secured a knife-block 10, adjustable longitudinally thereon by means of the set-screw 11 and slot 12, and in the block 10 is secured in an inclined position a channeling-knife 13. The lever 9 has a depending arm 14, to which is secured by the screws 15 the edge or shoulder knife 16.

The levers 7 and 9 are free to turn about their fulcrums 6 and 8 in order to raise and lower the channeling and edge-cutting knives away from and toward the work, and such levers are yieldingly held down in operative position by means of rods 17 and 18, pivoted, respectively, at 19 and 20 to the levers 7 and 9, which rods pass through openings formed in the overhanging arm 21 of a bracket 22, secured to the frame 1, the upper ends of

such rods being threaded and receiving adjusting-nuts 23 and 24, coiled springs 25 and 26 being placed on such rods and engaging at their upper ends the overhanging arm 21 and at their lower ends nuts or collars 27 and 28 on said rods.

The above arrangement is such that the springs 25 and 26 tend to maintain the levers 7 and 9 depressed with the channeling and edge-cutting knives in operative position, but permitting such knives to yield upwardly, if required, while the rods 17 and 18, together with the nuts 23 and 24, limit the downward movement of such levers and knives, which movement may be adjusted and regulated by turning the nuts on the rods, as will be clear from an inspection of the drawings.

In the present machine the shoe-sole is fed against the cutting edge of the knives by a feeding mechanism which grips the shoe-sole and pushes it against the knives for a short distance, then releases the sole and returns to its starting position preparatory to again gripping the sole for another feed. This feeding mechanism is arranged to grip the shoe-sole during its forward movement and also to grip the sole during a portion of its backward movement, whereby the sole is drawn back from the knife a short distance after each feeding movement and then forced against the knife while in motion. By this arrangement the sole is cut by a chopping action instead of by a continuous draw cut and superior results produced. One member of this feeding mechanism comprises the work support or table 29 and the other member a gripping-jaw 30, carried by the forward end of a lever 31, and a lateral or feed movement is imparted to the work-support 29 and gripping-jaw 30 by means of the feed-slide 32, which is arranged to have a sliding movement in a guideway 33, formed in the frame 1, the work-support 29 being mounted in a bracket 34, secured by a bolt 35 to the feed-slide 32, and the lever 31 of the gripping-jaw 30 being fulcrumed at 36 to a post 37, rising from the upper surface of the feed-slide.

The above arrangement is such that a lateral movement of the feed-slide will impart a simultaneous lateral movement to the work-support and gripping-jaw to feed the work. The gripping-jaw 30 is forced down to grip the work by means of a spiral spring 38, which bears at its lower end against the lever 31 and at its upper end against a washer 39, carried by an adjusting-screw 40, tapped in a threaded bearing in an overhanging arm 41 of a bracket 42, rising upwardly from the feed-slide 32. The lateral movements of the feed-slide are imparted by a shaft 43, mounted in suitable bearing 44 of the frame 1, which is rotated by a belt-pulley 45 and which at its forward end carries an eccentric 46, which fits between the two upwardly-projecting arms 47 of the feed-slide, whereby as said shaft is rotated the feed-slide will be rapidly reciprocated from side to side of the machine.

The gripping-jaw 30 is raised against the tension of the spring 38 to release the work by means of a link 48, which at one end engages a crank-pin 49, carried by the shaft 43, and at its other end is pivotally connected to a pin or stud 50, mounted in a bearing 51, carried by a bracket 52, mounted for lateral adjustment, by means of screws 53 and slots 54, to the upper surface of the feed-slide 32, the lever 31 of the gripping-jaw carrying an adjustable screw or stud 55, which rests upon the upper surface of the link 48.

The foregoing arrangement is such that a rotation of the shaft 43 will cause the crank-pin 49 to rock the link 48 about its pivot 50, and thus raise the lever 31 and the gripping-jaw 30 from the work to release the work when moving back for a new feed movement, and the spring 38 forces the gripping-jaw 30 in contact with the work, as hereinbefore set forth.

It will be evident from an inspection of Figs. 2 and 4 that the link 48 is out of contact with the adjustable stud 55 during the entire forward movement of the feed-slide 32 and does not engage the stud 55 to raise the lever 31 until after the slide 32 has begun its backward movement and that it disengages the stud before the slide 32 has completed its backward movement. The gripping-jaw 30 thus remains in contact with the stock during the forward movement of the feed-slide to feed the stock to the knives and also remains in contact with the stock during the first portion and also during the last portion of the backward movement of the feed-slide to withdraw the stock from the knives. The lateral reciprocations of the feed-slide 32 are uniform and cannot be adjusted, and it will thus be seen that the length of feed will depend upon the duration of contact of the jaw 30 with the stock during the backward movement of the feed-slide—that is, the length of feed will depend upon the distance to which the stock is withdrawn from the knives, being equal to the difference between the distance to which the stock is fed forward by the feed-slide and the distance to which it is withdrawn from the knives.

For adjusting the duration of contact of the jaw 30 with the stock during the backward movement of the feed-slide the stud 55 can be adjusted vertically in the lever 31 or the pin 50 adjusted laterally upon the feed-slide 32. It will be evident that either of these adjustments will change the point in the revolution of the crank-pin 49 at which the link 48 engages the stud 55 and also the point at which it disengages the stud. It will also be evident that a change in the adjustment of the pin 50 will cause a slight change in the points in the revolution of the crank-pin 49 at which the stud 55 is engaged and disengaged and that a change in the adjustment of the stud 55 will cause a considerable change

in such points. The stud 55 therefore constitutes a coarse adjustment for the feed mechanism and the pin 50 a fine adjustment. It will also be noted that if the pin 50 is moved away from the crank-pin 49, the adjustment of the stud 55 remaining unchanged, the vertical throw of the lever 31 will be increased and that if the pin 50 be moved toward the crank-pin 49 the throw of the lever 31 will be diminished. It will also be evident that if the adjustment of the stud 55 be changed, the pin 50 remaining unchanged, the throw of the lever 31 will be altered. It is desirable that the throw of the lever 31 should remain constant for different lengths of feed, and this result can be accomplished by means of the two adjustments which have been described. For instance, if it is desired to increase the length of feed the stud 55 is lowered, so as to be engaged and disengaged by the link 48 at earlier points in the revolution of the crank-pin 49 and the pin 50 is adjusted toward the crank-pin 49. By the adjustment of the pin 50 the operative length of the link 48 is diminished, and consequently the vertical throw of the lever 31, the arrangement being such that the throw of the lever remains practically constant for all lengths of feed. To permit the lateral adjustment of the pin 50, the link 48 is provided with a slot 501, through which the pin passes.

In the present machine instead of raising the levers 7 and 9 when inserting the work, as in machines of the prior art, I have arranged the work-support to be moved downward, and there is provided a latch for locking the work-support in its elevated position, and means, preferably a foot-treadle, for first releasing the latch and thereafter depressing the work-support. In the machine of the drawings this is accomplished by forming the work-support 29 on a slide 56, which is arranged for a vertical movement in a guideway 57, carried by the bracket 34, and said slide and work-support are raised by means of a spring 58, which is seated on a lug 59, projected from the front of the bracket 34 at its lower end, and which spring engages a lug 60, projected from the front of the slide 56. Pivoted to the slide 56 is a latch-lever 61, which has a latch 62 arranged to engage a notch 63, formed in one side of the guideway 57, whereby to prevent the downward movement of the slide and work-support. The latch-lever has a toe 64, which rests upon the lug 60, whereby when the spring 58 raises the slide 56 the said lever will be raised and the latch caused to engage the notch. The opposite end of the latch-lever carries a stud 65, which is engaged by a lever 66, fulcrumed at 67 to the frame 1 and which is pivotally connected at its opposite end to a rod 68, which connects with a foot-treadle, (not shown,) the arrangement being such that a downward pull on the rod 68 will cause the lever 66 to rock the latch-lever 61 and remove the latch 62 from engagement with the notch 63 and by

means of the toe 64 depress the slide and work-support against the tension of the spring 58. The pivot 56^x of the latch-lever 61 is nearly in a vertical line with the latch 62, whereby a downward pressure exerted upon the slide 56 will not tend to swing the latch-lever about its pivot and the slide will be held securely locked. When, however, the lever 66 is actuated, the pin 65 in the outer end of the latch-lever will be engaged and the latch-lever will be swung on its pivot 56^x to release the slide 56, the latch 62 traveling upwardly and inwardly in the arc of a circle about the pivot 56^x.

In the present invention the edge-gage 69 is formed on an arm 70 of a lever 71, fulcrumed at 72 in the frame 1, the other arm, 73, of the lever 71 being downwardly inclined (see Fig. 2) and pivotally connected at 74 to a rod 75, arranged to slide in bearings 76 of the frame 1. The gage 69 is yieldingly held in its normal position by means of a coiled spring 77, surrounding the rod 75, which at one end bears against one of the bearings 76 and at its opposite end against a collar 77^x, fixed to the rod 75, said spring tending to move the rod backwardly in its bearings to advance the edge-gage, the forward position of said gage being determined by means of an adjustable nut 78, carried by the rod 75, which engages the front bearing 76, and such rod also preferably carries an adjustable nut 79 between the bearings 76, which controls and limits the forward movement of the rod 75, and consequently the rearward movement of the edge-gage. The rod 75 is moved forward in its bearings 76 against the force exerted by the spring 77 by means of a bell-crank lever 80, fulcrumed at 81 to the frame 1 and carrying a fork 82, engaging the collar 77^x on the rod 75, the opposite arm 83 of the bell-crank lever 80 being connected to a rod 84, which connects with a foot-treadle. (Not shown.)

In machines of the type of the present invention it is usual to employ presser-feet—one for the channel-knife and another for the edge-knife—which rest upon the surface of the shoe-sole and cause such knives to rise and fall according to the variations in thickness in stock, and thus gage the depth of the cut from the upper surface of the stock. It is desirable in some classes of work that the channel-knife and edge-knife or the cuts made thereby should be gaged and controlled from the upper surface of the stock, and in some classes of work it is desirable that one of the cuts should be made with reference to the under surface of the stock, or, rather, the upper surface of the work-support, in order to have the position of the cut with reference to the under surface of the stock uniform, and in other classes of work it is desirable that both cuts be made with reference to the under surface of the stock or upper surface of the work-support.

To secure the above-suggested result in the machine of the drawings, I have provided a

single presser-foot which may be connected with either one of the levers 7 or 9 carrying the channel-knife and edge-cutting knife, or it may be connected with both of such levers 5 or disconnected from both.

The presser-foot of the present invention is shown at 85 and is provided with an enlarged shank 86, and passing through slots 87 and 88 in the shank 86 are set-screws 89 and 90, the set-screw 89 being tapped into a threaded aperture in the lever 9, carrying the edge-knife, and the set-screw 90 being tapped in a threaded aperture in the lever 7, carrying the channel-knife.

If it is desired that both levers be raised and lowered by the presser-foot, which rests upon the stock, each of the set-screws 89 and 90 is turned up tight, whereupon the cuts made by both knives will be gaged by the presser-foot and controlled by the variations in thickness of the stock.

If it is desired that the cut made by the channel-knife be controlled by the presser-foot according to the variations in the thickness of the stock and that the cut made by the edge-knife be made to produce a uniform thickness of leather, and therefore make its cut according to the upper surface of the work-support or the under surface of the stock, the set-screw 89 will be loosened, and thereby permit the spring 26 to always maintain the lever 9, carrying the edge-knife in its lowermost position, such lever at this time being free from the presser-foot and not partaking of the upward movement of the lever 7 of the channel-knife, and it will be further observed by loosening both set-screws both of the levers 7 and 9 will be held in their lowermost position by the springs 25 and 26, thus causing both of said knives to make their cuts with relation to the under surface of the stock or the upper surface of the work-support and not dependent upon variations in the thickness of the stock.

It will be noted that by the construction just described a single presser-foot only is sufficient to adapt the machine for performing or producing various forms of work required, whereas in machines of the prior art it has been necessary to employ a presser-foot for each knife.

It is thought that the operation of the present invention has been sufficiently described in connection with the foregoing description of its construction and arrangement and that further description thereof will be deemed unnecessary.

Having described the construction and mode of operation of my invention, I claim as new and desire to secure by Letters Patent of the United States—

1. In a channeling-machine, the combination with a channeling-knife, of an edge-cutting knife, independently-movable pivoted levers supporting said knives respectively, a presser-foot having an enlarged shank provided with slots, and screws passing through

said slots and screwed into the pivoted levers respectively, substantially as described.

2. In a channeling-machine, the combination with a knife, of a work-support, a gripping-jaw, means for causing the jaw to grip the work, and for moving it toward and from the knife, and means for adjusting the duration of contact of said jaw with the work, substantially as described.

3. In a channeling-machine, the combination with a channeling-knife carrier, and an edge-knife carrier, of a single presser-foot and independent means for connecting said presser-foot with either one or both of said carriers, substantially as described.

4. In a channeling-machine, the combination with a work-support, of a vertically-movable slide for said work-support, a spring for elevating said slide, a latch for maintaining the slide in its elevated position and connected mechanism for releasing the latch and depressing the slide, substantially as described.

5. In a channeling-machine, the combination with a knife, of means for feeding the stock to the knife, and for vibrating the stock in the direction of the line of feed, substantially as described.

6. In a channeling-machine, the combination with a knife, of a feeding device acting to intermittently withdraw the stock from the knife and then force it against the knife, and means for actuating the feeding device, substantially as described.

7. In a channeling-machine, the combination with a knife, of a feeding device acting to intermittently withdraw the stock from the knife and then force it against the knife, said feeding device being provided with means of adjustment for varying the distance to which the stock is withdrawn and means for actuating the feeding device, substantially as described.

8. In a channeling-machine, the combination with a knife, of a feeding mechanism comprising a gripping-jaw and a cooperating member, means for moving said jaw toward and from the knife, means for causing said jaw to grip the work during both of said movements, and means for adjusting the duration of contact of said jaw with the work during its backward movement, substantially as described.

9. In a channeling-machine, the combination with a knife, of a feed-slide, a work-support and a gripping-jaw carried by said feed-slide, a spring normally pressing said gripping-jaw toward the work-support, an actuating-lever for said jaw adjustably pivoted on the feed-slide and arranged to engage said jaw during the backward movement of the feed-slide, and means for actuating the feed-slide and lever, substantially as described.

10. In a channeling-machine, the combination with a knife, of a feed-slide, a work-support, and a gripping-jaw carried by said feed-slide, a spring normally pressing said grip-

ping-jaw toward the work-support, an actuating-lever for said jaw pivoted on the feed-slide, an adjustable projection on said jaw with which the lever is arranged to engage
5 during the backward movement of the feed-slide, and means for actuating the feed-slide and lever, substantially as described.

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

FRANK E. BECKMAN.

Witnesses:

T. HART ANDERSON,
CHRISTIANA KITCHING.