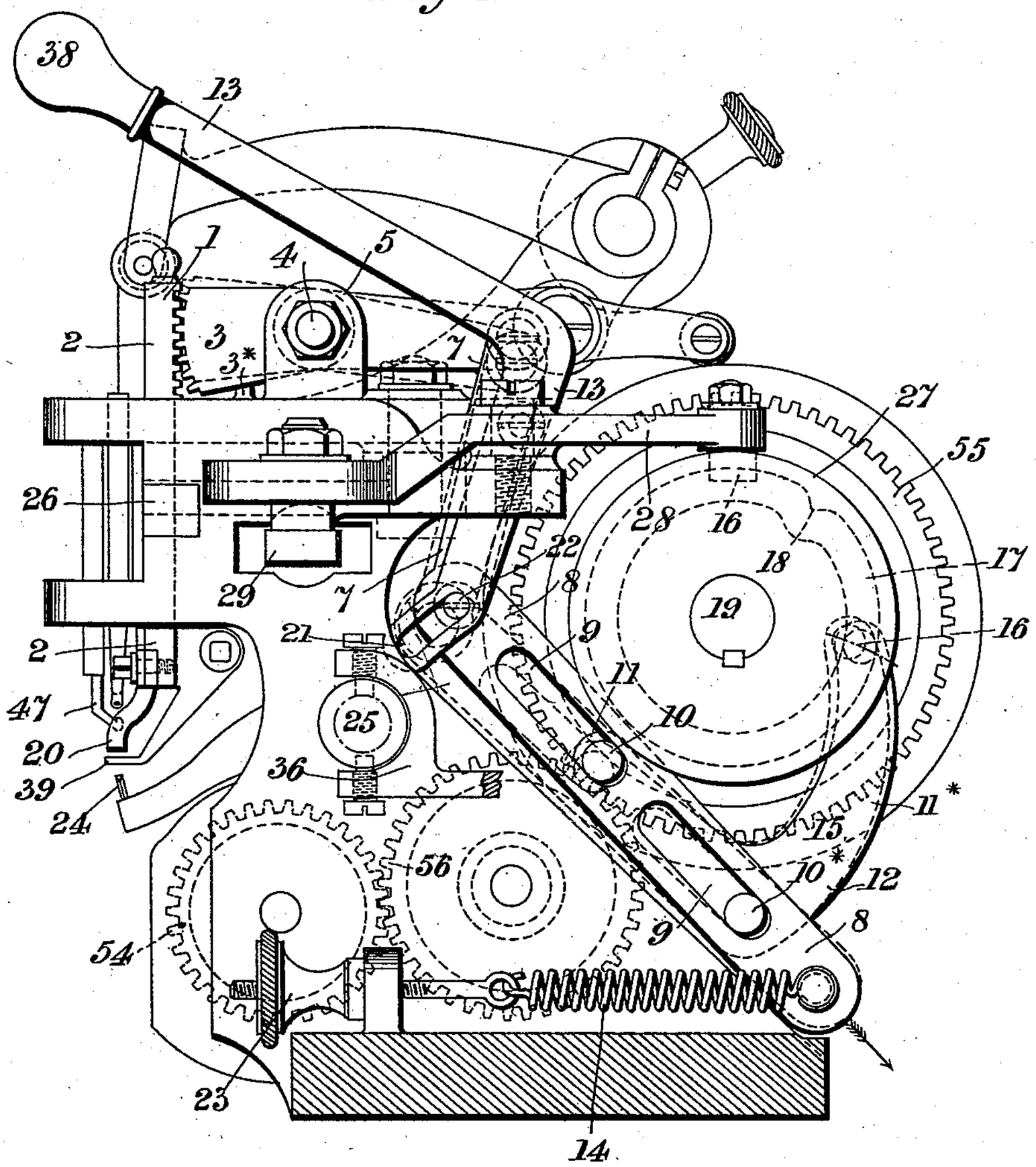
(No Model.) 3 Sheets—Sheet 1.

G. H. SCETRINI & H. K. BRIDGER.

SEWING MACHINE.

No. 571,053. Patented Nov. 10, 1896.

Fig. 1.



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(No Model.) 3 Sheets—Sheet 2.

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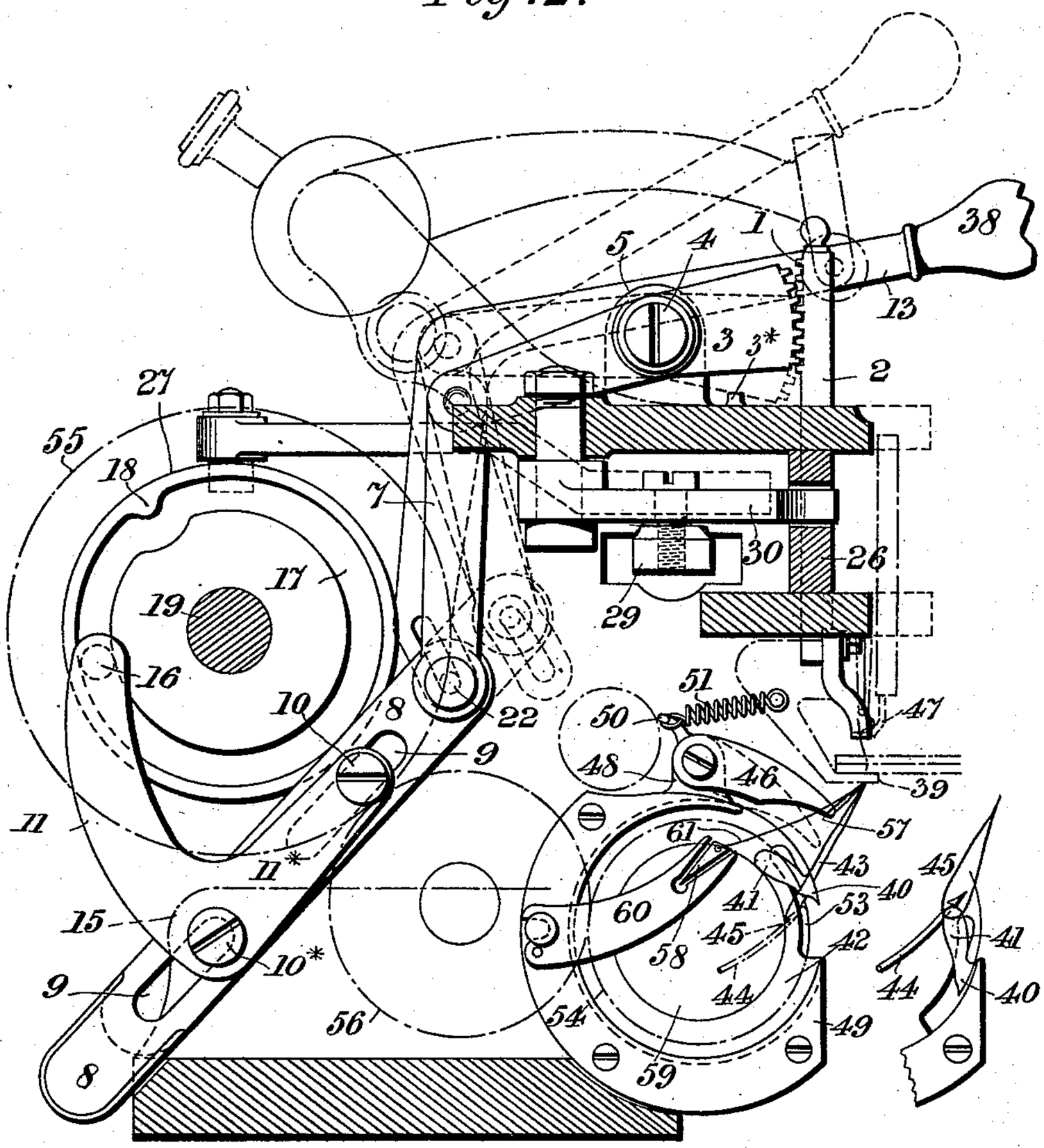
Fig. 2.



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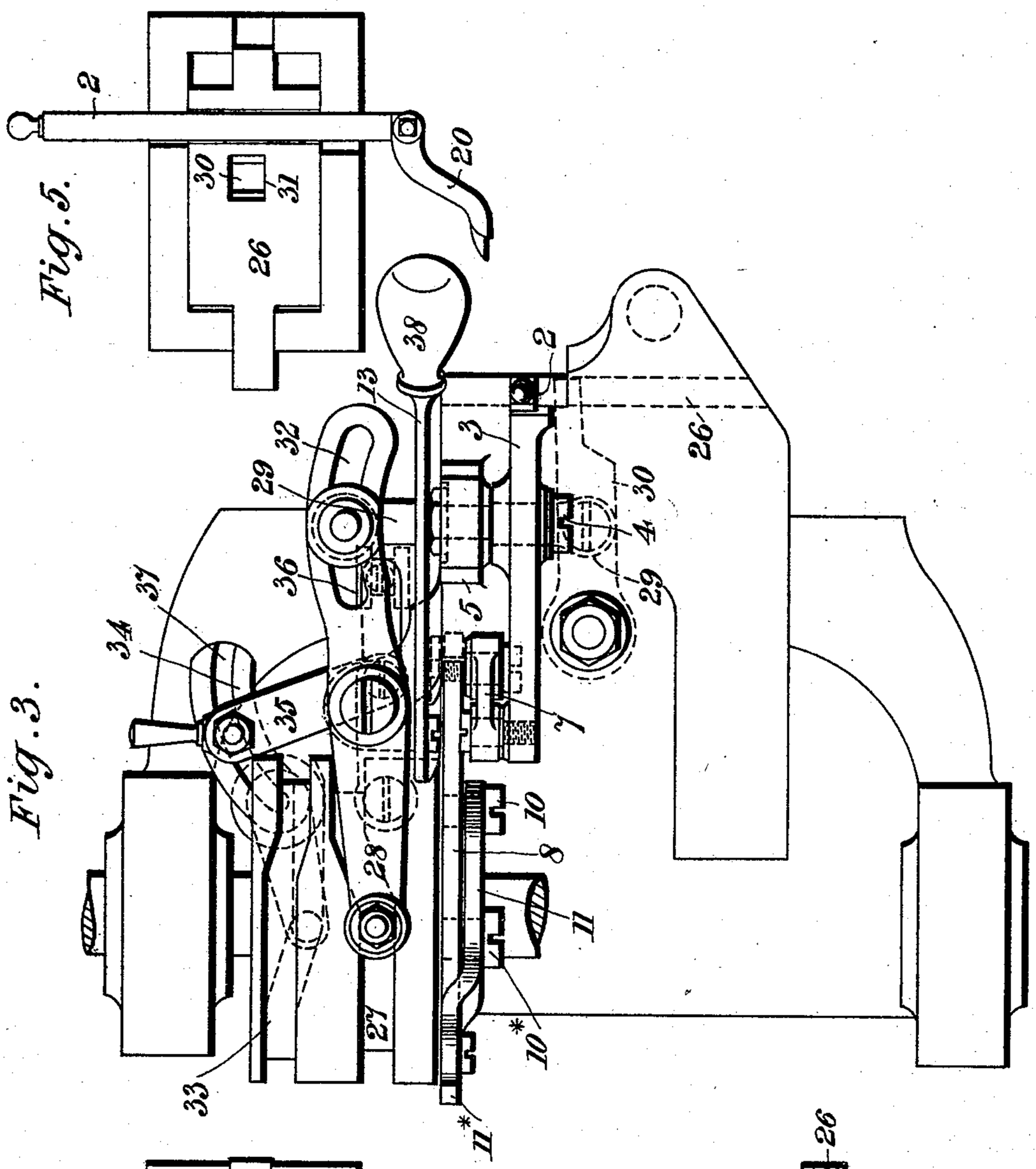

Fig. 3.

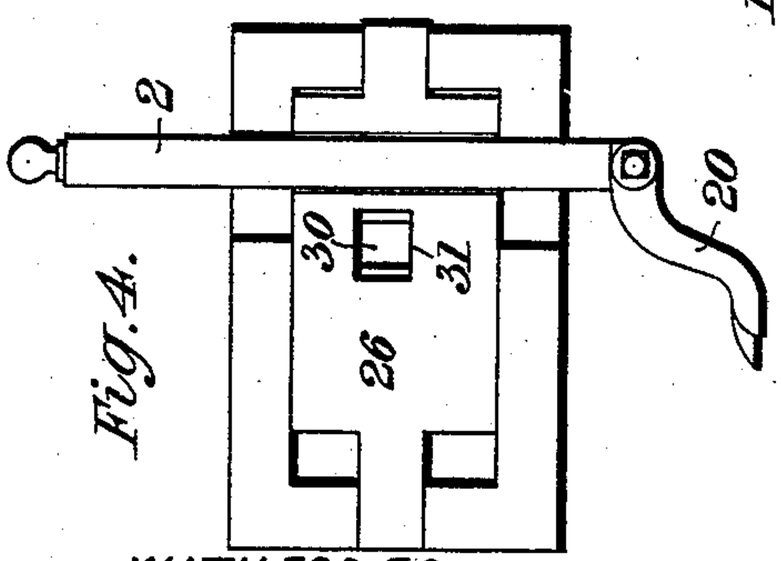

Fig. 4.

Fig. 6.

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UNITED STATES PATENT OFFICE.

GEORGE HARRY SCETRINI AND HERBERT KYNASTON BRIDGER, OF LONDON, ENGLAND; SAID SCETRINI ASSIGNOR TO SAID BRIDGER.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 571,053, dated November 10, 1896.

Application filed September 12, 1895. Serial No. 562,300. (No model.) Patented in England September 17, 1894, No. 17,683; in France September 11, 1895, No. 250,213, and in Belgium September 17, 1895, No. 117,456.

To all whom it may concern:

Be it known that we, GEORGE HARRY SCETRINI and HERBERT KYNASTON BRIDGER, subjects of the Queen of Great Britain and Ireland, residing at London, England, have invented certain new and useful Improvements in and Connected with Boot and Shoe Sewing Machines, (for which Letters Patent have been granted in Great Britain, No. 17,683, dated September 17, 1894; in France, No. 250,213, dated September 11, 1895, and in Belgium, No. 117,456, dated September 17, 1895;) and we 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.

This invention relates more particularly to lock-stitch sewing-machines, but some of the improvements hereinafter enumerated are applicable to chain or other stitch machines used for sewing boots and shoes.

It consists in the mechanism for locking the presser-foot down upon the work to hold it firmly in position upon the table during the piercing and stitch-making operations, and to accomplish this in such manner that it can only be released by the action of a cam on the driving-shaft or by a hand-lever suitably connected, and, moreover, that the presser-foot when released by the cam can automatically accommodate itself to any inequality or varying thickness of work with absolute certainty and ease, the locking at the same time being effected in an efficient and novel manner without the use of ratchets or gripping or jamming devices as heretofore employed for the purpose.

Our invention will be fully understood upon reference to the annexed three sheets of drawings, in which—

Figure 1 is a side elevation of the parts of a boot-sole-sewing machine constituting our invention. Fig. 2 is a reverse side sectional elevation. Fig. 3 is a plan of the parts connected with the presser-foot, the other parts of the machine being left out in order to show the invention more clearly. Figs. 4 and 5 are front views illustrating the two positions of the plate in which the presser-leg has its up-and-down movement and by which it is moved laterally at the time the work is fed by the awl. Fig. 6 is a sectional plan of the presser-foot front plate, more particularly showing the recess for receiving the presser-leg and the hole by which the plate is moved.

The presser-leg 2, formed at its upper end with rack-teeth 1, gears with a quadrant-lever 3, pivoted at 4 to the lug 5 on the top of the machine-frame. The quadrant-lever 3 is connected by a link 7 to the end of a sliding bar 8, which is acted on by a spring 14, tending to force it upward and so to lower the presser-foot toward the work, and is arranged at such angle to the link that a very considerable force must be transmitted through the link before the bar slides downward against the resistance of friction and the spring. A stop 3* limits downward motion of the presser-foot.

The sliding bar 8 is slotted and works on two pins 10 10*, one, 10, projecting from one arm, 11*, of a bell-crank 15 and the other, 10*, being fixed in the frame and serving as a pivot for the bell-crank 15. The other arm, 11, of the bell-crank 15 carries a roller 16, working in the race of the cam 17. The spring 14 tends to force the sliding bar longitudinally upward in the opposite direction to the arrow.

When the roller 16 passes into the depression 18 in the cam-race 17, the bell-crank 15 and sliding bar 8 take up the position shown in dotted lines in Fig. 1, the presser-foot being raised to allow of its return lateral movement. When the presser-foot is in this position and the resistance to its downward motion is removed by the presser-foot being withdrawn from the work, the spring 14 forces the bar 8 in the opposite direction to the arrow, so as to insure that when next depressed it shall come down firmly onto the work. When the roller 16 rises out of the depression, it forces the presser-foot down onto the work until the pressure of the foot on the work attains a certain amount. If this amount of pressure is attained before the roller has completely risen out of the depression in the cam, the resistance of the presser-foot to further motion causes the bar 8 to slide in the direction of the arrow, so as to prevent under

the action of the cam further downward motion of the presser-foot and consequent increase of pressure. The presser-foot thus automatically adjusts itself to the thickness of the work. The pressure of the presser-foot is thus practically always the same and depends principally on the friction of the bar 8 on its pins and to a lesser extent on the strength of the spring 14.

Normally while the stitch is being formed or the work being fed the parts occupy the position shown in full lines in Fig. 1 and any pressure exerted on the presser-foot while the awl or needle is piercing the sole is transmitted directly to the cam 17, so that the sole is held rigidly, as such pressure is not sufficient to cause the sliding bar 8 to slip back in the direction of the arrow on the pins 10 10*.

The function of the spring 14 is practically to force the sliding bar 8 longitudinally forward when the presser-foot is raised from off the work, so that even when working from thick to thin it shall always be brought to bear on the leather with the desired pressure; but it is also desirable to reduce this motion to the smallest amount consistent with the efficient working of the machine, so as to render the working of the machine more smooth and to reduce the wear on the sliding bar and its guide-pins. This forward movement, which should be sufficient to compensate for slightly more than the greatest decrease in thickness in the leather to be sewed that is likely to occur in practice from one stitch to the next, depends on the speed of the machine, the inertia of the parts to be moved, and the strength of the spring 14. To regulate the amount of this forward motion, the inertia of the parts can be increased to the requisite degree by means of a weight acting on the bar in a suitable manner. This is conveniently effected by a weighted hand-lever 13, that can also serve to raise the presser-foot by hand—for example, when inserting or removing the work.

The hand or bell-crank lever 13, pivoted to the frame, has a slot engaging with the pivot 22, connecting the link 7 to the sliding bar 8. On depressing the knob 38 on end of the lever 13 to the position shown in full lines in Fig. 2 the bar 8 is slid on the pins 10 10* to the position shown and raises the presser-foot. On releasing the lever 13 the spring 14 causes the presser-foot to again descend. Any action of the spring to move the sliding bar upward has to overcome the inertia of the weighted hand-lever. The amount the sliding bar is moved forward by the spring after each stitch, which, as before stated, depends on the velocity of the machine and the inertia of the parts, is in practice so small that it can barely be seen. This maximum amount of pressure can be varied. For example, if the sliding lever 8 were at right angles, (or, say, within ten degrees thereof,) depending on the angle of friction to the link 7, it would never slip, however great the force applied to the presser-foot. On the other hand, if the sliding lever 8 were arranged parallel to the link 7 a very small force applied to the presser-foot would cause the lever 8 to slip, depending principally on the strength of the spring 14. In practice the angle of the sliding lever and link is arranged so that if the force transmitted be resolved parallel to the lever and at right angles thereto the component parallel to the lever will be much less than that perpendicular component. When this parallel component overcomes the friction of the lever and the strength of the spring 14, the lever will slide. The friction of the sliding lever is caused principally by the perpendicular component.

The teeth of the quadrant 3 are of sufficient width to allow of the lateral movement of the presser-foot during the feed and withdrawal motions.

In order to move the presser-foot forward simultaneously with the awl to assist the awl in feeding the work, the presser-foot 2 is mounted in a groove in a carrier-plate 26, adapted to slide in the main frame and operated from the cam 27 on the driving-shaft through the lever 28 and link 29 by a lever 30, whose end engages in a hole 31 in the plate 26. The quadrant-slot 32 enables the extent of the traverse of the plate 26 to be adjusted to correspond with that of the awl. In order to traverse the awl simultaneously with the presser-foot, the awl-carrier 24 is fixed on the shaft 25, which is slid endwise in its bearings to traverse the awl by means of the cam 33 on the driving-shaft through the quadrant-lever 34, connecting-link 35, and fork 36. The traverse of the awl is adjusted by means of the quadrant-lever 34.

What we claim, and desire to secure by Letters Patent, is—

1. In a boot and shoe sole sewing machine, the means for operating and imparting the required pressure to the presser-foot whatever the thickness of the work, consisting of a cam, of mechanism for transmitting the motion of the cam to the presser-foot, of a lever in the said mechanism made in two parts, one part being free to slide on the other against a resistance so that when resistance to the motion of the lever exceeds a certain amount the parts slide and thus prevent its increase, and of a means tending to return the said lever parts to their normal position when the said resistance is removed.

2. In a boot and shoe sole sewing machine, the means for operating and imparting the required pressure to the presser-foot whatever the thickness of the work, consisting of a cam, of mechanism for transmitting the motion of the cam to the presser-foot, of a lever in said mechanism made in two parts, one part being free to slide on the other and transmitting the motion at an angle to the direction of its slide, and of a means tending to return the said part to its normal position.

3. In a boot and shoe sole sewing machine,

the means for operating and imparting the required pressure to the presser-foot whatever the thickness of the work, consisting of a cam, of mechanism for transmitting the motion of the cam to the presser-foot, and of a sliding piece in the said mechanism adapted to transmit the required motion and to slip in its guides when the resistance to the motion attains the required amount to prevent further motion of the presser-foot and consequent increase of its pressure, of a hand-lever for operating the sliding piece to raise the presser-foot by hand and of a means tending to return the sliding piece to its normal position when the resistance is removed.

4. In a boot and shoe sole sewing machine, the means for operating and imparting the required pressure to the presser-foot whatever the thickness of the work, consisting of a cam, of mechanism for transmitting the motion of the cam to the presser-foot, of a sliding piece in the said mechanism adapted to transmit the required motion and to slip in its guides when the resistance to the motion of the presser-foot attains the required amount to prevent further motion of the presser-foot and consequent increase of its pressure, of a spring tending to return the sliding piece to its normal position when the said resistance is removed, and of a counterweighted lever opposing the motion of the spring substantially as described.

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

GEORGE HARRY SCETRINI.
HERBERT KYNASTON BRIDGER.

Witnesses:
WILLIAM H. WHEATLEY,
JOHN W. MACKENZIE.