No. 793,709. PATENTED JULY 4, 1905.

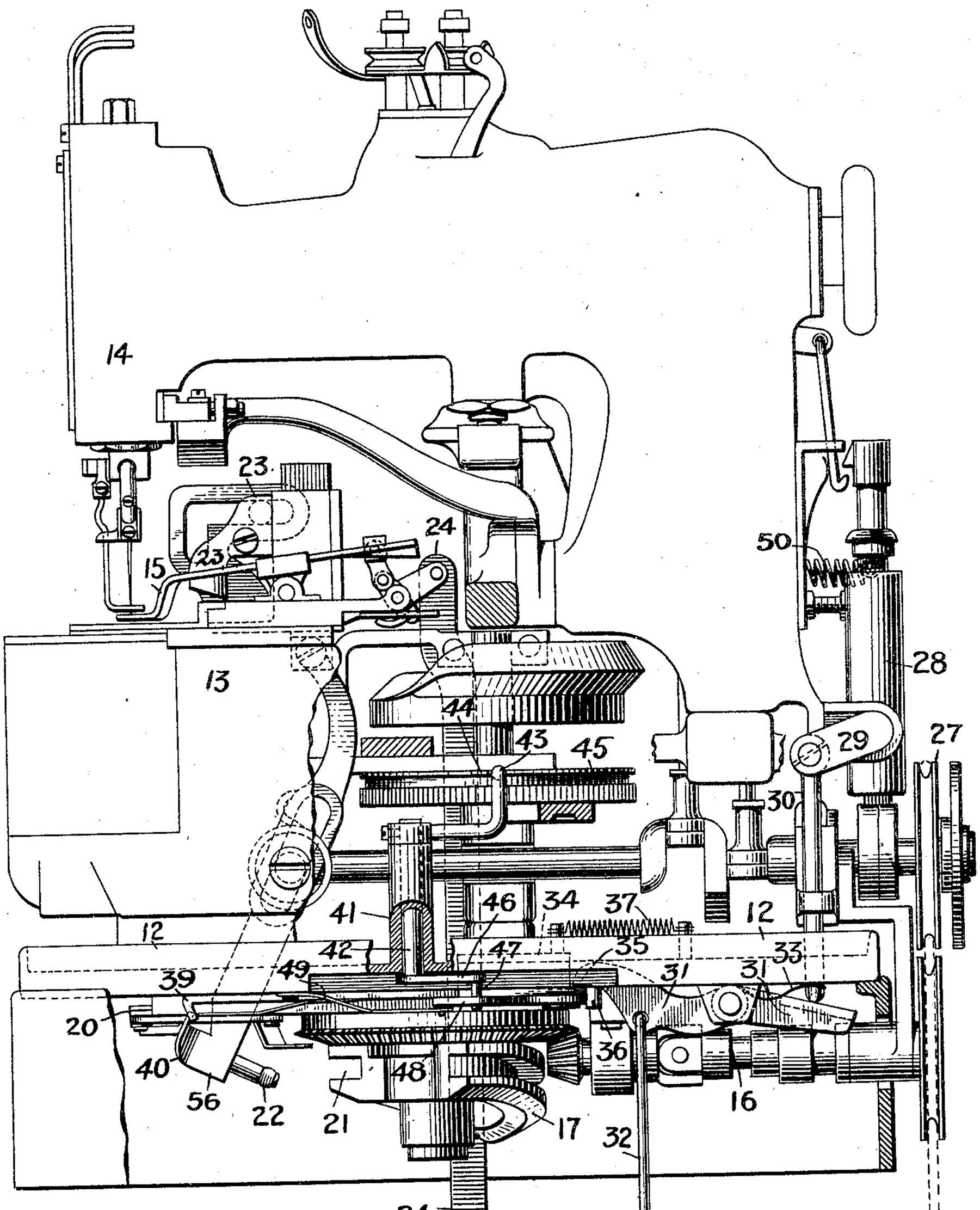
E. B. ALLEN.

BUTTONHOLE CUTTING AND STITCHING MACHINE.

APPLICATION FILED NOV. 26, 1904.

4 SHEETS—SHEET 1.

FIG. 1.



Witnesses:
Frank S. Ober
C. M. Sweeney.

Inventor:
Edward B. Allen,
By his Attorney Henry Calvert.

No. 793,709. PATENTED JULY 4, 1905.

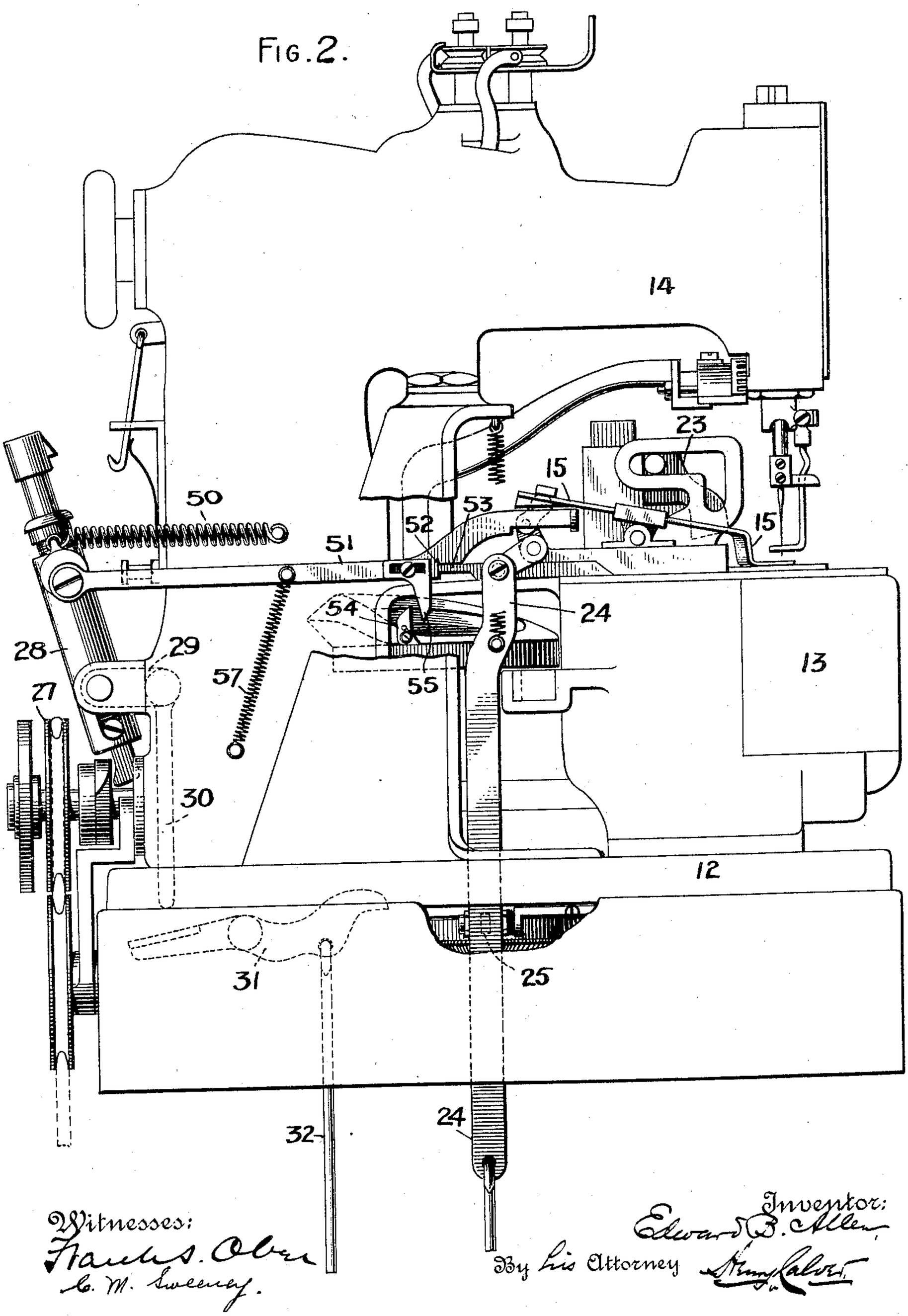
E. B. ALLEN.

BUTTONHOLE CUTTING AND STITCHING MACHINE.

APPLICATION FILED NOV. 25, 1904.

4 SHEETS—SHEET 2.

FIG. 2.



Witnesses:
Frank S. Allen
C. M. Sweeney.

Inventor:
Edward B. Allen,
By his Attorney Henry Calvert

No. 793,709. PATENTED JULY 4, 1905.

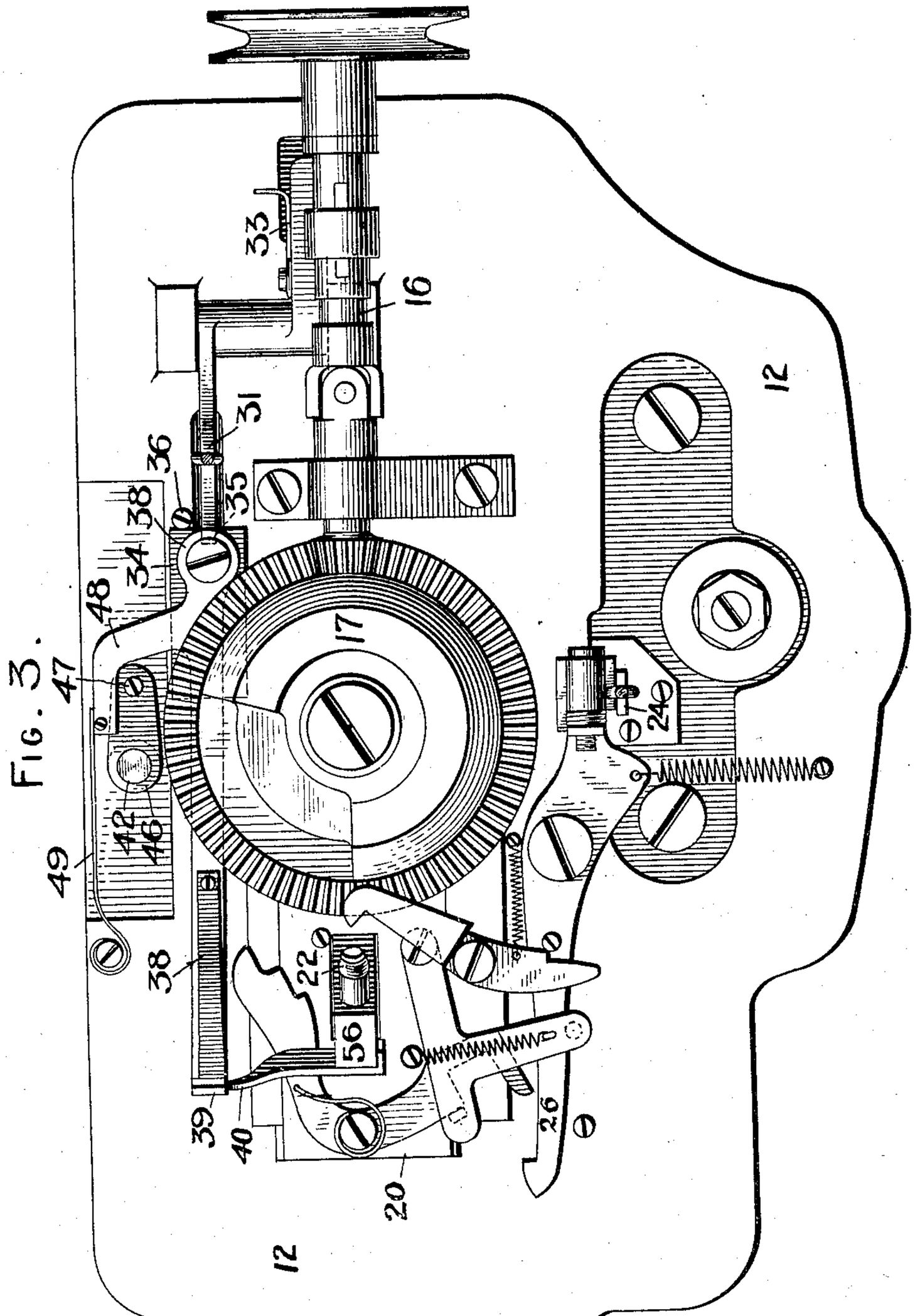
E. B. ALLEN.

BUTTONHOLE CUTTING AND STITCHING MACHINE.

APPLICATION FILED NOV. 25, 1904.

4 SHEETS—SHEET 3.

FIG. 3.



Witnesses:
Frank S. Oberlin
L. M. Sweeney.

Inventor:
Edward B. Allen
By his Attorney Henry Salomon

No. 793,709. PATENTED JULY 4, 1905.

E. B. ALLEN.

BUTTONHOLE CUTTING AND STITCHING MACHINE.

APPLICATION FILED NOV. 25, 1904.

4 SHEETS—SHEET 4.

FIG. 4.

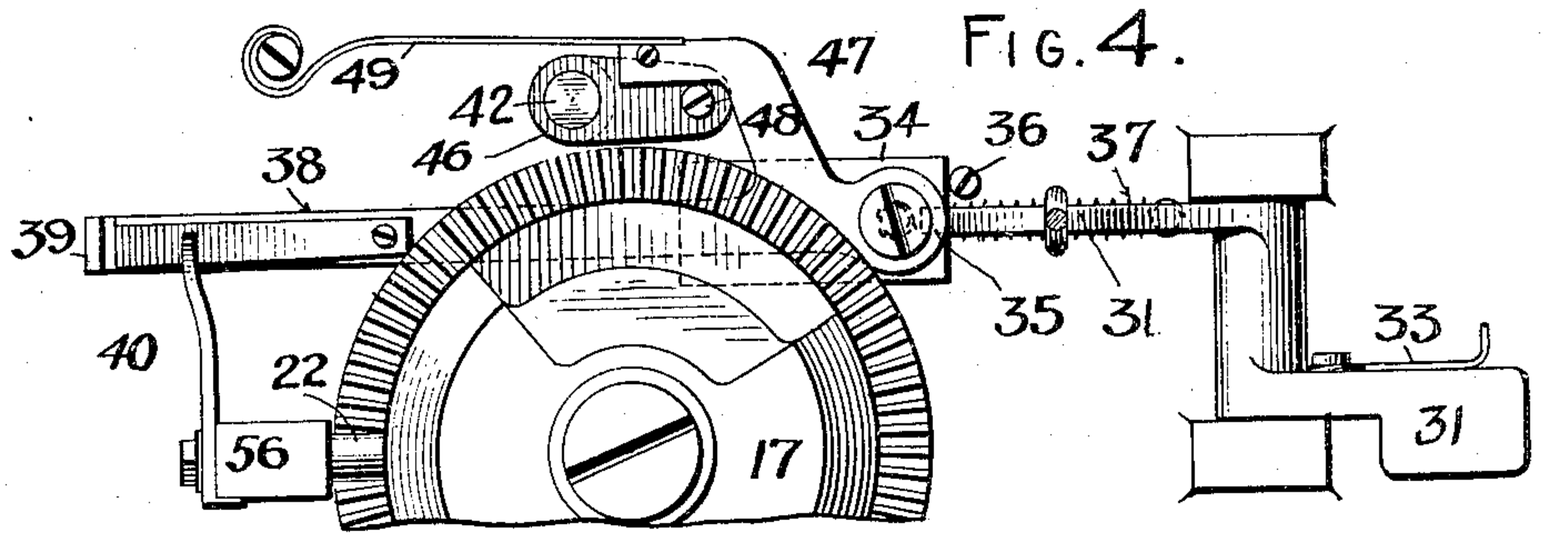


FIG. 5.

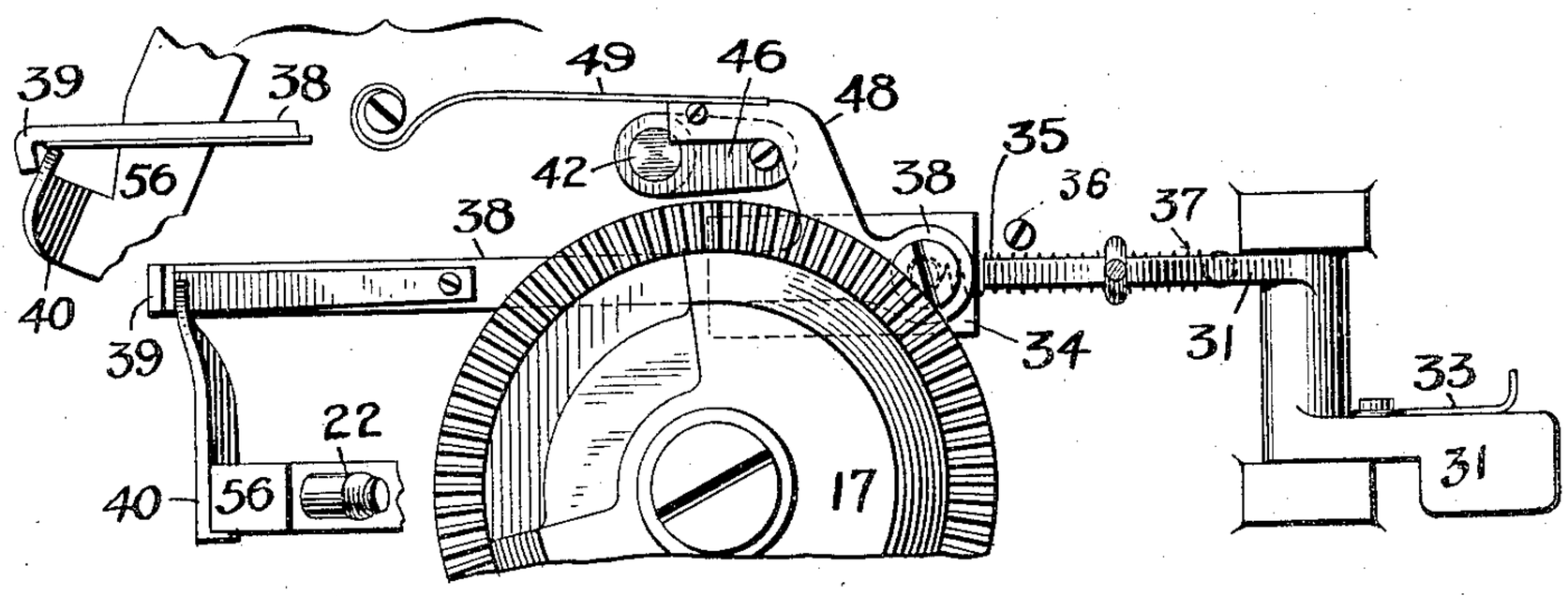


FIG. 6.

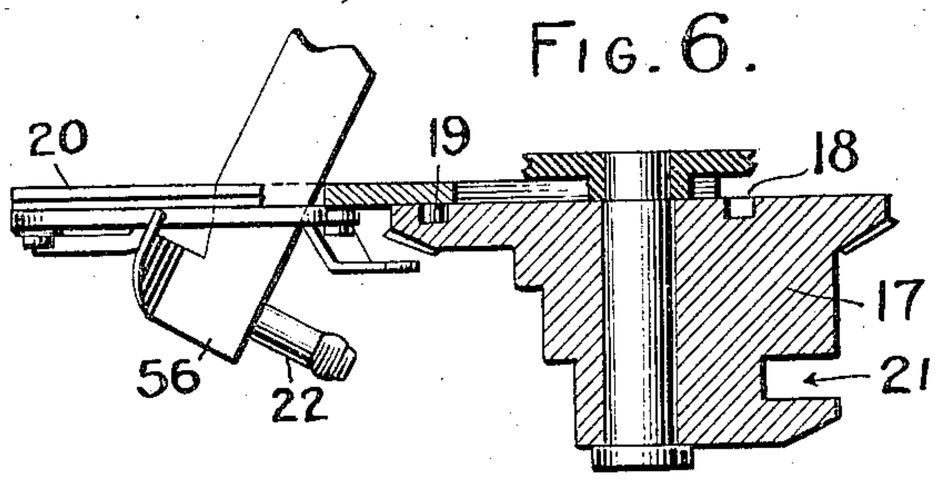


FIG. 7.

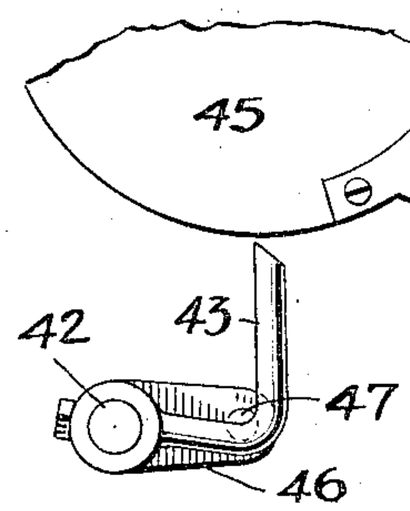
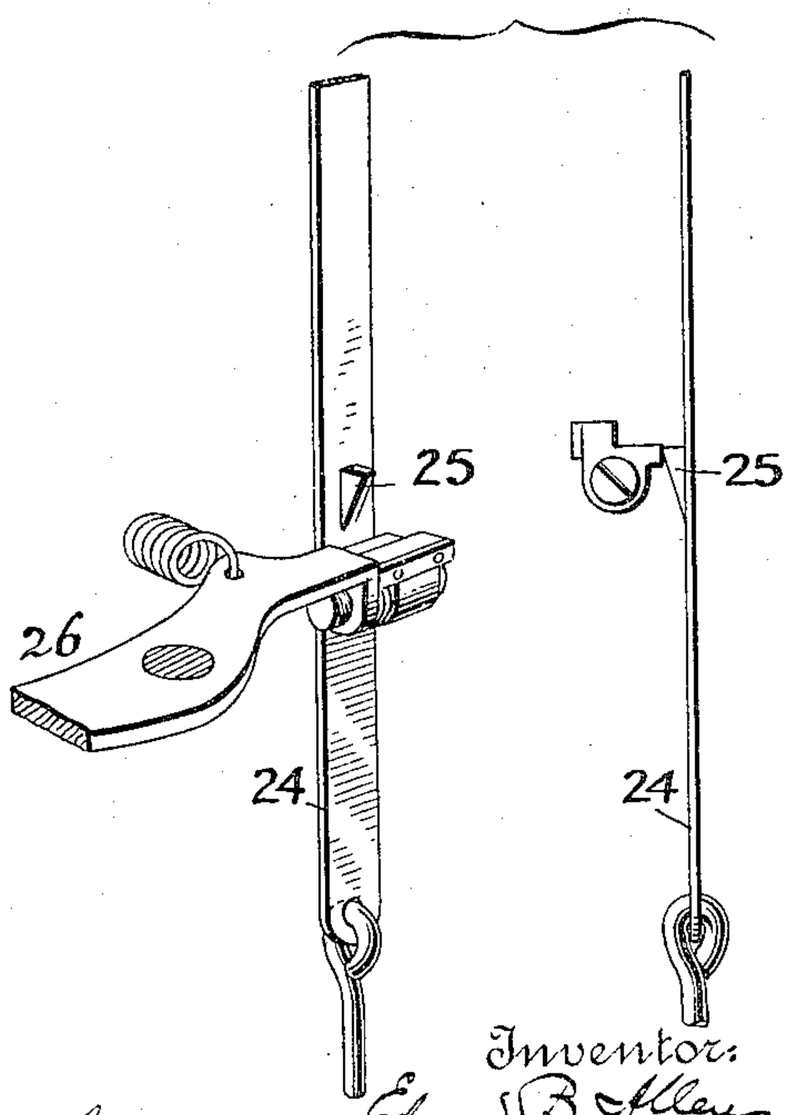


FIG. 8.



Witnesses:
Charles Ober.
C. M. Sweeney.

Inventor:
Edward B. Allen
By Henry Calvert
His Attorney

No. 793,709. Patented July 4, 1905.

UNITED STATES PATENT OFFICE.

EDWARD B. ALLEN, OF ELIZABETH, NEW JERSEY, ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

BUTTONHOLE CUTTING AND STITCHING MACHINE.

SPECIFICATION forming part of Letters Patent No. 793,709, dated July 4, 1905.

Application filed November 25, 1904. Serial No. 234,200.

To all whom it may concern:

Be it known that I, EDWARD B. ALLEN, a citizen of the United States, residing at Elizabeth, in the county of Union and State of New Jersey, have invented certain new and useful Improvements in Buttonhole Cutting and Stitching Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention relates to that class of buttonhole cutting and stitching machines in which the buttonhole-slits are cut prior to the stitching operations; and the invention has for its object to provide a simple and efficient mechanism by which a buttonhole-cutting device may by a manual operation first be coupled to its continuously-running actuating mechanism, after which by a second manual operation the starting device may be tripped to set the stitching mechanism into operation.

In the accompanying drawings, Figures 1 and 2 are opposite side views, partly in section, of a buttonhole-machine embodying the invention. Fig. 3 is a bottom view of the said machine. Figs. 4 and 5 show a portion of the mechanism shown in Fig. 3, but with some parts in different positions. Fig. 6 is a detail view showing the connection of the continuously-running cutter-transferring slide with its operating-cam. Fig. 7 is a detail view to show part of the restoring means for the locking-slide of the starting-lever, and Fig. 8 shows part of the means for tripping the cutter-coupling mechanism.

The machine herein shown is as to its general structure and as to the construction and operation of its feeding and stitching mechanisms essentially the same as the machine fully shown and described in United States Patent No. 734,794, granted July 28, 1903, but comprises a work-clamp like that of United States Patent No. 736,471, granted August 18, 1903, and a buttonhole-cutting device and an operating mechanism therefor like that of United States Patent No. 758,037, granted April 26, 1904, to which patents reference may be had for a full understanding of such features as it is not necessary to describe in detail herein. This machine comprises a stationary base or bed-plate 12, rigid with which is a work-support 13 and a movable stitching-frame 14, carrying stitch-forming devices which are mounted for periodical rotation for stitching eyed or eyelet-ended buttonholes, and a work-clamp 15, which is fixed to said work-support.

Beneath the work-plate 12 is the continuously-running shaft 16, geared to the cam-wheel 17, said cam-wheel having in its upper face a cam-groove 18, entered by a pin 19 on a continuously-reciprocating slide 20, to which a cutter-operating pitman-lever 56 is coupled at proper times, said cam-wheel or cam device comprising also a grooved peripheral cam 21 to be entered by a roller-stud 22 on the said pitman-lever when the buttonhole-cutter 23 is to be operated to cut a buttonhole-slit, and the pitman-lever of the buttonhole-cutting device is connected with the cutter-operating mechanism by a coupling mechanism carried by the continuously-reciprocating slide 20 by the tripping of a lever 26 at the downward movement of the treadle-rod 24, carrying an inclined lug 25, which releases the said tripping-lever, all as set forth in said Patent No. 758,037.

In the present machine the loose driving-pulley 27 is connected with the stitching-mechanism-driving shaft through a suitable stitch device which is or may be essentially the same as that shown in the patents hereinbefore referred to and the operation of which on connection with the controlling or start and stop motion lever 28 therefor is fully described in United States Patent No. 673,353, granted April 30, 1901, and the novel means to which the present invention relates for tripping the said lever 28 to start the stitching mechanism into action after a buttonhole has been cut will now be described.

The start and stop motion lever 28 is provided with a rigid laterally-extending arm 29, to which is connected the upper end of a rod 30. Beneath the bed-plate 12 is mounted a lever 31, the rear end of which extends under

the rod 30, and to the forward end of said lever is attached a rod 32, connected to a suitable treadle by which the said lever 31 may be operated to lift its rear end in opposition to the stress of the spring 33, so as to raise the rod 30 and tilt the lever 28 over from the stopped position shown in Fig. 1 of the drawings to the running position shown in Fig. 2 to start the stitching mechanism into operation.

It is desirable that the pedal or treadle operated starting-lever 31 should be locked during the buttonhole-cutting operations, so that the stitching mechanism cannot be set into action until after a buttonhole has been cut. To this end the invention comprises a slide 34, mounted for longitudinal movement in the bed-plate 12, and the lever 31 is provided with a forwardly-extending finger or part 35, which is normally lifted by the spring 33 up into a slot or recess in the said bed-plate, so that the rear end or a part of said slide may extend beneath the said finger 35, and thus prevent the forward end of the said lever 31 from being depressed by the treadle until the said locking-slide has been removed from beneath the said finger. The locking-slide 34 is normally held retracted against the stop-pin 36 by a spring 37, connecting said slide with a suitable part of the bed-plate 12, and mounted upon or pivotally attached to said slide is a pawl 38, having at its forward end a hook or depending lip 39 for engagement with an arm 40 on the lower end of the pitman-lever 56, so that when the said lower end of the pitman-lever moves forward as its upper end moves rearward to remove the cutter 23 out of the way of the needles after a buttonhole-cutting operation the said locking-slide 34 will be drawn forward against the stress of the retracting-spring 37 to unlock or release the treadle-actuated starting-lever 31, which will then be operated by the (preferably previously-applied) foot-pressure of the attendant to trip the start and stop motion lever 28, as above described, to start the stitching mechanism into operation.

It is desirable that the slide 34 should be automatically restored to its locking position after the stitching mechanism has been started and prior to the cutting operation for the next buttonhole to be stitched, and this is or may be effected by the means next to be described. Fixed to the bed-plate 12 is a sleeve or hollow post 41, in which is mounted a small vertical rock-shaft 42, having an upper arm 43, which extends laterally into the path of movement of a lug or projection 44 on the feed-wheel 45, and which lug 44 at any time during the stitching of a buttonhole or at the instant when the stitching operation is completed and the machine is stopped engages the said arm 43. On the lower end of the rock-shaft 42, beneath the bed-plate 12, is a second arm 46, carrying a pin 47, engaging an arm 48, with which the pawl 38 is provided, said arm being yieldingly held against said pin by a spring 49, and thus when the lug or projection 44 on the feed-wheel engages the upper arm 43 of the said rock-shaft 42 the pin 47 on the lower arm of said rock-shaft will move the forward end of said pawl 38 outward far enough to disengage its hook 39 from the arm 40 on the pitman-lever, thus leaving the locking-slide 34 free to be retracted to locking position by the spring 37, said slide carrying the said pawl 38 with it.

When the stitching mechanism is in operation, the start and stop motion lever 28 is retained in the position shown in Fig. 2 against the stress of the spring 50 by a latch 51, pivotally attached at its rear end to an arm on the said lever 28 and provided beneath, near its forward end, with a shoulder 52, abutting against a fixed stop 53. When the stitching of a buttonhole is completed, the retaining-latch 51 is released from engagement with the stop 53 by the engagement of a projection or dog 54 on the feed-wheel 45 with a depending projection 55 on the said latch to lift the latter against the stress of the depressing-spring 57, thus disengaging said latch from its holding-stop 53 and permitting the spring 50 to move the lever 28 from the position shown in Fig. 2 to the position shown in Fig. 1 to disengage the clutch device and stop the stitching operation of the machine.

From the foregoing it will be seen that the invention in its preferred form as herein set forth provides a buttonhole cutting and stitching machine which is equipped with a continuously-running cutter-operating mechanism with which the cutter is coupled when desired and which is also equipped with a pedal-tripped or manually-released starting device for the stitching mechanism, but which starting device is locked from operation during the buttonhole-cutting periods and is automatically released by the cutting device, so that the stitching mechanism can be set in motion only after a cutting operation, and the start-motion device is therefore dependent for its ability to set the stitching mechanism into action upon the previous operation of the cutting device, and it therefore follows that in a machine embodying the present invention a cutting operation must occur prior to each stitching operation.

It will be understood that while it is preferred to operate the starting-lever 31 to trip the start-motion device from a treadle or pedal, this result of tripping the said start-motion lever might be effected by a non-automatic or hand-operated device or lever, and the term "manual" as employed in this specification or the claims thereof is intended to refer to a start-motion tripping or releasing device by which the attendant may trip or release an automatic start-motion device

to set the stitching mechanism of a buttonhole-machine into action subsequent to each cutting operation. Also the present invention is not to be understood as being limited to the particular form of buttonhole-machine herein shown and described and comprising a movable frame on which the stitching devices are mounted for periodical rotation, as the invention might be applied to a machine in which the work instead of the stitching mechanism is fed along for spacing the stitches or to a machine for making straight buttonholes instead of eyed buttonholes.

Having thus described my invention, I claim and desire to secure by Letters Patent—

1. In a buttonhole cutting and stitching machine, the combination with a buttonhole-cutting device and a stitching mechanism, of an operating mechanism for said cutting device and an operating mechanism for said stitching mechanism, a manually-operating controlling device for said cutting device, a separate manually-controlled tripping device for said stitching mechanism, a locking device for the said tripping device, and means for releasing said locking device after the said cutting mechanism has been started; whereby first the cutting device may be coupled to its operating mechanism by one manual device and subsequently the stitching mechanism set into operation by the other manual device.

2. In a buttonhole cutting and stitching machine, the combination with a buttonhole-cutting mechanism and a stitching mechanism, of a start-motion device for the said stitching mechanism, a manually-operated tripping device for the said start-motion device, and a locking device for the said tripping device; whereby, after a buttonhole has been cut, the said start-motion device may be tripped or released by the attendant to set the said stitching mechanism into operation.

3. In a buttonhole cutting and stitching machine, the combination with a buttonhole-cutting device and a stitching mechanism, of a start-motion device for the said stitching mechanism, a manually-operated tripping device for the said start-motion device, a locking device for the said tripping device, and an automatic releasing device for the said locking device; whereby, after a buttonhole has been cut the said start-motion device may be manually tripped to set the said stitching mechanism into operation.

4. In a buttonhole cutting and stitching machine, the combination with a buttonhole-cutting device and a stitching mechanism, of a start-motion device for the said stitching mechanism, a manually-operated tripping device for the said start-motion device, a locking device for the said tripping device, and an automatic releasing device, operated from said cutting device, for the said locking device; whereby, after a buttonhole has been cut the said start-motion device may be manually tripped to set the said stitching mechanism into operation.

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

EDWARD B. ALLEN.

Witnesses:

HENRY J. MILLER,

H. A. KORNEMANN.