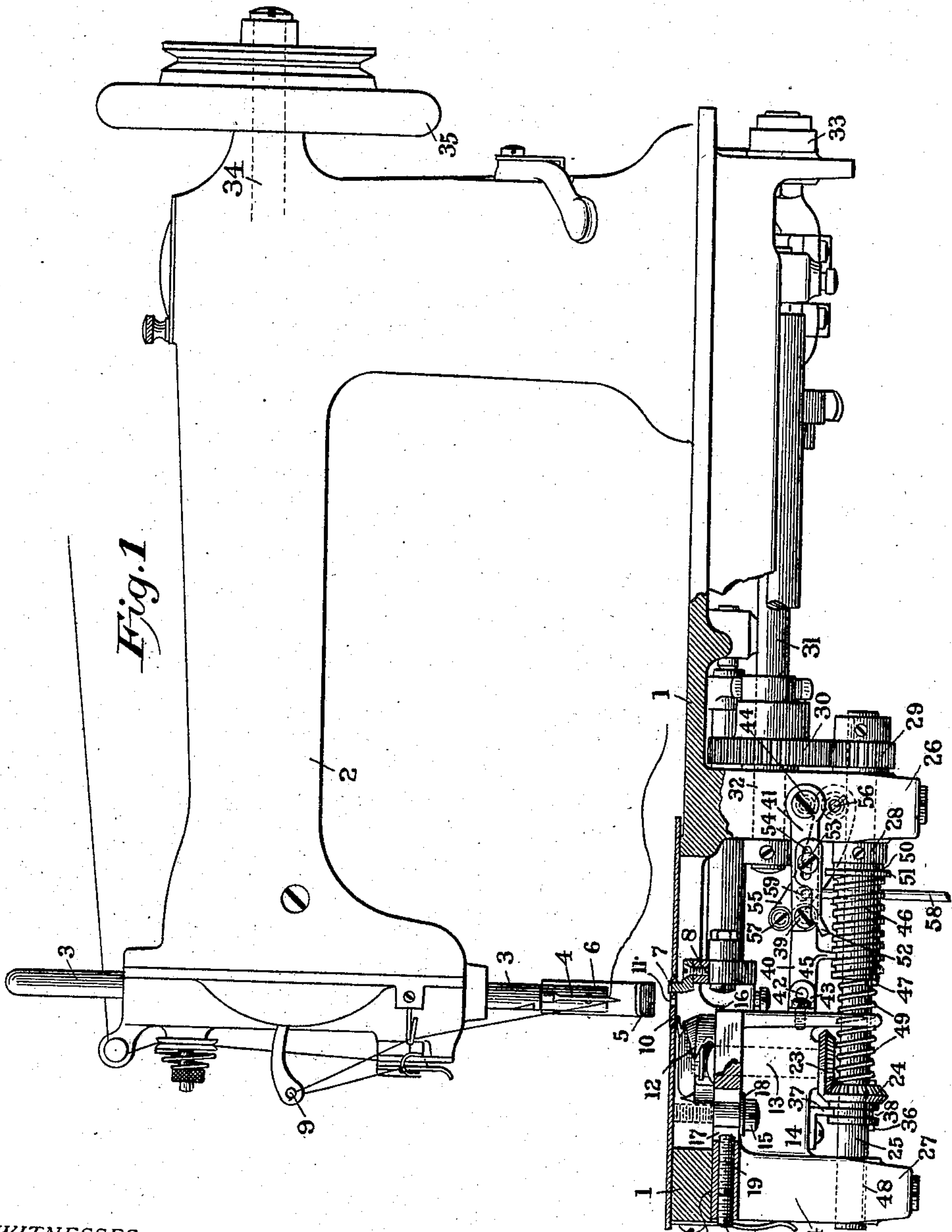


915,924.

A. V. ABERCROMBIE.
SEWING MACHINE.
APPLICATION FILED JULY 28, 1906.

Patented Mar. 23, 1909.
2 SHEETS—SHEET 1.



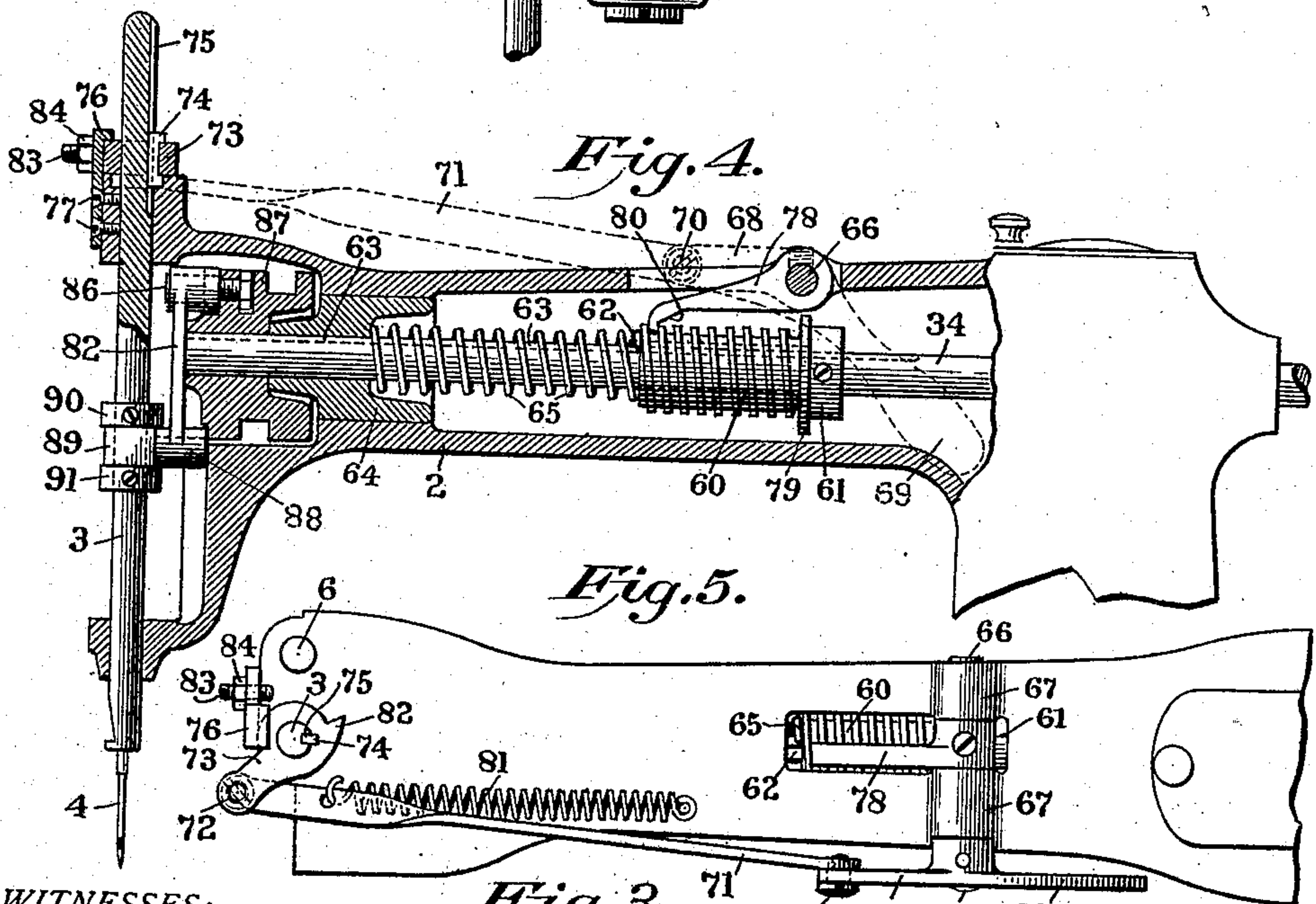
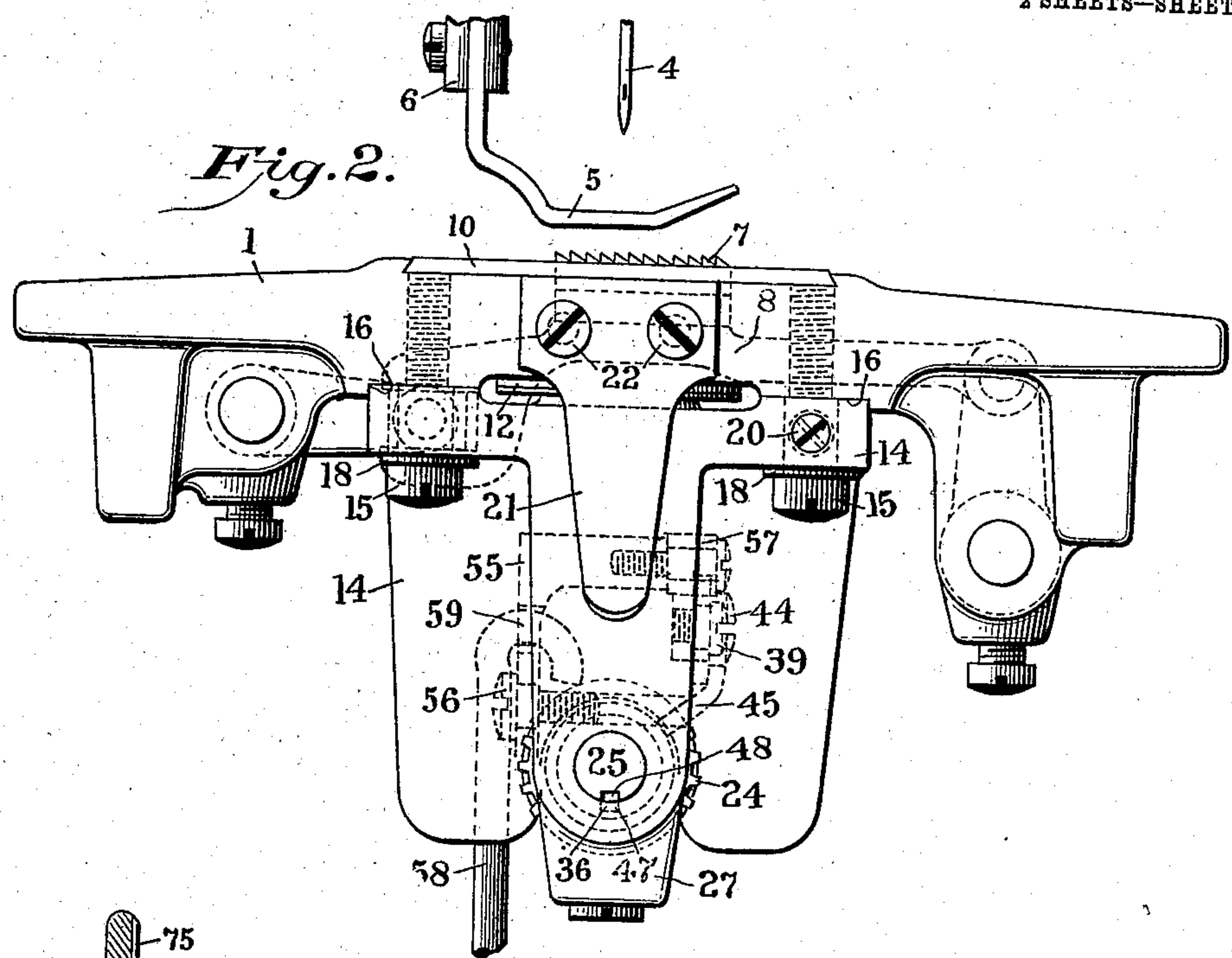
WITNESSES:
J. C. Finch.
J. R. Finch

INVENTOR.
Alexander V. Abercrombie
BY *J. C. Finch*
ATTORNEY.

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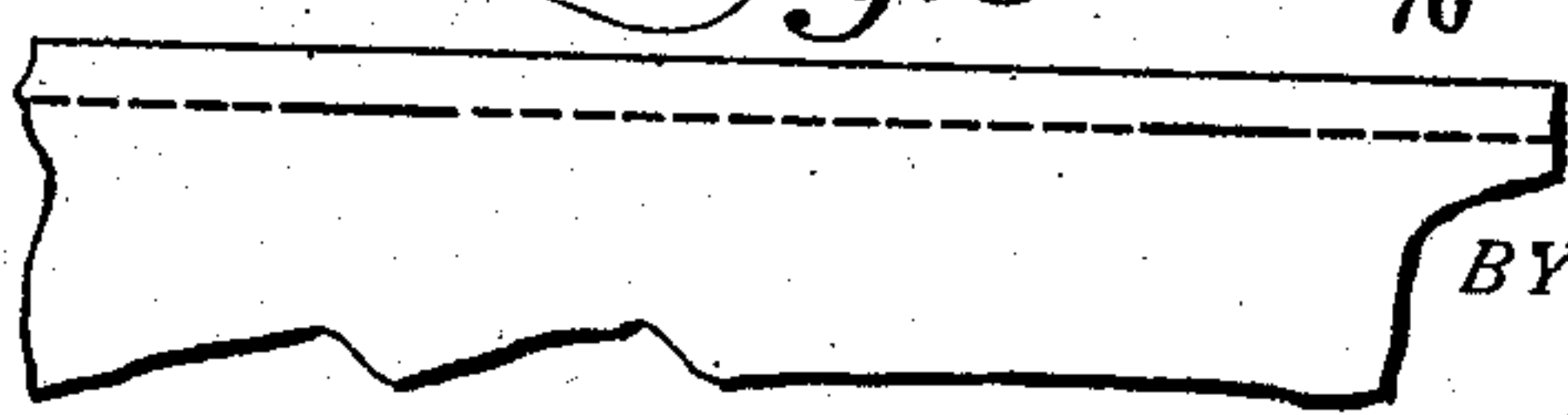
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2 SHEETS—SHEET 2.



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Fig. 3.



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UNITED STATES PATENT OFFICE.

ALEXANDER V. ABERCROMBIE, OF BRIDGEPORT, CONNECTICUT, ASSIGNOR OF ONE-HALF
TO CHARLES M. ABERCROMBIE, OF BRIDGEPORT, CONNECTICUT.

SEWING-MACHINE.

No. 915,924.

Specification of Letters Patent.

Patented March 23, 1909.

Application filed July 28, 1906. Serial No. 328,250.

To all whom it may concern:

Be it known that I, ALEXANDER V. ABERCROMBIE, a citizen of the United States, residing in Bridgeport, in the county of Fairfield and State of Connecticut, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification.

My invention relates to certain new and useful improvements in sewing machines and has for its object to provide a sewing machine which is especially adapted for use in the manufacture of corsets, and particularly for stitching the coverings for the fastening steels.

My invention comprises means for suspending the coöperation of the needle and loop-taker without stopping the machine whereby a number of stitches may be "skipped" and means whereby the stitching is automatically resumed after the required amount of "skipping" has occurred.

In the accompanying drawings which form a part of this specification and in which like parts are similarly designated throughout the several figures, Figure 1 is a front side elevation, partly in section of a sewing machine equipped with my improvements. Fig. 2, is a front end elevation of the lower portion of such machine. Fig. 3, is a detail view of a portion of a garment illustrating the appearance of the seam which is made by my machine, and Figs. 4 and 5, respectively, a longitudinal vertical sectional elevation of a sewing machine arm, and a plan view of the same, both partly broken away and illustrating a modified form of my invention.

In describing my improvements, only such limited reference will be made to the usual well known parts of a sewing machine as is deemed necessary for a proper understanding of my invention.

In the drawings I have shown my invention as applied to the well known Wheeler & Wilson vertical hook machine, but, of course, do not wish to be limited in this respect since my improvements are applicable to many other types of sewing machines.

Referring particularly to Figs. 1 and 2 of the drawings, 1 is the base-plate or frame of the sewing machine surmounted by the usual overhanging arm 2 within which is operatively mounted in any suitable manner the vertically reciprocating needle-bar 3 carrying the usual needle 4. 5 is the presser-foot carried by the presser-bar 6 and adapted

to coöperate with the feed-dog 7 mounted on the feed-bar 8 to effect the feeding of the material in the usual manner. 9 is the take-up and 10 is the throat plate provided with the usual needle aperture 11. All the above mentioned parts are or may be of the usual or any approved construction and operation. 12 is the hook or loop-taker, which, in the present instance, is carried on the upper end of a vertical shaft 13, journaled in a sliding bracket 14 supported by shouldered screws 15 within ways 16 formed on the under side of the base-plate 1. The screws 15 pass through slots 17 formed in the bracket 14 and are tapped into the underside of the frame 1, and interposed between the heads of said screws 15 and the underside of the bracket 14 are washers 18. Said screws 15 do not bind the bracket tightly to the base-plate but merely support said bracket so that the same is capable of a limited sliding movement to and from the needle and in order to adjust the loop-taker with respect to the needle, I have provided a stop-screw 19 tapped within said bracket and backed up by a binding screw 20, so that when the loop-taker is in position to coöperate with the needle in forming stitches, the end of said adjusting screw will abut against the shoulder of one of the screws 15. Bearing against the front edge of the bracket 14 and pressing the same toward the needle is a spring 21 which is secured to the front edge of the base-plate 1 by screws 22. Fast on the end of the vertical loop-taker shaft 13 is a bevel gear 23 which intermeshes with a similar gear 24 splined on the shaft 25, which latter is journaled at one end in a hanger or lug 26 depending from the base-plate 1, while the other end is journaled in a lug 27 depending from the bracket 14. Secured to the shaft 25 on opposite sides of the hanger 26 is a collar 28 and spur-gear 29, whereby said shaft is held against endwise movement. The gear 29 intermeshes with and is driven by a gear 30 tight on the shaft 31, which latter is journaled in suitable bearings at 32, 33, on the base-plate and is actuated from the main driving shaft 34, which supports the band pulley 35, in any suitable or approved manner. The gear 24 which is splined on the shaft 25 by a key 36 is held in operative engagement with the gear 23 by tongue 37 which depends from and is carried by the bracket 14, said tongue fitting

within annular groove 38 formed in the hub of said gear 24.

With the exception of having the loop-taker supporting bracket 14, held resiliently in position with respect to the needle by the spring 21, all of the previously described parts are well known and common to the before mentioned Wheeler & Wilson vertical hook sewing machine and form a part of my invention only in so far as to furnish a practical and approved sewing mechanism in conjunction with which my improvement may be employed.

Pivoted together by a screw 39 is a pair of toggle levers 40, 41, the lever 40 being in turn pivoted at 42 to an ear 43 secured to or formed on the bracket 14, while the lever 41 is in turn pivoted by a screw 44 to the depending hanger or lug 26 formed on the under side of the base-plate 1. Formed on the lever 40 is a depending finger or lead nut 45 adapted to engage a threaded sleeve 46 splined on the shaft 25 by a feather or key 47 carried by said sleeve and adapted to slide freely within a groove or key-way 48 cut lengthwise in said shaft. Interposed between said threaded sleeve 46 and the gear 24 on the shaft 25 is a coil spring 49 which tends to press said sleeve 46 in a direction toward the collar 28, a soft washer 50 being interposed between the end of said sleeve and said collar to act as a cushion between these parts. Formed on the rear end of the sleeve 46 is an annular flange 51, adapted to engage and cooperate with an adjustable trigger or trip 52 secured to the lever 41 by a screw 53, the slot 54 in said trip permitting the same to be adjusted nearer to or farther away from said flange, whereby a lesser or greater number of revolutions will occur before said flange contacts with said trigger to trip the toggle-joint formed by the levers 40, 41 and re-position the loop-taker for effective cooperation with the needle.

55 is a lever one end of which is pivoted at 56 to the hanger 26 while the other end carries a roll 57, which when said lever is depressed bears upon the levers 40, 41, and depresses the latter to distended position, and 58 is a treadle rod the upper end of which is attached in any suitable manner at 59 to said lever while the lower end is secured to any suitable operating treadle (not shown) the function of the lever 55 and treadle connection being merely to set the parts in locked position.

The operation of my invention is as follows: As shown in Fig. 1 the loop-taker and bracket 14 carrying the same has been withdrawn or pushed by the toggle-lever against the resiliency of the spring 21, to a position sufficiently removed from the path of the needle to prevent said loop-taker from seizing the loop of thread presented by the needle, and therefore no stitches will be

formed during this position of parts, the needle merely descending and perforating the material repeatedly until the loop-taker is again restored to a position near enough to the path of the needle to properly cooperate with the same. Rotation of the shaft 25 with the parts in this position, as illustrated in Fig. 1, will cause the sleeve 46, through the action of the lead-finger 45, to be advanced against the resiliency of the spring 49 until the flange 51 on said sleeve contacts with the trigger 52 whereupon the toggle-levers 40, 41, will be tripped or upset thereby permitting the loop-taker 12, and bracket 14, forced by the spring 21, to move toward the needle until arrested by the stop-screw 19 striking against the shouldered screw 15, in which latter position the loop-taker will be in such relation to the needle as to properly cooperate with the same in forming stitches. The adjustment of the levers 40, 41, with respect to each other is such that when these parts are in locked position as shown in Fig. 1, the pivot 39 will be slightly below a line drawn between the pivots 42, 44, so that the action of the spring 21 will tend to hold the lead-finger 45 in contact with the threaded sleeve 46 and insure the advancement of the latter on the shaft 25. When, however, said sleeve has been advanced sufficiently to contact with the trigger 52 and raise the pivot 39 slightly above a line intersecting the pivots 42, 44, the same action of said spring 21 will cause said levers to be upset and said lead-finger 45 to be quickly withdrawn from contact with the threaded sleeve 46, thereby permitting the latter to be returned to normal position against the washer 50 by the action of the spring 49, the downward pressure on the treadle rod 58 by the foot of the operator initially employed to set the parts in locked position having been removed, as will be readily understood. The trigger 52 having been adjusted with respect to the flange 51 on the threaded sleeve 46, for the number of revolutions it is desired to have the loop-taker miss catching the needle-loop for that portion of the seam where it is desired no stitching shall occur, the machine when started will form an ordinary seam until the treadle-rod 58 is depressed, whereupon the cooperation of the loop-taker and needle to form stitches will be suspended, as previously described, throughout the period when the flange 51 on the threaded sleeve 46 is advancing toward said trigger, the operator taking care meanwhile not to continue the pressure on said rod long enough to interfere with the automatic action of said flange and trigger upon meeting, whereupon the proper relation of loop-taker and needle to form stitches will be restored and the stitching automatically resumed. Throughout this operation the feeding of the mate-

rial is uninterrupted, so that the result is to produce a seam with certain places unstitched for a predetermined length, without stopping the machine, the appearance of such seam being clearly shown in Fig. 3. The strips of material to be stitched in this manner are usually marked at the beginning and termination of those places, which must be left free of stitching by awl pricks, and heretofore, it has been the custom of the operator, after placing the material in the machine, to stitch the same until one of such marks appeared directly beneath the needle, whereupon the machine was stopped and the work carefully advanced or shifted by hand to the next mark and the stitching resumed, a process which is both slow and expensive. By my improvement, however, the operator may finish the entire seam without stopping at these marks at all, being only careful to press the treadle rod when one of such marks appears beneath the needle, thereby causing the machine to "skip" the stitches for the required distance and to automatically resume the stitching at the proper time.

In Figs. 4 and 5 I have illustrated a slightly modified form of my invention, wherein the needle bar is given an axial movement to cause the skipping of stitches in lieu of shifting the loop-taker, which I will now explain. The upper shaft has splined thereon a threaded sleeve 60 and is limited in its rearward sliding movement by an adjustable collar 61, tight on said shaft, the key 62 of said sleeve sliding freely in a groove 63 in said shaft. Interposed between said sleeve and a bushing 64 secured in the forward end of the arm 2 is a coil-spring 65, which tends to press said sleeve against said collar 61. 66 is a rock-shaft journaled in suitable bearings 67 on said arm and having fixed thereon at its front end a lever 68 provided with an operating handle 69. Pivoted to the lever 68 by a screw 70 is a lever or link 71 which in turn is at its other end pivoted by a screw 72 to a lever 73 splined to the needle-bar 3 by a key 74 fitted to work freely in a groove 75 cut lengthwise in the needle bar. The lever 73 is held against moving vertically with the needle bar by an off-set finger 76 secured to the arm by screws 77, between which finger and the top of the arm said lever is confined. 78 is a lead-finger also secured to the rock-shaft 66 and adapted to engage and coöperate with the threaded sleeve 60 in a manner precisely similar to the finger 45 and sleeve 46 of my previously described construction. The sleeve 60 is also provided with a flange 79 which coöperates with an inclined surface 80 formed on said finger whereby the latter is disengaged from said threaded sleeve. 81 is a coil spring one end of which is secured to the link 71 while the other end is attached to the arm 2, the action of which tends to pull

the link 71 in a direction toward the rock-shaft 66. 82 is a stop or projection formed on the hub of the lever 73 which when the needle bar is in proper sewing position abuts against an adjustable stop-screw 83 tapped in the part 76 and backed up by a jam-nut 84. 82 is the needle bar actuating link which is at one end pivoted to the usual crank-stud 86 fast to the take-up cam 87 mounted on the end of the upper shaft 34 in the usual manner. The other end of said link 82 is pivoted around a stud 88 formed on a collar 89 through which the needle bar 3 passes and is free to turn axially therein. Secured to the needle bar 3 above and below the collar 89 are collets 90, 91, which bear upon opposite sides of said collar 89 and cause the needle-bar to move vertically with the motions of said link 82.

The form of mechanism just described is well adapted for use in connection with machines which employ loop-takers whose construction does not admit being shifted away from the needle to avoid the needle loop, such as the cast-over hook used in the well known high speed Wheeler & Wilson machine, and the operation of this form of my invention I will now describe.

In sewing position, the eye of the needle 4 bears such relation to the loop-taker as to spread the loop within the pathway of the point of the loop-taker or directly across the same, but in the position for suspending the coöperation of loop-taker and needle, the latter is rotated axially a quarter turn thereby causing the loop to be spread in a direction at right angles to the previous position and outside the pathway of travel of said loop-taker point, thereby causing the latter to miss the loop, as will be readily understood.

The parts having been positioned as shown in Fig. 4, by manipulating the handle 69, the loop-taker will continue to miss the loop spread by the needle until the threaded sleeve 60 has advanced far enough for the flange 79 to strike the incline 80 and raise the lead-finger 78 out of engagement with said threaded sleeve; at the same time raising the pivot 70 of the toggle-joint formed by the lever 68 and link 71 above a line intersecting the pivots 66, 72; whereupon the action of the spring 81 will cause the toggle-joint to be upset and the lever 73 and needle bar 3 to which it is splined rotated until the stop 82 abuts against the stop screw 83 in which latter position the needle will cause the loop to be spread across the pathway of the loop-taker and the stitching resumed.

The adjustment of the lever 68 and link 71 as shown in Fig. 4, is such that when these parts are set with the lead-finger 78 in proper engagement with the threaded sleeve 60, the pivot 70 will be slightly below a line intersecting the centers 66, 72, so that the

actions of the spring 81 will tend to hold said lead-finger 78 in engagement with said sleeve 60, and as soon as said finger and sleeve are disengaged by the action of the flange 79 striking the incline 80 said sleeve will be returned to its normal position against the collar 61 by the action of the spring 65. The number of skipped stitches is readily adjustable by varying the position of the collar 61, as will be readily understood.

In the matter of the various mechanical details I do not wish to be limited or circumscribed, since the same may be greatly varied without departing from the spirit of my invention, the gist of which resides in the broad idea of providing means for discontinuing the stitching for a predetermined period without interrupting the feeding of the material and then automatically resuming such stitching.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a sewing machine, the combination of stitch forming mechanism and means for feeding the material with manually controlled means for discontinuing the stitching without interrupting the feeding and means for automatically resuming the stitching.

2. In a sewing machine, the combination of stitch forming mechanism and means for feeding the material with manually controlled means for discontinuing the stitching throughout a predetermined period without interrupting the feeding and means for automatically resuming the stitching.

3. In a sewing machine, the combination of stitch forming mechanism and means for feeding the material with means for suspending the coöperation of needle and loop-taker without arresting their movements and means for automatically restoring the coöperation of needle and loop-taker.

4. In a sewing machine, the combination of stitch forming mechanism and means for feeding material with means for shifting the working portion of the loop-taker whereby coöperation between the latter and the needle to form stitches is suspended, and means for automatically restoring such coöperation.

5. In a sewing machine the combination of stitch forming mechanism and means for feeding the material with manually controlled means for shifting the working position of the loop-taker, whereby coöperation between the latter and the needle to form stitches is suspended and means for automatically restoring such coöperation.

6. In a sewing machine, the combination of stitch forming mechanism and means for feeding the material with means for shifting the working position of the loop-taker, whereby coöperation between the latter and the needle to form stitches is suspended,

instrumentalities for maintaining the loop-taker in such shifted position throughout a predetermined period, and means for automatically restoring said loop-taker in position to coöperate with the needle.

7. In a sewing machine, the combination of means for feeding the material and stitch forming mechanism including a loop-taker journaled in a bearing movably mounted on the frame, manually controlled mechanism for shifting said bearing and loop-taker away from the needle, whereby coöperation between the latter and said loop-taker is suspended and means for automatically returning said loop-taker to proper position with respect to the needle, whereby coöperation between the latter and said loop-taker is restored.

8. In a sewing machine, the combination of means for feeding the material and stitch forming mechanism including a loop-taker journaled in a bearing slidably mounted on the frame, manually controlled mechanism for shifting said bearing and loop-taker away from the needle, whereby coöperation between the latter and said loop-taker is suspended, means for maintaining said loop-taker in such idle position throughout a predetermined period, and means for automatically returning said loop-taker to proper position with respect to the needle, whereby coöperation between the latter and said loop-taker is restored.

9. In a sewing machine, the combination of means for feeding the material and stitch forming mechanism, including a loop-taker journaled in a bearing movably mounted on the frame, stops for locating said loop-taker with respect to the needle, a treadle connection and instrumentalities intermediate of the latter and said bearing for shifting said loop-taker for the purpose set forth.

10. In a sewing machine, the combination of means for feeding the material and stitch forming mechanism including a loop-taker journaled in a bearing movably mounted on the frame, stops for locating said loop-taker with respect to the needle, a treadle connection and instrumentalities intermediate of the latter and said bearing for shifting the loop-taker, including a pair of toggle-levers the opposite extremities of which are pivoted respectively, to said bearing and to a stationary part of the frame, substantially as set forth.

11. In a sewing machine the combination of means for feeding the material and stitch forming mechanism including a loop-taker journaled in a bearing movably mounted on the frame, stops for locating said loop-taker with respect to the needle, a treadle connection and instrumentalities intermediate of the latter and said bearing for shifting the loop-taker, including a pair of toggle-levers the opposite extremities of which are pivoted,

respectively, to said bearing and a stationary part of the frame, means for holding said toggle-levers in distended position throughout a predetermined period and
5 means for automatically actuating said toggle-levers at the termination of such period, for the purpose set forth.

12. In a sewing machine, the combination of means for feeding the material and stitch
10 forming mechanism including a loop-taker journaled in a bearing movably mounted on the frame, stops for locating said loop-taker with respect to the needle, a spring for returning said bearing against said stops, a
15 treadle connection and instrumentalities intermediate of the latter and said bearing for shifting the loop-taker, including a pair of toggle-levers the opposite extremities of which are pivoted, respectively to said bearing and a stationary part of the frame, means
20

for holding said toggle-levers in distended position throughout a predetermined period, including a threaded sleeve splined upon a rotatory shaft and adapted to engage a lead-finger carried by one of said levers, a spring
25 for returning said sleeve to normally retracted position and a flange on said sleeve adapted to engage an adjustable trip or trigger, carried by said toggles, when advanced by the action of said threaded sleeve
30 and lead-finger, substantially as and for the purpose set forth.

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

ALEXANDER V. ABERCROMBIE.

Witnesses:

CARL FOSTER,

ELIZABETH LEONARD.