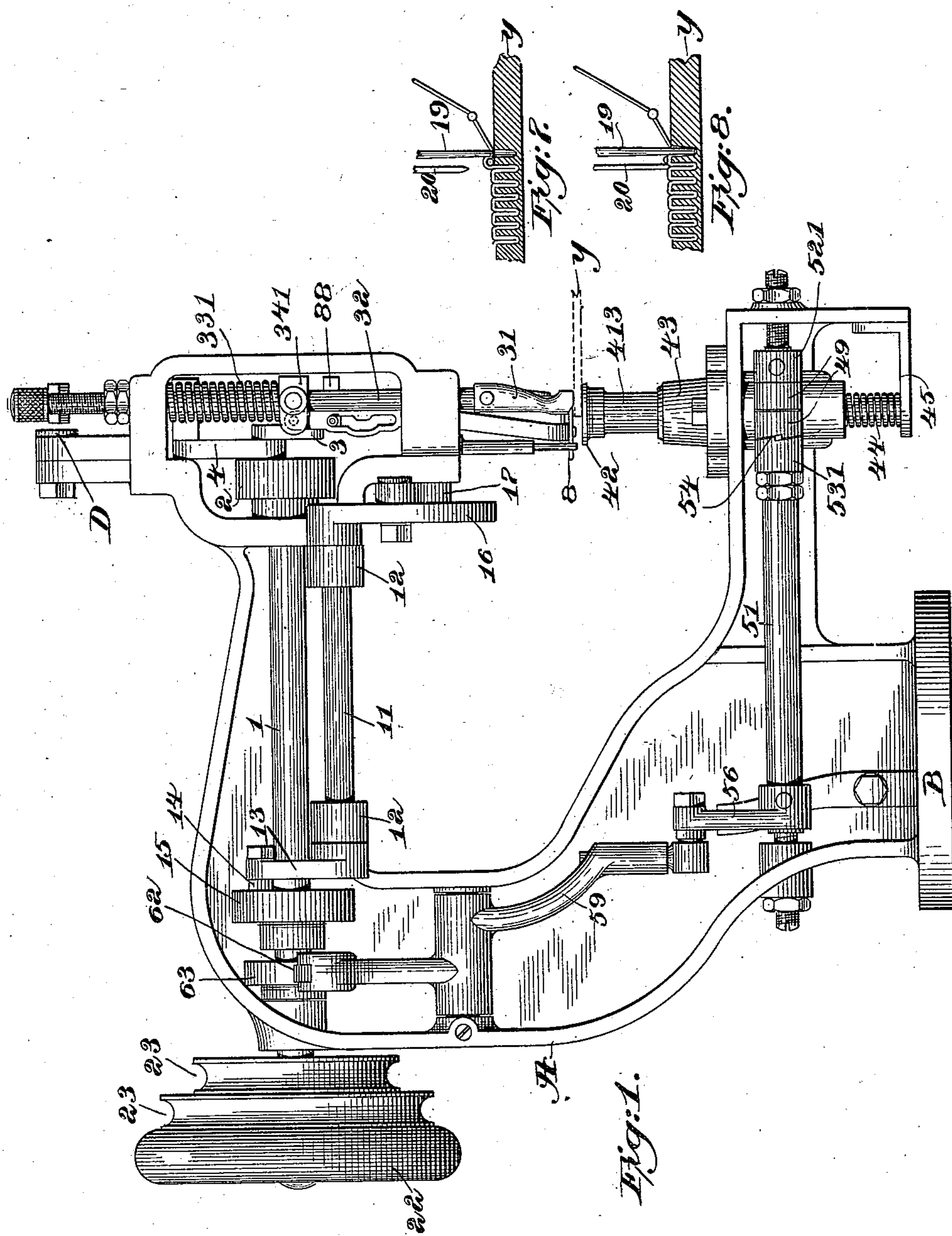


2 Sheets—Sheet 1.

No. 556,100.

Patented Mar. 10, 1896.



Witnesses.

Arthur L. Randall,  
Robert Wallace.

Inventor.

Edwin F. Mower  
by Macleod Calver & Randall  
his Attorneys

(No Model.)

2 Sheets—Sheet 2.

E. F. MOWER.  
FAIR STITCH SEWING MACHINE.

No. 556,100.

Patented Mar. 10, 1896.

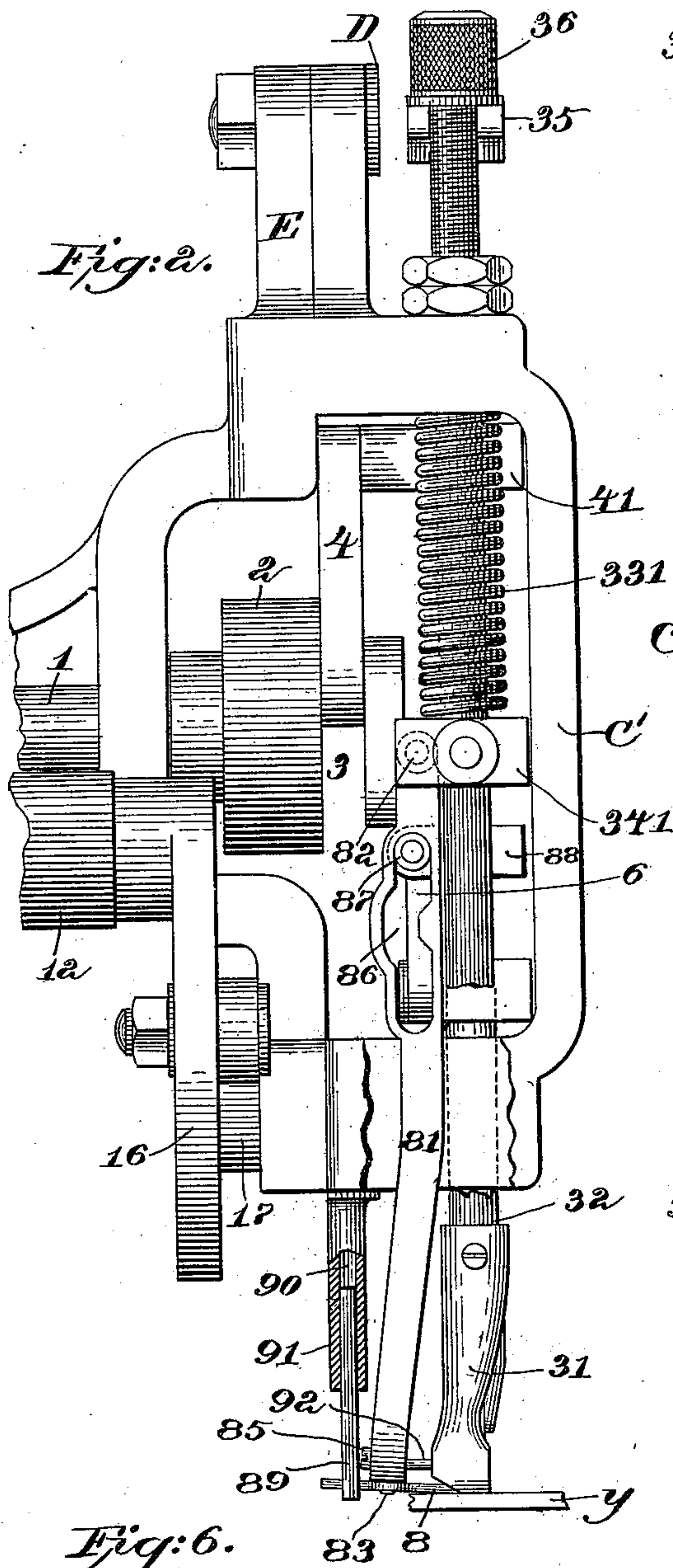


Fig. 2.

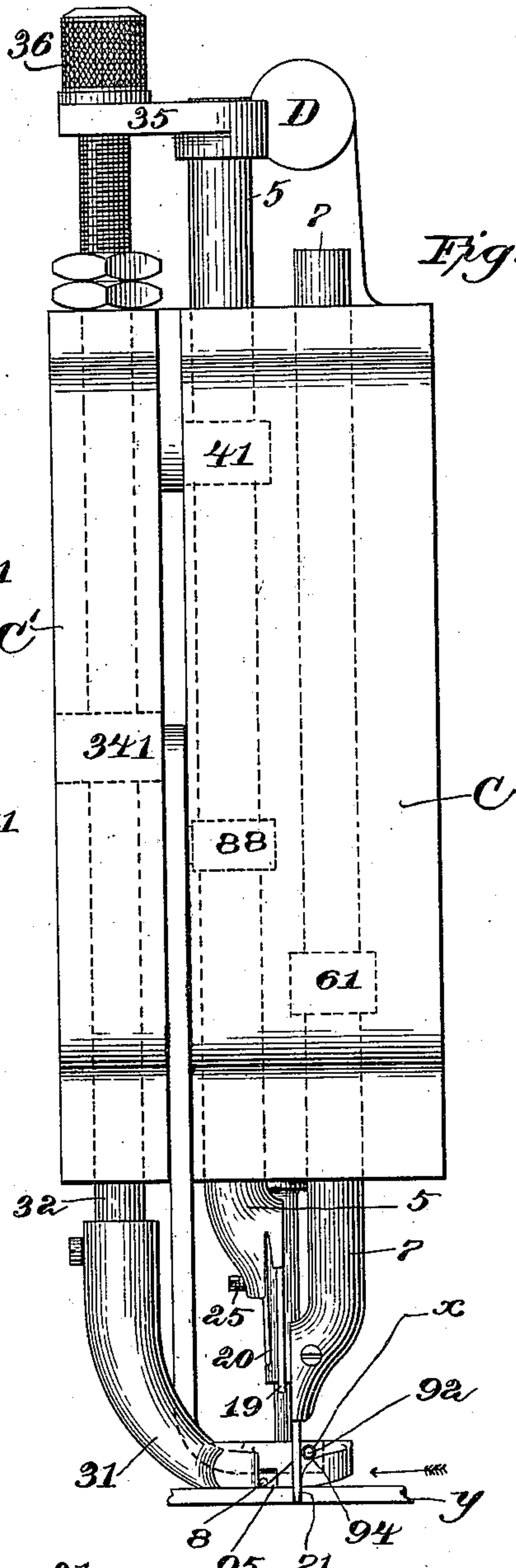


Fig. 3.

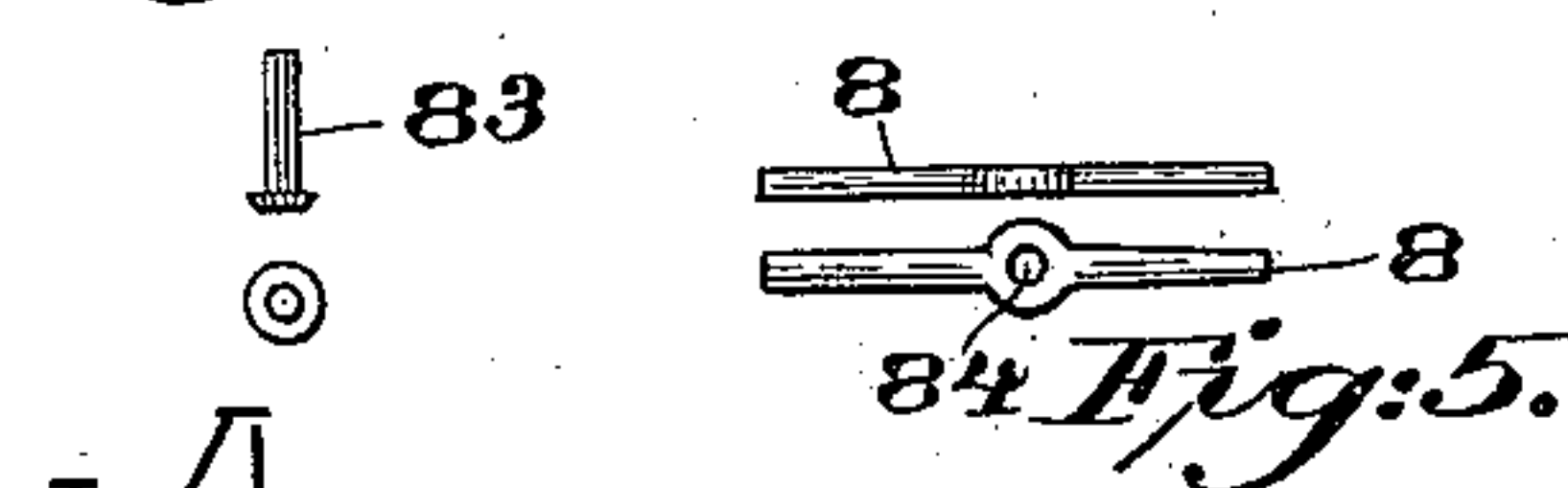


Fig. 5.

Witnesses.

Arthur V. Randall.  
Robert Wallace.

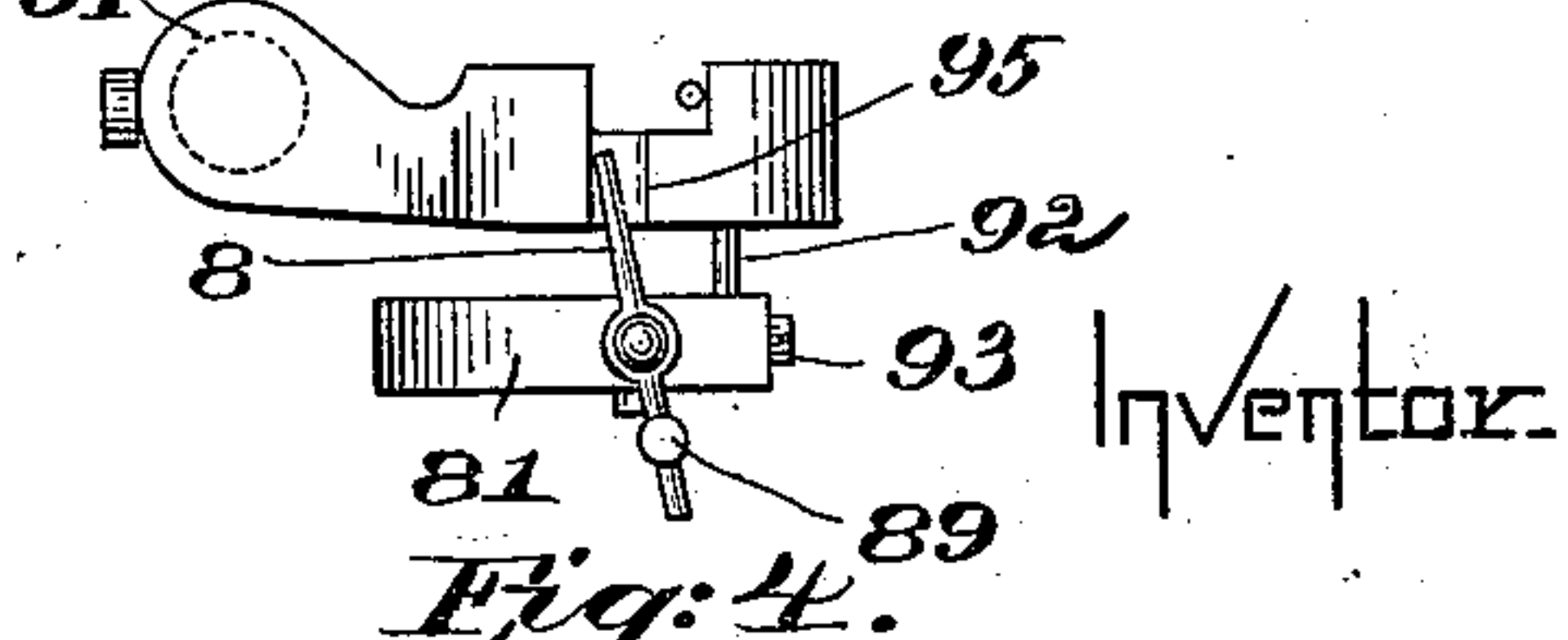


Fig. 4.

Edwin F. Mower  
by Macleod Calver & Randall  
his Attorneys



# UNITED STATES PATENT OFFICE.

EDWIN F. MOWER, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO FRANK W. WHITCHER, OF SAME PLACE.

## FAIR-STITCH SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 556,100, dated March 10, 1896.

Application filed May 31, 1895. Serial No. 551,104. (No model.)

*To all whom it may concern:*

Be it known that I, EDWIN F. MOWER, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Fair-Stitch Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

10 The invention relates to machines on the order of those which are presented in Letters Patent of the United States No. 507,377, granted to me on October 24, 1893, and in my application for patent filed March 4, 1895, and has for its objects to improve the construction and operation of such machines, and also to provide for the formation of stitches which are more regular and perfect in character.

20 The invention consists in certain features of improved and novel construction and certain novel and useful combinations of parts, and it will be explained first in the following description with reference to the accompanying drawings, after which characteristic features thereof will be particularly pointed out and distinctly defined in the claims at the close of this specification.

30 Figure 1 of the accompanying drawings shows in side elevation a machine embodying my invention in the best form thereof which has yet been devised. Fig. 2, Sheet 2, is a view in side elevation, with certain portions broken away, of the head of the said machine. Fig. 3, Sheet 2, is a view of the head of the machine in elevation from the right-hand side in Figs. 1 and 2. Fig. 4 is an inverted or bottom view of the presser-foot and adjacent parts. Fig. 5, Sheet 2, shows side and plan views of the preferred form of stitch-slackener. Fig. 6, Sheet 2, shows similar views of the pivot for said stitch-slackener. Figs. 7 and 8, Sheet 1, are diagrammatic views illustrating the working of the machine.

45 At A is the frame of the machine, it being of the well-known goose-neck pattern, and being provided with a base-plate B.

At 1 is the main shaft of the machine, which is journaled in the frame A, and is provided on the projecting end thereof with a fly-wheel 22 and band-pulleys 23 23, as usual.

On the opposite end of shaft 1 and within the frame is secured a disk 2, which latter is provided with a double crank 3. A link 4 connects one part of said double crank with the collar 41, (see Figs. 2 and 3,) which latter is secured on the tool-bar 5, and a second link 6 connects the other part of said double crank with the collar 61, which is secured to the awl-bar 7, the latter carrying the awl 71. These devices provide for reciprocating the awl-bar and tool-bar simultaneously, but in opposite directions, one thereof moving up as the other moves down. The said bars are mounted in usual manner in frame C, and slide up and down in the said frame, which latter constitutes a part of the head of the machine, and is pivoted at D to an upright E on the forward end of the goose-neck frame, as clearly shown in the drawings. For the purpose of swinging the frame C laterally, as is required in order to provide for causing the awl to feed the work along, the said frame is connected by a link 17 with the arm 16 of the feed rock-shaft 11, Fig. 1, which latter is journaled in bearings provided in projections 12 12 on the frame A, and has attached thereto an arm 13 having a cam-roll 14, which is engaged by a cam 15, that is secured upon the main shaft 1.

The tool-bar 5 carries at its lower end the stitch-forming tool 19 and combined pricker and marker 20, which last enters between and rounds up the successive stitches, as customary in "pricking up," and in addition marks the work adjacent to the stitches, as customary in marking. At 25 is an adjusting-screw, which is fitted to a threaded hole in the tool-bar 5 and bears at its inner end against the shank of the pricker and marker 20. The said screw affords a means of adjusting the pricker and marker laterally relatively to the tool 19.

31 is the presser-foot, and 32 the presser-bar, the latter being arranged to slide in a frame C', which is rigidly connected with the goose-neck.

331 is a spring, which is compressed between the top portion of frame C' and a collar 341, that is made fast on the presser-bar, the said spring serving to hold the presser-foot down upon the work.



35 is a forked projection carried by the upper end of the tool-bar 5 and engaging the adjustable collar 36 on the upper end of the presser-bar 32, to thereby raise the presser-bar from the work at each ascent of the tool-bar, thus freeing the work from the presser-foot and permitting it to be fed forward by the awl.

413, Fig. 1, is the work-post, and 42 is the work-plate at the upper end thereof. 43 is a sleeve or housing in which the said work-post is arranged to slide vertically. 44 is a spring, which is supported by the projection 45 and acts upon the work-post 413 with a tendency to raise the same so as to clamp the work between the work-plate 42 and the presser-foot 31, the said spring 44 being less powerful than spring 331, so as not to act to raise the presser-foot. 49 is a split collar surrounding the work-post. 51 is a rock-shaft, which passes through the projecting portions of said split collar and has thereon at one side of said projecting portions a plain collar 521, and at the other side thereof a collar 531 having a cam-face 54, which co-operates with a corresponding cam-face on the proximate projecting portions of split collar 49. When rock-shaft 51 is rocked, the devices described operate to clamp the split collar upon the work-post, so as to hold the latter rigidly in position and afterward release the hold of the said collar upon the work-post, so as to permit the work-post to accommodate itself to the thickness of the work between the presser-foot and the work-plate. 56 is an arm on shaft 51, and 59 is a lever operatively connected with said arm 56 and carrying a cam-roll 62, which bears against a cam 63 on shaft 1. These devices provide for rocking the rock-shaft 51 to operate the clamp for the work-post.

The foregoing parts are substantially as presented in my application aforesaid, and the novel features thereof are claimed in such application. For convenience I have shown the parts in which my invention immediately resides applied to the mechanism of the said application; but it will be understood that I do not restrict the invention to use in the precise connection in which it has been presented herein, for other constructions and arrangements may be used instead.

In the use of machines of the type that is illustrated and described in my patent aforesaid it has been found difficult to prevent the stitch-forming tool at each descent thereof from drawing upon the loop of thread last inserted into the work and partially withdrawing the same from the work, which has resulted in the production of defective stitches. To remedy this disadvantage is the chief object of the present invention, the essential features of which I now will proceed to explain with reference to the drawings.

At 8 is a device which I term a "stitch-slackener." As shown, it is mounted adjacent to the stitch-forming point, and in oper-

ation it is caused to engage with the thread of each stitch during the first portion of the process of forming the latter to hold distended the loop of thread of which said stitch is constituted and thereby provide sufficient slack to enable the new stitch to be completed without drawing upon that last formed. The device is withdrawn from the loop before the stitch-forming tool 19 has completed its downward movement, so that the slack in the loop of thread is entirely taken up in the stitch.

A convenient means of supporting and operating the stitch-slackener 8 is as follows: At 81 is an arm which at its upper end is pivotally connected at 82 to the block or collar 341 on the presser-bar 32, the said arm having the stitch-slackener 8 pivotally mounted upon its lower end. The stem or shank of a headed pin 83 passes upwardly through the hole 84 in the stitch-slackener and into a hole that is formed in the said lower end of arm 81, the pin being clamped in place in the said hole in the said arm by a screw 85. Thereby the stitch-slackener is mounted in a manner which enables it to swing in a substantially horizontal plane at the lower end of arm 81. This secures capacity for movement of the working end of the stitch-slackener back and forth in the direction of the line of feed. The pivotal connection of the arm 81 with the collar or block 341 is such as to enable the said arm to swing in a direction at right angles to the line of feed. To swing the arm in this direction I form the arm with the cam-slot 86, and in the said cam-slot plays a pin or roller 87, which is carried by a block or collar 88, that is made fast on the tool-bar 5. The movement of the stitch-slackener back and forth in the direction of the line of feed is produced by causing the rearwardly-extending arm of the stitch-slackener to pass through a hole in a vertical pin 89, which latter is fitted to the interior 90 of a hollow post 91, extending downwardly from the swinging frame C. The movement of the frame C thereby is transmitted to the stitch-slackener 8. The working end of the stitch-slackener 8 extends through an opening 95 formed in the presser-foot 31.

An improved arrangement of thread-guide consists in the following: 92 is a pin secured in a hole at the lower extremity of arm 81 and secured therein by a screw 93. The said pin projects laterally through a hole 94 in the side wall of the presser-foot 31, and the thread  $x$  passes through an aperture formed in the outer end of said pin adjacent to the awl and stitch-forming tool 19.

The operation of the invention is as follows: Fig. 3 shows the parts in the position which they occupy while the awl is in the work  $y$  and about to feed the latter in the direction of the arrow in such figure. Fig. 4 shows the same in inverted position. It is to be noted that the thread-guide 92 is retracted so far to the rear in Fig. 3 as to withdraw the thread en-



tirely out of the path of the awl. This withdrawal takes place during the descent of the awl and in season to obviate all liability of the thread being cut by the awl. The feed movement of frame C turns the device 8 upon its pivot 83, and swings its working end into position to be inserted under the portion of thread which leads upward from the last stitch to the slightly-elevated thread-guide 92. As the awl rises and the stitch-forming tool descends, the pin or roll 87 working in slot 86 causes arm 81 to swing to the right in Fig. 2, carrying the thread-guiding pin 92 into such position as to place the thread  $\alpha$  under the stitch-forming tool in position to become engaged by the lower end of the latter, and at the same time carrying the working end of device 8 in under the raised thread adjacent to the last stitch. The position of the parts as the tool 19 reaches the work is shown in Fig. 7, in which it will be seen that the working end of device 8 occupies the bight of the loop of thread pertaining to the stitch in course of formation. After the lower end of tool 19 enters the work, the device 8 is withdrawn from under the thread, thereby yielding up sufficient slack for the completion of the stitch. As the bar 5 completes its downstroke the pricker and marker 20 acts upon the work. Fig. 8 shows the device 8, tool 19, and pricker and marker 20 in the positions which are occupied by them at the completion of the stitch.

I claim as my invention—

1. The combination with a stitch-forming tool 19 which punches the thread into the work and thereby forms its stitch, and its operating means, of a stitch-slackener device to engage the loop of the stitch being driven into the work by the said tool and provide sufficient thread for the completion thereof thereby preventing the previous stitch from being withdrawn, substantially as described.

2. The combination with a stitch-forming tool 19 which punches the thread into the work and thereby forms its stitch, and its operating means, of a stitch-slackener, and means to insert the said device into the loop of the stitch being driven into the work by the said tool and then withdraw the same from such loop prior to the completion of the stitch thereby preventing the previous stitch from being withdrawn, substantially as described.

3. The combination with a stitch-forming tool 19 which punches the thread into the work and thereby forms its stitch, its operating means, and a thread-guide, of a stitch-slackener to engage the loop of the stitch being driven into the work by the said tool and provide sufficient thread for the completion thereof, thereby preventing the previous stitch from being withdrawn, and means to impart movement to the said stitch-slackener

in the line of the feed and also at right angles thereto, substantially as described.

4. The combination with an awl, a stitch-forming tool 19, and means to operate said awl and tool, and a presser-foot having a hole therethrough of a thread-guide fitted to said hole and serving to supply thread to said tool, and means to move the said thread-guide to carry the thread out of the path of the awl at the time of the descent of the latter and back again to place the thread in the path of the tool, substantially as described.

5. The combination with a stitch-forming tool 19, and its bar carrying a projecting pin or roller, of the pivoted arm 81 having a cam-shaped portion to coact with said pin or roller, a stitch-slackener 8 mounted on said arm 81, and means to impart movement to said stitch-slackener in the line of feed, substantially as described.

6. The combination with a stitch-forming tool 19, and its bar carrying a projecting pin or roller, of the pivoted arm 81 having a cam-shaped portion to coact with said pin or roller, a stitch-slackener 8 mounted on said arm 81, the swinging frame C, and means to transmit movement from said frame to the stitch-slackener in the line of feed, substantially as described.

7. The combination with the presser-foot, the presser-bar, a stitch-forming tool 19, and its bar carrying a projecting pin or roller, of the arm 81 pivotally connected with the presser-bar and having a cam-shaped portion to coact with said pin or roller, a stitch-slackener 8 mounted on said arm 81, the swinging frame C, and means to transmit movement from said frame to the stitch-slackener in the line of feed, substantially as described.

8. The combination with the presser-foot, the presser-bar, a stitch-forming tool 19, and its bar carrying a projecting pin or roller, of the arm 81 pivotally connected with the presser-bar and having a cam-shaped portion to coact with said pin or roller, a stitch-slackener pivotally mounted on said arm 81, the swinging frame C, its post 91, and the pin 89 engaging with said post and with the stitch-slackener, substantially as described.

9. The combination with the awl, its actuating means, a stitch-forming tool 19, and its actuating means, of the arm 81, means to swing the same at right angles to the line of feed, and a stitch-slackener and thread-guide mounted on said arm, substantially as described.

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

EDWIN F. MOWER.

Witnesses:

ARTHUR F. RANDALL,  
ROBERT WALLACE.