

No. 653,145.

Patented July 3, 1900.

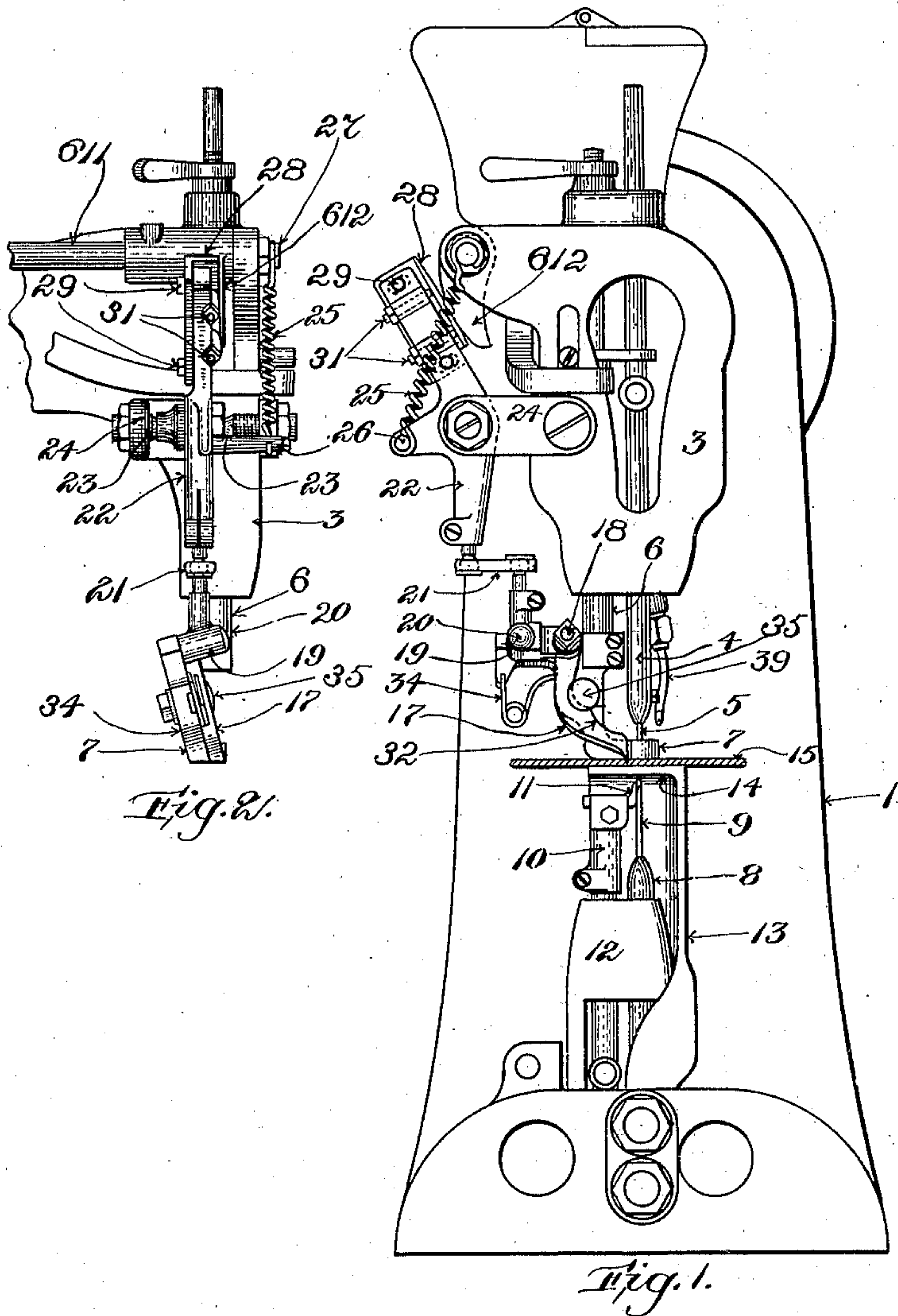
F. W. MERRICK.

STITCH SEPARATING MECHANISM FOR SEWING MACHINES.

(Application filed Nov. 25, 1898.)

(No Model.)

3 Sheets—Sheet 1.



Witnesses:

Arthur T. Randall  
Levine Hall Rice

Inventor:

Frank W. Merrick  
by Maceod Calver & Randall

Attorneys:

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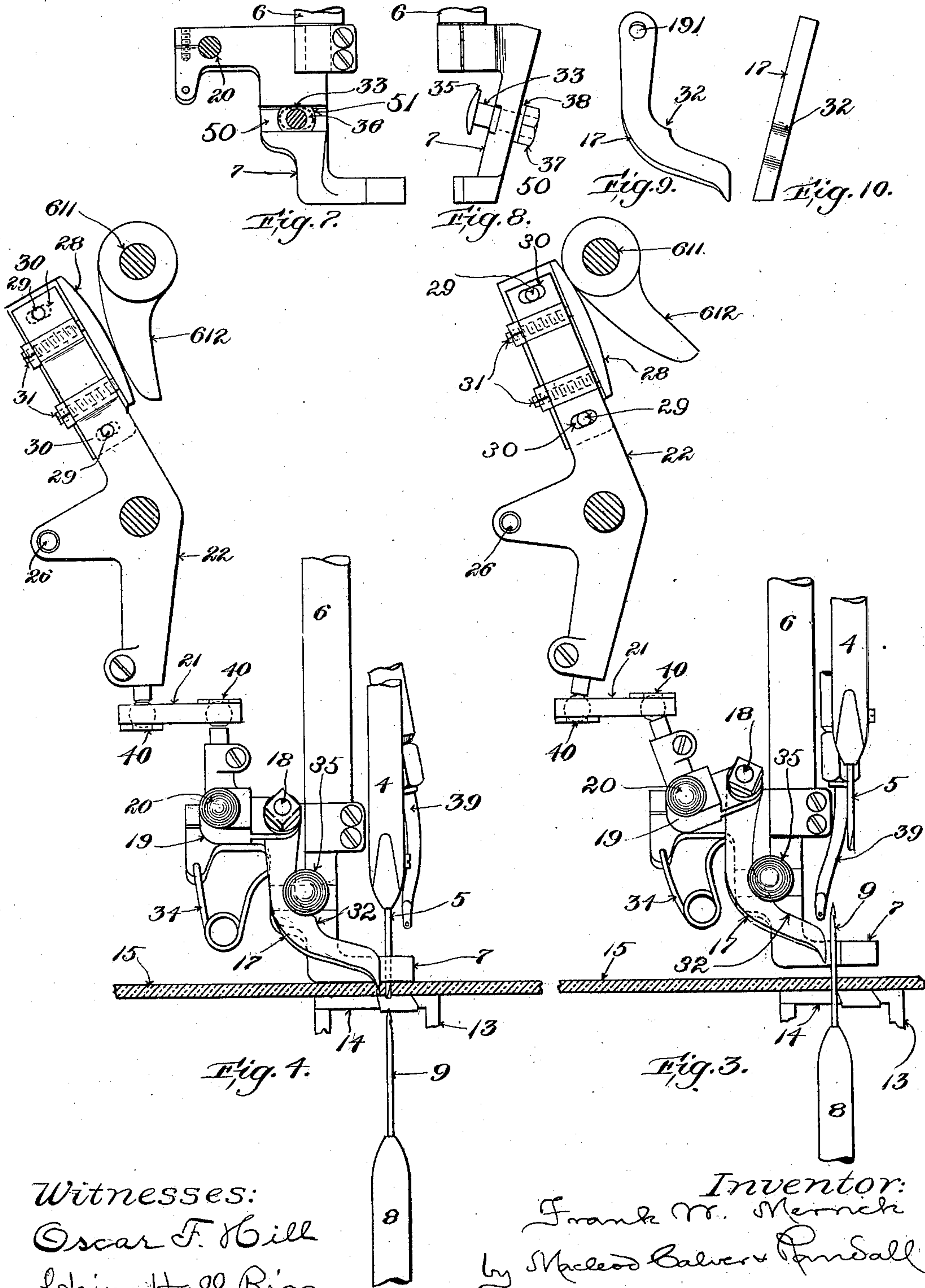
F. W. MERRICK.

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(No. Model.)

3 Sheets—Sheet 2.



Witnesses:  
Oscar F. Bill  
Levine Hall Rice

Inventor:  
Frank W. Merrick  
by Maceo Balvers Fundall  
Attorneys.

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F. W. MERRICK.

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3 Sheets—Sheet 3.

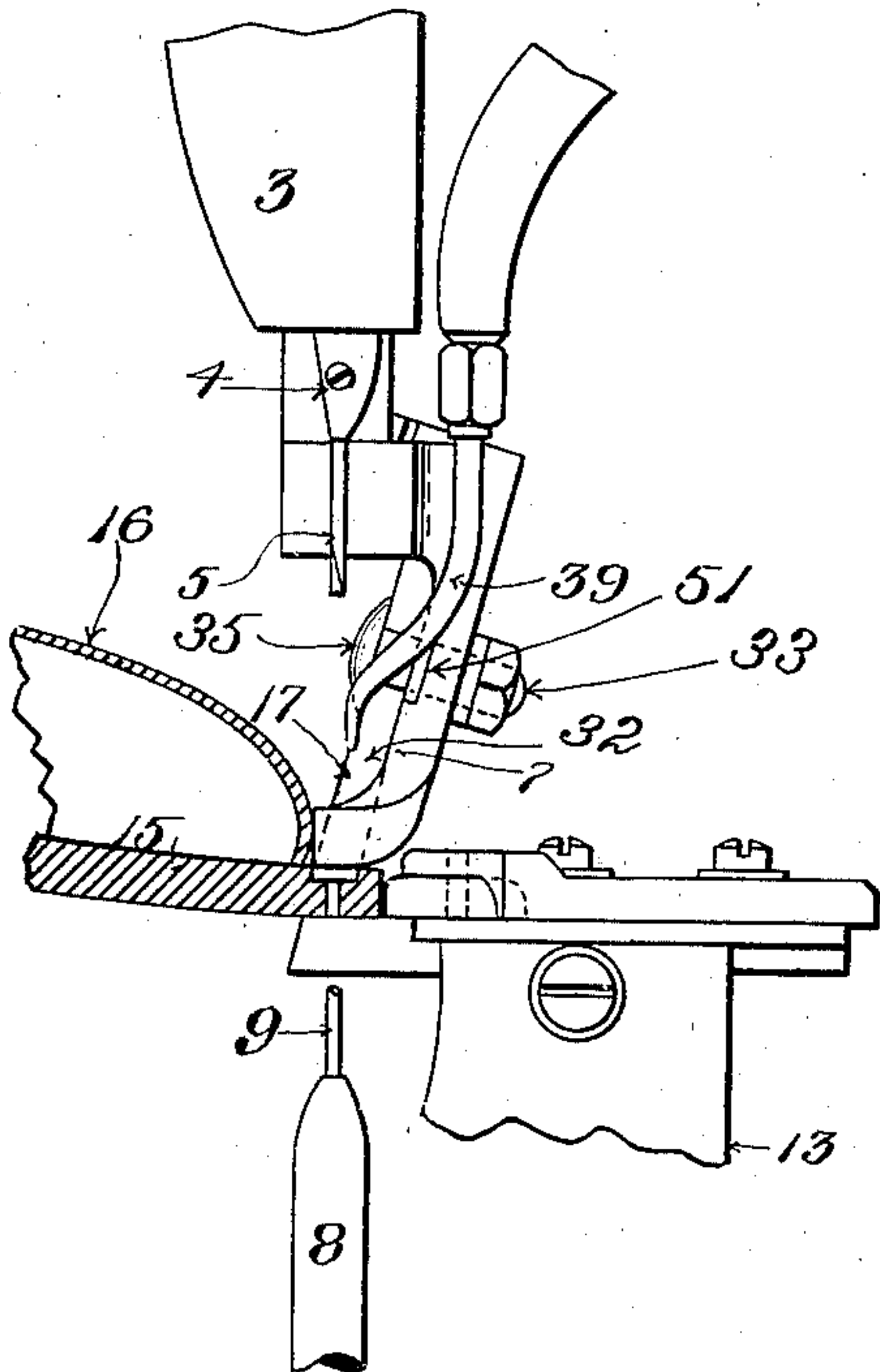


Fig. 6.

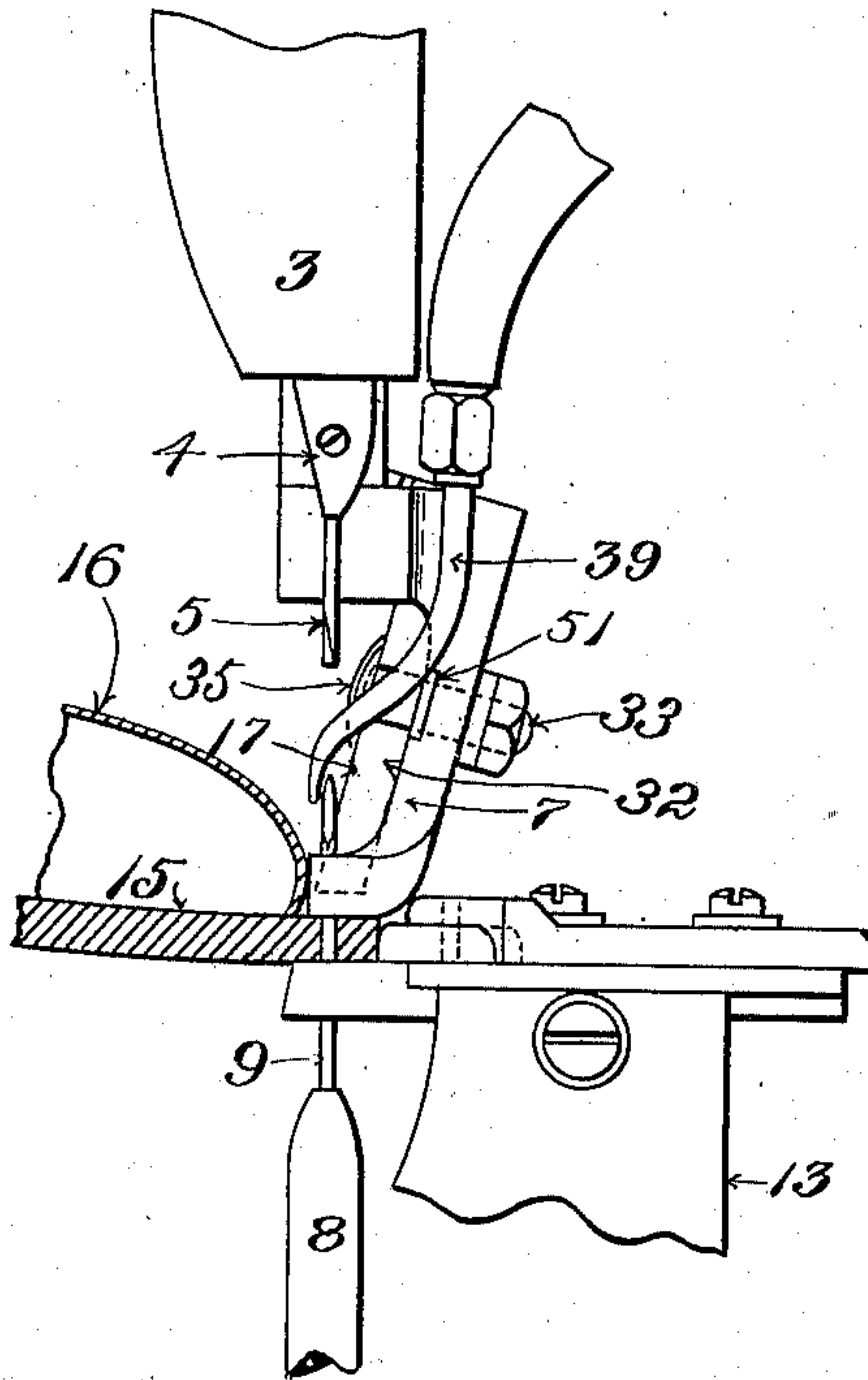


Fig. 5.

Witnesses:

Lepine Hall Rice

Oscar F. Kill.

Inventor:

Frank W. Merrick

by Maceo Calver Randall

Attorneys:



# UNITED STATES PATENT OFFICE.

FRANK W. MERRICK, OF BOSTON, MASSACHUSETTS.

## STITCH-SEPARATING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 653,145, dated July 3, 1900.

Application filed November 25, 1898. Serial No. 697,319. (No model.)

*To all whom it may concern:*

Be it known that I, FRANK W. MERRICK, 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 Stitch-Separating and Indenting Devices for Sewing-Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

In the manufacture of boots and shoes it is customary to improve the appearance of the line of stitching around the outer projecting portion or edge of the sole by dividing, separating, or setting up the stitches thereof on the upper surface of the said portion of the sole—that is to say, by forcing a tool in between successive stitches at the upper surface of the said projecting portion or edge of the sole—so as to divide or separate such stitches somewhat from one another and round or plump them up. It is customary also to further ornament the upper surface of the projecting portion or edge of the sole by the formation along the line of stitching of a series of transverse creases or indentations in the said surface, the said creases or indentations occurring at points where the thread enters the leather.

The general object of the invention is to provide improved devices operating in combination with the stitching devices of a sewing-machine and performing the work aforesaid—that is to say, either the dividing, separating, or setting up or both the dividing, separating, or setting up and the creasing or indenting—as the stitching proceeds.

One special object of the invention is to provide devices by means of which the indenting or marking around the projecting portion or edge of the sole of a boot or shoe shall be effected as the stitching proceeds and farther in under the adjoining overhanging or bulging portion of the upper than has been possible with the aid of the devices heretofore contrived or employed. The trade at the present day demands that the inner ends of the creases, marks, or indentations which are formed between the stitches shall be concealed beneath the said overhanging or bulging portion of the upper. None of the devices at present in use on sewing-machines is capable

of meeting this requirement. It is difficult to cause the markings, creases, or indentations to extend sufficiently far inward on account of the fact that the overhanging or bulging portion of the upper aforesaid is in the way of the indenting or marking tool and is liable to be injured thereby.

The invention will be described first with reference to the accompanying drawings, in which latter I have illustrated the best embodiment of the invention which I have yet contrived, after which the distinguishing and characteristic features thereof will be pointed out particularly in the claims at the close of this specification.

Figure 1 of the said drawings shows in end elevation a sewing-machine having the said embodiment of my invention applied thereto looking toward the head end of the machine. Fig. 2 is an elevation of the head of the machine and the said embodiment looking from the left-hand side in Fig. 1. Fig. 3 is a detail view, on an enlarged scale, showing chiefly the parts in which the invention more immediately resides, the tool being represented in its raised and retracted position. Fig. 4 is a similar view representing the tool in its depressed position in engagement with the material being operated upon. Figs. 5 and 6 are views looking from the right-hand side in Fig. 3, showing the thread-guide in different positions. Fig. 7 is a view showing the presser-foot in elevation. Fig. 8 is a view showing the said presser-foot in elevation looking at the same from the right-hand side in Fig. 7. Figs. 9 and 10 are views in elevation of the tool to which reference is made hereinafter.

In the drawings, 1, Figs. 1 and 2, designates the upright portion of the frame of a sewing-machine, 2 the arm, and 3 the head thereof. 4 is the usual awl-bar, and 5 is the usual awl.

6 is the presser-bar, and 7 is the presser-foot. 611 is a rock-shaft mounted in bearings in the frame, and 612 is an arm or tappet on said rock-shaft operating to effect the lifting of the presser-bar and presser-foot.

8 is the usual needle-bar, and 9 is the needle. 10, Fig. 1, is the cast-off bar, and 11 is the cast-off.

12, Fig. 1, is the vibrating post in which the needle-bar 8 and cast-off bar 10 are mounted.



13 (see particularly Fig. 1) is the work-supporting post, and 14 is the work-rest which is carried by the said work-supporting post.

The foregoing parts are or may be constructed as heretofore or in any approved manner, save as indicated hereinafter with reference to the presser-foot 7. In practice they are or may be actuated and caused to operate in usual or any approved manner.

15 15 designates portion of the sole of a shoe in process of being operated upon, while 16, Figs. 5 and 6, designates the adjacent overhanging or bulging portion of the upper of a shoe.

17 is the tool which I employ for operating on the work between the stitches as the stitching proceeds. The working end of the said tool in practice will be shaped properly to perform the desired work. When the said tool is designed simply to perform the work known variously as "dividing," "separating," "setting up," or "pricking up" the stitches in the goods being stitched, its working end will be shaped as customary to enter the holes between the stitches. When it is desired that the said tool shall crease, indent, or mark the goods transversely across the line of stitching, the edge of the said working end will be made long enough to act upon the leather adjacent to the line of stitching. (See Fig. 10.) The upwardly-extending shank of the tool 17 is connected pivotally, as by means of a stud 18, having its stem fitted to a hole 19 in said shank, Fig. 9, with the transversely-extending arm of a bell-crank 19, which is mounted to turn upon the stem of a headed stud 20, projecting from an arm of the presser-foot 7. The upwardly-extending arm of the said bell-crank is connected by a link 21 to the depending arm of a lever 22, which is mounted upon a suitable pivot or upon centers 23 23 on a projecting portion or bracket 24 of the head 3. The lever 22 I term the "actuating-lever" for convenience of designation. It derives its movement from a suitable cam. A cam for the special purpose may be provided if desired. In the present instance I utilize the cam or tappet 612 for the purpose of moving the said lever to depress the tool 17 positively against the work, and for the purpose of raising the tool after each depression thereof by the said cam I provide a spring, as 25, having one end thereof connected to a pin 26 on a laterally-projecting arm of the lever 22 and the other end thereof connected to a pin, as 27, applied to the head 3 of the machine.

For the purpose of enabling me to vary in convenient manner the depth of the indentations produced in the work by the action of the tool 17 I employ in connection with the actuating-lever 22 and its operating-cam an intermediate contact-face or shoe and means of adjusting the same. In the present embodiment of my invention I have applied the said contact-face or shoe to the upper arm of the actuating-lever 22, it being designated 28 and being held to the said lever by screws 29

29, the stems of which pass through transversely-elongated slots 30 30 in the flange of the contact-face or shoe 28 and into screw-threaded holes in the lever 22, said slots being shown in Figs. 3 and 4 in dotted lines. Adjusting-screws 31 31 are shown applied to tapped or threaded holes in the lever 22, their inner ends taking bearing against the contact-face or shoe.

The devices are constructed and arranged to operate the tool 17 in such manner as that in each descent of the said tool the working end thereof shall be impressed into the goods being operated upon and between the stitches at the stitch-making or stitch-forming point in the machine—that is to say, at each descent of the tool 17 the working end of the same is impressed between the stitches at the point in the machine where the stitches are drawn by the descent of the needle 9. In other words, it follows in the path of the descending needle and acts against the material at the upper end of the hole from which the needle has just been withdrawn. (See Fig. 4 of the drawings.) It is necessary in order to withdraw the tool out of the path of the parts which are concerned more immediately in forming the stitches and feeding the work along to retract the tool after each descent thereof to a position which is removed horizontally from the path of movement of the stitches and feeding devices. In the case of the sewing-machine which is illustrated in the accompanying drawings the work is fed along by the advance of the needle 9 after it has risen into the work. As is well known, this rise of the needle takes place in the vertical plane in which awl 5 reciprocates, and thereafter the needle is carried forward or advanced in the line of the feed into the position in which it is shown in Fig. 3. In order that the tool 17 may not interfere with the needle in the advance of the latter, the said tool is retracted, as just stated, into a position which is removed horizontally from the path of movement of the stitching and feeding devices, it being carried forward or advanced at its working end in the line of the feed also. In order to secure the desired path of movement of the working end of the tool, I combine with the moving tool and the presser-foot or equivalent relatively-fixed part guiding devices whereby the line of travel of the working end of the tool is defined. These guiding devices may variously be constructed in practice, but conveniently may comprise a cam on the one part coacting with a bearing on the other part in the shape, it may be, of a pin, stud, or roll. In the illustrated embodiment of the invention I have provided the tool 17 with the cam, the latter being represented as formed at 32 on one edge of the tool 17, and the bearing with which the said cam coacts is shown as constituted by a stud 33, which is carried by the upwardly-extending portion or stem of the presser-foot 7. The said cam 32, which, as



just indicated, may be applied to either the tool or the presser-foot, is shaped properly to occasion as the vertical movements of the tool take place the required extent of horizontal movement of the working end of the tool 17 in the direction of the line of feed toward and from the stitch-making point in the machine. A spring 34 holds pressed into contact with the stud 33 the edge of the tool on which the cam 32 is provided. The stud 33 has a head or flange 35, which holds the tool in position against the stem or upwardly-extending portion of the presser-foot 7 during the movements of the tool. It is necessary that provision should be made for enabling the position of the path of the working end of the tool to be determined or located to meet requirements. Thus when a change is made in the length of the feed of the sewing-machine a change or adjustment is necessary in the position of the path of the working end of the tool in order that the said working end may be caused to continue to strike at the stitch-making point. To this end I combine with the tool 17 and the stud or fixed bearing 33 suitable adjusting devices. I usually secure the desired results by mounting the stud 33 in a horizontally-extended slot 36 in the stem of the presser-foot 7, the said slot being indicated in dotted lines in Fig. 7. The stud 33 is secured at the desired point in the length of the said slot in suitable or convenient manner, as by means of the nut 37 and washer 38, which are represented in Fig. 8. 39 designates the thread-guide, the same being arranged and operated to lay the thread passing therethrough under the hook of the needle after the hooked end of the needle has been forced upward through the work, as in Figs. 3 and 5. Preferably in practice I employ a so-called "rotary" thread-guide, the latter being operated in a substantially-circular path by means substantially identical with that which is disclosed in United States Letters Patent to me, No. 490,856, granted January 31, 1893. It is important that the tool 17 and the parts by which its working is controlled should be removed entirely out of the path of movement of the thread-guide in order not to interfere with the movement of the thread-guide. Thus in the illustrated embodiment of the invention I locate the devices for actuating and controlling the tool 17 wholly in advance of the stitch-making point in the line of feed, and I form the working end of the said tool on a substantially horizontal extension of the latter, which extension is of sufficient length to project rearwardly under the stud 33 and below the path of movement of the thread-guide to the stitch-making point.

In order to enable the tool to strike well in under the overhanging or bulging portion of the upper of a shoe without liability to make contact with such portion of the upper, I construct the devices in such manner as to give

to the working end of the tool 17 a path of movement which is inclined laterally with respect to the sole of the shoe which is being operated upon. This enables me to cause the working end of the tool to strike in farther under the overhanging or bulging portion of the upper than has been possible heretofore with the aid of the devices in prior use on sewing-machines, and also enables me to meet satisfactorily the requirement of the trade that the inner ends of the creases, marks, or indentations in the upper surface of the sole shall be concealed beneath the said overhanging or bulging portion of the upper. The inclination of the path of movement of the tool will be obvious from Figs. 2, 5, 6, and 8. It is secured in the present case by forming the stem or upwardly-extending portion of the presser-foot 7 inclined, as shown, and by mounting the tool 17 and bell-crank 19 on the said stem, so that the movement of the said parts shall all take place in a plane which is parallel with the said stem. Necessarily the working end of the tool is formed at an oblique angle with reference to the sides of the tool (see Fig. 10) in order that the said end may act uniformly upon the sole throughout the length of the edge of the tool.

Universal-joint connections are employed between the opposite ends of the link 21 and the lever 22 and bell-crank 19, as indicated at 40 40. This compensates for the relative inclination of the plane in which bell-crank 19 vibrates. The universal-joint connections also enable the presser-foot to be swung or adjusted around the vertical axis of the presser-bar without occasioning cramping of the operating devices for the tool 17. Facility for making rotary adjustment of the presser-foot around the axis of the presser-bar is important, since it enables the distance between the edge of the upper of a shoe and the line of stitching in the sole thereof convenient to be varied. The side of the presser-foot constitutes a gage, against which the upper is pressed by the operator, and the position of the said side with respect to the needle determines the closeness of the approach of the upper to the needle.

It will be apparent that the improved features of construction and combinations of parts herein presented are in some cases equally applicable to use, whether or not the plane in which the tool works is inclined laterally with respect to the sole of the shoe being operated upon.

Referring again to the adjustment of the stud 33 in the slot 36, it will be seen that a channel 50 (see Figs. 7 and 8) is formed in the face of the presser-foot parallel with the slot 36 and that the stud 33 has an enlargement 51 thereon, which fits and slides in the channel 50. This enlargement 51 prevents the stud 33 from being retracted through the slot 36 when the nut 37 is turned up, the action being that the body of the presser-foot



7 is gripped between the enlargement 51 and the washer 38 and nut 37.

I claim as my invention—

1. In a sewing-machine, the combination  
5 with the stitching devices, of the indenting-tool, supporting means therefor and actuating means for the said tool moving its working end in a path cutting obliquely the path of movement of the needle, whereby to carry  
10 said working end in its descent in beneath the overhanging portion of the upper of the said shoe, substantially as described.

2. In a sewing-machine, the combination  
15 with the stitching devices, and the presser-foot, of the indenting-tool, means for supporting the same on the said presser-foot in an inclined position, and actuating devices for the said tool moving the latter in a path cutting obliquely the path of movement of the needle, whereby to carry said working end in its  
20 descent in beneath the overhanging portion of the upper of the said shoe, substantially as described.

3. In a sewing-machine, the combination  
25 with the stitching devices, of the indenting-tool, supporting means therefor, and actuating means for the said tool moving its working end in a path cutting obliquely the path of movement of the needle, and operating to  
30 advance the same to the stitch-making point in the machine, there impress it between the stitches, and then retract the same to a position horizontally removed from the path of movement of the said devices, whereby to  
35 carry said working end in its descent in beneath the overhanging portion of the upper of the said shoe, substantially as described.

4. In a sewing-machine, the combination  
40 of the indenting-tool, means for supporting the same, actuating devices for the said tool, guiding devices determining the path of movement of the working end of the said tool, and means for adjusting said guiding de-

vices whereby to enable the position of the  
said path to be varied, substantially as described.

5. In a sewing-machine, the combination  
with the stitching devices and presser-foot, of the indenting-tool, means for supporting  
50 said tool, actuating devices for the said tool, the cam and bearing determining the path of movement of the working end of the said tool, and the adjusting means whereby the position of the said path is varied, substantially  
55 as described.

6. The combination with the presser-foot, and the indenting-tool, the said parts having guiding devices to control the path of movement of the working end of the tool, of the bell-  
60 crank operatively connected with the tool, the actuating-lever operatively linked to the bell-crank, and the actuating-tappet, substantially as described.

7. The combination with the presser-bar,  
65 the presser-foot, the indenting-tool, and the bell-crank pivoted to the presser-foot, of the actuating-lever, the link having universal-joint connections with the said bell-crank and actuating-lever, and means to actuate the  
70 said actuating-lever, substantially as described.

8. The combination with the indenting-tool, means for supporting the same, the actuating-lever, and operating connections in-  
75 termediate the said tool and lever, of the operating-tappet, the movable contact-face intermediate the said tappet and lever, and means to adjust the said contact-face, whereby to vary the depth of the impressions pro-  
80 duced by the tool, substantially as described.

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

FRANK W. MERRICK.

Witnesses:

CHAS. F. RANDALL,  
WILLIAM A. COPELAND.