

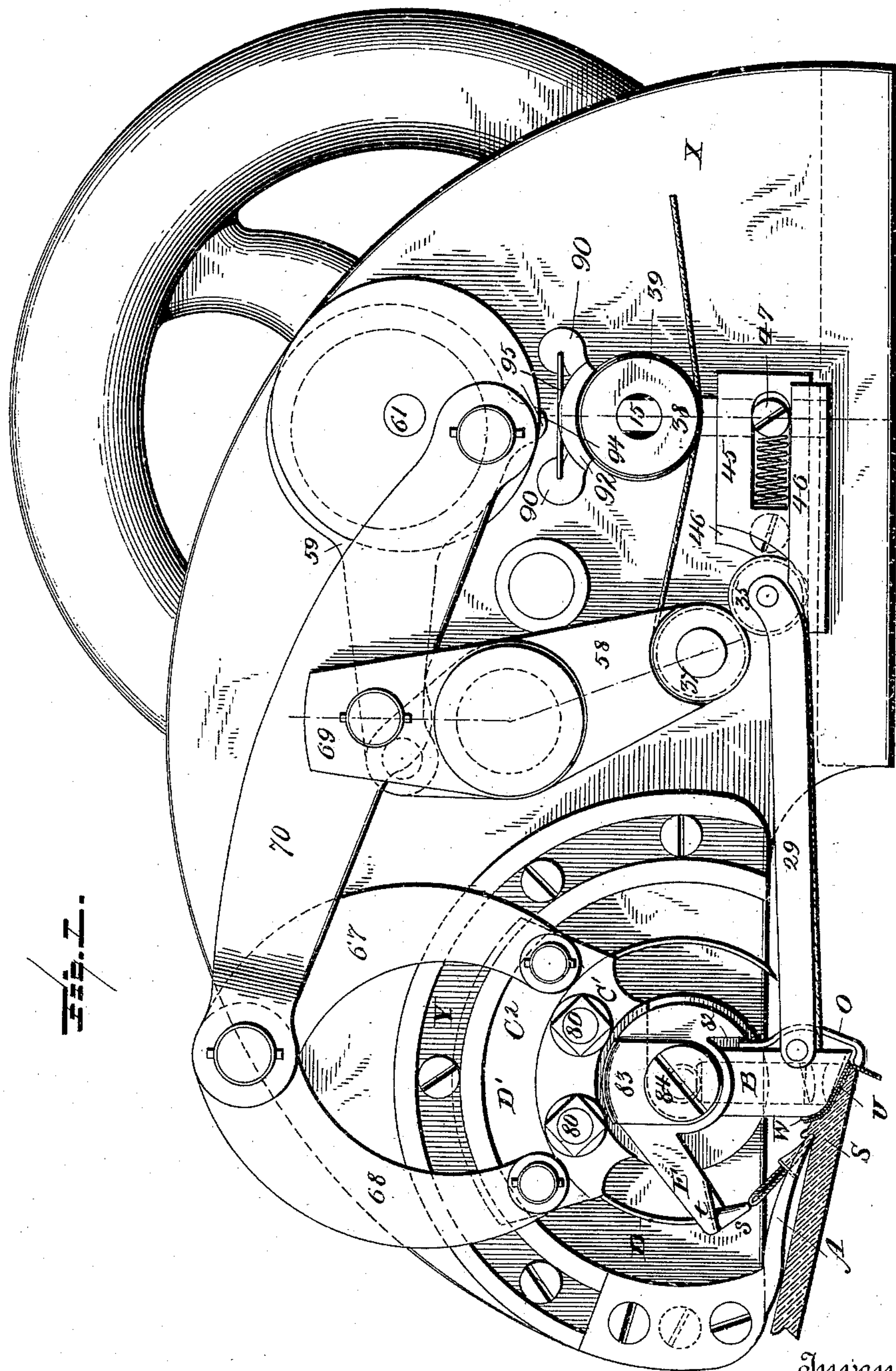
(No Model.)

2 Sheets—Sheet 1.

F. CHASE.
SEWING MACHINE.

No. 445,925.

Patented Feb. 3, 1891.



Witnesses
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Inventor
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his Attorney

(No Model.)

2 Sheets—Sheet 2.

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Fig. 2.

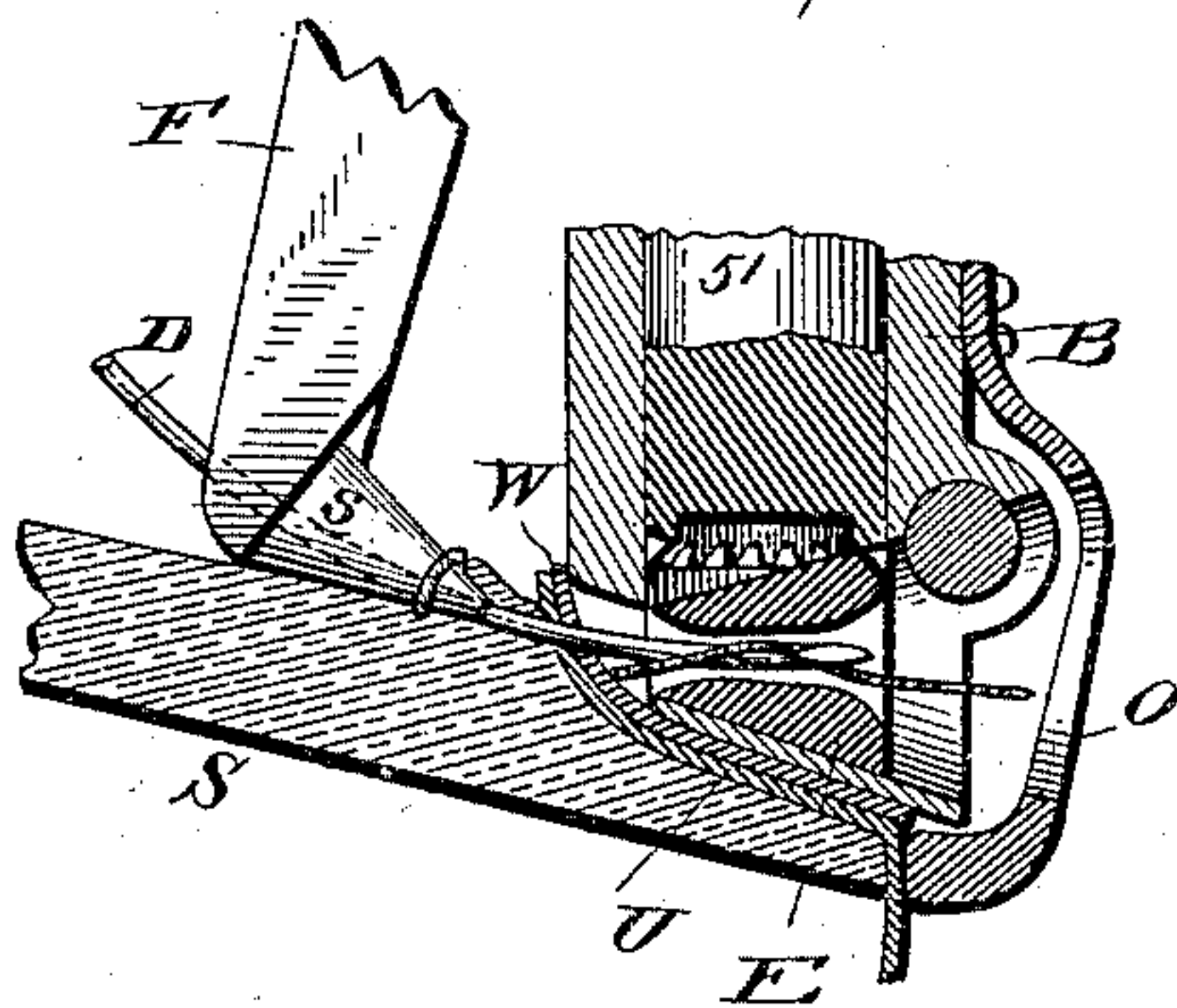


Fig. 3.

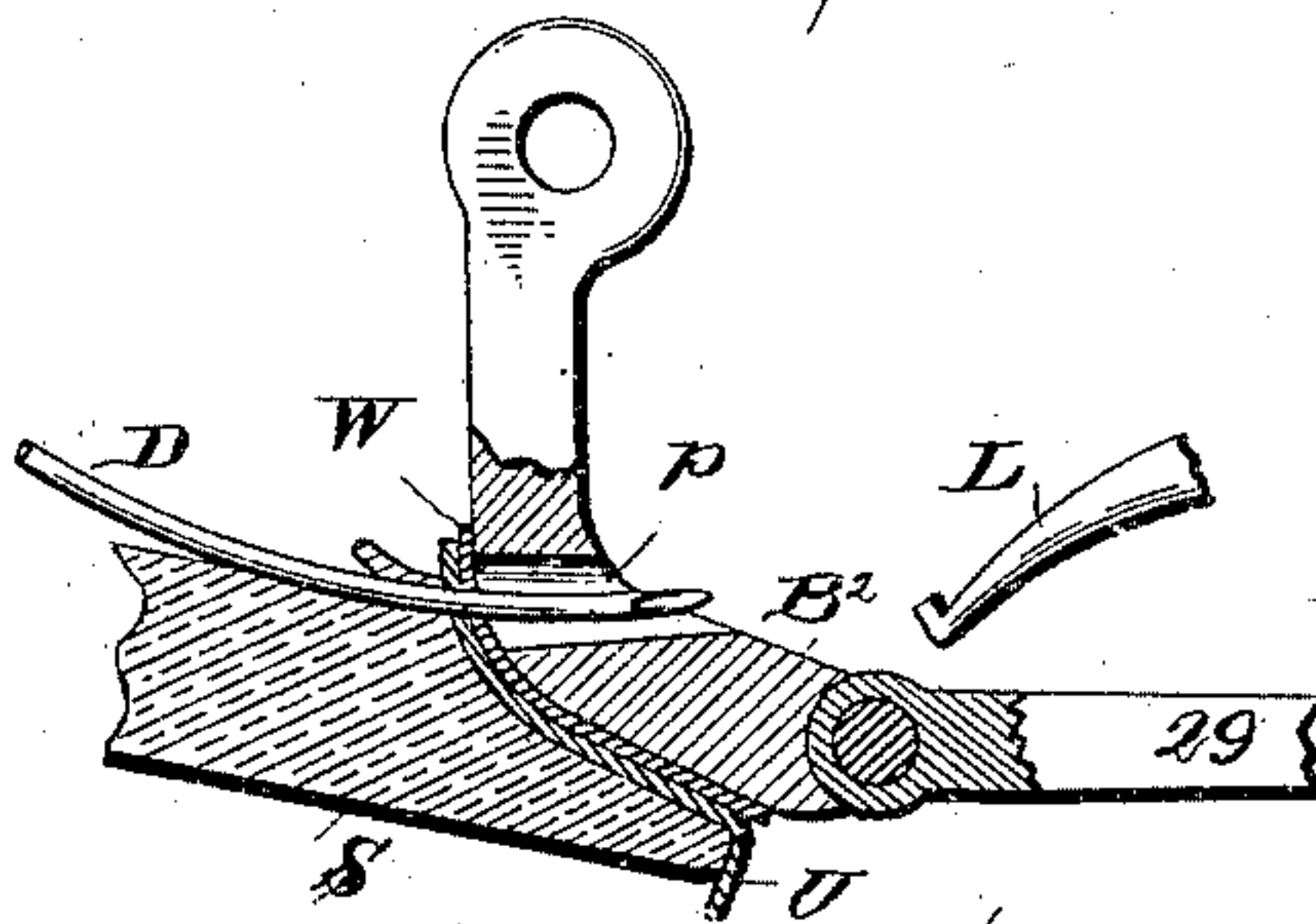
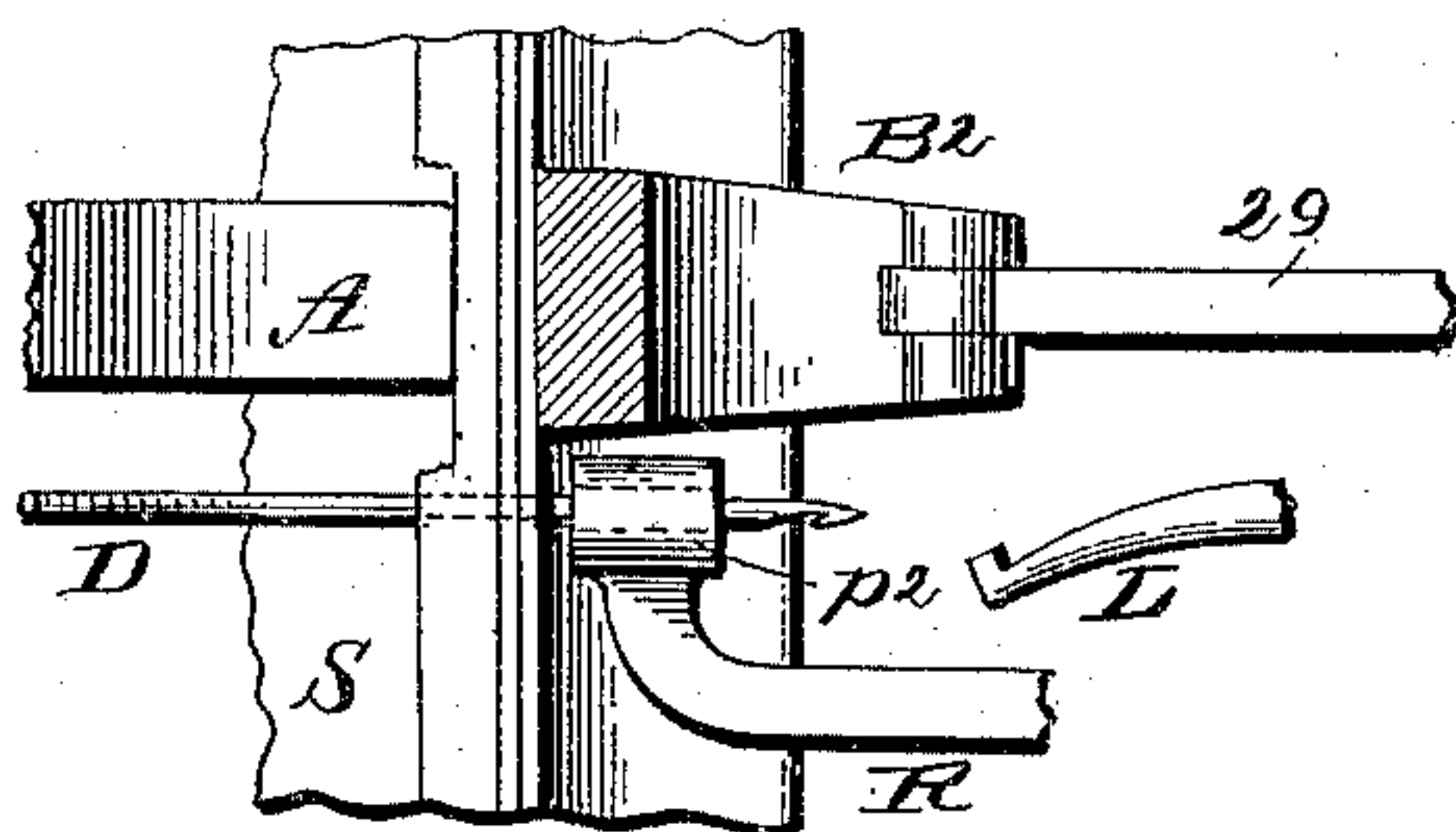


Fig. 4.



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UNITED STATES PATENT OFFICE.

FRANK CHASE, OF BOSTON, MASSACHUSETTS.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 445,925, dated February 3, 1891.

Application filed December 23, 1890. Serial No. 375,582. (No model.)

To all whom it may concern:

Be it known that I, FRANK CHASE, of Boston, in the State of Massachusetts, have invented a certain new and useful Improvement in Sewing-Machines, of which the following is a specification.

The improvement which I am about to describe, although applicable to some extent to sewing-machines generally, has been devised by me with more particular reference to the needs of a boot and shoe sewing machine, and it is in this connection that I shall describe it.

The main feature of the improvement consists in supporting the needle not only at its rear, but at its point at the time that it is in the work and the latter is being positively pressed between the channel-gage and the back gage while the take-up is operating to set the stitch. This feature is disclosed in my application for Letters Patent filed September 9, 1890, Serial No. 364,452, and is there illustrated in connection with a machine which has an awl-feed, and is designed more especially for sewing welted work; but has been reserved by me as the subject of this separate application, it being applicable generally to sewing-machines, whether having an awl-feed or not, and whether an awl be used or not, and whether a whirl (as in the aforesaid application) or some other form of looper be used to engage the thread with the barbed or hook needle.

In the machine hereinbefore referred to the work is powerfully and positively pressed together between the back gage and the channel-gage at the time the take-up is operating to set the stitch. The tendency of the pressure of the back gage, however, is not only to press the parts of the work (usually the upper, welt, and insole) together, but to force the work downward. This tendency to downward movement is resisted by the needle, which at this time is in the work, and thus acts in some sort as a dowel to hold the work up in place; but this downward pressure brings a strain upon the needle which will be apt to bend or break it if it be unsupported except by its carrier. To remedy this difficulty, I provide upon the side of the work opposite that on which the needle enters a support, in which the point or front end of the needle

after it passes through the work is received and held while the work is pressed between the channel-gage and the back gage. The needle at this time thus becomes in effect a dowel supported at both ends in a way to permit it to resist most effectively the downward strain exerted upon it. The support for the point of the needle can be applied to or formed in one with the back gage itself, or it can be furnished by a piece separate from the back gage. I also combine with the back gage an edge gage, which is spring yielding with respect to the back gage, so that when the back gage moves forward to press the work the edge gage after it meets the edge of the sole will yield to permit the back gage the further forward movement needed to insure the proper pressing together of the work.

The nature of my improvement can best be explained and understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of a machine embodying the improvement in its preferred form. Fig. 2 is a side elevation, partly in section, on enlarged scale, of the lower end of the back gage and the thread-retarder or cast-off, together with the work consisting of the inner sole, the upper, and the welt. Fig. 3 is a side elevation, partly in section, of a modification. Fig. 4 is a sectional plan of still another modification.

Like reference letters and numerals indicate corresponding parts in all the figures.

Figs. 1 and 2 of the present drawings are the same as Figs. 1 and 16 of the drawings forming part of my aforesaid prior application, Serial No. 364,452, (except as regards the yielding edge gage O, which is not shown in the latter,) and they bear the same reference letters. The parts illustrated in these figures, together with their operating mechanism, are fully described in my said application, so that a detailed description of them will not be required here. It is sufficient for the purposes of the present case to say that D is the needle and C is the awl. D' is the oscillating needle-carrier, and C' C² is the oscillating awl carrier and driver moving in guides Y. The parts last named receive their oscillating movement from the main revolving shaft 61 of the machine through the arms 67 and 68, pinned at their lower ends to the

awl-driver and needle-carrier, respectively, and pivoted at their upper ends to the forward end of a walking-beam lever 70, which at its rear is jointed to a crank-pin on shaft 61, and at about its middle is pivoted to a rocker-arm 69, journaled at its lower end in the main frame. F is the oscillating thread-retarder and cast-off provided with a tapered conical part s to cover the barb of the needle at the proper times. B is the oscillating back gage. All of these parts B F C' C² D' oscillate on one common axis.

The thread-looper consists in this instance of a conical whirl E, which fits and is capable of revolution in a socket in the lower end of the back-gage arm, and it (like the back-gage arm) is pierced from end to end, and is in line with the awl and needle, which are placed on opposite sides of the whirl and enter and pass through the same alternately. The whirl, for the purpose of looping the thread around the needle, is rotated by a driving mechanism, the lower part of which, as seen in Fig. 2, consists of a vertical rotating shaft 51 in the back-gage arm B, which at its lower end has beveled gear-teeth to mesh with a pinion on the large end of whirl E.

A is the fixed or stationary channel-gage adapted to work, as usual, in the channel formed in the inner sole S. The work (which, as shown, consists of the inner sole S, the upper U, and the welt W) is positively pressed together by and between the back gage and the channel-gage at the time the take-up is operating to set the stitch, at which time the needle has descended and passed through the work. The back gage tends when pressed toward the channel-gage to exercise also a downward pressure upon the work, as will be understood by considering Fig. 2, and this tends to bring upon the needle a strain which would result in injury to the needle were it not that the latter is at this time upheld at its rear by its carrier and at its point by the support afforded by the back-gage arm through which it passes, the needle thus in effect being a dowel, the intermediate portion of which passes through the work and the two ends of which are received and held in supports, which enable it to resist effectively and without injury to itself downward thrusts upon the work. It is this feature which, as hereinbefore stated, mainly characterizes the invention which is the subject of the present application.

The positive pressure upon the goods is obtained in the present instance from the take-up, which is so connected to the back gage that the latter is pressed toward the goods by and during the movement of the take-up in setting the stitch. To this end the take-up consists, essentially, of two grooved trucks 35 and 37. Truck 35 is hung in a strap 29, which at the opposite end is jointed to the back gage. Truck 37 is journaled in the lower end of a vibratory lever 58, which for convenience sake is mounted loosely on the journal of

rocker-arm 69, and is actuated from an eccentric on the main shaft 61 by an eccentric strap and rod 59, jointed to the upper end of lever 58, as indicated by dotted lines in Fig. 1. The needle-thread passes back under grooved truck 35, thence up over the same, under, around, and over the truck 37, back two or three times around a tension-truck 38, and thence to the spool.

In the operation of taking up the thread and setting the stitch the truck 37 is thrown forward by its lever 58. In so moving, however, it pulls through the medium of the thread upon the truck 35, and thus causes the latter, through the intermediary of the strap 29, to press the back gage positively and forcibly toward the work.

In rear of the truck 35 is a forwardly-impelled spring-bed 45, which acts to hold the back gage with yielding pressure against the work at such times as the gage is not under the positive control of the take-up. The tension truck is of course clamped at the time the take-up is operating to set the stitch, for which purpose its periphery is acted on by a vertically-movable clamp-plate 90, which is depressed by the action of a cam or projection 94 on the periphery of the eccentric-shaft 59, which bears upon a spring-strap 95 on the clamp-plate at the time the take-up is acting to take up the thread.

It is manifest that other forms of looper than the whirl shown in Figs. 1 and 2 can be made use of. For example, in Fig. 2 the back gage, while intended in other respects to be arranged and operated as in Figs. 1 and 2, is a solid arm provided with a passage p, in which the needle finds support for its point or front end at the time the take-up is operated to set the stitch; and the looper consists of the ordinary looper L, the front end only of which is shown, having a thread-eye in its front end, and actuated to move in a circle sufficient to throw the thread as a loop around the needle. This is a known form of looper, shown in many patented machines—as, for example, in Letters Patent No. 325,063, of August 25, 1885—and it therefore requires no further illustration or description. Again, the support, instead of being formed on or in or provided by the back gage itself, may be furnished by a separate piece R, as in Fig. 4, which represents in plan the acting end of the channel-gage A, the lower end of a back gage B², the front end of the looper L, and the end of the piece R, together with the needle D, passing through the tubular support p², with which the end of the piece R is provided. In this figure the back gage is solid and is set a little to one side of the path of the needle, and the piece R, which is stationary, and for this purpose is to be fixed to the frame of the machine just as the channel-gage is, is so placed that the tubular support p² will be in the path of the needle. This arrangement of the parts in question, like the arrangements for a similar purpose illustrated

in the preceding figures, furnishes that support for the point of the needle, which will prevent it from being injuriously affected by downward thrust upon the work.

5 The part marked 29 in Figs. 3 and 4 is the strap (similar to the like designated strap in Fig. 1) by which the back gage is connected to the truck 35 of the take-up.

10 With reference to the other feature of my present invention—viz., the yielding edge gage O—this feature is illustrated in Figs. 1 and 2. It will be remarked that this edge gage is an arm which is attached at its upper end to the back of the back gage, and thence extends
15 down below and a little under the back gage in position to meet the edge of the work, being curved or bowed at the point where it crosses the path of the needle, awl, and thread, so as not to interfere with these instrumentalities. The edge gage should be spring
20 yielding with respect to the back gage, for which purpose it is made in the present instance of spring metal, so that it may yield or give backward with respect to the back
25 gage, to which it is attached. Under this arrangement it will be noted that while the edge gage, by bringing up against the work, will act in itself as a gage, yet it also will permit by its yielding capacity the back gage to advance independently at the time that the latter is forced forward to press the work together. In this way the back gage may be
30 used simply as a presser, while the gaging-work will be performed by the spring-yielding edge gage.
35

In conclusion I desire it to be understood that all of the features (so far as they are of my invention) common to the machine herein
40 illustrated and that illustrated in my prior application, Serial No. 364,452, are the sub-

ject of the latter application, with the exception of the feature—viz., the supporting of the point or front end of the needle at the time the work is positively pressed between the take-up and the channel-gage and the take-up is operating to set the stitch, which is reserved for and forms the subject of the present application. Therefore

What I here claim as new and of my own invention, and desire to secure by Letters Patent, is—

1. In a stitch-forming mechanism, the combination, with the needle-carrier and needle, the take-up operated to set the stitch at the time the needle is in the goods, the channel-gage and the back gage positively forced toward and against the work at the time the stitch is being set, of a needle-support placed in the path of the needle on the side of the work opposite that from which the needle enters and adapted to receive and support at this time the point or front end of the needle against the downward thrust of the back gage upon the work, substantially as and for the purposes hereinbefore set forth. 65

2. The combination, with the stitch-forming mechanism and the channel-gage, the back gage, and means for pressing the back gage toward the channel-gage at the time the stitch is being set, of an edge gage carried by and spring yielding with respect to the back gage, substantially as and for the purposes hereinbefore set forth. 70

In testimony whereof I have hereunto set my hand this 20th day of December, 1890.

FRANK CHASE.

Witnesses:

EWELL A. DICK,
M. BAILEY.