

(No Model.)

2 Sheets—Sheet 1.

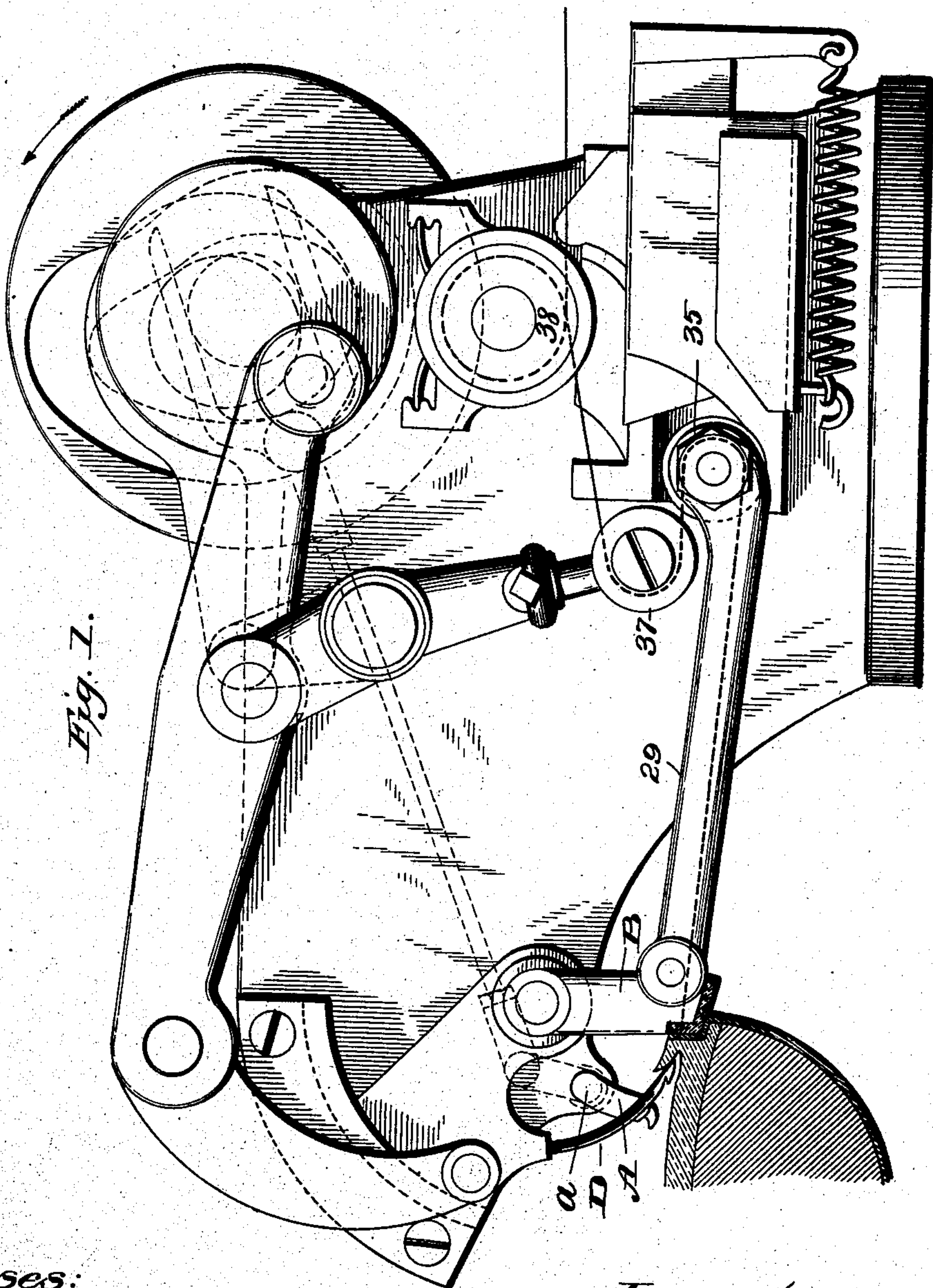
F. CHASE.  
SEWING MACHINE.

No. 605,040.

Patented May 31, 1898.

*Fig. 6.*

|             |             |    |           |     |             |     |           |     |             |     |           |     |
|-------------|-------------|----|-----------|-----|-------------|-----|-----------|-----|-------------|-----|-----------|-----|
| 0           | 30          | 60 | 90        | 120 | 150         | 180 | 210       | 240 | 270         | 300 | 330       | 360 |
| Needle      | Moving down | *  | Moving up | *   | Moving down | *   | Moving up | *   | Moving down | *   | Moving up | *   |
| Loop Keeper | Moving      | *  | Moving    | *   | Moving      | *   | Moving    | *   | Moving      | *   | Moving    | *   |
| Needle      | Down        | *  | Up        | *   | Down        | *   | Up        | *   | Down        | *   | Up        | *   |
| Needle      | 1/2         | *  | 1/2       | *   | 1/2         | *   | 1/2       | *   | 1/2         | *   | 1/2       | *   |



Witnesses:

L. C. Hills.

J. B. Kuper

Inventor:

Frank Chase,

By *Marshall Bailey*  
his Atty.



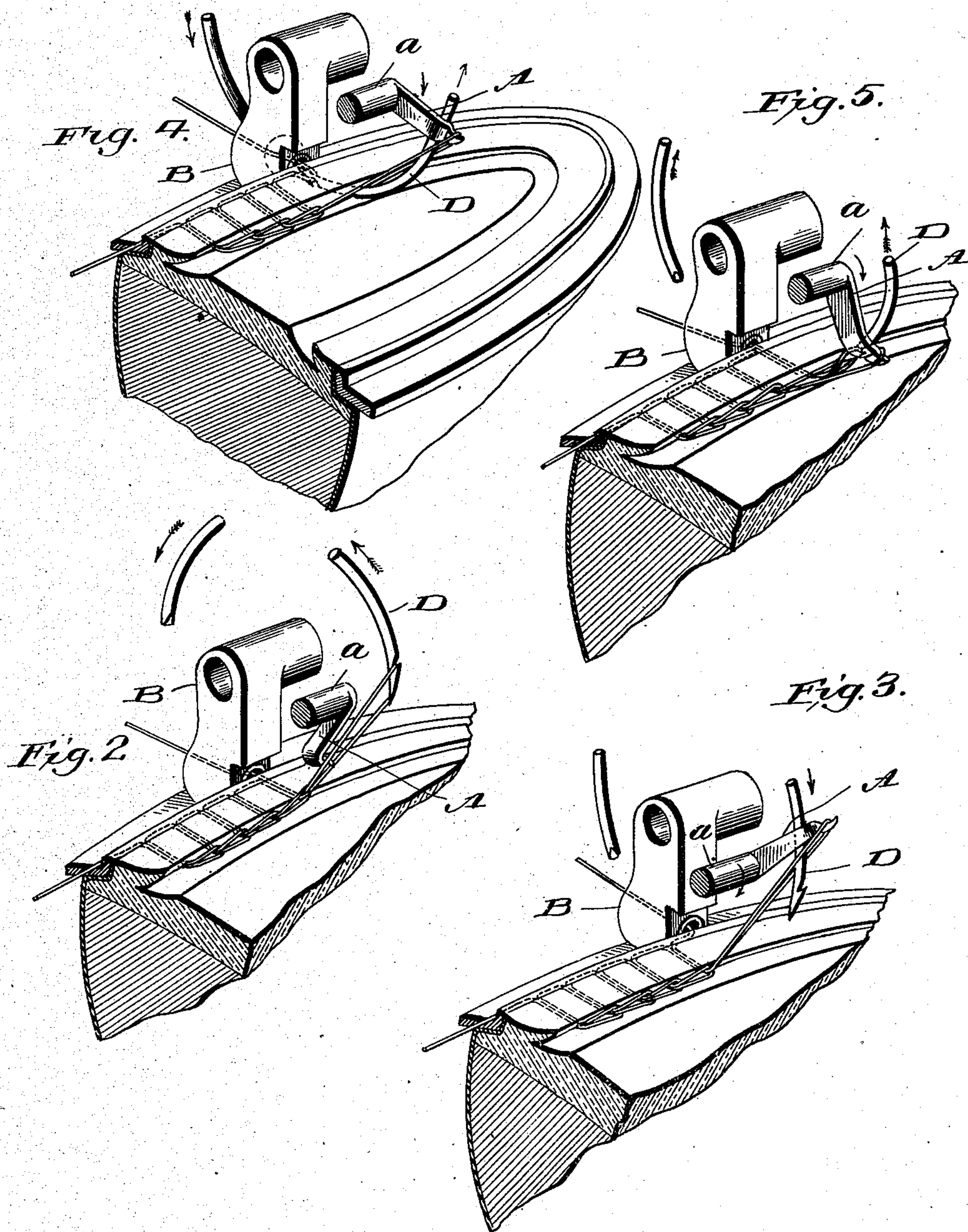
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2 Sheets—Sheet 2.

F. CHASE.  
SEWING MACHINE.

No. 605,040.

Patented May 31, 1898.



Witnesses:  
L. C. Hills.  
J. B. Keifer

Inventor:  
Frank Chase,  
by Matthew Bailey  
his Atty.



# UNITED STATES PATENT OFFICE.

FRANK CHASE, OF MALDEN, MASSACHUSETTS, ASSIGNOR TO WALTER SHAW, TRUSTEE.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 605,040, dated May 31, 1898.

Application filed May 23, 1895. Renewed August 12, 1896. Serial No. 602,582. (No model.)

*To all whom it may concern:*

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

My invention relates to that class of sewing-machines in which a hook-needle is used; and it consists in a device, termed by me a "loop-keeper," which enters the loop of thread as it is drawn out by the needle, which while the needle is taking a fresh loop holds so much of the previous loop as is needed to form about one-half of the fresh loop, and which when the needle is drawing out the fresh loop through the goods renders said portion of the previous loop to the needle so as to furnish about one half of the thread needed for the fresh loop, the remaining half being supplied by the spool or other source of thread-supply. The loop-keeper is thus, in effect, a "measurer," which by holding the previously-formed loop at a certain point and then rendering it to the needle as it draws out a fresh loop furnishes to the latter the needed length of thread to prevent the thread in the hook of the needle (as the latter is drawing the fresh loop through the goods) from moving or dragging crosswise in the hook, which action, as is well known, results oftentimes in the abrasion and cutting of the thread.

When the sewing mechanism is one in which a take-up is used to set the stitch in the goods, the loop-keeper also has the added function of receiving and resisting the strain exercised by the take-up, and thus preventing that strain from coming upon the needle. The final strain occasioned by the action of the take-up comes upon the loop-keeper at the time it is at rest in the position it occupies in holding the half loop or length of thread needed to furnish about one-half of the fresh loop in process of formation.

The nature of my improvement will be readily understood by reference to the accompanying drawings, in which—

Figure 1 is a side elevation of so much of my improved sewing-machine as needed for the purpose of explanation. Figs. 2 to 5, inclusive, illustrate the operation of the loop-keeper. Fig. 6 is a table showing the relation

of the driving mechanism for the loop-keeper and the needle during each revolution of the main shaft in the machine shown.

The particular form of machine which I have selected for the purpose of illustrating my improvement is that which is set forth in my Letters Patent No. 445,924, dated February 3, 1892. The machine is fully illustrated in my said patent, and I have therefore omitted from the drawings accompanying this specification many of the details thereof, retaining only such of the principal parts as will suffice for the purposes of explanation. I have omitted the awl, (except in so far as it is shown diagrammatically in Figs. 2 to 5,) the channel-gage, and the looper, (except so far as it is represented in the conical awl and needle passage in the lower end of the back gage B.) I remark here that of course any other appropriate form of looper can be used in lieu of the particular one represented in my said Letters Patent.

D is the needle. B is the back gage. and 35 constitute what I term in my patent the "multiple purchase take-up," although for the purposes of my present improvement I am not limited to this form of take-up. is the strap connecting the back gage with the take-up, and 38 is the tension. These parts operate together substantially in the manner described in my patent.

A is the loop-keeper. It is fast on a rock-shaft *a*, the rocking of which gives the keeper its proper motions. This device, in which my present improvement is mainly comprised, takes the place of the device which in my aforesaid Letters Patent is termed the "retarder." In the particular organization herein illustrated it, like the retarder, serves to take from the needle the strain which otherwise would be brought upon it when the take-up is setting the stitch; but it also has the added function of a measurer, which the retarder has not.

The position occupied by the loop-keeper with relation to the needle is clearly illustrated in the drawings, and their movements relatively to each other will be readily understood from the table in Fig. 6 taken in connection with Figs. 2 to 5, inclusive.

In Fig. 2 the needle has nearly completed



its upstroke in drawing out a loop, and the loop-keeper A is shown in its lowermost position. During the remainder of the upstroke of the needle (see right-hand end of the table in Fig. 6) the keeper makes its upstroke, entering and engaging the loop. Now following the table from the left-hand end it will be seen that the keeper holds the loop in this position a short time, while the needle commences its descent, as seen in Fig. 3, where the needle has moved down a short distance. Then the keeper commences to descend also and continues this movement until about half-way down, when it rests. During this movement of the keeper the take-up comes into operation, taking up so much of the loop (about one-half) as rendered by the keeper and gives the final strain requisite to set the stitch when the keeper comes to rest, and the needle completes its downstroke, takes a fresh loop, and then recedes on its upstroke until its hook reaches the goods, the parts being represented in this position in Fig. 4, the keeper having held back so much of the old loop as will be equal in length to about one-half of the new one now in process of being drawn out by the needle. Then as the needle continuing its upstroke pulls this new loop through the stock the keeper moves toward the stock, as seen in Fig. 5, thereby rendering to the needle sufficient thread for one leg of the loop to prevent sidewise drag of the thread through the hook, the thread for the other leg of the loop being drawn from the spool or other main source of thread-supply. This movement continues until the keeper has given up all of its thread, at which time the needle will have very nearly completed its upstroke, the parts at this time reassuming the position shown in Fig. 2.

I have shown the loop-keeper A as operated by a rock-shaft oscillated by a cam through a connecting-rod, as will be clear from Fig. 1 without further description; but it is obvious that these details form no part of my invention and may be widely varied. The form of loop-keeper also is a mere detail, the substance being that the keeper shall engage the loop drawn out by the hook-needle, hold back or retain such length thereof only as substantially is needed for one leg of the next succeeding loop, and then give up this length of the old loop to form part of the fresh loop drawn out by the needle.

I have illustrated my invention as applied to that class of hook-needle sewing-machines in which the stitch is tightened by a take-up; but my invention is equally applicable to that class of such machines in which ordinarily the needle tightens the stitch by a final pull on the loop, (the standing thread or thread leading from the spool being then held,) and when my invention is embodied in machines of the latter class the final pull upon

the loop to tighten the stitch will best be given by the keeper instead of the needle; but in this case the keeper would have substantially the same sequence of movement as in the other case so far as its "measuring" function is concerned, and the devices which in the other class of machines would act as a take-up would in the case now contemplated act simply to draw back the surplus or slack of the loop given up by the keeper in moving from its highest to its middle position, or the position represented in Fig. 4.

Obviously it would be a mere matter of adjustment of the stroke of the keeper to cause it to pull the loop to tighten the stitch, and it is equally obvious that it is a matter of adjustment of the range of movement of a take-up whether it shall merely take up the slack or surplus thread given up by the keeper in moving down to the position shown in Fig. 4, or whether in addition to taking up this slack it shall exercise the further pull needed to set the stitch.

What I claim, therefore, as new and of my own invention is—

1. The combination with the hook-needle and its looper, of a loop-keeper, located on that side of the work to which the loop is pulled by the needle, having a movement to and from the work with an intermediate period of rest during its loop-rendering movement, and actuating mechanism therefor, timed in their movements relatively to, and operating in connection with, the needle substantially as described, and means by which the slack or surplus of the old loop rendered by the loop-keeper before it attains its intermediate position of rest is drawn back to the side of the stock on which the needle takes its loops before the needle pulls the new loop through the stock; all substantially as hereinbefore set forth.

2. The combination with the hook-needle and its looper and the take-up for tightening the stitch, of a loop-keeper, located on that side of the work to which the loop is pulled by the needle, having a movement to and from the work with an intermediate period of rest during its loop-rendering movement, and actuating mechanism therefor, timed in their movements relatively to the needle and take-up substantially as described, whereby the loop-keeper retains that portion of the old loop needed to furnish the requisite supply of thread to one leg of the new loop, and at the same time takes the strain occasioned by the action of the take-up in setting the stitch, as set forth.

In testimony whereof I have hereunto set my hand this 20th day of May, 1895.

FRANK CHASE.

Witnesses:

H. D. BATES,  
L. B. SPENCER.