

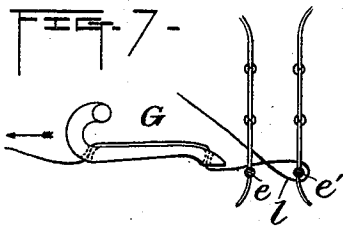
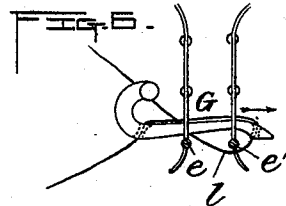
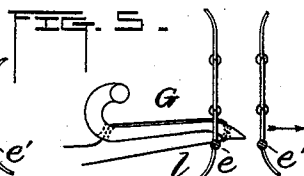
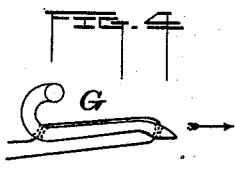
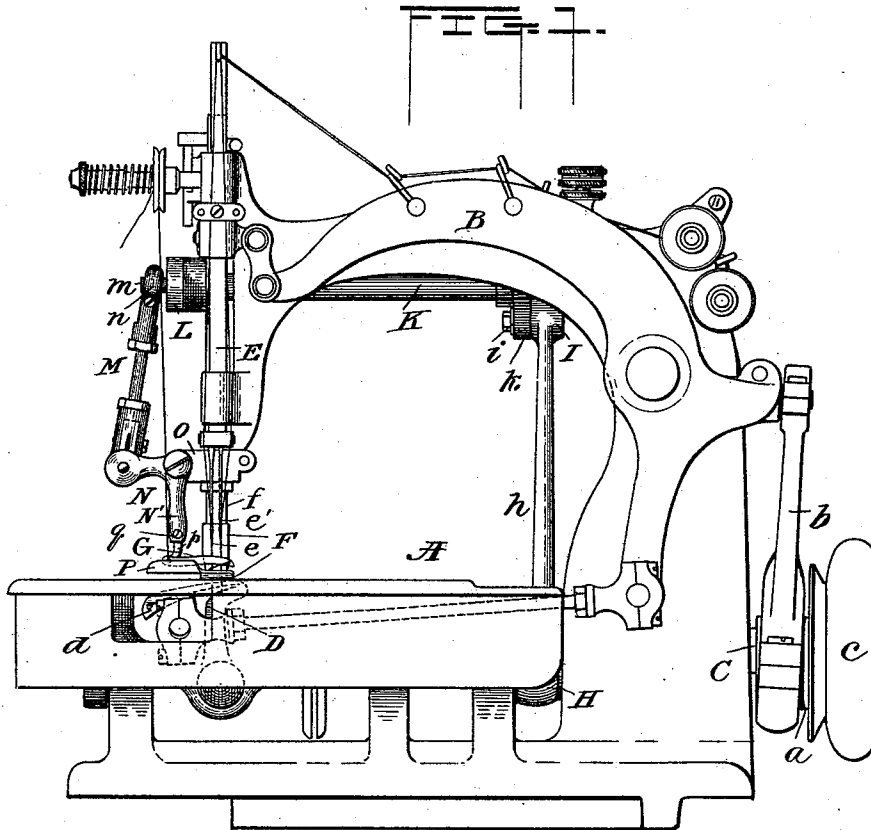
(No Model.)

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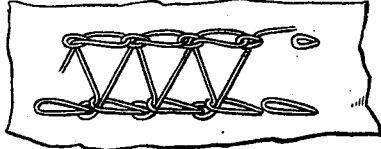
H. H. FEFEL.  
SEWING MACHINE.

No. 541,479.

Patented June 25, 1895.



Witnesses  
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 Attorney

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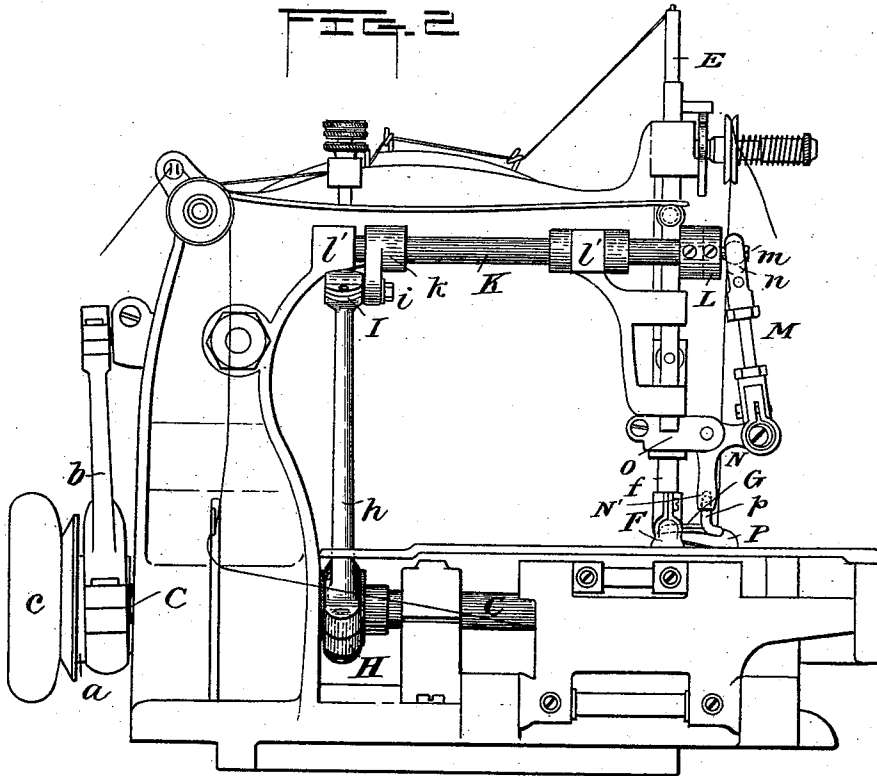


FIG. 2.

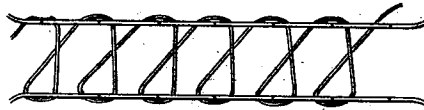
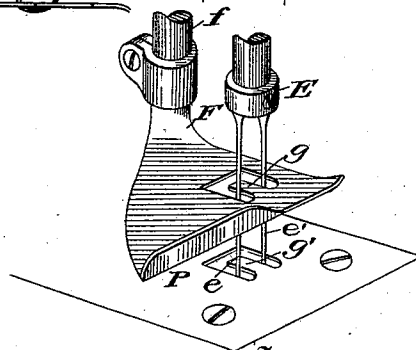
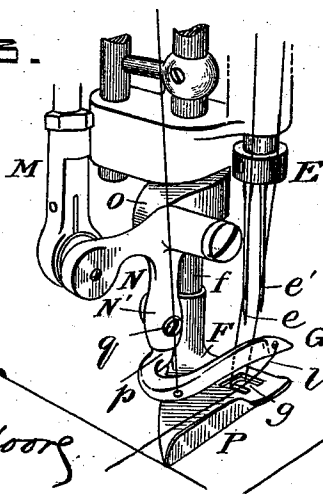


FIG. 3.

FIG. 3.



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# UNITED STATES PATENT OFFICE.

HENRY H. FEFEL, OF NEW YORK, N. Y., ASSIGNOR TO THE UNION SPECIAL SEWING MACHINE COMPANY, OF CHICAGO, ILLINOIS.

## SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 541,479, dated June 25, 1895.

Application filed October 8, 1892. Serial No. 448,218. (No model.)

To all whom it may concern:

Be it known that I, HENRY H. FEFEL, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to an improvement in sewing machines and is designed to be used principally in overseaming, uniting, or ornamenting knit fabrics, though as a matter of fact it can be applied for sewing any kind of material.

In an application filed of even date herewith, Serial No. 448,217, I have shown and described a peculiar seam of great utility when applied to fabrics and the object of the present invention is primarily to provide a machine adapted to make said seam, though of course, as to its features of construction I do not desire to be limited to any one form of seam.

The invention consists in the matters hereinafter described and referred to in the appended claims.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of a sewing-machine made in accordance with my invention. Fig. 2 is a rear view showing the mechanical connections for operating the thread-carrying device. Fig. 3 is an end view of part of the machine. Fig. 3<sup>a</sup> is a view similar to Fig. 3, but with portions of the operating mechanism removed and the presser-foot elevated above the cloth-plate to show the tongue on said throat-plate. Figs. 4, 5, 6, and 7 represent diagrammatic views of the manner of forming the stitch. Figs. 8 and 9 are respectively top and bottom views of the stitch.

In the drawings, A, represents the frame of the machine; B, the needle bar lever pivoted to the gooseneck and actuated in the usual manner from the main shaft C by eccentric and connecting rod *a*, *b*, said shaft being run by the belt wheel *c*.

D is an arm carrying the ordinary under thread carrying looper *d* and operated from

the needle arm extension in the well known way.

E is the needle bar receiving a vertical reciprocation by means of a link connection with the needle bar lever. Said needle bar as herein shown is provided with two needles *e e'* the former being the outer needle and the latter the inner one which latter is set higher than the former. It will be readily understood that any number of needles may be used.

So far as above described the parts are the same as in the well known Union Special Sewing Machine illustrated in Patent No. 344,493, and the same are operated in the same manner as disclosed in said patent.

F is the presser foot attached to the presser bar *f* in the ordinary manner, said presser foot being provided with an opening through which the needles pass and having a tongue or tongues *g* upon either side of which the needles pass. The upper thread carrier lays its thread over the tongue or tongues, and in the movement of the feed said thread slips off the tongue down upon the fabric.

I have herein shown the presser foot as having but one tongue, but it will be understood that instead said tongue may be located in the throat plate or indeed may be provided on both presser foot and throat plate as shown in Fig. 3<sup>a</sup>.

G is a thread carrying device herein shown as substantially in the form of a looper, said looper arranged above the throat plate and operated by the means hereinafter described. This looper is located as shown and carries the thread back and forth across the line of the seam. The movements of the looper are shown in Figs. 4, 5, 6 and 7. In Fig. 4 the looper G is shown in its farthest retracted position, the needles being at their lowest point, and the under thread carrying looper being in its farthest retracted position.

In the position of parts shown in Fig. 5 the under thread carrying looper has passed into the loops of the needle threads and the feed having started the fabric forward, the upper looper or thread carrying device has moved forward to a position in front of the threads carried by the needles, although in the rear of the needles themselves. Continuing the

movement the under thread carrying looper secures the needle threads in the customary manner and in the descent of the needles, the loop of the thread carried by the inner needle *e'* passes down through a loop *l* formed in the upper thread carried by the looper *G*. In the further descent of the needles and the backward movement of the upper thread carrying looper it passes behind the loops formed in the needle threads although still in rear of the plane of the needles and in its forward movement again, passes around the thread carried by the needles, and forward again around the thread of needle *e'*. It will be seen that the loop in the thread of the inner needle *e'* passes down through the loop *l* in the cross thread, while said cross thread passes around the first needle *e'*, thus making the stitch shown in the last two figures of the drawings.

As a means for reciprocating the upper thread carrying device or looper *I* provide the following: Secured on the main shaft is an eccentric *H* to which is attached the eccentric connecting rod *h*. It is provided at its upper end with a split bearing *I* through which passes a stud *i*, secured to a crank arm *k*, which at its opposite end is rigidly secured to the shaft *K* journaled in bearings *l' l'* attached to the gooseneck of the machine. Upon the other end of the shaft *K* is a crank *L* which carries on its opposite end a stud or pin *m* formed with a ball over which is fitted the socket *n* in the end of the connecting rod *M*, the same being similarly connected by a ball and socket joint with one end of the bell crank lever *N* as herein shown pivoted to a bracket *o*. The downwardly extending arm *N'* of the bell crank lever has a socket in its lower end in which the shank *p* of the upper thread carrying looper is removably secured by a set screw *q*.

The presser foot has a part *P* extending toward the end of the machine which acts as a guard for the looper *G* and takes the curl out of the fabric, preventing the looper striking the same in its forward movement.

In case it is desired to use more than two needles on the machine the number of tongues on the presser foot may be increased a proper amount.

It will be understood that any suitable trimmer may be used in combination with the described machine, arranged either before or behind or to one side of the needles. Furthermore the mechanism may be turned on end and a rotating pin cylinder attached thereto holding the material in position to be operated upon by the stitch pinning mechanism, substantially as shown in Patent No. 469,525.

Various minor modifications and changes may be made in the construction of the parts of this machine without departing from the spirit of my invention.

Having thus described my invention, what

I claim, and desire to secure by Letters Patent, is—

1. A sewing machine comprising a plurality of vertically reciprocating needles, and suitable feeding mechanism, a cloth-plate and a presser-foot having openings for the passage of the needles, one of said elements being provided with a tongue in rear of and in a plane between the openings for the passage of the needles, an under thread carrying device reciprocating below the cloth-plate and having means by which it is adapted to co-operate with the needles to form a cross stitch on the under surface of the fabric, and a single thread carrying device arranged above the cloth-plate in a plane parallel with and in rear of the vertical plane of the needles and at right angles to the line of feed, and means for reciprocating said thread carrying device, whereby it acts to lay a thread between the rows of stitches and across the said tongue, substantially as described.

2. A sewing machine comprising two vertically reciprocating, thread carrying, eye pointed needles and suitable feeding mechanism, a cloth-plate, a single under thread carrying looper arranged below the cloth-plate and having means by which it is adapted to co-operate with the needles to form a cross stitch on the under surface of the fabric, a presser-foot above the cloth-plate provided with openings for the passage of the needles, and a tongue in rear of and in a plane between said openings, and a single thread carrying device arranged above the presser-foot of the machine in a plane parallel with and in rear of the vertical plane of the needles and at right angles to the line of feed, with means for reciprocating said thread carrying device across the line of feed in said single plane, said upper thread carrying device acting to lay a thread between the two rows of stitches and across the tongue of the presser-foot; substantially as described.

3. In a sewing machine in combination with the main shaft the supplemental shaft *K*, the lugs on the goose neck of the machine forming bearings for said supplemental shaft, a crank *k* on said shaft, a connecting rod *h* secured to an eccentric on the main shaft and having a ball and socket connection with the crank *k*, a crank *L* on the end of said shaft *K*, a connecting rod *M*, pivoted lever *N* supporting the thread carrying device, a ball and socket connection between the connecting rod *M* and the crank *L* and bell crank lever *N*; substantially as described.

4. A sewing machine comprising suitable stitch forming mechanism including a thread carrying device reciprocating across the line of feed, and a presser-foot having a lateral extension with a guard for the thread carrying device; substantially as described.

5. In a sewing machine in combination with the stitch forming mechanism, a presser foot and a thread carrying device reciprocating

5 across the line of the seam, said presser foot being provided with a lateral extension for taking the curl out of the fabric to be sewed and provided with a guard for the thread carrying device, whereby the same is prevented from striking the fabric in its forward movement and said presser-foot having also a suitable tongue over which the thread carrying device lays a thread in its forward and back-

ward reciprocations; substantially as described.

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

HENRY H. FEFEL.

Witnesses.

J. H. HOWELL,  
HENRY R. BOYLE.