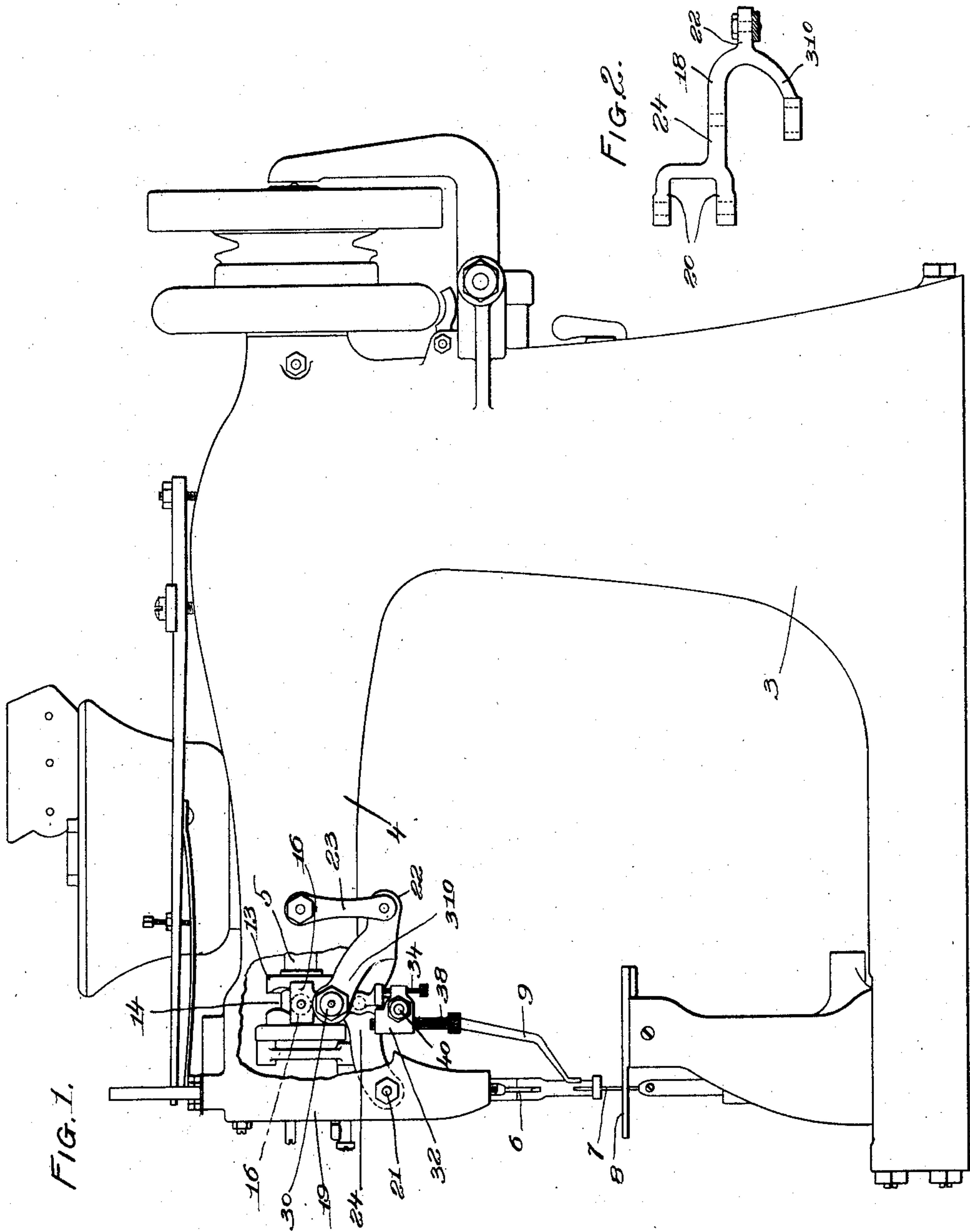


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APPLICATION FILED APR. 24, 1907.

Patented Dec. 15, 1908  
2 SHEETS—SHEET 1.



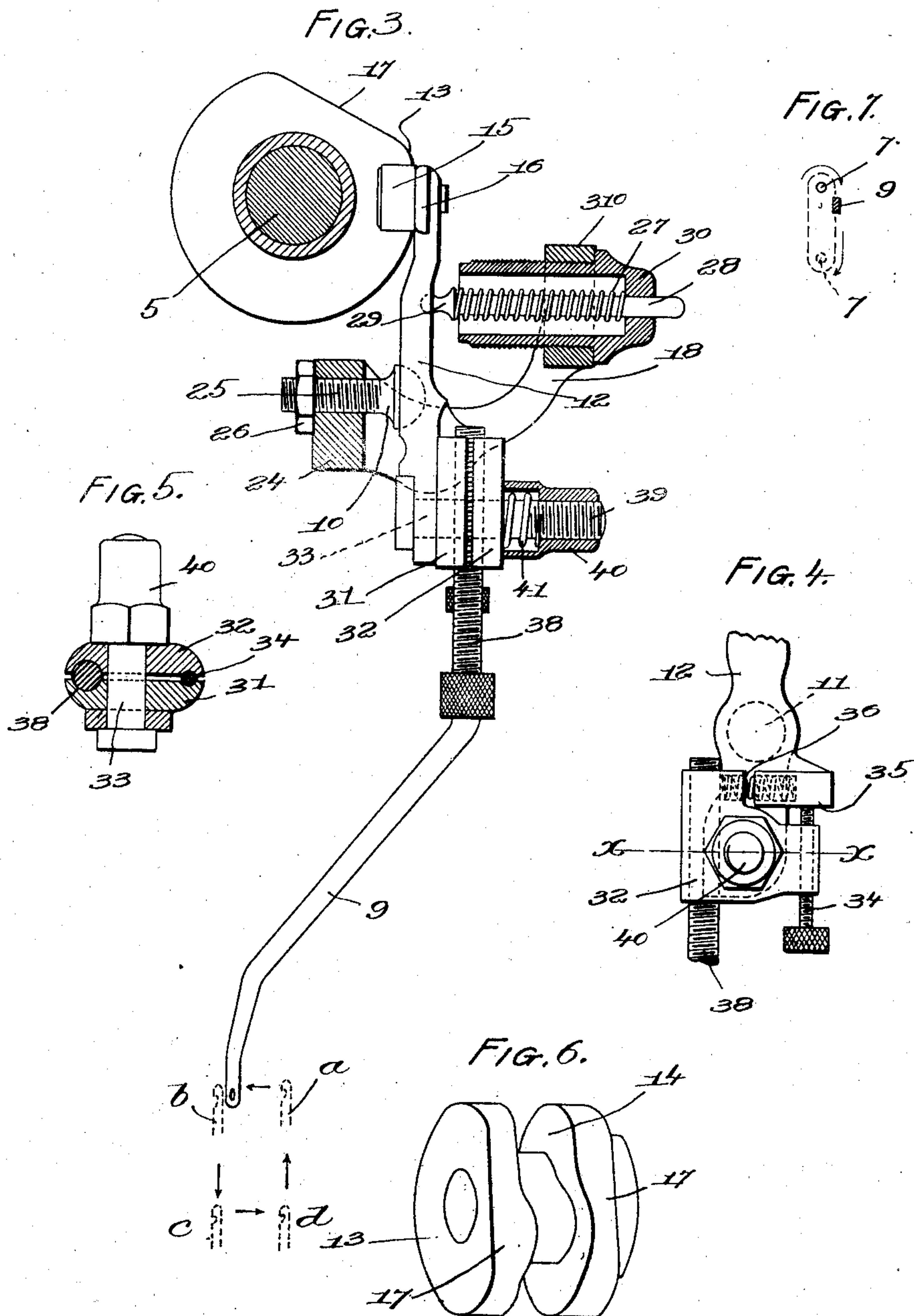
WITNESSES,  
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# UNITED STATES PATENT OFFICE.

JOSEPH FRENCH, OF WOONSOCKET, RHODE ISLAND.

## SEWING-MACHINE.

No. 907,027.

Specification of Letters Patent.

Patented Dec. 15, 1908.

Application filed April 24, 1907. Serial No. 369,914.

*To all whom it may concern:*

Be it known that I, JOSEPH FRENCH, a citizen of the United States, and a resident of Woonsocket, in the county of Providence and State of Rhode Island, have invented an Improvement in Sewing-Machines, of which the following description, in connection with the accompanying drawing, is a specification, like letters on the drawing representing like parts.

This invention relates to sewing machines of that class having a reciprocating hooked work-feeding needle and a thread-carrier to carry or loop the thread about the needle. A machine of this general class is shown in Patent No. 490,854, granted January 31, 1893 to F. W. Merrick.

One object of the present invention is to provide a sewing machine of this class in which the thread-carrier is brought to rest in its path at a point substantially opposite the position of the needle at the end of its feeding movement, and in which the thread-carrier is given its complete movement during a small portion of a complete rotation of the main shaft.

Another object of the invention is to provide a novel device for giving the thread-carrier the above described movement, which device is simple in construction and of such a nature that any wear which occurs therein will be automatically taken up.

I will first describe one embodiment of my invention and then point out the novel features thereof in the appended claims.

In the drawings, Figure 1 is a side view of a sewing machine showing my improved thread-carrier device applied thereto; Fig. 2 is a detail of the support for the thread-carrier; Fig. 3 is a detail in vertical section showing the thread-carrier; Fig. 4 shows a portion of the thread-carrier and its holder in side view; Fig. 5 is a section on the line  $x-x$ , Fig. 4; Fig. 6 is a side view of a cam for operating the thread-carrier, and Fig. 7 is a diagram showing the path of movement of the thread-carrier.

The sewing machine herein shown comprises the base or frame 3 having the overhanging arm 4 in which is mounted the driving shaft 5 for giving reciprocation to the awl 6 and movement to the thread-carrier 9.

The hooked needle is represented at 7 and it works through the work-support 8 and is

operated by any suitable or usual mechanism.

The parts thus far described are or may be of any suitable or usual construction, and in the illustrated embodiment of my invention they are similar to the corresponding parts shown in the above mentioned patent and they operate in a similar manner.

In a machine such as described the needle is given its upward or penetrative movement to penetrate the work when said needle is in one vertical position, and after the needle has penetrated the work the thread-carrier loops the thread about the needle, and the needle while still in the work is moved laterally in the direction of the line of feed thereby to feed the work forward. When the work has been fed the needle is withdrawn thereby drawing the last-formed loop through the work and enchaining the previously-formed loop thereon, the needle after having been withdrawn from the work moving laterally to return to its initial vertical position already to penetrate the work again.

In my improved device I have provided a thread-carrier-operating mechanism which moves the thread-carrier in an elliptical path and which brings the thread-carrier to rest at a point in its path substantially opposite the position of the needle at the end of its feeding movement.

In the embodiment of the invention herein shown the thread-carrier dwells between each successive movement thereof while the main shaft is making approximately three-quarters of a revolution, and the complete movement of the thread-carrier is accomplished during the other one-quarter of the revolution of the said main shaft.

The thread-carrier 9 is mounted to turn about a fulcrum member 10 which is shown as in the shape of a ball which sets in a corresponding socket 11 in the holder 12. The thread-carrier is given its movement by means of the cam 13 that is fixedly mounted on the main shaft 5. This cam has two cam portions, one of which is adapted to give a movement to the thread-carrier in the direction of the line of feed and the other of which is adapted to move the thread-carrier in a direction transversely to the line of feed.

The cam herein shown is provided with a cam groove 14 which co-acts with a roll or projection 15 carried by the holder 12, said groove 15 being shaped to give the thread-



carrier its movement transversely to the line of feed. The holder 12 is also provided with the bearing surfaces 16 which rest on the faces 17 of the cam, and said cam faces 17 are shaped to give the thread-carrier a movement in the direction of the line of feed.

The fulcrum-member 10 may be supported in any suitable way, and I have for convenience shown it as mounted in a bracket or support 18, shown best in Fig. 2, which is adapted to be secured to the overhanging arm 4 and head 19 in any suitable way. The bracket or support herein shown has the forked end 20 which enters the head 19 and is secured thereto by means of suitable bolts or screws 21 and the arm 22 to which is secured one end of a link 23, the other end of said link being mounted on the overhanging arm 4. The fulcrum member is mounted in the body 24 of the support and preferably said fulcrum member has the screw-threaded stem 25 which is screw-threaded into the body so as to permit said fulcrum member to be adjusted. The fulcrum member is locked in its adjusted position by a suitable lock nut 26. The holder 12 is held against the fulcrum member 10 by means of a spring 27 which encircles the stem of the thrust member 28 and acts against the same to hold the head 29 thereof against the holder 12. The other end of the spring 27 acts against a resistance member 30 which is shown as screw-threaded into the arm 310 of the bracket or support 18, and which is shown as hollowed out to receive the spring and thrust member. The screw-threaded engagement of the resistance member with the arm 310 permits the parts to be adjusted to take up wear. It will be noted that the spring 27 acts against the holder 12 between the fulcrum member and the cam, and therefore in all movements of the parts it will maintain the holder in engagement with both the fulcrum member and the cam. By making the fulcrum member with a ball fitting into a socket in the holder all the necessary movements of the thread-carrier are permitted without any other bearing between the parts than the ball and socket bearing between the holder and the fulcrum member. The cam groove 14 and cam surface 17 are so arranged that the entire movement of the thread-carrier takes place during about approximately one-quarter of a revolution of the main shaft 5 and during the other three-quarters of the revolution said thread-carrier is stationary.

In Figs. 3 and 7 I have shown diagrammatically the movements of the thread-carrier and the needle. In Fig. 7 the dotted lines indicate the path of movement of the thread-carrier, and I have shown in dotted lines Fig. 7 the vertical position of the needle during its penetrative movement, and in full lines the position of said needle at the end of the feeding stroke; and as shown in Fig. 3 the

needle moves from position *d* to position *a* while penetrating the work, from the position *a* to the position *b* during the feeding of the work and from position *b* to position *c* while drawing the loop through the work. The thread-carrier is shown in Figs. 3 and 7 in its position of rest. From these figures it will be seen that the position of the thread-carrier during the time of dwell is approximately opposite the position of the needle at the end of the feeding stroke. The advantage of this construction is that since the thread is looped about the needle at some time during its penetrative movement and its feeding stroke, said thread-carrier is at rest while the last-formed loop is being drawn through the work, and therefore said thread-carrier does not exert any added tension on the thread as would be the case if it were moving to the right, Fig. 3, during the downward movement of the needle.

The advantage of having the thread-carrier move in an elliptical path as shown is that it permits a comparatively long stitch to be made without the necessity of moving the thread-carrier in a circle of large diameter. I have also shown a novel means for adjusting the thread-carrier relative to the holder 12. As herein shown the thread-carrier is supported in a clamp comprising the two members 31 and 32 which are mounted on a stud 33 extending from the holder 12. 34 is an adjusting screw which is confined between the two members 31, 32, and has screw-threaded engagement with each, and which bears against the shoulder 35 on the holder. By adjusting the screw 34 the clamp can be turned about the stud 33 thereby swinging the thread-carrier transversely to the direction of feed. A suitable spring 36 serves to keep the adjusting screw in contact with the shoulder 35. I have also shown the thread-carrier as having the screw-threaded stem 38 which is confined between the clamping members 31, 32, and has screw-threaded engagement with each, whereby the thread-carrier may be adjusted vertically. The stud 33 is screw-threaded as at 39, and screw-threaded thereon is the cap nut 40 within which is a spring 41. By tightening up the nut 40 the two members 31, 32, are clamped firmly onto the adjusting screw 34 and the stem 38, and both the stem and adjusting screw are thus locked from movement. When it is desired to adjust either the screw 34 or the stem 38 the nut 40 is backed off slightly to permit such adjustment, and when this is done the spring 41 still clamps the members 31, 32 together sufficiently to prevent either the adjusting screw or the stem 38 from falling out of position.

I have shown herein one simple embodiment of my invention only and have not attempted to show all forms thereof.



Having fully described my invention, what I claim as new and desire to secure by Letters Patent is:—

1. In a sewing machine, the combination  
5 with a work rest, of a hooked needle below  
the work rest, means to move the needle ver-  
tically to give it its penetrative movement  
and laterally to give it its work-feeding move-  
10 means to move the thread carrier about the  
needle to loop the thread thereabout and to  
maintain said carrier at rest after each com-  
plete movement thereof at a point opposite  
the position of the needle at the end of its  
15 work-feeding movement.

2. In a sewing machine, the combination  
with a work rest, of a hooked needle below  
said work rest, means to move the needle ver-  
tically to give it its penetrative movement  
20 and laterally to give it its work-feeding move-  
ment, a thread carrier located above the  
work rest, and means to give the thread car-  
rier a movement about the needle to loop the  
thread thereabout, said means operating to  
25 complete the movement of the thread carrier  
and bring the latter to rest prior to the back-  
ward movement of the needle.

3. In a sewing machine, the combination  
with a hooked needle of means to give the  
30 needle its penetrative movement and also a  
work feeding movement, a thread-carrier,  
and means to give the thread-carrier a move-  
ment about the needle to loop the thread  
thereabout during the penetrative movement  
35 of the needle and to maintain said carrier at  
rest during the work feeding and the back-  
ward movement of the needle.

4. In a sewing machine, the combination  
with a needle and its operating mechanism,  
40 of a thread-carrier to loop the thread about  
the needle, a single fulcrum member for the  
thread-carrier, said thread-carrier and ful-  
crum member having a ball-and-socket ful-  
cruming engagement with each other where-  
45 by the thread-carrier may move about the  
fulcrum member in a plurality of directions,  
and a cam to give the thread-carrier its move-  
ment.

5. In a sewing machine, the combination  
50 with a needle and its operating mechanism of  
a thread-carrier to loop the thread about the  
needle, a holder for the carrier, a single ful-  
crum member having a ball-shaped end  
against which the holder rests, means to  
55 maintain the holder in operative engagement

with said fulcrum member, and a cam for op-  
erating the holder thereby to give the thread-  
carrier its movement.

6. In a sewing machine, the combination  
with a needle and its operating mechanism of 60  
a thread-carrier to loop the thread about the  
needle, a holder for the carrier, a single ful-  
crum member having a ball-shaped end  
against which the holder rests, means to  
maintain the holder in operative engagement 65  
with said fulcrum member, and a single cam  
to operate the holder, said cam having a cam  
groove and two cam surfaces in different  
planes.

7. In a sewing machine, the combination 70  
with a needle and its operating mechanism of  
a thread-carrier to loop the thread about the  
needle, a holder for the carrier, a single ful-  
crum member having a ball-shaped end  
against which the holder rests, a cam for op- 75  
erating the holder thereby to give the thread-  
carrier its movement, and a spring to main-  
tain the holder in engagement with both the  
cam and the fulcrum member.

8. In a sewing machine, the combination 80  
with a needle and its operating mechanism of  
a single fulcrum member having a ball-  
shaped end, a holder having fulcruming en-  
gagement with said fulcrum member, means  
to maintain the holder in operative engage- 85  
ment with said fulcrum member, a thread-  
carrier adjustably supported by the holder  
and a cam for operating the holder to cause  
the thread-carrier to loop the thread about  
the needle. 90

9. In a sewing machine, the combination  
with a needle and its operating mechanism of  
a single fulcrum member having a ball-  
shaped end, a holder having fulcruming en-  
gagement with said fulcrum member, means 95  
to maintain the holder in operative engage-  
ment with said fulcrum member, a thread-  
carrier supported by the holder and adjust-  
able both vertically and transversely relative  
thereto, and a cam for operating the holder to 100  
cause the thread-carrier to loop the thread  
about the needle.

In testimony whereof, I have signed my  
name to this specification, in the presence of  
two subscribing witnesses.

JOSEPH FRENCH.

Witnesses:

LOUIS C. SMITH,  
ELIZABETH R. MORRISON.