(No Model.)

T. A. WEBER.

SEWING MACHINE.

No. 469,458. Patented Feb. 23, 1892.

Fig. 1.

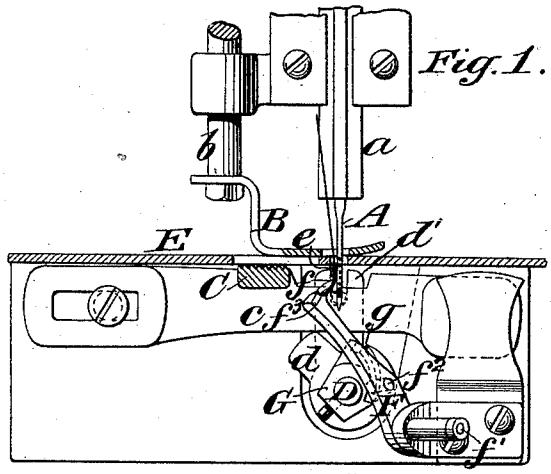


Fig. 2.

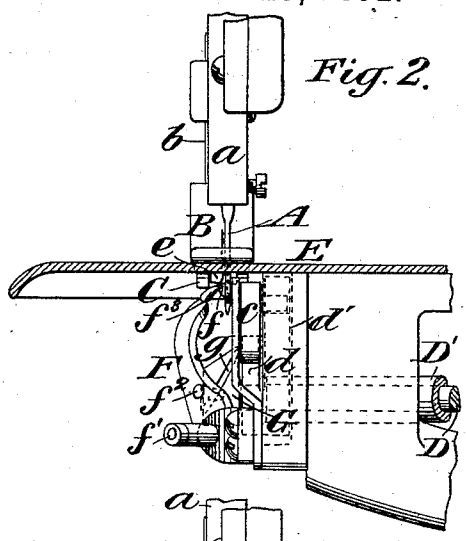


Fig. 3.

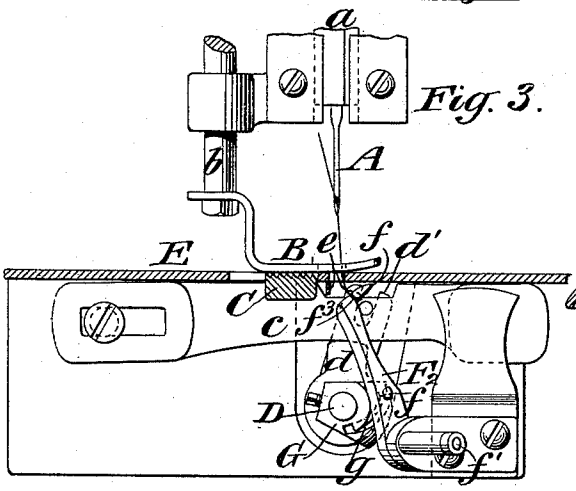


Fig. 4.

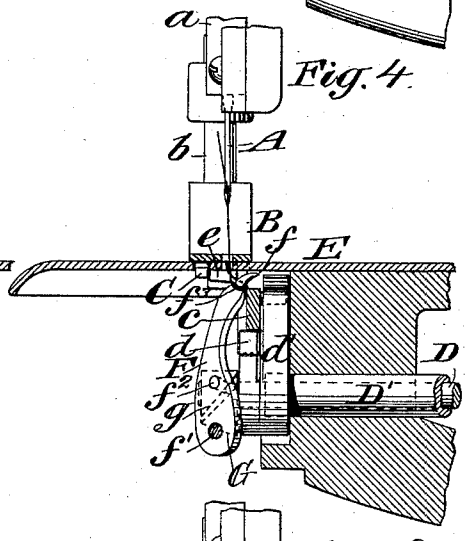


Fig. 5.

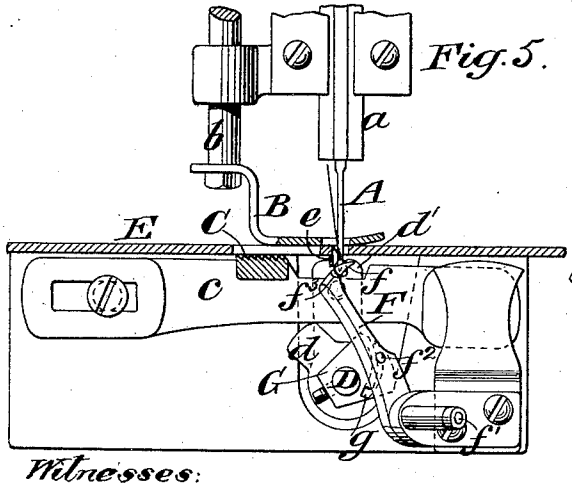
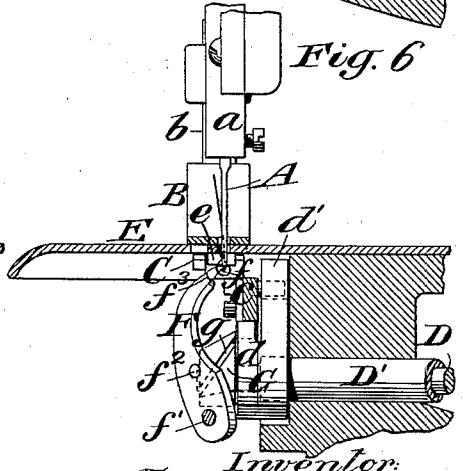


Fig. 6



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UNITED STATES PATENT OFFICE.

THEODORE A. WEBER, OF NEW YORK, N. Y., ASSIGNOR TO ELI W. BROADBENT, OF SAME PLACE.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 469,458, dated February 23, 1892.

Application filed June 24, 1891. Serial No. 397,317. (No model.)

To all whom it may concern:

Be it known that I, THEODORE A. WEBER, of the city and county of New York, in the State of New York, have invented a new and useful Improvement in Sewing-Machines, of which the following is a specification.

My invention relates to an improvement in sewing-machines of the single-thread or chain-stitch type, in which the loop is formed by a vibrating hook positively driven and so arranged with respect to the needle motion that the necessity of a special take-up mechanism is avoided and the machine rendered capable of a very rapid movement.

A practical embodiment of my invention is represented in the accompanying drawings, in which—

Figure 1 is a view of a portion of the machine in end elevation, showing the looper, feed, needle, and presser-foot in position as in use, the parts being represented in the position which they assume when the needle is slightly above the limit of its downward stroke. Fig. 2 is a view of the same in front elevation. Fig. 3 is a view of the same in end elevation with the parts in the position which they assume when the needle has completed the limit of its upward stroke. Fig. 4 is a front view of the same, the looper having just started on its backward or return stroke. Fig. 5 is an end view of the same, showing the position of the parts when the looper has returned to the position to receive the needle on its downward stroke through the loop held on the looper; and Fig. 6 is a front view of the same, showing the looper as just completing its rearward stroke and the needle passing through the loop which the looper has just shed.

A represents the needle fixed to a bevel-sided bar *a*, to which a reciprocating movement is imparted by any of the well-known means in connection with sewing-machines.

B represents the presser-foot attached to the vertically-reciprocating bar *b*, to which motion is imparted by the usual well-known means.

The feed-jaw is represented by C and is carried by a vertically and longitudinally reciprocating bar *c*, to which motion is imparted by a cam *d* and an arm *d'*, fixed, respectively, upon a rocking shaft D and on a sleeve D', mounted on said shaft. The rocking movements of the shaft D and the sleeve D' are imparted by well-known mechanism in connection with the drive-shaft of the machine. The cam *d* gives to the bar *c* its vertically-reciprocating movement and the arm *d'* gives to the bar its longitudinally-reciprocating movement, so that the feed-jaw C is caused to move in a direction to feed the fabric along the surface of the table E.

The gist of my invention lies in the structure and arrangement of the looper-hook in connection with the movements of the feed mechanism and needle, as follows: The looper consists of a vibrating hook, the shank of which is represented by F and the bill or point by *f*. The bill or point *f* is located at the free end of the shank, the opposite end of said shank being fixed upon a spindle or pivot *f'*, the axis of the spindle or pivot being set obliquely to the axis of the shaft D, so as to give to the free end of the shank a movement obliquely across the space beneath the table E in proximity to the path in which the needle A reciprocates. Positive motion is imparted to the looper by means of a stud f^2, which projects from the side of the shank F and is adapted to loosely engage a winding-groove *g*, formed in the face of a block G, fixed to the end of the rock-shaft D. The shape of the groove *g* is such that the rocking of the shaft D back and forth will impart to the looper its vibrating movement. The bill of the hook gradually swells in size from its point toward its end attached to the shank F, and at the point f^3, where it meets the shank F, there is a pronounced shoulder to prevent the thread from passing onto the shank F.

The table E is provided with a depending abutment *e*, located to the rear of and in proximity to the path of the needle, which serves to engage the loop as the looper-hook recedes and spreads and holds it in position to insure the passage of the needle therethrough upon its downward stroke.

The operation is as follows: The needle after it has descended and carried the thread through the fabric as it first begins its return movement slightly loosens the thread at its

side and above its eye, and at this moment the bill of the looper as the latter is advanced enters between the needle and the thread and forms the loop as the needle recedes upon its upward stroke. As the needle reaches the limit of its upward stroke the looper-hook begins its retrograde movement, and just as it passes the path in which the needle reciprocates the loop on its bill has been engaged by the abutment *e* on the table and is held more or less horizontally, so that the point of the needle, which at this moment is again descending through the table, enters the loop as the looper-hook recedes and sheds the loop off its point. By this structure and arrangement of the parts the bill of the looper may be made comparatively small, so as to take up a very slight amount of thread—as a matter of fact, no more than is required to form the stitch—and yet the loop is so positively held in position to receive the needle that its failure to so receive it is entirely avoided. The positive movement of the looper-hook imparted to it by the winding or cam groove *g* in the block G prevents any sudden jerky motion and at the same time insures its vibration with the greatest precision, while the parts, because of their slight movements, may be operated at a very high rate of speed without any tendency to drop a stitch or break a thread.

What I claim is—

The combination, with the reciprocating needle, the rock-shaft, and the feed mechanism, of a pivot set at an angle to the rock-shaft, a vibrating looper-hook mounted upon said pivot and having a swinging movement obliquely to the rock-shaft, a winding-cam, and a pin or stud in position to engage the cam, the winding-cam and the pin or stud being carried the one by the rock-shaft and the other by the vibrating looper, substantially as set forth.

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