

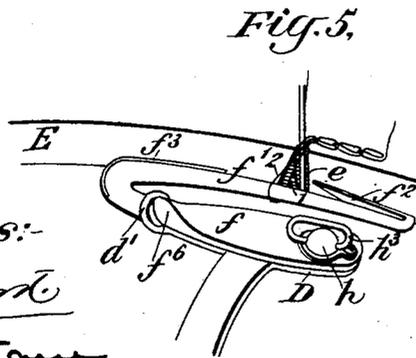
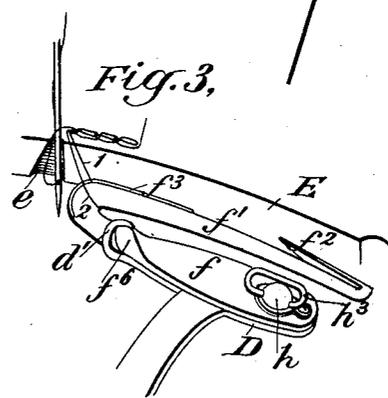
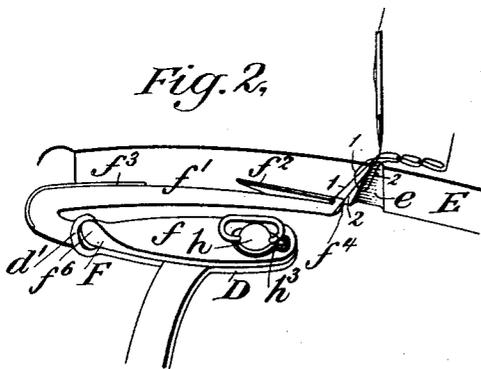
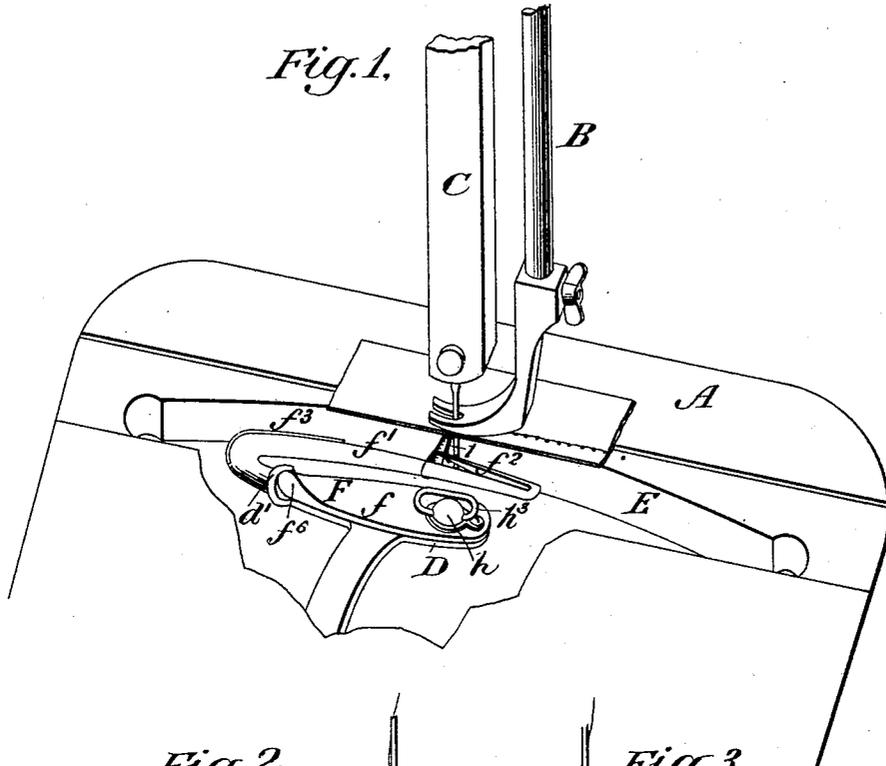
(No Model.)

2 Sheets—Sheet 1.

E. J. TOOF.
SEWING MACHINE.

No. 587,620.

Patented Aug. 3, 1897.



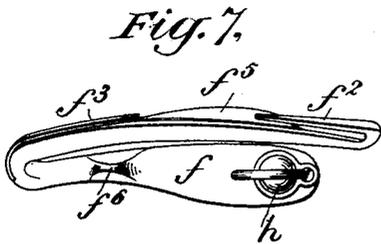
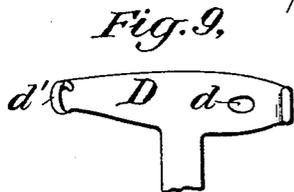
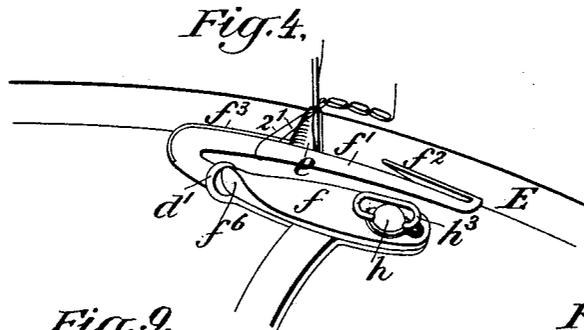
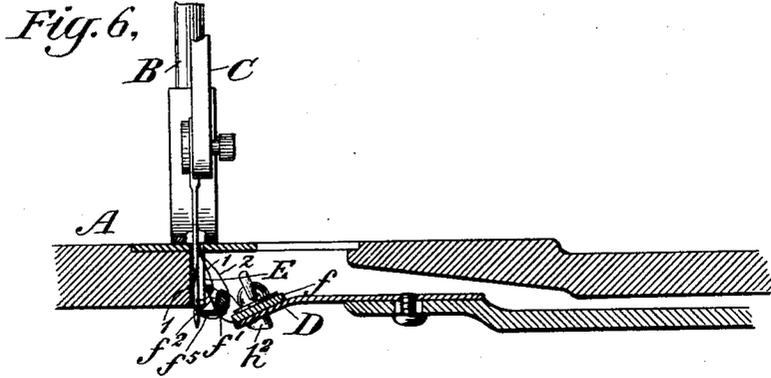
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Inventor:-
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SEWING MACHINE.

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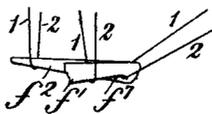
Patented Aug. 3, 1897.



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B. H. Hayward
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Fig. 11.



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UNITED STATES PATENT OFFICE.

EDWIN J. TOOF, OF NEW HAVEN, CONNECTICUT.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 587,620, dated August 3, 1897.

Application filed February 3, 1890. Serial No. 339,050. (No model.)

To all whom it may concern:

Be it known that I, EDWIN J. TOOF, a citizen of the United States, and a resident of the city and county of New Haven, State of Connecticut, have invented new and useful Improvements in Sewing-Machines, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates particularly to that class of lock-stitch sewing-machines employing a reciprocating shuttle, and has for its object to adapt such machines for making either a lock-stitch or chain-stitch, as may be desired, which object I secure by the means forming my invention, as will hereinafter be set forth in detail, and pointed out in the claims.

Referring to the drawings, Figure 1 is a perspective view of a portion of the bed-plate of a sewing-machine with the slide-plates removed, showing the wall of the raceway and the shuttle-carrier with a looper (for making a chain-stitch) supported therein, also a portion of the presser and needle bars. This figure further illustrates the looper in engagement with the needle-thread in one of the positions assumed during the formation of a stitch. Figs. 2, 3, 4, and 5 represent the shuttle-carrier and looper with a portion of the raceway and needle, showing the looper in engagement with the needle-thread during the several different positions assumed during the course of the operations in the formation of a stitch, to be hereinafter referred to. Fig. 6 represents a longitudinal section through the machine, as shown in Fig. 1, on a line just left of the needle, showing the position of the looper with relation to the raceway and the relative positions of the thread-loops and loop-engaging point of the looper when the latter is in the position shown in Fig. 1. Figs. 7 and 8 represent a plan and edge view, respectively, of the looper detached from the shuttle-carrier; Fig. 9, a plan view of the shuttle carrier or cradle; Fig. 10, the locking device for securing the looper in the shuttle-carrier detached from the looper; and Fig. 11 represents a detail view to be hereinafter referred to.

To explain in detail, A represents the bed-plate of a sewing-machine; B, the presser-bar; C, the needle-bar; D, the shuttle carrier or cradle; E, the wall of the raceway, and F my improved looper. This looper, which is adapted to be detachably secured in the

carrier D in lieu of the shuttle and be operated thereby in a manner as will be described, consists of a supporting-shank f , provided with an arm or bar f' , connected therewith, which extends when the looper is in operative position in a line substantially parallel with the wall of the raceway and is provided at one end thereof and on that side adjacent to said wall with a loop-engaging hook f^2 and at its opposite end with a loop-retarding arm f^3 , extending in a direction toward the point of the hook f^2 and in a position close to the arm f' , as shown.

The point of the hook f^2 at the forward movement of the looper enters the loop 1, being thrown out by the needle, as shown in Figs. 1 and 6, and passes through the same until the limit of movement in that direction is reached, as shown in Fig. 2, and the loop lies in the crotch between the hook and the arm, at which point the inner side 2 of the loop, which up to this time moved between the hook f^2 and the wall of the race, has been guided around the end of the arm f' in a position, as shown in Fig. 2, whereby said arm will pass through the loop during the backward or return movement of the looper. The inner side 2 of the loop is thus caused to be passed around or onto the end of the arm f' at the limit of the forward movement of the looper, as described, by reason of the lower edge of said arm at its point of union or connection with the hook being formed to extend above the lower edge of the latter, as at f'' in Fig. 11, whereby the engaged loop will be drawn or guided to said higher edge at the limit of movement of the looper in its forward movement and the forward side 2 of the loop be necessarily guided from the face side of the hook to a position to encircle the arm f' , as clearly shown in said Fig. 11, which latter figure shows an edge view of one end of the arm f' , with the hook f^2 and the engaged loop, illustrating the manner in which the latter is guided from the hook to the arm f' . The looper now begins its backward or return movement with the arm f' passing through the engaged or encircling loop until the end of the retarding-arm f^3 is reached, between which and the arm f' the side 1 of the loop is then caused to be passed and slightly impinged until the limit of movement in that direction is reached, as shown in Fig. 3. The function of this arm f^3 takes place at the next

forward movement of the looper, as shown in Fig. 4, when the hook f^2 is being moved forward to enter the loop now being thrown out by the needle, which function consists in holding the loop during the change of movement of the looper, carrying it past the new loop now being formed by the needle and retarding the same during the beginning of this forward movement of the looper at an angle away from contact with the said new loop, as clearly shown in Fig. 4.

In order to insure the inner side 1 of the loop being moved and held in position away from the path of the forwardly-moving hook f^2 to prevent the latter from engaging therewith and also insure the free passage of the hook between the opposite sides 1 and 2 of the loop, I have provided the arm f^1 with a longitudinally-tapering flange f^3 , located almost wholly forward of the end of the hook f^2 and projecting laterally beyond the same and behind the wall of the raceway, as clearly shown in Fig. 6, and have provided the wall of the raceway with a depression e therein, located adjacent to the path of the needle and on that side thereof opposite the advancing hook f^2 , as clearly shown in the several figures of the drawings.

The flange f^3 is adapted to engage with the inner side 1 of the loop after the retarding-arm f^3 has moved beyond the same and move or locate it into the said depression e behind the face-wall of the raceway, as shown in Fig. 5. The arm f^3 acting upon the loop as before described, whereby it produces a slight drag upon the same, also thereby assists in locating the inner side of the loop in its proper position within the groove e at an angle therein away from the needle and its loop, as shown in Fig. 5. The inner side 1 of the loop now being located behind the wall of the raceway, the advancing hook is free to enter the loop now formed by the needle, as shown in Figs. 1 and 6, and pass through the first loop 1 2 without any possibility of interfering therewith. After the hook has passed through said loop 1 2 the latter is drawn over or outside of the loop just being engaged by the looper; and when drawn up encircles the latter loop, as shown in Fig. 2, to form a stitch in the manner well understood by those skilled in the art.

The shank f of the looper, which is adapted to be seated and detachably secured in the carrier or cradle D, is provided with a hook or locking device h , whereby such connection is secured, which consists of a spindle h^1 , extending through an opening in the looper-shank and provided at its lower end with a hook h^2 and at its upper end with a head h^3 as a convenient means for turning or operating the same. When the looper-shank is placed in the carrier D, the hook h^2 is passed through the opening d with which the carrier is provided and is then turned to engage with the under wall of the carrier, as shown in Fig. 6, and hold the looper rigidly and detachably

in its operative position. The looper-shank is also provided (in the present instance shown) with a projection f^6 on its upper side, which projects upward in a position behind the retaining-arm d' , with which the carrier is provided, to assist in retaining the looper in position. Such projection may, however, be dispensed with. The looper by the means described is thus rigidly supported by the carrier in operative position and away from contact with the wall of the shuttle-race to avoid any friction with the latter.

The thread-engaging flange f^5 , as shown in Fig. 6 and before referred to as extending behind the face-wall of the raceway for the purpose described, may, however, in lieu of extending behind the same, as shown, be supported with its edge in a line with the vertical face of the wall and perform the same function, as it will be obvious that the thread will be forced or located in the depression e when the edge of the flange is in such latter position. The means described for retarding the loop on the return movement of the looper may also be more or less changed or modified or be entirely dispensed with without departing from the spirit of my invention.

Having thus set forth my invention, what I claim as new, and desire to secure by Letters Patent of the United States, is—

1. In a sewing-machine, the combination with the wall of the raceway provided with a transversely-arranged depression therein at one side of, and adjacent to, the path of the needle, of a reciprocating looper provided with a thread-engaging hook, and with a projecting flange located forward of the hook having a thread-engaging edge located adjacent to the point of the latter and to the wall of the race, whereby the engaging side of the loop will be located in said depression in the raceway and from the path of said hook, substantially as described and for the purpose set forth.

2. In a sewing-machine, the combination with the wall of the raceway provided with a transversely-arranged depression therein at one side of, and adjacent to, the path of the needle, of a reciprocating looper provided with a loop-engaging hook, a flange located forward of said hook, projecting laterally beyond the point of the same and behind the face-wall of the raceway, whereby the inner side of an engaged loop will be located in said depression in the raceway, and with means for engaging with an encircling loop to prevent undue slack of the same on the looper-arm during the forward movement of the hook to enter the next loop thrown out by the needle, substantially as described and for the purpose set forth.

EDWIN J. TOOF.

Witnesses:

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CHAS. F. DANE.