

(Model.)

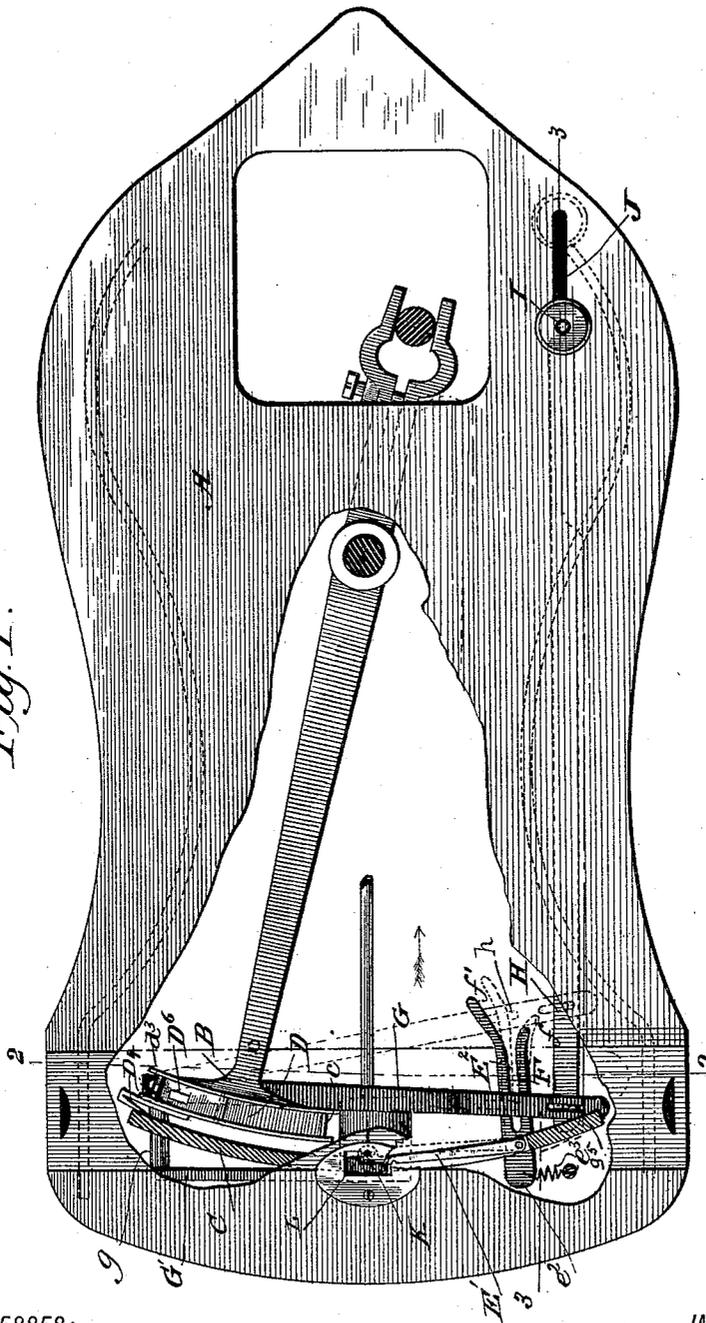
3 Sheets—Sheet 1.

J. T. BOWYER.
SEWING MACHINE.

No. 454,708.

Patented June 23, 1891.

Fig. 1.



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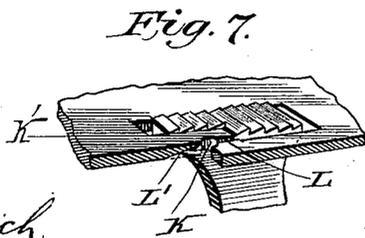
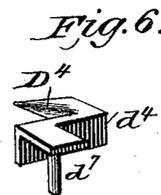
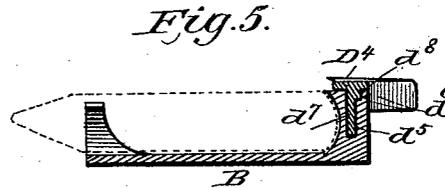
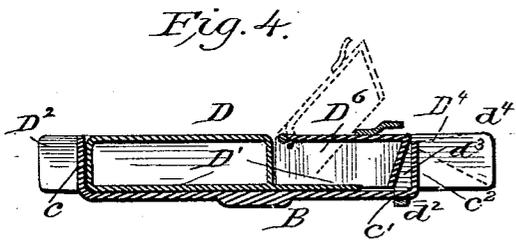
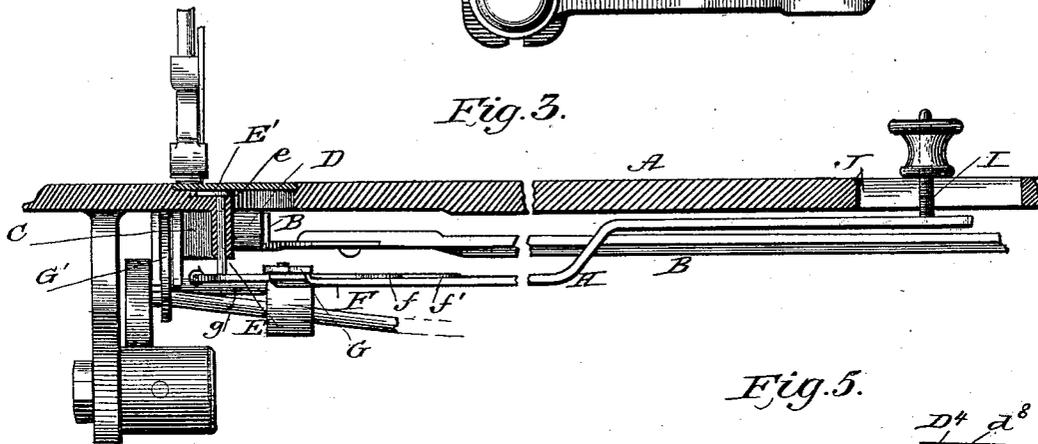
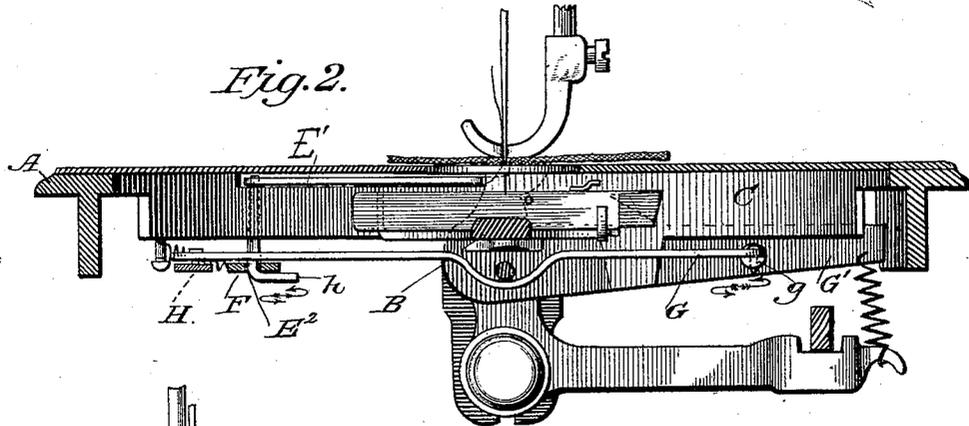
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UNITED STATES PATENT OFFICE.

JEROME TOLEDO BOWYER, OF WINFIELD, WEST VIRGINIA.

SEWING-MACHINE.

SPECIFICATION forming part of Letters Patent No. 454,708, dated June 23, 1891.

Application filed September 5, 1888. Serial No. 284,673. (Model.)

To all whom it may concern:

Be it known that I, JEROME TOLEDO BOWYER, residing at Winfield, in the county of Putnam and State of West Virginia, have invented certain new and useful Improvements in Sewing-Machines, of which the following is a specification.

My invention relates to certain attachments which may be readily applied to various makes of sewing-machines which have a lower shuttle and which produce what is known as a "lock-stitch," whereby the character of said stitch may be changed to a chain-stitch when desired; and it consists in arranging said attachments in connection with certain operative parts of the machine, said attachments being adapted to be quickly thrown into or out of operative position, thereby permitting either the chain-stitch or the lock-stitch to be made by the machine; and it further consists in a novel construction and combination of parts which will be hereinafter fully described in the annexed specification, and particularly pointed out in the claims, reference being had to the accompanying drawings, in which—

Figure 1 is a top plan view of the bed-plate of a "shuttle" sewing-machine with the shuttle removed and the attachments arranged in position for operation, part of the bed-plate being broken away. Fig. 2 is a transverse section on the line 2 2, Fig. 1. Fig. 3 is a section on the line 3 3, Fig. 1. Fig. 4 is a detail view of the looper and its connection with the shuttle-carrier. Fig. 5 is a detail view illustrating a modified form of looper, and Figs. 6 and 7 are detail views which will hereinafter be referred to. Fig. 8 is a detail plan view showing the shuttle-looper in its position for making the loop. Fig. 9 is a similar view showing the shuttle in its back position and the loop-holder engaging the loop last made. Fig. 10 is a detail view of the forked lever and its connection with the shifting or adjusting arm and the operating-bar, and Figs. 11 and 12 illustrate the manner in which the loop is made.

I will first proceed to generally describe the invention, and then specifically point out the operation and construction of the several parts in detail.

While my invention may be applied with any machine using the shuttle and reciprocating carrier-arm, I shall for convenience of reference describe and illustrate it in connection with what is known as the "Domestic Sewing-Machine."

When it is desired to convert the machine into a chain-stitch machine, a looper is detachably secured to the shuttle-carrier, which is adapted to operate in the shuttle-race at a point usually traversed by the point of the shuttle, and which looper passes between the thread and needle, is moved backward and forward by the shuttle-carrier, and is adapted to catch and engage the thread-loop and carry the same forward, where it is caught at proper intervals by a notched arm of a lever pivoted just below the bed-plate and a short distance in front of the needle-aperture, where it is retained while the looper is on its return movement. The bent lever is arranged to be automatically thrown in and out of engagement with the thread-loop, and such operation is accomplished by connecting the said bent lever with a longitudinal bar, which is connected at its inner or rear end to the feed mechanism of the machine and is arranged to be moved backward and forward by the alternate movements of said feed mechanism. The longitudinal bar is connected at its forward end with a forked extension of the pivoted lever arranged at the lower end thereof. Thus it will be understood that when the looper is at its farthest point forward, carrying the loop in the thread, the longitudinal bar will be moved backward by the movement of the feed device to which it is connected, which occurs at the time that the needle is at its highest point. This backward movement of the feed-bar and longitudinal bar is communicated to the bent lever and causes the notched arm of said lever to engage the loop in the thread at the proper instant. The looper now starts backward and leaves the thread, which remains on the notched arm of the bent lever, which arm presses the thread to the left of the needle-opening, and thus retains the loop in the thread until the descending needle carrying the thread passes through the loop. The feed-bar at this time is moved in an opposite (forward) direction to its previous movement, which movement is imparted to the notched arm, and thereby causes said arm to move to-

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ward the right, which movement releases the loop. This operation is constantly repeated and results in a complete and perfect chain-stitch.

5 A curved bar, which operates transversely to the longitudinal bar, is disposed below the bed of the machine, and is connected with said longitudinal bar, and serves to adapt this device to a long or short stitch, the peculiar operation of which will be explained farther on.

10 Having thus generally outlined the operation and arrangement of my improvements, I will now proceed to describe each portion and its operative connection in detail.

15 In the accompanying drawings, A denotes the bed-plate of the machine, B the shuttle-carrier arm, and C the shuttle-race.

D represents the looper, which is shown in detail, Fig. 4. This device is arranged to be 20 detachably connected with the shuttle-carrier when the shuttle is removed therefrom. The looper consists of a body portion D' , which is provided with extensions D^2 at one end, which lap the upwardly-projecting finger c of the carrier. The opposite end is provided with a stirrup d^1 , which fits over the outer edge of the end c' of the carrier, the finger c^2 of which projects upward between the sides d^3 d^3 of the portion D' , and a pivoted 25 latch D^6 is arranged in the upper face of the body portion D' , which when closed down locks the looper to the carrier, as clearly illustrated in the drawings.

Upon the corner d^4 of the body portion is 35 secured the looper-finger D^4 , said finger being composed of an approximately $<$ -shaped hook, which projects slightly beyond the face of the body portion and is arranged to travel snugly against the shuttle-race. If desired, 40 the looper-finger may be made in a separate portion and be detachably connected with the shuttle-carrier of the machine. In this case the rear portion of the shuttle-carrier is provided with a recess d^5 , provided with a key-way d^6 , into which recess is fitted the shank 45 d^7 of the looper-finger D^4 , which is provided with a key or rib d^8 , which engages the key-way d^6 , and is thereby securely held from turning in the slot. When this form of looper-finger is used, the thread is removed out of 50 the shuttle. In the last-described construction the shuttle will assist in forming the loop by passing between the thread and needle, and when the loop is passed over the rear end 55 of the shuttle the point of the finger attached to the shuttle-carrier will catch the said loop and carry it forward.

E indicates a short vertical rock-shaft journaled in front of the needle-aperture and near 60 the inner edge of the shuttle-race. Upon the upper end of the shaft E is formed an arm E' , which is disposed immediately below the bed of the machine and extends rearwardly toward the needle, its end E^3 ending just in advance of the needle-aperture, such end being 65 turned inward, so as to form a hook member e^4 , as most clearly shown in Fig. 8 of the draw-

ings. Upon the lower end of the rock-shaft E is secured a forked lever F, which projects inward at right angles to the arm E' , said lever 70 being formed with bifurcated outer ends, the prongs ff' of which are of different lengths, the inner one f' of which is the longer, said prongs forming the mouth of a slot E^2 , which extends about two-thirds the length of the said lever. 75 The rear end of the lever F is extended, as at e^2 , to which is secured a spring e^3 , the opposite end of which is connected to the frame, as shown, said spring serving to normally hold said forked lever F in its normal or in- 80 operative position. A longitudinally-arranged bar G operates below the shuttle-race, said bar being pivoted to a lateral projection g on the feed-bar G' , as most clearly shown in Fig. 2 of the drawings. The forward end of the 85 bar G is formed with a downwardly-projecting finger-piece h , which enters the slot E^2 in the lever F, such slot being somewhat widened at its forward end, as shown. By connecting the bar G with the feeder device and with the 90 forked lever F, as stated, such arm G will, as the feeder is reciprocated, be moved backward and forward, thereby imparting an alternating motion to the lever F, and thereby rocking the shaft E and reciprocating its 95 hooked arm E' back and forth, for the purpose before stated.

H indicates an adjusting-bar arranged beneath the bed-plate transversely to the bar G, its forward end being connected with the said 100 bar G by means of a stud on the bar H entering an elongated slot g^2 in said bar G. The rear end of the bar H is adjustably secured to the bed-plate by means of a thumb-screw I passing through an elongated slot J in the 105 bed-plate and connected to the arm H, as shown. By adjusting the bar H to the extreme right it will, through its connection with the bar G, swing such bar in the direction indicated by the arrow in Fig. 1, which 110 in turn will, through its lug h , cause the forked lever F to swing to the position shown in full lines in Fig. 1, in which position the lug h will be beyond the end of the short prong f , thus allowing for the bar G being operated by the reciprocating feed-bar G' without imparting motion to the forked lever F. 115 It will also be observed that when the said lever F is swung to the inoperative position just referred to the arm E' on the rock-shaft E will also be swung outward or to the left 120 out of operative position, the relation of the several parts being such when out of operative position that they can in an instant be thrown into position when it is desired to 125 change the stitch, it being only necessary to shift the adjusting-bar H to the left to throw the devices in operation to make a chain-stitch. A small slot L is extended backward a short distance from the rear of the hole K in the 130 needle-plate to permit the thread to be readily pulled backward and insure a good loop. The needle-hole K is formed with a concaved groove L' , extending from the upper face of

said hole downwardly toward the front of the machine, as shown in Fig. 8, said groove permitting the loop or thread to be the more easily drawn up into place on the under side of goods being sewed.

From the foregoing description, taken in connection with the drawings, it will be readily understood that by my invention a "Domestic" or other similar machine may be adapted to make a complete and perfect twisted "Automatic" or chain-stitch in addition to the lock-stitch, and which in no way interferes with the making of said lock-stitch.

The operation of the devices is exceedingly simple. All that is necessary when it is desired to change from the chain to the lock stitch is to remove the hook or looper from the shuttle-race and at the same time move the thumb-screw to the right. Then by inserting the regular shuttle it will be ready for the lock-stitch operation.

By adjusting the thumb-screw to a slight extent either way the devices for making the loops will be better adapted for a longer or shorter stitch.

These attachments may be applied to machines now in use at a small cost or they can be built in new machines.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. In a sewing-machine, the combination, with the frame of the machine, its shuttle-race, and needle-aperture, of the reciprocating shuttle-carrier, a looping-finger secured to said carrier and arranged to travel in the shuttle-race, the feed-operating devices, and the rock-shaft E, journaled in the frame of the machine in advance of the needle-aperture, its lower end formed with a lateral extension connected with the feed-operating devices, whereby the shaft is rocked, and with a notched arm E' at its upper end adapted to receive the thread from the looper-finger when the shuttle-carrier is at its forward throw, all arranged substantially as and for the purpose described.

2. The combination, with the shuttle-carrier B, provided with upturned fingers c^2 , of the looping device D, consisting of a body portion D', arranged between the said fingers of the carrier, a stirrup d^2 , fitting over the outer edge of the end c^2 of the carrier, a locking-latch D³ to secure said device to the carrier, and a looping-finger D⁴, formed on the inner face of the said portion D', all arranged substantially as and for the purpose described.

3. In a sewing-machine, the combination, with the main frame, its shuttle-race, and needle-aperture, of the shuttle-carrier, the looper-finger carried by and detachably secured to said carrier, the rock-shaft E, journaled in the frame near the edge of the shuttle-race and in front of the needle-aperture, said shaft provided with an inwardly-projecting notched arm E' at its upper end and a lever-arm E at its lower end, the bar G, and the feeder-bar G', said bar G connected at its rear end with the feeder-bar G' and near its forward end with the lever F, substantially as and for the purpose described.

4. In a sewing-machine, the combination, with the main frame, its shuttle-race, and needle-aperture, of the shuttle-carrier, a looping device carried and operated thereby, the feeder-bar, the rock-shaft E, journaled in front of the needle-aperture and adjacent the shuttle-race, said shaft formed with an inwardly-extending notched arm at its upper end and a lever F at its lower end, said lever having a bifurcated outer end forming projecting prongs $f f'$, the rear one f' extending beyond the prong f , and the bar G, having a hinged connection at its rear end with the aforesaid feeder-bar, said bar G connected at a point near its forward end with the bifurcated end of the lever F, substantially in the manner shown, and for the purpose described.

5. In a sewing-machine, the combination, with the bed-frame of the machine, formed with the usual shuttle-race and needle-aperture, the shuttle-carrier, and the looper-finger carried by such carrier, of the feeding-bar G', the rock-shaft E, formed with the arm E' and lever F, as stated, the bar G, connecting said shaft and feeding-bar G', and the shifting-bar H, connected to said bar G and to the bed of the machine, substantially as and for the purpose described.

6. In a sewing-machine, the combination, with the bed-frame of the machine, formed with a shuttle-race and needle-aperture, as described, the shuttle-carrier, and the looping-finger carried by such carrier, of the feeding-bar G', the loop-holding devices E, E', and F, the operating-bar G, connecting said feeding and loop-holding devices, and the bar H, connected at its inner end to the bar G and longitudinally adjustable at its rear end on the bed-frame of the machine, substantially as and for the purpose described.

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Witnesses:

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JEROME DUDDING.