No. 827,641. PATENTED JULY 31, 1906.

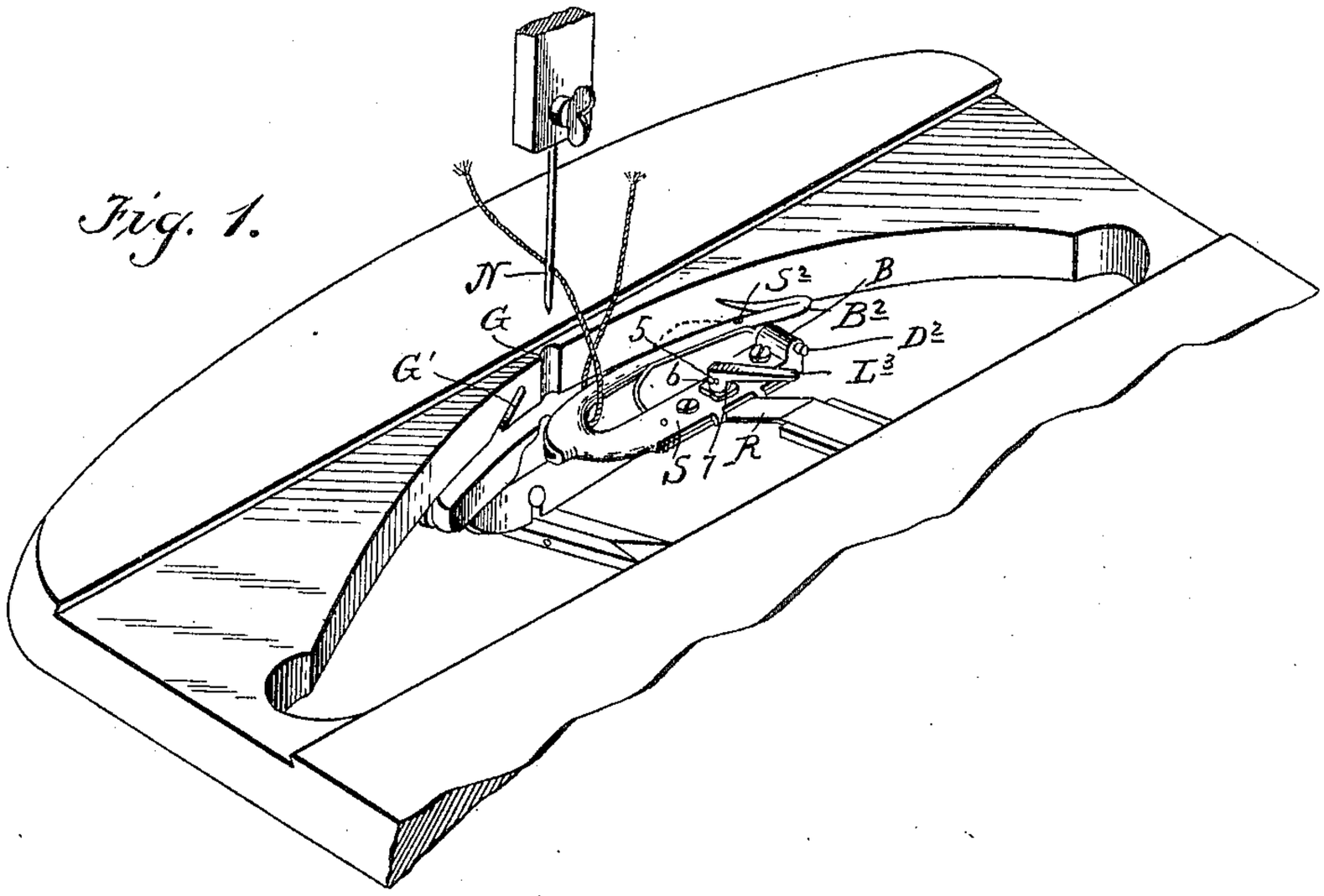
A. G. LAMB.

CHAIN STITCH LOOPER FOR LOCK STITCH SEWING MACHINES.

APPLICATION FILED MAR. 27, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



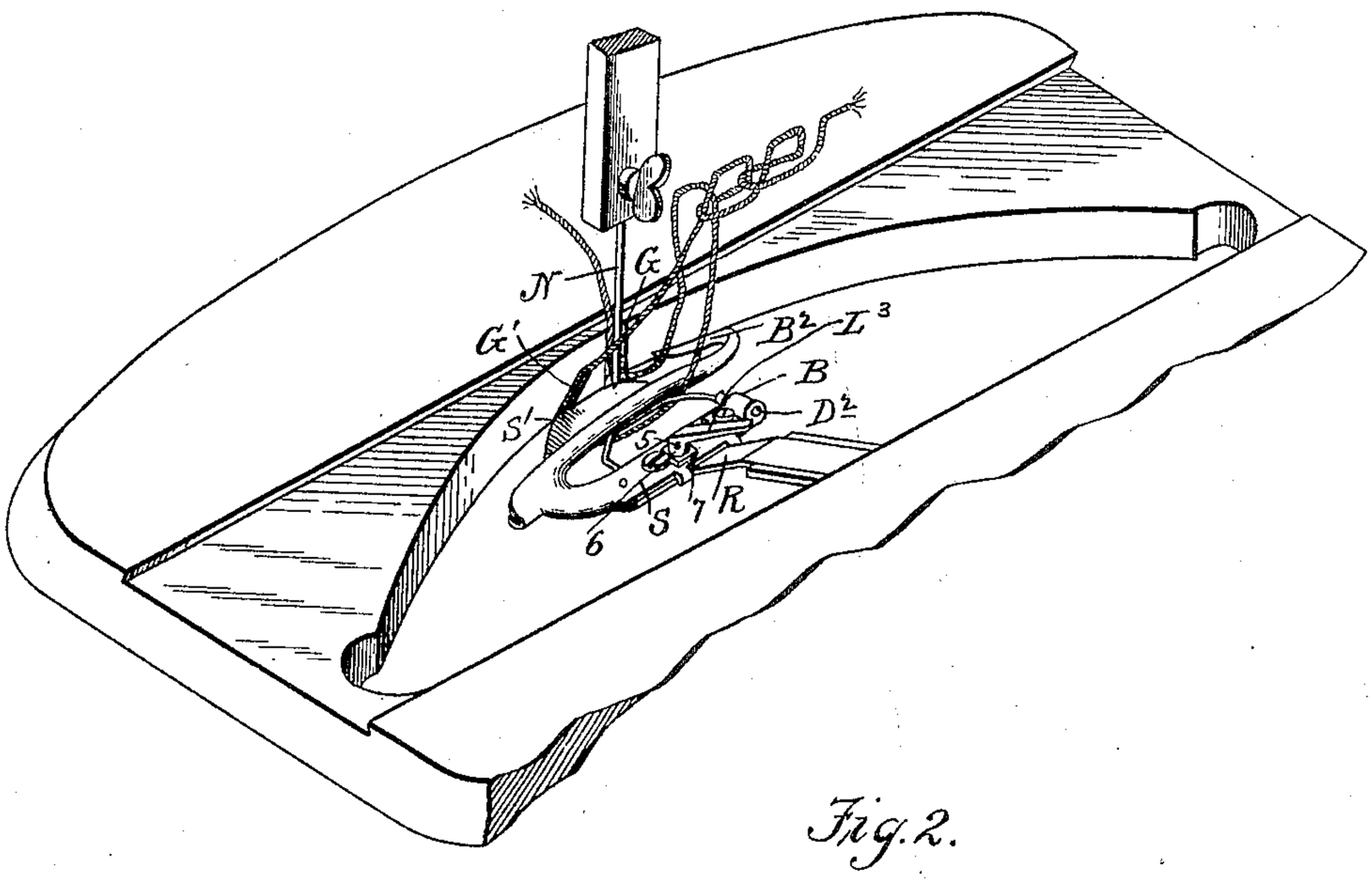


Fig. 2.

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2 SHEETS—SHEET 2.

Fig. 3.

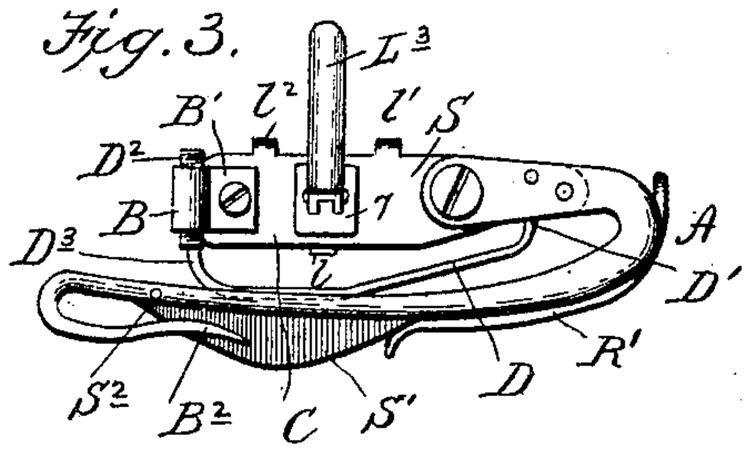


Fig. 6.

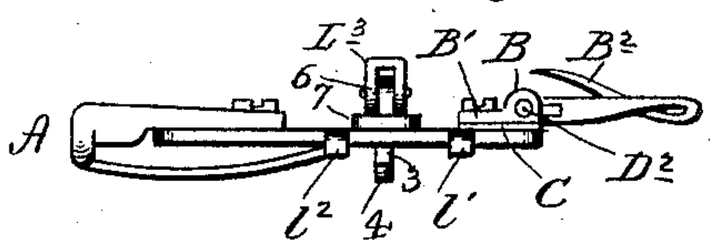


Fig. 4.

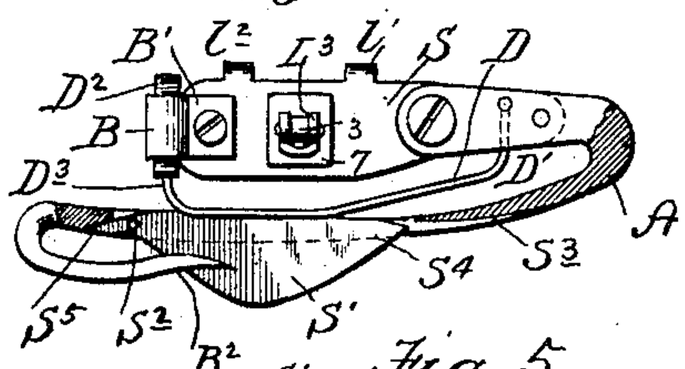


Fig. 6a

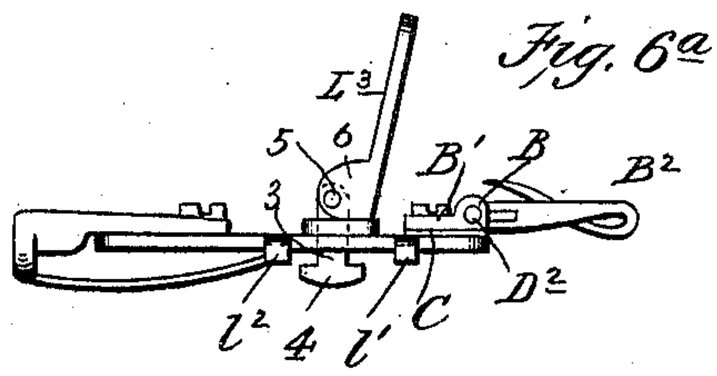


Fig. 5.

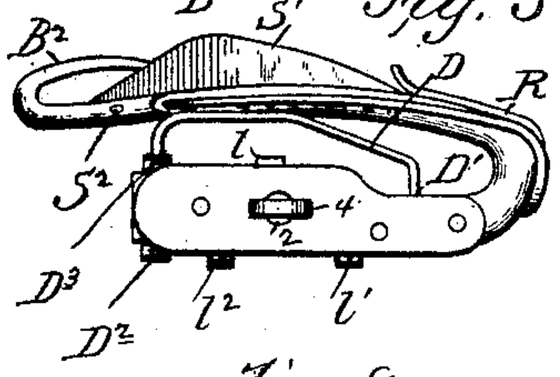


Fig. 7.

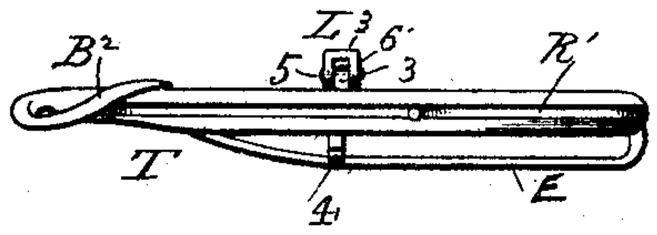
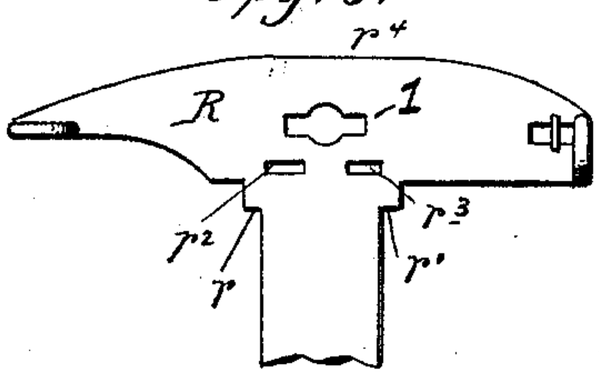


Fig. 8.



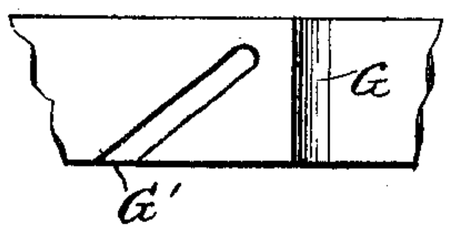


Fig. 9.

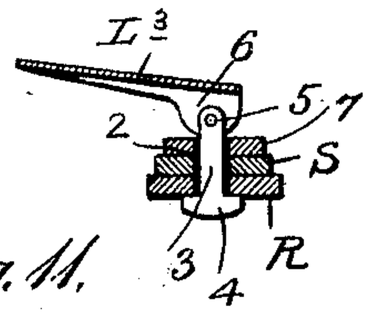


Fig. 11.

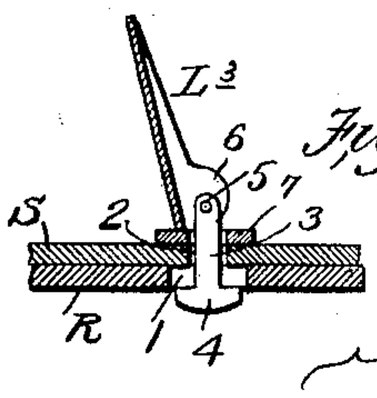


Fig. 12

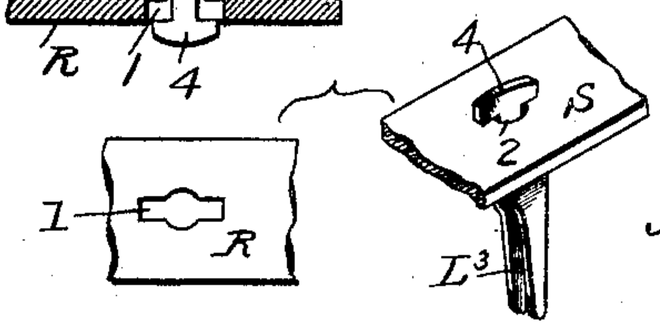
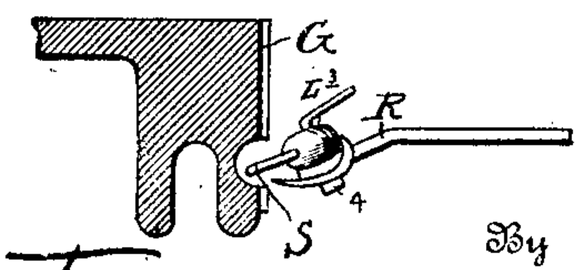


Fig. 13

Fig. 10



Witnesses

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UNITED STATES PATENT OFFICE.

AMHERST G. LAMB, OF TORRINGTON, CONNECTICUT, ASSIGNOR TO EXCELSIOR NEEDLE COMPANY, OF TORRINGTON, CONNECTICUT, A CORPORATION OF CONNECTICUT.

CHAIN-STITCH LOOPER FOR LOCK-STITCH SEWING-MACHINES.

No. 827,641. Specification of Letters Patent. Patented July 31, 1906.

Application filed March 27, 1905. Serial No. 252,248.

To all whom it may concern:

Be it known that I, AMHERST G. LAMB, a citizen of the United States, residing at Torrington, in the county of Litchfield, State of Connecticut, have invented certain new and useful Improvements in Chain-Stitch Loopers for Lock-Stitch Sewing-Machines, of which the following is a description, reference being had to the accompanying drawings and to the letters and figures of reference marked thereon.

My invention relates, broadly, to convertible sewing-machines—that is, machines which are capable of making either a lock-stitch or a chain-stitch at the will of the operator.

My invention resides in improvements in the chain-stitch looper which is substituted for the shuttle of a lock-stitch machine when it is desired to make chain-stitches.

My invention consists, first, in improved means for securing the looper to the shuttle-carrier, whereby it may be securely attached to said carrier and at the same time readily detached.

My invention consists, secondly, in improved means for spreading the loop carried by the looper, whereby the same is cast with certainty over the looper-beak.

Further, my invention consists in details of construction particularly pointed out in the description and set forth in the claims.

In the drawings, Figure 1 is a perspective view of parts of a sewing-machine with my improved looper in place. Fig. 2 is a similar view to that shown in Fig. 1 with the spreader expanding the loop preparatory to casting same over the beak of the looper. Fig. 3 is a top plan view of the looper. Fig. 4 is a view similar to Fig. 3, but with a section removed to show the construction of cast-off. Fig. 5 is a bottom plan view of the looper. Fig. 6 is a rear side elevation of the looper with locking-lever in closed position. Fig. 6^a is a view similar to Fig. 6 with the locking-lever opened. Fig. 7 is a front side elevation of the looper. Fig. 8 is a fragmentary view of the shuttle-carrier. Fig. 9 is a view showing a portion of the shuttle-race with the needle-groove and the thread-groove therein. Fig. 10 is a section through the shuttle-race and shuttle-carrier, showing the position of the looper-carrier, the cast-off, and the groove in the shuttle-race. Fig. 11 is a sectional view showing in detail the means for securing the shank of the looper to the shuttle-carrier, the parts being in section. Fig. 12 is a similar view to Fig. 11 with the keeper given a quarter-turn, whereby the parts are in position to be separated; and Fig. 13 shows the parts above referred to as separated, the carrier being in top plan and the looper-shank in bottom perspective.

The machine in which my invention is embodied is the ordinary oscillating-shuttle machine comprising the usual parts, a detail disclosure of which has not been given. In the drawings the shuttle has been removed from the machine and my improved chain-stitch looper substituted therefor, and the machine is arranged for chain-stitch work. The needle N reciprocates, as is usual in this class of machines, in a groove G cut in the shuttle-race. (See Fig. 9.) Coöperating with said needle is my improved chain-stitch looper, which I will now describe.

My looper consists in a shank portion S, which forms a support for the looper proper and as a means whereby the looper is rigidly but detachably secured to the shuttle-carrier. The shuttle-carrier R is formed with two projecting shoulders r' and r and with an opening r^4. The shank portion S of the looper carries two lugs l' and l^2, which are spaced and arranged to engage the shank of the shuttle-carrier and snugly embrace the same. A lug 6 on the shank engages in the opening r^4. These lugs prevent lateral movements of the looper relative to the carrier.

The shank portion S is provided with a circular opening 2, and extending through said opening is a locking-bolt 3, said bolt being provided with an enlarged head, which is rectangular in cross-section. Said head is adapted to be passed through a similar-shaped opening or slot 1 in the shuttle-carrier R, and when given a quarter-turn—that is, through an arc of ninety degrees—the shoulders of the enlarged head engage the shuttle-carrier, and thus prevent the bolt from being withdrawn. The other end of the locking-bolt is slightly flattened and provided with a pivot-hole. The lock-bolt is held in engagement with the looper-shank

and the head is drawn into engagement with the shuttle-carrier by means of a cam-lever L^3. This lever is provided at one end with spaced ears, which engage over the flattened upper end of the locking-bolt and are pivotally secured thereto by the pivot-pin 5. These ears are cam-shaped—that is, the outline of said ears is eccentric to the pivot-pin 5. Between the lever L^3 and the looper-shank is a bearing-plate 7, which freely engages the locking-bolt. The looper is placed in the machine by turning the lever L^3 into an upright position, inserting the head of the locking-bolt into the opening in the shuttle-carrier, and then turning the head until the longitudinal diameter of the same lies across the slot or opening 2. The lever-handle serves as a convenient means for holding and placing these parts. The lever is then turned to a horizontal position, which through the action of the cam-ears on the bearing-plate draws the head of the locking-bolt against the shuttle-carrier and firmly but detachably clamps the looper in place.

The looper proper consists of an arm rigidly connected with the shank S, and said arm at its forward end is bent back upon itself to form the loop-engaging beak B^2. This beak is deflected above the body of the looper, as shown in Fig. 7, and is pointed on the side adjacent the shuttle-race, whereby said beak may pass close to the needle. The looper-arm is grooved throughout a greater portion of its length, as is clearly shown in Fig. 4. A cast-off S′ is pivoted at S^2 in the groove in the looper-arm. This cast-off tapers to a point S^4 at the end opposite the pivot, and said free end is housed within the looper-body, so that the thread will slide over the point without engaging the same. From the point the cast-off broadens out into an extended shoulder. As noted above, the cast-off is pivoted and is spring-pressed outwardly by a light spring S^3, which is rigidly secured to the looper-body at A and lies wholly within the groove. The cast-off extends beyond the pivot S^2, forming a heel portion S^5, (see Fig. 4,) which limits the outward movement of the cast-off. Rigidly secured to the looper-body at A is a loop-retainer. This retainer is made of spring metal and lies partially housed in the groove of the looper. The forward or free end is, however, deflected outwardly to form a guide, so that the thread-loop will be directed between the retainer and the looper-body.

Rigidly secured to the shank of the looper at D′ is a loop-retarder D. This member, as shown, is in the form of a spring-wire, although any other suitable form may be used. The other end D^3 of the retarder is housed in an adjusting-screw D^2, carried by the block B. The retarder extends slightly into the groove in the looper-body, and by means of the adjusting-screw the space between the retarder and looper-body may be adjusted to accord with threads of varying sizes. This adjustable retarder forms the subject-matter of a separate application, Serial No. 252,249, filed of even date herewith.

A loop-spreader E is rigidly secured to the looper-body. At the rear end thereof this spreader is bent downward from the looper-body and then following the curvature of the looper-arm gradually approaches the same until it merges into the looper-arm directly opposite the cast-off shoulder. At this point the spreader is rigidly secured to the looper-arm. The object of this particular shape of the spreader is that the loop of thread taken by the looper will not be spread to the full extent until it has traveled the entire length of the looper-arm.

In order that the beak of the looper may pass closely to the shuttle-race, and thus with certainty take the loop thrown out by the needle, I have provided the shuttle-race with an angular groove G′, into which one limb of the loop carried by the looper is thrown by the cast-off, as the loop is cast from the looper.

The operation of the looper will now be described. Tracing the course of a single loop, the beak of the looper enters the loop thrown out by the needle. As soon as the looper reaches the extreme of its oscillation and begins its movement in the opposite direction the loop passes from the looper-beak to the looper-arm. As the loop passes along the looper-arm it is under tension, and the cast-off will be slightly depressed. The loop passes the retarder D and beneath the retainer R′. The spreader gradually increases the size of the loop which is not spread to its full extent until the same has traveled the entire length of the arm. As the looper moves forward the second time the beak takes a new loop and the old loop moves off the looper-arm. This old loop is not under a drawing tension, and the retainer R′ first acts as a slight drag on the loop. As the loop leaves the retainer R′ one limb of the loop is held by the retarder D, while the other limb passes along the face of the cast-off, the cast-off being held extended by the spring S^3 at this time. The looper has now reached such a position relative to the thread-groove G′ in the shuttle-race that the cast-off forces the limb into said groove. The loop now slips past the retarding member D and is cast over the looper-beak, and as it passes over the looper-beak off the end of the looper-arm it encircles the new loop on the looper-beak, thus forming a stitch.

It will be obvious that many changes in the details of structure may be made without departing from the spirit of my invention, the scope of which is pointed out in the claims.

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

1. The combination with the shuttle-carrier of a sewing-machine, of a looper, including a loop-engaging beak and a cast-off movable relatively to said loop-engaging beak, and means for securing said looper to said carrier, comprising a locking-lever carried by one of said parts, and means coöperating therewith to engage the other of said parts; substantially as described.

2. The combination with the shuttle-carrier of a sewing-machine, of a looper including a loop-engaging beak and a cast-off movable relatively to said loop-engaging beak, and means for securing said looper to said carrier, comprising a lever carried by said looper, and means for connecting the lever to said carrier; substantially as described.

3. The combination with the shuttle-carrier of a sewing-machine, of a looper, and means for securing said looper to said carrier, comprising a lever and a bolt connected thereto having an oblong head, said carrier having an oblong opening to detachably receive said headed bolt; substantially as described.

4. The combination with the shuttle-carrier of a sewing-machine, of a looper, and means for securing said looper to said carrier, comprising a lever, a cam projection formed thereon, a locking-bolt having an oblong head, and said carrier having an oblong opening to detachably receive said headed bolt; substantially as described.

5. The combination with the shuttle-carrier of a sewing-machine, of a looper, and means for securing said looper to said carrier, comprising a lever, a cam projection formed thereon, a locking-bolt having an oblong head, a bearing-plate intermediate said cam projection and said looper, and said carrier having an oblong opening to detachably receive said headed bolt; substantially as described.

6. The combination with the shuttle-carrier of a sewing-machine, of a looper, and means for securing said looper to said carrier, comprising a locking-lever having spaced cam-ears, a locking-bolt pivoted between said ears, said carrier having an oblong opening and said locking-bolt having an enlarged oblong head to detachably engage said opening; substantially as described.

7. The combination with the shuttle-carrier of a sewing-machine, of a looper, and means for securing said looper to said carrier, comprising a locking-lever having spaced cam-ears, a locking-bolt pivoted between said ears, a bearing-plate on said locking-bolt, said carrier having an oblong opening and said locking-bolt having an enlarged oblong head to detachably engage said opening; substantially as described.

8. The combination with a shuttle-carrier of a sewing-machine, having a rectangular opening therein, of a looper, a looper-shank having an oblong opening therein, a locking-bolt in the opening in said shank and having an enlarged oblong head adapted to detachably engage the opening in the carrier, a cam-lever, cam-ears formed on said lever, a pivot-pin securing said lever to said bolt, and a bearing-plate on said bolt between the cam-lever and the looper-shank; substantially as described.

9. A looper for a sewing-machine, comprising a shank portion, a looper-arm carried thereby, a loop-engaging beak carried by said arm, and a pivoted cast-off carried by said arm and adjacent said looper-beak and movable relatively thereto; substantially as described.

10. A looper for a sewing-machine, comprising a shank portion, a looper-arm carried thereby, a loop-engaging beak carried by said arm, and a yielding cast-off carried by said arm and adjacent said looper-beak and movable relatively thereto; substantially as described.

11. A looper for a sewing-machine, comprising a shank portion, a looper-arm carried thereby, a loop-engaging beak carried by said arm, a pivoted cast-off carried by said arm and adjacent said beak and movable relatively thereto, and a spring for holding said cast-off in extended position; substantially as described.

12. A looper for sewing-machines, comprising a shank, an arm carried thereby, a loop-engaging beak, said arm having a slot therein and a cast-off pivoted in said slot and extending adjacent said looper-beak; substantially as described.

13. A looper for sewing-machines, comprising a shank, an arm carried thereby, a loop-engaging beak, said arm having a slot therein, and a cast-off yieldingly mounted in said slot and extending adjacent to said beak; substantially as described.

14. A looper for sewing-machines, comprising a shank, an arm carried thereby, a loop-engaging beak, said arm having a slot therein, and a cast-off pivoted in said slot, and a spring in said slot for engaging said cast-off whereby the same is held in extended position; substantially as described.

15. A looper for sewing-machines, comprising a shank portion, an arm carried thereby, a loop-engaging beak carried by said arm, a cast-off carried by said arm and a loop-spreader carried by said looper; substantially as described.

16. A looper for sewing-machines, comprising a shank portion, an arm carried thereby, a loop-engaging beak carried by said arm, a yielding cast-off carried by said arm and a spreader carried by said looper; substantially as described.

17. A looper for sewing-machines, comprising a shank portion, an arm carried thereby, a loop-engaging beak carried by said arm, a yielding cast-off carried by said arm and a spreader carried by said looper, said spreader being rigidly connected to said looper and having a portion thereof bent outward and then gradually approaching the looper toward the loop-engaging beak; substantially as described.

18. A looper for sewing-machines, comprising a shank portion, an arm carried thereby, a loop-engaging beak carried by said arm, a pivoted cast-off carried by said arm, and a spreader carried by said looper, said spreader being rigidly connected to said looper and having a portion thereof bent outward and then gradually approaching the looper toward the loop-engaging beak; substantially as described.

19. A looper for sewing-machines, comprising a shank, a looper-arm, a looper-beak carried by said looper-arm and extending above the plane of said arm, a cast-off carried by said arm, and a spreader secured underneath said arm and having a portion thereof bent outward from said arm and gradually approaching said arm to a point adjacent the looper-beak where it is rigidly secured to the arm; substantially as described.

20. A looper for sewing-machines, comprising a shank portion, an arm carried thereby, a looper-beak carried by said arm, a cast-off carried by said arm and adjacent said beak, a spreader carried by said looper, and a thread-retarder carried by said looper-shank and extending adjacent said looper-arm; substantially as described.

21. A looper for sewing-machines, comprising a shank portion, an arm carried thereby, a looper-beak carried by said arm, a cast-off carried by said arm and adjacent said beak, a spreader carried by said looper, a thread-retarder carried by said looper-shank and extending adjacent said looper-arm, and a thread-retainer carried by said arm; substantially as described.

22. A looper for sewing-machines, comprising a shank portion, an arm carried thereby, a looper-beak carried by said arm, a cast-off carried by said arm and adjacent said beak, a spreader carried by said looper, and a thread-retainer carried by said arm and extending to a point adjacent said cast-off; substantially as described.

23. The combination of a shuttle-carrier, a looper-shank detachably secured to said carrier, a looper-arm carried by the shank, a loop-engaging beak carried by said arm, said arm having a groove therein, a cast-off pivoted in said groove, a spring engaging said cast-off, a spreader secured beneath said arm, a thread-retarder connected to said shank and extending adjacent to said looper-arm, and a thread-retainer secured to said looper-arm; substantially as described.

24. The combination with a shuttle-race having a thread-groove therein, and a shuttle-carrier, of a looper carried by said shuttle-carrier, said looper comprising a loop-engaging beak and a cast-off movable relatively to said beak and in a direction substantially at right angles to the direction of movement of the looper for deflecting the thread into said groove and over said looper-beak; substantially as described.

25. The combination with a shuttle-race having a thread-groove therein and a shuttle-carrier, of a looper carried by said shuttle-carrier, said looper comprising a loop-engaging beak and a spring-controlled cast-off movable relatively to said beak for deflecting the thread into said groove and over said looper-beak; substantially as described.

26. The combination with a shuttle-race having a thread-groove therein and a shuttle-carrier, of a looper carried by said shuttle-carrier, said looper comprising a loop-engaging beak, a pivoted cast-off movable relatively to said beak, a spring for engaging said cast-off, whereby said loop is deflected into said groove and over the looper-beak, substantially as described.

27. The combination with a shuttle-race having a thread-groove therein and a shuttle-carrier, of a looper carried by said shuttle-carrier, said looper comprising a pivoted cast-off, a loop-spreader carried by said looper, whereby said loop as it is given up by the spreader is deflected by the cast off into said groove and over said beak; substantially as described.

28. The combination with a shuttle-race having a thread-groove therein and a shuttle-carrier, of a looper carried by said shuttle-carrier, said looper comprising a pivoted cast-off, a loop-spreader carried by said looper, and a thread-retarder carried by said looper-shank and exending adjacent to said looper-arm, whereby as the loop is given up by the spreader one limb thereof is held by the retarder and the other limb is deflected by the cast-off into said groove and over said beak; substantially as described.

29. The combination with the shuttle-race having a needle-groove and a thread-groove independent thereof and at an angle thereto, of a shuttle-carrier, a looper carried thereby, said looper comprising a shank, a looper-arm, a looper-beak, a cast-off, and a thread-retarder whereby one limb of the loop is held by the retarder, and the other is deflected by the cast-off into said thread-groove and over said beak; substantially as described.

30. The combination with the shuttle-race having a needle-groove and a thread-groove independent thereof and at an angle thereto, of a shuttle-carrier, a looper carried thereby,

said looper comprising a shank, a looper-arm, a looper-beak, a cast-off, a loop-spreader, and a thread-retarder, whereby one limb of the loop is held by the retarder and the other is deflected by the cast-off into said thread-groove and over said beak; substantially as described.

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

AMHERST G. LAMB.

Witnesses:
D. HILDRETH,
C. E. MOREHOUSE.