W. L. BARRON.

BUTTON SEWING MACHINE.

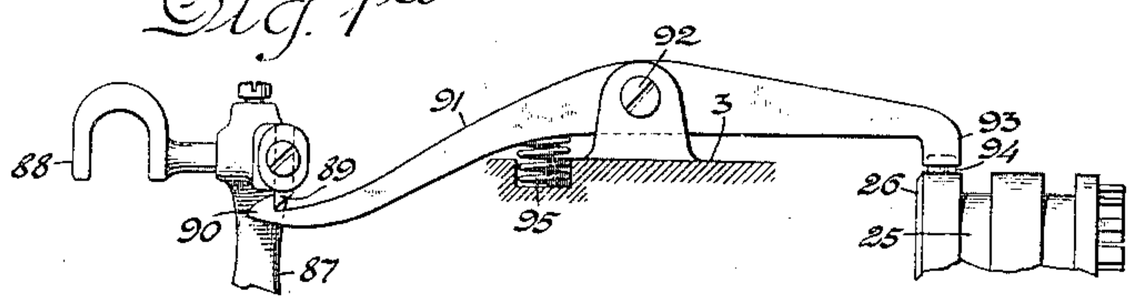
APPLICATION FILED MAR. 15, 1910.

998,595.

Patented July 25, 1911.

2 SHEETS—SHEET 1.

Fig. 1a



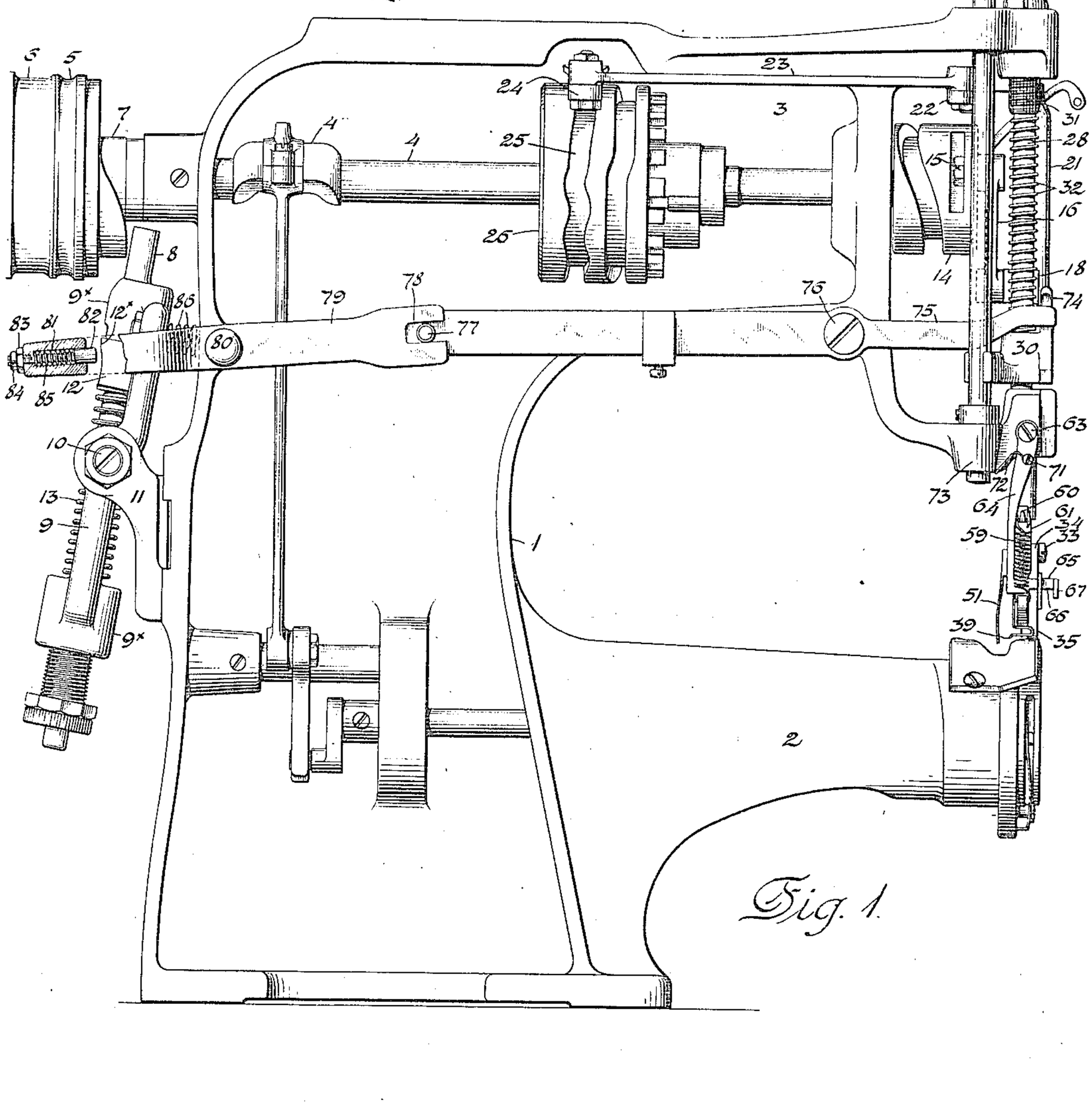


Fig. 1.

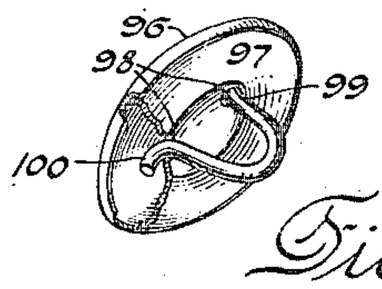


Fig. 8.

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2 SHEETS—SHEET 2

Fig. 3.

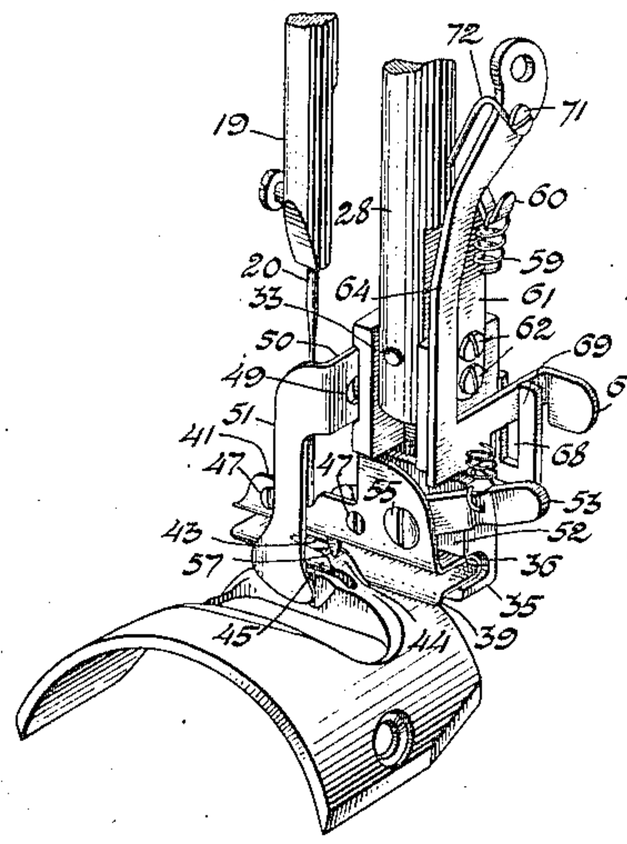
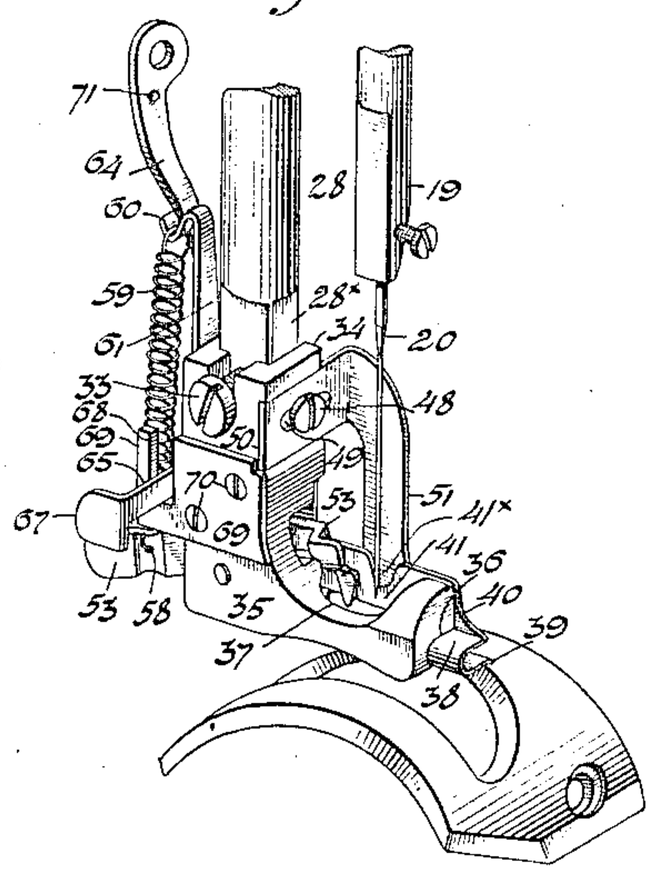


Fig. 4.



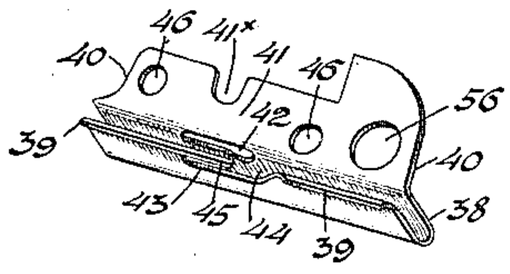


Fig. 5.

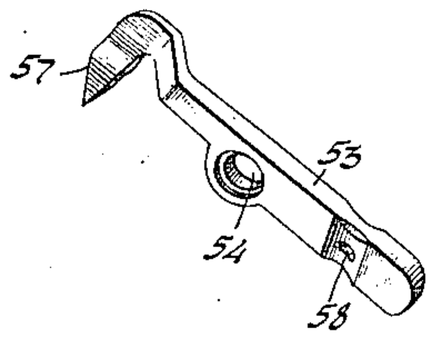
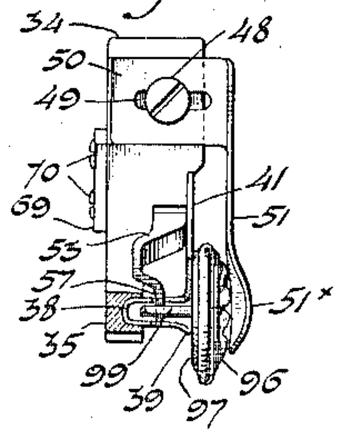


Fig. 6.

Fig. 2.

Fig. 7.



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UNITED STATES PATENT OFFICE.

WILLIAM L. BARRON, OF NEW YORK, N. Y., ASSIGNOR TO THE SINGER MANUFACTURING COMPANY, A CORPORATION OF NEW JERSEY.

BUTTON-SEWING MACHINE.

998,595. Specification of Letters Patent. Patented July 25, 1911.

Application filed March 15, 1910. Serial No. 549,458.

To all whom it may concern:

Be it known that I, WILLIAM L. BARRON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Button-Sewing Machines, of which the following is a specification, reference being had therein to the accompanying drawings.

This invention has for its object to provide a simple and effective device for holding shank buttons, and particularly of that class known as "military" buttons, in which the shank is pivotally connected with the head.

The invention consists primarily in a presser-foot having formed in one edge a longitudinal open-sided button-shank runway with a needle aperture extending through the same, the edge thus formed affording one wall of a button-head channel whose other wall is formed by a spring-plate spaced therefrom substantially the thickness of a button-head, a shield-plate being provided intermediate the needle-hole and the button-head channel to prevent the tilting of the button-head into the needle path and consequent breakage of the needle.

The invention further consists in a spur carried by the presser-foot and adapted to enter the eye of the shank to securely hold the same for the stitching operation, and automatically acting means for releasing the button-shank from said holding spur after a stitching operation, and certain other features of construction herein shown, described and claimed.

In the accompanying drawings, Figure 1 is a rear side elevation of a shank-button sewing machine of the well known Singer type having the general constructive features represented in the United States Patent to G. S. Gatchell No. 885,990, dated April 28, 1908, and embodying the present improvement, and Fig. 1ª a plan of the stop-motion controlling device of the same. Fig. 2 is a front end elevation of the machine. Figs. 3 and 4 are perspective views taken from different positions and representing the button-holding presser-foot, the throat-plate, a portion of the needle-bar and the needle. Fig. 5 is a perspective view of the button-shank guide detached from the presser-foot, and Fig. 6 a detached perspective view of the lever carrying the button-holding spur. Fig. 7 is a front elevation, partly in section, of the button-holding foot with a button inserted therein. Fig. 8 is a perspective view, upon an enlarged scale and partly in section, showing a loose-shank-button such as the button-holding foot of the present invention is especially adapted to handle.

The frame of the machine is constructed with the hollow standard 1 with work-supporting arm or horn 2 and overhanging arm 3 in which is journaled the main-shaft 4 provided upon its rearward end with the fast and loose grooved pulleys 5 and 6 to the former of which is attached the usual stopping cam 7 adapted for engagement by the upper end of the plunger-bar 8 which is journaled in the stop-lever 9 fulcrumed upon center-screws 10 carried by a bracket 11 secured to the standard 1. The plunger-bar 8 has fixed thereon adjacent the upper bearing boss 9ˣ the collar 12 between which and the lower bearing boss 9ˣ is interposed the spring 13.

The main-shaft 4 carries at its forward end the take-up cam-cylinder 14 carrying the crank-pin 15 connected by means of the pitman 16 with a lateral pin 17 carried by the collar 18 fixed upon the reciprocating needle-bar 19 carrying the needle 20 and journaled in suitable bearings in the swinging needle-frame 21 pivotally mounted upon the head of the bracket-arm and provided with a lateral lug 22 which is pivotally connected with the forward end of the link 23 whose rearward end is pivotally connected with the vibratory lever 24 receiving its operative movements from a cam-groove 25 of the cam cylinder 26 loosely mounted upon the main-shaft 4 and deriving step-by-step operative movements from suitable driving means. The needle receives its lateral jogging movements in a plane transverse to the work-supporting arm 2 and has coöperating therewith in the production of stitches the oscillating shuttle 27 mounted in a suitable raceway in the arm 2 and operatively connected with the actuating crank 4ˣ of the main-shaft.

The presser-bar 28 is mounted in suitable bearings afforded by the head of the bracket-arm, and has fixed thereon by means of the screw 29 a collar 30 between which and the lower end of the bearing bushing 31 is interposed the spring 32. The presser-bar has

secured upon its reduced lower end 28× by means of the screw 33 the slotted shank 34 of the presser-foot whose operative portion 35 has in its inner edge, or that nearest the standard 1, a longitudinal slot 36 intersected by the elongated needle aperture 37. Within the lateral slot 36 of the presser-foot is introduced the body of a U-shaped sheet metal button-shank guide 38 having at the edge of its lower member a short depending lip 39 and at the corresponding edge of its upper member the upwardly extending lip 40 affording a partition plate 41 adapted to close the open side of the needle aperture 37 and afford a shield to protect the needle from interference with the head of a button resting upon the exposed face of said shield. The upper member of the button-shank guide is formed with a closed needle-aperture 42 in register with that of the presser-foot, while the lower member has an aperture 43 having at its rear end an inclined opening 44 leading outwardly to the edge of the lip 39, thus forming adjacent the needle aperture a button-shank supporting tongue 45. The shield-plate 41 is provided with screw-holes 46 entered by fastening screws 47 by which the button-shank guide is secured to the presser-foot.

Secured to a suitable transverse seat upon the front side of the presser-foot shank by means of a fastening screw 48 passing through a slot 49 therein is the shank 50 of a depending spring-plate 51 whose lower operative end portion is spaced substantially the thickness of a button head from the lips 39 and 40 of the guiding member 38 in conjunction with which it acts to confine the button-head yieldingly in position with its shank extending within the longitudinal runway afforded by the guide 38 and across the needle apertures in the latter. As represented in the drawings, the operative lower portion of the spring-plate 51 has an outturned lip 51× to insure easy entrance of the button-head within the channel afforded between the member 51 and the guiding lips 39 and 40 of the member 38. As in other shank-button attaching machines of this general class, the needle descends alternately within and outside of the eye of the button-shank in applying the fastening stitches by which the button is secured to the fabric. As the fastening stitches extend over one member of the button-shank resting upon the supporting tongue 45 of the guide-member 38, it will be observed that in order to detach the work after a stitching operation, it must be advanced to bring the fastening stitches beyond the end of the tongue 45, when the button-head passes the rear edge of the confining spring-plate 51 and may then be readily moved laterally to disengage the shank from its guide-member 38.

In order to insure the proper holding of the button-shank in stitching position for application of the fastening stitches, the rearward portion of the presser-foot above its housing slot 36 is cut away at 52 to receive a lever 53 formed intermediate its ends with a screw-aperture 54 to admit a transverse fulcrum-screw 55 tapped into the body of the foot and having its head countersunk with an aperture 56 in the shield-plate 41. The lever 53 is provided in its laterally offset forward end with a depending prong or spur 57 having a wedge-shaped operative end adapted to enter the needle-apertures 37 and 42 near the edge thereof farthest from the shield-plate 41, so as to enter and lock firmly in position the eye of the button-shank while leaving ample room for reciprocation of the needle between itself and the shield-plate 41 for application of the fastening stitches. The rearward end portion or tail of the lever 53 is formed with a transverse aperture 58 in which is secured one end of a spring 59 whose other end is attached to a hook 60 at the upper end of a rigid arm 61 having its lower end secured by means of screws 62 to the back of the presser-foot shank. The forward end of the lever 53 is thus maintained yieldingly in its lower or operative position with the spur 57 extending into the eye of the button-shank.

Pivotally mounted upon the fulcrum-stud 63 tapped into the head of the bracket-arm is a swinging detent-lever 64 having at its lower end a transverse member 65 with a notch 66 in its lower edge and terminating in a finger-piece 67 exposed in front of the presser-foot shank. The member 65 of the lever 64 is embraced by the vertical slot 68 of a guide-plate 69 secured by means of screws 70 upon the front side of the presser-foot shank, whereby the swinging lever 64 is suitably guided in its movements transversely of the presser-foot. The lever 64 has rigidly secured thereon near the fulcrum-stud 63 by means of the screw 71 one end of a bent wire spring 72 whose opposite end rests against a boss 73 upon the head of the bracket-arm and tends to throw the lever forwardly to bring the unnotched portion of its lower end directly above the tail of the lever 53.

The parts are so arranged and proportioned that when the presser-bar is lowered to bring the presser-foot into operative relation with the work the tail of the shank-holding lever 53 is entirely disengaged from the detent-lever 64 and the spur 57 is in its operative position within the rounded end of the button-shank eye; but when the presser-bar is raised to lift the presser-foot clear of the work, the lever 53 is lifted bodily upon its fulcrum-stud 55 until its tail encounters the lower end of the detent-lever 64, when it becomes tilted thereon to retract

the spur 57 from the button-shank eye, whereby the button is released from the presser-foot and is permitted to be withdrawn with the work as before described. After a new button has been inserted in stitching position by the operator, a slight pressure upon the finger-piece 67 serves to shift the detent-lever 64 in opposition to its spring 72 so as to bring the notch 66 into register with the upper edge of the lever 53, which causes the release of the same and its tilting upon its fulcrum-stud 55 under the action of the spring 59 to enter its spur 57 into the button-shank eye for a succeeding button-fastening operation.

While any usual or suitable means may be provided for lifting the presser-bar, the automatically acting means to this end, herein shown and described, is considered preferable. The collar 30 is provided with a rearwardly projecting lug 74 whose lower edge is engaged by the forwardly extending arm of a tilting lever 75 fulcrumed upon the screw-stud 76 and carrying at its rearward end the roller-stud 77 entering a longitudinal slot 78 in the extremity of the forwardly extending arm of a rock-lever 79. This lever is mounted upon the fixed fulcrum-stud 80 and has in its offset rearward end a socket 81 entered by the plunger-pin 82 whose reduced rearward end passes through said socket and is provided with the thrust-nut 83 and the jam-nut 84 to sustain the thrust of a spring 85 encircling the same and interposed between the inner end of the socket and the enlarged forward end of the pin 82. In order to hold the stop-lever 9 with its upper end in its forward inoperative position in opposition to the action of the spring 86 so as to maintain the plunger-bar 8 disengaged from the stopping cam 7, the arm 87 of said lever which carries the belt-shifting fork 88 is provided with a bevel-pointed pin 89 adapted to be engaged by the hook 90 of a detaining rock-lever 91 fulcrumed upon a fixed screw-stud 92 and having its tail 93 disposed in the path of movement of a tripping stud 94 upon the cam-cylinder 26, the rock-lever 91 being held in operative position by means of the spring 95. Upon the tripping of the rock-lever by the pin 94, the hook 90 is disengaged from the pin 89 which permits the stop-lever 9 to be shifted under the action of its spring 86 to bring the plunger-bar 8 into operative relation with the cam 7, thereby throwing the side of the collar 12 into engagement with the point of the plunger-pin 82 to force the same inward. The plunger-bar 8 is depressed in opposition to its spring 13 under the action of the cam 7, the shoulder $12^{\times}$ afforded by the top of the collar 12 moving downwardly beneath the plunger-pin 82 which snaps forward above the same to be positively engaged when the plunger-bar rises in its final stopping action, so as to tilt the rock-lever 79, and through the lever 75 lift the presser-bar 28. As before explained, the lifting of the presser-bar causes the retraction of the button-shank detaining spur 57 and release of the button from the foot, whereby the button is adapted to be withdrawn from stitching position.

In practice, the shield-plate 41 is provided in its upper edge with a notch $41^{\times}$ which is made sufficiently deep to expose the needle-eye for the purposes of threading.

As represented in Fig. 8, the so-called "military" or loose shank buttons are composed of a front 96 having a peripheral flange embracing the rim of the back 97 which is formed with spaced apertures 98 entered by the spaced members 99 of the shank whose outturned extremities 100 enter the space intermediate the front and back and are securely anchored therein while affording a pivotal connection between the hollow button-head and the shank.

Having thus set forth the nature of the invention, what I claim herein is:—

1. A presser-foot having extending inwardly from one edge a longitudinal open-sided button-shank runway and a laterally-open needle-aperture transverse to the same, a button-head confining spring-plate adapted to yield outwardly from the closed side of said runway and disposed adjacent but spaced from said edge of the presser-foot to form in conjunction with the latter a button-head channel, a needle-shield plate extending upwardly from said runway and affording a partition between said needle-aperture and the button-head channel, and means adapted to engage and lock the button-shank from movement both endwise and sidewise in said runway.

2. A presser-foot having extending inwardly from one edge a longitudinal slot and a laterally-open needle-aperture transverse to the same, a U-shaped sheet metal button-shank guide having its body portion housed within said slot and formed with a closed needle-aperture in register with that of said foot and provided with upwardly and downwardly projecting lips extending respectively from its upper and lower members, and a button-head confining spring-plate arranged adjacent but spaced from said lips of the button-shank guide and forming therewith a button-head channel.

3. A presser-foot having extending inwardly from one edge a longitudinal open-sided button-shank runway and a laterally-open needle-aperture transverse to the same, a button-head confining spring-plate disposed adjacent but spaced from said edge of the presser-foot and having a shank angularly arranged relatively thereto and adjustably secured to the presser-foot to form a button-head channel of adjustable width,

and a needle-shield plate extending upwardly from said runway and affording a partition between said needle-aperture and the button-head channel.

4. A presser-foot having extending inwardly from one edge a longitudinal button-shank runway open at both ends and at one side and formed with upper and lower shank-guiding members, and a transverse needle-aperture extending through both of said members and open at one end in the lower of said members to produce a button-shank supporting tongue extending along the outer side of the needle-aperture and an adjacent release passage for the fastening means, whereby the button is adapted to move along said presser-foot to fastening position and to issue therefrom in the same direction.

5. A presser-foot having extending inwardly from one edge a longitudinal button-shank runway with upper and lower shank-guiding members, and a transverse needle-aperture extending through both of said members and open at one end in the lower of said members, and a shank-holding spur disposed transversely of said runway at said needle-aperture and adapted to enter the eye of the button-shank to hold the same in position for receiving fastening stitches.

6. A presser-foot having extending inwardly from one edge a longitudinal button-shank runway with upper and lower shank-guiding members, and a transverse needle-aperture extending through both of said members and open at one end in the lower of said members, and a spring-pressed shank-holding spur normally entering said needle-aperture and extending across said runway for holding a button-shank in position for receiving fastening stitches.

7. A presser-foot having extending inwardly from one edge a longitudinal button-shank runway with upper and lower shank-guiding members, and a transverse needle-aperture extending through both of said members and open at one end in the lower of said members, a tilting lever fulcrumed upon said presser-foot, a shank-holding spur carried by said lever and normally entering the needle-aperture and extending across said runway, and a spring for maintaining said lever normally in operative position.

8. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, a presser-bar, a spring for depressing the same, and means for lifting the presser-bar, of a presser-foot secured to the presser-bar and having extending inwardly from one edge a longitudinal button-shank runway with upper and lower shank-guiding members, and a transverse needle-aperture extending through both of said members and open at one end in the lower of said members, a shank-holding spur normally entering said needle-aperture and extending across said runway, and means actuated by the lifting of the presser-foot for retracting said spur from operative position.

9. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, a presser-bar, a spring for depressing the same, and means for lifting the presser-bar, of a presser-foot secured to the presser-bar and having extending inwardly from one edge a longitudinal button-shank runway with upper and lower shank-guiding members, and a transverse needle-aperture extending through both of said members and open at one end in the lower of said members, a tilting lever fulcrumed upon said presser-foot, a shank-holding spur carried by said lever and normally entering the needle-aperture and extending across said runway, a spring for maintaining said lever normally in operative position, and a detent-lever mounted upon a fixed fulcrum and presenting a shoulder for engagement with the spur-carrying lever whereby the raising of the presser-foot brings into operative engagement with the detent-lever the spur-carrying lever for tilting the latter to retract the spur from operative position.

10. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, a presser-bar, a spring for depressing the same, and means for lifting the presser-bar, of a presser-foot secured to the presser-bar and having extending inwardly from one edge a longitudinal button-shank runway with upper and lower shank-guiding members, and a transverse needle-aperture extending through both of said members and open at one end in the lower of said members, a tilting lever fulcrumed upon said presser-foot, a shank-holding spur carried by said lever and normally entering the needle-aperture and extending across said runway, a spring for maintaining said lever normally in operative position, a spring-pressed detent-lever mounted upon a fixed fulcrum and presenting a shoulder for engagement with the spur-carrying lever when the presser-foot is lifted, and means for shifting said detent-lever out of operative engagement with the spur-carrying lever to enable the latter to resume operative position while the presser-foot remains raised.

11. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, a presser-bar, a spring for depressing the same, and means for lifting the presser-bar, of a presser-foot secured to the presser-bar and provided with button-holding means, button-detaining means adapted to enter and remain within the eye of a button for positively locking the same in position to receive fastening stitches, and

means operated by the lifting of the presser-foot to retract said button-detaining means for the release of the button after a stitching operation.

12. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a presser-foot constructed with a button-shank runway and a button-head guideway and provided with a shank-holding spur movable transversely of said runway substantially parallel with and independently of the needle and adapted to enter the button-shank adjacent the needle for holding the same during the production of a succession of fastening stitches.

13. In a sewing machine, the combination with stitch-forming mechanism including a reciprocating needle, of a button-holding member constructed with a button-shank runway and a button-head guideway, and button-detaining means comprising a shank-holding spur normally extending across said runway and entering the button-shank for holding the same in position for receiving fastening stitches.

14. A presser-foot constructed with a button-shank runway and a button-head guideway, and provided with detaining means entering said runway and adapted to engage and lock the shank of the button from movement endwise and sidewise in the runway for receiving fastening stitches.

15. A presser-foot constructed with a button-shank runway and a button-head guideway, and provided with detaining means comprising a shank-holding spur disposed transversely of said runway and adapted to enter a button-shank to hold the same for receiving fastening stitches.

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

WILLIAM L. BARRON.

Witnesses:

H. A. KORNEMANN, Jr.,

NORMAN J. ACKER.