

April 29, 1941.

A. E. CARLILE

2,240,455

STAPLE SETTING MACHINE

Filed Jan. 5, 1939

2 Sheets-Sheet 1

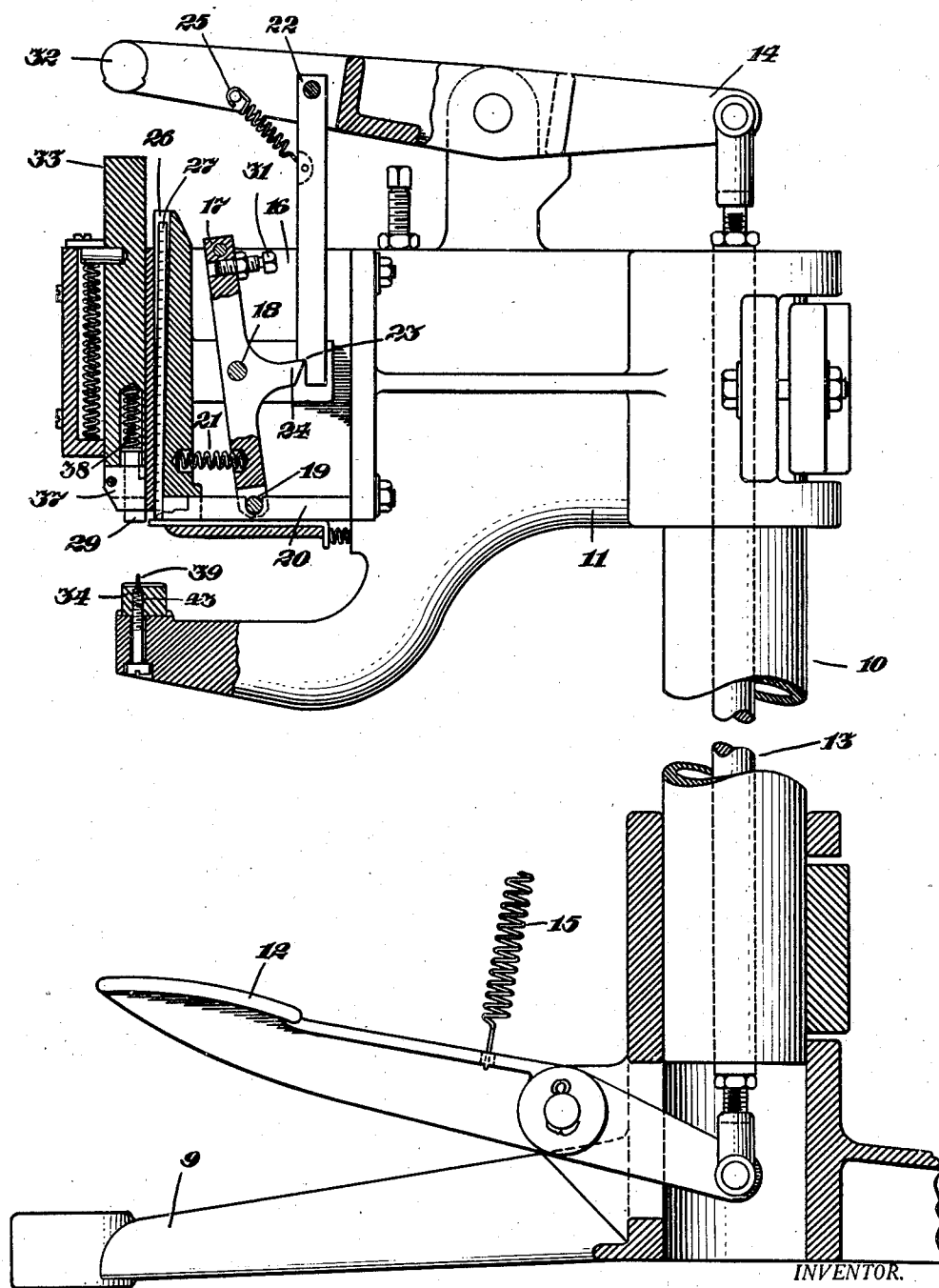


Fig. 1.

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2 Sheets-Sheet 2

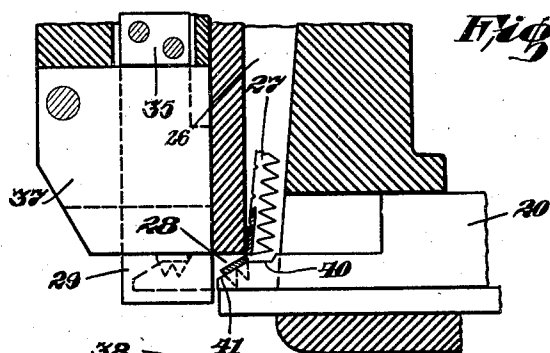


Fig. 3.

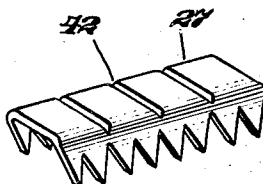


Fig. 2.

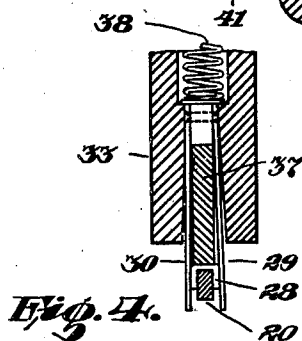


Fig. 4.

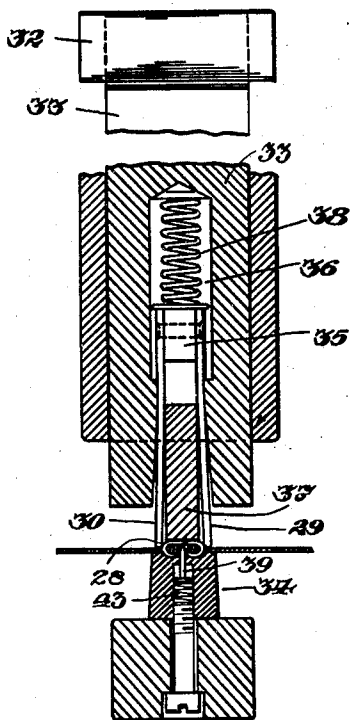


Fig. 6.

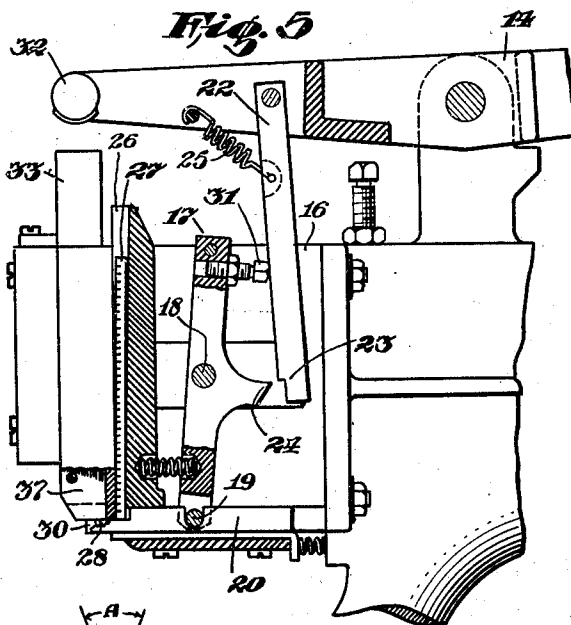


Fig. 7.

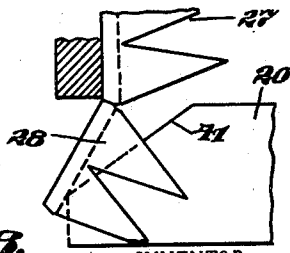


Fig. 8.

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UNITED STATES PATENT OFFICE

2,240,455

STAPLE SETTING MACHINE

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4 Claims. (Cl. 1—2)

This invention relates to staple setting machines and particularly to a machine for applying staple bottom stops on slide fasteners after the slide fastener has been attached to a garment.

In applying slide fastener assemblies to certain garments, for example, trousers, it has been learned in practice that it is most feasible to construct the garment in complete halves with the respective slide fastener stringers attached to the opposed parts, and then to join the halves together. In this construction it is necessary to join the bottom ends of the stringers after the halves of the garment have been put together. In other words a permanent bottom stop must be applied to the stringers at the ends of the rows of interlocking elements. Former types of machines devised for this purpose have been relatively complicated and expensive to manufacture for sale to garment manufacturers where the slide fasteners are assembled in the process of the garment manufacture.

It is therefore an object of my invention to provide an improved staple setting machine which is relatively cheap to manufacture and which may be easily used by garment manufacturers desiring to assemble the slide fastener on the garment when it is manufactured.

It is a further object of my invention to provide a staple setting machine which is simple in construction and has as few working parts as possible and at the same time, dependable over a long period of operation.

More specifically my invention provides a setting machine which receives a strip of preformed staples joined together by a portion between the staples notched to an angle of about 30° to 40° with a plunger acting against the end staple to break it off from the strip, transfer the same and load it into a staple setting punch.

In the accompanying drawings I have shown for purposes of illustration one embodiment which my invention may assume in practice. In the drawings:

Fig. 1 is a side elevation of the machine partly in section and showing the working parts thereof;

Fig. 2 is a perspective view of a strip of staples intended for use with my machine;

Fig. 3 is an enlarged section showing the transfer and setting mechanism;

Fig. 4 is a vertical section through the setting plunger and shows a staple element in position for setting;

Fig. 5 is a side elevation partly in section of a

part of the machine and shows the automatic release for quick return of the transfer finger from the setting punch;

Fig. 6 is a vertical section taken through the setting punch and shows a staple set in position on the respective edges of slide fastener stringers;

Fig. 7 is an enlarged side view of a staple and shows the angle of the notch formed in the strip between the staples;

Fig. 8 is an enlarged diagrammatic view illustrating the manner in which the transfer plunger acts against the bottom staple on the strip and breaks it off at the point of the notch shown in Fig. 7.

The machine disclosed comprises generally a base 9, a standard 10, which supports the main frame 11 of the machine, and a foot pedal 12 acting through the rod 13 on a bell crank lever 14. A conventional spring 15 attached to the foot lever is employed to return the setting mechanism to its initial position.

Attached to the frame 11 of the machine is a channeled housing 16 which retains a toggle lever 17 mounted on a pin 18 attached to the side of the housing. This toggle lever 17 operates through a pin 19 to impart motion to a transfer finger 20. A spring 21 engages the toggle lever 17 and the side of the housing 16 for returning the transfer finger 20 to its initial, or retracted, position. A link 22 is pivoted to the bell crank lever 14 and has on its forward end a notch 23 which engages a projection 24 on the toggle lever 17. A spring 25 acting between the bell crank lever 14 and the link 22 holds the link 22 against the toggle lever projection 24.

Formed in the forward side of the housing 16 is a guide channel 26 through which the strip of staples 27 is fed by gravity. This channel 26 is aligned with the transfer finger 20 and the strip advances when the transfer finger is retracted by spring 21 so that a part of the end staple 28 projects over the end of the transfer finger 20. When the transfer finger 20 moves forward it operates to break the end staple or element off the strip 27 during one cycle of operation of the machine. The end of the transfer finger 20 has an inclined surface 41 which comes in contact with the end staple 28 of the strip 27 and disengages it or breaks it off in a manner shown in Figs. 3 and 8. The strip 27 is formed with a deep notch 42 between the adjoining staples. It is important that these notches define an angle of about 30 or 40 degrees in order that when the transfer finger 20 strikes against

the end staple 28, the sides of the notch 42 will strike against each other and the material will stretch sufficiently to break at the notch.

If the notches were of the usual form with its sides meeting at about 60° the material which is usually a copper nickel alloy will not break on bending the staple 90° from the strip. After the element 28 is broken off the transfer finger 20 advances the element to the position in the setting punch shown in dash lines in Fig. 3. In this position the broken off end element 28 is urged back in the recessed portion 40 of the transfer finger 20 and the sides of the element 28 come in contact with side springs 29 and 30, respectively. These side springs grip the broken off element 28 and hold it in properly aligned setting position as the transfer finger 20 retracts to its initial position. As shown in Fig. 5 after the broken off element 28 has been transferred to the setting punch 33, an adjustable screw 31 positioned on the toggle lever 17 bears against the link 22 on the bell crank lever 14 and pushes the notch 23 of the link 22 out of engagement with the projection 24 on the toggle lever 17. In this position the toggle lever 17 is released, and the spring 21 acting against the toggle lever 17 quickly returns the transfer finger 20 to its initial position and allows the strip of staples to advance in position to repeat the operation. After the toggle lever 17 is released and the link 22 attached to the bell crank lever 14 is retracted, the end 32 of the bell crank lever strikes the setting plunger 33 and pushes it down carrying the broken off end staple 28 between the side springs 29 and 30 to a position where the end staple 28 strikes the setting anvil 34 and sets this staple through the fastener stringers. The side springs 29 and 30 are attached to the side of the block 35 which rides in a bore 36 formed in the setting plunger 33 and while the setting head 37 of the setting plunger 33 clinches the staple 28 the spring 38 yields to allow the side springs 29 and 30 to retract into the bore 36. A central positioning pin 39 for positioning the goods to be stapled relative to the setting mechanism may be employed as illustrated in Figs. 1 and 6. This positioning or locating pin in the anvil is normally spring pressed upwardly by an adjustable compression spring 43 and will be pressed downwardly by the punch during a setting operation.

While I have shown and described in this application one embodiment which my invention may assume in practice it will be understood

that this embodiment is merely for the purposes of illustration and that various other forms may be devised within the scope of the invention as set forth in the appended claims.

What I claim as my invention is:

1. A fastener setting machine of the class described comprising a guideway for a fastener strip, setting mechanism including an anvil and a setting punch, and a normally retracted transfer finger movable transversely of the path of movement of the setting punch and across the fastener strip guideway and having means for bending and breaking an element from the end of a strip in the guideway turning said element through substantially 90° and presenting it to the setting punch, and common means for positively moving said transfer finger from retracted position and subsequently operating said setting punch.

2. In a fastener setting machine of the class described, a guideway for a fastener strip, a transfer punch adapted to disconnect a staple from the strip and move it out of alignment with the guideway, means for actuating said transfer punch for the above purpose, means for automatically disengaging the transfer punch from said actuating means when it reaches its limit of travel and a spring for quickly returning the transfer punch to its initial position.

3. A stapling machine comprising a guideway for a pronged staple strip, an anvil, setting mechanism including a setting punch movable in a path substantially parallel to the said guideway toward said anvil, and a normally retracted transfer finger movable across the end of the guideway transversely to the path of movement of the setting punch, the end of said transfer finger in its retracted position being substantially in transverse alignment with the end of the guideway, and said transfer finger having an inclined staple engaging surface engaging the end staple of the strip for bending and breaking said staple from the strip then turning it at an angle to its position in the guideway and directing its prongs downwardly toward said anvil, the transfer punch being movable to carry said staple to the setting punch.

4. A machine comprising the combination of elements defined in claim 3 and automatically retractable spring fingers carried by the setting punch for engaging and holding the staple after the transfer finger has retracted.

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