Feb. 18, 1941. S. A. WALKER 2,232,016

FASTENER-APPLYING IMPLEMENT

Filed July 8, 1939 2 Sheets-Sheet 1

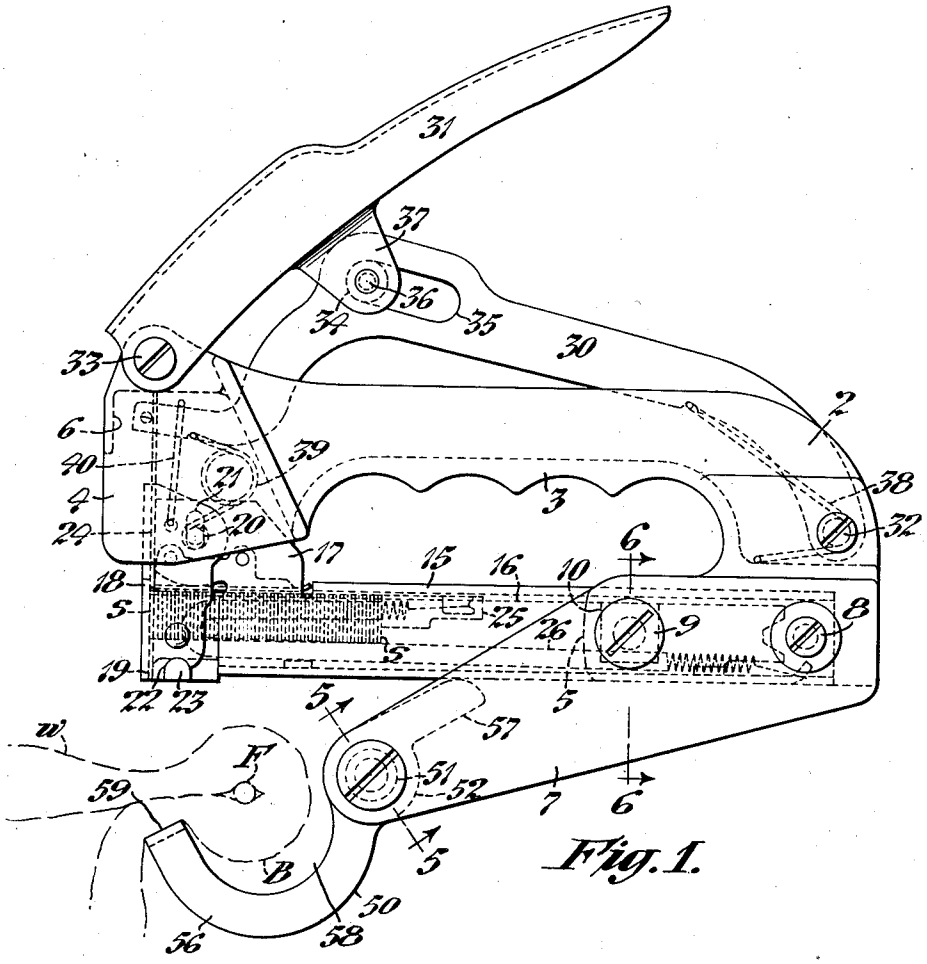

Fig. 1.

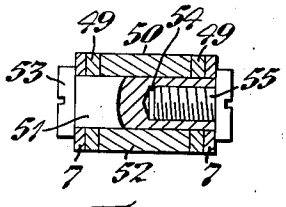

Fig. 5.

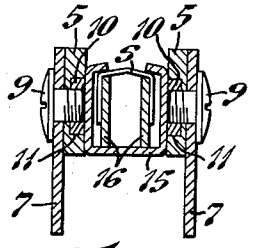

Fig. 6.

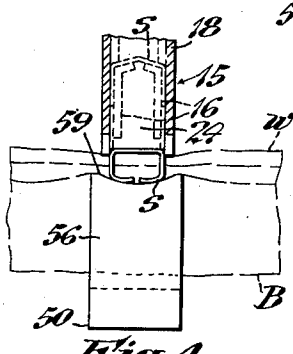

Fig. 4.

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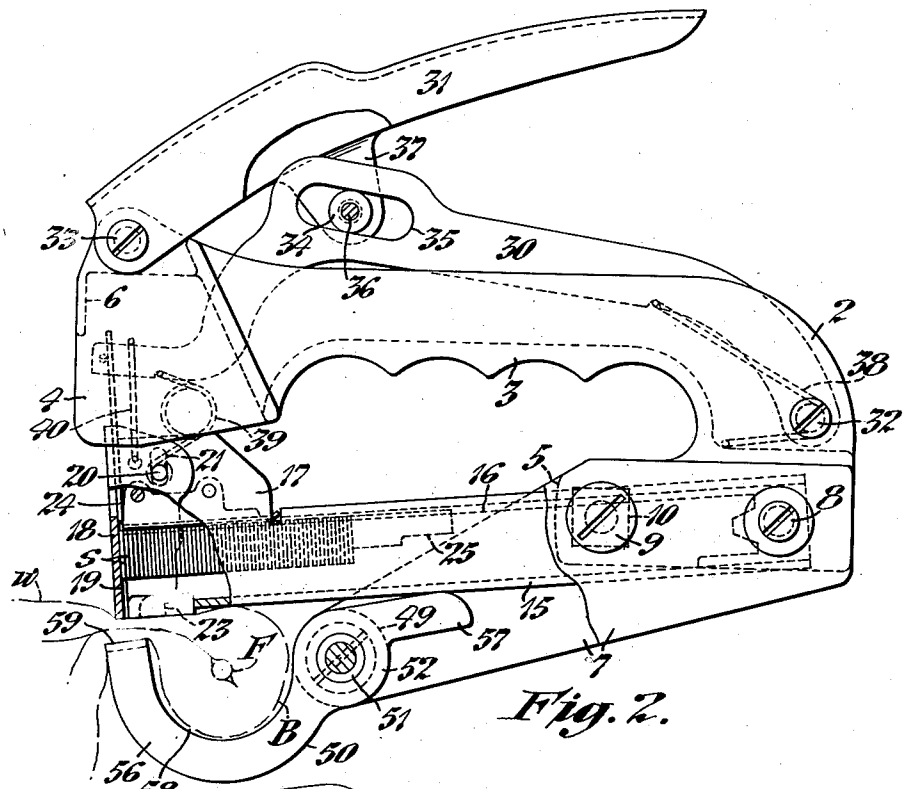


Fig. 2.

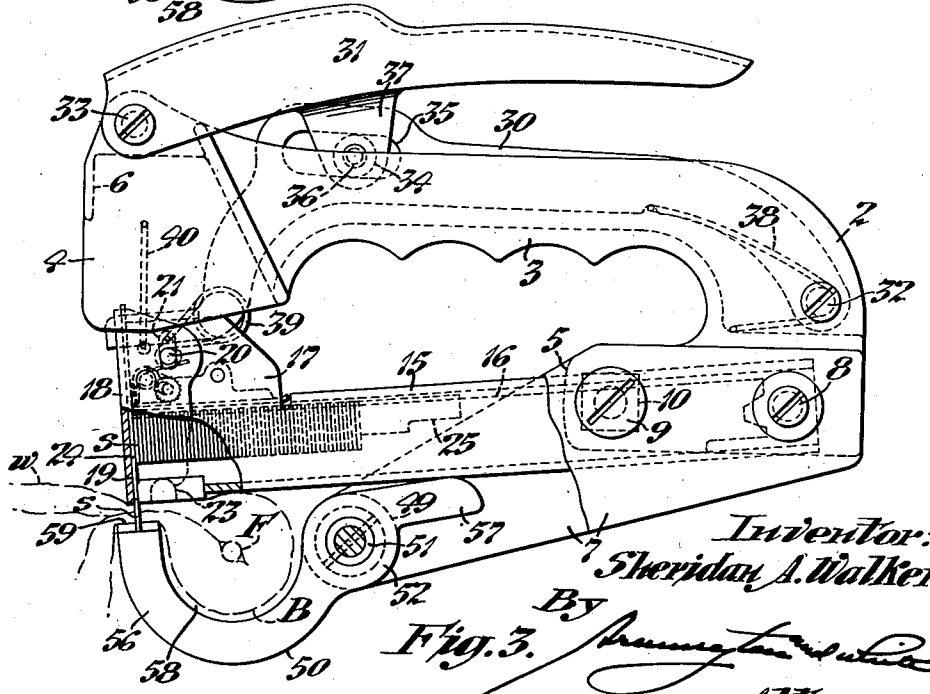


Fig. 3.

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# UNITED STATES PATENT OFFICE

2,232,016

## FASTENER-APPLYING IMPLEMENT

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Application July 8, 1939, Serial No. 283,400

6 Claims. (Cl. 1—49)

The present invention relates to improvements in fastener-applying implements and more particularly to plier-type implements for applying fasteners to soft, yielding work.

One of the objects of the invention is to provide a device of the type indicated having a fastener-applying arm and a clinching anvil movable away from each other simultaneously to provide a wide mouth for receiving the work and movable toward each other simultaneously to compress and grip the work to be operated upon.

Another object of the invention is to provide a device of the type indicated having an anvil with a hook-shaped forward end to provide a pocket for receiving the edge of the work to be fastened.

Another object of the invention is to provide a device of the type indicated having the anvil pivotally mounted and adapted to be actuated by the fastener-applying means to rock it about its pivot to grip the work.

Still another object of the invention is to provide a device of the type indicated which is of simple and compact construction to adapt it for economical manufacture.

Further objects of the invention are set forth in the following specification which describes a preferred form of construction of the implement, by way of example, as illustrated by the accompanying drawings. In the drawings:

Fig. 1 illustrates an implement incorporating the present invention and showing the pivoted anvil swung to its open position to adapt the work to be applied thereto;

Fig. 2 is a view similar to Fig. 1 showing the anvil rocked to its closed position by the fastener-applying means to compress and grip the work which is illustrated by dash-lines as held in the pocket in the anvil;

Fig. 3 is a view similar to Fig. 1 showing the fastener-applying means as having been operated to apply a fastener to the work;

Fig. 4 is a fragmentary front view of the implement shown partly in section and illustrating the clinching means at the end of the anvil;

Fig. 5 is a transverse sectional view taken on line 5—5 of Fig. 1 showing the pivot for the clinching anvil; and

Fig. 6 is a transverse sectional view taken on line 6—6 of Fig. 1 showing the means for attaching the depending side plates to the frame of the implement.

The present invention consists generally in a fastener-applying implement having fastener-applying means and a clinching anvil, each pivotally mounted on a frame for simultaneous movement either toward or away from each other. The anvil is pivoted intermediate its ends and has a curved hook-shaped portion forwardly of its pivot constituting a pocket for receiving the edge of the work and an actuating arm rearwardly of its pivot engageable by the fastener-applying means. Due to the curvature of the forward portion of the anvil the end-face thereof underlies the fastener-applying means and is recessed to provide a camming groove for deflecting the ends of the legs of the fasteners to clinch them against the under side of the work. The arrangement of the fastener-applying arm and anvil is such that both are simultaneously operated to compress and grip the work.

The present invention is illustrated in the drawings as applied to an implement for stitching a mattress *w* inwardly from its edge to form a bead B thereon but it is to be understood that the device is adapted for other uses. Mattresses are stuffed with soft fluffy material such as hair, sisal, cotton-batting or the like and are usually provided with a reenforcing wire or frame F at the edge thereof. The mattress ticking is usually hand-sewed inwardly of the wire to hold it in place so that the finished mattress will retain its shape.

The implement of the present invention as herein shown is particularly adapted to stitch mattress tickings with wire-fasteners or staples, being constituted by a frame 2 having a hand-grip portion 3 of channel-shape in cross-section with spaced flanges 4 at its forward end and similar depending flanges 5 at its rearward end. An integral web 6 extends between the spaced flanges 4 adjacent their upper portions and cooperates therewith to provide a housing for the forward end of the fastener-applying means, described hereinafter. Side plates 7 are attached to the rearward depending flanges 5 of the frame 2 extending forwardly therefrom as illustrated in Fig. 1. A bolt 8 extends through the side plates 7 and flanges 5 on the frame 2 at the rearward end of the implement and screws 9 at each side project through the plates 7 and flanges 5 forwardly of the bolt with their ends threaded into nuts 10 in recesses 11 on the inside faces of the flanges secure the parts in rigid connection.

The fastener-applying means comprises a fastener-applying arm 15 of usual construction pivotally mounted between the depending flanges 5 of the frame 2 on the bolt 8 at its rearward end and underlying the hand-grip portion 3 of the frame. The fastener-applying arm 15 is of chan-

nel-shape enclosing a core 16 for supporting arched crown-staples *s* therein in the manner shown in Fig. 6. At the forward end of the arm 15 are spaced flanges 17 which extend upwardly and forwardly to overhang the projecting end of the core 16. A U-shaped gate 18 encloses the end of the core 16 and cooperates therewith to provide a throat 19 through which the staples *s* are driven. The gate 18 is pivotally mounted on a pin 20 extending between its side walls and through an elongate slot 21 in the flanges 17 on the arm 15 to adapt it to be swung outwardly therefrom to open the end of the arm for receiving a supply of fasteners. The gate 18 is latched in closed position by the engagement of notches 22 at the lower edges of its side walls with lugs 23 on the forwardly projecting end of the core 16. An inverted U-shaped pusher 25 is mounted to slide on the core 16 at the rear of the staples *s* and to be yieldingly advanced by a spring 26 to feed the staples to the throat 19.

A driver 24 is mounted to reciprocate in the throat 19 and guided in its motion by the forward edges of the flanges 17 and the inside face of the front wall of the gate 18. The driver 24 is operated by interconnected compound levers 30 and 31 which increase the mechanical advantage of the force applied thereto. The actuating lever 30 is pivoted at its rearward end on a bolt 32 extending between the slide walls of the rearward channel-shaped portion of the frame 2 and extending forwardly therefrom. The free end of the lever 30 is curved downwardly and forwardly with its extremity projecting through a slot in the driver 24. The manually-operative lever 31 is of inverted channel-shape in cross-section with its forward end pivoted on the laterally projecting ends of a bolt 33 projecting through the web 6 of the frame 2. The operating lever 31 extends rearwardly in overlying relation to the actuating lever 30 and the finger-grip portion 3 of the frame 2. The operating lever 31 carries a roller 34 which engages the opposite edges of a slot 35 in the actuating lever 30. As illustrated in Fig. 1, the roller 34 is rotatably mounted on a pin 36 extending between depending flanges 37 of the operating lever 31 which are spaced apart to overlie the sides of the actuating lever 30. The actuating lever 30 is yieldingly held in raised position by means of a hair-pin-shaped spring 38 acting between the frame 2 and the under side of the lever. The upward movement of the levers 30 and 31 on the frame 2 is limited by the engagement of the roller 34 with the end of the slot 35 as shown in Fig. 1. A second spring 39 arranged between the actuating lever 30 and the pivot-pin 20 for the gate 18 acts to hold the gate closed and the lever raised with respect to the fastener-applying arm 15. A loop-like link 40 has its ends attached to the opposite flanges 17 on the fastener-applying arm 15 with its loop embracing the forward end of the actuating lever 30 rearwardly of the driver 24 to limit the upward movement of the lever with respect to the fastener-applying arm.

In accordance with the present invention a clinching anvil 50 is pivotally mounted on the frame 2 for rocking movement with respect thereto. The anvil 50 is preferably constructed in the form of a bar of generally rectangular shape in cross-section and of a width to adapt it to fit between the spaced side plates 7 on the frame 2. The anvil 50 is pivotally mounted on a pin or stud 51 extending between the spaced side plates 7 of the frame at their forward ends and through a hub 52 on the anvil intermediate its ends, washers 49 being provided between the hub and side plates. As illustrated in Fig. 5, the pivot-pin 51 has a head 53 at one end and a tapped bore 54 at its opposite end into which a headed screw 55 is threaded to securely hold the pin in place on the frame. The portion of the anvil 50 extending forwardly from the pivot-pin 51 is curved or of equivalent shape to provide a hook-shaped jaw 56 and the portion extending rearwardly from the pivot-pin constitutes an actuating arm 57 engageable by the fastener-applying arm 15. The hooked form of the jaw 56 provides a pocket 58 for receiving the edge of the mattress-ticking or other work *w* to be fastened and positions the end face 59 of the anvil in underlying relation to the throat 19 of the fastener-applying means. The end face 59 of the anvil 50 is recessed to provide a curved cam-groove for deflecting the ends of the legs of the staples *s* to cause them to be clinched against the under side of the work *w*. Thus the present invention provides for pivotally mounting both the fastener-applying arm 15 and anvil 50 on the frame 2 to adapt them to be rocked away from each other to provide a wide mouth for receiving the work and to be rocked toward each other simultaneously to compress and grip the work. One embodiment of the invention having been described in detail the mode of operation of the implement is explained as follows:

The implement is held in the hand with the ends of the fingers underlying the finger-grip portion 3 of the frame 2 and with the ball of the thumb overlying the operating lever 31. With the parts in the relative position illustrated in Fig. 1, the edge of the mattress-ticking or of any other similar work *w* is inserted through the opening between the fastener-applying arm 15 and the anvil 50 to the position illustrated by dash lines in Fig. 1 with the fold or other projecting part of the work in the pocket of the anvil and the part to be stitched or fastened lying across the end face 59 thereof. The lever 31 is then operated by pressing it toward the finger-grip 3 of the frame 2 and its motion is transmitted through the interengaging roller 34 and slot 35 to rock the actuating lever 30 about its pivot 32. The actuating lever 30 is yieldingly held in spaced relation to the fastener-applying arm 15 by the spring 39 so that the two parts initially move together as a unit toward the anvil 50 to the position illustrated in Fig. 2. As the fastener-applying arm moves downwardly its engagement with the actuating arm 57 of the anvil 50 causes the latter to rock on its pivot 51 from the position illustrated in Fig. 1 to that illustrated in Fig. 2 to move its forward hook-shaped jaw 56 upwardly. Thus the fastener-applying arm 15 and the hook-shaped jaw 56 of the anvil 50 move toward each other simultaneously to compress the work *w* and clamp it in position to receive a fastener. As will be noted by reference to Figs. 2 and 3, the edge or bead B of the work *w* is positioned in the pocket 58 formed by the curved hook-shaped jaw 56 of the anvil 50.

When the resistance of the work *w* held between the end face 59 of the anvil 50 and the forward end of the fastener-applying arm 15, exceeds the resistance of the spring 39 the actuating lever 30 will be moved downwardly with respect to the fastener-applying arm to operate the driver 24 in the manner as illustrated in Fig. 3. The descent of the driver 24 through the throat 19 causes the staple *s* positioned therein

to be driven into the work *w* and as the legs of the staple penetrate therethrough their ends engage the curved end-face **59** of the anvil **50** and are continuously deflected inwardly toward each other to clinch the staple as indicated in Fig. 4.

After a staple *s* has been driven and clinched the operating lever **31** is released and the spring **33** acting between the frame **2** and actuating lever **30** rocks the latter to the position illustrated in Fig. 1. During the upward movement of the actuating lever **30** the slot **35** therein acts to cam the roller **34** therealong to thereby raise the operating lever **31** with the return movement of the parts limited by the engagement of the roller with the end of the slot. The spring **39** acts to hold the fastener-applying arm **15** down while the lever **30** moves upwardly to cause the driver **24** to be withdrawn. The engagement of the actuating lever **30** with the looped end of the link **40** limits the upward movement of the actuating lever with respect to the fastener-applying arm **15** and thereafter the lever and arm move upwardly as a unit. After the driver **24** has moved above the end of the core **16** the pusher **25** and staples *s* in the fastener-applying arm **15** are advanced by the spring **26** to position the foremost staple in the throat **19**. As the fastener-applying arm **15** moves away from the actuating arm **57** of the anvil **50** the forward hook-shaped jaw **56** of the latter being overbalanced, automatically rocks to first position as illustrated in Fig. 1. The implement may thus be operated to apply the fasteners by merely depressing the operating lever **31** and the relatively wide mouth of the implement adapts it to be moved along the edge of work *w* to be stitched.

It will be observed from the foregoing description that the present invention provides a plier-type of implement having a relatively large mouth to receive the work to be fastened. It will also be observed that both the fastener-applying arm and anvil are pivotally mounted on a frame and operated simultaneously toward or away from each other and that the curved hook-shaped end of the anvil provides a pocket for receiving the edge of the work such as a mattress or the like.

While the invention is herein illustrated and described as embodied in a preferred form of construction, it is to be understood that various modifications may be made in the structure and arrangement of the parts of the implement without departing from the spirit or scope of the invention. Therefore, without limiting myself in this respect, I claim:

1. In a device of the type indicated, a frame, a fastener-applying arm pivotally mounted on the frame, an anvil pivotally mounted on the frame and having a U-shaped portion providing a relatively deep recess and having means at its end for clinching the fasteners, said U-shaped portion of the anvil cooperating with the fastener-applying arm to provide a pocket for receiving the folded edge of the work, and means for rocking the fastener-applying arm and anvil toward each other simultaneously to grip the work and thereafter operating the fastener-applying means to apply a fastener.

2. In a device of the type indicated, a frame, a fastener-applying arm pivotally mounted on the frame, a driver on the fastener-applying arm, an anvil pivotally mounted on the frame intermediate its ends and having a hook-shaped portion disposed forwardly of its pivot with clinching means at its end and an actuating arm extending rearwardly of its pivot and engageable by the fastener-applying arm, said hook-shaped portion of the anvil and said fastener-applying arm cooperating to provide a pocket for receiving the edge of the work, and means for rocking the fastener-applying arm toward the anvil and thereafter actuating the driver to apply a fastener, the engagement of the fastener-applying arm with the actuating arm on the anvil acting to simultaneously rock the latter to move its clinching means toward the fastener-applying arm.

3. In a device of the type indicated, a frame, fastener-applying means pivotally mounted on the frame, an anvil pivotally mounted on the frame intermediate its ends and having a hook-shaped portion disposed forwardly of its pivot with a clinching groove at its end and an actuating arm extending rearwardly of its pivot, said anvil being adapted to be rocked on its pivot by the engagement of the fastener-applying means with its actuating arm to move its hook-shaped portion toward the fastener-applying means, and means for operating the fastener-applying means to rock it toward the anvil and thereafter drive a fastener.

4. In a device of the type indicated, a frame having depending sides, a fastener-applying arm pivotally mounted at its rearward end on the frame, means for rocking the fastener-applying arm on its pivot and thereafter driving a fastener, and an anvil pivoted intermediate its ends between the depending sides of the frame and forwardly of the pivotal mounting for the fastener-applying arm, said anvil having a hook-shaped portion disposed forwardly of its pivot and an actuating arm extending rearwardly of its pivot and engageable by the fastener-applying arm whereby rocking movement of the fastener-applying arm toward the anvil acts to rock the hook-shaped portion of the anvil toward the fastener-applying arm.

5. In a device of the type indicated, a frame, fastener-applying means pivotally mounted on the frame, an anvil pivotally mounted intermediate its ends on the frame and having clinching means forwardly of its pivot, said fastener-applying means engaging the anvil rearwardly of its pivot to rock its clinching means toward the fastener-applying means, and means for operating the fastener-applying means to rock it toward the anvil and thereafter drive a fastener, said anvil being hook-shaped forwardly of its pivot to adapt it to cooperate with the fastener-applying means to provide a pocket for the work.

6. In a device of the type indicated, a frame, fastener-applying means pivotally mounted on the frame, an anvil pivotally mounted on the frame and having a U-shaped portion with means at its end for clinching the fasteners, said fastener-applying means and anvil being rockable on the frame away from each other to provide a relatively wide mouth for insertion of the work and said U-shaped portion of the anvil providing a deep pocket for receiving the folded portion of the work, and means for simultaneously rocking the fastener-applying means and anvil on the frame toward each other to grip the work therebetween and thereafter operate the fastener-applying means to drive a fastener.

SHERIDAN A. WALKER.