March 16, 1937. S. A. CROSBY 2,073,960

ANVIL FOR STAPLING MACHINES

Filed March 7, 1935

Fig. 1

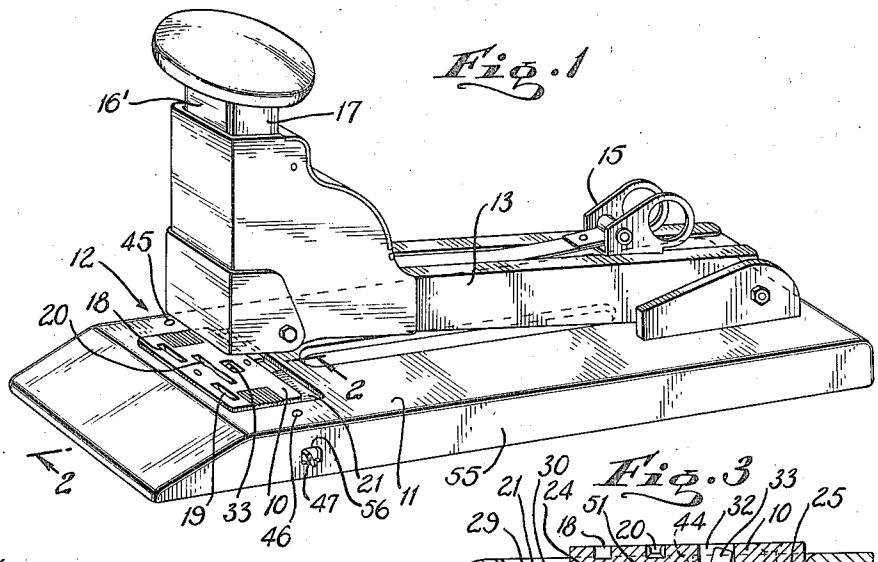


Fig. 2

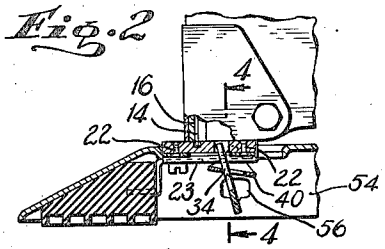


Fig. 3

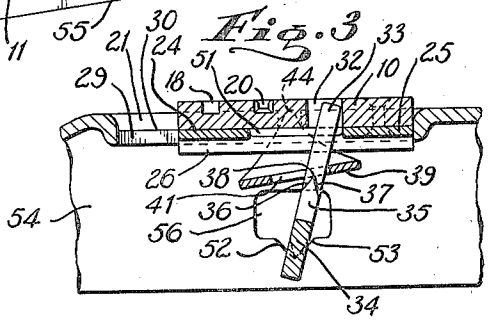


Fig. 5

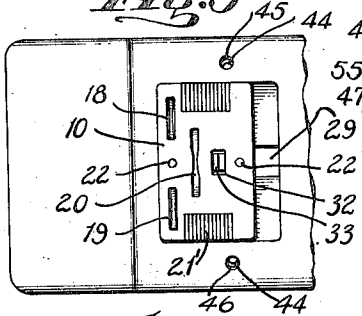


Fig. 4

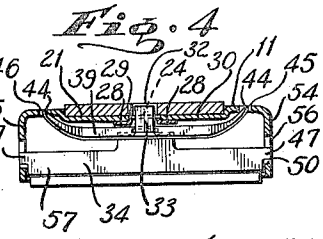


Fig. 7

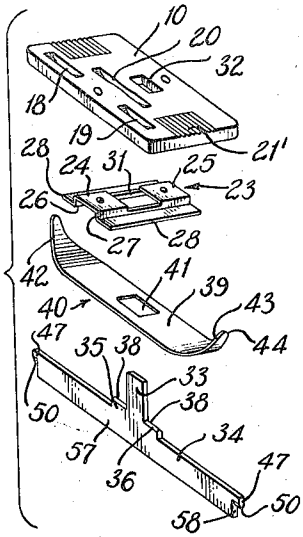


Fig. 6

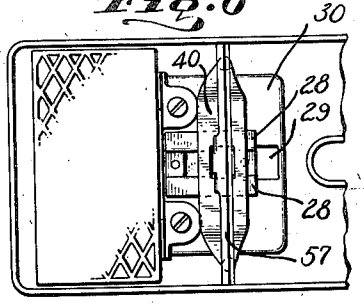
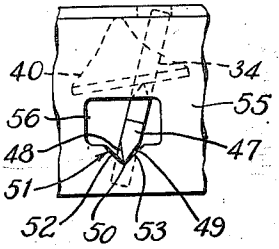


Fig. 8



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ANVIL FOR STAPLING MACHINES

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Application March 7, 1935, Serial No. 9,710

25 Claims. (Cl. 1—3)

The present invention relates to stapling machines and more particularly to machines employing a shiftable anvil having a plurality of types of relatively elongated clinching indentations selectively utilized in deforming successive staples of a staple strip for either permanent or temporary fastening purposes.

One object of the invention is to provide in a stapling machine of the character referred to an improved shiftable anvil adapted to be conveniently and quickly set in a position to cooperate with a staple driving blade for deforming a staple of a staple strip for either temporary or permanent fastening of several papers or the like and tiltable means automatically actuated in response to the displacement of the anvil for retaining the latter in either one of two positions, namely, when set for permanent fastening of a staple or when set for temporary fastening of a staple.

The invention has as another object the provision of a stapling machine in which the anvil thereof may be readily manipulated by relatively slight finger pressure on the part of the operator for setting the anvil for either temporary or permanent fastening of a staple.

The invention has as another object the provision of a stapling machine wherein the anvil is slidably shifted by relatively light finger pressure on the part of the operator and wherein the anvil during displacement thereof longitudinally of the base of the machine actuates a transversely disposed pivoted bar for setting a spring member in a predetermined relation in respect to the pivoted bar for holding the latter in a retained position to prevent accidental displacement of the anvil relative to the base.

The invention has as a further object the provision of a shiftable anvil having a carriage member bodily movable therewith and cooperating with an extension of a transversely disposed pivoted bar to oscillate a U-shaped spring which serves to hold the bar in a selected and retained position.

Other objects, advantages and features of the invention will appear from the detailed description when considered in the light of the accompanying drawing in which:

Fig. 1 is a perspective view of a stapling machine showing the anvil according to the invention in position to deform a staple for permanent fastening.

Fig. 2 is a fragmentary sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is a fragmentary view of Fig. 2 shown on a larger scale but illustrating the anvil shifted to deform a staple for temporary fastening.

Fig. 4 is a sectional view on the line 4—4 of Fig. 2.

Fig. 5 is a plan view of a fragmentary portion of the base of the stapling machine.

Fig. 6 is a bottom view of Fig. 5.

Fig. 7 is an exploded or disassembled view illustrating the anvil and the retaining mechanism cooperating therewith and

Fig. 8 is a fragmentary side view of Fig. 1 but shown on a larger scale.

Referring to the drawing, the anvil 10 is slidably mounted on the base 11 of a stapling machine generally designated 12 which comprises an appropriately pivoted arm 13 suitably supporting a conventional staple strip (not shown) whereby a U shaped staple 14 of the staple strip may be advanced by a spring actuated follower 15 to the forward part of the arm and in registration with a vertically disposed staple receiving raceway 16 through which a registered staple is slidably displaced downwardly by a blade 16' carried by a reciprocable plunger 17 onto several papers or the like (not shown) to be anchored or fastened together. This fastening is done more particularly by the depending legs of a conventional U shaped staple which are passed through the papers to be anchored on the downward displacement of blade 16' until they enter the spaced indentations or relatively elongated recess 18 and 19 for temporary fastening or the transversely disposed relatively elongated indentation or recess 20 for permanent fastening depending whether the anvil 10 is set for temporary or permanent crimping or deforming of a staple.

Anvil 10 is in the form of rectangularly shaped plate having knurled marginal portions 21' to facilitate the gripping thereof by finger pressure. The anvil is slidably mounted and guided in a relatively shallow recess 21 formed in the base 11. The height of the anvil is slightly greater than the depth of recess 21 and consequently the upper portion of the anvil projects beyond the upper surface of base 11.

Rigidly attached to the bottom face of anvil 10 by rivets or pins 22 is a carriage 23 which comprises spaced horizontal walls 24 and 25 carrying depending sides 26 and 27 from each of which laterally extends a flange 28.

Upper spaced walls 24 and 25 of the carriage together with the depending walls 27 and 28 constitute a rectangular shaped head slidably guided in a longitudinally disposed opening 29 in the bottom wall 30 of recess 21 and the spaced later-

ally extending wings or flanges **28** cooperate with the lower face of wall **30** adjacent opening **29** to prevent disengagement of the slidable anvil from recess wall **30**.

The spaced walls **24** and **25** of the head of the slidable carriage **23** define a centrally disposed opening or gap **31** in registration with opening **32** of the anvil and a tongue or extension **33** of a pivoted bar **34** projects through elongated opening **31** of the carriage and into opening **32** of the anvil.

The pivoted bar **34** includes a centrally arranged reduced portion **35** from which tongue **33** projects. The upper faces of the reduced portion or shoulders **35** are each provided with inclined faces **36** and **37** converging to form an apex or relatively sharp edge **38** on which the base **39** of the U shaped spring **40** is supported.

Tongue **33** also passes through an opening **41** in base of spring **40** which embodies spaced and diverging arms **42** and **43** having their terminals **44** closely confined in the spaced openings or sockets **45** and **46** in the upper wall of the base **11**.

Integral with bar **34** and extending laterally from each side thereof is an overhanging lug **47** each of which includes beveled faces **48** and **49** forming a downwardly and longitudinally disposed apex or relatively thin edge **50** seated at the lowermost portion or apex of a V shaped fulcrum bearing or groove **51** having diverging faces **52** and **53** formed in the spaced longitudinal depending sides **54** and **55** of the base **11**. More specifically each of the spaced sides **54** and **55** is provided with an opening **56** in which a lug **47** extends, each opening **56** communicating with a V shaped groove or bearing **51** in which a knife edge **50** is rockably seated. It will be noted that the lower part **57** of the bar **34** has a width coextensive with the distance between the spaced sides **54** and **55** of the base and hence side faces **58** of the bar cooperate with the spaced sides of the base to prevent transverse or lateral displacement of the bar.

The knife edges **50** of the bar **34** are seated on substantially corresponding shaped knife edges of the bearings **51**, the longitudinally disposed apices of the latter serving as fulcrum means on which bar **34** may be selectively rocked in a direction towards the front or rear portion of the anvil, that is to say, lugs **47** have a pivotal connection with the spaced sides of the base **11**.

In Figs. 1 and 2, anvil **10** is illustrated as occupying the entire front portion of shallow recess **21**. In such position of the anvil permanent crimping indentation **20** thereof is in alinement with the raceway **16** of course after arm **13** has been depressed. Consequently, after plunger **17** has been actuated staple **16** is driven out of raceway **14**, the legs of the staple, however, first penetrate through several papers to be anchored after which the legs of the staple come in contact with walls of indentation **20** and the latter cooperates to deform the legs of the staple to permanently anchor the papers together.

Where it is desired to anchor several papers by a staple temporarily, the operator first applies slight pressure on a knurled marginal portion **21'** or on any front portion of the anvil but exerted in a rearward direction and consequently the anvil is slidably shifted in a direction towards the rear of the base. If anvil **10** be displaced, extension **33** is actuated and accordingly bar **34** is rocked so that spaced edges **50** pivot on their fulcrum bearings, that is, the upper portion of the bar swings rearwardly and assumes the position illustrated in Fig. 3 and in such position indentations **18** and **19** of the anvil are utilized for deforming a staple for temporary fastening. The rearward or forward tilting of bar **34** is controlled by the movement of the anvil which is stopped in its travel by the forward or rearward transverse walls of recess **21**, that is, the extreme limits of the swing of the bar **34** takes place at a time when the anvil strikes or abuts either the front or rear transverse walls of recess **21** which serves as stop means for the anvil.

During rearward displacement of the anvil, bar **34**, of course, is actuated and tilts towards the rear of the base. In tilting rearwardly, U shaped spring **40** is also actuated to retain or hold the bar when in an extreme position thereof to prevent accidental displacement of the anvil. More particularly, when the bar is swung, edges **38** actuate spring **40**, causing the arms **42** and **43** of the latter to swing in the same direction relative to the base although the terminals **44** of the spring are continuously retained in their respective sockets **45** and **46**. Hence, by reason of the resiliency of the spring, base **39** maintains a downwardly directed pressure against inclined faces **36** adjacent apices **38** and consequently bar **34** is prevented from accidentally swinging forwardly. It follows therefore that after the anvil is shifted to a selected position it must be deliberately actuated to another selected position. Accordingly, in the position of the anvil for temporary fastening of papers, (see Fig. 3) the anvil occupies the entire rear portion of recess **21**, the bar is in a position tilting towards the rear of the base **11**, and the retaining spring is also tilted, inclining towards the rear of the machine but holding the bar in a retained or set position.

Having completed temporary fastening, the anvil may be readily adjusted for permanent fastening. By a slight finger pressure exerted on the anvil the latter may be quickly slidably displaced towards the front of the recess **21**. In moving forwardly, extension **33** is struck causing pivoted bar **34** to swing through the dead center and subsequently move to incline or tilt towards the front of the machine until its movement is resisted when the forward transverse face of the anvil strikes or abuts the forward transverse wall of recess **21**. However, during the swing of the bar, spring **40** has also been actuated or swung, that is, oscillated by reason of rectilinear edges **38** which are continuously in close engagement and cooperate with base **39**, swinging the latter in a direction towards which the bar has been displaced and consequently base **39** of spring **40** is also in an inclined position and tilting in a direction towards the front of the machine. That is to say, when the anvil has been set for permanent fastening, base **39** due to the pressure imparted thereby cooperates with face **37** to prevent accidental displacement of the bar and hence the anvil is prevented from displacement towards the rear of the machine. Base **39** is continuously in contact with apices **38** by reason of the downward pressure imparted thereto by the arms **42** and **43** which may be considered as having their terminals pivotally sustained in the spaced sockets **46**.

By the expression "to prevent displacement of the anvil" as set out in the specification and claims, it is to be understood, shall mean, involuntary or accidental displacement of the anvil relative to the base after having stopped in either its forward or rearward extreme posi-

tion for it is obvious that the anvil may be displaced from a set position upon deliberate application thereon of appreciable finger pressure acting in a direction longitudinally of the base.

While I have shown and described a preferred embodiment of my invention, it will be understood that changes involving omissions, alterations, substitutions and reversal of parts may be made without departing from the scope of my invention defined in the appended claims.

I claim:—

1. In a stapling machine, a base having a horizontally shiftable unitary anvil comprising spaced elongated staple deforming indentations, means pivoted to said base and adapted to be actuated by said anvil during displacement of said anvil longitudinally of said base, and means cooperating with said pivoted means to prevent accidental displacement of said anvil.

2. In a stapling machine, a base having a rectilinearly shiftable anvil comprising several types of elongated clinching indentations, swingable means disposed transversely of said base and actuated upon shifting of said anvil, means to limit rectilinear movement of said anvil for limiting the movement of said swingable means and means for retaining said swingable means at the completion of movement thereof to prevent displacement of said anvil.

3. In a stapling machine, a base having a shiftable anvil comprising several types of spaced and elongated clinching indentations, a transversely disposed member pivoted to said base, and spring means tiltable relative to said base and cooperating with said member to retain said anvil in a predetermined position.

4. In a stapling machine, a base having a rectilinearly and horizontally shiftable anvil, a bar extending transversely of and pivoted to said base and actuated during movement of said anvil longitudinally of said base, and spring means in part seated on and actuated by said bar and cooperating therewith to prevent movement of said anvil from a set position thereof.

5. In a stapling machine, a base comprising a recess, an anvil disposed in said recess and rectilinearly displaceable therein longitudinally of said base, a transversely disposed bar tiltable relative to said base and bodily swingable during movement of said anvil, and spring means in part seated on and cooperating with said bar and in part cooperating with said base to prevent displacement of said anvil.

6. In a stapling machine, a base comprising a recess, an anvil slidably disposed in said recess and rectilinearly guided therein longitudinally of said base, means tiltably supported by said base and actuated by said anvil during displacement thereof, and spring means tiltably actuated by said tiltable means and cooperating therewith to prevent displacement of said anvil.

7. In a stapling machine, a base having a horizontally movable slidably guided anvil, a transversely disposed bar having means tiltably carried by said base and actuated by horizontal movement of said anvil, and swingable spring means tiltably actuated by said bar to prevent movement of said anvil.

8. In a stapling machine, a base having a slidably guided anvil, a bar having ends supported by said base, a spring having a portion seated on said bar and including means retained by said base, said anvil being rectilinearly and rearwardly displaceable upon the application of finger pressure thereon and means to limit rearward displacement of said anvil, said spring upon stopping of said anvil cooperating with said bar to prevent displacement of said anvil.

9. In a stapling machine, a base having a slidably guided anvil, a bar having ends tiltably supported by said base, a spring having a portion seated on said bar and including arms retained by said base, said anvil being rectilinearly and forwardly displaceable upon the application of finger pressure thereon, and means to limit forward displacement of said anvil, said spring upon stopping of said anvil cooperating with said bar to prevent displacement of said anvil.

10. In a stapling machine, a base having a slidably guided anvil comprising several types of staple deforming indentations, a bar having spaced ends tiltably supported by said base and comprising means cooperating with said anvil to tilt said bar upon rectilinear movement of said anvil, said base having means cooperating with said anvil to limit rectilinear displacement of said anvil, and swingable spring means cooperating with said bar and retained by said base to prevent displacement of said anvil.

11. In a stapling machine, a base having a slidably and rectilinearly guided anvil comprising several types of staple deforming indentations, said base having means to stop forward or rearward displacement of said anvil, tiltable means adapted to be actuated by said anvil and having ends pivotally carried by said base, and spring means cooperating with said tiltable means for holding said anvil against displacement when disposed in a stopped position.

12. In a stapling machine, a base having a slidably guided anvil, a transversely disposed bar having ends tiltably supported by said base, means upon rectilinear displacement of said anvil cooperating to tilt said bar, and a spring seated on said bar and having arms retained by said base, said anvil having means cooperating with said base to limit forward or rearward displacement of said anvil, said spring cooperating to retain said bar in an extreme forward or rearward position of said anvil to prevent displacement of the latter.

13. In a stapling machine, a base having a slidably guided anvil, a transversely disposed bar having V shaped ends each having a bottom edge tiltably supported by said base, means upon rectilinear displacement of said anvil cooperating to tilt said bar, and a U shaped spring comprising arms retained by said base and a member common to said arms seated on said bar and actuated by the latter for tilting said spring to retain said bar and hold said anvil against displacement.

14. In a stapling machine, a base having a slidably guided anvil, a transversely disposed tiltable bar adapted to be actuated by said anvil and having V shaped ends, said base having V shaped bearings for tiltably retaining said ends, means to limit forward or rearward displacement of said anvil, and spring means actuated in response to the displacement of said bar and cooperating therewith in a stopped position of said anvil to prevent displacement thereof.

15. In a stapling machine, a base having a slidably guided anvil comprising several types of staple deforming indentations, a bar actuated by said anvil and comprising V shaped ends, said base having V shaped bearings tiltably supporting said ends, means to limit forward or rearward rectilinear displacment of said anvil longi-

tudinally of said base, and tiltable spring means operatively sustained by said base and displaceable in response to the movement of said bar and cooperating therewith in a stopped position of said anvil to prevent displacement of the latter longitudinally of said base.

16. In a stapling machine, a base having spaced V shaped openings, a bar comprising ends tiltably sustained in said openings, an anvil adapted to be shifted upon the application of pressure thereon to actuate said bar, and a U shaped spring swingable in response to the displacement of said bar and cooperating therewith to prevent displacement of said anvil.

17. In a stapling machine, a base comprising a recess, an anvil slidably guided in said recess, means to limit forward or rearward movement of said anvil, transversely disposed means tiltably carried by said base and swingably displaced upon displacement of said anvil and a spring actuated by said tiltable means cooperating with the latter to prevent displacement of said anvil when disposed in a normally forward or rearward position.

18. In a stapling machine, a base having a horizontally shiftable anvil movable over the upper face thereof, tiltable retaining means adapted to be actuated by said anvil, stop means to limit displacement of said anvil, and spring means for retaining said tiltable means to prevent shifting of said anvil.

19. In a stapling machine, a base having a shiftable anvil, tiltable means actuated in response to the rectilinear displacement of said anvil, stop means to limit forward or rearward rectilinear displacement of said anvil relative to said base, and swingable spring means cooperating with said tiltable means to prevent displacement of said anvil when disposed in a normally forward or rearward position.

20. In a stapling machine, a base having a horizontally and slidably guided anvil comprising several types of elongated staple clinching indentations, a transversely disposed bar having ends pivotally sustained by said base, said anvil having means for actuating said bar and a spring contacting said bar and including spaced arms movably retained by said base, said anvil being rectilinearly displaceable upon application of finger pressure thereon, said base having means to limit rearward displacement of said anvil, said spring upon stopping of said anvil cooperating with said bar to prevent displacement of said anvil.

21. In a stapling machine, a base having a longitudinally displaceable anvil comprising several types of staple clinching indentations, a transversely disposed bar having V shaped ends tiltably mounted on said base and means operatively associated with said anvil whereby upon displacement of the latter longitudinally of said base said bar is tilted towards the direction of movement of said anvil, and spring means mounted on said bar and retained by said base to prevent displacement of said bar.

22. In a stapling machine, a base having a horizontally displaceable anvil comprising several types of staple clinching indentations, a transversely disposed bar having V shaped ends tiltably mounted on said base and means adapted to be actuated by said anvil whereby upon displacement of the latter longitudinally of said base said bar is tilted towards the direction of movement of said anvil, said bar having laterally disposed shoulders each including fulcrum means, and a spring seated on said fulcrum means and retained by said base to prevent displacement of said anvil.

23. In a stapling machine, a base having a horizontally displaceable anvil comprising several types of staple clinching indentations, a transversely disposed bar having V shaped ends tiltably mounted on said base and means adapted to be actuated by said anvil whereby upon displacement of the latter longitudinally of said base said bar is tilted in the direction of movement of said anvil, said bar having shoulders each including beveled fulcrum means, and a U shaped swingable spring having its intermediate portion seated on and urged against said fulcrum means and comprising spaced arms operatively sustained by said base.

24. In a stapling machine, a base having a horizontally displaceable anvil comprising several types of staple clinching indentations, a transversely disposed bar having V shaped ends tiltably mounted on said base and means adapted to be actuated by said anvil whereby upon displacement of the latter longitudinally of said base said bar is tilted in the direction of movement of said anvil, said bar having shoulders each including beveled portions each having edge fulcrum means, and a swingable spring having its intermediate portion urged against said edge fulcrum means and seated thereon and comprising spaced arms operatively sustained by said base to prevent displacement of said anvil.

25. In a stapling machine, a base having a horizontally and rectilinearly displaceable anvil comprising several types of staple clinching indentations, a transversely disposed bar having V shaped ends tiltably mounted on said base and means adapted to be actuated by said anvil whereby upon displacement of the latter longitudinally of said base said bar is tilted in the direction of movement of said anvil, means to limit forward or rearward rectilinear displacement of said anvil, said bar having shoulders each including fulcrum means, and a swingable spring seated on said fulcrum means and retained by said base for holding said bar in a stopped tilted position.

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