Aug. 18, 1959 H. G. ALLEN 2,899,679

FASTENER-APPLYING IMPLEMENT

Filed June 4, 1957 4 Sheets-Sheet 1

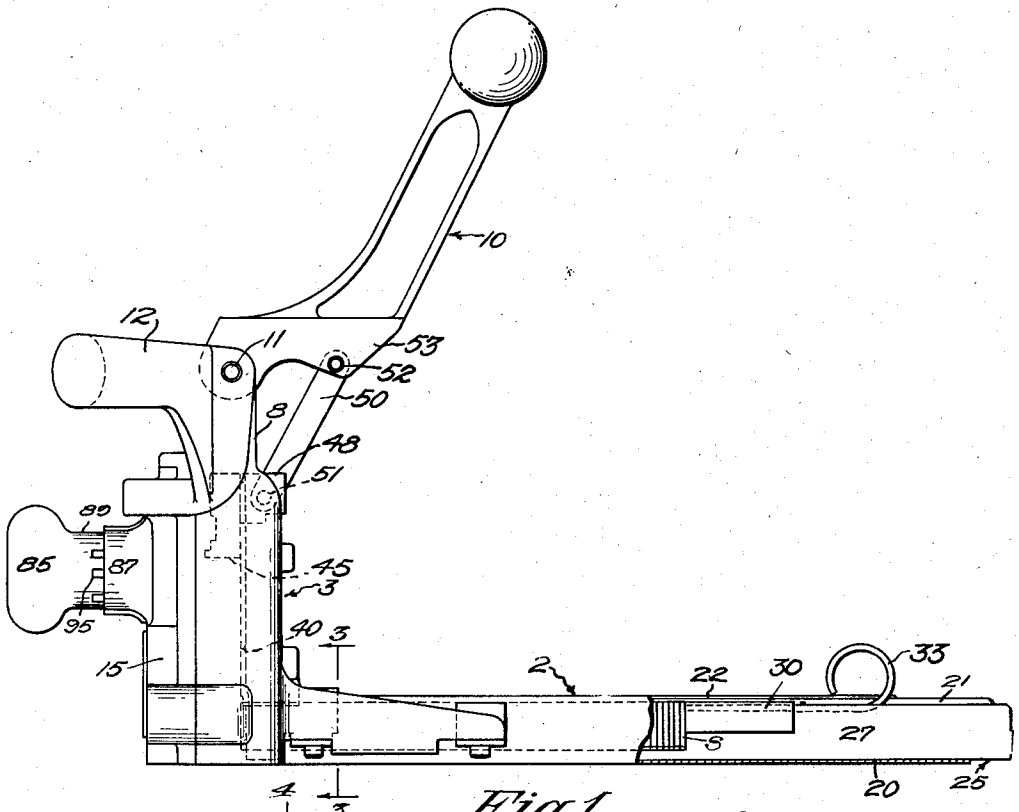

Fig. 1.

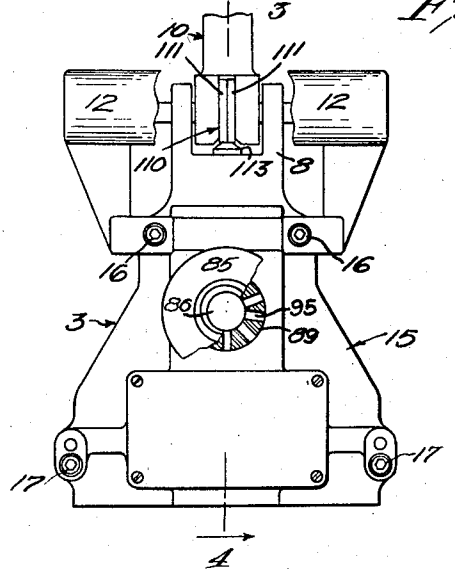

Fig. 2.

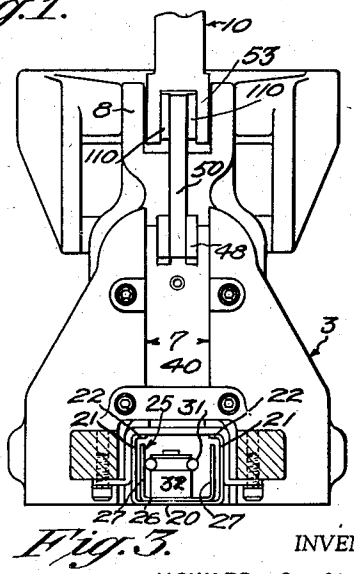

Fig. 3.

INVENTOR.
HOWARD G. ALLEN
BY Pennington & Wilson
ATTORNEYS

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FASTENER-APPLYING IMPLEMENT

Filed June 4, 1957 4 Sheets-Sheet 2

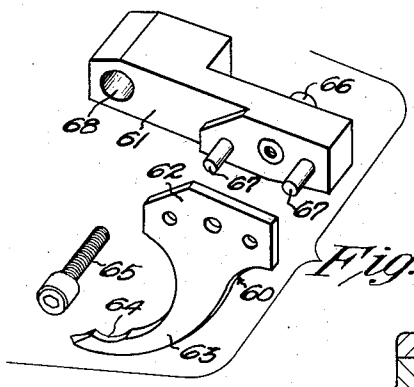

Fig. 6.

Fig. 4.

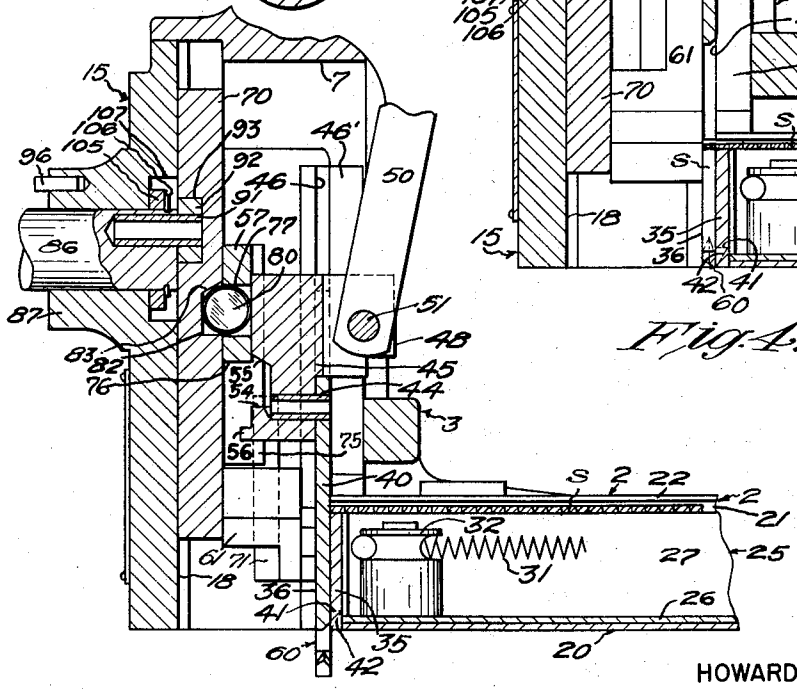

Fig. 5.

INVENTOR.
HOWARD G. ALLEN
BY
ATTORNEYS

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FASTENER-APPLYING IMPLEMENT

Filed June 4, 1957 4 Sheets-Sheet 3

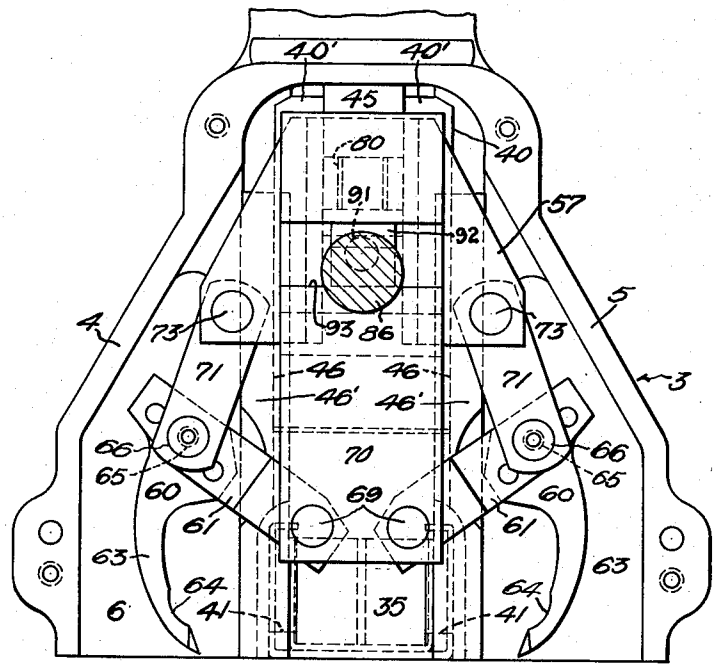

Fig. 7.

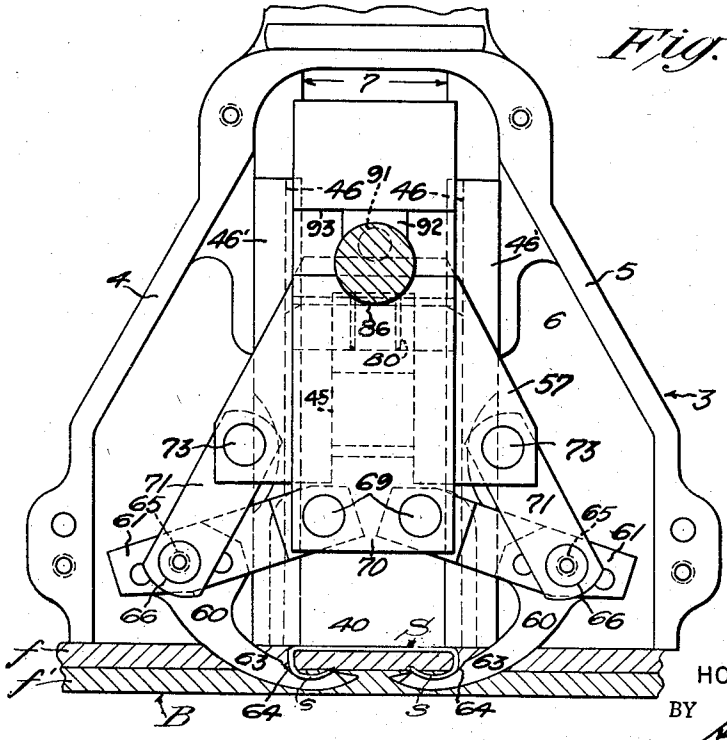

Fig. 8.

INVENTOR.
HOWARD G. ALLEN
BY
ATTORNEYS

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FASTENER-APPLYING IMPLEMENT

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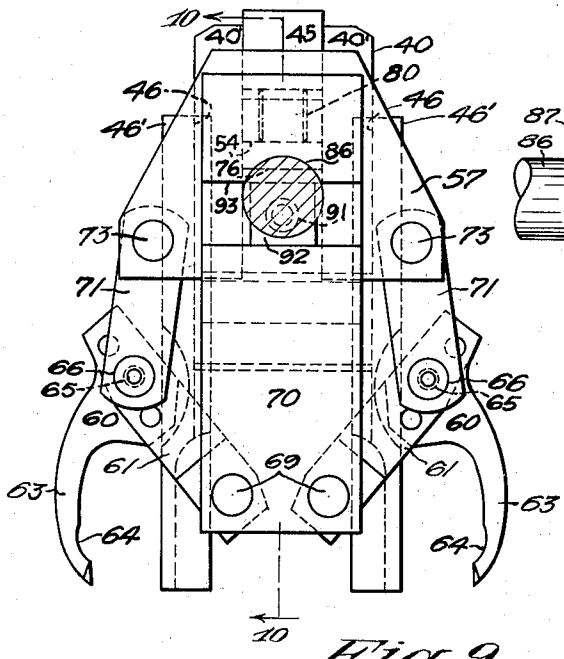

Fig. 9.

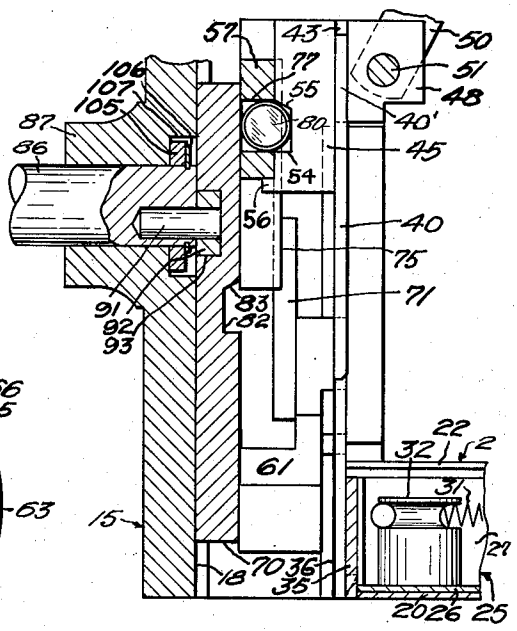

Fig. 10.

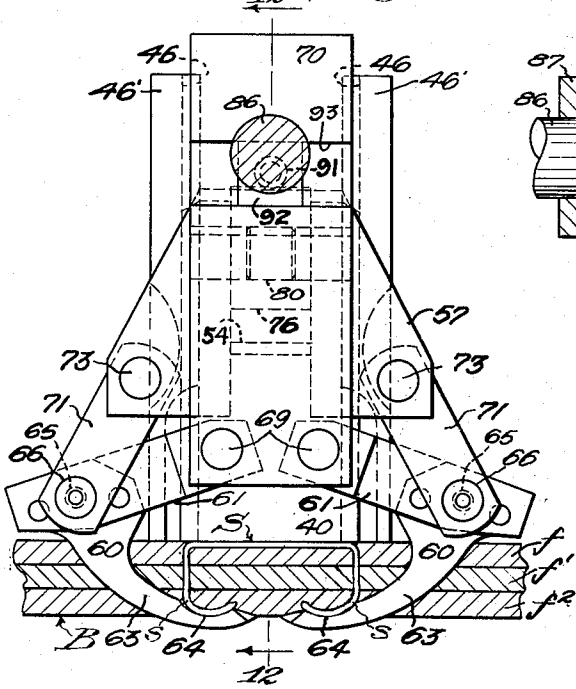

Fig. 11.

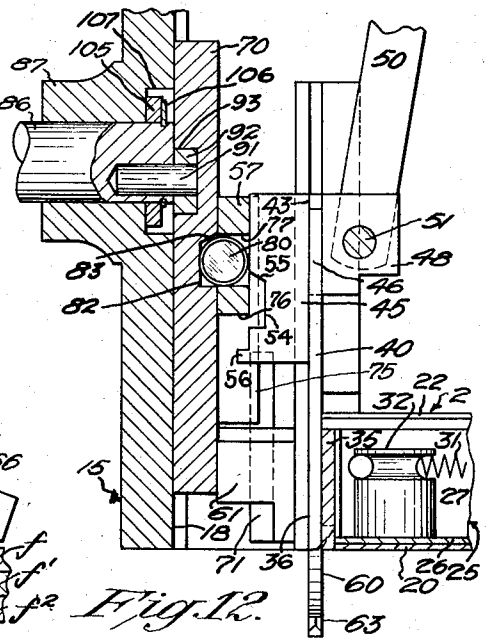

Fig. 12.

INVENTOR.
HOWARD G. ALLEN

BY Armington & White

ATTORNEYS

United States Patent Office 2,899,679 Patented Aug. 18, 1959

2,899,679

FASTENER-APPLYING IMPLEMENT

Howard G. Allen, Stonington, Conn., assignor to Bostitch, Inc., Stonington, Conn., a corporation of Rhode Island

Application June 4, 1957, Serial No. 663,519

12 Claims. (Cl. 1—49)

This invention relates to improvements in fastener-applying implements or machines for sealing closed containers and cartons. More particularly, the present invention consists in a machine for applying staples to the overlapping flaps of a closed container by driving them therethrough and clinching their legs on the under side of the unsupported material. For this purpose the clinching anvils are provided with sharpened points for penetrating the material of the work to position them for receiving the legs of a staple and clinching them in the material or on the under side of the flaps.

One object of the invention is to provide in a machine of the type indicated means for actuating the clinching elements or anvils to cause them to penetrate the material to the depth required and initially locking the anvils in operative relationship for receiving the ends of the legs of a staple as said staple is driven into the work.

Another object is to provide means comprising a plunger for reciprocating the staple-driver of the machine and a crosshead reciprocable by said plunger for actuating the clinching elements before they are locked in operative relationship to clinch the legs of a staple as the driver continues to descend with the plunger for driving a staple into the work.

Another object is to provide in a machine of the type indicated a reciprocable plunger which may be operated either manually or by power with a staple-driver carried by and movable with said plunger, a crosshead initially connected to said plunger and carrying means for operating the clinching elements, and means for disconnecting said crosshead from the plunger and holding it in fixed position prior to the final action of the driver in driving the staple.

Another object of the invention is to provide manually-operable means for adjusting the stroke of the crosshead which actuates the clinching elements to regulate the extent of penetration of said elements into or through the material of the work.

Another object is to provide simple and convenient means comprising a hand-knob for adjusting the length of stroke of the crosshead in its descent with means for positively locking said adjusting means in fixed relationship.

Another object is to provide in a machine of the type indicated a reciprocating plunger, releasable means for connecting the crosshead to said plunger, said crosshead being reciprocated to actuate the clinching elements, and automatically-operated means for disconnecting the crosshead from said plunger and locking it in fixed position for regulating the desired extent of penetration of the clinching elements into the work.

Further objects of the invention are set forth in the following specification or will appear from an understanding thereof by those skilled in the art. The invention is herein described and illustrated, by way of example, as embodied in a preferred form of manually-operable machine, but it is to be understood that the construction and arrangement of its mechanism may take other forms

and be adapted for purposes other than that herein indicated. In the accompanying drawings illustrative of a preferred embodiment of the invention:

Fig. 1 is a side elevational view of the complete machine with one side of the staple-magazine shown as partly broken away;

Fig. 2 is a front view of the machine shown with certain parts broken away;

Fig. 3 is a part sectional view on line 3—3 of Fig. 1 looking in the direction indicated by the arrows;

Fig. 4 is an enlarged longitudinal sectional view of the fore part of the machine taken on line 4—4 of Fig. 2 and showing the operative elements of the mechanism with the staple-driver in raised position, and also illustrating the manually-operable adjusting means for regulating the extent of penetration of the clinching anvils into the work;

Fig. 5 is a similar longitudinal sectional view of the machine showing the staple-driver at the end of its descent after driving a staple and illustrating the crosshead which actuates the clinching elements as locked in position at the end of its downward stroke;

Fig. 6 is a composite view in perspective of one of the clinching elements including the arm or lever on which the anvil is mounted for oscillation;

Fig. 7 is an enlarged view of the operating mechanism of the machine including the reciprocable plunger, the staple-driver carried thereby, and the crosshead moved by the plunger for actuating the clinching anvils, which latter are shown as withdrawn to inoperative relationship;

Fig. 8 is a similar enlarged view showing the parts at the end of the descent of the plunger and illustrating the clinching anvils as penetrated into an under layer of material for clinching the legs of a staple in a blind stitch;

Fig. 9 is a view corresponding to Fig. 7 showing the clinching elements withdrawn from the work;

Fig. 10 is a vertical sectional view taken on line 10—10 of Fig. 9;

Fig. 11 is a view similar to Fig. 9 showing the clinching anvils as having been penetrated through three thicknesses of material and operated for clinching the legs of a staple within the lowermost layer; and

Fig. 12 is a vertical sectional view on line 12—12 of Fig. 11.

Machines of the present type are commonly used in the art for stapling together the flaps of closed cartons to seal such containers in condition for shipping. With many of the prior art devices, positive control of the clinching elements or anvils has not always been possible due to various causes. Moreover, where the movement of the staple-driver and the clinching anvils in continuous, that is without arrestment of the motion of the anvils, the work performed is not always satisfactory. It is therefore an object of the present invention to improve the mechanism and the method of operation of the device whereby the clinching anvils are first brought to rest and locked in operative position before the staple is driven to engage the ends of its legs therewith.

It is a further object of the invention to provide convenient adjusting means for varying the length of stroke of the moving element which actuates the clinching anvils to insure a precise accurate control of the extent of penetration of the anvils into or through the work. Such accurate control is important for sealing cartons containing various products packed therein so that the legs of the staples will not penetrate clear through the several overlying flaps of the carton to damage the goods contained therein; for example, by piercing can tops, engaging frangible or fragile parts of the packaged objects, or otherwise interfering with the contents of the carton. With the present improved construction control of the penetration of the clinching anvils is positive and may

be adjusted for different types of containers or other work wherein the legs of the staples must be prevented from projecting from the under side of one or more layers thereof.

In general, the present machine comprises an elongated staple-magazine **2** (Fig. 1) surmounted at its forward end by a vertical standard or housing **3** of triangular shape in front view (Figs. 2 and 3) which serves as a frame for mounting the operating elements of the machine. The main portion of the housing **3** is of hollow construction (Figs. 4, 7 and 8) comprising lateral walls **4** and **5** and a rear wall **6** with a vertical opening **7** at its center. Surmounting the top of the housing and integral therewith is a bifurcated bearing **8** between the sides of which an operating handle **10** may be pivoted on a cross-pin **11**. Projecting angularly from each side of the bearing member **8** are two horizontal hand-rests **12** which may be used for holding the implement down against the work.

Closing the front of the housing **3** is a hollow cover-member **15** of complementary configuration having its side walls abutting the walls **4** and **5** of the housing and fastened thereto by screws **16** and **17** (Fig. 2). The forward wall of the cover **15** is slotted at **18** (Figs. 4, 5) to provide a guideway for receiving a slidable adjusting member or plate **70**, later described.

The magazine **2** is of U-shape in cross-section as commonly used in the art and therefore it is not described in detail herein. The magazine **2** may be constructed of sheet-metal formed with a bottom wall **20** (Fig. 3) and upstanding side walls **21** terminating in inturned flanges **22** at the top. Extending longitudinally within the magazine **2** is a so-called core **25** formed of sheet-metal folded into U-shape with a bottom wall **26** and upstanding side walls **27** across which the staples *s* may be straddled, in a manner common to machines of the present type. A staple-pusher **30** (Fig. 1) shaped to slide on the core **25** is adapted to be drawn forwardly therealong by means of a helical spring **31** (Fig. 4) fastened thereto at one end, reaching forwardly therefrom to encircle a pulley **32** (Fig. 4) and thence extending rearwardly with its opposite end anchored to the side of the magazine **2**, all as usually arranged. Projecting upwardly from the rearward end of the staple-pusher **30** is a circular loop **33** for receiving the operator's finger by which the pusher may be retracted and removed from the magazine to be held in any suitable manner for loading staples into the rearward end of the magazine **2**.

At the forward end of the magazine **2** is a vertical abutment or plate **35** (Fig. 4) welded or otherwise suitably fastened to the bottom wall **20** of the magazine and extending thereacross. The abutment **35**, called a "shear-plate," is reduced in width laterally corresponding to that of the staple core **25** so that the staples may be supported with their legs depending at the sides of the plate to be fed forwardly thereacross for entering them into the staple throat **36** in which the staple-driver **40** reciprocates. The shear-plate **35** has laterally-projecting lugs **41** at the bottom extending outwardly to the sides of the magazine **2** and these preferably have beveled faces **42** inclined downwardly and forwardly to serve as camming means for forcing the lower ends of the legs of the staple outwardly into the throat **36** should the legs tend to cant rearwardly as the staple is fed across the shear-plate.

Mounted to slide vertically in the rearward portion of the housing **3** is a plunger **45** of substantially rectangular shape (Figs. 4–10) which constitutes the reciprocating element of the machine for actuating the clinching anvils in timed relation to the operation of the staple-driver **40**. The staple-driver **40** may be in the form of a hardened metal blade welded or otherwise suitably fastened to the rearward face of the plunger **45**. As shown in the present drawings, the driver-blade **40** is bifurcated at the top to straddle the sides of the plunger **45** with the edges of the bifurcated portions **40'** engaging in grooves **43** in the plunger. A hollow pin or rivet **44** extends through the blade **40** and plunger **45** for fastening these parts together.

The lateral edge portions of the driver-blade **40** slidably engage in slots **46** formed in ways **46'** fastened to the rear wall **6** of the housing **3** by suitable means such as welding or screws (not herein shown) extending through the wall **6** from the rear. Extending rearwardly from the plunger **45** to project through the opening **7** at the center of the rear wall **6** of the housing **3** is a rectangular projection **48** (Figs. 1, 3, 10) which is slotted vertically on its sides to receive the edges of the bifurcations **40'** of the driver-blade **40**. The rearward end of the projection **48** is bifurcated to receive the end of a link **50** (Figs. 1, 4) for connecting the plunger to the operating lever or handle **10**. The lower end of the link **50** is pivoted on a pin **51** and its upper end on a pin **52** extending between bifurcations **53** at the inner end of the handle **10**. The forward face of the plunger **45** is formed with a transverse slot **54**, the upper face of which is beveled or inclined at **55** at a slight angle to the horizontal (Figs. 5, 10 and 12) for a purpose later explained. At the bottom of the plunger **45** is a forwardly-extending lip or step **56** adapted to engage under a portion of a crosshead **57** for raising it as later explained.

The crosshead **57** is of substantially triangular shape in front view (Figs. 9–11) and is releasably connected to the plunger **45** for actuating the clinching elements comprising the anvils **60** carried by levers or arms **61** (Fig. 6). Each clinching anvil **60** may be constructed from sheet-metal formed with a head-portion **62** and an arcuate or crescent-shaped extension **63** sharpened at its end for penetration into the work. The cresent-shaped portion **63** of the anvil **60** is formed adjacent its end with a concavity **64** for receiving the end of the leg of a staple to bend it into a clinch. The clinching anvils **60** are mounted at the outer ends of the arms **61** by means of screws **65** extending through their head-portions and threaded holes in the arms with cylindrical bearing bosses **66** engaged by the ends of the screws. The bosses **66** project from the opposite side of the arms **61** to serve for a purpose later explained. A pair of dowel-pins **67** hold each anvil **60** from turning on its screw **65**.

The inner end of each arm **61** is formed with a relatively large bore **68** for receiving a pivot-stud **69** projecting rearwardly from an adjustable plate-member **70** which is slidably mounted in the slotted recess **18**, previously mentioned, on the inner face of the cover-member **15**. The plate **70** is slidable vertically in the recess **18** for adjusting the position of the pivots **69**. Thus, the axis of rotation for each arm **61** may be adjusted up or down to control the oscillating movement of the clinching anvils **60** so as to regulate the extent of their penetration into the work. As before indicated, the clinching elements, comprising the arms **61** and anvils **60**, are oscillated from the reciprocating movement of the crosshead **57** by means of links **71** connecting the arms **61** thereto. Each link **71** is pivoted at its upper end on a stud **73** projecting forwardly from the outer, lower end of the crosshead **57** with the opposite end of the link pivotally connected to the boss **66**, previously described, as fastened to the arm **61** by the screw **65**.

The crosshead **57** is formed on its rearward side with rib-like runners **75** which overlap the sides of the plunger **45** to mount it for sliding movement relatively thereto. The lower portion of the crosshead **57** is cut away at the center to form a rectangular opening **76** with a horizontal edge at its top engageable by the lip or step **56** on the plunger **57** for raising the crosshead after the clinching of a driven staple S. Above the opening **76** is a square opening **77** in which is mounted a small cylinder or rolier **80** adapted to engage in the transverse slot **54** in the forward side of the plunger **45** (Fig. 10) to

releasably connect these two elements together for simultaneous reciprocation. During the initial downward movement of the plunger **45** the roller **80** rides on the face of the adjusting plate **70** to retain the roller in the recess or slot **54** in the plunger **45** for positive engagement with the lower edge of said recess. As the plunger **45** continues its descent, however, the beveled upper face **55** of the slot **54** will cam the roller **80** out of the slot **54** and into a transverse slot **82** in the rearward face of the plate **70** as shown in Figs. 5 and 12. The slot **82** in the plate **70** is similar in shape to the slot **54** in the plunger **45**, being formed with a beveled upper face **83** which acts to force the roller back into the slot **54** as the plunger **45** reverses its motion and is moved upwardly to position the last-named slots in alinement. It will be understood from the foregoing description that the crosshead **57** is locked to the plunger **45** during the initial portion of the downward stroke of the latter, but is released therefrom before the plunger reaches the end of its descent. Then as the plunger rises, the crosshead **57** will again be connected thereto in a manner more fully explained in connection with the operation of the complete machine.

The plate **70** is manually adjustable vertically for raising or lowering the pivot-studs **69** to regulate the extent of oscillating movement of the clinching anvils **60** by means of a hand-knob **85** (Fig. 4). The hand-knob **85** is rotatively connected with a shaft or spindle **86** journaled in a bearing boss **87** projecting forwardly from the cover-section **15** of the housing **3**. The knob **85** is formed with longitudinal slots **88** in its hub **89** engaged by the ends of a pin **90** in the shaft **86** for keying the knob rotatively with the shaft. Inserted into the inner end of the shaft **86** is a hollow crank-pin **91** disposed eccentrically of its axis. The pin **91** engages a hole in a square block-like member or slide **92** which is fitted to a transverse slot **93** in the plate **70** whereby to cause it to raise or lower the plate when the crank-pin is turned by the shaft **86**.

A series of shorter slots or radial notches **95** in the end of the hub **89** of the knob **85** are provided for locking the knob and thereby the shaft **86** in any one of several adjusted positions. A pin **96** projecting from the end of the bearing boss **87** is engageable with one of the slots **95** to lock the shaft **86** against rotation after the knob **85** has been turned for adjusting the plate **70**. A collar **97** fastened to the outer end of the shaft **86** by means of a spring-ring **98** is received in a counterbore **99** in the end of the knob **85**. A helical spring **100** surrounding the shaft **86** within a second counterbore **101** bears against the end thereof with its opposite end engaging the collar **97**, thereby tending to hold the knob **85** with one of its slots **95** engaged with the locking pin **96**. The knob **85** may be drawn outwardly against the tension of the spring **100** to release the selected slot **95** from the locking pin **96** to allow the knob to be turned. A collar **105** fastened to the inner end of the shaft **86** by a spring ring **106** engages the end of a counterbore **107** in the cover **15** to prevent the shaft from being withdrawn from the bearing boss **87**.

Releasable detent-means are provided for retaining the lever or handle **10** in raised relationship after it has been rocked upwardly. Referring to Figs. 2 and 4, the pivoted end of the handle **10** has a pair of sheet-metal members **110** located between its two bifurcated portions and provided with circular cam-members **111** at their forward ends. The members **110** extend rearwardly and surround the cross-pin **52** to adapt them to pivot thereon with the motion of the handle **10**. Each member **110** is cut away along its edge to form an inclined cam-face **112** engaged by the beveled end of a hollow sleeve **113**. The sleeve **113** is slidably mounted in a vertical bore **114** in the upper bearing portion **8** on the housing **3**. A helical spring **115** contained in the sleeve **113** bears at its lower end against a centrally-recessed pin **116** inserted in a transverse bore **117** in the bearing. The spring **115** thus tends to force the sleeve **113** upwardly to engage its beveled end with the cam-face **112** on the members **110** to retain the handle **10** in raised relationship. When, however, the handle **10** is manually depressed the spring **115** allows the plunger sleeve **113** to yield so that the cam-faces **112** on the member **110** are disengaged from its end. If desired, however, a spring may be applied for returning the handle to raised relationship after each operative stroke as usually arranged.

Before starting the operation of the machine the plate **70** may be adjusted for varying the position of the pivots **69** of the anvils **60** to control the extent of their penetration into the work. The adjusting plate **70** may be raised or lowered as necessary by turning the hand-knob **85** to rotate the shaft **86** and cause its crank-pin **91** to shift the slide **92** for sliding the plate vertically. It has been explained that the knob **85** may be turned by drawing it outwardly on the shaft **86** to release its particular slot **95** from the pin **96**. After the adjustment has been completed the spring **100** will slide the knob **85** back into place and engage its selected notch **95** with the pin **96** for locking the shaft **86** from turning so as to secure the plate **70** in adjusted position. The notches **95** may be marked with indicia to facilitate adjusting the pivots for the clinching anvils **60** in the desired relationship.

The complete implement or machine is operated in the manner as next explained. With the handle **10** held in raised position by the detent-means, last above described, the operator presses it downwardly to cause the plunger **45**, connected thereto by the links **50** to descend through an operating stroke. During the initial downward motion of the plunger **45**, the crosshead **57** is connected thereto by means of the roller **80** engaging in its slot **54** (Fig. 4). The crosshead **57** will thus descend with the plunger **45** and through its connection by the links **71** to the arms or levers **61** the levers will be rocked to oscillate the clinching anvils **60** for penetrating them into the material of the work; such as the overlying flaps *f* and *f'* of a carton blank B (Fig. 8).

At this juncture the movement of the clinching elements is arrested by disconnecting the crosshead **57** from the plunger **45** so as to retain the anvils **60** in proper relationship for receiving the legs of the staple as the driver **40** continues its descent with the plunger. For example, Fig. 8 illustrates the clinching anvils as inserted through the upper flap *f* and into an underlying flap *f'* without emerging therebelow; while Fig. 11 shows the staple-clinching means as arranged for clinching a staple having longer legs for penetrating the material of a third layer of material in the flap f^2 without protruding from the under side thereof. However, in this instance the ends of the clinching anvils **60** may penetrate through this third layer to a slight extent providing the material contained in the carton is such that it will not be damaged by contact of the anvils therewith.

The disconnection of the crosshead **57** from the plunger **45** is accomplished by releasing the roller **80** from the slot **54** in the plunger. This occurs when the opening **77** in the crosshead **57** reaches a point in register with the slot **82** in the adjusting plate **70** (Fig. 12). At this juncture the inclined cam-face **55** in the slot **54** acts to cam the roller **80** laterally out of the slot **54**, through the opening **77** and into the slot **82** of the plate **70** so that the crosshead is restrained from further downward movement as the plunger **45** continues its descent with the roller riding on the forward face of the plunger. During this latter descent of the plunger **45** the staple-driver **40** is moved downwardly thereby to drive a staple S down in the throat **36** to penetrate its legs *s* into the work until the ends thereof engage in the depressions or recesses **64** in the arms **63** of the anvils **60**. Further downward movement of the driver **40** will consequently cause the ends of the legs to be bent or curled upwardly as shown

in Figs. 8 and 11 to clinch them for securely holding the several flaps *f* of the carton bound together for sealing the closure.

After each staple has been driven into the work and clinched in the material thereof the operating lever or handle 10 is swung upwardly to withdraw the plunger 45 and restore the crosshead 57 to initial relationship as shown in Figs. 4 and 10. As the plunger 45 is raised by upward movement of the handle 10 its lip or step 56 will eventually come into engagement with the upper edge of the bottom opening 76 in the crosshead 57 to initiate the raising of the crosshead. During the initial upward movement of the plunger its slot 54 will register with the slot 77 in the crosshead 57 and cause the beveled cam-face 83 in the slot 82 of the plate 70 to force the roller 80 through the opening 77 and into the slot 54 to reconnect the two elements to descend together (Figs. 1, 4 and 10) for the next operative stroke. The parts are thus restored to initial relationship to provide for a repeat operation of driving and clinching another staple in the work.

It will be observed from the foregoing description that the present invention provides an improved implement or machine for driving staples through several layers of material and clinching their legs therein without penetration therethrough. A particular feature of the improvement consists in the provision of adjusting means for regulating the extent of penetration of the clinching anvils into the work and thereby the location of the clinched legs of a staple. The adjusting means is convenient to operate and readily accessible from the outside of the machine without disassembling or disconnecting any of the working parts of the mechanism to change their location or relationship.

While the improved machine is herein illustrated and described as embodied in one preferred form of construction by way of example, it is to be understood that modifications may be made in the structure and arrangement of the parts of the device without departing from the scope of the invention as expressed by the accompanying claims. Therefore, without limiting myself in this respect, I claim:

1. In a stapling machine, a housing adapted to rest against the work, a reciprocable plunger slidable vertically in said housing, an operating lever pivoted to a stationary part of said housing, means connecting said lever to said reciprocable plunger for reciprocating it, a staple-driver connected to said plunger for movement thereby, a crosshead, means for releasably connecting said crosshead to said plunger for movement therewith, an adjustable member, clinching anvils pivoted to said adjustable member to adapt them to oscillate relatively thereto, means connecting said crosshead to oscillate the anvils to cause them to penetrate the work in position to engage the legs of a staple to clinch them, and means for adjusting said adjustable member for locating the pivots of said anvils at different distances from the pivotal axis of said lever to regulate the extent of penetration of the anvils into the work.

2. In a machine of the type indicated having a casing adapted to rest on the work, an operating lever pivoted to a stationary part of said casing to adapt it to rock about a fixed axis, a reciprocable plunger in said casing, staple-driving means reciprocable by said plunger, clinching anvils having sharpened ends adapted to penetrate the work in position to receive and clinch the legs of a driven staple, an adjustable member, means for mounting said adjustable member to move toward and away from the fixed axis of said operating lever, means for pivotally mounting said clinching anvils on said adjustable member to adapt them to oscillate for penetrating their sharpened ends into the work, a crosshead reciprocable by said plunger, means for connecting said crosshead to oscillate said clinching anvils, means for arresting the movement of the crosshead after the anvils have been moved into position for clinching the legs of a staple, and manually-operable means accessible from the outside of the machine for adjusting said adjustable member to locate the pivots of said anvils at different distances from the pivotal axis of said operating lever so as to vary the extent of penetration of said anvils into the work.

3. In a stapling machine, a housing, a plunger reciprocable in said housing, a crosshead releasably connected to said plunger to reciprocate therewith, an adjusting member slidably mounted in said housing, a pair of clinching anvils pivotally mounted on said adjusting member to adapt them to oscillate relatively thereto, means connecting said crosshead to said anvils for oscillating them to cause their ends to penetrate into the work, said operating lever pivotally mounted on a stationary part of said housing independently of said adjusting member, eccentric means for sliding said adjusting member, and manually-operable means on the outside of the housing for actuating said eccentric means to raise or lower said adjusting member.

4. In a machine of the type indicated, a reciprocable plunger, a fastener-driver reciprocated by said plunger, a pair of pivoted anvils for clinching the legs of fasteners as they are driven into the work, a crosshead connected to said anvils for oscillating them to penetrate them into the work, means for releasably connecting said crosshead to said plunger, means for releasing said crosshead from the plunger prior to driving a fastener into the work, a projection on said plunger engageable under said crosshead for raising the latter as the plunger is raised after the driving and clinching of a fastener, and means for reconnecting said crosshead to said plunger as the latter is returned to initial relationship after driving and clinching a fastener.

5. In a stapling machine of the type indicated, a staple-driver, a plunger for reciprocating said driver, a crosshead releasably connected to said plunger, a pair of pivoted clinching anvils connected to said crosshead for oscillation thereby to penetrate them into the work, means for disconnecting said crosshead from said plunger after said anvils have been brought into operative position for clinching the legs of a staple, means on said plunger positively engageable with said crosshead for raising it during the return stroke of said plunger, and means to releasably reconnect said crosshead to said plunger as the plunger returns to initial position for repeating the operation of driving and clinching another staple.

6. In a machine of the type indicated comprising a reciprocable plunger and a staple-driver reciprocable by said plunger, a crosshead, clinching anvils, means connecting said crosshead to said clinching anvils for moving them into operative relationship, a shiftable member carried by said crosshead, a recess in said plunger engageable by said shiftable member to connect said crosshead therewith, a manually-adjustable member, means on said adjustable member for engaging said connecting member to release said crosshead from said plunger, means on said plunger engageable with said crosshead for raising it after the driving and clinching of a staple, and means on said adjustable member for shifting said shiftable member to reconnect said crosshead to said plunger as the plunger reverses its stroke to return to initial position.

7. In a stapling machine comprising a casing adapted to rest against the work, an operating lever pivoted to a stationary part of said casing, a plunger reciprocable by said lever, a staple-driver reciprocable by said plunger with a constant length of stroke, a crosshead connected to said plunger for reciprocation thereby, an adjusting member slidable vertically within said casing, a pair of retractible clinching anvils having pointed ends for penetrating the work, means pivotally mounting said anvils on said adjusting member for rocking about their pivots, means connecting said crosshead to said clinching anvils for rocking them to penetrate their ends into the work,

means for arresting the movement of the crosshead to maintain the anvils in fixed relationship after they have been moved into operative relationship for clinching the legs of a staple, and manually-operable means for raising and lowering said adjusting member to displace the pivots of the clinching anvils toward and away from the pivotal axis of said operating lever to vary the extent of penetration of said anvils into the work.

8. In a machine for stapling the flaps of cartons, a frame adapted to rest against the flaps, an operating lever pivoted directly to a stationary part of said frame, a plunger slidable on said frame, a link connecting said operating lever to said plunger for reciprocating it, an adjusting member slidable on said frame, a pair of clinching anvils pivotally mounted on said adjusting member to oscillate for penetrating their ends into the work, a crosshead reciprocable on said frame, means releasably connecting said plunger to said crosshead for reciprocating it, links connecting said crosshead to said clinching anvils for oscillating them, means for disconnecting said crosshead from said plunger after the anvils have penetrated into the work, eccentric means for sliding said adjusting member to raise and lower the pivots of the clinching anvils toward and away from the pivotal axis of said operating lever, and manually-operable means on the outside of said frame for turning said eccentric means to raise and lower said adjusting member.

9. In a machine of the type indicated comprising a casing, an operating lever pivoted to a stationary part of said casing to rock about a fixed axis with a constant length of stroke, a plunger slidably mounted within said casing, a fastener-driver reciprocated by said plunger, an adjustable member slidable within said casing, a pair of anvils pivotally mounted on said adjusting member to adapt them to rock for penetrating the work and clinching the legs of the fastener driven therethrough, a crosshead connected to said anvils for oscillating them, means for releasably connecting said crosshead to said plunger, means for releasing said crosshead from said plunger prior to driving a fastener into the work, means engageable between the plunger and crosshead for raising the latter after the driving and clinching of a fastener, means for reconnecting said crosshead to said plunger as the latter is returned to initial relationship after driving and clinching a fastener, eccentric means for raising and lowering said adjusting member toward and away from the pivot of said operating lever, and means on the outside frame for operating said eccentric means.

10. In a stapling machine comprising a casing, an operating lever pivoted directly to a stationary part of said casing to swing about a fixed axis, a plunger reciprocable within said casing, staple driving means reciprocable by said plunger, an adjusting member slidable vertically within said casing, retractible anvils pivoted on said adjusting member for oscillation to penetrate the work in position to clinch the legs of a driven staple, pivots on said adjustable member for rockably mounting said clinching anvils, means for connecting said plunger to said anvils for oscillating them, an eccentric disk in said casing engaging said adjusting member for raising and lowering it to displace the pivots of the clinching anvils toward and away from the pivotal axis of said operating lever, a shaft journaled in said casing for rotation to turn said eccentric disk, and a hand-knob on the outside of said casing connected to said shaft for turning said eccentric disk to adjust the adjusting member vertically relatively to the pivotal axis of said operating lever.

11. In a machine of the type indicated comprising a casing, an operating lever pivoted to a stationary part of said casing to rock about a fixed axis, a plunger slidable within said casing, means connecting said operating lever to said plunger for reciprocating it, a reciprocable crosshead, means for releasably connecting said plunger to said crosshead for reciprocating it, an adjustable member slidable within said casing, pivots on said adjustable member, a pair of clinching anvils rockably mounted on said pivots, means connecting said crosshead to said anvils for rocking them, means for releasing said crosshead from said plunger after the anvils have been rocked to penetrate the work, eccentric means engaging said adjustable member within said casing, a shaft connected to said eccentric means, a hand-knob carried by said shaft on the outside of said casing for operating said eccentric means to raise and lower said adjustable member for locating the pivots of said anvils at different distances from the pivotal axis of said operating lever, and means for locking said knob from turning to maintain said adjustable member in adjusted position relative to the pivotal axis of said operating lever.

12. In a stapling machine, a casing, a plunger reciprocable in said casing, a staple-driver connected to said plunger for reciprocation thereby, a lever pivoted on a stationary part of said casing, means connecting said lever for reciprocating said plunger, a crosshead, means for releasably connecting said crosshead to said plunger, an adjustable member slidably mounted on said casing, clinching anvils pivoted to said adjustable member, means connecting said crosshead for oscillating said anvils to cause them to penetrate the work, eccentric means engaging said adjustable member, a shaft journaled in said casing and connected to said eccentric means for operating it to raise and lower said adjustable member for locating the pivots of said anvils at different distances from the pivotal axis of said lever, and means outside the casing for manually rotating said shaft to operate said eccentric means.

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