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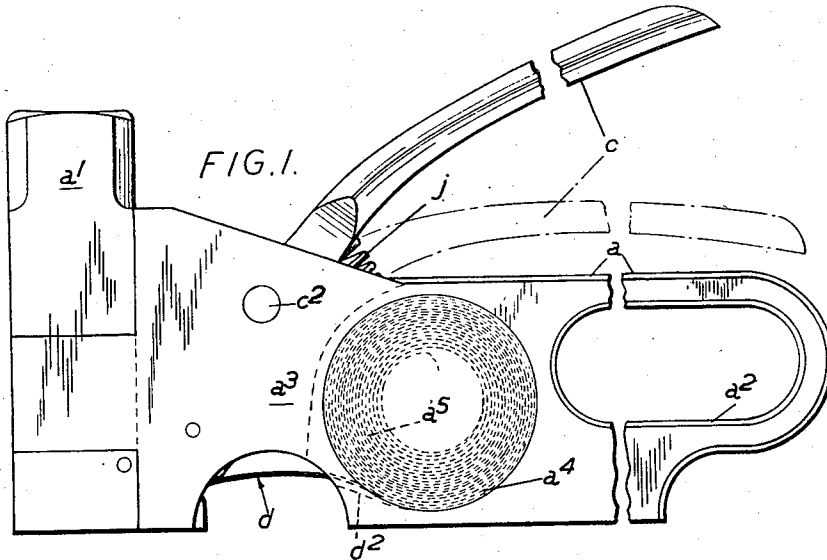
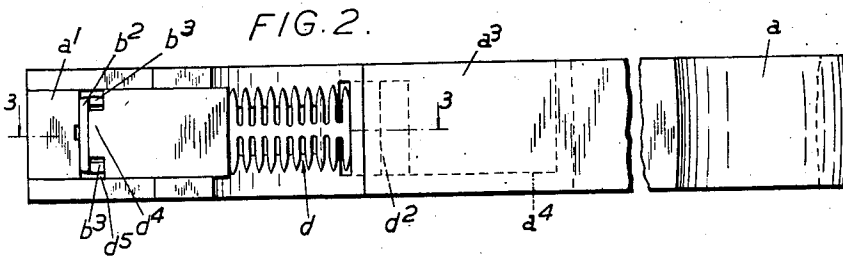
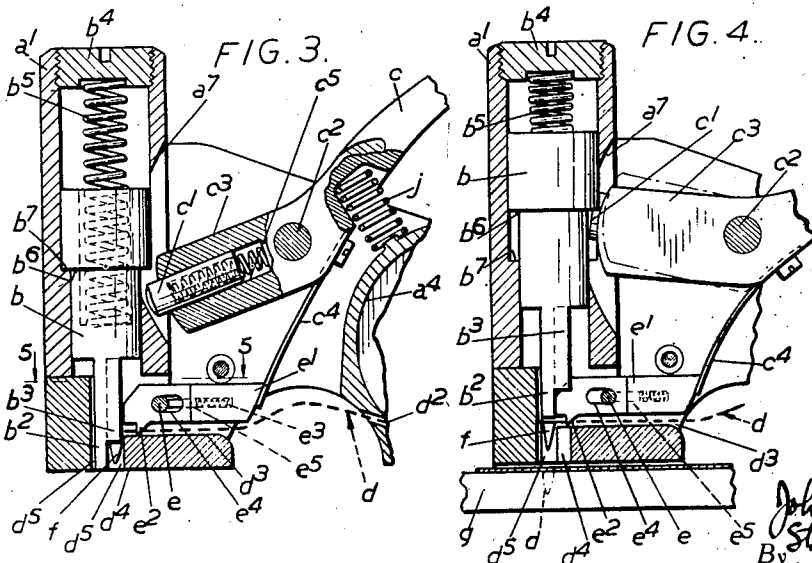
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2,606,320

STAPLING TOOL

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2 SHEETS—SHEET 1



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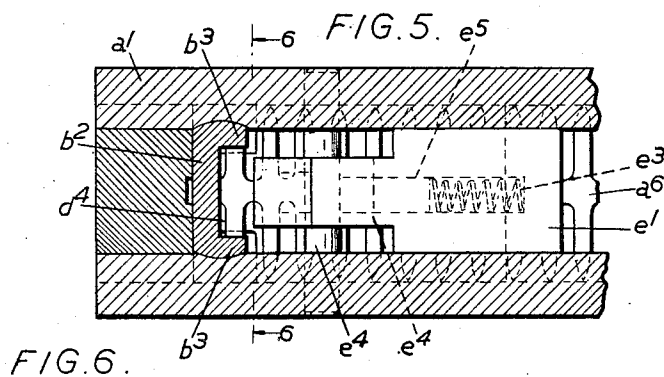
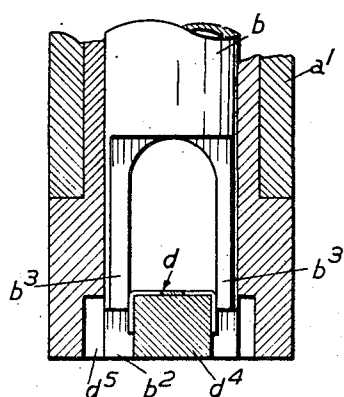
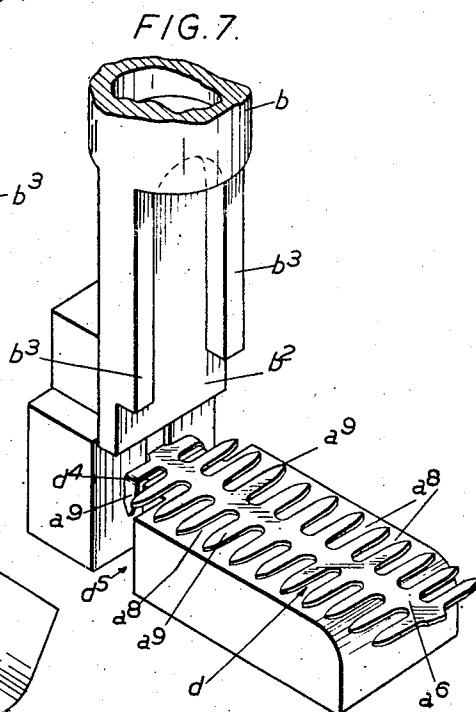
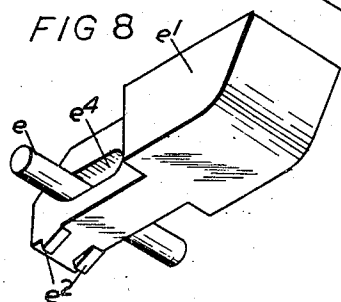
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STAPLING TOOL

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2 SHEETS—SHEET 2



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STAPLING TOOL

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6 Claims. (Cl. 1—48.1)

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This invention relates to improvements in stapling tools for use in applying individual staples from a strip of stapling blanks to papers and the like for holding them connected together or for securing labels to boxes or similar uses.

An important object of the present invention is the provision of a container for housing a strip of staples in the blank state, which strip can be of considerable length so that it will take a long time for a charge to be used up and before it will become necessary to put a fresh blank strip in the magazine.

A further object of the invention is to enable the staples to be pre-formed to U-shape one by one during the staple driving motions of the tool.

Other objects include the provision of simple means for driving the staples, pre-forming them from a strip of blanks, and for feeding them step by step to the pre-forming and driving positions.

The invention will now be described by way of example with reference to the accompanying diagrammatic drawings wherein:

Figure 1 is a side elevation of a tool made in accordance with the invention. The operating handle shown in full lines indicates the normal or inoperative position; the dotted lines show the operative position of the handle;

Figure 2 is an underneath plan of Figure 1;

Figure 3 is a sectional view on the line 3—3 on Figure 2;

Figure 4 is a view similar to Figure 3 but showing the tool at the position just prior to driving a staple and showing a staple driven into the work;

Figure 5 is a sectional view on the line 5—5 on Figure 3;

Figure 6 is a sectional view on the line 6—6 on Figure 5;

Figure 7 is a perspective view of a staple forming and driving tool and adjacent parts and showing a portion of a strip of blank staples; and

Figure 8 is a perspective view of a staple feeding block.

The tool comprises a body a shaped to form a finger grip a^2 and having a front vertical part a^1 and an intermediate part a^3 connecting the parts a^1 and a^2 . The intermediate part a^3 is formed with a chamber a^4 to contain a reel a^5 of staples in the form of a strip indicated generally by reference d in which the staples are connected together by a central rib a^6 (Figure 7) and extending transversely as wings a^9 spaced apart along the rib to leave spaces a^8 between adjacent staples.

The body has a slot d^2 leading from the cham-

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ber a^4 and a horizontal slot d^3 leading into a vertical opening d^4 in the lower end of the vertical part a^1 . The staples are lead through the slots d^2 and d^3 and the end staple enters the opening d^3 which is the driving position.

For driving the staples there is provided a staple driving element b^2 at the lower end of a plunger b which is slidably mounted in a vertical bore in the part a^1 . The upper end of the bore is closed by a plug b^4 . A spring b^5 in the bore urges the plunger downwards. The bore and plunger are of enlarged diameter at their upper ends whereby the plunger has an annular shoulder or projection b^6 and the bore has an annular shoulder b^7 . The projection b^6 engages the shoulder b^7 to limit the downward movement of the plunger. The part a^1 is slotted at a^7 to expose part of the projection b^6 and to receive the end c^3 of a handle c that is pivoted on a pivot pin c^2 carried by the intermediate part a^3 of the body. The front end c^3 has a cavity containing a sliding catch c^1 the nose of which projects out of the cavity and is normally held in that position by a spring c^5 that is in the cavity.

The body part a^1 is provided with an anvil d^4 adjacent the driving position d^5 , this anvil being of less width than the flat staple. Above the anvil is a staple forming tool in the form of two projections b^3 integral with the driving element b^2 on the plunger b and spaced apart so as to straddle the anvil and to press the ends of the wings a^9 of the staples downward to form the staple into U-shape. During each staple driving movement of the plunger b the projections b^3 preform the staple next to the driving position.

For feeding the staple strip step by step there is provided a staple feeding block e^1 having a slot e^4 through which passes a pin e carried by the body part a^1 . The block has a bore e^5 at right angles to the pin e and a spring e^3 in the bore engages the pin so as to urge the block back after its feed motion. The feed motion is effected by means of a curved blade spring c^4 that is connected at one end to the handle c and at its other end engages the block e^1 . The block e^1 has two downwardly extending projections e^2 spaced apart so as to straddle the rib a^6 and engage in the spaces a^8 . The blade spring c^4 urges the block in the direction to feed the staples and the block also turns about its pivot pin e in the direction to cause the projections e^2 to dip into said spaces but these projections can ride up over the staples by rocking about said pin on the retraction of the block.

On the first part of the operative stroke of the

handle *c* the catch *c*¹ engages under the projection *b*⁶ and lifts the plunger *b* against the action of the spring *b*⁵ whilst the spring blade *c*⁴ moves the block *e*¹ to feed the staple strip to bring the preformed staple from the anvil *d*⁴ to the driving position *d*⁵. On continued movement of the handle *c* the catch *c*¹ moves past the projection *b*⁶ whereupon the spring *b*⁵ drives the plunger *b* downwards which causes the element *b*² to drive the end staple *f* into the work *g* and simultaneously causes the projections *b*³ to form the next staple over the anvil *d*⁴. The pawl block *e*¹ in its forward position shown in Figure 4 moves into engagement with or nearly into engagement with the cut back surface of the plunger *b* between like projections *b*³, this surface being shown by a vertical broken line in Figure 4 (see also Figures 5 and 7). Thus the plunger *b*, *b*² can descend while the pawl *e*¹ is in the forward position.

The spring *c*⁴, together with a spring *j* located between the handle *c* and the body *a*³, returns the handle *c* to the full line position of Figure 1 and during this return movement the catch *c*¹ is repressed as it rides over the plunger *b*. The block or pawl *e*¹ is returned by its spring *e*³ and the projections *e*² ride back over the next staple and are thereby moved slightly upwards causing the block to be momentarily tilted about the pin *e*, the rear end of the block riding down the spring *c*⁴. The spring *c*⁴ then acts on the rear inclined end of the block to tilt it back so that the projections *e*² move down and engage behind the next staple.

We claim:

1. A stapling tool having a body adapted to carry a strip of staples, a pivot pin carried by the body, a staple feeding block provided with a slot through which said pin passes, a spring operatively disposed between said pin and staple feeding block to urge said block away from the staple driving position, and means connected between said block and handle for moving said block to effect its staple feeding motion.

2. A stapling tool comprising a body adapted to carry a strip of staples, means for driving the end staple of the strip, a strip feeding element slidably carried by the body, a handle movably carried by the body, a blade spring connected at one end to the handle and at the other end contacting said block for moving said block on its feeding motion, a spring for returning said block, means for driving the end staple, and means for operating said staple driving means when the handle is operated to move said block on its staple feeding motion.

3. A stapling tool having a body provided with a compartment adapted to contain a strip of staple elements in the form of a reel, a plunger reciprocatably mounted at one end of the body for driving the staples, a spring which effects the staple-driving movements of the plunger, a feed pawl for feeding the strip step by step, an anvil carried by the body, means carried by the plunger which straddle the anvil transversely of the line of feed of the strip so as to bend down the legs of the staple elements on opposite sides of the line of feed of the strip, a lever pivoted to the body at a position nearer to one end than the other thereby forming a long end and a short end, the long end constituting a handle extending over said compartment to a position on the side of the compartment remote from the plunger, means whereby the short end lifts the plunger against the action of said spring during the first part of

its operative stroke and finally releases the plunger, means whereby the lever moves the pawl to feed the strip during plunger-lifting part of its stroke, and a finger grip provided at the other end of the body adjacent the long end of the lever on the side of the compartment remote from the plunger with said compartment located between the finger grip and the plunger.

4. A stapling tool comprising a body provided with a compartment and adapted to contain a reel of staples, a movable lever, a pivot carrying said lever nearer to one end of the lever than the other providing a short end and a long end, the latter constituting a handle extending over said compartment to a position on the side of the compartment remote from the plunger, means operated by the lever for feeding the strip step-by-step to bring the end staple to a driving position, staple driving means for driving the end staple at the driving position, and staple forming means for pre-forming the staples at a position preceding the driving position, a plunger slidably guided in a bore in one end of said body, said staple driving means and said staple forming means being carried by said plunger, an anvil carried by the body and located in the position of the staple next to the driving position over which anvil the staples are pre-formed by said staple forming means during the staple driving movement of the plunger, a shoulder on the plunger, a sliding catch located in a recess in said short end of the lever, and a helical spring in the recess in said short end said spring urging the catch out of the bore into engagement with said shoulder, said catch being adapted to lift the plunger then release it and finally move back to its position under the shoulder, and a finger grip provided at the other end of the body adjacent the long end of the lever on the side of the compartment remote from the plunger with said compartment located between the finger grip and the plunger.

5. A stapling tool having a body, an anvil attached to the body, a plunger for driving the end staple and simultaneously deforming the next staple over the anvil, a first spring which effects the staple-driving movements of the plunger, a pivot pin carried by the body, a feed pawl provided with a slot through which said pin passes said pawl forming with said body a horizontal slot leading a strip of staple elements over the anvil, a second spring operatively disposed between said pin and pawl to urge said pawl away from the staple driving position, said feed pawl being adapted also for feeding the strip of staple elements step by step, a lever pivoted to the body at a position nearer to one end than the other thereby forming a long end and a short end, the long end constituting a handle, means whereby the short end lifts the plunger against the action of said spring during the first part of its operative stroke and finally releases the plunger, and means whereby the lever moves the pawl to feed the staples during plunger-lifting part of its stroke.

6. A stapling tool comprising a body provided with a compartment adapted to contain a strip of flat staple elements in the form of a reel, a plunger reciprocatably mounted at one end of the body for driving the staples, a spring which operates on the plunger to effect the staple driving movements of the plunger, an anvil carried by the body, a part on said plunger for pre-forming the staples over the anvil at a position preceding the driving position, a lever pivoted to the body at a position nearer to one end than the other thereby forming a long end and a short end, the long end

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constituting a handle extending over said compartment to a position on the side of the compartment remote from the plunger, an abutment on the plunger projecting therefrom, a sliding catch located in a recess in the short end of the lever, 5 a spring in the recess urging the catch out of the bore into engagement with said abutment, said catch being adapted to engage the abutment and lift the plunger against the action of its spring during the first part of the stroke of the lever 10 on the side of the compartment remote from the plunger and finally release the plunger, a feed pawl engageable in spaces between the staple elements for feeding the strip step by step, means 15 for conveying feed motion from the lever to the feed pawl during the raising of the plunger against its spring, and a finger grip provided at the other end of the body adjacent the long end

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of the lever with said compartment located between the finger grip and the plunger.

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