



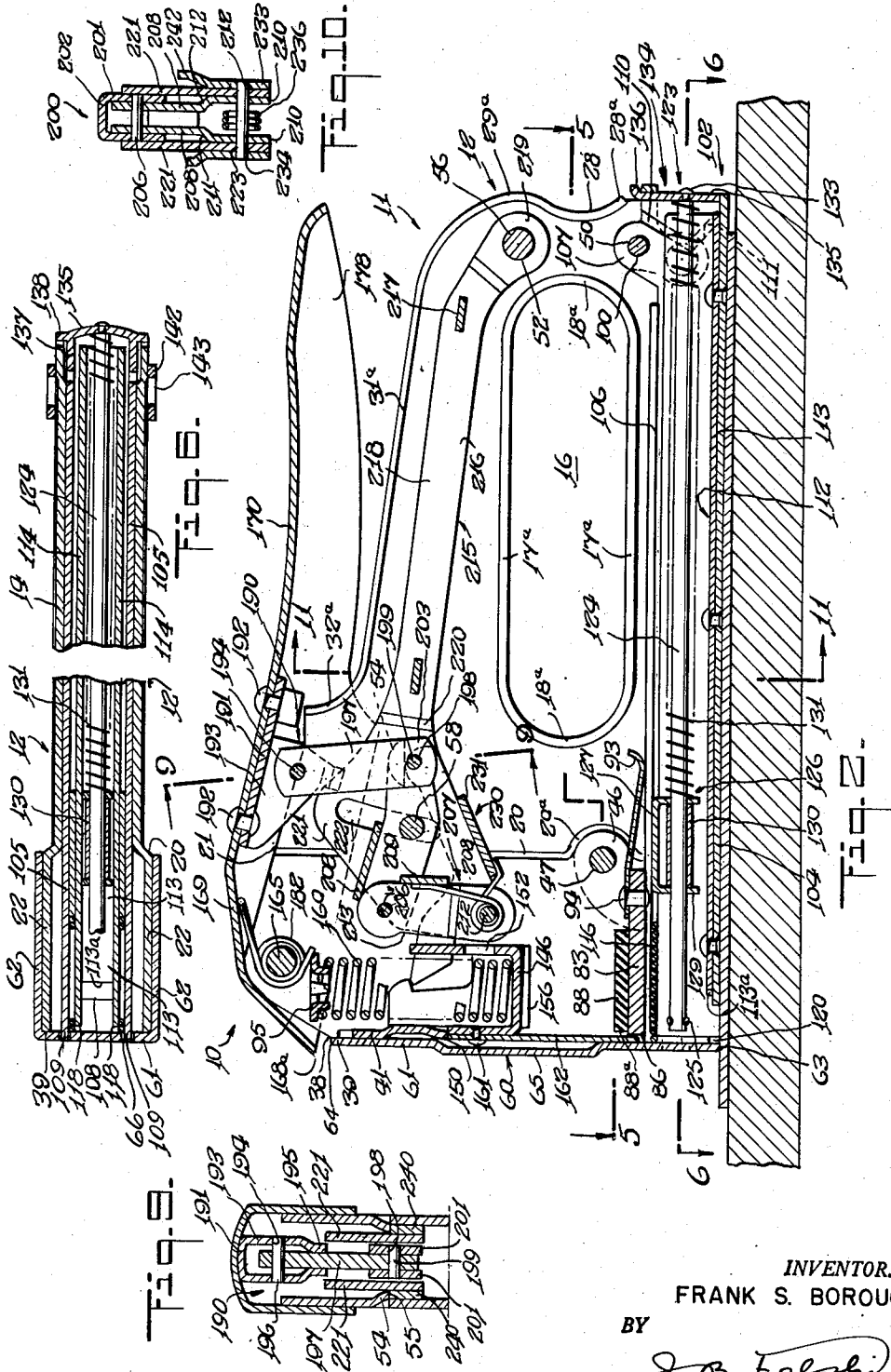
Nov. 17, 1953

F. S. BOROUGHS  
HAND TYPE STAPLE TACKER

2,659,083

Filed Jan. 13, 1951

4 Sheets-Sheet 2



INVENTOR.  
FRANK S. BOROUGHS  
BY  
*J. B. Felsch*  
ATTORNEY

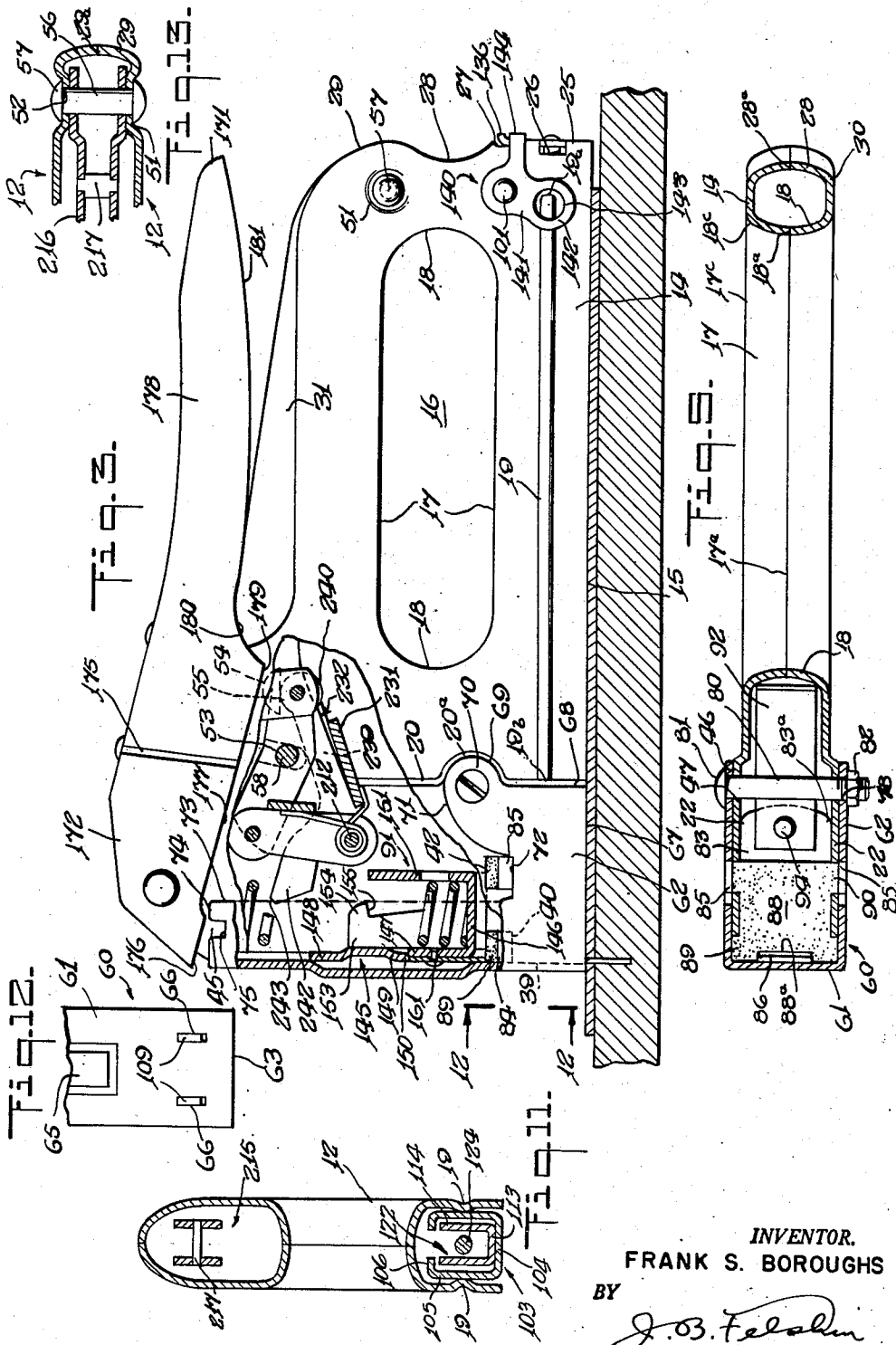
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INVENTOR.  
FRANK S. BOROUGHS  
BY  
*J. O. Felshin*  
ATTORNEY

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4 Sheets-Sheet 4

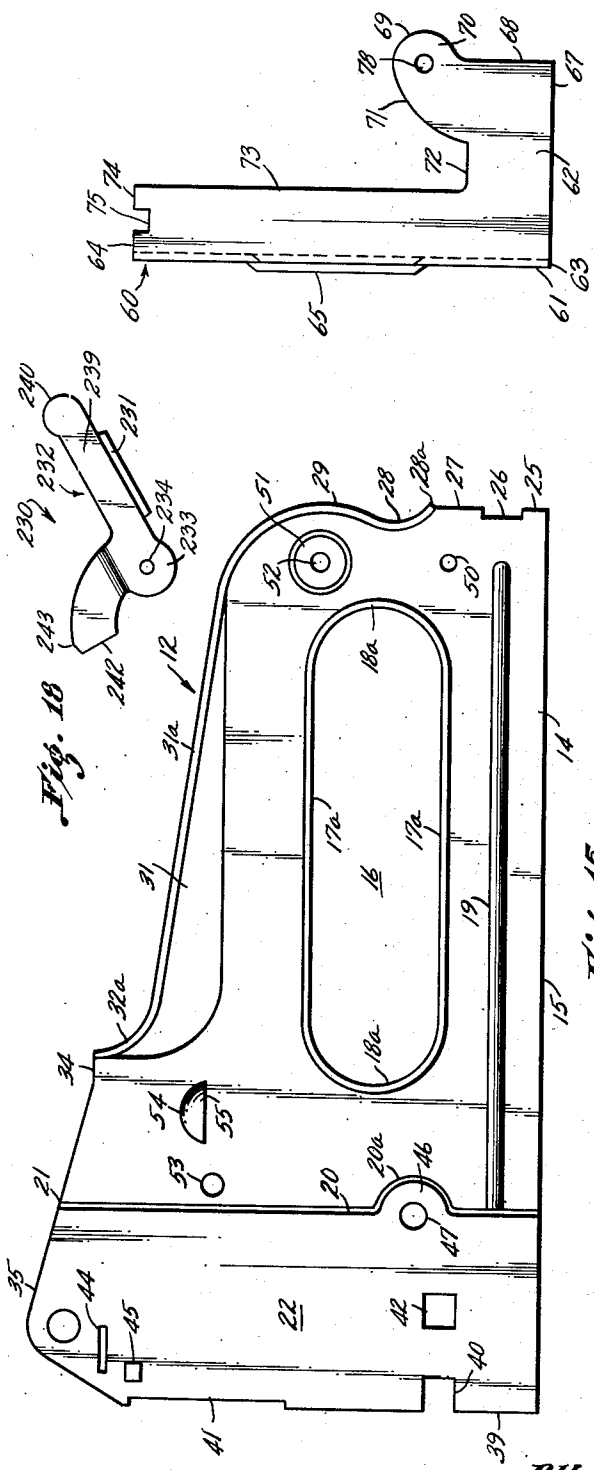


Fig. 15

BY

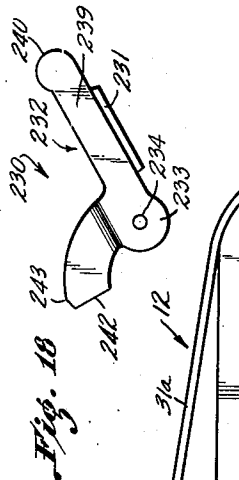


Fig. 18

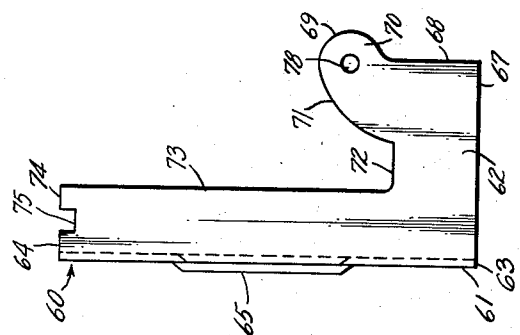


Fig. 16

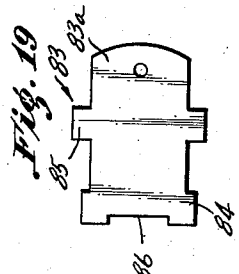


Fig. 19

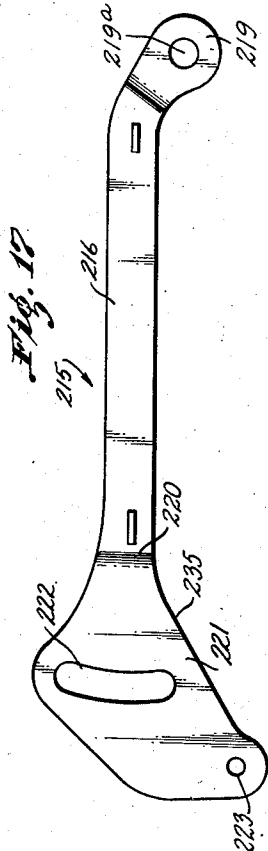


Fig. 17

Inventor  
FRANK S. BOROUGHS  
J. B. Felsher  
Attorney

# UNITED STATES PATENT OFFICE

2,659,083

## HAND TYPE STAPLE TACKER

Frank S. Boroughs, Elmhurst, N. Y., assignor to  
Arrow Fastener Co., Inc., Brooklyn, N. Y., a  
corporation of New York

Application January 13, 1951, Serial No. 205,922

16 Claims. (Cl. 1—49)

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This invention relates to heavy duty gun type tackers or stapling machines.

An object of this invention is to provide a stapling machine of the tacker type that takes into consideration the span, the strength, and the squeezing capacity of the average hand. It will be observed that when a hand is opened up too much it does not have much squeeze force in opened up condition. Also, if the hand is closed up too much it does not have very much squeezing strength. As the hand is closed from open position there is a zone where the squeezing power of the hand is greatest. The present stapling machine is so constructed that the handle of the stapling machine is squeezed during the zone of greatest force through the zone of greatest squeezing capacity.

In accordance with the present invention, although the staple used with the machine is an extra long one, the position of the handle when open in relation to the body finger grip hole, has been reduced by special operating lever design to a minimum. Furthermore, the machine is so designed that the hand squeeze power necessary to operate the machine has been reduced by special lever arrangement to be comfortable and to require less strength to squeeze. The machine is furthermore so designed in accordance with the present invention that when the handle is in closed or firing position it is wide enough apart from the finger grip hole in the body so that the hand retains and maintains sufficient power to have a comfortable feel when the plunger to which the driver is attached is released.

The above mentioned features would be greatly appreciated by those who use this tacker constantly on construction or other type of work as it gives the user the feeling of power with comfort.

Another object of this invention is to provide a highly improved means to achieve a relatively large staple driving power with comfort.

In accordance with the present invention the device comprises a body and a handle pivoted thereto, and a main support arm pivoted to the rear of the body and extending forwardly therefrom, and a pawl pivoted to said main support arm and adapted to engage a spring pressed driver, the handle being connected by links and a lever to the pivoted main support arm, causing lifting of the arm about its pivot when the handle is squeezed down, stop means being provided on the body to engage one end of the pawl when the pawl reaches the firing point to cause

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the pawl to release the driver so that the compressed spring will move the plunger attached to the driver for driving the staple.

In accordance with the present invention the arc of the main support arm to which the pawl is attached is long enough to give it sufficient capacity for lifting the driver and the plunger attached thereto high enough to clear the crown of the next in line staple, and yet short enough so that the final movement of the pawl in order to release the plunger is reduced to a minimum so that the mechanical release of the plunger and its driver is not unduly noticeable to the user.

In accordance with the invention, furthermore, the pawl itself is so constructed that the final release of the plunger is accomplished in a smooth manner by reason of the provision of a perfect radius on the end of the pawl relative to its pivoting point. The pawl furthermore is so constructed that the mechanical release of the plunger is smoothly achieved. This is done by making the distance from the point of engagement of the pawl with the stop on the main body to the pivot point of the pawl much greater than the distance from the point where the pawl engages the plunger to said pivot point.

In accordance with the present invention the pawl is pivoted to the pivoted main support arm at a point to which is also pivoted a link that connects the main support arm to a lifting lever, which in turn is pivoted at an intermediate point to the main frame and is connected by another link to the handle. This lifting lever and its connection by links to the handle and to the main support arm assures smooth operation of the lifting mechanism when under spring tension. The lifting lever is so positioned that the leverage of said lever is increased as the handle is pressed down.

Another object of this invention is to provide in a tacker or stapling machine of the character described, a bracket fixed to the handle and to which is connected a link pivoted in turn to one end of the lifting lever, said bracket being so positioned as to give maximum leverage when the handle is squeezed, and therefore smoothness of operation for the whole lifting mechanism.

Yet another object of this invention is to provide in a stapling machine or tacker of the character described, lifting and release mechanism so constructed and arranged that the plunger is lifted and fired with a minimum of friction. To accomplish this advantage the pivot point of the main support arm is so positioned as to control

the position of the firing point during the compression cycle and assures smoother release of the plunger. The plunger itself is so constructed that there is clearance between the point of the lifting pawl and the forward surface of the plunger below the firing point. The engaging edges on the plunger and pawl are furthermore so arranged that the release of the pawl relative to the plunger is smooth and prevents the plunger from crawling with the pawl and delaying the firing time. Furthermore, the position of the parts of the plunger which are engaged by the pawl are practically on the center line of the spring load so as to prevent tendency of the plunger to tilt sideways and whereby the plunger will move straight up and down as the handle is squeezed.

Yet another feature of the present invention is the fact that the driver blade is anchored to the plunger with a rivet and the upper end of said blade engages an extrusion on the front wall of the plunger. The plunger furthermore is so formed that its upper wings fit into the front cover of the stapling device and centers the plunger and hence prevents tilting of the plunger forwardly. The upper end of the front wall of the plunger furthermore rides on the inner surface of the front cover to assure straight up and down motion for the plunger.

Yet another object of this invention is to provide in a stapling device of the character described, a pawl having two sides interconnected by a bottom transverse portion contacting an edge of the main supporting arm to limit rotation of the pawl relative to said main supporting arm.

Yet another object of this invention is to provide in a stapling machine of the character described, a front cover provided with side walls having aligned notches in their upper ends and means on the body received in said notches so that the cover is firmly secured to the body by a screw passing through registering openings in the body and cover, thereby allowing easy removal of the cover for cleaning the staple track.

Yet another object of this invention is to provide in a stapling device of the character described, two stopping points for the handle, one at the front end of the handle when the handle raises, and another stopping point when the handle is squeezed, the latter comprising a rivet which attaches a link bracket to the underside of the handle and which rivet contacts the body to limit squeezing movement of the handle.

A still further object of this invention is the provision in a staple machine of the character described of a floating magazine which allows the driver blade to extend beyond the body so that staples can be driven fully. The extension on the blade counteracts motion of the rebound that is common to the present type of tackers. The magazine is hinged at its rear end but is free to swing down somewhat below the underside of the body, and such movement is limited by two lugs that extend forwardly from the front end of the magazine frame and fit into slots in the front wall of the cover. The slots are longer than the lugs allowing a spring to push the magazine assembly down so that the driver blade is either flush or above the surface of the magazine, preventing the driver from scratching the finished surface on which the stapling machine is placed. The lugs on the magazine body and the slots in the front cover also help to centralize the magazine track clearance with the driver

blade and with the spacer that guides the driver blade.

Yet a further object of the present invention is to provide a highly improved pusher rod and means for locking the pusher rod in position to prevent it from jarring loose and yet to permit it to be readily removed when desired. To accomplish this purpose there is pivoted to the rivet that secures the rear end of the staple magazine to the main body or frame, a latch that may be swung down to lock the pusher rod retaining bracket in position on the machine, and which may be swung up to release the pusher rod and its retaining bracket so that they may be removed from the staple magazine. The bracket fixed to the rear end of the pusher rod had freedom of movement relative to the main body or frame, thereby permitting the swinging latch to clear the lug on the retaining bracket, the spring on the pusher rod serving to push said bracket rearwardly for keeping the lug thereon in engagement with the swinging latch.

Yet another object of this invention is to provide in a stapling machine of the character described, a pair of fixed stop members on the main frame which are engaged by the end of the pawl as the handle is squeezed to disengage the pawl from the plunger at a predetermined point in squeezing the handle, the pawl furthermore being provided with spring means to return the pawl to a position for engaging the plunger after the handle is released.

Yet a further object of this invention is to provide a strong, compact and durable stapling machine of the character described, which shall be relatively inexpensive to manufacture, easy to operate, comfortable in use and yet practical and efficient to a high degree in use.

Other objects of this invention will in part be obvious and in part hereinafter pointed out.

The invention accordingly consists in the features of construction, combinations of elements, and arrangement of parts, which will be exemplified in the construction hereinafter described, and of which the scope of invention will be indicated in the following claims.

In the accompanying drawings in which are shown various illustrative embodiments of this invention,

Fig. 1 is a vertical longitudinal cross-sectional view through a stapling machine embodying the invention, in normal position;

Fig. 2 is a view similar to Fig. 1 but showing the handle compressed and just before the plunger is released for driving a staple;

Fig. 3 is a side elevational view of the stapler with parts broken away, showing some of the parts just after the plunger has been released in position where a staple is driven;

Fig. 4 is a cross-sectional view taken on line 4-4 of Fig. 1;

Fig. 5 is a cross-sectional view taken on line 5-5 of Fig. 2;

Fig. 6 is a cross-sectional view taken on line 6-6 of Fig. 2;

Fig. 7 is a cross-sectional view taken on line 7-7 of Fig. 4;

Fig. 8 is a cross-sectional view taken on line 8-8 of Fig. 1;

Fig. 9 is a cross-sectional view taken on line 9-9 of Fig. 2;

Fig. 10 is a cross-sectional view taken on line 10-10 of Fig. 1;

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Fig. 11 is a cross-sectional view taken on line 11—11 of Fig. 2;

Fig. 12 is a partial vertical view taken along a plane of line 12—12 of Fig. 3;

Fig. 13 is a cross-sectional view taken on line 13—13 of Fig. 1;

Fig. 14 is a cross-sectional view taken on line 14—14 of Fig. 1;

Fig. 15 is a side elevational view of the main frame member;

Fig. 16 is a side elevational view of the front cover;

Fig. 17 is a side elevational view of the pawl arm;

Fig. 18 is a side elevational view of the pawl; and

Fig. 19 is a top plan view of the bottom stop member.

Referring now in detail to the drawing, 10 designates a heavy duty gun type tacker or stapling machine embodying the invention. The same comprises a main body frame 11 (Fig. 2). Said frame 11 comprises a pair of similar symmetrically disposed complementary mating frame members 12 (Figs. 2, 6, 11 and 15). Since said 25 members are similar, only one thereof will be described. Each of said members 12 may be made as a die stamping of sheet metal. Each member 12 comprises a flat wall portion 14 (Figs. 5, 6 and 15) having a straight longitudinal bottom edge 15. Above said bottom edge said wall 14 is formed with elongated longitudinal horizontal hand hole 16. The hand hole 16 (Figs. 2 and 3) has upper and lower longitudinal flange portions 17 interconnected by end semi-circular 35 flange portions 18. Said flange portions 17 and 18 are connected to the wall 14 by curved corners 17c and 18c, and are curved inwardly and terminate in longitudinal edge portions 17a and semi-circular edge portions 18a. When the two 40 frame members are assembled the edge portions 17a and 18a of the two frame members mutually contact, as will appear hereinafter.

The wall 14 is furthermore formed below the hand hole 16, with a longitudinal inwardly 45 pressed transversely curved rib 19 (Figs. 3, 11 and 15) terminating short of the rear end of wall 14, as at 19a, and terminating at the forward end of said wall, as at 19b. At the front end of the flat wall 14 is an outwardly extending vertical shoulder 20 (Fig. 15) having above its 50 lower end a semi-annular portion 20a. The shoulder 20 extends to the lower edge 15 of the wall 14. The shoulder extends also to an upper forwardly and upwardly inclined edge 21 (Fig. 15) of said wall. Extending forwardly from the shoulder 20 is a flat vertical wall 22 (Fig. 5), 55 having a lower edge 23 (Fig. 4) in the plane of the edge 15.

Wall 22 is parallel to wall 14 and spaced outwardly therefrom. Extending upwardly from the rear end of the lower edge 15, is a vertical edge 25 (Fig. 3), formed above its lower end with an inwardly extending rectangular notch 26 (see also Fig. 15). Edge 25 terminates at point 27 65 substantially at the level of the edge 17a of hand hole 16. Extending upwardly from edge 27 is an inwardly curved flange portion 28 formed with an inner edge 28a in the plane of edge 17a, 18a, said edges being in the plane of the split between 70 the two mating or complementary frame members 12.

Extending upwardly from curved portion 28 is an outwardly and then inwardly curved flange portion 29 having an inner edge 29a (Fig. 13) 75

forming a continuation of the edge 28a. The flanges 28, 29 are connected to the wall 14 by curved corners 30 (Fig. 5). Extending forwardly from the upper and inner end of the flange portion 29 is a flange portion 31 which increases in curvature toward its front end, being substantially semi-annular at its forward end. The flange portion 31 has an inner edge 31a (Fig. 1) forming a continuation of the edge 29a. At the forward end of the flange portion 31 is a more flattened flange portion 32 curved upwardly and having an inner edge 32a forming a continuation of the edge 31a. The flange portion 32 terminates in an upper edge 33. It will be noted that the flange portions 28, 29, 31 and 32 all extend from the flat wall 14.

Said flat wall 14 is formed with a forwardly extending horizontal edge 34 (Figs. 1 and 15) extending forwardly from the upper edge 33. Extending from the forward end of edge 34 is the forwardly and upwardly inclined edge 21 referred to hereinabove. The edge 21 extends to the shoulder 20. At the upper end of wall 22 is a forwardly and upwardly inclined edge 35 forming a continuation of the edge 21 after the break due to the shoulder 20. The inclined edge 35 merges with a forwardly and downwardly curved edge 36 (Fig. 3) from which extends a downwardly and forwardly inclined edge 37, terminating at a point 38 which is the upper end of the front edge 39 (Fig. 3) of wall 22.

Said wall 22 (Fig. 15) is formed at its front edge 39 and above its lower edge with a square notch 40. It is also formed with an elongated vertical groove or notch 41 (Fig. 1) disposed between the notch 40 and the upper end 38 of said front wall. Said wall 22 is furthermore formed with a square through opening 42 (Fig. 3) aligned with the notch 40 but spaced rearwardly thereof. Said wall 22 is furthermore formed at the center of curvature of the curved edge 36 with a through opening 43 (Figs. 1 and 4) for the purpose hereinafter appearing. Said wall 22 is furthermore formed with a horizontal slot 44 (Fig. 4) disposed below the through opening 43. It is also formed with an outwardly pressed downwardly projecting square prong 45 (Fig. 4) disposed below the slot 44 and in alignment with the forward end of said slot. The prong is disposed just below the level of the upper end 38 of the front edge 39 of wall 22.

The curved shoulder portion 20a forms a semi-circular extension 46 of wall 22. At the axis of said semi-circular extension is a through opening 47 (Figs. 2, 5 and 15) for the purpose hereinafter appearing.

Wall 14 (Fig. 15) is furthermore formed adjacent its rear end, substantially at the level of the lower edge 17a and between said edge and the upper end of the rear edge 25, with a through opening 50 (Fig. 2). Said wall 14 is also formed between the rear end of the hand hole 16 and the flange 29 with an inwardly pressed annular portion 51 (Figs. 3 and 13) at the center of which is a through opening 52 (Figs. 13 and 15). The center of the opening 52 is disposed vertically above the center of the opening 50. Said wall 14 is furthermore formed adjacent the shoulder 20 and substantially at the level of the lower portion of the flange 31 with a through opening 53 (Fig. 3). Said wall 14 is also formed adjacent to and rearwardly of the opening 53, with an inwardly pressed longitudinally curved shoulder 54 (Fig. 1) having a lower curved stop edge 55 located in a horizontal plane.

It will now be understood that the two frame members 12 are placed together with the edges 17a, 18a, 28a, 29a, 31a and 32a of one contacting said edges of the other. Means is provided to hold said frame members together with said edges mutually contacting. To this end a rivet 56 (Fig. 13) is passed through the openings 52. The heads 57 (Figs. 3 and 13) of the rivet 56 are received within the recessed portions 51. Said frame members are furthermore fixed together by means of a rivet 58 (Figs. 2, 3 and 8) passing through the openings 53. The heads of the rivet 58 contact the walls 14 of the frame members 12.

Fitted over the front of the main body frame 11, which comprises the frame members 12, is a front cover 60 (Figs. 25 and 16). Said front cover 60 comprises a vertical transverse front wall 61 (Figs. 5 and 6) from which extend parallel side walls 62 (Figs. 3 and 5). The front wall contacts the front edges 39 of the frame members 12 and the side walls 62 contact the outer surfaces of walls 22 of said frame members. The front wall 61 has a bottom edge 63 (Fig. 2) in the plane of the bottom edges 15 and 23. It has a top edge 64 substantially at the level of points 38 of the frame members 12. The front wall 61 is formed with a longitudinal forwardly recessed, substantially rectangular portion 65 (Fig. 2) for the purpose hereinafter appearing. Said front wall is furthermore formed near its lower end with a pair of parallel spaced slots 66 (Fig. 12) for the purpose hereinafter appearing.

The side walls 62 have lower edges 67 (Figs. 3 and 16) in the plane of the edges 63, 23 and 15. Extending upwardly from the rear end of the lower edges 67 are edges 68 coextensive with the lower portions of the shoulders 20. Extending from the edges 68 are semi-circular edges 69 following the curvature of the shoulder 20a and forming an ear 70. Extending from the upper portion of edge 69 of each side wall 62 is a forwardly and downwardly curved edge 71 from which extends forwardly a horizontal edge 72. Extending from edge 72 is an upwardly extending vertical edge 73 parallel to the front wall 61. At the upper end of the side walls 62 are horizontal edges 74 (Fig. 3) at the level of the upper edge 64 of the front wall 61. The upper edges 74 are formed with downwardly extending notches 75 into which the outwardly extending prongs 45 (Figs. 4 and 16) project to properly locate the front cover with respect to the main frame 11. The ears 70 of the side walls 62 are formed with through openings 78 (Fig. 5) which register with the through openings 47 and the side walls 22. Extending through the registering openings 47, 78 is a screw 80 having a head 81 at one end contacting one ear 70. Screwed to the opposite end of the screw 80 is a nut 82 contacting the other ear 70.

Interposed between the side walls 22 of the frame member 11 is a horizontal lower spacer member 83 (Figs. 1 and 2) having at its forward end outwardly extending lugs 84 (Fig. 3) projecting into the lower portions of the notches 40 (Fig. 15). Said spacer is also provided with outwardly extending wings 85 (Figs. 3 and 5) projecting into the lower portions of the square holes 42. It will be noted that thickness of the spacer 83 is equivalent to one-half of the height of the notches 40 and rectangular openings 42. The spacer 83 is formed at its forward end with a shallow groove 86 (Fig. 2) spaced from the inner surface of the front wall 61 of the front cover 60.

The outer edges of the wings 84 contact the

inner surface of the side walls 62 of the front cover. Overlying the front portion of spacer 83 is a bumper disc or plate 88 (Figs. 2 and 5) having front wings 89 superimposed over the wings 84. The bumper plate 88 also has wings 90 superimposed over the wings 85. The wings 89 pass through the notches 40, whereas the wings 90 pass through the openings 42. It will be noted that the combined thicknesses of the spacer 83 and the plate 88 are equivalent to the height of notches 40 and openings 42. Bumper plate 88 is formed with a notch 88a in its forward edge registering with the notch or groove 86.

It will be noted furthermore that the spacer 83 has a rear portion 83a (Fig. 5) which extends rearwardly of the bumper 88. The spacer 83 serves to accurately space the frame members 12 and to prevent the side walls of the members from being pressed too close together. Said spacer 83 also serves as a bottom stop for a plunger 91 (Fig. 3) to be described hereinafter. The bumper 88 may be made of "neoprene," rubber or the like material to serve as a shock absorber for a spring actuated descending plunger 91 as will be described hereinafter.

For the purpose hereinafter appearing there is riveted to the rear portion 83a of the spacer 83 a leaf spring 92 (Fig. 5) having a rear downwardly projecting curved free tongue 93 (Fig. 2). The spring 92 is attached to the spacer 83 by means of the rivet 94.

The side walls 22 of the frame members are furthermore separated by a top spacer and stop member 95 (Figs. 1, 2 and 7) having outwardly extending wings 96 (Fig. 7) projecting through the openings or slots 44 in the side walls 22. The side edges of the spacer 95 contact the inner surfaces of the side walls 22 to space the latter. Said spacer 95 is formed with a central through opening 97 and with a plurality of downwardly extending annularly arranged prongs 98 surrounding said opening. The center of the opening 97 is substantially centrally located with respect to the bottom bumper 88.

Extending through the aligned openings 50 of the frame members 12 is a transverse pivot pin 100 (Fig. 2) having heads 101 at its outer ends. Disposed between the frame members 12 adjacent the bottom of the frame and pivoted to the pivot pin 100 is a staple magazine 102 (Fig. 2). Said staple magazine 102 comprises a magazine body 103 (Fig. 4) having a bottom wall 104 from which extend upwardly parallel side walls 105 formed at their upper ends with inwardly extending flanges 106. The side walls 105 are disposed between and substantially contact grooved portions 19 (Fig. 11). They are formed adjacent their rear ends with upwardly and rearwardly inclined apertured ears 107 through which the pivot pin 100 passes.

The bottom wall 104 has at its front end a forwardly projecting tongue 108 (Figs. 1 and 6) spaced rearwardly from the front ends of the side walls 105. The side walls 105 are formed at their forward ends with forwardly projecting lugs 109 (Fig. 12) passing through the slots 66 in the front wall of the cover 60. The lugs 109 are somewhat shorter than the slots 66 so that there is a lost motion or movement permitted between the lugs 109 and the slots 66 in an up and down direction. When the upper ends of the lugs 109 contact the upper ends of the slots 66 the bottom surface of the bottom wall 104 of the magazine body is flush with the lower edges of the frame members and front cover.

The spring tongue 93 (Fig. 1) contacts the flanges 106 and serves to normally depress the forward end of the staple magazine to cause a slight movement of the staple magazine about its pivot 100 so that normally the front end of the staple magazine projects about  $\frac{1}{8}$ " below the front end of the frame and cover.

The upwardly and rearwardly apertured ears 107 have upwardly and rearwardly inclined rear edges 110 (Fig. 1), and the rear ends of the side walls 105 have upwardly and forwardly inclined edges 111 forming a V with the edges 110. Ears 107 and side walls 105 are part of the same unit. The inclined edges 110 and the inclined edges 111 are both at the rear ends of the side walls 105.

Disposed within the staple magazine and extending longitudinally thereof is a staple guide member 112 (Figs. 2 and 11) comprising a bottom wall 113 (Fig. 4) from which extend upwardly parallel side walls 114 spaced inwardly from the side walls 105 and having upper edges spaced below the flanges 106. The forward end 113a of bottom wall 113 is disposed rearwardly of the forward edges of side walls 114 and rearwardly of the forward edge of tongue 108. The bottom wall 113 is riveted to the bottom wall 104 by rivets 115. Between the staple guide 112 and the staple magazine 103 is formed a passage for a staple strip 116 (Fig. 2). The side walls 114 of the staple guide are formed at their forward end with downwardly extending flanges or tongues 117 (Fig. 1) engaging opposite sides of the forwardly extending tongue 108. The forward ends 118 of the side walls 114 of the staple guide are spaced from the front wall 63 to form a passage 120 (Fig. 2) therewith for driving a staple there-through. The passage 120 is aligned with the notch 86 in stop 83 and the notch 88a in the bumper disc 88.

Means is provided to resiliently urge the staple strip 116 forwardly so that the foremost staple will enter the passage 120. To this end there is provided a pusher mechanism 123 (Fig. 2). The same comprises a rod 124 passing through the staple guide 112 longitudinally thereof. At the forward end of the pusher rod 124 are upset lugs 125. Slidably mounted on the pusher rod 124 is a pusher member 126 made of sheet metal and comprising a top wall 127, the side edges of which rest on the top edges of said walls 114 of the staple guide. Extending downwardly from the front and rear ends of the top wall 127 are flanges 129 formed with through openings through which the rod 124 passes. A spacer sleeve 130 may surround the rod 124 between the apertured flanges 129. The top wall 127 serves to push the staple strip 116 forwardly. Surrounding the rod 124 rearwardly of the pusher member 126 is a coil compression spring 131. Riveted to the rear end of the rod, as at 133, is a latch member 134 comprising a rear wall 135 (Fig. 6) having a rearwardly extending upper lip 136 disposed just below the lower ends of the flanges 28. Spring 131 contacts rear wall 135.

Extending forwardly from the back wall 135 are side walls 137 (Figs. 1 and 6) having V-shaped forward edges adapted to fit into the V-groove formed by edges 110, 111 of the side walls of the magazine body, but normally spaced therefrom.

It will thus be noted that the side walls 137 of member 134 fit within the side walls 14 of the frame members. Extending outwardly from the back wall 135 are lugs 138 (Fig. 6) which are adapted to move into the rear notches 26 (Fig. 3) of the side walls 14 of the frame members.

Pivoted on to the ends of the pivot pin 100 is a bell crank shaped keeper member 140 (Fig. 3). The keeper member 140 comprises side portions 141 having suitable openings through which the pivot pin 100 passes. Said side portions 141 also have downwardly extending portions 142 formed with openings 143, to provide a better grip for the fingers of the operator. The side portions 141 are interconnected by a rear strap 144 which extends around the back wall 135 below the lip 136. The strap 144 thus engages member 134 to prevent the pusher mechanism from coming out. In such position the forward V-shaped edges of the side walls 137 are spaced from the V-shaped grooves formed by edges 110, 111. To remove the pusher rod member 134 is first pushed forwardly and then the keeper member 140 is swung in a counterclockwise direction, looking at Fig. 6, so that the strap 144 moves above the lip 136. The whole pusher mechanism may then be removed rearwardly from the staple magazine to permit loading of another staple strip. After a new staple strip is loaded the pusher mechanism is reinserted, member 123 is pushed forwardly and the latch 140 is then swung down so that the strap 144 comes below the lip 136. Member 123 is then released and the strap keeps it from coming out.

The plunger 91 comprises a housing 145 (Fig. 3) provided with a bottom wall 146. Extending upwardly from the front of the bottom wall 146 is an upwardly extending front wall 147 having at its upper end a forwardly projecting vertical upward extension 148. Said extension 148 has wing extensions 148a (Fig. 4) received in groove 41 to aid in guiding the plunger up and down. In Fig. 4, part of the wall 22 is broken away so that part of one wing 48a can be seen. Said front wall 147 is formed with a forwardly and downwardly projecting prong 149 (Fig. 1) pushed out from said wall and having a lower edge 150. The extension 148 is adapted to contact the inner surface of the front wall 61 of the front cover 60 above the forwardly recessed portion 65 of the latter. Extending upwardly from said bottom wall 146 is a rear wall 151 formed with a through opening 152 (Fig. 2). Extending rearwardly from the front wall 147 are side walls 153 (Fig. 3) each formed with a rearwardly extending hook 154 having an upwardly and rearwardly inclined hook underedge 155. The hook edge 155 is located substantially midway between the front wall 147 and the rear wall 151. It will be noted that the side walls 153 are disposed in planes disposed beyond the side edges of the rear wall 151.

Extending inwardly from the lower ends of the side walls 153 are bottom flanges 156 (Fig. 4) contacting the underside of the bottom wall 146. The flanges 156 have inner substantially meeting edges. In normal condition the plunger rests on the bumper plate 88, the undersurfaces of the flange 156 contacting said bumper. Interposed between the bottom wall 146 and the top stop member 95 and received within the plunger is a coil compression spring 160 (Figs. 1 and 4) which presses the plunger downwardly against the bumper plate 88 on the bottom stop 83. The upper end of the coil compression spring 160 surrounds the downwardly projecting prongs 98 (Figs. 1 and 4) which serve to center the spring.

Riveted to the front surface of the front wall 147 by rivet 161 aligned with opening 152 and riding in recess 65, is a driver blade 162 (Fig. 1)

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which passes down through the notches 88a and 86 and through the passage 120 for driving the foremost staple of the staple strip 116 when the stapling machine 10 is actuated. The upper edge of the driver blade 162 contacts the edge 150 of the prong 149 on the front wall 147 of the plunger. In normal condition the lower end of the driver blade projects about  $\frac{1}{16}$ " below the lower edge of the front wall of the front cover, being flush with the underside of the front end of the staple magazine, which also projects about  $\frac{1}{16}$ " below the front cover. The staple magazine prevents the lower end of the plunger blade from scraping the surface on which the stapling device may be placed.

Means is provided to raise the plunger against the pressure of the spring 160 and to then release the plunger so that it is forceably moved downwardly by the compressed spring 160 to drive the staple. To this end there extends through the openings 43 in the side walls 22 of the frame members 12, a transverse horizontal rivet 165 (Figs. 2 and 4) having rivet heads 166 at its outer ends, spaced from said side walls 22. Mounted on oscillation on the rivet or pivot pin 165 is a handle member 167 (Fig. 1). Said handle member 167 may be made of die stamped sheet metal. It comprises an upwardly and rearwardly inclined wall 168, the forward lower edge 168a (Fig. 2) of which normally contacts the upper end edge 64 of the front wall 61 of the cover. Extending rearwardly and inclined upwardly but to a lesser degree than wall 168, is wall 169 (Fig. 1) from which there extends a rearwardly curved top wall 170, slightly bent or curved downwardly at its rear end, as at 171 (Fig. 3). Extending downwardly from walls 168 and 169 and from the forward end of top wall 170 are parallel side walls 172 receiving the side walls 22 therebetween. Walls 172 are formed with aligned through openings 174 (Fig. 4) registering with the openings 43. The rivet 165 passes through the openings 174 and the rivet heads 166 contact the outer surface of said side walls 172. At the rear ends of the side walls 172 are inwardly extending shoulders 175 (Fig. 3) which are aligned with the shoulders 20, when the handle is in normal up position. The side walls 172 have at their forward ends bottom edges 176 adapted to contact the upper edges 74 of the side walls 62 of the front cover, when the handle is in normal up position.

Rearwardly of the edges 176 are underedges 177 (Fig. 3) at a somewhat higher level. Extending downwardly from the top wall 170, 171 are side walls 178 disposed rearwardly of the shoulders 175. The side walls 178 have at their forward ends underedges 179 at the level of the edges 177. Extending from the rear ends of the edges 179 are upwardly and rearwardly part-circular edges 180 from which extend rearwardly and upwardly curved edges 181 which merge with the rear ends of the top wall 171.

Surrounding the pivot pin 165 is a coil torsion spring 182 (Figs. 2 and 4), one arm of which contacts the rear edge of the top stop 95, and the other arm of which contacts the underside of top wall portion 169. The coil torsion spring 182 normally tends to rotate the handle in a counterclockwise direction. In other words, the torsion spring tends to raise the handle when the handle is squeezed down and then released. The engagement of the lower edge 168a of the handle with the upper edge 64 of the front cover

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serves to limit upward movement of the rear end of the handle.

In operating the stapling machine the palm of the hand contacts the top of the handle in the region of top wall 170 and the fingers pass through hand hole 16. The hand may then be moved to move the handle toward the body to operate the stapling machine.

Attached to the underside of the top wall 170 of the lever 16 and adjacent the wall 169 is a handle bracket 190 (Figs. 2 and 9). Said bracket 190 has a top transverse wall portion 191 contacting the underside of said top wall 170 and it is fixed thereto by a pair of longitudinally spaced rivets 192. Extending downwardly from the forward end of the top wall 191 are side walls 193 formed with aligned through openings 194. The lower ends 195 (Fig. 9) of said side walls 193 are pressed inwardly toward each other, but are spaced apart. The space between the lower ends or fingers 195 is less than the space between the wall portions 193.

Mounted on and between the side walls 193 and received within the aligned openings 194 is a transverse pivot pin 196. Pivoted on said pivot pin 196 and extending between the guide fingers 195 is the upper end of an upper link 197 (Figs. 1, 2 and 9). The link 197 extends downwardly below said fingers 195. The lower end of the link 197 is formed at its lower end with a through opening 198 and extending therethrough is a pivot pin 199. Pivoted to the pin 199 is a lever 200 (Figs. 1 and 10).

The lever 200 comprises a pair of spaced similar side walls 201 (Figs. 1, 9 and 10) interconnected by top web portion 202. Said side walls 201 have rearwardly extending arms 203 receiving the lower end of the upper link therebetween, and said arms are formed with registering openings through which opposite ends of the pivot pin 199 pass. Said side walls 201 are furthermore formed with intermediate through openings 204 (Fig. 1) through which the rivet 58 passes. The rivet 58 serves as a fulcrum for rotation of the lever 200. At the forward ends of the side walls 201 are aligned through openings 205 (Fig. 1) through which pass a transverse pivot pin 206, traversing the space between said side walls. It will be noted that the forwardly extending arm of the lever 200 is longer than the rearwardly extending arm thereof.

Received between said side walls 201 is the upper end of a lower link 207 (Figs. 2 and 10) formed with through opening through which the pivot pin 206 passes. Said lower link 207 comprises side walls 208 interconnected by a rear web 209. It is the upper ends of these side walls 208 which are formed with the opening through which the pivot pin 206 passes. The upper portions of the side walls 208 are spaced closer together than the lower ends 210 of said side walls. The side walls 208 contact the inner surfaces of the side walls 201 of lever 200. At the upper ends of the lower portions 201 are shoulders 211. The lower ends 210 of the lower link are formed with through openings through which passes a transverse pivot pin 212.

It will now be noted that the forward edges of the side walls 208 are cut back as at 213 (Figs. 2 and 17) so that during the operation of the device said edges will not contact the plunger.

Pivoted to the rivet or pivot pin 56 is a pawl supporting arm 215 (Fig. 2) which passes through the frame body between the hand hole 16 and the top wall 31. Said member 215 comprises a pair of sim-

ilar symmetrically disposed pawl arm members 216 (Figs. 2 and 12) attached together by a pair of spacer rivets 217 (Fig. 13). Each of the members 216 comprise an intermediate elongated portion 218 formed with a pair of spaced slots 5 through which the reduced ends of the spacer rivets 217 pass. Said portions 218 are in parallel vertical planes. At their rear ends are outwardly recessed rearwardly inclined apertured ears 219 formed with openings 219a through which 10 the pivot pin 56 passes. At the forward ends of the arms 218 are outwardly pressed shoulders 220 (Figs. 2, 10 and 17) and extending therefrom are parallel head portions 221 formed with aligned curved slots 222 through which the pivot pin 58 15 passes. The center of the slots 222 is pin 56 to permit oscillation of the pawl arm 215 between limits. The walls 221 of the pawl arm 215 (Fig. 10) contact the outer surfaces of the lower ends 210 of the lower link and the side walls 201 of 20 the lever 200. Said walls 221 are formed adjacent their lower forward ends with through openings 223 receiving the outer ends of the pivot pins 212.

It will now be understood that when the handle 25 167 is moved toward the body, the link 197 will be pressed downwardly to cause clockwise rotation of the lever 200, thereby raising the lower link 207 and at the same time raising the pawl arm 215, moving the latter in a clockwise direc- 30 tion. The slots 222 permit said upward movement of the pawl arm 215.

Pivoted to the pivot pin 212 is a pawl 230 (Figs. 2 and 18). Said pawl 230 comprises a bottom web 231 from which extend upwardly side walls 35 232. The side walls 232 are in the shape of bell cranks and comprise intermediate ears 233 (Fig. 10) formed with through openings 234 to receive the outer ends of the pivot pin 212 (Figs. 3, 10 and 18). The intermediate ears portions 233 of 40 the pawl contact the outer surface of the side walls 221 of the pawl arm. The web 231 contacts upwardly and rearwardly inclined lower edges 235 of the side walls 221 of the pawl arm 215.

Surrounding the pivot pin 212 and disposed 45 between the lower ends 210 of the lower link 207 is a coil torsion spring 236 (Figs. 1 and 10) having one arm 237 contacting the front surface of the web 209 of the lower link and another arm 50 238 contacting the underside of the web 231 of the pawl. The coil torsion spring 236 thus serves to press the web 231 against the underedges 235 of the pawl arm members 216. Extending upwardly and rearwardly from the intermediate ear portions 233 of the pawl are arms 239 (Fig. 55 3) having heads 240 at their rear ends lying substantially against the inner surfaces of the side walls 14 of the frame members 12. The heads 240 are located below the prongs 54. Extending upwardly and forwardly from the intermediate portions of the pawl are outwardly pressed fingers 242 (Figs. 3 and 18) straddling the rear wall 151 of the plunger and disposed in the planes of the side walls 153 of said plunger. The fingers 60 242 are formed with upper end edges 243 which have a curvature relative to the axis of the pivot pin 212 and are adapted to engage beneath the underedges 155 of the hooks 154 on the plunger 145.

The operation of the stapling machine will now be described. Beginning with the parts in the position shown in Fig. 1 it will be noted that the plunger is pressed downwardly by the coil compression spring 160, the handle is up, the 75

plunger blade projects about  $\frac{1}{8}$ " below the front cover, and the spring 92 presses the staple magazine downwardly so that its forward end also projects about  $\frac{1}{8}$ " below the front cover. The staple magazine is then placed on a sheet S to be stapled to a plate P. The stapling machine is grasped as stated above by placing the palm of the hand against the top of the handle and passing the fingers through the hand hole 16 with the thumb straddling the handle. The handle is then squeezed by squeezing the hand, causing the upper link 197 to press downwardly and rotate the lever 200 about the pivot pin 58, thereby raising the lower link 207 and thru the pin 212 raising the pawl supporting arm 215. As the pawl arm is raised the pawl 230 engages the hook edges 155 of the plunger 145 and elevates the plunger and the driver blade. As the handle is further pressed downwardly toward the main frame, the plunger will be raised to the position shown in Fig. 2, thereby compressing the coil spring 160. At the end of the stroke the heads or enlargements 240 on the rear ends of the arms 239 on pawl 230 contact the lower edges 55 of the inwardly pressed prongs 54. During upward movement of the pawl arm 215, the web 231 of the pawl remains in contact with the underedges 232 of the pawl arm until heads 240 contact edges 55. A slight further movement of the handle will then cause the pawl 230 to be rotated in a clockwise direction, by reason of engagement of heads 240 with fixed edges 55 causing webs 231 to move away from edges 235 the outer ends 243 of the fingers 242 of said 35 pawl to move off the edges 155, releasing the plunger and permitting the latter to descend sharply under the influence of the compressed coil spring 160, and thereby causing the driver blade to drive the foremost staple of the staple strip through the passage, through the sheet S and into the plate P. When the handle is released it will be raised by the torsion spring 182.

It will now be understood that there is provided a stapling machine of the tacker type that takes into consideration the span, the strength, and the squeezing capacity of the average hand. When the hand is opened up too much it does not have very much squeezing force. Also, if the hand is closed up too much it does not have very much squeezing strength. As the hand is closed from open position, there is a zone where the squeezing power of the hand is greatest. With the present stapling machine the arrangement is such that the handle is squeezed during the zone of the greatest squeezing strength of the hand. With the present device the amount of handle rotation is minimized so that it need be rotated only during the zone of greatest squeezing strength. Furthermore, the arrangement of the 60 pawl arm 215, the pawl 230, the links and the lever, and the handle is such that less strength is required to squeeze the handle for driving a staple. Furthermore, in the firing position, that is in the position where the pawl moves off the plunger, the handle is sufficiently opened up so that the hand still has considerable strength to effect the firing or release of the plunger.

It will be observed that the main support or pawl arm 215 is of considerable length, being pivoted adjacent the rear end of the main frame, thereby reducing the strength necessary to operate the stapling device. The movement of the main pawl arm is short enough however so that the firing movement of the pawl in order to release the plunger is reduced so that the me-

mechanical release of the plunger and its driver is not unduly noticeable to the user.

It will be further observed that with the present construction the final release of the plunger is accomplished smoothly by reason of the provision of a perfect radius on the end of the pawl relative to its pivoting point. The release of the pawl is furthermore made more smooth by making the distance from the point of engagement of the pawl with the stops 54 on the main body 10 to the pivot point of the pawl much greater than the distance from the point where the pawl engages the plunger to said pivot point. The lifting lever 200 is furthermore so positioned that the leverage of said lever is increased as the handle 15 is pressed down. The bracket 190 is so positioned furthermore to give maximum leverage when the handle is squeezed and therefore smoothness of operation for the whole lifting mechanism. The plunger furthermore is so arranged that it may be lifted and fired with a minimum of friction. This is accomplished by positioning the pivot point 57 of the main pawl arm or support arm 215 so as to control the position of the firing point during the compression 25 cycle and insures smoother release of the plunger. The plunger itself is so constructed furthermore that there is clearance between the point of the lifting pawl 242 and the rear edge of the side walls of the plunger below the firing point. The arrangement is such furthermore that the plunger will not crawl upwardly with the pawl while the pawl is becoming disengaged from the under edges 155, so that there will be no delay in the firing time. The pawl engages the plunger substantially at the middle between the front and back of the plunger so as to prevent tendency of the plunger to tilt sideways, whereby the plunger will move straight up and down as the handle is squeezed.

The driver blade, it will be noted, is anchored to the plunger by a rivet and the upper end of the blade engages an extrusion on the front wall of the plunger to steady the blade. The plunger is furthermore so formed that its upper wings 45 fit into the front cover of the stapling device and centers the plunger and hence prevents tilting of the plunger forwardly. The upper end of the front wall of the plunger furthermore rides on the inner surface of the front cover to assure 50 straight up and down motion for the plunger.

The reception of the prongs 45 on the main frame body in the notches 75 of the front cover assures that the cover is firmly secured to the body. The removal of the screw 80 however, permits easy removal of the cover for cleaning the staple track. The handle has two stopping points, one when it is raised by engagement of the edge 168a with the edge 64. Also when the handle is squeezed, the rear rivet 192 will contact the upper edge 33 of flanges 32 serving to stop the squeezing movement of the handle.

The floating magazine allows the driver blade to extend below the body so that the staples can be driven fully. The extension of the blade counteracts motion of the rebound that is common to present type tackers. The magazine is hinged at its rear end but is free to swing down somewhat below the underside of the body and such movement is limited.

The lugs on the magazine body which are received in the somewhat longer slots in the front cover limit movement of the floating magazine and also help to centralize the magazine track

clearance with the driver blade and with the bottom spacer that guides the driver blade.

It will be further noted that provision is made to prevent the pusher rod from jarring loose and yet to permit it to be readily removed when desired.

It will thus be seen that there is provided a device in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As various possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention I claim as new and desire to secure by Letters Patent:

1. A stapling device comprising a main frame body, a handle movably mounted thereon, a plunger movably mounted in the body, a pawl arm pivoted to the body, a lever pivoted to the body, means to connect the lever to said handle, means to connect the lever to the pawl arm, a pawl pivoted to the pawl arm and having means to engage the plunger to move the same in one direction when pressing the handle towards the body, and means to release said pawl from the plunger.

2. A stapling device comprising a main frame body, a handle movably mounted thereon, a plunger movably mounted in the body, a pawl arm pivoted to the body, a lever pivoted to the body, means to connect the lever to said handle, means to connect the lever to the pawl arm, a pawl pivoted to the pawl arm and having means to engage the plunger to move the same in one direction when pressing the handle toward the body, means to release said pawl from the plunger, the means for connecting said lever to said handle and pawl arm comprising links, and the pawl being pivoted to said pawl arm at the pivotal point of the pawl arm to the link which connects it to the lever.

3. A stapling device comprising a main frame body, a handle pivoted thereto, a plunger slidably mounted in said body and provided with a driver blade, spring means to press the plunger downwardly, a pawl arm pivoted to the body, a lever pivoted intermediate the ends thereof to said body and having arms, means including an upper link interconnecting one arm of the lever with the handle, a lower link interconnecting the other arm of the lever with the pawl arm, a pawl pivoted to said pawl arm, means on the pawl to releasably engage said plunger, and means on said body engageable with said pawl to cause rotation of the latter upon moving the handle towards the body, to release the pawl from engagement with the plunger.

4. A stapling machine comprising a main frame body provided with a hand hole, a handle pivoted adjacent its front end to said body adjacent the front upper end of said body, a bottom stop in said frame body, a top stop in said frame body, a plunger slidable in said frame body, a coil compression spring interposed between said plunger and top stop for pressing the plunger toward the bottom stop, a driver blade on said plunger, a pawl arm pivoted adjacent its rear end to the rear end of the frame body, a lever pivoted medially the ends thereof to said body, means including a link interconnecting one arm of said lever with the handle, a second link in-

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terconnecting the other arm of said link with the forward end of said pawl arm, a pawl pivoted to said pawl arm and being provided with means to releasably engage the plunger, said pawl having a rearwardly extending arm, and stop means on the body adapted to engage said arm upon moving the handle towards the body for rotating the pawl to release the pawl from said plunger.

5. A stapling machine comprising a main frame body provided with a hand hole, a handle pivoted adjacent its front end to said body adjacent the front upper end of said body, a bottom stop in said frame body, a top stop in said frame body, a plunger slidable in said frame body, a coil compression spring interposed between said plunger and top stop for pressing the plunger toward the bottom stop, a driver blade on said plunger, a pawl arm pivoted adjacent its rear end to the rear end of the frame body, a lever pivoted mediate the ends thereof to said body, means including a link interconnecting one arm of said lever with the handle, a second link interconnecting the other arm of said link with the forward end of said pawl arm, a pawl pivoted to said pawl arm and being provided with means to releasably engage the plunger, said pawl having a rearwardly extending arm, stop means on the body adapted to engage said arm upon moving the handle towards the body for rotating the pawl to release the pawl from said plunger, and spring means to urge the rearwardly extending arm of said pawl toward said pawl arm.

6. A stapling machine comprising a main frame body provided with a hand hole, a handle pivoted adjacent its front end to said body adjacent the front upper end of said body, a bottom stop in said frame body, a top stop in said frame body, a plunger slidable in said frame body, a coil compression spring interposed between said plunger and top stop for pressing the plunger toward the bottom stop, a driver blade on said plunger, a pawl arm pivoted adjacent its rear end to the rear end of the frame body, a lever pivoted mediate the ends thereof to said body, means including a link interconnecting one arm of said lever with the handle, a second link interconnecting the other arm of said link with the forward end of said pawl arm, a pawl pivoted to said pawl arm and being provided with means to releasably engage the plunger, said pawl having a rearwardly extending arm, stop means on the body adapted to engage said arm upon moving the handle towards the body for rotating the pawl to release the pawl from said plunger, and spring means to urge the rearwardly extending arm of said pawl toward said pawl arm, the means for pivoting the lever to the body comprising a transverse pivot pin mounted on said body, and said pawl arm being formed with an arcuate slot through which said pivot pin passes.

7. A stapling machine comprising a main frame body, said frame body comprising a pair of similar symmetrically disposed frame members having registering hand holes and having meeting edges, a rivet interconnecting said frame members, a pawl arm pivoted to said rivet, a second rivet interconnecting said frame members, said pawl arm having a slot through which said second rivet passes, a third rivet interconnecting said frame members, a handle pivoted to the third rivet, a lever pivoted to said second pivot, means including a link interconnecting

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one arm of said lever with said handle, a second link interconnecting the other arm of said lever with said pawl arm, a pawl pivoted to said pawl arm about the pivotal point between the second link and said pawl arm, said pawl having means to limit rotation of the pawl relative to said pawl arm in one direction, spring means to urge pivotal movement of said pawl relative to said pawl arm in said direction, a plunger slidably mounted within said body, said plunger having side walls formed with hooks, and said pawl having means to engage said hooks, and a driver blade fixed to said plunger.

8. A stapling machine comprising a main frame body, said frame body comprising a pair of similar symmetrically disposed frame members having registering hand holes and having meeting edges, a rivet interconnecting said frame members, a pawl arm pivoted to said rivet, a second rivet interconnecting said frame members, said pawl arm having a slot through which said second rivet passes, a third rivet interconnecting said frame members, a handle pivoted to the third rivet, a lever pivoted to said second pivot, means including a link interconnecting one arm of said lever with said handle, a second link interconnecting the other arm of said lever with said pawl arm, a pawl pivoted to said pawl arm about the pivotal point between the second link and said pawl arm, said pawl having means to limit rotation of the pawl relative to said pawl arm in one direction, spring means to urge pivotal movement of said pawl relative to said pawl arm in said direction, a plunger slidably mounted within said body, said plunger having side walls formed with hooks, and said pawl having means to engage said hooks, and a driver blade fixed to said plunger, said hooks being located midway between the front and the back of said plunger.

9. A stapling machine comprising a main frame body, said frame body comprising a pair of similar symmetrically disposed frame members having registering hand holes and having meeting edges, a rivet interconnecting said frame members, a pawl arm pivoted to said rivet, a second rivet interconnecting said frame members, said pawl arm having a slot through which said second rivet passes, a third rivet interconnecting said frame members, a handle pivoted to the third rivet, a lever pivoted to said second pivot, means including a link interconnecting one arm of said lever with said handle, a second link interconnecting the other arm of said lever with said pawl arm, a pawl pivoted to said pawl arm about the pivotal point between the second link and said pawl arm, said pawl having means to limit rotation of the pawl relative to said pawl arm in one direction, spring means to urge pivotal movement of said pawl relative to said pawl arm in said direction, a plunger slidably mounted within said body, said plunger having side walls formed with hooks, and said pawl having means to engage said hooks, and a driver blade fixed to said plunger, said hooks being located midway between the front and the back of said plunger, a bottom stop fixed to said body and below the plunger, a top stop fixed to said body and disposed above the plunger, and a coil compression spring interposed between the plunger and the top stop for pressing the plunger down against the bottom stop.

10. A stapling machine comprising a main frame body, having a hand hole, a rivet on said body, a pawl arm pivoted to said rivet, a second rivet on said body, said pawl arm having a slot

through which said second rivet passes, a third rivet on said body, a handle pivoted to the third rivet, a lever pivoted to said second pivot, means including a link interconnecting one arm of said lever with said handle, a second link interconnecting the other arm of said lever with said pawl arm, a pawl pivoted to said pawl arm about the pivotal point between the second link and said pawl arm, said pawl having means to limit rotation of the pawl relative to said pawl arm in one direction, spring means to urge pivotal movement of said pawl relative to said pawl arm in said direction, and a plunger slidably mounted within said body between said frame members, said plunger having side walls formed with hooks, said pawl having means to engage said hooks, and a driver blade fixed to said plunger.

11. A stapling device comprising a main frame body, a pawl arm pivoted to said body, a lever pivoted to said body, and a handle pivoted to said body, means including a link interconnecting one end of the lever with the handle, a second link interconnecting said lever with said pawl arm, a pawl pivoted to said pawl arm, a plunger slidably mounted within said body and having side walls formed with underedges engageable by said pawl, said underedges having a curvature, the center of which is the pivotal point of said pawl relative to said pawl arm.

12. A stapling machine comprising a main frame body, a pawl arm pivoted at its rear end to the rear end of the body, a plunger slidably mounted at the front of the body, a lever pivoted to the body rearwardly of the plunger, a handle pivoted at its front end to the front upper end of the body, said lever having a rearwardly extending arm and a forwardly extending arm, means including an upper link interconnecting the rearwardly extending arm with the handle, a lower link interconnecting the forwardly extending arm of the lever with the pawl arm, a pawl pivoted to said pawl arm on the pivotal point between the link and the pawl arm, said pawl having a forwardly extending arm and a rearwardly extending arm, means on the forwardly extending arm of said pawl to releasably engage said plunger, and means on the body to engage the rearwardly extending arm of said pawl upon depressing the handle towards the body to disengage the forwardly extending arm of said pawl with respect to said plunger.

13. A stapling machine comprising a main frame body, a pawl arm pivoted at its rear end to the rear end of the body, a plunger slidably mounted at the front of the body, a lever pivoted to the body rearwardly of the plunger, a handle pivoted at its front end to the front upper end of the body, said lever having a rearwardly extending arm and a forwardly extending arm, means including an upper link interconnecting the rearwardly extending arm with the handle, a lower link interconnecting the forwardly extending arm of the lever with the pawl arm, a pawl pivoted to said pawl arm on the pivotal point between the link and the pawl arm, said pawl having a forwardly extending arm and a rearwardly extending arm, means on the forwardly extending arm of said pawl to releasably engage said plunger, means on the body to engage the rearwardly extending arm of said pawl upon depressing the handle towards the body to disengage the forwardly extending arm of said pawl with respect to said plunger, the rearwardly extending arm of said pawl being greater in length than the forwardly extending arm of said pawl.

14. A stapling machine comprising a main frame body, a pawl arm pivoted at its rear end to the rear end of the body, a plunger slidably mounted at the front of the body, a lever pivoted to the body rearwardly of the plunger, a handle pivoted at its front end to the front upper end of the body, said lever having a rearwardly extending arm and a forwardly extending arm, means including an upper link interconnecting the rearwardly extending arm with the handle, a lower link interconnecting the forwardly extending arm of the lever with the pawl arm, a pawl pivoted to said pawl arm on the pivotal point between the link and the pawl arm, said pawl having a forwardly extending arm and a rearwardly extending arm, means on the forwardly extending arm of said pawl to releasably engage said plunger, means on the body to engage the rearwardly extending arm of said pawl upon depressing the handle towards the body to disengage the forwardly extending arm of said pawl with respect to said plunger, the rearwardly extending arm of said pawl being greater in length than the forwardly extending arm of said pawl, the forward end of said lever being movable from a point horizontally below the pivotal point of the lever to a point above the pivotal point of the lever upon depressing said handle towards said body.

15. A stapling machine comprising a main frame body, a pawl arm pivoted at its rear end to the rear end of the body, a plunger slidably mounted at the front of the body, a lever pivoted to the body rearwardly of the plunger, a handle pivoted at its front end to the front upper end of the body, said lever having a rearwardly extending arm and a forwardly extending arm, means including an upper link interconnecting the rearwardly extending arm with the handle, a lower link interconnecting the forwardly extending arm of the lever with the pawl arm, a pawl pivoted to said pawl arm on the pivotal point between the link and the pawl arm, said pawl having a forwardly extending arm and a rearwardly extending arm, means on the forwardly extending arm of said pawl to releasably engage said plunger, means on the body to engage the rearwardly extending arm of said pawl upon depressing the handle towards the body to disengage the forwardly extending arm of said pawl with respect to said plunger, the rearwardly extending arm of said pawl being greater in length than the forwardly extending arm of said pawl, the forward end of said lever being movable from a point horizontally below the pivotal point of the lever to a point above the pivotal point of the lever upon depressing said handle towards said body, and spring means to move the rearwardly extending arm of said pawl into engagement with said pawl arm.

16. A stapling machine comprising a main frame body, a pawl arm pivoted at its rear end to the rear end of the body, a plunger slidably mounted at the front of the body, a lever pivoted to the body rearwardly of the plunger, a handle pivoted at its front end to the front upper end of the body, said lever having a rearwardly extending arm and a forwardly extending arm, means including an upper link interconnecting the rearwardly extending arm with the handle, a lower link interconnecting the forwardly extending arm of the lever with the pawl arm, a pawl pivoted to said pawl arm on the pivotal point between the link and the pawl arm, said pawl having a forwardly extending arm and a rearwardly

extending arm, means on the forwardly extending arm of said pawl to releasably engage said plunger, means on the body to engage the rearwardly extending arm of said pawl upon depressing the handle towards the body to disengage the forwardly extending arm of said pawl with respect to said plunger, the rearwardly extending arm of said pawl being greater in length than the forwardly extending arm of said pawl, the forward end of said lever being movable from a point horizontally below the pivotal point of the lever to a point above the pivotal point of the lever upon depressing said handle towards said body, and spring means to move the rearwardly extending arm of said pawl into engagement with said pawl arm, said plunger having a hook formed with an underedge engaging the forwardly extending arm of said pawl, and said underedge having a radius of curvature, the center of which

is the pivotal point of the pawl relative to said pawl arm.

FRANK S. BOROUGHS.

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