

Jan. 11, 1955

F. M. STEBBINGS
FASTENER-APPLYING MACHINE

2,698,938

Filed July 18, 1951

3 Sheets-Sheet 1

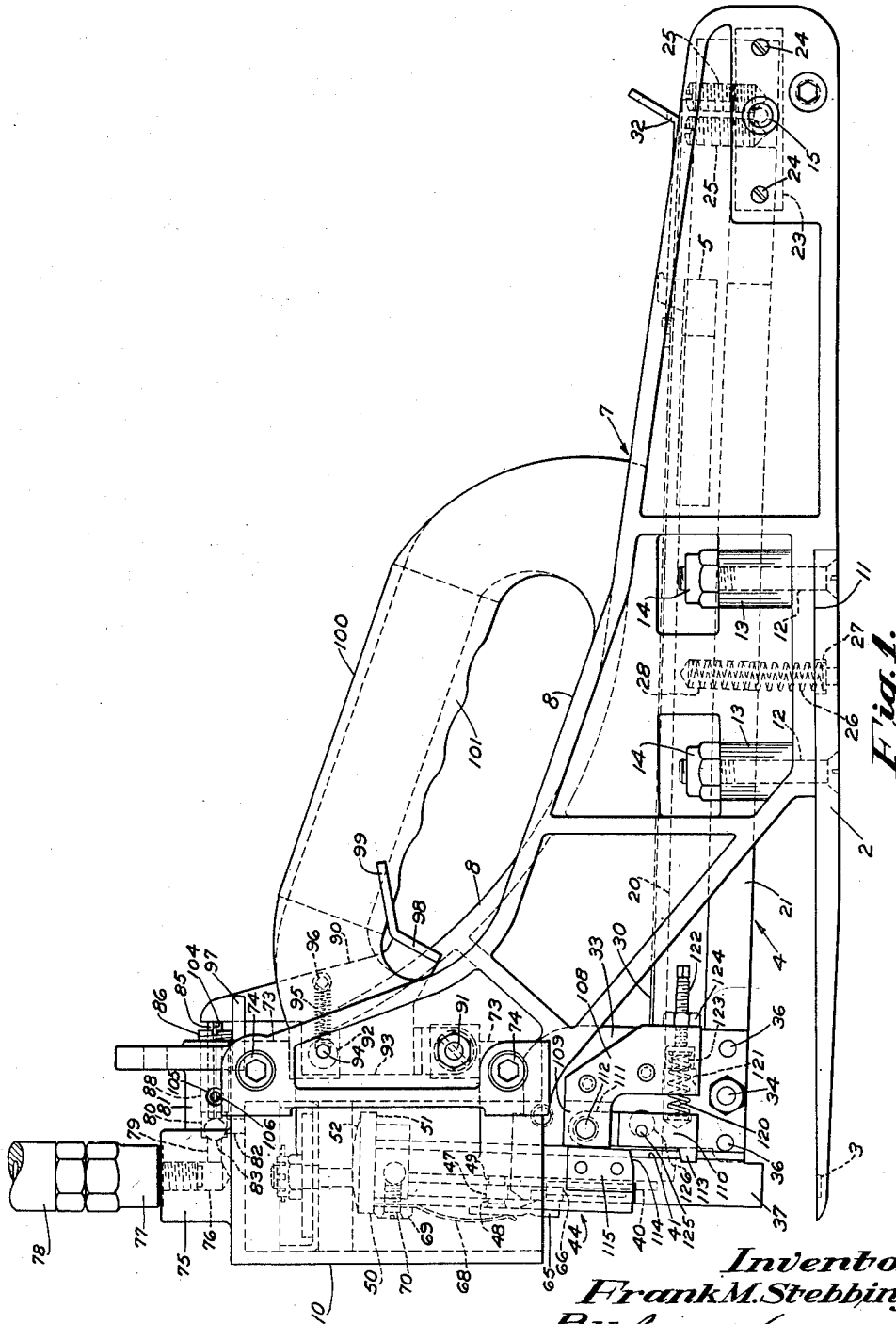


Fig. 1.

Inventor:
Frank M. Stebbings
By *James F. White*
Attorneys.

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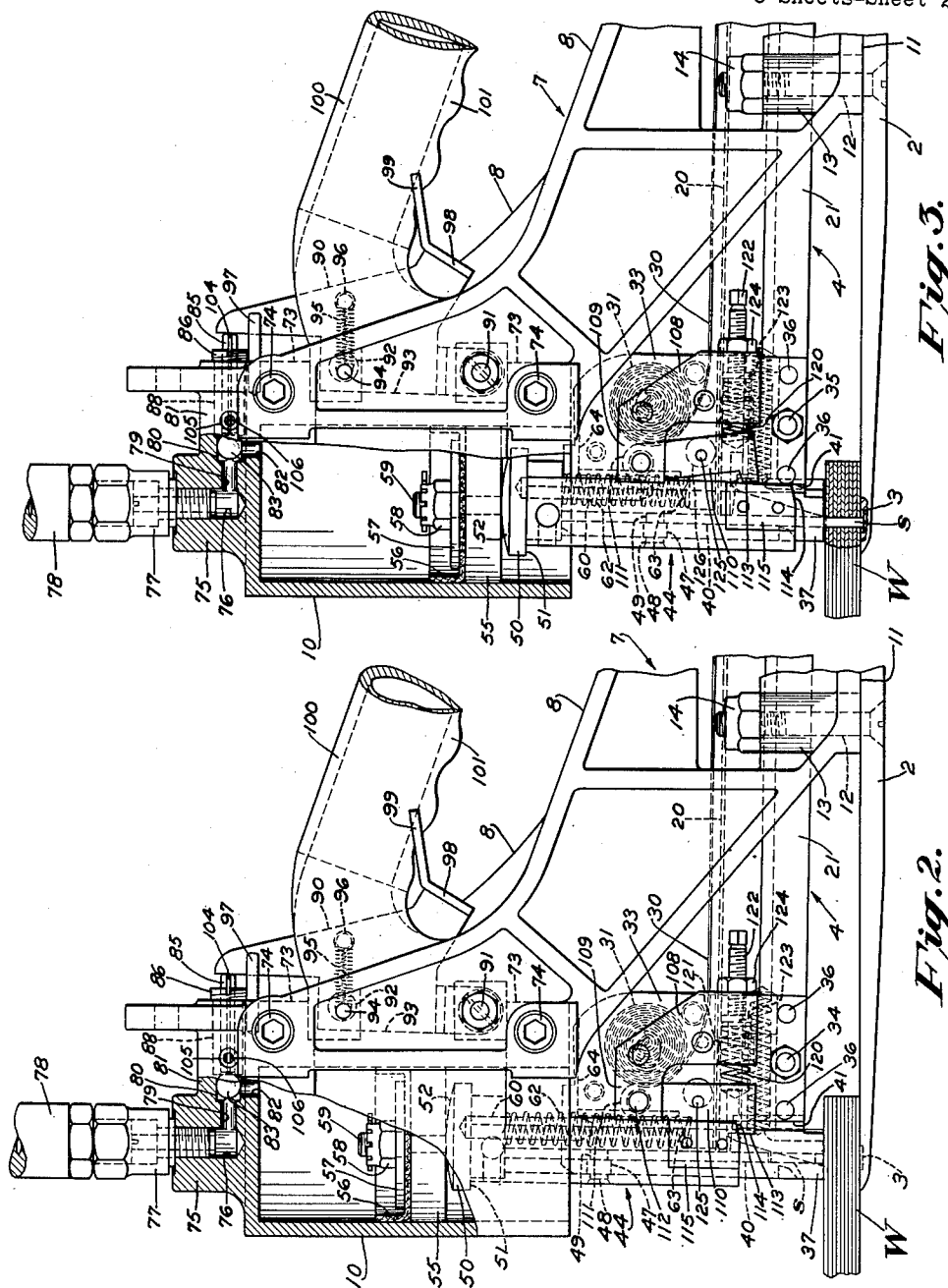
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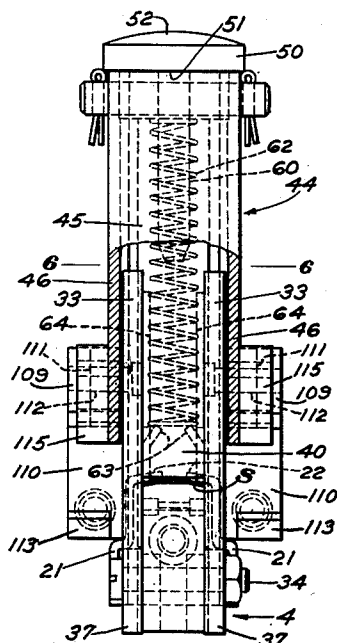


Fig. 5.

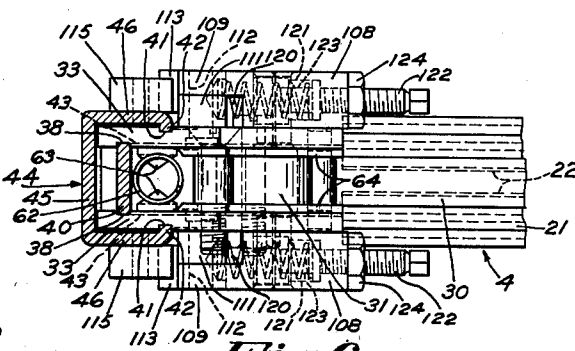


Fig. 6.

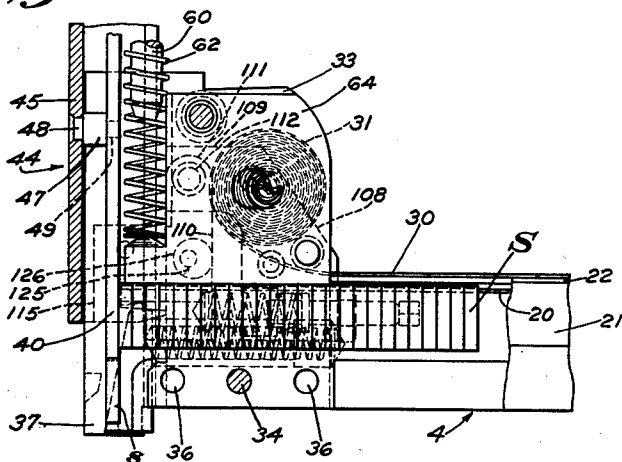


Fig. 4.

Inventor:
Frank M. Stebbings
By *Frederick L. White*
Attorneys.

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2,698,938

FASTENER-APPLYING MACHINE

Frank M. Stebbings, Stonington, Conn., assignor to Bostitch, Inc., Stonington, Conn., a corporation of Rhode Island

Application July 18, 1951, Serial No. 237,366

12 Claims. (Cl. 1-44.4)

This invention relates to improvements in stapling and wire-stitching machines and particularly to a heavy-duty implement for applying relatively large staples or other types of fasteners to materials of considerable hardness and thickness.

The invention is herein illustrated and described as embodied in a fluid pressure operated stapling implement adapted to be manipulated manually and driven by compressed air. However, the present improvements are adapted for use with other types of machines, such as wire-stitchers employed in industry for manufacturing purposes and designed for operation by either pneumatic or hydraulic power.

One object of the invention is to provide in a power-operated heavy-duty stapling or wire-stitching machine of minimum weight, means for driving relatively large staples while preventing dissipation or reduction in the energy applied by the power-operated means.

Another object is to provide a machine of the type indicated having a fluid pressure operated motor for actuating the staple-applying means and means for preserving the maximum energy of the motor as the staple is driven into the work.

Another object is to provide in a machine of the type indicated means for momentarily detaining the power-operated staple-driver after it severs a staple from the supply stick to build up a reserve of power for driving the staple into work of considerable thickness and resistance.

Another object is to provide latching means engageable with the power-driven plunger that operates the staple-driver to detain the latter momentarily during its operating stroke after it has severed a staple from the stick whereby to recover the maximum energy for driving the staple into or through the work.

Another object is to provide a resiliently-operated latch engageable with the power-operated plunger that actuates the staple-driver to halt its downward stroke for accumulating the power therein, and means for automatically releasing the latch to continue the stroke of the plunger and apply the cumulative force to the driver in driving the staple into the work.

Another object is to provide means for adjusting the action of the latching means to regulate the duration of its engagement with the plunger during detention thereof for restoring the energy of the power means as required for different types of work.

Another object is to provide a simple and practical form of construction of the detention means capable of efficient operation and durable in use over long periods of time.

Further objects of the improvement are set forth in the following specification which describes a preferred embodiment of the invention as illustrated by the accompanying drawings. In the drawings:

Fig. 1 is a side elevational view of a stapling or wire-stitching implement showing the essential elements of its operating mechanism and illustrating the present improvements applied to use therewith;

Fig. 2 is a similar side elevational view of the forward part of the implement showing the fluid-pressure cylinder partly in section at its upper end and illustrating the reciprocating plunger as having descended part way to shear a staple from the end of the stick;

Fig. 3 is a similar view showing a greater portion of the air-pressure cylinder in section and illustrating the plunger at the end of its downward stroke with the sta-

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ple applied to the work and its legs clinched on the under side thereof;

Fig. 4 is an enlarged vertical sectional view of the forward part of the machine showing the staple-driver at a point in its descent where the staple has been severed from the strip and is about to be driven into the work;

Fig. 5 is an enlarged front elevational view showing the reciprocable plunger for operating the staple-driver as partly broken away and illustrating the driver in engagement with the foremost staple at the end of the stick in the magazine; and

Fig. 6 is an enlarged plan view of the forward end of the machine showing the parts of the staple-driving plunger in section on line 6-6 of Fig. 5.

Referring to the drawings, the present improved machine is herein shown as embodying certain elements of its stapling mechanism generally similar to those illustrated in United States Patent No. 1,780,530 of November 4, 1930 granted to Arthur H. Maynard and assigned to the present assignee. Whereas this previous machine included positively-operated clincher elements for bending over the legs of the staple as they are pierced through the work, in the present construction a fixed anvil is employed for automatically clinching the legs of the staple as they are driven through the work. Moreover, while the stapling mechanism of the prior machine was designed for manual operation, in the present improved implement the staple-driving means are power-driven by a fluid pressure operated motor.

In general, the present improved machine comprises a frame including a plate-like base and work-support 2 formed at its end with grooves 3 which provide a stationary clinching anvil; a stapling arm 4 pivotally mounted at the rear of the frame and constituted as a magazine for holding a supply of staples; a reciprocable staple-driver; and a spring-urged staple-pusher 5 for feeding the staples to the driving means.

The main frame 7 of the implement is constituted by a pair of ribbed side members or plates 8 tapering toward their rearward ends and projecting upwardly at the front at an angle to support a cylinder 10 for compressed air which furnishes the energy for driving the staples. The two side members 8 of the frame are recessed along their lower portions at 11 to receive the end length of the base-plate 2 that forms the work-support and clinching anvil. Bolts 12 projecting upwardly through holes in the base-plate 2 with their heads countersunk therein extend through hubs or bosses 13 on the side members 8 with nuts 14 screwed onto their ends to fasten the parts together with the side members held in parallel spaced-apart relationship.

The magazine 4 is pivotally mounted between the rearward ends of the side members 8 on a cross pin 15. The magazine-arm 4 consists in a solid metal bar of substantially rectangular cross-sectional shape which is reduced in width at the top along its entire length. The upper portion of the arm 4 forms a support for the staples *s* in the nature of a core 20 across which the staples are straddled with their legs abutting its sides. As in the prior patent referred to above, a pair of sheet-metal side strips 21 are welded to the sides of the wider part of the arm 4 with their upper portions spaced from the core 20 and folded inwardly at the top in flanges 22, see Figs. 5 and 6, which overlie the crossbars of the staples to hold them down on the core as they feed therealong.

A pair of cheek-plates 23 abut the inner faces of the side members 8 at their rearward ends for engagement with the sides of the arm 4 to form lateral bearings therefor with the pivot-pin 15 passing therethrough. Pairs of screws 24 threaded through the side members 8 with their ends bearing against the cheek-plates 23 are employed for adjusting the plates to properly aline the arm 4 with the stapling mechanism at the forward end of the frame 7. A pair of studs 25 threaded through holes in the arm 4 have pointed ends which engage in a peripheral groove in the pin 15 to hold it against displacement. A helical spring 26 seated in a counterbore 27 in the base-plate 2 is arranged with its upper end held in a bore 28 in the arm 4 to normally maintain the latter raised for the

insertion of the work thereunder overlying the top of the base-plate 2.

Slidable on the reduced upper portion or core 20 of the arm 4 is a staple-pusher 5 urged forwardly by a flat spring 30 having its forward portion wound into a helical coil 31, shown by dotted lines in Fig. 4 and by full lines in Fig. 6, as mounted between upstanding side plates 33 at the forward end of the arm 4. The end of the spring 30 is connected to the pusher 5 by a link 32 having an upwardly projecting finger-held at its rearward end for use in manually withdrawing the pusher from the core 20 to load the staples *s* on the magazine-arm 4. Referring to Figs. 1, 4 and 6, the upstanding parallel plates 33 at the forward end of the magazine-arm 4 are fastened to the side faces of its wider lower portion by means of a bolt 34. Inwardly-directed protuberances formed by indenting the outer faces of the plates 33 at 36 are engaged with holes in the arm 4 to locate the plates in proper position. The plates 33 have downwardly projecting foot-portions 37 at the forward end of the arm 4 adapted to bear against the top of the work when the arm is carried downwardly into the position shown in Figs. 2 and 3 to hold the work on the anvil-plate 2 when applying the staples thereto. As shown more particularly in Fig. 6, the inner faces of the plates 33 are grooved at 38 to form vertical guideways for a staple-driver 40 to adapt it to slide therein. The outer faces of the plates 33 are grooved vertically at 41 to receive the inturned flanges 42 of a hollow plunger 44 to which power is applied for forcing the driver 40 downwardly in the operation of separating a staple *s* from the strip *S* and driving it into the work.

As shown in Fig. 6, the plunger 44 is of rectangular shape in cross-section constituted by a vertical front wall 45 and right-angular side walls 46 formed at their ends with the flanges 42 previously referred to. Referring to Fig. 4, the driver 40 is in the form of a flat metal blade fastened to the plunger 44 by means of a stud 47. The stud 47 has a reduced end portion 48 riveted through a hole in the front wall 45 of the plunger 44 and a rearward reduced stem 49 engaging through a hole in the driver 40 with the shouldered portion of the stud abutting the front face of the driver. The plunger 44 is thus mounted to reciprocate vertically at the front of the arm 4 as it is guided by the grooves 41 in the plates 33, with the staple-driver 40 reciprocated with it to slide in the grooves 38.

Inserted in the upper end of the hollow plunger 44 is a head 50 flanged outwardly at the top to form a shoulder 51 engaging across the upper edges of the plunger. The head 50 is crowned at 52 to provide a convex upper face adapted for engagement by a piston 55 which is slidable within the cylinder 10, previously referred to, under pneumatic or hydraulic pressure. The piston 55 is in the form of a cylindrical disk which carries a washer 56 of leather or similar flexible material overlying its upper face and cupped within the sides of the cylinder 10 in the usual manner. A metal washer 57 overlying the leather washer 56 is held down thereon by a castellated nut 58 screwed onto a stud 59 having its reduced portion held in a bore in the piston 55. A pin 60 held in a bore in the head 50 projects downwardly therefrom for supporting a helical spring 62 with its lower end seated on a pair of inwardly-bent prongs 63, see Fig. 5, which are formed on side plates 64 fastened to the inner faces of the plates 33. The spring 62 functions to return the plunger 44 and piston 55 to upper position after each operating stroke of the driver 40.

A full throw mechanism comprising trip-latch 65 is mounted on the front of the plunger 44, see Fig. 1, and formed at its lower end with a stop-lug 66 projecting through an opening in its forward wall 45 for engagement with a series of detent-shoulders on the plates 33. The trip-latch 65 is actuated by an arcuate leaf-spring 68 having its upper end held against the plunger 44 by a plate 69 fastened thereto by a screw 70. The trip-latch 65 is similar in construction and arrangement to that shown in the prior patent referred to above and therefore is not herein described in detail as it has no direct relation to the present invention. Suffice it to state that the device operates to prevent a complete return stroke of the staple-driver 40 until the latter has been forced downwardly sufficiently to set a staple in the work so as to prevent a partially driven staple from releasing another one from the magazine to be driven on

top of the first one or to cause clogging of the machine. A suitable staple-supporter such as shown and described in the prior application identified above is also employed for sustaining the staple from dropping down out of the throat of the machine, but this element is not herein shown and described in detail as it forms no part of the present invention.

The cylinder 10 is mounted on the frame 7 of the machine by fastening it between the two side members 8. For this purpose one side of the cylinder is formed with relatively long lugs 73, shown by dotted lines in Fig. 1, which are secured to finished faces on the side members 8 by means of bolts 74. The upper end of the cylinder 10 is formed with a smaller cylindrical extension 75 bored vertically to provide an air inlet passage 76 threaded interiorly to receive a union 77. The union 77 provides means for coupling a hose-pipe or other conduit 78 to the cylinder 10 for supplying compressed air or hydraulic fluid to its interior. From the air-inlet 76 a smaller lateral passage 79 leads to a valve-chamber 80 in a neck-like extension 81 projecting from the extension 75 of the cylinder 10. Leading downwardly from the valve-chamber 80 is a port 82 which debouches into the interior of the cylinder 10 for supplying the air thereto. A ball 83 in the chamber 80 serves as the valve-closure for shutting off the ingress of air into the cylinder 10. The ball 83 is normally held seated against the end of the lateral air-passage 79 by a plunger-pin 85 which is slidable in the bore of a cylindrical bushing 86 threaded through a bore 88 leading through the neck 81 into the valve-chamber 80.

The plunger-pin 85 normally is held pressed against the ball 83 to close the inlet passage 79 to the valve-chamber 80 by means of a spring-actuated finger-lever or trigger 90 pivoted on a stud 91 screwed into one of the side members 8. The trigger 90 has an enlarged hole 92 in its forward upper portion 93 through which projects a stop-pin 94 driven into one of the frame members 8 and serving to limit the pivotal motion of the trigger.

A helical spring 95 anchored to the pin 94 with its opposite end attached to a pin 96 on the trigger 90 holds the upper end of the trigger against the end of the plunger-pin 85 to maintain the latter pressing against the ball-closure 83. A pair of pins 97 projecting from the lug 73 at the rear of the cylinder 10 straddles the upper end of the lever 90 to guide it in its motion. Adjacent the lower end of the trigger 90 is an offset arm 98 bent angularly to form a finger-rest 99 which is located at the forward side of a handle 100. The handle 100 is cast integral with one of the side members 8 and formed with a hollow grip-portion 101 having a bottom undulating surface for receiving the fingers of the operator's hand. The offset arm 98 on the trigger 90 projects through the opening between the handle-grip 101 and the top of the side member 8 with the finger-rest 99 located adjacent the grip in convenient position to be pressed by the end of the operator's thumb. The handle 100 is employed for holding the implement in place resting on a plane surface or for adjusting it in relation to the work to be performed, either on the rest or when held in any other position. By pressing on the finger-rest 99 the trigger 90 may be rocked to release the plunger-pin 85 whereof the air-pressure will force the ball 83 away from the seat at the end of the lateral passage 79 to release the air to flow through the port 82 and into the cylinder 10. The plunger-pin 85 may be of irregular contour to provide longitudinally-extending ribs forming air-passages throughout its length, for example, it may be of substantially + shape in cross-section with right-angularly related ribs 104. Opening through the sides of the neck 81 is a hole 105 which permits egress of the air exhausting from the cylinder 10 through the port 82 and the bore of the bushing 86 which also is provided with a smaller radial hole 106. The purpose of this arrangement is to relieve the pressure on the piston 55 when the latter is slid upwardly in the cylinder 10 under the force of the spring 62 during the return stroke of the plunger 44 after the setting of a staple in the work.

The present improvements relate more particularly to the means for controlling the stroke of the staple-driver to cause its downward motion to halt momentarily after shearing a staple *s* from the stick *S* whereof to recover the full force of the energy should it be partly dissipated by the staple-shearing action of the driver. The device for performing this function is constructed and arranged as next described. Formed as a part of, or welded to each

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side plate 33 on the side of the arm 4, is a block-like projection 108 which has a forwardly-projecting bearing portion 109 spaced outwardly from the side of the plate 33. Pivoted to this projecting portion 109 of the block-like member 108 is a pendant pawl or latch 110. The latch 110 has its upper portion 111 reduced in thickness and received between the projection 109 on the block 108 and the side face of the plate 33 for pivoting the latch on a pin 112 passing therethrough. The lower end of the latch 110 is formed with a forwardly-projecting toe 113 which is beveled at the top to adapt it to engage with a beveled face 114 on a block 115 riveted or otherwise secured to the side wall 46 of the plunger 44. The latch 110 is maintained in substantially vertical relationship as shown in Figs. 1 and 2 by a helical spring 120 pocketed in a bore 121 in the block 108. An adjusting screw 122 threaded through the block 108 from the rear carries a thimble-like element 123 projecting into the end of the spring 120 which may be tightened to increase the pressure of the spring and locked by a check-nut 124 set up against the block. A pin 125 projecting through the latch 110 engages through an enlarged hole 126 in the side plate 33 to limit the forward pivoting movement of the latch under the force of the spring 120. It will be understood that the same construction of the latch 110, its mounting, and adjustable spring-pressure means are duplicated on the opposite side of the arm 4; the method of operation of the double latching means being explained more fully hereinafter.

In use the improved machine is adapted to operate as follows: In its present form the implement may be manipulated by grasping its handle 100 and placing its base on a bench or other rest, while in other instances it may be held in raised position adjacent the work to be performed. The magazine-arm 4 is loaded with staples by withdrawing the pusher 5 from the end of the core 20 and placing one or several sticks S of connected staples s in straddled relation on the core. The staple-pusher 5 is then replaced at the rear of the staples and the spring 30 will cause it to slide forwardly to advance the staples along the core 20 to feed them to the staple-driver 40. It will be understood that by this usual arrangement of the elements all the staples on the core 20 will be slid forwardly to advance each foremost staple into position beneath the driver 40 when the latter is at the upper end of its stroke. The staple stick S is held from unwarranted forward movement by the foremost staple engaging against the shoulders of the grooves 38 in the side plates 33 in which the driver slides, see Fig. 6; it being understood that the side plates are slotted horizontally as indicated by the dotted lines 43 in this latter view to allow the staples to register with the grooves 38. The implement is connected to a suitable source of fluid pressure for example, a compressed air supply, or hydraulic fluid under pressure, by means of the hose or conduit 78 communicating with the interior of the cylinder 10.

The work to be performed is laid across the base-plate or anvil 2 overlying the clincher-grooves 3 and beneath the foot 7 on the arm 4. To operate the stapling mechanism the trigger 90 is rocked clockwise against the force of the spring 95 by pressure of the operator's thumb on the rest 99 whereby to release its pressure on the plunger-pin 85; the pin 94 extending through the large hole 92 in the trigger serving to limit the motion of the trigger in this direction. As the plunger pin 85 is released the pressure of the air or other fluid admitted through the inlet 76 at the top of the cylinder 10 will force the ball-closure 83 back from the seat against the end of the passage 79, thereby opening the port 82 to admit the fluid into the interior of the cylinder. The air or hydraulic pressure in the cylinder 10 will thus be caused to force the piston 55 downwardly in the cylinder 10 to carry the plunger 44 downwardly and slide the driver 40 in the grooves 38 for engaging its end with the foremost staple located in said grooves. The driver 40 is thus moved downwardly at a rapid rate whereof it acts to shear the foremost staple s from the strip or stick S and slide it downwardly in the grooves 38. If the staples are relatively large, considerable force may be expended or even dissipated as the driver descends below the top of the core 20. In such circumstances the pawl or latch 110 comes into play to momentarily halt the driver 40 in its downward movement until the pressure in the cylinder 10 can be built up to the maximum so that the remainder of the

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stroke of the driver will be operated with maximum force to drive the staple through the work.

Referring particularly to Fig. 2, as the driver 40 continues its descent after shearing a staple from the stick the beveled faces 114 of the blocks 115 on the opposite sides of the plunger 44 make contact with the beveled faces of the toes 113 on the latches 110 to sustain the plunger 44 and the driver 40 for an instant, whereby to recover the maximum pressure acting against the piston 55. As the pressure is built up in the cylinder 10 the engagement of the beveled faces 114 on the blocks 115 with the beveled top of the projecting toes 113 on the latches 110 causes a camming action to force the latches rearwardly, as indicated in Fig. 3, and release the plunger 44 to permit it to descend with maximum force to drive a staple s through the work W.

As the ends of the legs of the staple s engage in the grooves 3 in the anvil-plate 2 they are bent over to clinch them on the under side of the work. In this way the present improved device comprising the detention latches 110 function to control the descent of the staple-driver 40 to secure the maximum force in driving the staple through the work and clinching its legs in proper relationship on the under side thereof. By this improvement the implement is rendered more efficient in action and capable of applying relatively large staples to work of considerable thickness and excessive resistance to penetration. The present invention is thus of manifest advantage in adapting staple-driving machines or other fastener-applying implements for heavy duty operation beyond the range of ordinary machines of this type.

After the staple has been set in the work with its legs clinched on the under side thereof the trigger 90 is released from the pressure of the thumb so that the spring 95 will return it to initial position to slide the plunger-pin 85 through the bore in the bushing 86. The ball 83 will therefore be forced back against the seat at the end of the air-passage 79, as shown in Fig. 1, to shut off the flow of fluid into the cylinder 10. At the same time the port 82 will be opened to allow the air to exhaust there-through and escape through the bore of the bushing and the lateral hole 106 in the sides of the neck 81 and the holes 106 in the bushing 86; it having been explained that the plunger-pin 85 is slotted longitudinally or ribbed longitudinally to provide passages for the air through the bore of the bushing.

After the application of each staple to the work and the relief of pressure in the cylinder 10 the spring 62 comes into play to raise the plunger 44 into its uppermost position, shown in Fig. 1, the trip-latch 65 then engaging with one of the shoulders on the plates 33 to limit this return stroke of the plunger. Concurrently with the return of the plunger 44 the staple-driver 40 is raised to locate its lower edge above the end of the staple-core 20 and the arm 4 is swung upwardly by the spring 28 to lift its foot 37 from the work. The several parts of the stapling mechanism are thus restored to their original relationship shown in Fig. 1 for repeating the operation of continuously applying staples to the work in the manner as explained above.

While the present improvements are herein shown and described as embodied in a preferred form of construction, it is to be understood that modifications may be made in the form and arrangement of the component parts thereof without departing from the scope of the invention as expressed in the following claims. Therefore, without limiting myself in this respect, I claim:

1. In a stapling or wire-stitching machine having a driver, means for supporting a strip of connected staples, and means for progressively feeding the foremost staples in the strip to the driver, the combination therewith of a fluid pressure operated motor for actuating the driver to drive the staples into the work, detent-means for arresting the driving stroke of the driver after it severs a staple from the strip to recover the maximum pressure in the motor, and means for automatically releasing the detent-means to cause the driver to complete its driving stroke to drive a staple into the work with the maximum force of the pressure operating thereon.

2. In a stapling or wire-stitching machine comprising a magazine for containing wire staples connected in a strip, and a staple-driver movable across the end of the magazine to sever the staples from the strip and drive them into the work, the combination therewith of a fluid pressure operated motor for actuating the staple-driver,

detent-means for arresting the motion of the staple-driver after it has been moved to sever a staple from the strip, and means for automatically releasing said detent-means at the point of arrestment of the staple-driver to apply the maximum force of the fluid pressure for driving the staple into the work.

3. In a stapling or wire-stitching machine having a magazine for containing wire staples connected in a strip, a staple-driver movable relative to the magazine for applying the staples to the work, and means for progressively feeding the staples to said staple-driver, the combination therewith of a fluid pressure operated motor, a plunger actuated by said motor and connected to operate the staple-driver to drive the staples, a latch engageable with the plunger to arrest the motion of the staple-driver for an interval and recover the maximum pressure in the motor after the severing of a staple from the strip, and automatically-operated means for releasing the latch to permit the driver to complete its stroke to drive the staple into the work with a maximum force applied thereto.

4. In a stapling or wire-stitching machine having a magazine for containing staples, and a staple-driver for applying the staples to the work, the combination therewith of a plunger for operating the driver to drive the staples into the work, a fluid pressure cylinder, a piston in said cylinder for actuating the plunger, a latch having a beveled toe engageable with a beveled face on the plunger, and resilient means for engaging the latch with the plunger to arrest its motion after the first part of its stroke to build up the pressure in the cylinder, said beveled faces between the latch and plunger acting with camming effect to release the latch from the plunger to complete the stroke of the driver to drive the staple into the work with the increased force of the pressure on the piston.

5. In a stapling or wire-stitching machine having a driver for inserting staples into the work, the combination therewith of a plunger connected to operate the driver to drive the staples, a fluid pressure cylinder, a piston in said cylinder for actuating the plunger, manually-operable valve-means for admitting fluid under pressure into the cylinder and exhaustng it therefrom, a latch engageable with the plunger for arresting the driving stroke of the driver before it drives the staple into the work, said latch having a beveled detent-portion engageable with an oppositely-beveled face on the plunger and releasable therefrom upon increased force of pressure on the piston, a spring for actuating the latch to engage it with the plunger, and means for adjusting the tension of the spring to regulate the duration of engagement of the latch with the plunger before its automatic release by the camming action of the beveled faces thereon.

6. In a machine of the type indicated, a frame, a fluid pressure cylinder supported on said frame, a piston in said cylinder, means for admitting fluid pressure into said cylinder to slide the piston in one direction, a plunger movable in the same direction by said piston, fastener-applying means actuated by said plunger, detent-means engageable with said plunger to interrupt its stroke to build up pressure in the cylinder, a spring for resiliently engaging said detent-means with the plunger, means for adjusting the tension of the spring to regulate the duration of the engagement of the detent-means with the plunger, and camming means actuated upon increase of pressure on the piston for automatically disengaging the detent-means from the plunger to thereafter continue its stroke for driving the fastener with maximum force applied thereto.

7. In a machine of the type indicated, a frame, a fluid pressure cylinder supported by said frame, valve-means for admitting pressure into the cylinder, a manually-operable trigger for actuating said valve-means, a piston reciprocable in the cylinder, a plunger driven by said piston, means actuated by the plunger for applying fasteners to the work, a pivoted pawl having a beveled portion engageable with a beveled face on the plunger, and a spring for rocking the pawl to engage its beveled face with the plunger, said beveled faces acting with a camming effect upon increased pressure on the piston to release the piston

toward the end of its stroke to cause it to operate the fastener-applying means with a maximum force.

8. In a machine of the type indicated comprising a framework formed with a handle and embodying staple-clinching means, a pivoted arm constituting a magazine for containing a supply of staples, a reciprocable plunger, means actuated by the plunger for applying the staples to the work, a fluid pressure cylinder supported by said frame, a piston slidable in said cylinder to reciprocate the plunger, valve-means for admitting pressure to the cylinder, a manually-operable trigger for controlling said valve-means, detent-means engageable with said plunger to interrupt its stroke to build up pressure in the cylinder, and means for automatically releasing said detent-means to continue the stroke of the plunger to apply the staples to the work with a maximum force.

9. In a machine of the type indicated, a frame comprising side members mounted in spaced parallel arrangement, a stapling arm pivoted at its rearward end between said side members and embodying a magazine for holding a supply of staples, a fluid pressure cylinder mounted on the upper portion of the frame, a piston slidable in said cylinder, valve-means for admitting fluid pressure to the cylinder to slide the piston in one direction, a plunger slidable by the piston in the same direction to drive staples fed from the magazine, a pawl pivoted on the stapling arm and having a beveled toe for engaging a beveled face on the plunger to momentarily interrupt its stroke for increasing the pressure in the cylinder, and a spring for engaging the pawl with the plunger, said beveled faces acting with a camming effect under the force of increased pressure on the piston to eventually release the pawl from the plunger to cause the latter to continue its stroke to drive a staple with the maximum force.

10. In a fastener-applying machine having a driver for applying fasteners to the work, a fluid-pressure operated plunger for moving the driver toward the work to set a fastener therein, detent-means engageable with said plunger to arrest its motion after the driver has been moved part way toward the work and before it reaches the end of its stroke, and means for automatically releasing said detent-means to cause the motor to move the plunger to the end of its stroke and operate the driver under maximum power for setting a fastener in the work.

11. In a stapling or wire-stitching machine having a staple-driver for driving staples into the work, the combination therewith of a fluid-pressure motor for actuating said staple-driver for a driving stroke, detent-means for arresting the driving stroke of said driver after it has been moved a predetermined distance toward the work without reaching the end of its stroke whereby to accumulate the maximum pressure in the motor, and means for automatically releasing said detent-means to cause the driver to continue its driving stroke under the increased power of the motor.

12. In a stapling or wire-stitching machine having a reciprocable driver for driving staples into the work, a fluid-pressure motor, and a piston in said motor for applying power to move the staple-driver toward the work, the combination of detent-means for arresting the motion of the piston before it reaches the end of its stroke to build up the pressure in the motor, said arrest of the piston acting to halt the driver during its driving stroke after it has been moved through only a portion of its full stroke toward the work, and means automatically operated to release said detent-means and cause the piston to apply the maximum power for continuing the motion of the staple-driver toward the work to drive a staple thereinto.

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