

July 7, 1942.

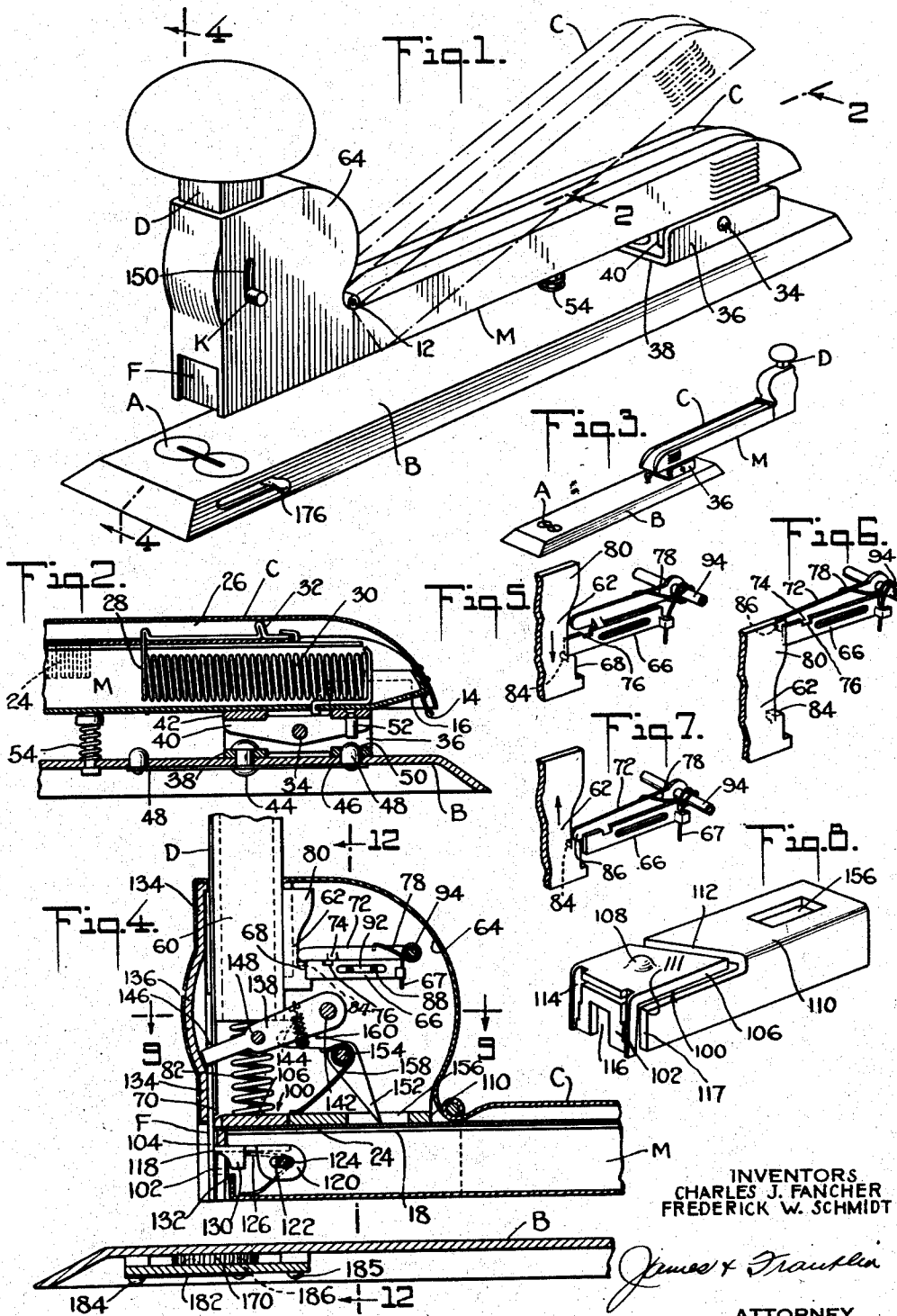
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2,289,308

STAPLING MACHINE

Original Filed Oct. 12, 1936

2 Sheets-Sheet 1



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2 Sheets-Sheet 2

Fig. 9.

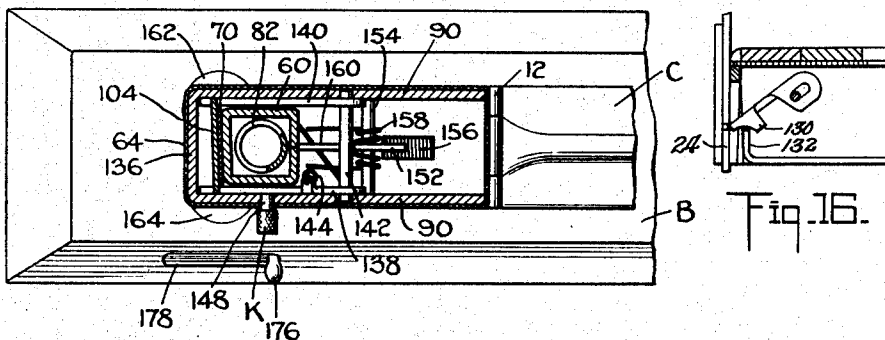


Fig. 10.

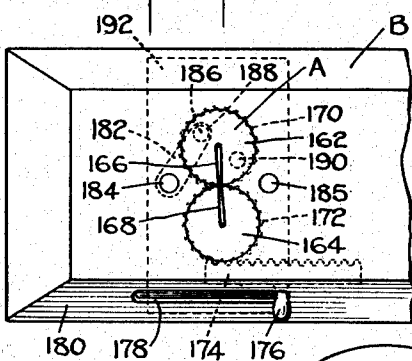


Fig. 11.

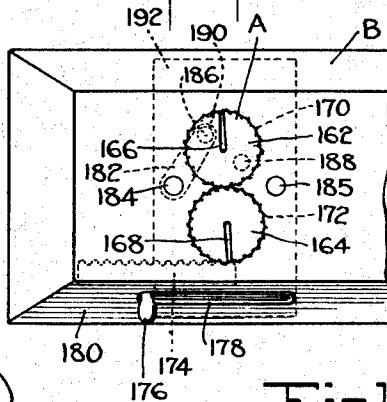


Fig. 12.

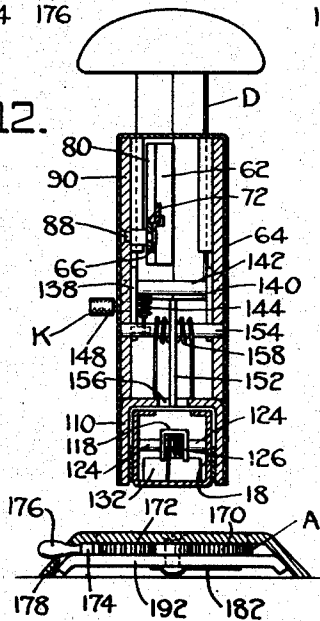


Fig. 13.

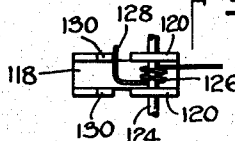


Fig. 14.

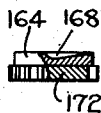
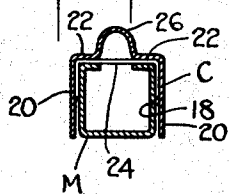


Fig. 15.



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2,289,308

STAPLING MACHINE

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Original application October 12, 1936, Serial No. 105,196. Divided and this application October 4, 1939, Serial No. 297,834

7 Claims. (Cl. 1—3)

This invention relates to stapling machines.

The primary object of our invention is to generally improve stapling machines and to widely increase the range of usefulness of the same.

Another object of our invention resides in the provision of an improved, simplified and wholly dependable stroke control mechanism for insuring completion of each driving stroke before permitting the start of another driving stroke. Without this mechanism a staple may be wedged on top of another staple already in the drive channel of the machine, thus blocking the plunger and clogging the machine.

The staples used in ordinary desk stapling machines for attaching office correspondence and the like are made of fine wire, and the only reason that this fine wire is able to penetrate comparatively heavy thicknesses of paper is because the wire is well supported by closely adjacent walls so that the wire can not begin to bend or crumple. Heretofore, in an effort to obtain the desired close support of the wire it was necessary to construct the drive channel with extreme accuracy and with very close tolerances, the channel having practically the same dimension as the wire used. This increased the cost of manufacture and led to greater likelihood of clogging in the event of variations in the wire or staple thickness. As a practical compromise some, although little, clearance has been provided. In accordance with a further object of our invention, we provide a drive channel the sides of which are formed of hardened steel in order to take the necessary wear, but these sides are movable relative to one another and are normally moved toward one another by relatively powerful compression spring means. In this way a closed, tightly fitting drive channel is provided at all times, yet variations in staple thickness may be accommodated and clogging of the drive channel is eliminated. A substantial frictional resistance to movement may be applied directly to the sides of the staple, and this operates to prevent deformation of the staple even when using exceedingly fine wire.

A staple drives through and clinches against the material better when driven by means of a sudden impact or blow rather than by slow gradual movement. The use of quick impact tends to eliminate the likelihood of bending or crumpling of the staple and provides a tighter clinch at the bottom. In practice, however, we find that many people, particularly those using desk stapling machines in offices and the like, press the handle of the stapling machine rather lightly.

A further object of our invention is to provide a stapling machine with means to automatically increase the pressure applied to the staple during the latter part of the stapling stroke. To this end, we provide yieldable means which normally resists the downward movement of the driving blade of the stapler. Toward the end of the stapling stroke, however, the said resisting means is abruptly moved out of the path of the driving blade, thereby freeing the mechanism of this extra load. The effective pressure on the staple is thereby increased near the end of the stroke, producing much of the benefit of driving the staple by means of a blow rather than gradually applied pressure. In accordance with a further feature and object of the invention, the aforescribed means is combined with and additionally functions as a retractor tongue for bearing upwardly on the top or bridge of the staple during the driving operation.

To the accomplishment of the foregoing and such other objects as will hereinafter appear, our invention consists in the stapling machine elements and their relation one to the other, as hereinafter are more particularly described in the specification and sought to be defined in the claims. The specification is accompanied by drawings, in which:

Fig. 1 is a perspective view of a stapling machine embodying features of our invention;

Fig. 2 is a section taken in elevation through the rear end of the machine, as is indicated by the section line 2—2 in Fig. 1;

Fig. 3 is a perspective view showing the manner in which the stapling machine may be converted for use as a tacker;

Fig. 4 is a section in elevation through the front end of the machine taken in the plane of the line 4—4 of Fig. 1;

Fig. 5 is a perspective view showing the mechanism for insuring completion of each driving stroke, and showing the relation of the parts after a driving stroke has been started;

Fig. 6 shows the relation of the parts at the end of the driving stroke;

Fig. 7 shows the relation of the parts near the end of the upward or return stroke;

Fig. 8 is a perspective view of a yieldably movable insert forming a part of the staple feed and staple driving channels;

Fig. 9 is a section taken in plan in the plane of the line 9—9 of Fig. 4;

Fig. 10 is a plan view of the forward end of the base showing the anvil or clinching mechanism.

nism in proper relation for permanently clinching the staples;

Fig. 11 is a similar view showing the relation of the parts for bending the staple legs outwardly for temporarily pinning or fastening papers together;

Fig. 12 is a vertical section taken in the plane of the line 12—12 of Fig. 4;

Fig. 13 is a detail of the staple retractor and stroke accelerating mechanism;

Fig. 14 is a detail showing one of the gear discs employed in the clinching mechanism;

Fig. 15 is a section through the staple magazine showing the formation of the staple feed channel; and

Fig. 16 is explanatory of a detail of the retractor shown in Fig. 13.

Referring to the drawings, the staple machine comprises a base B on which is oscillatably mounted a magazine arm M, said arm carrying staple driving mechanism D. The base B carries anvil or clinching mechanism A. In the present machine the magazine arm M is provided with a movable hood or cover C which when opened exposes the staple clip on the staple core and makes the staples accessible for removal or for loading. The magazine arm M may be swung laterally with respect to the base B, thus bringing the parts in the relation shown in Fig. 3. The machine may then be used as a tacker and the base B may be used as a handle to help support the tacker during operation of the same. The anvil or clinching mechanism A is novel in that a single mechanism may be employed either for clinching, as indicated in Fig. 10, or for temporary pinning together of sheets of paper or the like, as indicated in Fig. 11. The machine may be loaded with staples from the front, and the front loading door F is vertically slidable within the housing of the driving mechanism, it being moved by a conveniently accessible operating knob K.

Considering the mechanism of the stapling machine in greater detail, and referring first to Figs. 1, 2 and 15 of the drawings, the hood or cover C is in the present case hinged at one end, specifically the forward end of the machine, the hinged connection being indicated at 12. The opposite end of the cover is preferably provided with a suitable spring catch clearly shown at 14 in Fig. 2 for holding the same closed. Catch 14 snaps over the end 16 of a projection extending rearwardly from the staple core.

The cover functions not only as a housing to prevent dust and dirt from collecting in the staple magazine, but also is preferably used to form walls of the staple feed channel. Referring to Fig. 15 it will be seen that the staple feed channel 18 is relatively closely encompassed by the side walls 20 and the top wall 22 of the cover, and these parts form a staple channel in which the staple clip 24 is received. The center part of the top wall is preferably pressed upwardly or channeled as indicated at 26 in order to stiffen and strengthen the cover in a structural sense, and in order to form clearance for movement of certain upwardly projecting parts of the staple pusher 28 best shown in Fig. 2. As will be understood by those skilled in the art, the pusher 28 rides on the staple core and is urged toward the driving end and against the staple clip by a suitable feed spring 30. In the specific structure here disclosed the upward projection 32 riding within channel 26 is a manually operable handle for moving the pusher 28 rearwardly and

latching the same in retracted position. This is done during reloading of staples whether the staple clip be loaded from the top or from the forward end. It will be understood that because the cover forms the outer portion of the staple feed channel, the channel is entirely opened when the cover is opened, and it is for this reason that the staple clip may be loaded from the top and also that bent or piled-up or jammed staples may be removed from the staple core.

Referring now to Figs. 1, 2 and 3, the magazine arm M is vertically oscillatable by reason of pivotal connection 34. This connection or pin passes through upwardly flanged bearings 36 on the bearing plate 38, and also passes through downwardly bent flanges 40 on a plate 42 permanently secured to the bottom of the magazine arm. Bearing plate 38 is rotatably mounted on base B by means of a pin 44. Because of the rotatable connection at 44, the magazine arm may be swung laterally about the base to a position such as that shown in Fig. 3. At this time the base will move upwardly or downwardly relative to the magazine arm only slightly, for the permitted range of movement is slight. The base B may thus be used as a handle for conveniently supporting the mechanism with one hand while operating the driving mechanism D with the other hand.

It is important to keep the magazine arm M and the base B in alignment when using the machine as a stapler and for this reason the parts are provided with appropriate detent or locating mechanism. Referring to Fig. 2, the base B is provided with a leaf spring 46, the fixed part of which may, if desired, be supported by pin 44 and the movable ends of which carry rounded protuberances or locating pins 48. The bearing plate 38 is perforated at 50 to receive either detent 48. Top plate 42 is preferably provided with a pusher pin 52 disposed directly over perforations 50. It will be manifest from inspection of Fig. 2 that the bearing plate 38 and consequently the magazine arm are normally held strictly in alignment with the base by means of detent 48, but that by elevating the magazine arm M more than its normal elevation by restoring spring 54, the pusher pin 52 will bear against and depress detent 48, thus freeing bearing plate 38 so that the magazine arm may be swung laterally about pin 44 to convert the machine from a stapler to a tacker. Hole 50 is then engaged by the other detent 48, thus keeping the magazine arm and the base in alignment.

The stroke control mechanism is best shown in Figs. 4, 5, 6 and 7, and referring to these figures, it will be seen that the plunger 60 of the driving mechanism is provided on its rear face with a stepped member 62. The housing 64 of the driving mechanism carries a horizontally reciprocable lock bar 66. Lock bar 66 is normally urged toward stepped member 62 by resilient means 67. In Fig. 4 the plunger is in elevated position, and by comparing Fig. 4 with Fig. 5, it will be seen that as soon as the plunger is moved downwardly a short distance equal to the height of the step 68 on stepped member 62, lock bar 66 slides above step 68, thus holding the plunger from returning to its full elevated position. The parts are preferably so proportioned that the vertical dimension of step 68 is greater than the vertical clearance between the bottom end or tip 70 of the staple driving blade and the staple clip 24.

The stroke control mechanism further includes a detent 72 having a tooth 74 adapted to be received in a notch or recess 76 on lock bar 66 whenever the lock bar is moved rearwardly far enough to bring these parts in alignment. Inasmuch as detent 72 is normally urged downwardly by the end 78 of spring 67 previously referred to, the parts thereupon assume the locked condition shown in Fig. 6. To move lock bar 66 rearwardly to locked position shown in Fig. 6, the stepped member 62 is provided with a camming surface 80 which rides in front of and bears against the end of lock bar 66. Camming surface 80 is disposed near the top of stepped member 62, and the parts are so dimensioned that the lock bar is not locked in retracted position by the detent until the driving stroke of plunger 60 has been completed. Detent 72 then functions to hold the lock bar 66 retracted in order to permit the upward or restoring movement of the plunger 60, this being caused by a compression spring 82 located beneath the plunger, as is best shown in Fig. 4.

It is necessary to again release the lock bar at the top of the upward or return stroke of the plunger in order that the mechanism may function for the next stroke. For this purpose a trip lug 84 is bent sidewardly from stepped member 62, and detent 72 is made with a tip 86 (Fig. 7) adapted to ride at one side of stepped member 62 and to lie in the path of trip lug 84, as is best shown in Figs. 4 and 7. In Fig. 7 the relation of the parts near the top of the return stroke of the plunger is shown, and it will be noted that trip lug 84 bears against and elevates detent 72, thus freeing lock bar 66, which thereupon moves forwardly to the position shown in Fig. 4. Lock bar 66 is supported by a pair of pins 88 anchored on the adjacent side wall 90 of the frame of the operating mechanism, as is best shown in Fig. 12, and passing through an elongated slot 92 (Fig. 4) in lock bar 66. Detent 72 is oscillatably mounted on a pin or rod 94 which may most simply extend between the side walls of the frame. Spring 67, 78 may be coiled about pin 94, the arrangement of the parts being clearly shown in the drawing.

Referring now to Figs. 4 and 8, we shall next describe the yieldable feed channel. The staple core 18 is provided at its forward end with an L-shaped member or insert 100. The arms of this member are preferably disposed at an angle somewhat greater than 90°. The approximately vertical arm 102 functions as one side of the drive channel for the staple, the other side of the drive channel being formed by the front loading door 104 heretofore referred to. For the present purpose, the door 104 may be considered a fixed side, while the vertical arm 102 of insert 100 may be considered a movable side, and it will be understood that where no front loading door is desired, a truly fixed member may be used instead of the door 104. The approximately horizontal arm 106 of insert 100 is supported directly on the side walls of a member 110, though these parts are shown separated somewhat in Fig. 8 to clarify the separable construction. With arm 106 resting on member 110, the arm overlies core 18 with sufficient space therebetween to receive the staple clip 24. The member 100 rocks or pivots about the corners 111, one of which is visible in Fig. 8, for, as above mentioned, the angle of member 100 is greater than the angle at the forward end of member 110. A relatively powerful compression spring 82 bears

downwardly against the horizontal arm 106, thus tending to turn insert 100 clockwise, or in other words, tending to close the drive channel or space between the relatively movable members 102 and 104. This insures close or tight frictional support of the staples during the driving operation, which in turn prevents bending or crumpling of the same. The desired staple support is provided despite minor variations in staple dimension. It will be noted that horizontal arm 106 is provided with a locating projection 108 over which the lower end of spring 82 is received.

It should be noted that with the present arrangement it is conveniently possible to use a single spring, that is the spring 82, for two purposes, that is, for restoring plunger 60 to elevated position and for yieldably reducing or closing the drive channel. Moreover, this arrangement with a common spring 82 has the advantage that the resistance to buckling of the staple is increased as the stapling stroke nears completion.

It has previously been mentioned that the staple feed channel is closed at the top by cover C. Within the housing 64 of the driving mechanism the staple feed channel is completed by a member 110. The ends of member 110 and the horizontal arm 106 of insert 100 come into abutting relation. These ends are preferably cut at a substantial angle or bias, as is indicated at 112 in Fig. 8. This is done so that the space or crevice therebetween is directed at an angle relative to the staples passing therebeneath, thus preventing a staple from rising up into or becoming caught in the crevice. Again referring to Fig. 8, it will be observed that the vertical arm 102 of member 100 is cut away in inverted U-shape at 114, thus forming a passage through which the staples pass as they are fed to the drive channel. Arm 102 is also cut away at 116 to form a space or recess in which a retractor tongue is movable, as will be subsequently described. It will be understood that the insert 100 may be made of hardened steel appropriately tempered for long wear, in contrast with the ordinary working parts of the machine which may be made of ordinary steel. Where the drive channel is not made of a separate member such as the insert 100, it is necessary to make a considerable part of the machine of hardened steel, or else an inferior machine subject to rapid wear results. The ends 117 of the side walls of member 110 come immediately in back of arm 102 and positively limit its maximum movement to a slight amount, say five thousandths of an inch.

The retractor tongue above referred to is clearly shown at 118 in Figs. 4 and 13. The tongue is provided with downwardly bent ears 120, and these are slotted at 122 to receive a support pin 124 which extends across the staple core 18. A spring 126 is coiled about pin 124 and functions to normally urge retractor tongue 118 upwardly or clockwise as viewed in Fig. 4. The upper end 128 (Fig. 13) of spring 126 is turned sidewardly and bears against the inner wall of camming lug 130. Spring end 128 functions to normally urge the retractor tongue forwardly, that is, into the staple drive channel. It will be evident that as so far described the retractor tongue will function in the usual manner, it tending to support the center or bridge of the staple against downward movement. Moreover, the present construction, by reason of the slots 122, has the advantage of not excessively binding the driving blade 70 during the driving stroke, and even more importantly, during the upward or return

stroke. This is so because any tendency of the tongue to wedge or jam against the driving blade during its upward movement is relieved by rearward bodily movement of the tongue on support pin 124.

In the present construction, the retractor tongue serves an even more important function, namely that of increasing the driving pressure in the latter portion thereof. To this end the spring 126 of the retractor tongue is made relatively heavy, and the tongue is provided with downwardly bent cam members 130 which cooperate with an upwardly bent stationary camming member 132 (see Figs. 4 and 16). It will be clear from inspection of the drawings that after the driving stroke has been partially completed and in the last portion thereof, the curved cam surfaces or forward edges of the cam members 130 reach and ride on the upwardly turned member 132. Any continued downward movement of the retractor tongue immediately causes the tongue to move rearwardly on pin 124, the end of the tongue being abruptly moved out of the staple drive channel, as shown in Fig. 16. In this way the plunger load is suddenly relieved of the resistance theretofore offered by the retractor tongue, thus increasing the effective pressure on the plunger near the end or clinching part of the driving stroke.

As has already been mentioned, the machine is provided with a door F for front loading. Referring to Figs. 4, 9 and 12, the door mechanism comprises a strip or blade 104 housed within and vertically reciprocable in the housing 64 of the driving mechanism. Door 104 is guided between the side walls 90 of the frame of the driving mechanism and is held against outward movement by the end wall 134 of the frame. A part of the end wall 134 is convexed outwardly, as is indicated at 136, in order to receive the ends of a pair of door-operating arms, and it is because of this convexity at 136 that a substantial space is shown in Fig. 9 between door 104 and the housing wall. A pair of door-operating arms 138 and 140 are provided on opposite sides of plunger 60. Arms 138 and 140 are secured to a rod 142 and therefore move together. One of the arms, in this case 138, is provided with a small pull spring 144 which normally urges the arms downwardly. The ends of the arms are received in slots 146 in door 104. One of the arms, in this case the arm 138, has fixed thereto the pin 148 of a suitable operating knob K. The housing wall is slotted at 150 (see Fig. 1) to receive pin 148. It will be evident that by moving the knob K upwardly in slot 150 the front loading door 104 is elevated, thereby clearing the end of the staple core and permitting the delivery of a new staple clip into the machine. It will also be understood that this front loading door is characterized by the usual advantages of most front loading arrangements in that the drive channel is fully accessible and openable in the event of a staple jam.

The staple pusher should, of course, be locked in retracted position before the front loading door is opened. If not, there would be a tendency to eject the staple clip from the machine. To prevent this possibility, even if the pusher is not latched in retracted position, a safety pawl 152 is provided, as is best shown in Figs. 4, 9 and 12. The staple pawl is oscillatable on a rod 154 supported in frame 90. The lower end of the staple pawl is movable in a suitable clearance slot 156. The pawl is normally moved clockwise as viewed in Fig. 4 by a suitable torsion spring 158. Opera-

tively connected to and preferably formed integrally with pawl 152 is an operating arm 160 the end of which is disposed slightly beneath the lower end of plunger 60. It will be evident from inspection of Fig. 4 that when the plunger is partially depressed, the pawl 152 is moved out of engagement with the staple clip, thus permitting forward or feed movement of the staples. Of course, during the downward stroke no feed movement takes place because at first the end-most staple is in the way and thereafter the driving blade 70 is in the way. However, during the last portion of the upward movement of plunger 60, the staple clip is moved forward. When the upward stroke of the plunger has been completed the staple clip can no longer move forward, the pawl 152 coming into engagement with the transverse ridges formed by the staples of the staple clip. The operating parts are so proportioned that pawl 152 is disengaged from the staple clip when the driving blade has moved downwardly to a point intermediate the staple clip and the uppermost position of the driving blade.

The anvil or clinching mechanism of the stapling machine may be described with reference to Figs. 10, 11, 12 and 14. In these figures, it will be noted that the anvil comprises discs 162 and 164 disposed side by side on the base of the machine and beneath the driving mechanism. Disc 162 is provided with a slot 166 extending from the center of the disc outwardly toward the periphery thereof, and similarly, disc 164 is provided with a slot 168 extending from the center of the disc toward the periphery thereof. The discs are rotatably mounted in the base, and it will be apparent from comparison of Figs. 10 and 11 that by appropriately rotating the discs, the slots may be moved from a position directed toward one another, as in Fig. 10, to a position directed away from one another, as in Fig. 11. With the parts in the relation shown in Fig. 10, the legs of the staple are bent beneath the staple and are clinched in place. With the parts in the position shown in Fig. 11, the legs of the staple are bent outwardly and the staple is therefore readily removable. This forms a temporary attachment equivalent to the use of a pin or clip.

For convenience, suitable operating means is provided to rotate the discs in unison. Specifically, discs 162 and 164 are provided with gear teeth 170 and 172, these teeth being in mesh. A gear rack 174 is provided, the teeth of which are in mesh with one of the discs, specifically disc 164. Rack 174 is provided with an operating handle 176 reciprocable in a slot 178 cut through a side wall 180 of the base. It will be evident that by shifting the handle 176 back and forth, the discs may be oscillated in unison to assume either the position shown in Fig. 10 or that shown in Fig. 11. To help lock the discs in desired position, spring detent mechanism may be provided. Specifically, a leaf spring 182 is fixedly secured to the base of the machine at 184. The movable end of spring 182 is provided with a suitable detent projection or knob 186, and this is adapted to fit into either of two detent holes or recesses indicated at 188 and 190 in Fig. 10. In special cases the discs may be stopped after, say, 90° rotation, thus bending the staple with the legs perpendicular to the cross bar.

For the sake of economy, the gears 170 and 172 are preferably stamped from sheet metal by a simple die operation. The discs 162 and 164 are

also stamped from sheet metal, and the parts are welded together, as is most clearly shown in Fig. 14. Disc 164 is preferably made somewhat smaller in diameter than gear 172 so that the parts may be held in position by inserting discs 162 and 164 in mating holes in base B and thereafter holding the same in elevated position by a suitable bottom plate 192 which may be welded at its ends to the base of the machine, and which may be further secured in place by rivets 184 and 185. Plate 192 also functions to support and guide the rack 174. By making the thickness of discs 162 and 164 substantially equal to the thickness of the metal forming the base of the machine, the anvil or clinching device is made flush with the top of the base, which is very convenient when using the machine, as sheets to be stapled are readily slid in place.

It is believed that the construction and operation, as well as the many advantages of our improved stapling machine, will be apparent from the foregoing detailed description thereof. The machine includes a simplified and highly dependable stroke control mechanism which insures completion of each driving stroke before another staple may be fed to the drive channel. The drive channel is composed of sides which are relatively movable and which are normally urged together by suitable resilient or yieldable means. In this way the staple wire is well supported during the driving operation and can not begin to bend or crumple. The desired close support of the staple wire is obtained without demanding exceedingly close tolerances in the construction of the parts of the machine, and is obtained despite any minor variations in the size of the staple wire. Moreover, the frictional restraint on the staple may be made much greater than that which would be obtainable when using a fixed drive channel. The desired result is obtained by the use of an insert, which is convenient because it may be made of hardened and tempered steel in order to take the wear to which it is subjected. A single spring may be employed for both the drive channel wall and the restoring movement of the plunger.

The machine is provided with a retractor tongue which is characterized by the usual advantages of such a device, and which has the additional advantages of not catching or binding the driving blade, particularly during the upward movement thereof, and of providing a sudden release of the retraction pressure. This abrupt removal of the retractor tongue from the drive channel is obtained by special camming parts, and functions to increase the driving pressure near the end of the driving stroke, thereby obtaining some of the advantages of operation of the machine by an impact or blow even when the machine is in fact operated by gradually or steadily applied pressure.

It will be apparent that while we have shown and described our invention in a preferred form, many changes and modifications may be made in the structure disclosed without departing from the spirit of the invention defined in the following claims.

Features disclosed above, but not claimed hereinafter, are claimed in a co-pending application of William Drypolcher, Serial No. 105,196, filed October 12, 1936.

We claim:

1. A stapling machine comprising staple driving mechanism, a staple magazine, staple feed means for feeding staples toward the driving

mechanism, and slightly spaced outer and inner walls for bearing against the legs of a staple being driven in order to form a staple drive channel, the outer side of said drive channel being fixed during operation of the machine, and the inner or opposite side of said drive channel being resiliently urged outwardly by a relatively powerful compression spring toward the first side of the drive channel in order to exert frictional restraint on the legs of the staples being driven through the drive channel, and to thusly re-enforce said staple legs for better penetration of the material being stapled.

2. A stapling machine comprising staple driving mechanism including a depressible operating plunger and a blade secured thereto and moved thereby, a staple drive channel, the outer side of said channel being fixed during operation of the machine, and the inner or opposite side of said channel being movable toward the first side of the channel in order to exert frictional restraint on staples being driven through the drive channel by the blade, and a single resilient means operating in a single direction line for restoring the plunger to elevated position and for urging the movable side of the drive channel toward the fixed side.

3. A stapling machine comprising staple driving mechanism, a staple guide core, staple feed means for feeding staples on the guide core toward the driving mechanism, means spaced from one end of the guide core forming one side of a staple drive channel, an angle member disposed with one arm approximately horizontally over the staple guide core and with the other arm approximately vertically at the end of the staple guide core, the vertical arm forming the opposite side of the drive channel, and resilient means bearing downwardly on the horizontal arm in order to press the vertical arm outwardly toward the other side of the drive channel.

4. A stapling machine comprising staple driving mechanism, a staple guide core, a member thereabove forming a staple feed channel therebetween, staple feed means for feeding staples through the feed channel toward the driving mechanism, a staple loading door at the driving end of the core, said door forming one side of a staple drive channel, a hardened steel L-shaped insert disposed with one arm approximately horizontally over the staple guide core and with the other arm approximately vertically at the end of the staple guide core, the vertical arm forming the opposite side of the drive channel, and resilient means bearing downwardly on the horizontal arm in order to press the vertical arm toward the aforesaid door.

5. A stapling machine comprising staple driving mechanism, a staple guide core, a member thereabove forming a staple feed channel therebetween, staple feed means for feeding staples through the feed channel toward the driving mechanism, a staple loading door at the driving end of the core, said door forming one side of a staple drive channel, a hardened steel L-shaped insert disposed with one arm approximately horizontally over the staple guide core and with the other arm approximately vertically at the end of the staple guide core, the vertical arm forming the opposite side of the drive channel, and resilient means bearing downwardly on the horizontal arm in order to press the vertical arm toward the aforesaid door, the end of the horizontal arm being cut at an angle, the abutting forward end of the aforesaid member being

cut at an angle to mate therewith, the angular disposition of the cleft between the arm and the member functioning to prevent staples from escaping upwardly from the staple core.

6. A staple machine comprising staple driving mechanism, a staple magazine, staple feed means for feeding staples toward the driving mechanism, slightly spaced outer and inner walls for bearing against the legs of a staple being driven in order to form a staple drive channel, the outer side of said drive channel being fixed during operation of the machine and the inner or opposite side of said drive channel being rigid but movably mounted and resiliently urged by resilient means toward the first side of the drive channel in order to exert frictional restraint on the legs of the staples being driven through the drive channel and to thusly reenforce said staple legs for better penetration of the material being stapled, and rigid stop means fixedly disposed closely in back of the movable side of the drive channel in order to positively limit its movement

away from the channel to a very small amount.

7. A stapling machine comprising staple driving mechanism, a staple guide core, staple feed means for feeding staples on the guide core toward the driving mechanism, means spaced from one end of the guide core forming one side of a staple drive channel, an angle member disposed with one arm approximately horizontally over the staple guide core and with the other arm approximately vertically at the end of the staple guide core, the vertical arm forming the opposite side of the drive channel, resilient means bearing downwardly on the horizontal arm in order to press the vertical arm outwardly toward the other side of the drive channel, and rigid stop means fixedly disposed closely in back of the movable side of the drive channel in order to positively limit its movement away from the channel to a very small amount.

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