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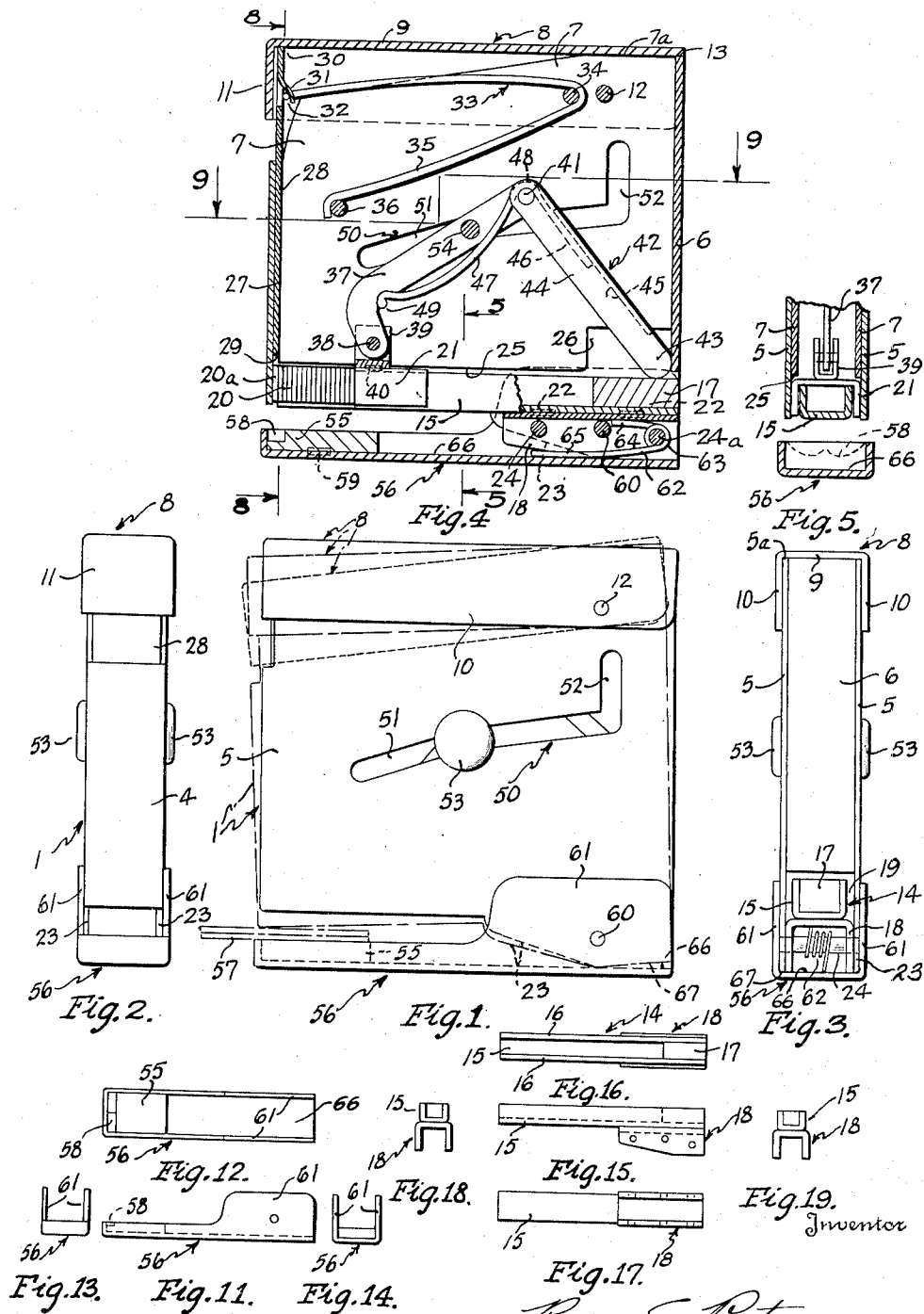
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2,542,879

FEED MECHANISM FOR STAPLING MACHINES

Original Filed March 31, 1947

2 Sheets-Sheet 1



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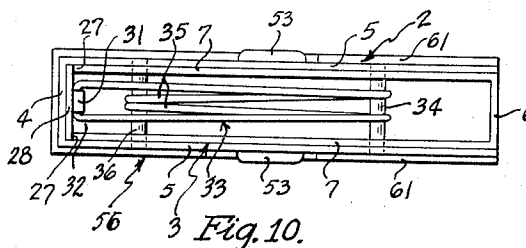
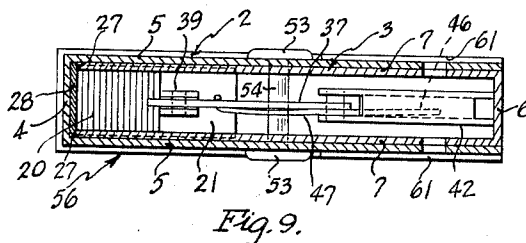
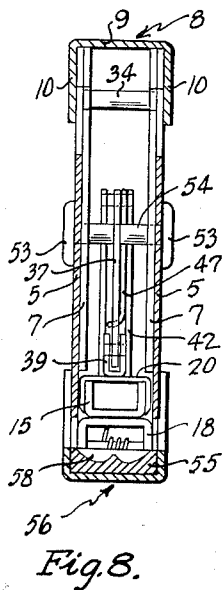
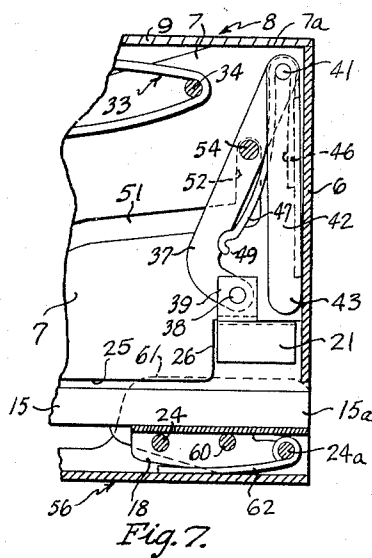
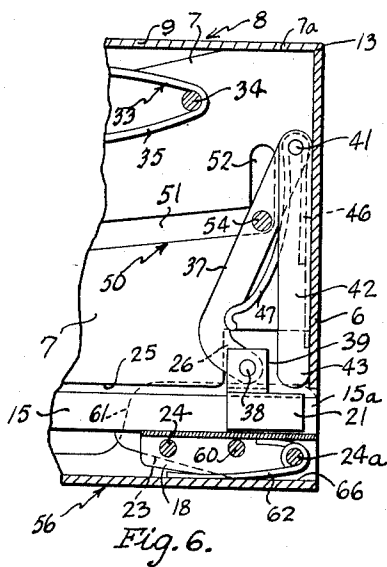
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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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FEED MECHANISM FOR STAPLING
MACHINES

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Original application March 31, 1947, Serial No.
738,367. Divided and this application June 9,
1950, Serial No. 167,198

6 Claims. (Cl. 1-49)

1 This invention relates to a staple driving machine, and particularly to the type of stapler which will drive and clinch the staples in the work, and has for an object to provide a construction which can be incorporated in a staple driving machine of a very small, compact construction. In fact, it can be made of a construction which is no larger or heavier than the common type of cigarette lighter, and can, therefore, be readily carried in a hand bag or vest pocket, or the like.

Another object is to provide a structure in which the operation of loading the staples into the machine is greatly simplified, and which does not require the removal or disengagement of any of the parts.

Another object is to provide a staple driving machine of this type which is very simple, and is easy to operate, it being merely necessary to insert the parts to be stapled and then press the device with a simple hand operation.

A still further object is to provide a stapling machine which not only may be readily carried in the pocket or handbag, for example, but is particularly adapted for effecting temporary repairs on various articles as garments, for example, to pin on flowers or other decorations, for stapling notes, reports, memos, receipts and so forth; or it can be used by doctors for fastening bandages, papers and the like.

With the foregoing and other objects in view, I have devised the construction illustrated in the accompanying drawings forming a part of this specification. It is, however, to be understood the invention is not limited to the specific details of construction and arrangement shown, but may embody various changes and modifications within the scope of the invention.

In these drawings:

Fig. 1 is a side elevation of the machine on an enlarged scale;

Fig. 2 is a front view thereof;

Fig. 3 is a rear view of the device;

Fig. 4 is a longitudinal section just inside the side wall of the machine with some of the parts broken away to more clearly show the construction, and showing the parts in the normal position of operation;

Fig. 5 is a detail section substantially on the line 5-5 of Fig. 4;

Fig. 6 is a section similar to Fig. 4 of the rear portion of the machine showing the staple feed follower retracted;

Fig. 7 is a similar section showing the follower raised or removed from the staple guide to permit

2 the loading of a staple strip into the machine;

Figs. 8 and 9 are sections substantially on lines 8-8 and 9-9 respectively of Fig. 4;

Fig. 10 is a top plan view with the operating lever removed;

Figs. 11, 12, 13, and 14 are a side, top, and opposite end views respectively of the base or anvil carrying member, and

Figs. 15, 16, 17, 18 and 19 are side, top, bottom and opposite end views respectively of the staple guide member.

The scale of Figs. 12 to 19 is substantially natural size.

This application is a division of my prior application Serial No. 738,367, filed March 31, 1947, for Staple Driving Machine, and issued as U. S. Letters Patent No. 2,511,003, on June 13, 1950.

The device comprises a housing 1 including outer and inner casings 2 and 3. The outer casing comprises an upright front wall 4 and two laterally spaced rearwardly extending side walls 5. The inner casing 3 comprises an upright rear wall 6 and laterally spaced side walls 7, this inner casing being enclosed within the outer casing with its side walls 7 at the inner sides of the side walls 5 of the outer casing. The two casings are open at the top and closed by an operating lever 8, preferably of substantially inverted U shape in cross section, including the top wall 9, side walls 10 embracing and located at the outer sides of the side walls 5, and a front end wall 11. This lever is pivotally mounted adjacent the rear end thereof in the housing by a transverse pin 12, and the rear end portion of the top wall 9 in normal position engages the top edges of the side walls 5 and 7, as indicated at 5a and 7a, and upper end 13 of the rear wall 6, to limit upward movement of the lever 8.

Mounted in the lower portion of the housing is a staple guide means 14. This includes the staple guide bar 15 which is preferably of substantially U-shape with the space between the side walls 16 closed at the rear end of the bar by a filler block 17. On the under side of this bar, also at the rear end portions thereof, is a supporting member 18 which is of substantially inverted U shape and somewhat wider than the bar 15, this member 18 being a mounting for the bar between the side walls 5 of the outer casing, the greater width of the supporting member 18 spacing the side walls 16 of the guide bar from the side walls 5 to provide a space 19 for the prongs of the staples 20, and the sides of the substantially inverted U-shaped follower 21.

The guide bar 15 is secured to the support 18 by any suitable means, such, for example, as spot welding 22, rivets, or any other suitable means. The lower edges of the rear portions of the side walls 5 of the outer casing are extended downwardly, as shown at 23, to provide ears between which the member 18 is mounted by any suitable means such as the cross pins or rivets 24 and 24a, and this, therefore, supports the staple guide bar 15 in the lower part of the housing. The lower edges 25 of the side walls 7 of the inner casing stop a short distance above the top edges of the side walls 16 of the staple guide, as shown in Figs. 3, 4 and 5, to provide clearance for the top connecting bar of the staples and also the top wall of the inverted U-shaped follower 21. At the rear end portion each of these walls is provided with an upwardly extending notch 26, for a purpose presently to be described. The lower edges 25 of these side walls form a top guide for the staple strip 20 and the follower 21 to retain them on the staple guide 14.

The front wall 4 of the housing is spaced forwardly from the front end of the staple guide bar 15 and the forward edges 27 of the side walls 7 of the inner casing to form a guideway for a vertically reciprocable staple driver 28, and at the lower end of this guideway form a raceway for the forward staple 20a to be driven. This driver 28 is preferably a flat strip of steel normally positioned with its lower end 29 spaced a short distance above the forward staple 20a, and with its upper end 30 resting against the under side of the top wall 9 of the operating lever 8. A lug 31 is lanced and bent backwardly from this driver to receive the forward loop 32 of a spring 33 supported in the housing by looping over transverse pin 34, and the free ends of the other arms 35 resting against a transverse pin 36. This spring is tensioned so that it tends to lift the staple driver 28 to raise it to its upper position of Fig. 4, and with it the operating lever 8, this movement being limited by the rear end of the top wall of the lever engaging the top end 13 of the upright rear wall 6 and top edge portions 7a and 5a of the side walls 7 and 5 of the casings.

A novel improved means is provided for advancing the follower 21 to the staple strip 20 along the staple guide bar 15 to bring the staples successively to the forward end of this bar under the lower end of the driver 28 and into driving position. This comprises a member or lever 37 having a down-turned end pivotally connected at 38 to the follower 21. It may be connected by a substantially U-shaped member 39 secured to the top of the follower 21 by any suitable means, such, for example, as spot welding 40. At its opposite end the member 37 is pivoted at 41 to one end of the second member or lever 42, the other end 43 of this lever or member being preferably rounded and seating on top of the block 17 and resting against the lower portion of the rear upright wall 6, forming an abutment or holding means for the free end of this member. This member may be of any suitable shape, but is preferably of substantially U-shape in cross section to provide side walls 44 between which the member 37 is pivoted, and a connecting wall 45 to form a rest for one end portion 46 of a spring 47 which is looped over the connecting pivot 41 at 48 and engages under the member 37 at 49. This spring being tensioned tends to swing the members 37 and 42 about their connecting pivot 41 and, therefore, as the free end 43 of the mem-

ber 42 is held stationary, it tends to swing the free end of the member 37 forwardly and to slide the follower 21 along the guide bar 15 to feed the staples forwardly along this bar to the driving position under the driver 28.

In each of the opposite side walls of the housing is a substantially L-shaped slot 50 including a substantially horizontal or slightly curved portion 51 and an upright angular portion 52. Mounted in an intermediate portion of the member 37 is a finger grip comprising a pair of heads or knobs 53 on the outer side walls of the housing and connected by a transverse rod or pin 54 mounted in the member 37 and extending through the slots 50. This forms a guide means for the member 37 during forward movement of the follower 21, but especially forms a retracting means for the follower 21 to permit loading of a new staple strip onto the guide means 14 or specifically the guide bar 15. When the staples have been exhausted and the operator wishes to load a new strip of staples in the machine, he grips the two heads or knobs 53 of the finger grip in any suitable manner, such, for example, with his thumb and first finger on opposite sides of the casing, and slides them rearwardly in the curved or horizontal portions 51 of the slots 50 to the rear as far as it will go. This brings the parts to substantially the position of Fig. 6, shifting the follower 21 rearwardly on the guide bar 15 to the rear end of this bar, as shown in Fig. 6. This is permitted by the two members 37 and 42 swinging together about their connecting pivot 41, the member 42 being held by the rear upright wall 6, and as the two members fold together somewhat like a jack-knife, as shown in Fig. 6, this brings the follower 21 under the recesses or notches 26 in the lower edges of the side walls 7 of the inner casing, and also brings the transverse pin 54 carrying the knobs or heads 53 of the finger grip into alignment with the lower ends of the upright slots 52. Then, by lifting this finger grip upwardly, this pin 54 will slide upwardly in the portions 52 of the slots and will carry the pivotally connected members 37 and 42 with it, the rearward member 42 sliding on the inner surface of the upright wall 6. This brings the parts to the position of Fig. 7, and it will be seen that the operation of raising the members 37 and 42 lifts the staple feed follower 21 from the staple guide bar 15 and carries it above this bar into the recesses or notches 26. This, therefore, removes the follower from the staple guide bar 15 and permits the operator to insert a new staple strip onto this bar at the rear end 15a thereof and pass it under the follower to a position forwardly of the follower. Then by reversing the movement of the finger grip members 53, the follower 21 and the members 37 and 42 are shifted downwardly to the position of Fig. 6, again replacing the follower 21 on the guide bar 15 to the rear of the staple strip. Then, when released, the spring 47 swings the member 37 forwardly and carries pin 54 along the horizontal portions of the slots 50 and shifts the follower 21 forwardly to feed or advance the staples to the stapling position.

If only just this much of the device is used, it can be used as a tacker to drive the staples into the work to tack a tag, for example, to a wooden member or the like, but if the device is to be used as a stapler to clinch the staples in the work by folding over the prongs of the staples, then an anvil 55 is provided under the forward staple 20a to fold over and clinch the

prongs of the staple after it is driven through the work. In this construction this comprises a substantially U-shaped base or lever member 56 mounted under the lower edge of the housing and normally spaced from this lower edge, as shown in Figs. 1 and 4, for insertion of the work pieces, indicated in dotted lines at 57. For folding over and clinching the prongs, the anvil block 55 is provided with the usual form of curved recesses 58 under the staple driver, which may act to fold the prongs in either direction for the clinching operation, depending on the shape and location of these recesses. The block 55 may be secured to the member 56 by any suitable means, such, for example, as spot welding 59. This member 56 is pivotally connected to the housing, and particularly the downwardly extending wings or lugs 23, by means of a transverse pin 60, the rear end portion of the side walls of the member 56 being extended upwardly, as shown at 61, to embrace the opposite side walls of the housing, and specifically the upright side walls 5 of the outer casing. This member or lever 56 is normally held with its forward end and the anvil 55 spaced from the lower edge of the staple guide bar 15 by means of a spring 62, including an intermediate loop 63 about the transverse pin 24a, and with its opposite free arms 64 and 65 engaging the top wall of the member 18 and the connecting bottom wall 66 of the member 56, forwardly of the pivot 60, so as to tend to swing the member 56 downwardly with its forward end spaced from the lower side of the staple guide bar, this movement being limited by the lower edges 67 of the side ears 23 engaging the bottom wall 66 of the member 56.

In use of the device, assuming staples have already been loaded into the machine, the work to be stapled is inserted between the top of the lower hinged member 56 and the under side of the staple bar 15 and the lower edge of the housing, as shown at 57 in Fig. 1. The device may be supported with the member 56 resting on some support, such, for example, as a table or desk, or it could be held in the operator's hand, with the thumb or fingers under the member 56 and the fingers or thumb on top of the operating lever 8. Then, by depressing the forward end of the lever 8 the housing is first swung downwardly about the pivot 60 to the dot-and-dash line position of Fig. 1, bringing the lower edge of the forward part of the housing and the under edge of the staple guide bar 15 against the top of the work, as indicated by the dot-and-dash lines of Fig. 1. Then further depression of the lever 8 to the dotted line position of this figure will depress the staple driver 28 to force the forward staple 20a downwardly and to drive the prongs of this staple through the work, and by pressure of the free ends of the prongs against the recesses 58 of the anvil to clinch these prongs on the under side of the work. When the lever 8 is released the spring 33 will retract the staple driver 28 upwardly and shift it to its upper position of Fig. 4, carrying with it the lever 8. At the same time the spring 62 will swing the casing upwardly, or member 56 downwardly, about the pivot 60 to separate the lower edge of the casing and the member 56 for insertion of work for the next stapling operation.

The device is shown in the drawings on an enlarged scale of about twice the size intended to be made, but of course it is not limited to

any given size but may be made of any size desired. The compact arrangement permits the assembly in a very small construction, in fact no larger than the standard type cigarette lighter, so that it may be readily carried in the vest pocket or in the handbag or the like; but of course the mechanism involved may be used in larger scale constructions if desired. It will be seen the novel staple feed mechanism permits the shifting of this mechanism, and particularly the follower, to an inoperative position away from the staple guide without removing anything from the machine or disconnecting anything from it. This simplifies the operation of reloading the machine and obviates the possibility of losing or misplacing any of the parts. It is a very simple device and is particularly adaptable for making temporary repairs to garments, such, for example, as slip straps, hems, garters and so forth, or pinning on flowers for decorations, and similar uses. It is also very practical for students for clipping notes and other papers, or for salesmen in clipping together reports, memos, orders and the like. It is also very handy for housewives for clipping together bills, recipes and memos, and doctors may employ it for connecting bandages, papers and so forth. It may be made of all steel construction, or of other materials, as found practical or desirable.

Having thus set forth the nature of my invention, I claim:

1. A staple driving machine comprising a housing including spaced side walls, a staple guide bar, means for feeding staples along the bar to driving position comprising a follower, a pair of pivotally connected levers, one of said levers being pivoted to the follower at its free end, an abutment in the housing for the free end of the other lever, and a spring tending to swing the levers about their connecting pivot to shift the follower along the bar.

2. A staple driving machine comprising a staple guide, means for feeding staples along the guide to driving position comprising a follower movable along the guide, a member pivoted at one end to the follower, a second member pivoted at one end to the other end of the first member, a holding means for the other end of the second member, and a spring tending to swing the members about their connecting pivot to shift the follower along the guide.

3. A staple driving machine comprising a staple guide, means for feeding staples along the guide to driving position comprising a follower movable along the guide, a member pivoted at one end to the follower, a second member pivoted at one end to the other end of the first member, a holding means for the other end of the second member, and a spring comprising an intermediate bend mounted on the pivot between the members and arms on the opposite sides of said bend tending to swing the members about said pivot to feed the follower along the guide.

4. A staple driving machine comprising a housing including spaced side walls, a staple guide, means for feeding staples along the guide to driving position comprising a follower movable along the guide, a member pivoted at one end to the follower, a second member pivoted to the other end of the first member, a holding means for the second member spaced from said pivot, a spring tending to swing the first member about the pivot between the members to feed the fol-

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lower along the guide, a side wall of the housing being provided with a guide slot, a finger grip on the first member projecting through said slot, said slot comprising a substantially horizontal portion and an upright angular portion, and said finger grip being movable along the first portion of the slot to retract the follower and then into the upright portion to lift the follower from the guide to permit loading of a staple strip onto the guide under the follower.

5. A staple driving machine comprising a housing, a staple guide mounted in the housing, means in the housing for feeding staples along the guide to the driving position comprising a follower movable along the guide, means in the housing for shifting the follower along the guide to advance the staples including a member connected with the follower, a spring cooperating with said member to shift the follower, a finger grip connected with said member, and means mounting said follower shifting means in the housing for retraction of the follower along the guide and lifting of it from the guide by action

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of the finger grip while the means is retained in the housing.

6. A staple driving machine comprising a housing including an upright rear wall, a staple guide mounted in the lower part of the housing, means in the housing for feeding staples along the guide to driving position comprising a follower movable along the guide, means in the housing for shifting the follower to advance the staples including a pair of pivotally connected members one of which is pivotally connected to the follower and the other of which is guided by said rear wall, a spring coacting with the first member to shift the follower, a finger grip connected with the follower operating means, and means mounting said members in the housing to permit shifting of said members by the finger grip to retract the follower and shift them upwardly to lift the follower from the guide to clear the guide for loading a staple strip onto the guide.

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No references cited.