Dec. 4, 1934. F. POLZER 1,983,398

STAPLE DRIVING MACHINE

Filed May 17, 1932

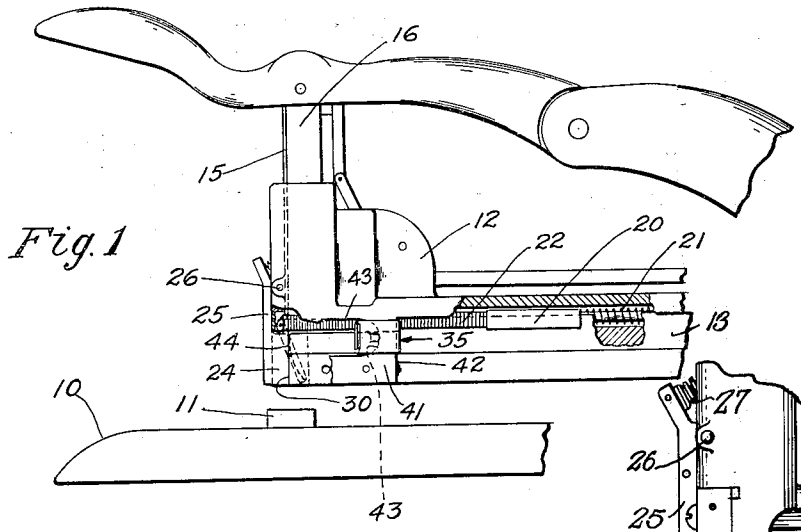


Fig. 1

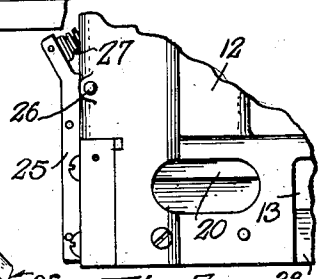


Fig. 7.

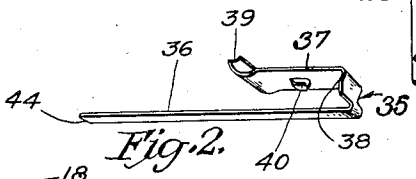


Fig. 2.

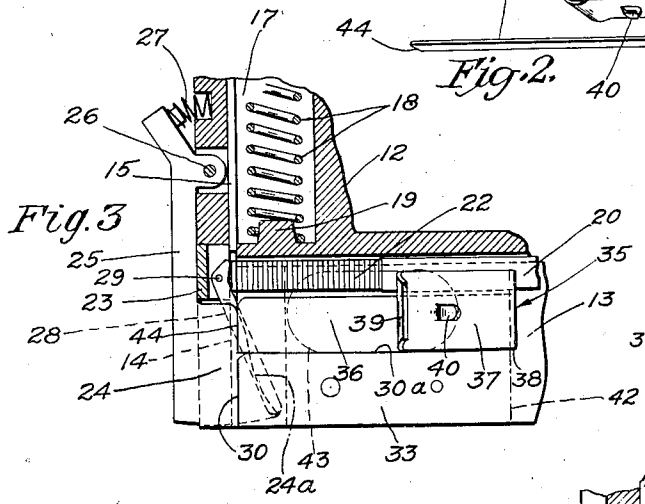


Fig. 3

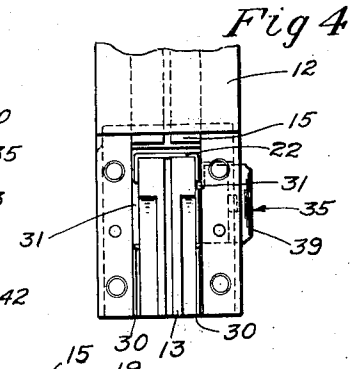


Fig 4

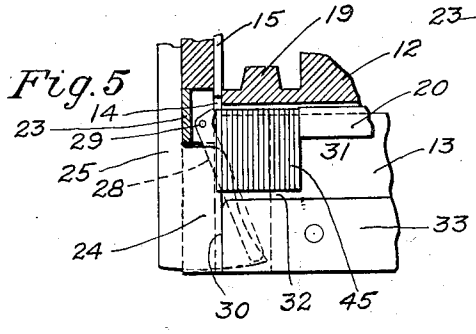


Fig. 5

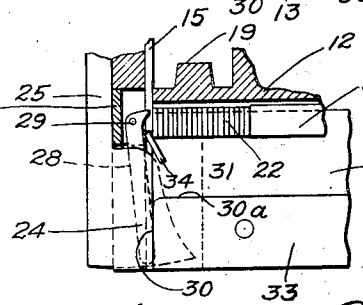


Fig. 6

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Patented Dec. 4, 1934

1,983,398

UNITED STATES PATENT OFFICE

1,983,398

STAPLE DRIVING MACHINE

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Application May 17, 1932, Serial No. 611,837

9 Claims. (Cl. 1—3)

This invention relates to new and useful improvements in staple driving machines, and has for an object to provide a removable or detachable staple guide or backing up means which may be easily and quickly applied to a staple driving machine constructed for operation on long staples whereby to adapt the machine for driving short staples.

Another object is to provide a device for the purpose stated which is simple in construction and which may be easily applied for use and easily and quickly removed from a machine after use.

Other objects and advantages will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawing wherein a satisfactory embodiment of the invention is shown. However, it will be understood that the invention is not limited to the details disclosed but includes all such modifications and variations as fall within the spirit of the invention and the scope of the appended claims.

In the drawing:

Fig. 1 is a view partly in side elevation and partly in section and showing the removable staple guide or backing up means in place on a stapling machine;

Fig. 2 is a perspective view of the removable means alone;

Fig. 3 is a detail view on an enlarged scale one side wall of the stapling machine being omitted and the removable guide being shown in position on the machine;

Fig. 4 is a detail view looking from the left in Fig. 3 parts being omitted;

Fig. 5 is a view somewhat similar to Fig. 3, the machine being shown loaded with long staples;

Fig. 6 is a somewhat similar view, the machine being loaded with short staples and the view showing the possible course of a short staple when the backing up means of the invention is not in place; and

Fig. 7 is a side view of the lower part of the housing with the guide removed.

In the drawing, the invention is shown as applied to a stapling machine although it will be apparent that the guide or backing up means of the invention is equally applicable to a tacking machine, and in the accompanying claims the machine is described as a staple driving machine by which term it is intended to cover both stapling machines and tacking machines. The stapling machine of the drawing includes a base 10 on which is disposed an anvil portion 11 to turn over and clinch the staple arms as the staples are driven. Disposed above the base 10 is a housing 12 into which extends a guide bar 13 at its inner end forming a wall of a raceway 14 through which staples are adapted to be driven by a plunger 15.

Plunger 15 is mounted on a support 16 adapted to be reciprocated in a relatively deep well or recess 17 within which is also disposed a coil spring 18 adapted to raise the plunger and plunger support at the end of a staple driving operation. The inner end portion of the spring 18 may be disposed about a lug or extension 19 whereby the spring is maintained properly centered in the recess or well 17. A follower 20 is mounted on the guide bar 13 and is normally urged forwardly thereon as by a coil spring 21 bearing at one end against the follower. This follower is adapted to feed a staple strip along the guide bar to the raceway 14 and such staple strip may be in the form of a strip of short staples 22 as shown in Figs. 1, 3, 4 and 6 or a strip of long staples 23 as shown in Fig. 5.

It will be understood that the staples are fed one at a time into the raceway and are driven therethrough by the plunger 15. The walls of the raceway engaged by the forward and outer sides of the arms of the staple strip are formed in a block 23 which is centrally cut away to provide for the entrance of the enlarged portion 24 of a lever like member 25 pivoted to the housing 12 on a pivot 26. A coil spring 27 interposed between the housing and the upper end portion of this lever like member serves normally to retain the same in the position in which it is shown in Figs. 1, 3 and 5.

As a staple is being driven the curved front wall 24*a* of enlarged portion 24 of the member is engaged by the cross bar of the staple and the member is rocked outwardly or to the left about its pivot against the action of the spring 27. During the operation of driving a staple the enlarged portion 24 of this lever like member is straddled by the staple and the staple arms are prevented from collapsing inwardly toward one another. A dog 28 is pivotally mounted on the block 23 as at 29 and this dog serves to prevent a second staple entering the raceway 14 until after the first staple to enter the raceway has been driven therefrom.

The lower portion of the inner part of the raceway is defined by the end surfaces 30 of enlarged or wider lower portions 33 of the guide bar 13. It will be noted that these portions are laterally of the upper surface of the guide bar whereby said surfaces are in the same vertical planes as the arms of the staples on the guide bar and whereby spaces 31 are provided at the

sides of the guide bar to accommodate the arms of the staples. As here disclosed, the spaces 31 are relatively high since the machine is particularly adapted for the driving of the long staples 45 as shown in Fig. 5.

Referring particularly to Fig. 5 it will be noted that there is but a relatively short space 32 between the lower ends of the arms of the staples of the strip 45 and the enlarged portion 33 of the guide bar. This space 32 is considerably less in height than the arms of one of the staples of the strip 45 and it will therefore be understood that as one of these staples is being driven through the raceway the remaining staples of the strip will form a portion of the inner or rear wall of the raceway and that before the staple being driven moves entirely away from the next adjacent staple of the strip the staple being driven will be so disposed that the rear surfaces of its arms are in engagement with and being guided by the forward edges 30 of the enlarged portions 33 of the guide bar.

From the foregoing description it will be seen that the machine here disclosed is particularly adapted for operation on long staples. Attempts to use this machine for the driving of short staples are likely to result in difficulties in that the machine will be likely to become clogged. This is illustrated in Fig. 6 wherein the front staple designated 34 of the strip 22 is shown as having been cut from the strip by the plunger 15. Since the arms of these staples are relatively short, the staple 34 has passed beyond the point where it is supported by the other staples of the strip 22 and has not as yet reached the point where it would be supported by the guide or raceway surfaces 30. Therefore, the arms of staple 33 are not guided at the rear and are likely to swing into the spaces 31 at each side of the guide bar with the result that the staple will be forced through the raceway out of the upright position and will be caught by the top surfaces 30*a* of the extensions 33 and become jammed.

The present invention provides a means whereby a machine adapted for driving long staples may be efficiently used to drive short staples. This means generally designated 35 is preferably formed of a single piece of sheet metal as shown and comprises an arm 36 of a width and thickness to substantially fill the space 31 at one side of the guide bar between the top edge 30*a* of the extension 33 and the lower edge of the staple strip 22 but leaving sufficient clearance for easy passage of the staple strip along the guide bar 13. In addition to the arm 36 the device includes a plate like portion 37 arranged substantially parallel with the arm and connected therewith as by a portion 38 whereby a spring clip is provided. The forward edge of the plate 37 is bent to provide a lip 39 and a portion is lanced and pressed from the plate providing a lug 40 disposed between the plate and the arm.

The housing 12 includes a side wall portion 41 terminating as at 42 short of the rear end of the guide bar 13 and this wall portion 41 is provided with an opening 43. The length of the arm 36 of the guide or backing up attachment 35 is such that when the plate like portion 37 of said attachment is disposed against the outer surface of said wall portion 41, with the portion 38 of the attachment against the end 42 of the wall, the said arm will be so disposed that its forward end or edge 44 is in alignment with and forms an extension of the guide surfaces 30 above referred to. With the parts in this position the lug 40 will be disposed within the opening 43 and in engagement with the rear edge thereof and will serve to prevent movement of the attachment in a direction rearwardly with respect to the raceway. Therefore, the attachment will be held against casual movement as pressure develops against its edge 44 during the operation of driving a staple through raceway 14.

The attachment or backing up means may be easily applied to a staple driving machine since it is but necessary to push it into place and it may likewise be easily removed from a machine. To remove the attachment or backing up member it is simply necessary to force the forward or lip portion 39 of the plate 37 outwardly to bring the lug 40 beyond the outer surface of the wall 41 of the housing and the attachment may then be slid rearwardly with respect to the machine and removed. While the attachment is in place on the machine the machine may be efficiently used in the driving of short staples since prior to the time a driven staple passes beyond the point where it is supported by the remaining staples of a strip one of its arms will engage the forward edge or end surface 44 of the arm 36 of the backing up member and turning of the staple as suggested in Fig 6 will be prevented. As the driven staple moves away from the end of the arm of the backing up member it will be supported by the surfaces 30 as above explained.

From the foregoing description taken in connection with the accompanying drawing it will be apparent that I have provided a guide or backing up means or attachment which may be easily and quickly applied to a machine designed for driving long staples to adapt said machine for the efficient driving of short staples. Further, it will be seen that the means may be easily and quickly removed from the machine after use so as not to interfere with the normal use of the machine in the driving of long staples. The device does not in any way complicate the mechanism of the machine and is extremely simple in construction and may be manufactured at a very low cost.

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

1. In a staple driving machine for long staples, a housing having a raceway therein, a guide bar, a follower for feeding staples along said guide bar to said raceway, a plunger operable to drive staples through said raceway, guide means forming part of said raceway and spaced laterally of and below the upper edge of said guide bar to provide room for the long arms of the staples as the staples are fed along the guide bar and to guide the staple arms during the latter part of their movement through the raceway, said machine adapted to be loaded with short staples, a backing up means including a portion adapted when the machine is loaded with short staples to be inserted between the ends of the arms of the short staples and said guide means and with an edge disposed to provide an extension of said guide means, and said backing up means including a manipulating portion disposed at the outer side of the housing whereby the backing up means may be readily applied and removed

2. In a staple driving machine for long staples, a housing having a raceway therein, a guide bar, a follower for feeding staples along said guide bar to said raceway, a plunger operable to drive staples through said raceway, a guide means forming part of said raceway and spaced laterally of and below the upper edge of said guide bar to pro-

vide room for the long arms of the staples as the staples are moved along the guide bar and to guide the staple arms during the latter part of their movement through the raceway, said machine adapted to be loaded with short staples, a backing up means including a portion adapted when the machine is loaded with short staples to be inserted between the ends of the arms of the short staples and said guide means with an edge portion disposed to provide an extension of said guide means, means securing said backing up means to the housing to prevent casual movement thereof during the driving of a staple, and said backing up means including a manipulating portion disposed at the outer side of the housing whereby the backing up means may be readily applied and removed.

3. In a staple driving machine for long staples, a housing having a raceway therein, a guide bar, a follower for feeding staples along said guide bar to said raceway, a plunger operable to drive staples through said raceway, guide means forming part of said raceway and spaced laterally of and below the upper edge of said guide bar to provide room for the long arms of the staples as the staples are moved along the guide bar and to guide the staple arms during the latter part of their movement through the raceway, said housing including a side wall portion spaced laterally from the guide bar, said wall portion having an opening therein, said machine adapted to be loaded with short staples, a backing up means including a portion adapted when the machine is loaded with short staples to be inserted into the space between said guide bar and side wall and the ends of the arms of the short staples and said guide means with an edge disposed to provide an extension of said guide means, and said backing up means including a portion to enter said opening in the side wall of the housing to secure the means against accidental movement during the driving of a staple.

4. In a staple driving machine for long staples, a housing having a raceway therein, a guide bar, a follower for feeding staples along said guide bar to said raceway, a plunger operable to drive staples through said raceway, guide means forming part of said raceway and spaced laterally of and below the upper edge of said guide bar to provide room for the long arms of the staples as the staples are moved along the guide bar and to guide the staple arms during the latter part of their movement through the raceway, said housing including a side wall portion spaced laterally from the guide bar, said wall portion having an opening therein, said machine adapted to be loaded with short staples, a backing up means including a portion adapted when the machine is loaded with short staples to be inserted into the space between the ends of the arms of the short staples and said guide means with an edge disposed to provide an extension of said guide means, said backing up means including a spring arm to be disposed at the outer side of said wall of the housing when the backing up means is in operative position, and said spring arm including a portion to enter the opening in the side wall of the housing to lock the backing up means against accidental movement during the driving of a staple.

5. A staple guiding attachment for staple driving machines, the same comprising an arm having a staple guiding edge and a spring arm to engage a portion of a staple driving machine to mount the attachment thereon, and said spring arm having a lug struck therefrom to engage a portion of the staple driving machine to secure the attachment against casual movement relative thereto.

6. A staple guiding attachment for staple driving machines, the same comprising a body formed of a single piece of sheet metal, said body including an arm having a staple guiding edge, said body including a second arm arranged substantially at right angles to said first arm whereby said arms may receive a portion of a staple driving machine between them, and said second arm having a locking lug pressed therefrom in the direction of the first arm.

7. In a staple driving machine for long staples, a housing having a raceway therein, a guide bar, a follower for feeding staples along said guide bar to said raceway, a plunger operable to drive staples through said raceway, guide means forming part of said raceway and spaced laterally of and below the upper edge of said guide bar to provide room for the long arms of the staples as the staples are moved along the guide bar and to guide the staple arms during the latter part of their movement through the raceway, said housing including a side wall portion spaced laterally from the guide bar, said wall portion having an opening therein, said machine adapted to be loaded with short staples, a backing-up means including a portion adapted when the machine is loaded with short staples to be inserted into the space between the ends of the arms of the short staples and said guide means with an edge disposed to provide an extension of said guide means, said backing up means including an arm to be disposed at the outer side of said wall of the housing when the backing up means is in operative position, said arm providing a manipulating portion whereby the backing up means may be readily applied and removed from the housing, and said arm including a portion to enter the opening in the wall of the housing to secure the backing up means against accidental movement during the driving of a staple.

8. A staple guiding attachment for staple driving machines, the same comprising a body having an arm provided with a staple guiding edge and a spring arm spaced from said first arm and providing an attaching and manipulating means, and said second arm including a portion to cooperate with a portion of a staple driving machine to secure the attachment to the machine against casual movement relative thereto.

9. A staple guiding attachment for staple driving machines, the same comprising a relatively narrow arm having a staple guiding edge, a relatively wide spring arm, a relatively wide connecting portion connecting said arms, said spring arm providing an attaching and manipulating means, and means included in said spring arm to cooperate with a portion of a staple driving machine to secure the attachment to the machine against casual movement relative thereto.

FRIDOLIN POLZER.