A. F. SHAFER.

STAPLING MACHINE.

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1,288,704. Patented Dec. 24, 1918.

Fig. 1

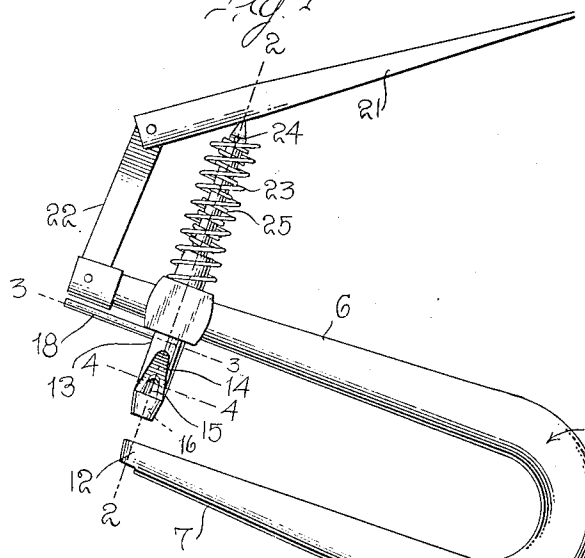


Fig. 2

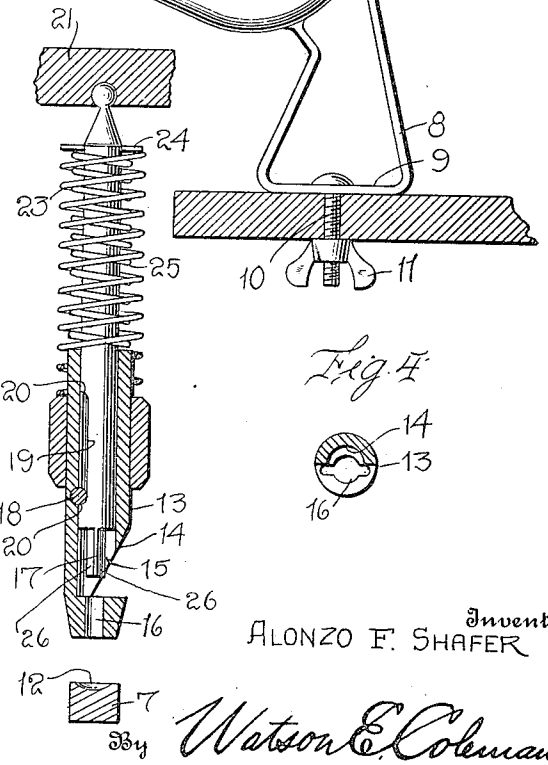


Fig. 3

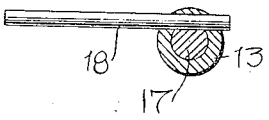


Fig. 4

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STAPLING-MACHINE.

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To all whom it may concern:

Be it known that I, ALONZO F. SHAFER, a citizen of the United States, residing at Moore, in the county of Tucker and State of West Virginia, have invented certain new and useful Improvements in Stapling-Machines, of which the following is a specification, reference being had to the accompanying drawings.

This invention relates to an improved stapling machine of that character shown and described in Patent No. 1,222,149, issued to me April 10, 1917, and has for its primary object to provide improved means for mounting the machine frame upon a suitable base, whereby the positioning of the work and of the staple in proper engagement therewith is facilitated.

It is also another object of the invention to provide certain improvements in the construction and mounting of the outer work engaging sleeve and the stapling plunger which are disclosed in the patent above referred to.

And it is a further general object of the invention to provide a machine wherein the staples are fed to the plunger by hand, which is very simple in its construction, may therefore be cheaply manufactured, and is reliable and efficient in operation.

With the above and other objects in view, my invention consists in the novel features of construction, combination and arrangement of parts to be hereinafter more fully described, claimed, and illustrated in the accompanying drawing, in which,

Figure 1 is a side elevation of a stapling machine constructed in accordance with the preferred embodiment of the present invention;

Fig. 2 is a vertical section taken on the line 2—2 of Fig. 1;

Fig. 3 is a section taken on the line 3—3 of Fig. 2; and

Fig. 4 is a section taken on the line 4—4 of Fig. 1.

Referring in detail to the drawing, 5 designates a U-shaped metal casting having upper and lower arms designated 6 and 7 respectively, said arms tapering longitudinally of the upper arm 6 projecting beyond the end of the lower arm 7. To the medial portion of this casting, the ends of a supporting bracket 8 are securely fixed in any suitable manner, and said bracket having an angular intermediate portion 9 through which the bolt 10 extends. This bolt is adapted to extend downwardly through an opening in a workbench or other suitable base, and has a nut 11 threaded upon its lower end. Then the machine is securely clamped to the bench or base as shown in Fig. 1, it will be observed that the arms 6 and 7 of the casting 5 are obliquely disposed in an upward direction from the supporting bracket 8.

Upon the terminal of the lower arm 7, a clenching die 12 is formed, upon which the points of a staple are adapted to be driven through the material arranged over the die and securely clenched by the operating plunger to be hereinafter more fully described.

The upper arm 6 of the casting 5 is provided in spaced relation to its end and immediately opposite the die 12 with an opening through which the work holding sleeve 13 is movably disposed. One side of this sleeve, in spaced relation to its lower end, is cut away on an oblique angle, the beveled or inclined face 14 of the sleeve intersecting the sleeve bore 15. At the lower end of this inclined face, the sleeve is formed with a staple receiving opening 16 which gradually tapers or decreases in width to the end face of the sleeve.

The stapling plunger 17 is longitudinally movable in the bore of the sleeve 13 and projects some distance beyond the upper end thereof. A rod 18 extends transversely through the wall of the sleeve 13 below the arm 6 and is engaged with a flattened side face 19 of the plunger 17. The shoulders 20 at the ends of this flattened face of the plunger co-acting with the rod 18, limit the longitudinal movement of the plunger relative to the sleeve in each direction.

21 designates the operating lever, one end of which is pivotally connected to an arm 22 which, in turn, is pivotally mounted upon the extremity of the arm 6 of the casting 5. A ball and socket connection is provided between the upper end of the plunger 17 and the lever 21. A coil spring 23 encircles the upper end of the sleeve 13 and rests upon the arm 6, the upper end of said spring bearing against a transverse pin 24 fixed in the plunger 17. This spring normally acts to urge the plunger and sleeve upwardly through the arm 6 and support the lever 21 in the position shown in Fig. 1. A second spring 25 of relatively smaller diameter is engaged upon the plunger rod 17 within the spring 23, and bears at its lower end against the

upper end of the sleeve 13, the upper end of said spring 25 also engaging the transverse pin 24 fixed in the plunger rod. This latter spring is of much greater tensile strength than the spring 23 and serves to yieldingly prevent axial movement of the plunger with respect to the sleeve 13.

Normally, it will be noted that the lower end of the plunger 17 is disposed above the staple receiving channel or opening 16 provided in the lower end of the sleeve 13. This lower end of the plunger is reduced or cut away on its opposite sides, as shown at 26, so that it will freely enter the staple receiving channels 16, and the lower end face of said plunger is slightly concave so as to properly engage upon the staple. It is further to be observed that in the normal position of the plunger, no portion of the same projects beyond the plane of the obliquely inclined face 15 on the sleeve. Thus, this plunger will in no way interfere with the proper disposal of the staples in the upper end of the channel 16.

The improved stapling machine above described is especially designed for applying reinforcing staples to the seams of shoes, heavy canvas gloves, and like articles, and is particularly serviceable in the repairing of such articles when the seams become ripped. In operation, the work is properly arranged over the die 12 and, as the forward end of the frame casting 5 is elevated, the operator will have a clear view of the work, and by bending forward, he may bring his chest into bearing engagement with the end of the lever 21, thereby forcing the sleeve 13 downwardly against the action of the spring 23 into contact with the work. After the sleeve has been engaged upon the work so that the latter will be held against shifting movement on the die 12, the operator then grasps the lever 21 and forces the same downwardly so as to further compress the outer spring 23 and also compress the spring 25 which resists the downward movement of the plunger. As the plunger is moved through the sleeve, the lower end thereof strikes the medial portion of the staple, the ends of which have been engaged in the upper end of the channel 16. As the side walls of this channel converge in a downward direction, in the projection of the staple through the channel by the plunger, the spaced portions of the staple will be forced toward each other so that when the points of the staple finally engage with the die face, in the continued pressure of the plunger upon the staple, said end portions will be bent in opposite directions and securely clenched upon the material. Upon the release of the lever, the springs 23 and 25 immediately return the parts to their normal positions. Another staple is now placed in position in the upper end of the channel 16, a suitable tweezers or other implement being employed for this purpose.

From the foregoing description, taken in connection with the accompanying drawing, the construction, manner of use, and several advantages of my improved stapling machine will be clearly and fully understood. The rod 18 which is fixed in the sleeve 13 serves to limit the upward movement of the sleeve through the arm 6, as well as to limit the movement of the plunger in each direction, and also affords a convenient handle whereby the sleeve and plunger may be rotated within the arm 6 when it is desired to set the staples in the material in an irregular line. In view of the relatively few parts employed in the construction of the device, it will be appreciated that the same is not liable to get out of order, but on the other hand, is extremely durable and serviceable in practical use. It is, of course, manifest that the machine may be made in various sizes, and that staples of any desired length may be used in connection therewith. The form, construction, and relative arrangement of the several elements above referred to is also susceptible of considerable modification and I, therefore, reserve the privilege of resorting to all such legitimate changes as may be fairly embodied within the spirit and scope of the invention as claimed.

Having thus fully described my invention, what I desire to claim and secure by Letters Patent is:

1. In a stapling machine, the combination of a rotatable guide sleeve cut away on one side to provide an obliquely inclined face intersecting the bore of the sleeve, the end of the sleeve below the inclined face being provided with a staple receiving guide, a rotatable stapling plunger movable in the sleeve to engage and force the staple through said guide, means for operating said plunger, and means for limiting the operating movement of the plunger constructed and arranged for use as a handle for rotating the sleeve and plunger.

2. In a stapling machine, the combination of an axially movable sleeve cut away on one side to provide an obliquely inclined face intersecting the bore of the sleeve, said sleeve at the inner end of said inclined face being provided with a staple receiving channel, a stapling plunger movable in the sleeve to engage and force the staple through said channel, and means for first moving the sleeve axially to engage the same with the work, and subsequently moving the plunger within the sleeve to operatively engage the plunger with the staple.

3. In a stapling machine, the combination of an axially movable rotatable sleeve cut away on one side to provide an obliquely inclined face intersecting the bore of the

sleeve, said sleeve at the inner end of said inclined face being provided with a staple receiving channel, a stapling plunger movable in the sleeve and rotatable therewith to engage and force the staple through said channel, and a transverse rod fixed in the sleeve, constructed and arranged for use as a handle for rotating together the sleeve and plunger, said rod also limiting the axial movement of the sleeve in one direction.

4. In a stapling machine, the combination of an axially movable rotatable sleeve cut away on one side to provide an obliquely inclined face intersecting the bore of the sleeve, said sleeve at the inner end of said inclined face being provided with a staple receiving channel, a stapling plunger movable in the sleeve and rotatable therewith to engage and force the staple through said channel, and a transverse rod fixed in the sleeve, constructed and arranged for use as a handle for rotating together the sleeve and plunger, said rod also limiting the axial movement of the sleeve in one direction and also co-acting with said plunger to limit the axial movement of the plunger relative to the sleeve.

5. In a stapling machine, the combination of a rotatable sleeve provided with a staple receiving guide, a stapling plunger axially movable in said sleeve, means for operating the plunger to force the staple through the guide into engagement with the work, and means for limiting the operative movement of the plunger and for preventing rotation of the plunger within the sleeve, said means being constructed and arranged for use as a handle for rotating the sleeve and plunger as a unit.

In testimony whereof I hereunto affix my signature in the presence of two witnesses.

ALONZO F. SHAFER.

Witnesses:
J. F. BLACKMAN,
C. H. FITZWATER.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."