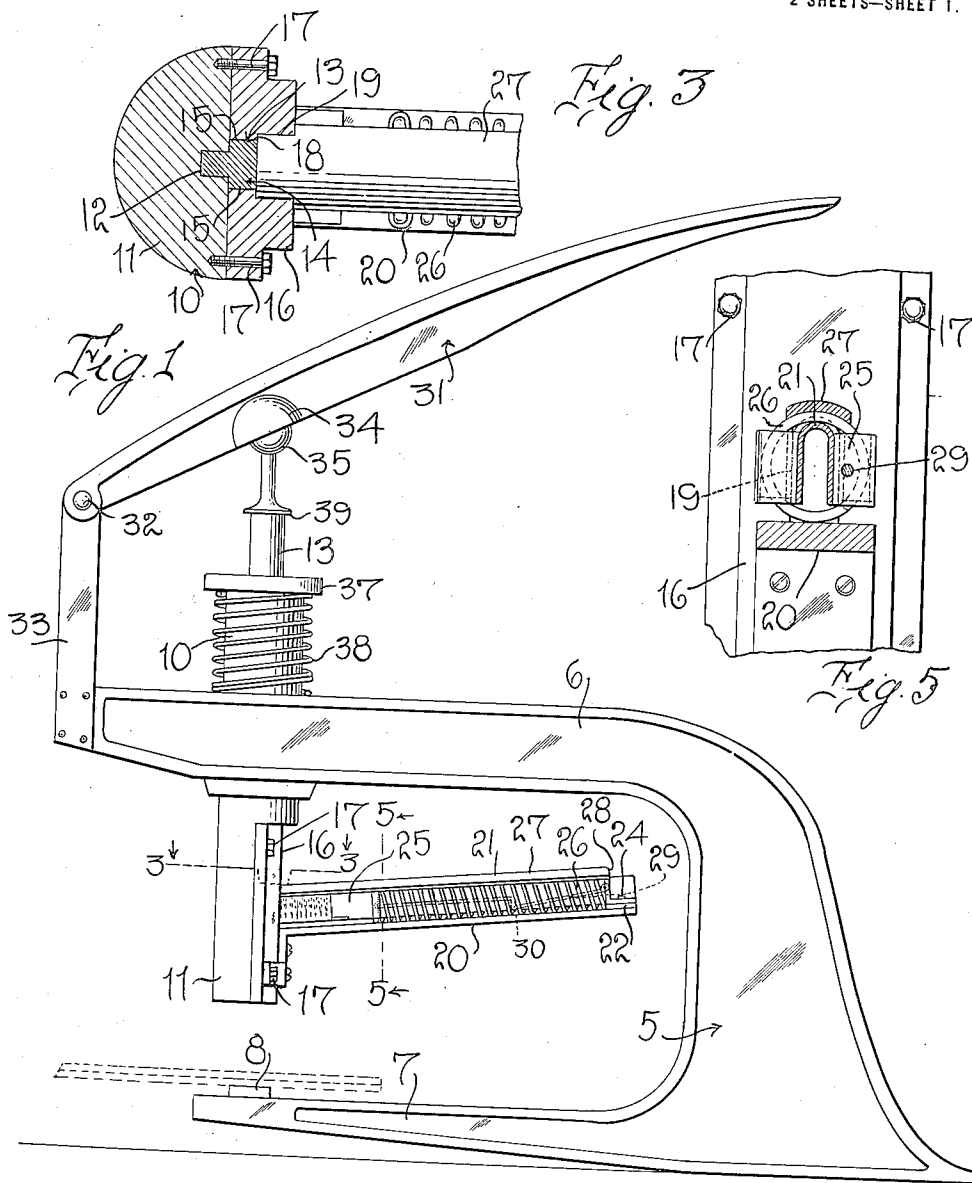


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STAPLING MACHINE.
APPLICATION FILED MAR. 4, 1916.

Patented Apr. 10, 1917.
2 SHEETS—SHEET 1.



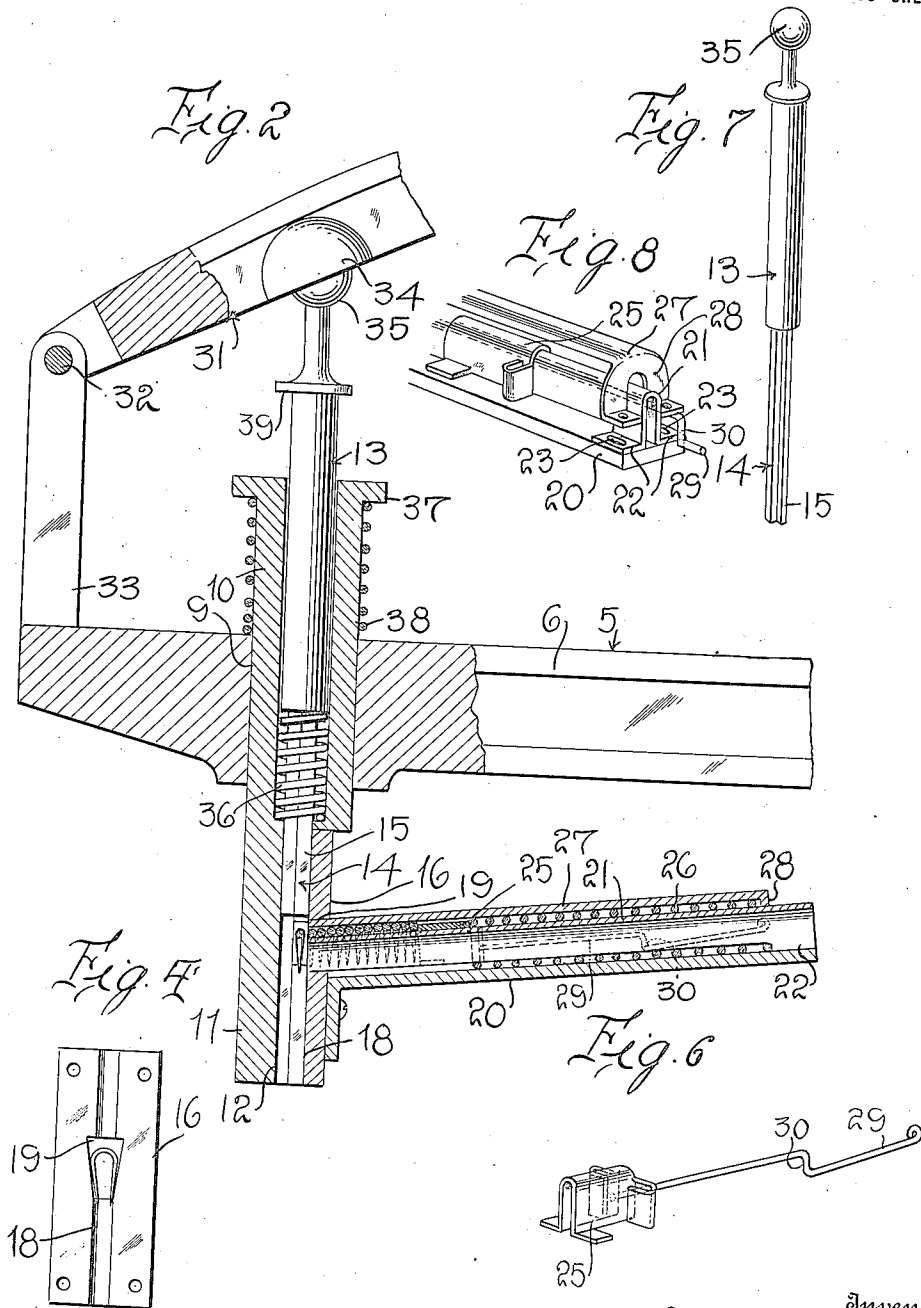
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UNITED STATES PATENT OFFICE.

ALONZO F. SHAFER, OF MOORE, WEST VIRGINIA.

STAPLING-MACHINE.

1,222,149.

Specification of Letters Patent.

Patented Apr. 10, 1917.

Application filed March 4, 1916. Serial No. 82,212.

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 and has for its primary object to provide a hand operated machine of this character for applying reinforcing staples to the seams of shoes, heavy canvas gloves, and like articles, which is particularly useful in the repairing of such articles when the seams become ripped.

It is another and more particular object of the invention to devise a stapling machine for the above purpose having an improved magazine construction for automatically feeding the staples to a vertically movable plunger.

It is another object of my invention to provide means for so mounting the magazine with respect to the operating plunger that the magazine and plunger may be swung or turned in various directions for applying the staples in an irregular line.

It is a further general object of the invention to reduce the number of necessary parts in such machines to a minimum and thereby correspondingly reduce the manufacturing cost of the machine and, at the same time, provide a machine which is highly efficient in practical use and convenient and serviceable for the purposes in view.

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 my invention;

Fig. 2 is a vertical sectional view thereof;

Fig. 3 is an enlarged sectional view taken on the line 3—3 of Fig. 2;

Fig. 4 is a detail inner face view of the guide plate for the staples;

Fig. 5 is an enlarged transverse section

of the magazine taken on the line 5—5 of Fig. 2;

Fig. 6 is a detail perspective view of the follower;

Fig. 7 is a perspective view of the plunger, and

Fig. 8 is a detail fragmentary view of the magazine construction, showing the cover lifted from its normal position.

Referring in detail to the drawings, 5 designates a casting having a suitable base which may be fastened upon a board, bench, or other desirable support, by a plurality of bolts or screws, and upon which an upwardly and laterally extending frame arm 6 is integrally formed. Beneath this arm 6 and in spaced relation thereto, an obliquely and upwardly inclined horn or extension 7 is integrally formed upon the casting, and at its extremity and upon the upper face thereof is provided with a suitable clenching die indicated at 8, upon which the points of the staple are adapted to be driven and clenched by the operating plunger to be hereinafter more fully described.

The arm 6 of the casting is provided with an opening 9 therein within which a vertically movable sleeve 10 is arranged, said sleeve being provided upon its lower end with a longitudinal extension 11, the inner face of which is substantially in alinement with the bore of said sleeve. The inner face of said extension is formed with a longitudinal groove or channel 12. 13 designates the plunger mounted to reciprocate within the bore of the sleeve 10, said plunger having a reduced rectangular stem 14 which is formed upon one side with the flanges 15 projecting from opposite faces of said stem.

A plate 16 is arranged over the exposed side of the stem 14 and is detachably secured at its opposite edges by means of screws 17, to the extension 11 of the sleeve 10. This plate is provided in its inner face with a shallow rectangular channel 18 which is adapted to receive the flanges 15 on the stem 14 of the plunger. An opening 19 is formed in the plate 16 intermediate of the ends of the channel 18.

A longitudinally inclined supporting plate 20 is fixed at one of its ends by means of the screws 17 securing the plate 16 to the extension 11 of the sleeve, and upon this

plate the several parts of the magazine for the staples are mounted and supported. The magazine includes a sheet metal plate bent upon itself to provide a narrow, inverted, U-shaped saddle or seat indicated at 21, upon which the staples are adapted to be arranged. At one end of this plate, the same is formed upon its longitudinal edges with outwardly projecting arms 22 in each of which the slot 23 is formed. Bolts 24 extend through these slots and are secured in the end of the supporting plate 20. The other end of the saddle 21 fits within the opening 19 in the plate 16, and by loosening the bolts 24 this saddle plate may be readily adjusted so as to position the latter end thereof with respect to the reciprocating plunger. A follower 25 of substantially the same cross-sectional form as the saddle 21, is loosely engaged upon said saddle for longitudinal movement, and it will be understood that the staples are arranged upon the saddle between this follower and the plunger stem 14. A coil spring 26 is arranged over the saddle 21 and is connected to the follower 25 at one of its ends to force the same longitudinally upon the saddle and thus feed the staples to the plunger stem. The other end of this spring bears against the stop plate 28 on the end of the cover 27. The staples and the follower are held in place upon the saddle 21 by means of a longitudinally extending cap or cover 27, one end of which is reduced in width to fit within the upper end of the opening 19 in the plate 16. The other end of this longitudinally extending cover is formed with a substantially semi-circular, transversely disposed stop plate 28 which engages over the end of the spring 26. The ends of the plate 28 are angularly extended and provided with apertures to receive the fastening bolts 24 which secure the saddle member 21 upon the supporting plate 20. To the follower 25, one end of a rod 29 is connected. Adjacent the other end of said rod, the same is formed with an angular offset 30. When it is necessary to replenish the magazine, this rod is pulled longitudinally to move the follower 25 upwardly upon the inclined supporting plate 20 against the action of the spring 26, and the offset 30 in said rod is engaged over the end of the plate 20 to retain the follower in such position. The cap or cover 27 is then removed and the staples arranged upon the saddle 21. When the cover is replaced, the rod 29 is released so that the follower will be again urged downwardly by the spring 26 to feed the staples through the opening 19 in the plate 16 to the reciprocating stem of the plunger.

31 designates the operating lever which is fulcrumed, as at 32, upon the upper end of a vertically disposed arm 33 suitably mounted upon the end of the casting arm 6. This

lever is provided with a bearing socket 34 to receive the ball 35 formed upon the upper end of the plunger 13. This plunger is normally urged upwardly through the sleeve 10 by means of a coil spring 36 arranged within the lower end of said sleeve and surrounding the stem 14, the upper end of said spring bearing against the body of the plunger while the lower end thereof is seated upon the upper end of the extension 11 on the sleeve 12. The upper end of said sleeve is formed with an annular flange 37 against which the upper end of a coil spring 38, surrounding said sleeve, bears. This spring which is of considerably less tensile strength than the spring 36, also operates to move the sleeve 10 upwardly through the opening in the casting arm 6 and yieldingly retard its downward movement when engaged by the annular shoulder 39 formed upon the plunger 13.

It will be noted from reference to Fig. 4 of the drawings, that the upper portion of the rectangular channel 18 in the inner face of the plate 16 is slightly enlarged or flared immediately opposite the opening 19 in said plate. In the normal position of the plunger 13, the lower end of the stem 14 is disposed above the upper end of the opening 19, and the staples, as they are successively fed through this opening by the follower 25, are pushed into the upper portion of the channel 18. The channel 18 in the plate 16 is only sufficiently deep to receive a single staple, and by widening this channel opposite the opening 19, the single staple delivered to the channel is supported to prevent it from dropping down in the channel and thereby permitting more than one staple to leave the magazine under the pressure of the follower 25.

From the above description, taken in connection with the accompanying drawings, the construction and manner of operation of the device will be clearly understood. When the plunger 13 is forced downwardly by means of the operating lever 31, such movement is transmitted through the spring 36 to the sleeve 10 and the magazine mounted on the extension of said sleeve so that the lower end of the sleeve extension and the plate 16 will be engaged upon the work, thereby holding the work or material in proper position upon the die to receive the staples. The spring 38 is, of course, thus placed under compression, and in the continued downward movement of the plunger 13 the end of the stem 14 engaging upon the staple, forces the same downwardly through the channel 18, the spring 36 being compressed. The points of the staple are thus driven through the material arranged on the clenching die and said points securely clenched. The sleeve 10 and the magazine and the supporting plate 20 therefor, together with the plun-

ger 13, may be turned or rotated with respect to the arm 6 of the casting so that the staples may be applied to the material in a curved or irregular line. The stapling operation is performed in each downward movement of the plunger and may be repeated until the magazine is exhausted, when the same may be reloaded or replenished as above described.

It will be readily seen that I have produced a very simple and convenient stapling machine which may be conveniently employed and easily operated, with a minimum of manual labor in repair work, for closing and reinforcing the seams of shoes, workmen's gloves, and articles constructed of analogous materials. The machine may, of course, be made in various sizes, and staples of different lengths and other forms than that illustrated in the drawing can also be utilized by resorting to obvious mechanical variations in the form and construction of the several parts. The invention is also susceptible of many modifications therein and I, therefore, reserve the privilege of adopting 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 an axially movable sleeve, a reciprocating plunger operating therein, a plate detachably secured to one side of said sleeve and having a channel in its inner face and an opening communicating with said channel, a saddle plate having one of its ends disposed within said opening, said plate being adapted to support a plurality of staples, and a spring-pressed follower mounted upon the saddle plate to urge the staples successively into the channel of the first named plate for engagement by the plunger in its downward movement.

2. In a stapling machine, the combination of a sleeve, a reciprocating plunger operating therein, said sleeve having a longitudinal extension, a plate detachably secured upon said extension and having a guide channel in its inner face to receive the plunger and an opening in said plate communicating with said channel, a laterally projecting saddle plate mounted upon said first named plate and extending into said opening, said saddle plate being adapted to support a plurality of staples, a cover plate for the staples also engaged at one of its ends in the opening of the first named plate, and a spring pressed follower mounted upon the saddle plate to urge the staples successively into the channel of the first named plate for engagement by the plunger in its downward movement.

3. In a stapling machine, the combination

of a sleeve having a longitudinal extension formed on one end provided with a guide channel, a plunger operating in said sleeve and having a stem engaged in said guide channel, a plate detachably secured to said extension and having a channel in its inner face in which the plunger stem is slidably engaged, said plate also having an opening therein communicating with said channel, and a staple magazine carried by said plate to feed the staples successively into the said channel for engagement by the plunger stem in its downward movement.

4. In a stapling machine, the combination of a sleeve having a longitudinal extension formed on one end provided with a guide channel, a plunger operating in said sleeve and having a stem engaged in said guide channel, a plate detachably secured to said extension and having a channel in its inner face in which the plunger stem is slidably engaged, said plate also having an opening therein communicating with said channel, a laterally extending, downwardly inclined plate carried by said first named plate, a staple support mounted upon the inclined plate and having one of its ends disposed in the opening of the first named plate, and a spring-pressed follower mounted upon said support to urge the staples successively into the channel of the first named plate for engagement by the plunger stem in its downward movement.

5. In a stapling machine, the combination of a sleeve having a longitudinal extension formed on one end provided with a guide channel, a plunger operating in said sleeve and having a stem engaged in said guide channel, a plate detachably secured to said extension and having a channel in its inner face in which the plunger stem is slidably engaged, said plate also having an opening therein communicating with said channel, a laterally extending, downwardly inclined plate carried by said first named plate, a staple support mounted upon the inclined plate and having one of its ends disposed in the opening of the first named plate, a spring-pressed follower mounted upon said support to urge the staples successively into the channel of the first named plate for engagement by the plunger stem in its downward movement, and means connected to the follower to co-act with the inclined plate to hold the follower in a retracted position against the action of its spring.

6. In a stapling machine, the combination of a sleeve having a longitudinal extension formed on one end provided with a guide channel, a plunger operating in said sleeve and having a stem engaged in said guide channel, a plate detachably secured to said extension and having a channel in its inner face in which the plunger stem is slidably engaged, said plate also having an opening

therein communicating with said channel, a
laterally extending downwardly inclined
plate carried by said first named plate, a
staple support mounted upon the inclined
5 plate and having one of its ends disposed in
the opening of the first named plate, a spring-
pressed follower mounted upon said support
to urge the staples successively into the chan-
nel of the first named plate for engagement
10 by the plunger stem in its downward move-
ment, means connected to the follower to co-
act with the inclined plate to hold the fol-

lower in a retracted position against the
action of its spring, and a cover plate ex-
tending over the staple support and having 15
one of its ends engaged in the opening of
said first named plate.

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

ALONZO F. SHAFER.

Witnesses:

W. H. BLOSSEN,
W. K. PRITT.