

June 16, 1925.

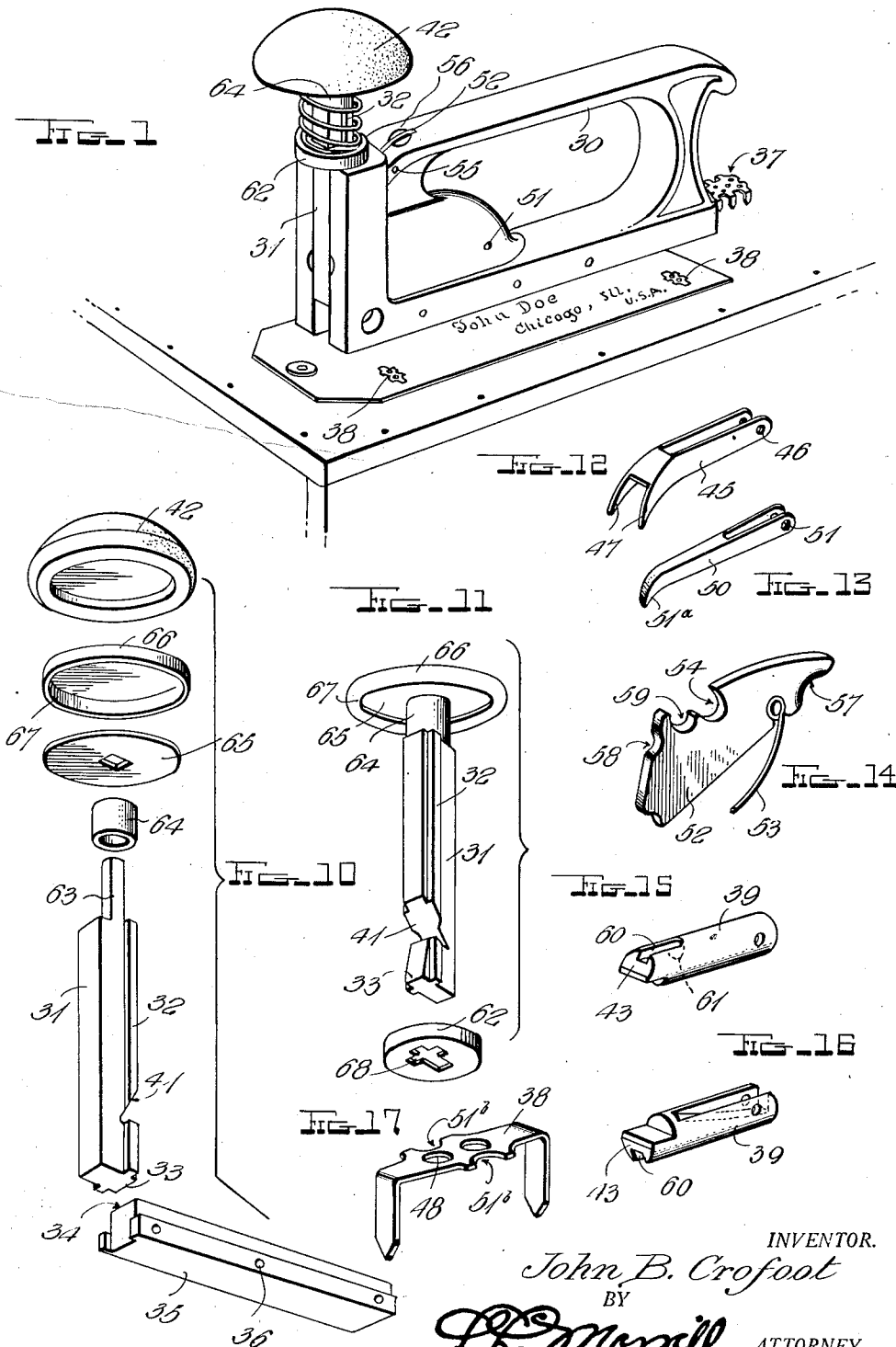
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J. B. CROFOOT

STAPLING MACHINE

Filed Feb. 18, 1924

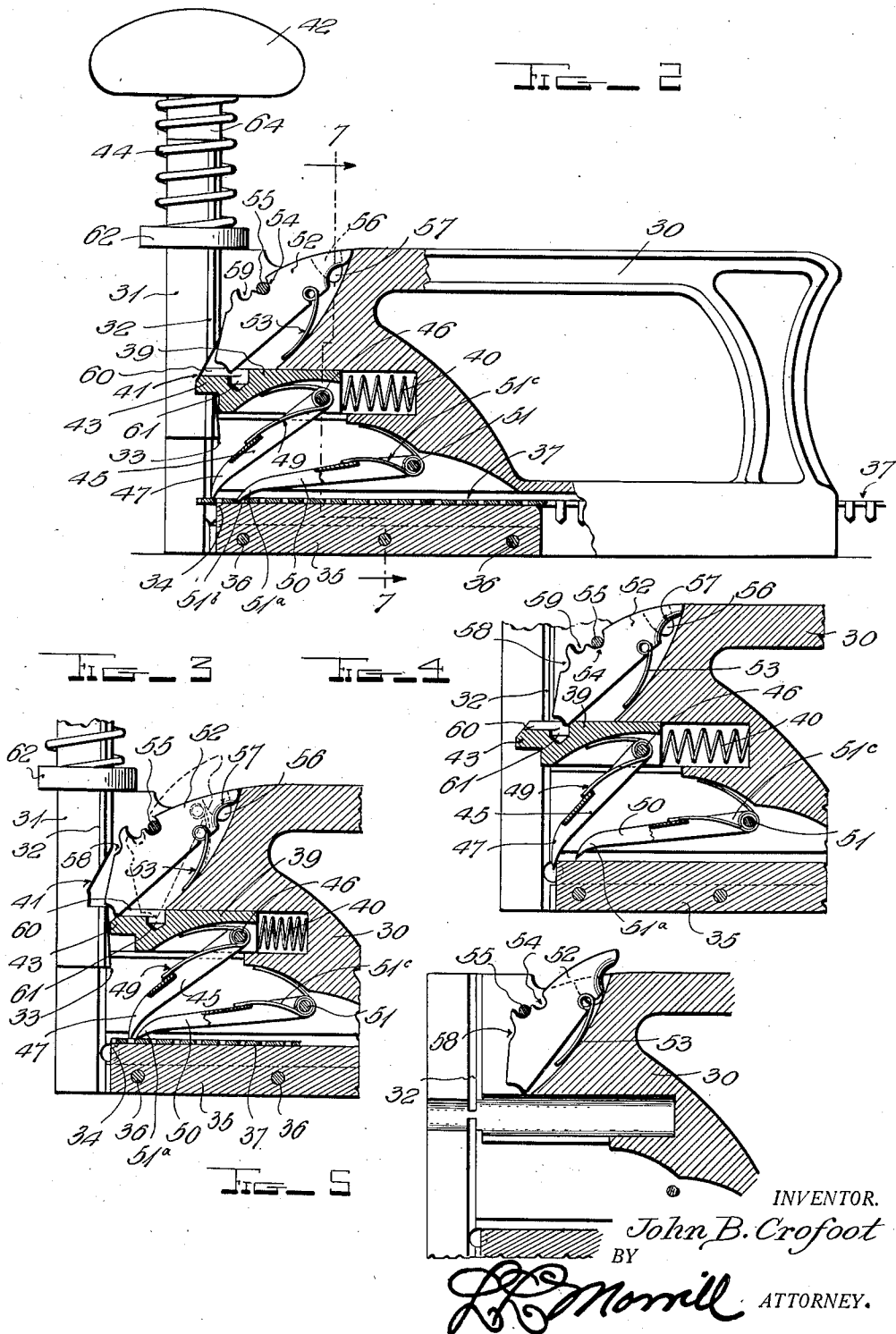
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STAPLING MACHINE

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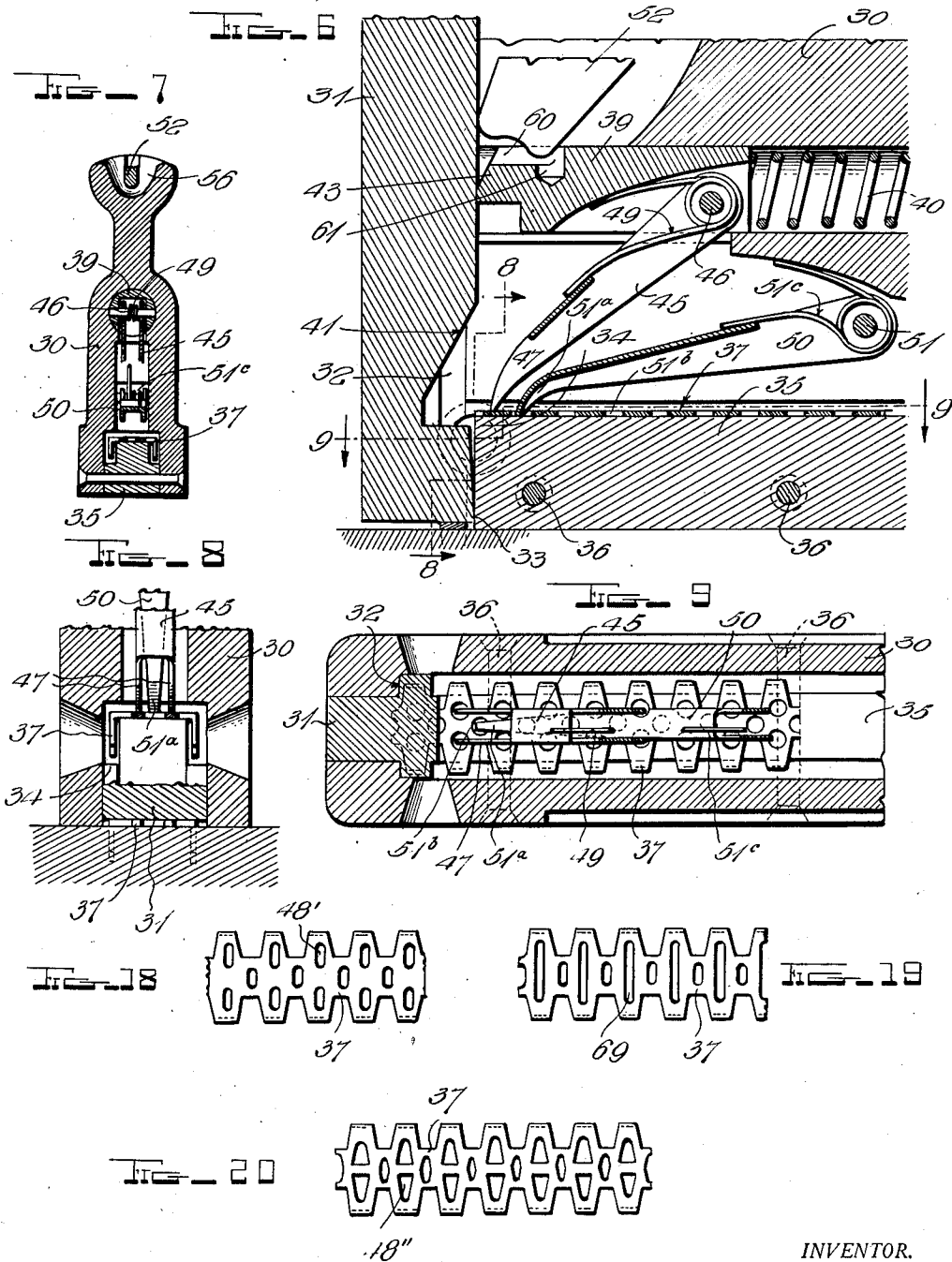
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3 Sheets-Sheet 3



INVENTOR.

John B. Crofoot

BY

R. B. Morrill ATTORNEY.

UNITED STATES PATENT OFFICE.

JOHN B. CROFOOT, OF CHICAGO, ILLINOIS.

STAPLING MACHINE.

Application filed February 18, 1924. Serial No. 693,612.

To all whom it may concern:

Be it known that I, JOHN B. CROFOOT, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Stapling Machines, of which the following is a specification.

This invention relates to stapling machines of the type employed for inserting staples into boxes or the like for stapling thereon address tags or labels and has for an object to provide a device having improved means for maintaining the parts in operative relation with a quick dissembling when dissembling is desired.

A further object of the invention is to provide improved means for preventing the dissembling of the parts when some of the movable parts have become clogged or otherwise impeded during the action of the several units.

A further object of the invention is to provide an improved type of staple strip feeding mechanism.

With these and other objects in view, the invention comprises certain novel parts, elements, units, combinations, functions and mechanical movements, as disclosed in the drawings, together with mechanical and functional equivalents thereof, as will be hereinafter more fully described and claimed.

In the drawings:

Figure 1 is a perspective view of the stapling machine.

Figure 2 is a view of the stapling machine, partly in side elevation and partly in vertical section showing the movable parts in position for forwardly feeding the staple strip.

Figure 3 is a fragmentary vertical sectional view showing the movable parts with the plunger released from engagement with the bolt.

Figure 4 is a vertical sectional fragmentary view showing the plunger removed and the feeding bolt restrained by the detent.

Figure 5 is a vertical sectional, fragmentary view with the plunger and feeding bolt removed.

Figure 6 is a vertical fragmentary sectional view with the parts shown in staple setting relation.

Figure 7 is a vertical transverse sectional view taken on line 7—7 of Figure 2.

Figure 8 is a vertical transverse sectional view taken on line 8—8 of Figure 6.

Figure 9 is a horizontal sectional view taken on line 9—9 of Figure 6.

Figure 10 is a perspective view of the plunger units disassociated and shown in its relation to the knife.

Figure 11 is a perspective view of the plunger complete and the spring supporting collar.

Figure 12 is a perspective view of the feed pawl.

Figure 13 is a perspective view of the feed detent.

Figure 14 is a perspective view of the latch.

Figure 15 is a perspective view of the feed bolt in normal position.

Figure 16 is a perspective view of the bolt inverted.

Figure 17 is a perspective view of one of the staple units.

Figures 18, 19 and 20 are plan views of various modifications of the staple units united into staple strips.

Like characters of reference indicate corresponding parts throughout the several views.

The improved stapling machine which forms the subject matter of this application comprises a frame 30 in which a plunger 31 is mounted for vertical reciprocation, any approved mechanical guides being employed as the tongue and groove connection 32. The plunger is provided at its lower end with a cutting corner 33 proportioned and positioned to co-act with the corner 34 of the knife 35 which is secured into the frame 30 by any approved means as by riveting at 36. The knife 35 also serves as a guide-way for the staple strip 37 which is inserted into the rear of the machine as indicated more particularly at Figures 1 and 2.

Means is provided for feeding forward this strip with a step by step movement corresponding to one unit of the strip, which is indicated in perspective at 38 in Figure 17. Such feeding means comprises a bolt 39 mounted to slide in the frame 30 and held normally outwardly into engagement with the plunger 31 by means of a spring 40. The plunger is provided with a notch having a cam face 41 so proportioned that, when it is depressed by applying manual pressure to the head 42, such cam face will

engage the cam extremity 43 of the bolt 39 and force the same rearwardly against the tension of the spring 40 but, when the plunger is raised by the spring 44 upon the release of pressure on the head 42, the bolt is moved forwardly by the spring 40 into the notch and engages the plunger to prevent its displacement from the frame.

The reciprocation of the bolt 39 is translated into feeding movement by means of a feeding pawl 45 pivoted to the bolt at 46 and provided with spaced extremities 47, properly proportioned to engage upon opposite sides of the center line and in the perforations 48 in the unit of the staple strip, the reciprocation of the bolt 39 being such as to move the pawl 45 forwardly at each reciprocation the distance of any one staple unit. A spring 49 is employed to maintain said pawl in yielding engagement with the strip to perform its function.

To prevent the retroactive movement of the strip with the return movement of the pawl 45, a feeding detent 50 is employed pivoted at 51^a to the frame and having a single point 51^b positioned to engage the perforation 51^b in the neck intermediate the units and held in yielding engagement by the spring 51^c.

As thus constructed, the device is an operative machine but, at times in the use of the device, the bolt 39 becomes jammed by the introduction of splinters and the like which prevents its return from the position shown at Figure 6 to the position shown at Figure 2, whereupon the spring 44 will throw the plunger 31 out of the frame. As this is undesirable, a latch 52 is provided, being held by a spring 53 with the notch 54 in pivotal engagement with the pin 55. When, therefore, the bolt 39 is held from forward movement as shown at Figure 3, the latch 52 will engage the notch in the plunger as shown in that figure and prevent its accidental removal from the frame, holding it in such position until the parts can be cleared for further action.

When, however, it is desired to remove the plunger for any reason, a wire, awl, nail or other convenient article will be inserted downwardly into the depression 56 in the top of the frame under the latch at the notch 57, lifting the latch to the dotted line position at Figure 3, thus forcing the bolt 39 backwardly and clearing the engagement with the plunger, whereupon the plunger will spring out under the impetus of the spring or may be removed manually. When so removed, the latch will assume the position shown at Figure 4 and will prevent the displacement of the bolt from the frame.

When, however, it is desired to remove the bolt from the frame, the wire or like implement is inserted through the space left vacant by the removed plunger into engage-

ment with the notch 58 and the latch as an entirety forced backwardly to the position shown at Figure 5 so that the notch 59 forms a pivot upon the pin 55, whereupon the socket for the bolt is clear as shown at Figure 5 and the bolt may be manually removed or will be forcibly discharged by the action of the spring 40. Such position is not intended for ordinary use but only in the case of assembling and disassembling the machine. The latch as an entirety may be inserted from below through the space from which the plunger and bolt have been removed or returned through that position to the position shown at Figure 5, whereupon the plunger may be put into position and the latch returned to normal as shown at Figure 4. By lifting the upper end of the latch as shown at Figure 3, the plunger may be returned to position. This provides for the quick assembling and disassembling of the several parts. To accommodate the lower end of the latch 52 in its swing about the pin 55 as a pivot, the bolt is preferably provided with a groove 60 terminating in a countersink or depression 61 which will accommodate the end of the latch in its extreme movement.

To support the spring 44, a collar 62 is provided bearing upon the frame 30. The plunger is preferably made up of a plurality of parts, the plunger proper 31 being provided with a reduced portion 63 upon which is fitted a collar 64 with a disk 65 bearing upon the collar with the end of the reduced part 63 upset to hold the parts rigidly together. A convex cap 66 is secured upon the disk 65 by spinning the flange 67 under the margin of the disk. Preferably also upon this a cushion or resilient cap will be employed indicated at 42 composed of rubber or some like material. This plunger as an entirety slides through with the collar 62, an opening 68 being employed to substantially fit the area of the plunger to provide for accuracy of movement.

It is believed that the manner of operating the device as an entirety and the manner of assembling and disassembling have been sufficiently and completely explained during the description of the construction and that further explanation of these functions will not be necessary. Suffice to say that, while a staple strip has been shown in use having circular perforations in the backs of the units and in the necks intermediate the units, such circular perforations are not essential as other perforations 48' or 48'', as shown at Figures 18 and 20, may be employed in the back, or they may be connected to form an elongated slot 69 as shown at Figure 19. Also, the perforations in the necks intermediate the units may assume any of the forms shown in said Figures 18, 19 and 20.

With either type of staple strip, the spaced points 47 of the feed pawl are adapted to engage in the perforations in the back of the unit and to move forward beyond the edge 34 of the knife, as indicated at Figures 2 and 4 whereby a more accurate forward feeding of the staple strips and especially the last one or two units may be accomplished and thus avoid clogging the machine.

What I claim to be new and desire to secure by Letters Patent is:

1. In a stapling machine, a frame, a plunger mounted to reciprocate in the frame, a feeding mechanism mounted to reciprocate in the frame and at its forward position to interlock with the plunger, and a latch inserted into the frame normally inactive but positioned to engage the plunger when released by the inaction of the feeding mechanism and adapted for swinging movement to another position to release the feeding mechanism from locking engagement with the plunger and for further movement to a position to release the feeding mechanism from the frame.

2. In a stapling machine, a frame, a plunger mounted to reciprocate in the frame, a feeding bolt mounted to reciprocate approximately perpendicular to the plunger and to be operated thereby and to lock the plunger against removal from the frame, a latch inserted into the angle between the plunger and the feeding bolt, and a pivotal connection between the latch and the frame, said latch being normally inactive but positioned so as to engage and restrain the plunger in case of inaction of the feeding bolt and to be manually moved to release the plunger from locking engagement of

the feeding bolt, and to be further manually moved to release the feeding bolt to permit removal thereof from the frame.

3. In a stapling machine, a frame, a plunger mounted to reciprocate in the frame, a feeding bolt mounted to reciprocate substantially perpendicular to and be reciprocated by the plunger and at its forward movement to lock the plunger against removal, and a member pivoted in the frame in position to be manually moved to remove the bolt from locking engagement with and permit the removal of the plunger.

4. In a stapling machine, the combination of a casing, a reciprocating plunger, a feeding mechanism actuated thereby, said feeding mechanism being adapted to retain said plunger within the casing when the same is in its inoperative position, and a latch constructed to retain the plunger within the casing when the feeding mechanism fails to perform this function and arranged for actuation to remove the feeding mechanism from retaining position to permit removal of the plunger.

5. In a stapling machine, the combination of a casing, a reciprocating plunger, a feeding mechanism actuated thereby, said feeding mechanism being adapted to retain said plunger within the casing when the same is in its inoperative position, and a latch constructed to retain the plunger within the casing when the feeding mechanism fails to perform this function and arranged for actuation to remove the feeding mechanism from retaining position to permit removal of the plunger and for actuation to release said feeding mechanism to permit removal thereof.

In testimony whereof I affix my signature.

JOHN B. CROFOOT.