

(No Model.)

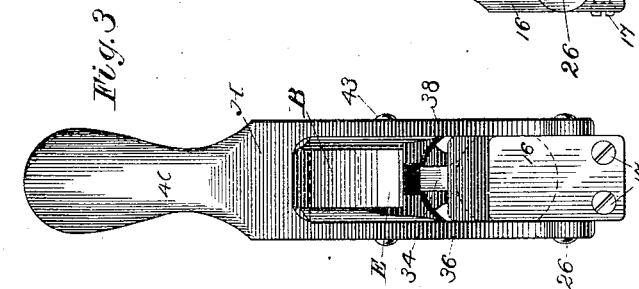
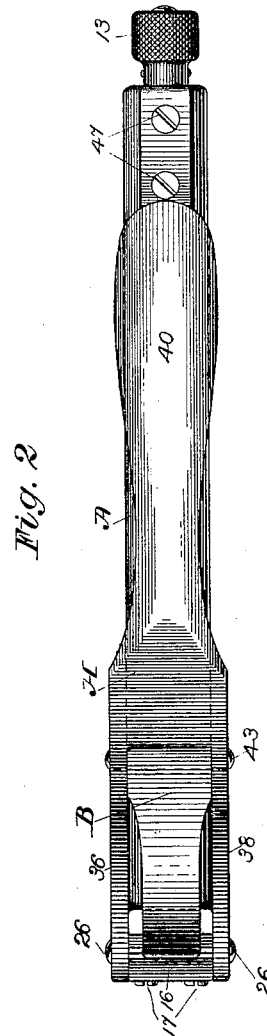
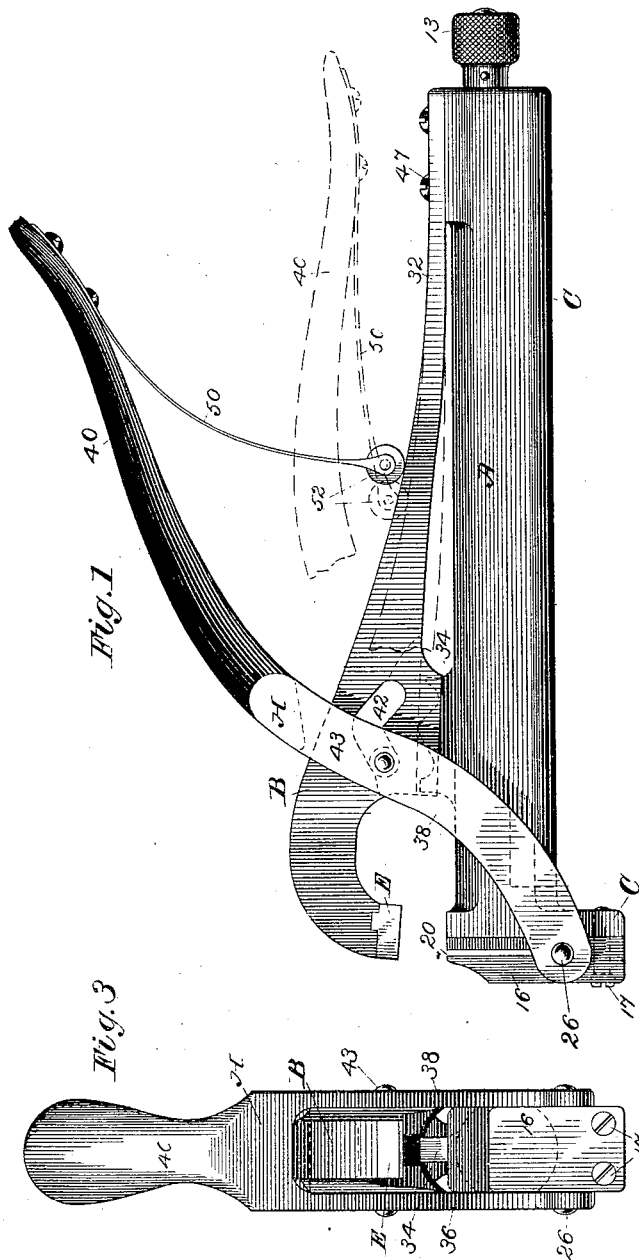
2 Sheets—Sheet 1.

F. H. RICHARDS.

BUTTON SETTING INSTRUMENT.

No. 348,236.

Patented Aug. 31, 1886.



Witnesses:

Frank H. Pierpont
C. E. Buckland.

Inventor:

Francis H. Richards

(No Model.)

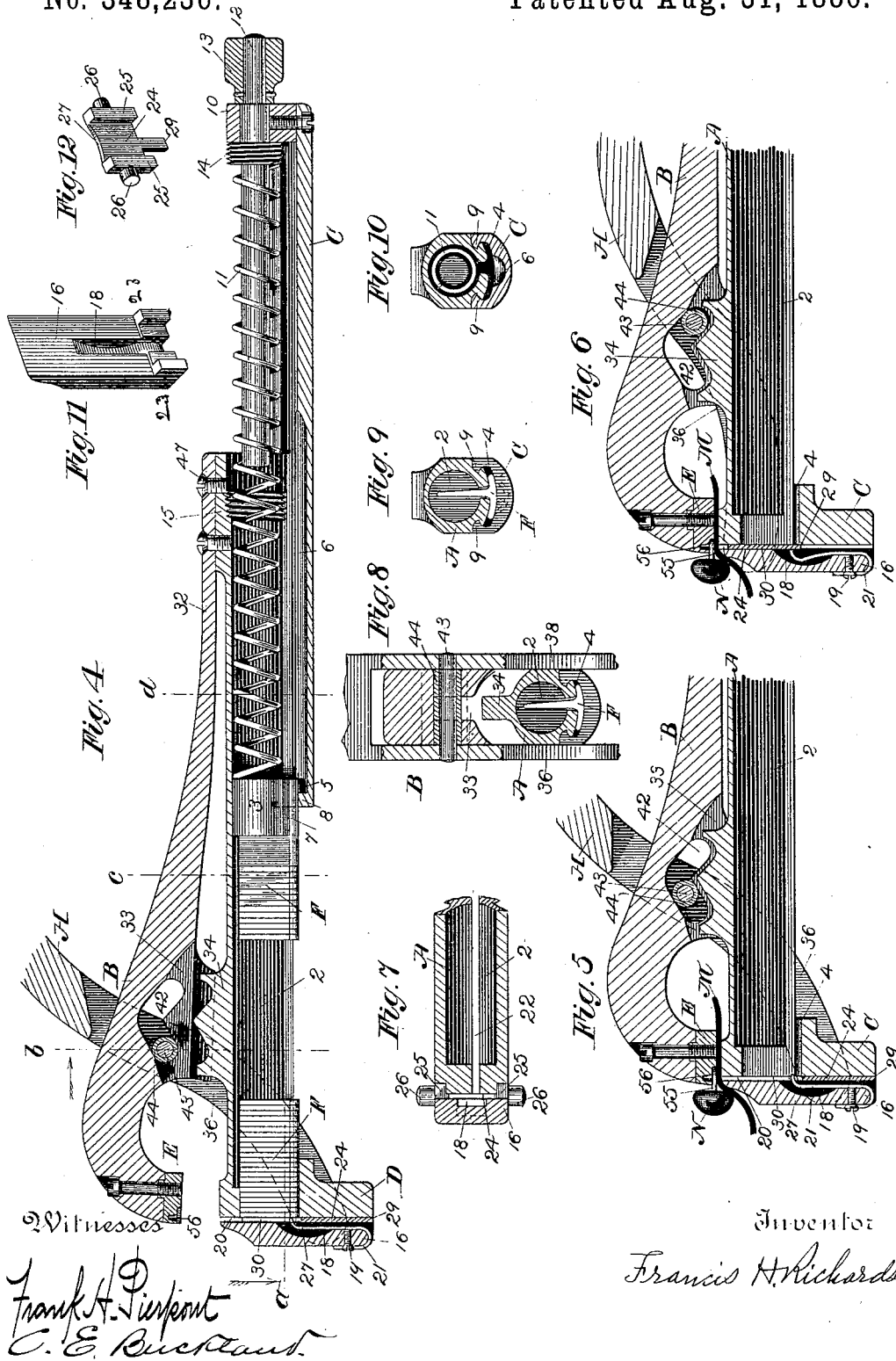
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UNITED STATES PATENT OFFICE.

FRANCIS H. RICHARDS, OF SPRINGFIELD, MASS., ASSIGNOR TO THE AMERICAN BUTTON FASTENER COMPANY, OF NEW BRITAIN, CONN.

BUTTON-SETTING INSTRUMENT.

SPECIFICATION forming part of Letters Patent No. 348,236, dated August 31, 1886.

Application filed February 9, 1886. Serial No. 191,363. (No model.)

To all whom it may concern:

Be it known that I, FRANCIS H. RICHARDS, a citizen of the United States, residing at Springfield, in the county of Hampden, State of Massachusetts, have invented certain new and useful Improvements in Button-Setting Instruments, of which the following is a specification.

This invention relates to improvements in instruments to be operated by hand for attaching buttons to shoes and fabrics by means of malleable pointed metallic fasteners, the object being to provide an instrument of that class which shall contain in a suitable magazine the fasteners to be used, and which shall have increased power toward the close of the setting operation, thereby requiring less stroke of the handle to produce a given effect.

To this end the invention consists in the improvements and combinations hereinafter described and claimed.

In the drawings accompanying and forming a part of this specification, Figure 1 is a side elevation of a button-setting instrument embodying my improvements. Fig. 2 is a top view of the same. Fig. 3 is a front elevation of the instrument, as seen from the left hand in Fig. 1. Fig. 4 is a longitudinal vertical section through the instrument, showing the parts in position ready for operation, with the exception that the magazine is here uncovered. Figs. 5 and 6 are two views, similar to Fig. 4, of the front part of the instrument, showing the parts in two successive positions during the setting operation. Fig. 7 is a horizontal section in line *a*, Fig. 4, showing a top view of the driver. Fig. 8 is a vertical section in line *b*, Fig. 4. Fig. 9 is a vertical section in line *c*, Fig. 4. Fig. 10 is a similar section in line *d*, Fig. 4. Fig. 11 is a perspective view of the side cap, showing the back side thereof. Fig. 12 is a similar view of the driver.

Similar characters designate like parts in all the figures.

This improved instrument comprises a frame containing the fastener-magazine and the driver-channel, and serving as one of the handles, a driver, a movable arm carrying the setting-die, and a handled lever operating the driver-arm. The frame-work consists of a

tubular or hollow case, A, grooved to receive the sliding cover C, and having a flange, D, carrying the front plate.

B designates a vertically-movable arm, which at its back end is attached to said frame, and at the front end is provided with the usual setting-die, E.

The case A has formed therein a suitable passage, 2, in which the follower 3 is fitted to slide, which follower has ribs 7, which extend through slot 22 into the magazine-groove 4, that is formed between the said case A and cover C, and has also a stop, 5, Fig. 4, working in a groove, 6, formed in the upper side of said cover. Said groove 6 terminates near the front of the cover, thus leaving a short part, 8, which, when the cover is drawn off, as in Fig. 4, serves as a hook to engage the stop 5, and thereby draw back the follower, as shown in said figure.

The cover C is constructed to be drawn off, as shown, for the purpose of replenishing the supply of fasteners F in the magazine, the instrument being inverted during this operation. Said cover has in its preferred form (shown best in Figs. 4 and 8 to 10) two inwardly-projecting ribs, 9, of any convenient shape, sliding in corresponding grooves in case A. At its back end said cover has a bearing, 10, carrying the spindle 12, which serves to lock and unlock the cover, and, when this is opened, as a guide for the magazine-spring 11. Said spindle is furnished with some means—as, for instance, the milled head 13—whereby it may be turned by the operator using the instrument, and with a threaded collar, 14, which, when the cover is closed, is screwed into the nut 15, Fig. 4, and thus securely locks the magazine. Having opened the magazine, as in Fig. 4, and supplied it with fasteners, the operator forcibly slides forward the cover, thereby compressing the spring 11 between collar 14 and follower 3, at the same time screwing the collar into said nut 15, when the parts will appear as in Fig. 1.

The magazine at its front end opens into a vertical driver-channel, 20, formed between the vertical front surface of a case, A, and the similar back surface of front plate, 16, which plate is secured to flange C by screws 17, and has a space or cavity, 18, for the reception of

a detent-spring, 21, which is fastened to said plate by screw 19. The driver is a thin plate or blade, 24, constructed to slide closely but freely between said surfaces, and has in its preferred form, Fig. 12, side frame, as best shown in Fig. 7. These flanges serve as ribs to stiffen the driver-blade and prevent lateral movement thereof, but also form a sufficient support for the projecting trunnions 26, whereby said blade is operated. The driver-point 27 is shaped to conform to the head of the fastener used, and the whole blade should be slightly less in thickness than such fastener, to secure free working of the instrument. In its lowest position the driver stands with its point just below the magazine-groove, as in Fig. 4, the lower end thereof resting on surfaces 28, Fig. 11, which thus serve as stops limiting its downward movement. The driver being very short vertically, it has a downward continuation, 29, which, when the driver is down, lies in a notch in cap 16, and when it is up forms a guard in front of the magazine, to prevent any fasteners getting into the driver-channel below the driver. This particular improvement has, however, been described and claimed by me in another application of even date herewith. By using said device the depth of the front part of the instrument may be made less than otherwise, thereby adapting it for setting buttons on small-sized shoes, since this part is put within the shoe when attaching the lower buttons.

To prevent the accidental displacement of the foremost fastener, 30, which stands in channel 20 above the driver, a detent-spring, 21, is provided and secured, as above described, to plate 16, the point projecting above the fastener-head at one side (or on both sides, if preferred) of the prong. On moving up the driver the fastener is forcibly carried under the point of the spring, which then rests on blade 24, and, later, on the projection 29, as in Fig. 6. This particular improvement I do not broadly claim herein, having described certain forms thereof and claimed them in a prior application, No. 176,598. The detent constructed as therein shown and described is not, however, so readily applicable to this hand-instrument as the improvement thereon herein described. The arm B may be pivotally connected to the case A, and normally held down by a separate spring; or it may be (and preferably) fastened, by screws 47 or otherwise, to the back end of said case, as herein shown, the part at and near 32 being then a spring normally holding the arm down. By this construction and arrangement of the parts the said arm serves as a clamp to hold the fabric M over the driver-channel during the setting operation. For preventing any objectionable lateral movement of the setting-die during said operation, said bar has in its under side a slot, 33, into which guide 34 fits closely when the arm is closed. The arm B and the driver are both operated by a lever, H, having a handle, 40, which lever is bifurcated, its

two arms, 36 33—one on each side of case A—being pivoted on aforesaid trunnions 26.

For operating arm B, and to furnish a fulcrum for the hand-lever, said arm has a slot, 42, and the lever-arms have a pin, 43, which (with or without roller 44) works in said slot 42. In shape this slot may be a straight one situated parallel to frame A; but in this case no increase of power is obtained when the handle is nearly closed. To secure this result, which, as above stated, is one of the objects of my present invention, I make said slot in the shape of an obtuse angle pointing upward, as shown in the drawings. This shape may, however, be modified as to the particular angles and proportions, and one or both sides thereof may be slightly curved in one or the other direction; but I have found by practical experiment, as well as by geometrical delineations, that the form shown is suitable and efficient for the purpose intended. Lever H being pivoted on the driver, and this moving vertically, the pin 43 must necessarily move toward the right hand when the driver is raised, this circumstance making it possible to modify the upward movement of said driver relative to the downward movement of handle 40 by means of the cam-shaped slot 42. When the handle is wide open, pins 26 are the fulcrum on which it turns to close the arm B, after which pin 43 acts as the fulcrum for raising the driver. At the beginning of this closing movement pin 43 moves up the inclined slot, thus accelerating, while toward the close it moves down the opposite incline, thereby retarding, the driver's motion. The stroke of the handle is shown in Fig. 1, where its closed position is represented in dotted lines. Here, too, is illustrated the operation of the spring 50, which is arranged in a peculiar manner for the purpose of opening the hand-lever and arm B. The spring being attached to the outer end of handle 40, it acts, when the handle is closed, as an ordinary spring; but when said handle is opened, or nearly so, it takes a position more nearly at right angles to the lever and arm B, thus acting, on the well-known toggle-joint principle, to open said parts with greatly-increased force. The working end of the spring is preferably furnished with an anti-friction roller, 52, to increase its efficiency. This end of the spring is made to bear on arm B, instead of on case A, so that when said arm is closed, as in Fig. 5, the pressure of said spring will assist in holding it closed. Furthermore, the spring standing so far back when the handle is up prevents it from acting forward of the operator's hand to throw up the driver too quickly—that is, the forward end of the spring does not at any time become the fulcrum on which the lever swings.

The operation of my improved button-setting instrument, and especially the operation of the details thereof, will be readily understood from the drawings and preceding description. In using the instrument, the magazine being first properly supplied, a fabric or

other material, M, is placed in position over the driver-channel. The operator then partly closes the handle, thereby allowing arm B to close down and hold said material in place.

- 5 A button, N, is now put with its shank 55 under the concave part 56 of the die, after which the handle is further closed, first to quickly drive the fastener-prong up through the material and button-shank to the die, and next
10 to more forcibly and slowly drive it against said die to turn it over into a hook holding the button in place, after the manner of other machines for setting this class of button-fasteners. This operation being completed, the
15 lever H and the parts operated thereby are allowed to resume their first position, being returned by the spring, as above described, ready for the next operation. It will of course be understood that this instrument, and especially the minor details thereof, is capable of modification in various ways and degrees, after the manner of machines in general, without departing from my invention.

Having thus described my invention, I
25 claim—

1. In a button-setting instrument, the combination, substantially as described, of a frame containing a magazine, a front plate attached to said frame at a distance below said magazine, there being a driver-channel between said
30 frame and front plate and open at the sides thereof, into which the magazine opens, and a driver in said channel operated by trunnions projecting through said open sides, all arranged substantially as shown and described.

2. The combination of frame A, having the fastener-magazine, front plate, 16, having space 18, detent-spring 21, affixed to said plate, and
40 driver 24, substantially as described.

3. The combination of the case A, having nut 15, cover C, sliding on said case, and hav-

ing bearing 10, and spindle 12, having thread 14, substantially as set forth.

4. The combination of case A, cover C, sliding on said case, follower 3, spindle 12, and spring 11, all constructed and arranged substantially as described.

5. The combination of a frame having a driver-channel, a driver in said channel, arm B, attached to said frame, and having a slot, substantially as described, lever H, pivoted at one end on the driver, and having a pin working in said slot, and means, substantially as described, operating the lever, all operating
55 substantially as set forth.

6. The combination of frame A, having a driver-channel and driver, substantially as described, arm B, having the cam-shaped slot 42, and lever H, connected to the driver and having a pin operating in said slot, substantially
60 as and for the purpose described.

7. The combination of frame A, having a driver-channel and driver, substantially as described, arm B, normally held closed, and having a slot, substantially as described, lever H, pivoted to said driver and having a pin operating in said slot, and spring 50, all operating substantially as and for the purpose described.
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8. The combination, in a button-setting instrument of the class described, with a frame having a driver-channel and driver, substantially as described, and having guide 34, of the arm B, rigidly connected to said frame and fitting over said guide, said arm having the
75 spring part 32, and carrying a setting-die above said channel, and means, substantially as described, operating said arm and driver, substantially as described.

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