F. E. STANLEY & G. R. LEGGETT.

BUTTON SETTING MACHINE.

APPLICATION FILED MAY 10, 1915.

1,183,822.

Patented May 16, 1916.

4 SHEETS—SHEET 1.

Fig. 1.

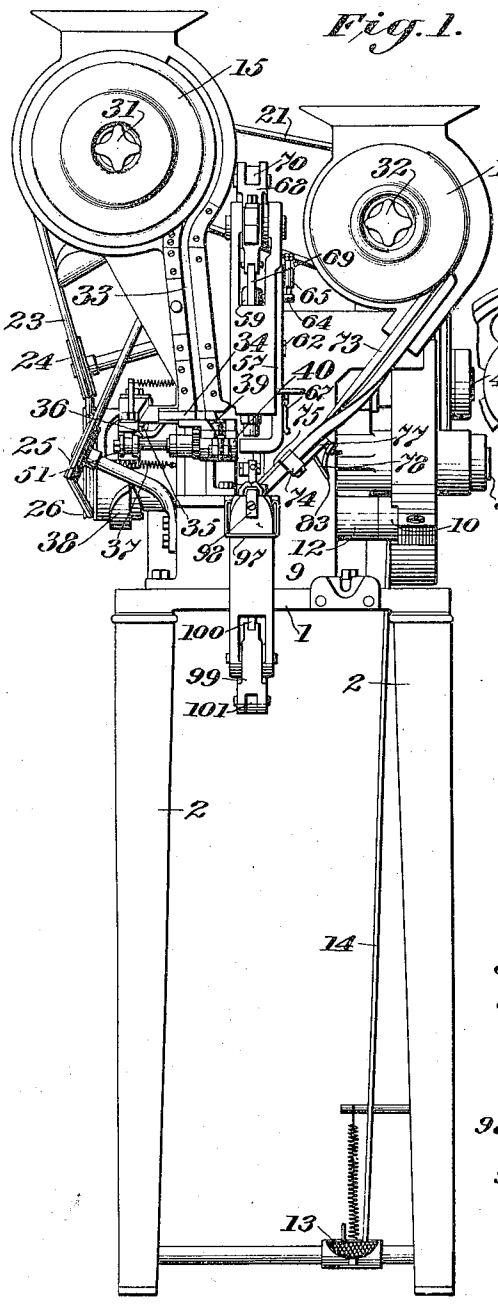


Fig. 2.

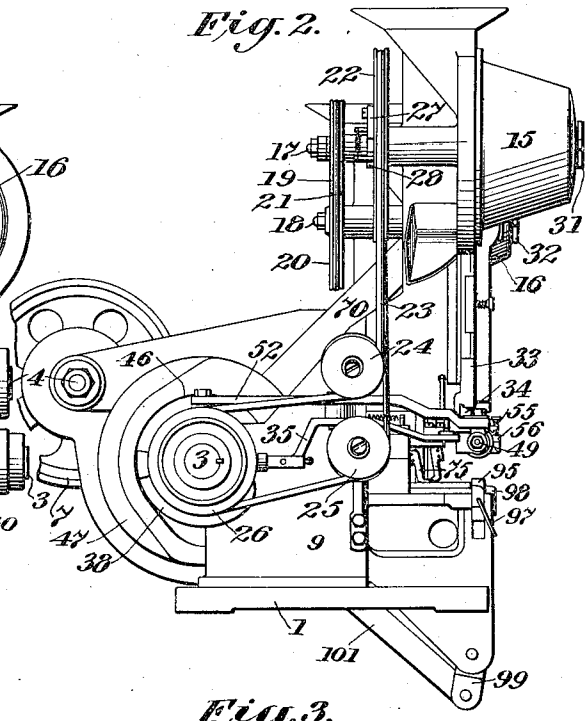


Fig. 3.

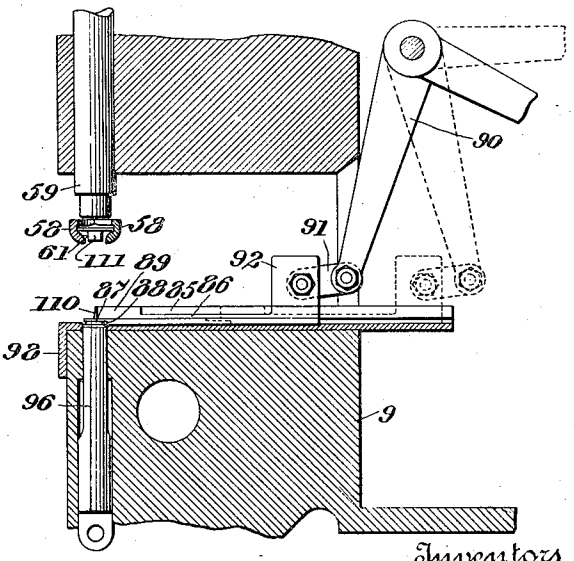


Fig. 4.



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4 SHEETS—SHEET 2.

Fig. 5.

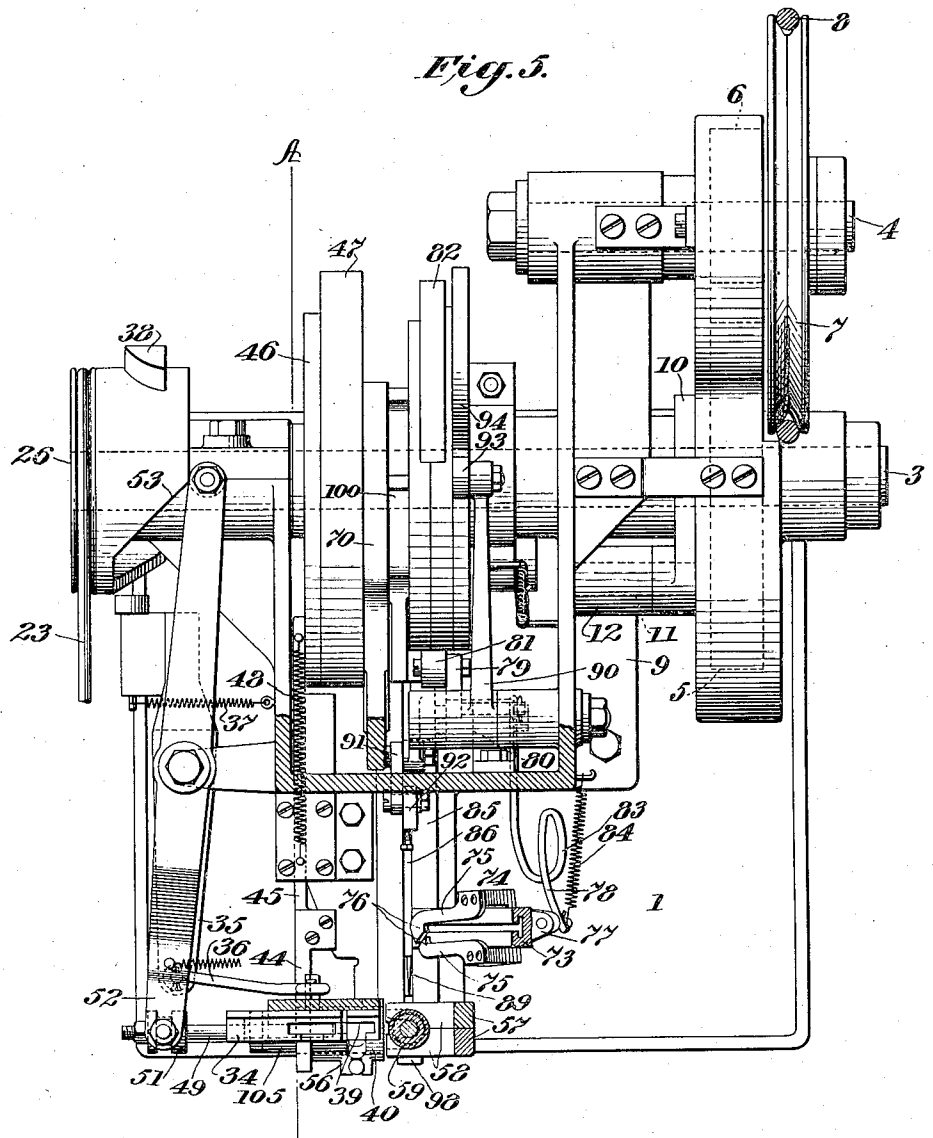
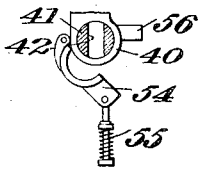


Fig. 7.



B

Fig. 6.

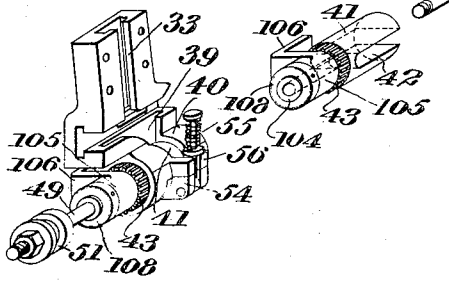
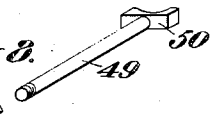


Fig. 8.



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4 SHEETS—SHEET 3.

Fig. 9.

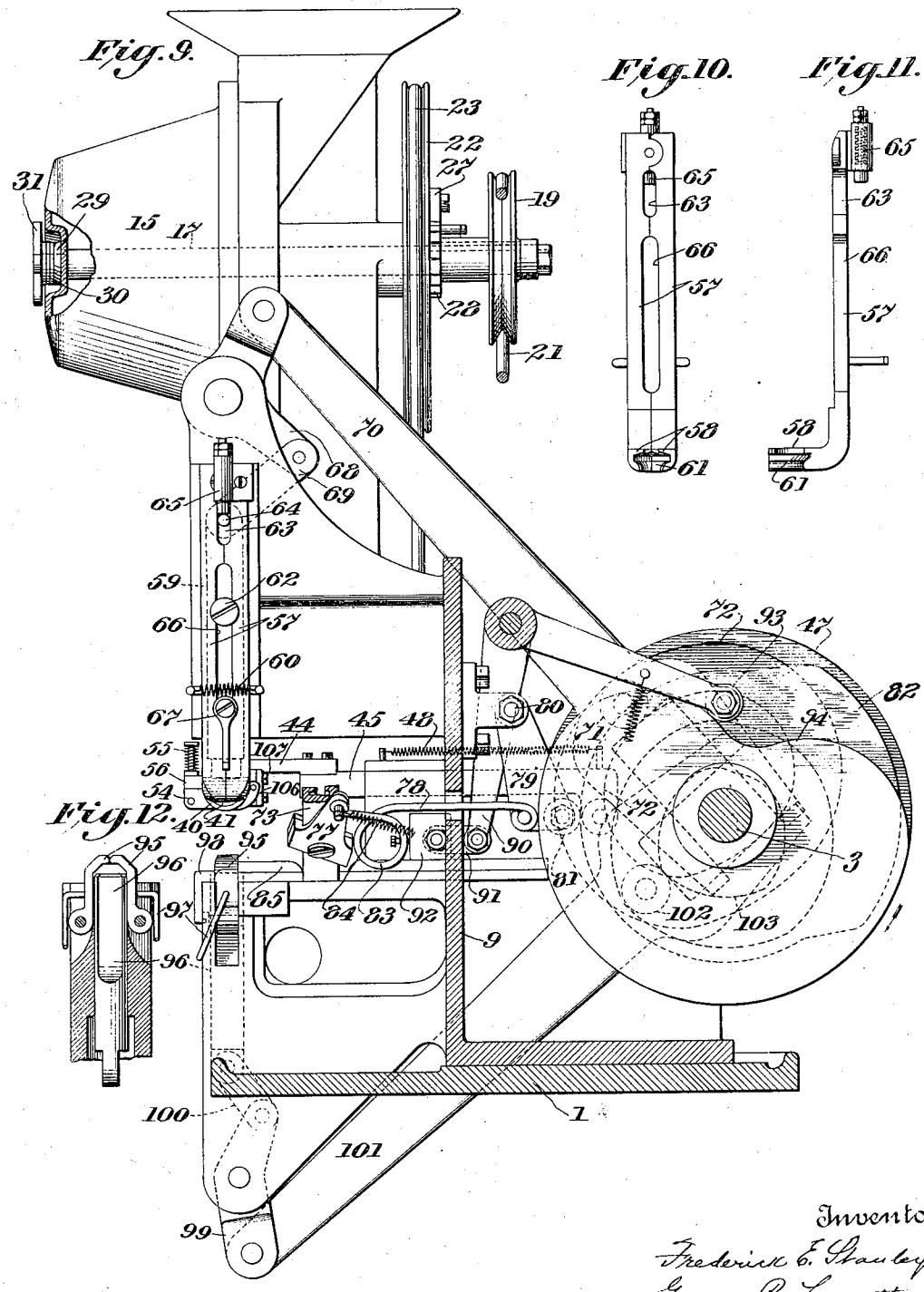


Fig. 10.

Fig. 11.

Fig. 12.

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4 SHEETS—SHEET 4.

Fig. 13.

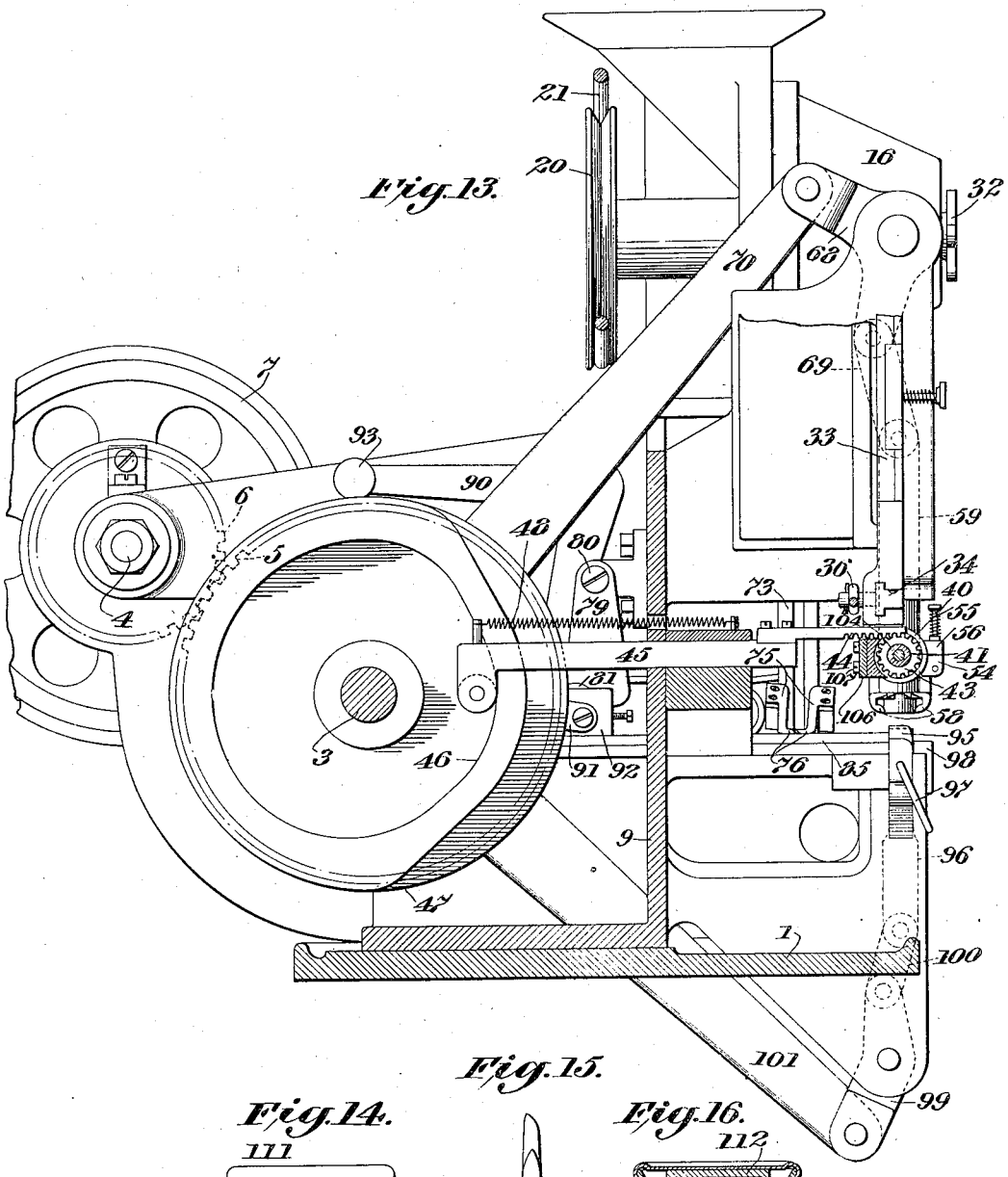


Fig. 15.

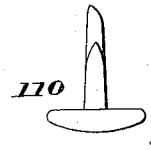


Fig. 14.

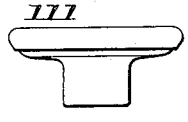
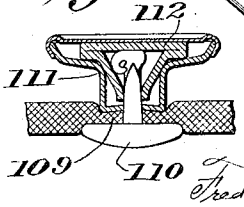


Fig. 16.



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UNITED STATES PATENT OFFICE.

FREDERICK E. STANLEY AND GEORGE R. LEGGETT, OF WATERBURY, CONNECTICUT, ASSIGNORS TO SCOVILL MANUFACTURING COMPANY, OF WATERBURY, CONNECTICUT, A CORPORATION OF CONNECTICUT.

BUTTON-SETTING MACHINE.

1,183,822. Specification of Letters Patent. Patented May 16, 1916.

Application filed May 10, 1915. Serial No. 27,042.

To all whom it may concern:

Be it known that we, FREDERICK E. STANLEY and GEORGE R. LEGGETT, citizens of the United States, residing at Waterbury, in the county of New Haven and State of Connecticut, have invented a certain new and useful Improvement in Button-Setting Machines, of which the following is a full, clear, and exact description.

The object of this invention is to provide a power machine for setting tack-fastened buttons on garments and other articles rapidly and accurately.

In the preferred construction, the buttons are fed from above, and the tacks supplied from below the article to which they are to be attached, and the article moved by hand between them to space the successive buttons properly thereon.

The invention consists of a button feeding and delivering mechanism, whereby a button fed edgewise, for example, is righted, that is to say, given a quarter turn over into a horizontal position, with its hub down, and in this position or angular relation transferred to means by which it is presented to the fastener-applying mechanism to be set, as we will proceed now to explain and finally claim.

In accordance with the requirement of the Patent Office the claims for the button turning mechanism are divided out of this case and form the subject of our case filed November 13, 1915, Serial No. 61,326, and the claims for the tack-feeding mechanism are likewise divided out of this case and form the subject of our case filed November 13, 1915, Serial No. 61,327.

In the accompanying drawings illustrating the invention, in the several figures of which like parts are similarly designated, Figure 1 is a front elevation. Fig. 2 is a left-hand side elevation of the upper parts of the machine. Fig. 3 is a detail in vertical section of parts of the button and tack mechanism. Fig. 4 is a perspective view of the tack-positioning slide. Fig. 5 is a horizontal section below the magazines or hoppers, on a larger scale. Fig. 6 is a perspective view of the button righting device. Fig. 7 is a side elevation of part of the bearing for the button righting device open to gain access to such device. Fig. 8 is a perspective view of the button righting cylinder and the button ejector separated. Fig. 9 is a vertical section taken to the right (Fig. 1) of the setting mechanism and on a larger scale. Fig. 10 is an inside elevation of the button holder, and Fig. 11 is a side elevation of one of the two fingers of the button holder. Fig. 12 is a sectional elevation of the tack holder and plunger. Fig. 13 is a vertical section taken in the plane of line A B, Fig. 5, looking toward the right, but showing the parts in position when the button has been set. Fig. 14 is an edge view or elevation of one form of button which the machine shown is designed to set; Fig. 15 is an elevation of a fastening tack, and Fig. 16 is a cross-section of a button set on a piece of fabric.

1 is the bed-plate or table, mounted upon legs or frames 2.

3 is the main-shaft from which the various moving parts are driven. This shaft may be and preferably is connected with a drive-shaft 4 by reducing gearing 5 and 6 for the purpose, among others, of running the machine at high speed. The shaft 4 is provided with any suitable means, preferably a band-pulley 7, for application of power by means of a round belt 8. The shafts 3 and 4 are mounted in bearings in a head 9 erected on the bed-plate or table 1, and the gear 5 is arranged loosely upon its shaft 3 with any suitable friction or other clutch (not shown) interposed between the shaft and gear and operated by any suitable means to cause the gear to turn with the shaft, as by a lever 10 pivoted on stud-shaft 11 mounted in boss 12 on the head, and connected with a treadle 13 by a rod 14, but other suitable means may be used for starting and stopping the machine instantly.

The driven parts of the machine derive motion from the main-shaft, as will appear more fully in the progress of this description, and we have found that the high speed required and the necessary control of the machine are best obtained by applying the power by what is commonly called a round belt not directly to the main shaft 3 but to a driving shaft 4, and gearing these shafts by a two to one or other desired train of gears 5, 6, the main shaft having the stopping and starting mechanism applied to it.

The button magazine or hopper 15 and

the tack magazine or hopper 16 are mounted upon the head in any suitable manner, and at any suitable angle, and so as to be capable of being turned to effect the discharge of their contents. Preferably these magazines have their shafts 17 and 18 respectively extended rearwardly and supplied with band-pulleys 19 and 20 respectively, which are fast on their shafts and are connected by the band 21, so as to turn in the same direction. The shaft 17 is driven by a pulley 22 connected by a band 23 passing over direction idlers 24 and 25 to a driving pulley 26 on the main-shaft. The pulley 22 is loose on shaft 17 and carries a pawl 27 which engages a ratchet 28 fast on shaft 17. The button hopper or magazine is loose on its shaft but is held frictionally to turn with it by any suitable means, such as the spring 29 and the washers 30, which latter are keyed to turn with the shaft and the nut 31. By these means the button and tack magazines may be turned by hand, independently of the driving pulley 22, so as to remove obstacles and provide for emergency filling, and the filling of the raceways leading from the magazines to the setting devices, whenever they become empty or insufficiently filled. The tack hopper may be secured to its shaft in any suitable way to turn with it as desired, and we have shown a nut 32 as the means for retaining it upon its shaft.

The buttons are discharged from the magazine into a raceway 33 depending therefrom, with their hubs outermost, and must be turned for setting purposes, so as to present their hubs lowermost and vertically. The lower end of the raceway is intercepted transversely by a reciprocating cut-off 34, actuated by a rock-lever 35 pivoted on the head of the machine, a connecting link 36, a spring 37 and a cam 38 on the main shaft, to deliver one button at a time, and below this cut-off is an offset raceway 39 which opens into a transversely arranged casing 40, in which is arranged the button-turner that receives the button edgewise from the raceway and gives it a quarter turn so as to present its hub vertically downward. This turner comprises a cylindrical piece 41, having a diametrical opening or slot 42 at one end, of a size sufficient to receive the button edgewise, and it is provided with circumferential spur-teeth 43 outside of the casing which are engaged by a toothed rack 44 on a longitudinally reciprocating bar 45 mounted in the head of the machine at the rear of the turner and actuated by a cam 46 on the cam-carrier 47 fast on the main shaft, and a spring 48. By this means the turner is turned with its opening vertical to receive a button edgewise from the raceway and then it is turned a quarter turn so as to move the button from a vertical to a horizontal position with its hub down and in the position it must have in order to be set. The turner piece 41 is bored longitudinally and in this bore is mounted a stem 49 having the transverse head 50 curved on its face to conform to the curvature of the rim of the button-head. The stem projects out of the toothed end of the turner device and its head works in the opening or slot 42. The stem is provided with an adjustable grooved collar 51 which is engaged by a tracker pin on a shifter lever 52 pivoted on the head of the machine and having a cam roller engaged by a cam 53 on the main shaft, so that when the machine is running the stem and its head will be given a longitudinal reciprocating movement in the turning device to eject the turned or righted button therefrom, and because of this function the stem and its head are herein referred to as an ejector. The cams 38 and 53 may be and are here shown as one structure. In order to obtain access to the turner to remove a defective button and for other purposes, the bottom of the casing is made with a hinged gate 54 provided with a pivoted spring or other effective latch 55 engaging a slotted keeper projection 56 on the casing,—see details Figs. 6, 7 and 9.

By means of the button-turner or button-righting device described, the positioning of the button is removed from the uncertain automatic action of the prior art raceways, to a certain and positively acting mechanism, with the result, among others, that the speed or capacity of the machine is greatly increased, and its operation attended by relatively few misplaced or improperly set buttons.

The buttons are delivered, one at a time, to the spring closed fingers 57, mounted upon the side of the head and having their lower ends 58 turned toward the turner last described. These fingers are hinged together at their upper ends so as to be capable of parting or separating at their inturned lower ends to permit the movement ment therethrough of the vertically reciprocating setting anvil 59 and the discharge therefrom of the button being set, and these fingers are held in operative relation by a spring 60. The inturned ends of the fingers are undercut at their outer portions transversely to the vertical anvil passage, to form a pocket 61, of substantially the profile of the button, into which the buttons are successively ejected by the ejector; and by means of this pocket the button is held in the fingers against the possibility as well of misplacement as of accidental displacement. The fingers are held in longitudinally sliding engagement with the head by a screw 62, the head of which is large enough to overlap the fingers at their greatest lateral

separation in operation. The upper portions of the fingers are cut away to form an intermediate slot 63 and into this slot projects a pin 64 fast on the anvil. Above the pin is an adjustable spring adjusting device 65 on the fingers, to adjust the finger-ends to the turner and take up any shock. The anvil 59 in its descent comes into contact with the finger-ends and carries said fingers down with it until said fingers reach the limit of their downward movement, which is determined by the relation of the screw 62 to the slot 66 between the fingers in which it is arranged. The finger-ends are moved by the anvil into a position lower than that of the turner, and then the further descent of the anvil and its consequent ejection of the button cams the fingers apart under resistance of their spring, and the button is in position to be set. After the button is set the anvil is retracted and as it rises and the pin 64 comes into engagement with the adjusting device 65, the fingers are returned to normal button-receiving relation to the turner and ejector. This return movement of the fingers is arrested by the bottom of the slot 66 coming into contact with the emergency finger-opening cam lever 67. This cam-lever 67 is pivoted to the head so as to operate within the slot 66 to separate the fingers whenever desired. When in this position the turner opening or slot 42 is in horizontal alinement with the pocket 61 in the finger-ends and the ejector is in position to eject the button from the turner into the pocket in the fingers.

The anvil may be operated by any suitable means, such as a bell-crank lever 68 mounted in the head and connected with the anvil by a link 69, the lever 68 being actuated by a connecting rod 70 extending thence rearwardly and forked to straddle the main shaft and having a cam-roller 71 engaged by a cam 72 fast on said main shaft which imparts a compound longitudinal and rising and falling motion to the connecting rod and a rocking motion to the bell-crank lever 68.

The tack magazine has a raceway 73 made with a twist so as to receive the tack heads on edge from the magazine and turn the tacks point up before they reach the cut-off 74. This cut-off has two fingers 75 having their tips 76 extending toward one another across the raceway, and these fingers are fast on a rock-lever 77 pivoted on the back of the raceway and connected by a rod 78 with a vibrating arm 79 pivoted at 80 to the head and having a cam-roller 81 engaging a cam 82 fast on the main shaft. In order to prevent breaking of parts in the event of jamming the raceway or cut-off, the rod 78 has a coil 83 formed in it to serve as a spring which will yield under such jamming and thus prevent breaking any of the parts. The rock-lever 77 and its fingers 75 may be returned to position by a spring 84 fastened to said lever by one end and to the head by the other. The tacks are delivered one by one to a feed trough 85 arranged in the head beneath and in line with the anvil, and in this feed trough is a slide 86 having the pair of parallel fingers 87 to straddle the tack point, and undercut to afford a recess 88 to receive the head of the tack, and an upstanding fin 89 to keep the tack point upright. This slide constitutes the tack ejector. The slide is reciprocated in the feed-trough by means of a bell-crank 90 pivoted on the machine head and having one arm connected by a link 91 with an upstanding lug 92 on the slide, and another arm provided with a cam-roller 93 engaging a cam 94 fast on the main shaft. The tack ejector delivers the tack to fingers 95 pivoted to the head adjacent to the setting die or plunger 96, these fingers being yieldingly connected, as by a bow spring 97. A stop 98 prevents the escape of the tack and also serves to position it on the plunger.

The plunger 96 is vertically reciprocated in the head and between the yielding fingers 95 by a bell-crank lever 99 pivotally mounted in an extension of the head beneath the bed-plate 1, and connected with the plunger by link 100, and having a connecting rod 101 provided with a forked end which straddles the main shaft and is provided with a cam roller 102 engaged by a cam 103 fast on the main shaft.

We have herein referred to the cams 82, 94 and 103 as though each were a separate structure, as they may be, but they are herein shown as combined in one structure. These and other details of construction and operative parts are variable at the pleasure of the machine builder, so long as the effective coöperation and coördination of parts are concerned and the principle of the invention followed. Again, it is to be noted that we have described the button turner in broad terms, in order to emphasize the fact that we do not wish to be considered as limiting our invention to details. In the drawings, however, one construction only is shown, and this illustrates the cylindrical piece 41 as having a reduced portion 104 next to the teeth 43 and fitted in a sleeve 105 having a rear extension 106 fixed to the back of the casing, as by screws 107. This cylindrical piece is held in the casing and sleeve by the collar 108 fixed to the reduced portion 104 outside the sleeve. The casing in this instance is a part of or attached to the lower end of the button raceway. The teeth 43 may be cut in the piece 41 as shown, or otherwise provided.

The operation would appear to be sufficiently indicated in and by the foregoing.

However, it may be briefly stated that, the respective magazines being supplied with buttons and tacks and the machine started, the buttons and tacks are fed one by one to their respective delivery points. The article to be supplied with buttons, represented at 109, Fig. 16, is passed by the operator between the anvil and plunger and arrested momentarily beneath the anvil. The tack 110 is first positioned over the plunger, point up, and held by the fingers 95, and the tack ejector recedes to take its place for the next tack. Then a button 111 is righted, transferred to the pocket in the fingers 57 and carried down by the fingers and anvil toward the tack and the plunger is caused to ascend and pass the tack point through the article and into the combined anvil and filler 112 in the button wherein it is clenched and the button so set. Then the parts reverse, the article is moved along to a point where another button is to be attached, and the operations repeated. The spring fingers 95 yield in the direction of movement of the article and thus offer no obstacle to the release of the set tack, but rather facilitate it.

As already sufficiently indicated, the invention contemplates such changes as will meet the requirements of the user, the kind or type of button to be set, and the kind or type of tack or fastener.

What we claim is:

1. In a button setting machine, the combination with a button supplying means, a tack supplying means, and means to unite the buttons and tacks upon an interposed article, of a button turner adapted to receive the buttons one at a time and turn them aright for subsequent discharge therefrom and application of the tack, means to receive the buttons from the turner and position them for setting, and an ejector mounted on the turner in permanent alinement with its discharge end for transferring the righted button from the turner to the positioning means.

2. In a button setting machine, the combination with a button magazine, and a raceway for conducting the buttons therefrom, of a rotary reciprocating button turning device intercepting the raceway at its delivery end and adapted to turn the buttons one at a time right side up, a setting mechanism, means to receive the button from the turning device and present it to the setting mechanism, and a reciprocating ejector arranged in and carried by the turning device and serving to transfer the righted button from the turning device to the presenting means.

3. In a button setting machine, the combination of a magazine button feed, including a delivery raceway in which the buttons feed edgewise, means to receive and right the buttons arranged transversely at the delivery end of the raceway and including a cylinder having a diametrical opening at one end into which the buttons fall, spur-teeth on the cylinder, a toothed rack engaging said teeth to turn the cylinder a quarter turn to change the position of the button, an ejector arranged in and carried by the cylinder and having a head in the opening therein and a stem projecting outside of the cylinder, means to actuate the rack, means to reciprocate the ejector, and partible button-holding and presenting fingers to which the buttons are transferred by the ejector from the cylinder.

4. In a button setting machine, a button supplying mechanism having a turning device by which the button is presented right side up, and a button transferring mechanism including vertically movable and laterally separable fingers adapted to receive the button from the turning device, and an adjustable spring adjusting device applied to said fingers to adjust the finger-ends to the turner and take up shock.

5. In a button setting machine, the combination of a button feeding mechanism having a rotary shaft, a tack feeding mechanism having a rotary shaft, a main shaft, pulleys on the shafts of the button and tack supplying mechanisms, a band connecting said pulleys, a loose pulley on the shaft of the button feeding mechanism, means to cause it to turn said shaft, a band pulley on the main shaft, and a band connecting said main shaft band pulley with the loose pulley on the shaft of the button feeding mechanism.

6. In a button setting machine, a button feeding mechanism, a raceway into which the buttons are delivered edgewise, a turning device to receive the buttons one by one as delivered and right them, an ejecting mechanism for discharging the buttons from the turning device, vertically movable partible fingers to which the button is transferred from the turning device, a setting anvil coöperating with said fingers, a tack feeding mechanism, and means to present the tacks one by one into coöperative relation with the button, a main shaft, and cams thereon for actuating the button discharge, the turning device, the anvil and fingers and the tack presenting mechanism.

7. In a button setting machine, a button feeding mechanism, a raceway into which the buttons are delivered edgewise, a turning device to receive the buttons one by one as delivered and right them, an ejecting mechanism for discharging the buttons from the turning device, vertically movable partible fingers to which the button is transferred from the turning device, a setting anvil coöperating with said fingers, a tack mechanism and means to present the tacks

one by one into coöperative relation with the button, a main shaft and cams thereon for actuating the button discharge, the turning device, the anvil and fingers and the tack presenting mechanism, a driving shaft, and a reducing gearing interposed between the driving shaft and the main shaft.

In testimony whereof we have hereunto set our hands this 8th day of May, A. D. 1915.

FREDERICK E. STANLEY.
GEORGE R. LEGGETT.

Witnesses:
JOHN H. GOSS,
WM. H. MONAGAN.