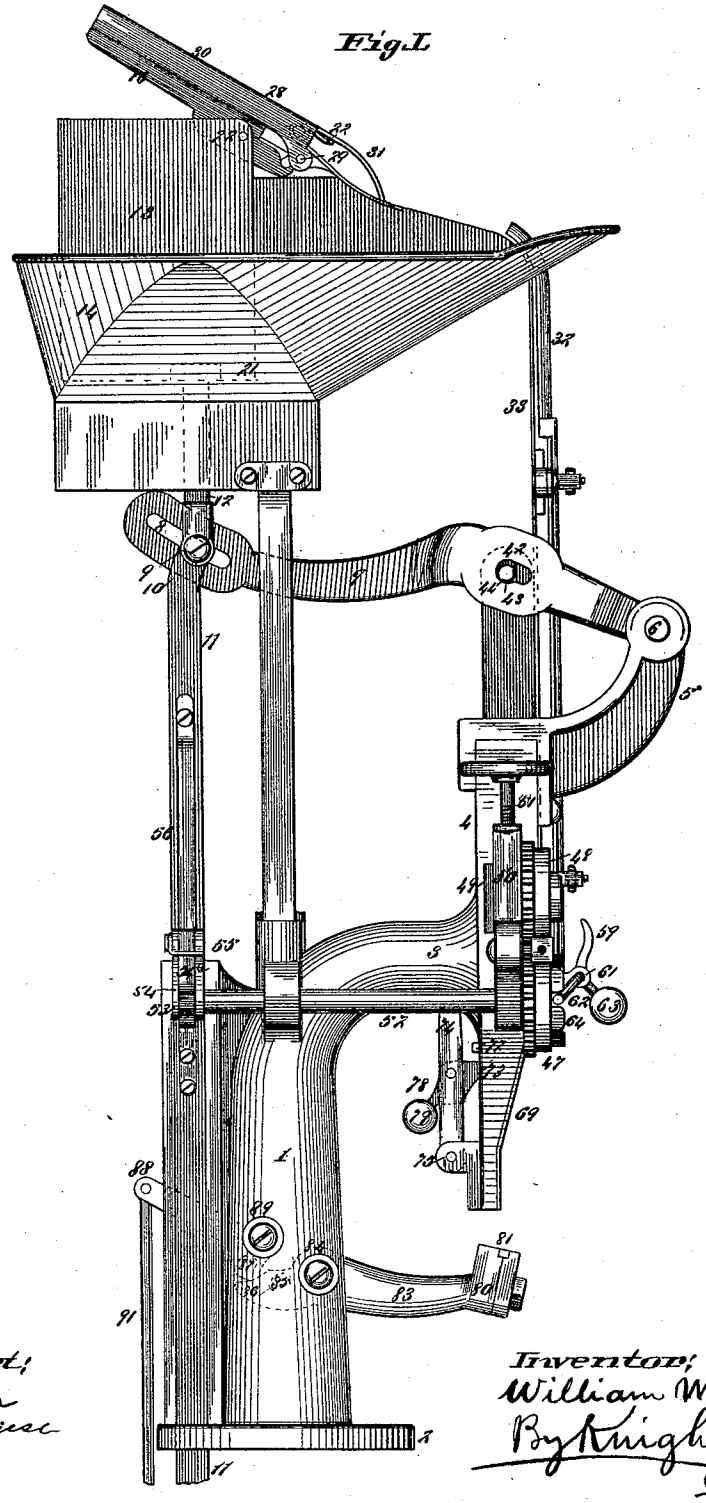
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W. M. GERKEY.

BUTTON SETTING MACHINE.

No. 457,268. Patented Aug. 4, 1891.

Fig. 1.



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Fig. II.

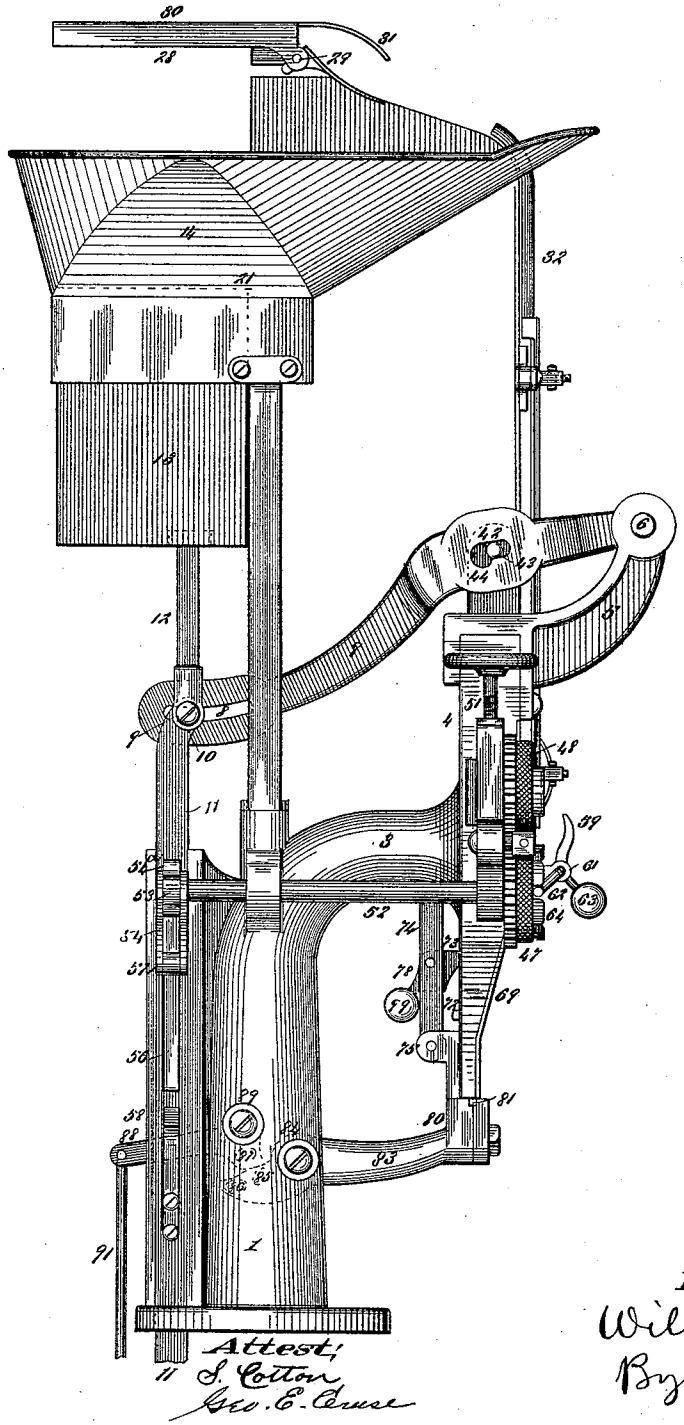


Fig. III.



Fig. IV.



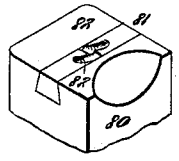
Fig. V.



Fig. VI.



Fig. VII.



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W. M. GERKEY.

BUTTON SETTING MACHINE.

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Fig. VIII.

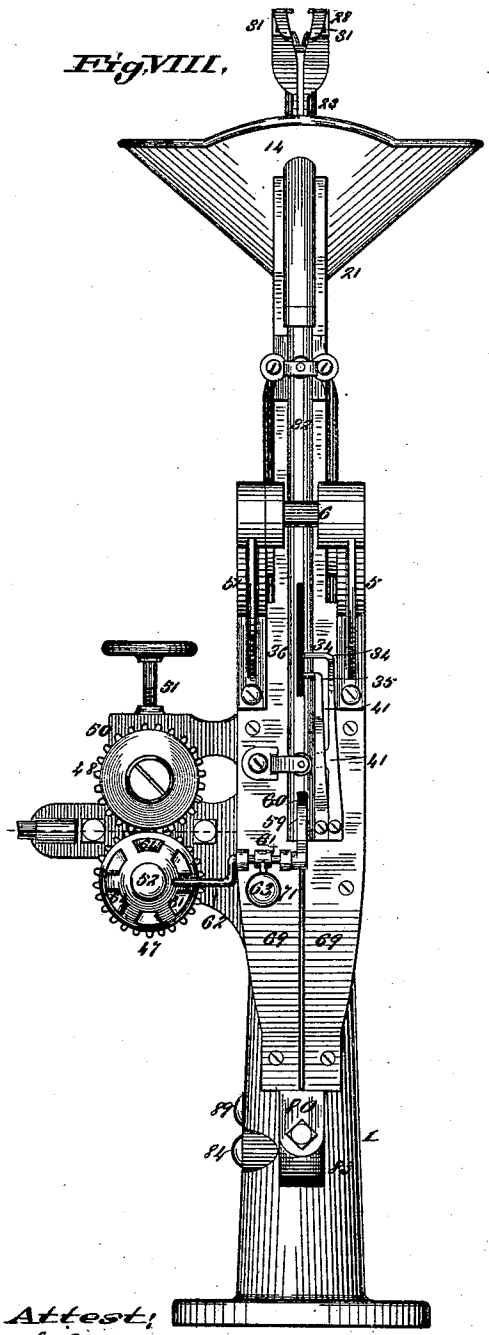
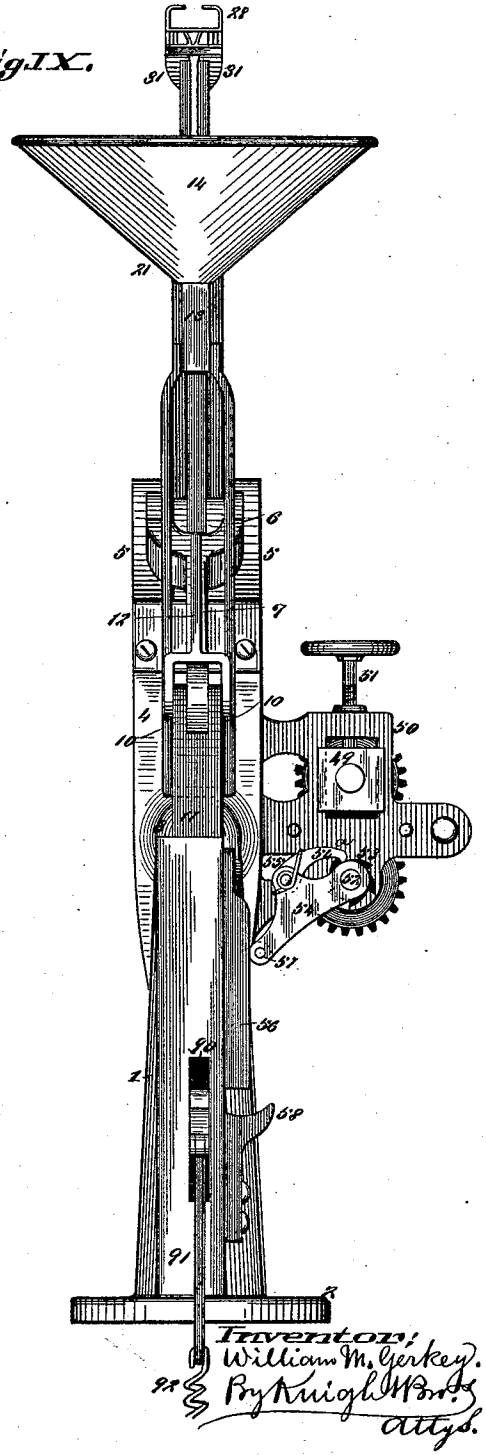


Fig. IX.



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W. M. GERKEY.

BUTTON SETTING MACHINE.

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Fig. X

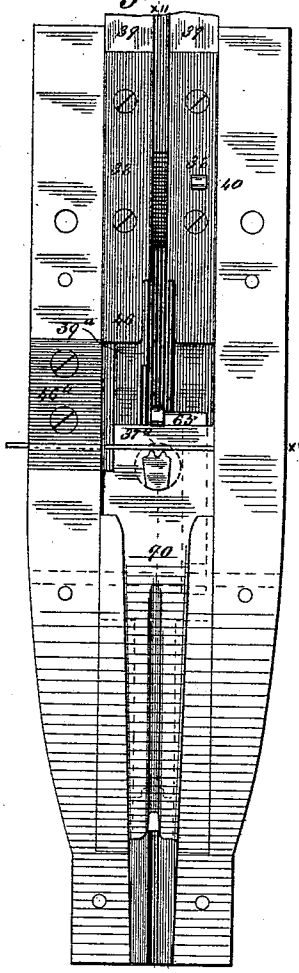


Fig. XI

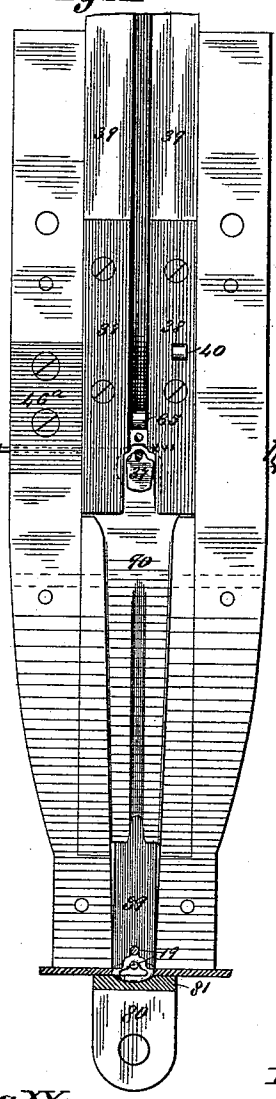


Fig. XII

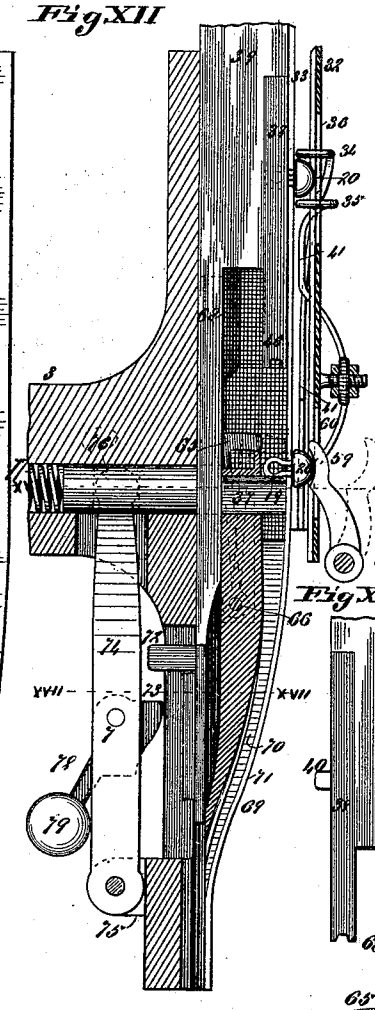


Fig. XIII.

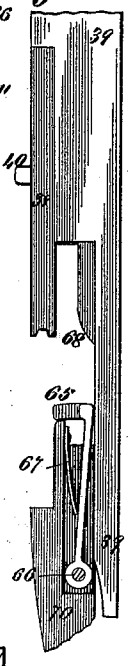


Fig. XIV.

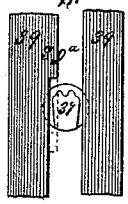


Fig. XV.

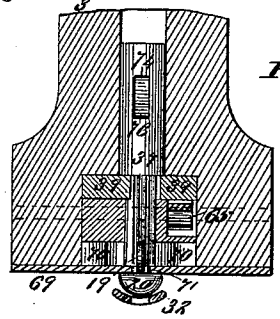


Fig. XVI.

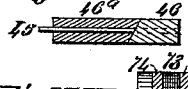
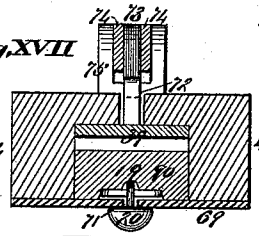


Fig. XVII



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Fig. XVIII.

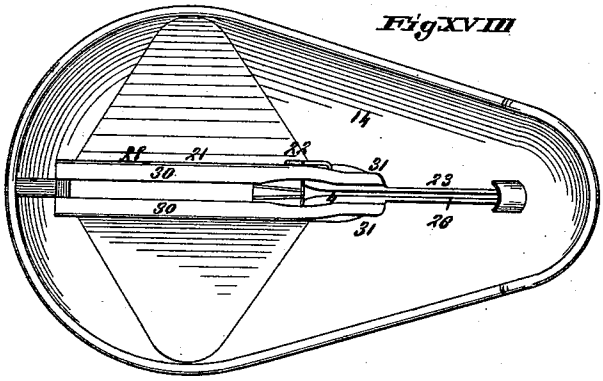


Fig. XIX.



Fig. XX.

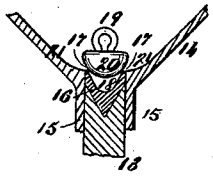


Fig. XXI.

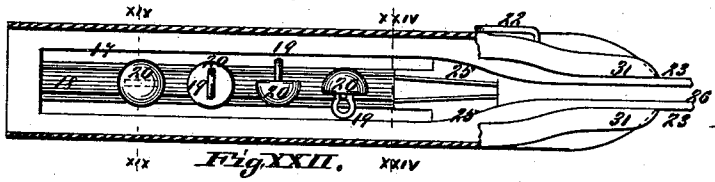


Fig. XXII.

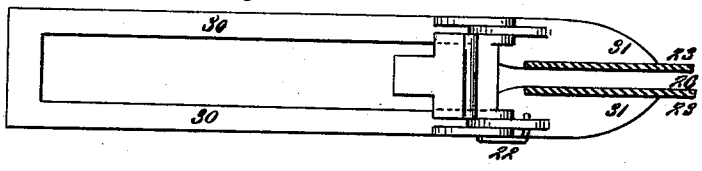


Fig. XXIV.

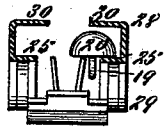


Fig. XXIII.



Fig. XXV.



Fig. XXVI.



Fig. XXVII.

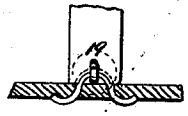


Fig. XXVIII.

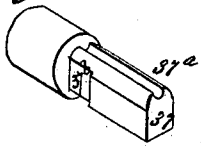
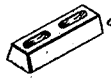


Fig. XXIX.



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UNITED STATES PATENT OFFICE.

WILLIAM M. GERKEY, OF ST. LOUIS, MISSOURI.

BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 457,268, dated August 4, 1891.

Application filed November 11, 1890, Serial No. 371,084. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM M. GERKEY, of the city of St. Louis, in the State of Missouri, have invented a certain new and useful Improvement in Button-Setting Machines, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming part of this specification.

This is an improvement on the machine patented to me May 27, 1890, and relates to the following principal features: the device for transferring the buttons from the hopper to the race, the same having a vertically-lifting slide with two parallel bars, which engage and lift the buttons and which are made to tilt and discharge the buttons into the race; also, the mechanism for causing the intermittent feed of the wire; also, the device for feeding the wire, combined with that for holding the button in place, the latter having a finger which engages the button and which is actuated by cam projections on the wire-feed wheel; also, the device for separating the buttons of the race, consisting of two detent-triggers, which enter the race alternately and separate the lower button from those above it; also, the clinching-die, which has two parallel recesses by which the ends of the staple are made to lap each other in clinching; also, a device for holding down the staple on the ascent of the knife and former, which consists of a spring-dog which is pushed over the staple on descent of the knife and former and which is retracted by a spring.

The novel features will be set forth in the claims.

Figure I is a side elevation of the machine in normal position. Fig. II is a side elevation of the machine with the moving parts in opposite position to that shown in Fig. I. Fig. III is a perspective view of the button with the wire inserted. Fig. IV is a perspective view of the button with the staple in the eye of the same. Fig. V is a perspective view of the button attached. Fig. VI is a perspective view of the clinched part of the staple. Fig. VII is a perspective view of the top of the anvil block and die. Fig. VIII is a front elevation of the machine. Fig. IX is a rear elevation of the machine. Fig. X and XI are enlarged detail front elevations of the machine with the face-plate removed, the moving parts being in opposite positions in the different figures. Fig. XII is a vertical section taken at XII XII, Fig. X, with the plunger in elevation. Fig. XIII is a detail side view of the plunger and spring-dog for holding down the staple when the plunger ascends. Fig. XIV is a detail elevation of the anvil over which the staple is formed. Fig. XV is a horizontal section taken at XV XV, Fig. XII. Fig. XVI is a detail horizontal section through the knife, taken at XVI XVI, Fig. XI. Fig. XVII is a horizontal section taken at XVII XVII, Fig. XII. Fig. XVIII is a top view of the hopper. Fig. XIX is a detail vertical section taken at XIX XIX, Fig. XXI. Fig. XX is a detail transverse vertical section of the lower part of the hopper with the lifting slide down. Fig. XXI is a top view of the tilting slide, part broken away. Fig. XXII is a bottom view of the tilting slide, the inclined race being in horizontal section. Fig. XXIII is a top view of the lifting-slide. Fig. XXIV is a vertical transverse section taken at XXIV, XXIV, Fig. XXI. Figs. XXV and XXVI are vertical sections of a modified form of staple-anvil, showing the staple respectively unformed and formed. Fig. XXVII shows the staple clinched in the material, the latter being in section. Fig. XXVIII is a perspective view of the anvil. Fig. XXIX is a perspective view of the clinching-die.

The working parts of the machine are supported on a standard 1, whose base 2 may be fixed to any suitable support. The upper part 3 of the standard is curved forward and carries a vertical plate 4, that forms a guide for the plunger, &c., and to which are attached the arms 5, to which is fulcrumed at 6 the lever 7. The rear end of the lever has a slot 8, through which passes a pin 9 that passes also through the lugs 10, forming the upper end of the pitman 11. The pitman is operated by a treadle. (Not shown.) The pitman is connected by a rod 12 to the button-lifting slide 13, that works through the bottom of the button-hopper 14. The slide works in guides 15 at the bottom of the hopper. The slide 13 has at top a tilting piece 16, having two parallel ribs 17, between which is a groove 18, adapted to receive the shank

19 of the button 20. (See Figs. XIX and XX.) In Fig. XX the lifting-slide is in its lower position, the top of the ribs 17 being even with (or below) the bottom 21 of the hopper, so that the buttons roll onto the tilting piece 16 and are lifted with it as the slide ascends. The tilting piece is connected to the body of the slide by a pivot 22, on which it is tilted as it reaches its upper position to cause the buttons to slide down the ribs 17 and to be discharged onto the inclined bars or race 23. These bars are curved apart at the upper end 24 to favor the entrance between them of the button-shank.

By reference to Fig. XXI it will be seen that the buttons are liable to occupy four different positions on the tilting piece—namely, with the shank down or up or to either side. Where the shank is down, the button simply slides down the tilter when the same is inclined and the shank passes between the guide-bars 23. If the button is upon the tilter with its shank up, it usually rolls over on its head as soon as the tilter is inclined and the shank 19 enters the groove 18. Where the shank projects to either side, it is turned downward and inward by guide-strips 25 at the lower end of the tilter, and thus the shank is made to enter the slot 26 between the bars 23. In case the shanks 19 miss the slot 25, the buttons roll off the bars 23 back into the hopper. When the tilter has nearly reached its upper position, its front end 27 comes in contact with a tilting guard 28, pivoted to the hopper at 29. The guard has strips 30 at each side which project over the button and prevent its being thrown off the tilter when the latter is tilted up to keep the buttons from jumping from the race 23 when they first reach it.

The buttons are carried by gravity down the inclined race 23. If they are in proper position with their shank in the slot 26, they enter the vertical chute or guide-tube 32. If, however, the buttons are out of position, they roll off the race 23 into the hopper. The buttons descend the chute with their shanks projecting from the vertical slot 33 upon the inner side of the chute. In order that they shall be presented singly to receive the staple, I have two independent spring fingers or triggers 34 and 35, which are carried by the force of the spring into the chute 32 through aperture 36. The distance between the triggers within the chute is equal to the diameter of a button, so that one button occupies the space between them. Their operation is as follows: The upper trigger 34 is first withdrawn from the chute, allowing the column of buttons therein to descend, the descent being arrested by the lower trigger 35, which is at this time in its inner position. The upper trigger then moves inward, separating the lower button from the column above, and on the outward movement of the lower trigger the single button descends to the position to receive the staple-wire. The descent of the button is arrested by the forming-die 37, over which the staple is formed by the descent of the die-plates 38, which are attached to the plunger 39. The triggers are forced inward by their spring-shanks and are forced outward by a projection 40 upon one of the die-plates, (see Figs. X and XI,) the projection acting on the inner sides of the shanks, which are suitably formed to make the action of the projection effectual for the purpose stated. (See 41, Figs. VIII and XII.)

The plunger 39 is operated by the lever 7, which is vertically slotted for the passage of the plunger, and is slotted through transversely at 42 to receive the ends of the cross-pin 43, that passes transversely through the plunger. The slots are preferably made with a rounded recess 44 to receive the pin, so that the plunger shall not be pressed forward in raising it.

The wire 45, of which the staples are made, is unwound from a reel (not shown) as needed, and is automatically cut off in lengths by an oblique knife 46, working against a fixed cutter 46^a, attached to the plunger 39 or one of the die-plates 38. The wire passes between two feed-wheels 47 and 48, which have cog connection, so as to turn together.

The lower wheel 47 is the drive-wheel and turns in fixed bearings, while the upper wheel 48 has bearing in box 49, supported between vertical guides 50 and pressed down by a hand-screw 51, so as to adjust the pressure on the wire. The wheel 47 is fixed on the shaft 52, which carries a ratchet-wheel 53 and which forms the fulcrum of a lever 54, carrying a draw-pawl 54^a, depressed by a spring 55 upon the ratchet-wheel 53. The pitman 11 carries a projection 56, which acts upon an anti-friction wheel 57, so as to carry the free end of the lever downward as the plunger descends and hold it down until the ascent of the plunger, when a hook 58 upon the plunger engages the wheel 57 and lifts the free end of the lever. (See Fig. IX.) In the descent of the lever the pawl causes the forward rotation of the feed-wheels and the forward movement of the wire, carrying it through the eye of the button, while on the ascent of the lever the pawl slips over a tooth of the ratchet-wheel and is again ready for service. In order to hold the button firmly in position while the wire is passing into the eye, a pressure-finger 59 is made to pass through the aperture 60 in the chute and press against the button. The finger 59 is upon a rock-shaft 61, having an arm 62 and a counter-weight 63.

64 are cam projections on the wheel 47, which come in contact with the arm 62 when the wire is moving forward and carry the end of the finger 59 against the button. When the cam projection has passed the arm 62, the counter-weight 63 causes the finger to swing outward from the button, leaving the button free. The lower part of the button-shank occupies a recess 37^a in the top of the forming-die. When the wire has been pushed into

the eye, the plunger descends and the knife 46 severs the piece for the staple, and is immediately followed by the die-plates 38, which bend down the ends of the wire beside the forming-die.

65 is a catch adapted to engage over the staple and prevent its being drawn up with the die-plates 38. This catch is pivoted at 66, and is held in its inactive position by a spring 67. (See Figs. XII and XIII.) As the plunger descends, the catch is moved forward to engage the staple by a projection 68 on the plunger, so that it remains in its active position until the ascent of the plunger has drawn the die-plates 38 from the staple, when the projection 68 leaves the catch, and it is thrown back by the spring.

After the staple is formed the forming-die 37 is moved backward, so as to allow the descent of the button and staple, the button being outside the face plate or plates 69 and the staple in the channel 70 within these plates, the shank of the button passing down the vertical slot 71. The staple hangs in the eye points down, so as to be in position for insertion in the leather or other material to which the button is to be attached.

The mechanism for drawing back the forming-die is as follows: The plunger has a projection 72, which, as the plunger ascends, comes in contact with an incline 73 on a lever 74, fulcrumed at 75 to the fixed plate 4. This lever has a rounded head 76, working in a vertical longitudinal slot in the shank 37^b of the forming-die, so that the oscillatory movement of the lever will cause the endwise movement of the die-shank.

77 is a spring bearing against the inner end of the die-shank and acting to throw the die in its forward position. The incline 73 is upon a trip-piece 78, pivoted to the lever 74 and having a counter-weight 79, tending to hold the piece in the normal position. (Seen in Fig. XII.) The construction is such that as the projection 72 descends it depresses the inclined end of the trip-piece without acting on the lever, and as soon as the projection passes the incline the counter-weight restores the trip-piece to its normal position. When the die 37 moves inward, the staple descends the channel 70 till the points reach the leather or other object upon the anvil 80 and clinching-die 81, the anvil being at this time in the upper position, as seen in Figs. II and VIII.

The downward extension of the plunger impinges upon the staple and forces its ends through the material into the downwardly-curved recesses 82 of the die. The outer ends of these recesses are arranged in a line parallel and coincident with the lower end of the staple-channel 70, so that the ends of the staple will upon descending strike in the recesses without fail. The recesses themselves are parallel, but not coincident, their form being such that the ends of the staple are curved inward and upward in a slightly-oblique direction, so as to lie side by side. (See Fig. VI.) It is necessary that the anvil should descend to allow the removal of the article. To this end the anvil is situated upon the fore end of a lever 83, fulcrumed at 84 in the standard 1, and having a tail, with two bearing-faces 85 and 86, for the toe 87 of a cam-lever 88, that is fulcrumed in the standard at 89. The lever passes through a slot 90 in the pitman 11, the construction being such that as the pitman ascends the part of the pitman at the lower end of the slot impinges against the lever and raises it, throwing the toe backward from the bearing-face 85 and allowing the anvil to descend. As the pitman again descends, the toe is carried forward from bearing-face 86 to 85, and the anvil is again thrown up to its working position. The toe may be given this inward movement by a weight or spring acting upon its outer end. For this purpose I show a rod 91, connected to the end of the lever and forced downward by a spring 92.

In order to prevent the retraction of the forming-die 37 while the plunger is down, the plunger has upon it a projecting rib 39^a, which on its descent enters a groove 37^b in the side of the forming-die. (See Figs. X, XIV, and XXVIII.)

I claim as new and of my invention—

1. The combination, in a button-setting machine, of a tack-hopper, a button-lifting slide working vertically through the bottom of the hopper, a tilting piece 16, having ribs 17 and pivoted to the slide, and a tack-chute 32, all constructed and arranged substantially as set forth.

2. The combination, in a button-setting machine, of the slide 13, working in a hopper 14, tilting piece 16, having ribs 17 and hinged to the slide, and strips 25, with inclined edges, substantially as and for the purpose set forth.

3. The combination, in a button-setting machine, of the hopper 14, slide 13, with tilting piece 16, and the inclined guide-bars 23, adapted to discharge the buttons when out of position thereon, substantially as set forth.

4. The combination, in a button-setting machine, of the hopper 14, slide 13, tilting piece 16, and tilting guard 30, substantially as and for the purpose set forth.

5. The combination, in a button-setting machine, of the wire-feed wheels 47 48, geared together, the shaft 52 of wheel 47, ratchet-wheel 53 on the shaft 52, lever 54, carrying spring-pawl 54^a, the pitman 11, having a projection 56 and hook 58, the button-chute, and the presser-finger 59 for holding the button, substantially as set forth.

6. The combination, in a button-setting machine, of the button-chute, the wire-feed wheel 47, having cam projections 64, the rock-shaft 61, having an arm 62, and a finger 59 for holding and releasing the button, all substantially as and for the purpose set forth.

7. The combination, in a button-setting machine, of the button-chute, the forming-

die, the spring-catch 65, projecting over said die and holding the button against upward movement, and plunger 39, with die-plates 38 and projection 68, substantially as and for the purpose set forth.

8. The combination, in a button-setting machine, of the button-chute, the forming-die 37, spring 77, lever 74, engaging in the stem of the die 37 and carrying a trip-lever 78, with projection 73, the plunger 39, having a projection 72, the die-plates 38, a catch 65 for holding the staple, and the finger 59 for holding the button, all substantially as and for the purpose set forth.

9. The combination, in a button-setting machine, of the button-chute, a finger for holding the button in said chute, the forming-die 37, having a recess 37^b, and the plunger 39, having a projection 39^a, and die-plates 38, substantially as and for the purpose set forth.

10. The combination, in a button-setting machine, of the button-chute 32, having orifice 36, the plunger 39, having a projection 40, and the spring-plates, each having a trigger projecting into the button-chute, and inwardly-bent portion 41, arranged to one side of said triggers and projecting into the path of said projection 40, substantially as set forth.

WM. M. GERKEY.

Witnesses:
SAML. KNIGHT,
THOS. KNIGHT.