

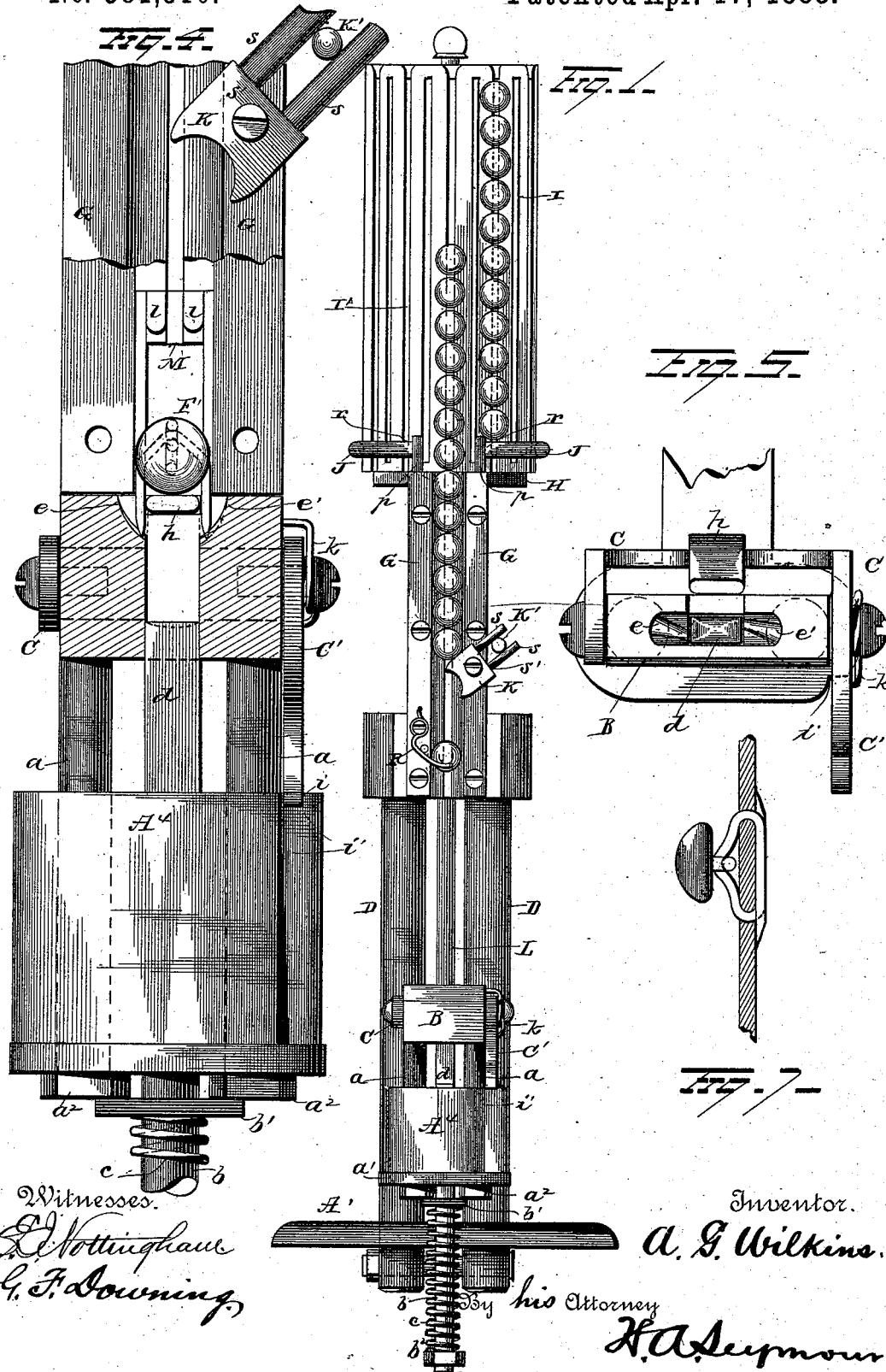
(No Model.)

5 Sheets—Sheet 1.

A. G. WILKINS.  
BUTTON SETTING MACHINE.

No. 381,310.

Patented Apr. 17, 1888.



Witnesses.

*E. Nottingham*  
*C. F. Downing*

Inventor.

*A. G. Wilkins.*

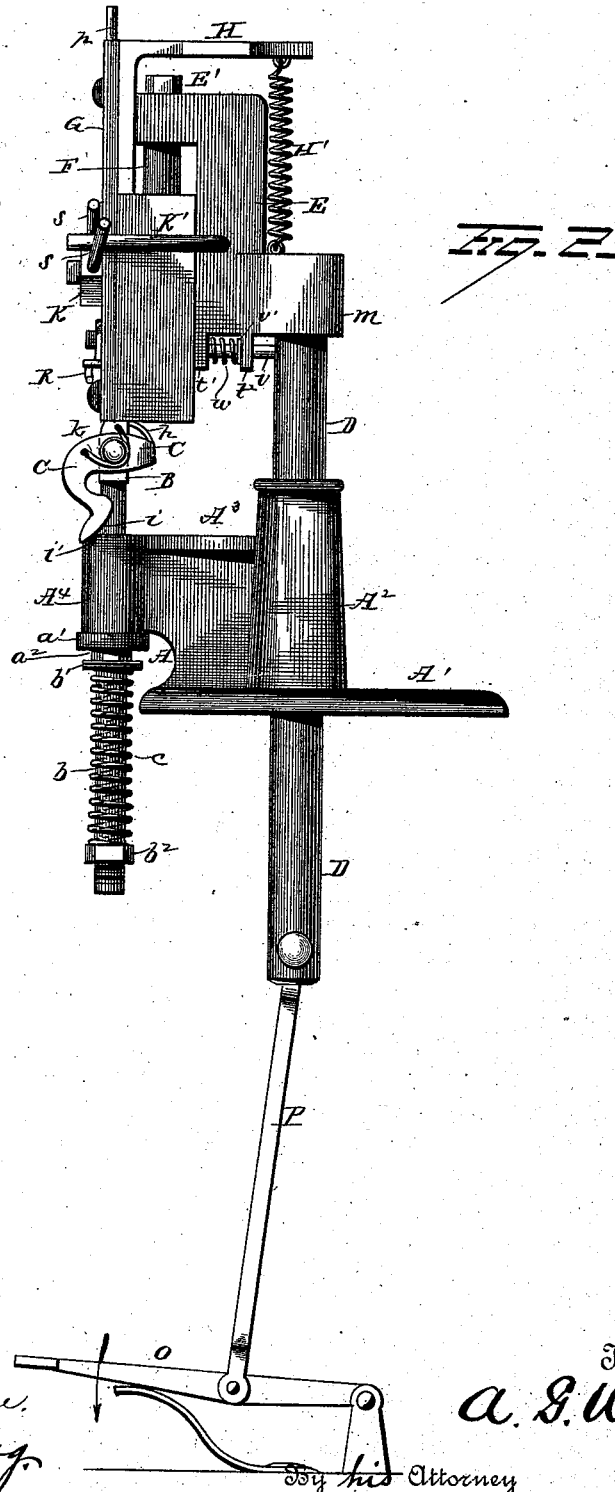
By his Attorney

*H. A. Seymour.*

5 Sheets—Sheet 2.

No. 381,310.

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 G. F. Downing.


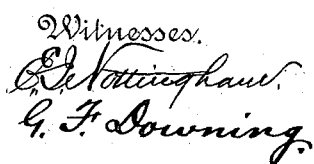
Inventor.  
A. S. Wilkins.

Attorney  
H. A. Seymour

5 Sheets—Sheet 3.

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Inventor.  
A. G. Wilkins.  
By his Attorney  
H. A. Seymour

(No Model.)

5 Sheets—Sheet 4.

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FIG. 8.

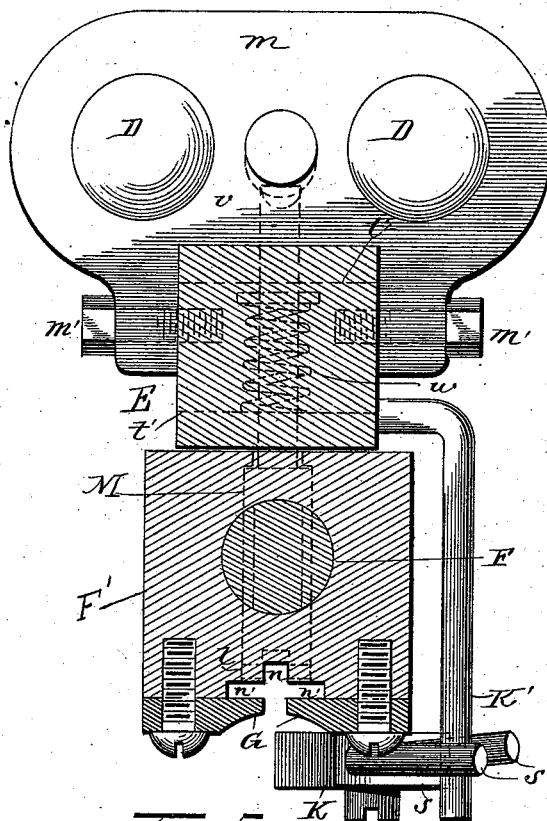
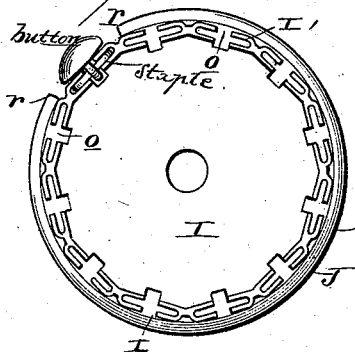


FIG. 5.



Witnesses.  
E. Nottingham.  
C. F. Downing.

Inventor.  
A. G. Wilkins.  
By his Attorney  
H. A. Seymour.

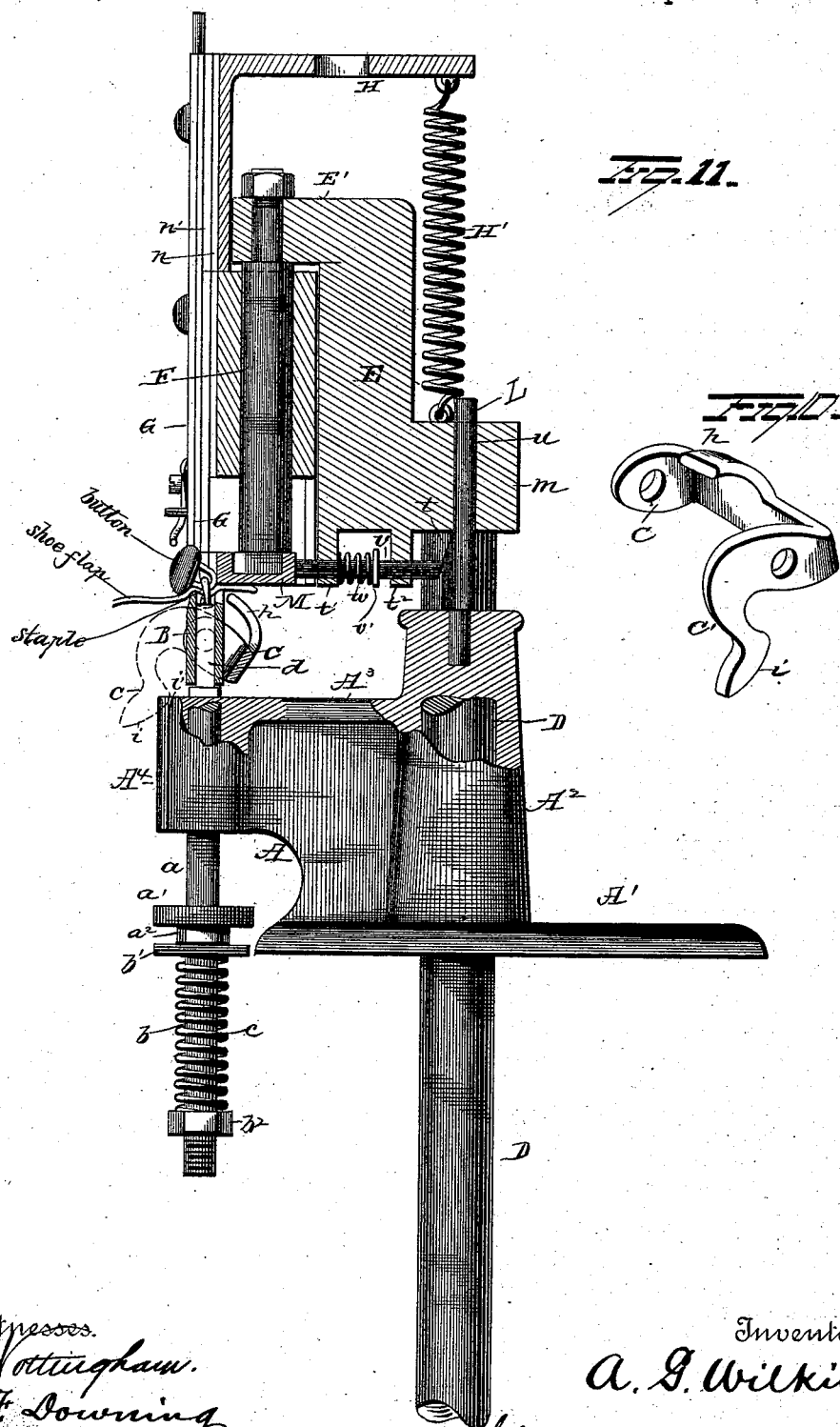
(No Model.)

5 Sheets—Sheet 5.

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BUTTON SETTING MACHINE.

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E. Nottingham.  
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Inventor,  
A. G. Wilkins.

By his Attorney  
H. A. Seymour.

# UNITED STATES PATENT OFFICE.

ALEXANDER G. WILKINS, OF MEADVILLE, PENNSYLVANIA, ASSIGNOR OF  
ONE-HALF TO ANDY L. DUNBAR, OF SAME PLACE.

## BUTTON-SETTING MACHINE.

SPECIFICATION forming part of Letters Patent No. 381,310, dated April 17, 1888.

Application filed December 7, 1887. Serial No. 257,237. (No model.)

*To all whom it may concern:*

Be it known that I, ALEXANDER G. WILKINS, of Meadville, in the county of Crawford and State of Pennsylvania, have invented certain new and useful Improvements in Button-Setting Machines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to an improvement in machines to affix buttons upon shoes, known as "button-setting machines," and more particularly to a type in which the buttons are vertically fed to clinching-dies and secured in place on a shoe by the insertion and proper clinching of a staple.

The object of my present invention is to produce a button-setting machine that will be simple in construction, have few working parts, be reliable in action, and that may be worked by the foot of an operator or other applied power.

A further object is to provide a button setting machine with peculiarly-formed clinching-dies, which will by their action lap the ends of the button-staple side by side and set them against the shoe-flap or other article to which buttons are to be affixed.

A further object is to furnish a vertical button and staple holding and feeding magazine, that will be held in place by the frictional contact of the buttons and the combined weight of the buttons and staples, so as to dispense with any locking-stops for such a magazine and allow it to be rotated by design to bring its chutes opposite a raceway in the button-setting machine, to discharge buttons and staples into such a raceway, and at the same time prevent any accidental displacement of the magazine.

With these objects in view my invention consists in certain features of construction and combinations of parts that will be hereinafter described, and pointed out in the claims.

Referring to the drawings, Figure 1 is a view in front elevation of the button-setting machine, showing the sliding upper portion elevated to its highest point of reciprocal movement. Fig. 2 is a view in side elevation of the machine, representing the sliding upper por-

tion at its lowest point of vertical travel, or when the machine is clinching a button-staple to secure a button in place. Fig. 3 is a vertical section of the machine through the center, viewed from the right side of the device. Fig. 4 is a view of the staple-guiding block enlarged, having its front wall broken away to show the oblique guiding-channels that are located in it and the guide-rods that are affixed to it. Fig. 5 is a top view of the staple-guiding block and pivoted spacing-tongue, shown in opened adjustment. Fig. 6 is a plan view of the magazine. Fig. 7 shows a section of a shoe-flap with a button clinched upon it. Fig. 8 is a sectional view on line *xx* of Fig. 3. Fig. 9 is a detached view of the staple-upsetting die that is located to slide across the lower end of the raceway when a staple is to be clinched. Fig. 10 is a detached view of the spacing-tongue; and Fig. 11 is a side view, partly in section, showing the several parts in the act of clinching the staple.

A represents the metallic base portion of the machine, consisting essentially of a flange, A', of proper thickness and area to afford a substantial base for the other parts of the button-setter, and is perforated at several points to allow screws to be inserted into a bench or other supporting-stand above the floor a suitable distance to be convenient for operation of the machine.

Upon the upper surface of the flange A' of the base portion A and integral with it a column or guide-post, A<sup>2</sup>, is erected. This guide-post is preferably made oval in cross-section to afford room for the formation of two parallel holes through it for the reception of sliding bars, which are attached to the upper portion of the machine and which will be more fully described in their proper order.

In front of the guide-post A<sup>2</sup> a forwardly-projecting T-shaped flange or web, A<sup>3</sup>, is formed, the outer transverse head, A<sup>4</sup>, of which is vertically perforated, two parallel holes being formed through this "T-head."

The perforations of the T-head A<sup>4</sup> are intended as guideways for two parallel guide-rods, *a*, which are attached at their upper ends to the staple-guiding block B. The lower ends of the guide-rods *a* are secured to a spacing-

plate,  $a'$ , so as to firmly hold these rods parallel to each other and free to slide in the perforations of the transverse T-head  $A^4$ . Through a hole in the center of the spacing-plate  $a'$ , firmly attached to the T-head  $A^4$ , a guide-rod,  $b$ , projects downwardly. It is thus located in the same vertical plane and about central between the sliding guide-rods  $a$ , to which it is parallel. The depending guide-rod  $b$  has a collar-plate,  $b'$ , secured to it just below the spacing-plate  $a'$ . The collar-plate  $b'$  is of sufficient diameter to rest upon the securing-nuts  $a^2$ , which are affixed to the lower ends of the guide-rods  $a$ , and bear against the lower surface of the spacing-plate  $a'$ , to hold the rods and plate together. A spiral spring,  $c$ , is placed upon the guide-rod  $b$ , and is adapted to be adjusted to exert proper force against the collar  $b'$  by a nut,  $b^2$ . Now it is apparent that if the staple guiding block B is pressed upon with sufficient force the spring  $c$  will yield and the guiding-block be depressed.

Central between the parallel guide-rods  $a$  the anvil-bar  $d$  is secured rigidly upon the T-head  $A^4$ , so as to project vertically and slide in a slot made to receive it in the staple-guiding block B, the anvil-bar  $d$  having its free upper end square with its sides, and its top surface made concave or dished from all its edges toward its center to clinch a staple properly. In height the anvil-bar is so proportioned that when the staple-guiding block B is fully raised by the spring  $c$  the dished top end of the anvil-bar will be inserted in the slot in this block B, and at rest near the bottom of the same. The staple-guiding block B is made of two flat plates of metal, which are attached to the rods  $a$ , parallel to each other, and spaced apart by the upper ends of the rods, which are flattened and have their adjacent edges extended toward each other, so as to form the parallel edges of the slot through which the anvil-bar  $d$  rises when the block B is depressed. Immediately above the vertical parallel sides of the slot just mentioned the flattened portions of the upper ends of the guide-rods  $a$  are cut on an incline, so as to provide a throat of sufficient width at the upper edge of the block B to receive the parallel prongs of a staple that may be presented points downward to enter this throat, which is gradually contracted till the upper edge of the anvil-bar slot is reached; or, in other words, this slot is gradually widened from its top edge to the top edge of the block B, so as to produce inclined jaw-faces  $e e'$  on the upper ends of the parallel guide-rods  $a$ . In the jaw-faces just mentioned oblique grooves are cut that extend from the top edge of the block B downwardly and diagonally across the inclined faces  $e e'$ , till the grooves intersect the vertical groove or slot in which the anvil-bar  $d$  is located. The diagonal grooves  $e e'$  are inclined in opposite directions and from opposite sides of the elongated throat, so that a staple which is forced down these grooves will have its prongs or legs diverted laterally,

and when made to forcibly impinge against the fixed anvil-bar  $d$  will be folded parallel to each other lengthwise, thus clinching the staple by its contact with the concave surface of the anvil-head, which will throw the staple-legs together and bed their points in the leather of the shoe-flap, to prevent injurious contact with the foot of the wearer of the shoe the buttons of which are thus secured.

In the upper edge of the rear side of the staple-guide block B a notch is cut near the center of length of the block, which is designed to receive the spacing-tongue  $h$ , which is an integral portion of the bent yoke C. The yoke C is of a length to permit its bent ends to lie adjacent to the ends of the staple-guide block B, and be pivoted to them by set-screws inserted through the yoke and into the ends of the block. The end or arm C' of the yoke C is downwardly extended and given a proper curvature near its free end to produce a cam-edge,  $i$ , that is designed to engage a seat,  $i'$ , cut on the vertical outer face of the T-head  $A^4$  of the flange-bracket projection made on the guide-post  $A^2$ , so that when the staple guide block B is forced downward by the action of other parts of the machine the cam-arm C' will rock outward and carry the tongue  $h$  out of its normal position just previous to the clinching of a staple.

A spring,  $k$ , is attached by one end to the end of the staple-guiding block B above the bent arm C' of the yoke C, and bent to form a volute coil, the other end of the spring being inserted into the arm C' such a distance from its fulcrum-pivot as to insure a return of the yoke and its tongue  $h$  to normal position when pressure is removed from the block B.

In the two parallel and vertical holes that are formed in the guide-post  $A^2$  that have been before alluded to the sliding bars D are fitted so as to slide freely. These bars are of sufficient length to permit a proper reciprocal movement of the operative mechanism, which is mounted upon these parallel bars, when the bars are actuated to produce such a motion.

The upper ends of bars D are secured together by a spacing-block,  $m$ , which is rigidly attached to the bars by any proper means, and this block is firmly fastened to the bracket-head E by a set bolt or rivet,  $m'$ . The bracket-head E is a rectangular oblong piece of metal with an integral forwardly-projecting limb,  $E'$ , formed at its upper end, the head being of proper thickness to afford stability.

A perforation is made in the limb  $E'$  of the bracket head E about in its center, and a depending guiding-plunger, F, is secured in this perforation, this plunger being parallel throughout its length to the front face or wall of the bracket-head E.

A sliding block,  $F'$ , is perforated longitudinally to allow it to slide upon the plunger F, and have its rear face in contact with the front face of the bracket-head E, and on the front face of the sliding block  $F'$  a vertical raceway, G, is attached.

The raceway G is grooved at *n* to receive the shanks of shoe-buttons edgewise and let them slide down into it, and a transverse slot, *n'*, (see Fig. 8,) is made at the rear of the button-shank slot or groove *n* to intersect it and thus provide a passage for staples, which are first hooked into the eyes of the buttons so that they may slide down together.

Connected to the upper end of the raceway G a platen, H, is secured, which is projected rearwardly over the bracket-head E and forms a horizontal base for the button-feeding magazine I. Upon the rear edge of the platen H a spiral spring, H', is attached, which has its other end secured to the spacing-block *m*, the strength of this spring H' holding the platen and attached raceway G and sliding block F' at the lowest point of sliding movement to the bracket-head E, against which the block F' moves when reciprocated on the plunger F.

The button-and-staple retaining magazine I is vertically supported upon the platen H by a center pivot, on which it may be revolved. It consists, essentially, of top and bottom circular disks or heads, to the peripheral edges of which a series of sheet-metal chutes, I', are secured as vertical staves that form a skeleton cylinder.

Each trough or button-chute I' is bent over a former to afford a continuous passage through it that is T-shaped in cross-section. The vertical slit *o* in front of each chute I' receives the shank of the button-eye edgewise of the eye, so that a staple hooked through the button-eye may have its limbs or prongs introduced into the elongated cross-slot of the T-shaped conduit or passage, and thus afford a receiver for a series of buttons and staples hooked in their eyes that will freely slide down each chute if not prevented by a stop at the bottom of these chutes.

On the platen H, at its front edge, two upright pins or studs, *p*, are affixed. These are located on each side of the vertical groove *n* of the raceway G, at equal distance therefrom.

A ring, J, is provided, having such a diameter as to loosely fit on the outer surface of the magazine I and rest on stops *p'*, made near its lower end. From the body of the ring J a portion is cut out to afford an opening of proper width which will permit the free ends *r* of the cut ring J to rest against the sides of the studs *p* and be held by them to prevent the ring from turning around.

When the several vertical chutes I' of the magazine I are filled with buttons and staples, as previously stated, the weight of the buttons will rest on the ring J, and by frictional contact on the surface of the ring prevent any accidental rotative displacement of the magazine, which, it is evident, may be easily rotated by the hand of the operator of the machine to bring the chutes I' successively in position to discharge the buttons and staples they contain into the raceway G.

Upon the front surface of one side, prefer-

ably the right side, of the raceway G a button-feeding fork, K, is pivoted. The prongs *s* of the fork project from a notched head, *s'*, a sufficient distance outside the edge of the raceway to be engaged by a finger, K', which is inserted between the prongs, and is rigidly attached by its other end to the side of the bracket-head E.

The head *s'* on the button-feeding fork *k* is so located with regard to buttons that descend the groove *n* of the raceway that when the head is rocked to carry the prongs *s* downward its scalloped front edge will engage a button, and this upward movement of the forked ends *s* will push the engaged button below the fork K, so that the fork answers the double purpose of a stop or cut-off and a feeder, which will periodically feed a button from above the fork to a point below it in the raceway G when this raceway is in contact with the staple-guiding block B, as will be further explained.

A slot is made through the lower end of the sliding block F' from front to rear of the same, so as to leave equal walls remain, thus locating the slot in the center of the block, the vertical height of this slot being sufficient to admit a staple-upsetting die, M, which is intended to reciprocate a limited distance horizontally in the slot.

The lower end of the bracket-head E is cut away so as to leave two depending flanges, *t'* *t''*, which are perforated to receive the rounded rearwardly-extended shank *v* of the staple-upsetting die M, and thus afford boxes for the support of this die that will allow it to slide horizontally.

Around the shank *v* of the upsetting-die M a spiral spring, *w*, is placed, which has a bearing against the forward flange, *t'*, with one of its ends, and a cross-pin, *v'*, that is inserted tightly into and through a transverse hole made in the shank *v*. This arrangement of the spring will cause the free rear end of this shank to project a short distance beyond the rear face of the supporting-flange *t''*.

The front end of the upsetting-die M is provided with two round prongs, *l*, that are of a length about equal to the width of the staple chute in the raceway, so that when the upsetting-die is in forward adjustment these prongs will lie across this chute or channel to bear on the top surface of the bow of the staple on each side of the button-eye, and when a staple is in this position the action of a lower die that clinches the staple will be aided in the operation by the support thus afforded to the arch or bow of the staple from its contact with the upsetting-die M.

Upon the top surface of the guide-post A<sup>2</sup>, between the sliding bars D, an upright post, L, is rigidly secured, upon the body of which at a proper point the cam-slope *t* is formed. This cam inclines so as to strike the end of the shank *v* and force the upsetting-die M forward a proper distance to project the prongs *l* of this die across the vertical staple-chute of the race-



way G to engage the top surface of the loop of a staple just previous to the operation of clinching the staple.

Above the cam slope *t* the post L is reduced, and preferably rounded, to slide in a neatly-fitting perforation made through the spacing-block *m*, that projects rearwardly from the bracket-head E, as shown at *u* in Fig. 3.

The sliding bars D are extended such a distance below the base plate of the machine as to afford proper reciprocal travel to the bracket-head E and parts attached to it. The lower ends of the bars D are connected in any suitable manner so as to provide a wrist-pin between them near the lower extremity of the bars, by which a pitman, P, is attached to operate the machine.

The pitman P may be connected to a spring-treadle, O, or, if the machine is to be operated by other than manual power, a crank-shaft may be substituted for the treadle, and thus transmit motion to the device.

It will be understood that the normal position of the bracket-head E is that shown in Fig. 1, or elevated to remove the sliding block F' sufficiently above the staple guide block B to admit a shoe flap to be placed properly over this block, and also that the spiral spring H' will normally retain the raceway and attached sliding block F' at the lowest point of vertical travel of the block on its plunger-guide F. When the parts are in this position, the button cut-off and feeding-fork K will be so adjusted that the head of the cut-off will lie across the groove of the raceway and thus prevent the downward movement of the buttons.

At a proper point between the cut-off head *s'* of the feeding-fork K and the lower end of the raceway G a bent spring, R, is affixed by one end to the front surface of the raceway, and it is so curved that it will lie across the path of a button that has been fed by the scalloped head *s'* of the feeding-fork K, and prevent buttons thus operated upon from falling out of the open lower end of the raceway. The spring-detent R is of such resilience that it will yield to the downward pressure effected by a rocking action of the feeding-fork K, and so allow one button to pass it for each stroke or reciprocal movement of the sliding bracket-head E.

The magazine I having its chutes filled with buttons and attached staples, one of these chutes is brought into line with the groove *n* of the raceway G. The buttons and staples will thus be permitted to fill the raceway above the heads *s'* of the fork K, the chute and raceway being retained in alignment by the weight of the buttons, as has been before mentioned.

Now, to put the machine in use, the bracket-head E, depressed by the foot of the operator applied to the treadle, or other means, if a treadle is not used, the lowering of the bracket-head E will cause the sliding block F' and attached raceway G to have contact with the shoe-flap on its adjacent or upper surface.

Now, as the spiral spring *c* is comparatively stiff, it supports the impingement of the sliding block until the latter-named piece is forced upward on its plunger-guide. This movement will rock the feeding-fork K, and as this will elevate the scalloped edge of the head *s'* it will engage a button, which will be moved down, when the sliding block F' is again elevated by the upward movement of the spring-treadle, permitting the spiral spring H' to retract and, from its resilience, cause this upward movement of the block. A shoe having its flap properly located upon the staple-guiding block B, a downward stroke of the bracket-head will cause the staple of the button which occupies the lowest place in the groove *n*, and consequently rests upon the detent-spring R, to be engaged on the top surface of its bow or bent portion by the prongs of the upsetting-die M, as the cam-slope *t* on the post L is so made that it will now come into action and push the die forward. A continuation of the downward movement of the bracket-head E will cause its forwardly-projecting limb E' to engage the upper end of the sliding block F' and force it downward, so as to thrust the pointed ends of the staple-prongs through the shoe-flap and into the orifices afforded for their reception in the top surface of the guide-block B. When the staple legs or prongs enter the guiding-block B, each prong is engaged by the diagonal grooves *e e'*, located in this block, and the vertical pressure of the upsetting-die M upon the staple will cause the points of the staple to be forced down these inclines toward opposite sides of the guiding-block until these prongs are engaged by the head or top face of the anvil-bar *d*, and the staples folded so as to lie parallel to each other and in close contact with each other and the lower surface of the shoe-flap, this contact of the anvil-bar being caused by the yielding of the spiral spring which supports the guiding-block B. The downward movement of the guiding-block B will cause the cam-arm C' to rock and remove the tongue *h* from its normal position in the top of the block B, its office being to keep the staple prongs or legs spread apart while they are being forced down the diagonal grooves *e e'*. The removal of the tongue *h* will be effected just previous to the engagement of the anvil-bar D with the staple-prongs, so that the clinching of these prongs upon the shoe may be executed by contact of the head of the anvil with them, as has been described.

It should be mentioned that the rounded surface of the prongs *l* of the upsetting-die M, which are adapted to bear upon the upper surface of a staple that is being clinched to the shoe-flap, and press downwardly on each side of the button-eye, will have a tendency to re-curve the bow of the staple, and thus close it toward the eye of the button, which will hold the button better in place and prevent lateral motion of its eye in the staple, as would result if the rounded arch of the staple were not closed

inwardly toward the button-eye by the action of the prongs of the upsetting-die M, as just mentioned.

Many slight changes might be made in the constructive features of this device and their arrangement together without a departure from the spirit and scope of my invention; hence I do not wish to restrict myself to the exact forms and combinations of parts herein shown; but,

Having fully described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. In a button-setting machine, the combination, with a bracket-head supported to reciprocate vertically, and a sliding block carrying a raceway, of a platen and a staple-feeding magazine adapted to be turned on the platen to line its chutes with the raceway, substantially as set forth.

2. In a button setting machine, the combination, with a base-plate and guide-post affixed to the base-plate, of two sliding bars, a bracket-head affixed to the sliding bars, a sliding block, a raceway adapted to move with the sliding block, a platen, and a spring located between the platen and bracket-head, substantially as set forth.

3. In a button-setting machine, the combination, with a bracket-head adapted to reciprocate vertically, a plunger-rod, a sliding block guided by the plunger-rod, a platen, and a spiral spring located between the platen and the bracket-head, of a raceway, a magazine, a base-ring for the button-chutes of the magazine, and two stop posts or studs that engage the free ends of the cut base-ring, substantially as set forth.

4. In a button-setting machine, a skeleton button-and-staple holding and feeding magazine having a base-ring loosely supported at the lower ends of the chutes, the ends of said ring being separated sufficiently for the passage of the buttons from a single chute, substantially as set forth.

5. In a button setting machine, a skeleton button-and-staple holding and feeding vertical cylindrical magazine, made up of separate chutes and provided with a loosely-fitting base-ring that rests on projections at the lower end of the magazine, and has a portion of its body removed, forming two free ends, and stops on a platen on which the magazine rests, adapted to engage the free ends of the ring, substantially as set forth.

6. In a button-setting machine, the combination, with a bracket-head supported to reciprocate vertically, a raceway adapted to reciprocate on the bracket-head, and a magazine located above the raceway and moving with the same, and a feeding-fork adapted to feed one button at a time and stop all others above it in the raceway, of a detent-spring below the feeding-fork, which will discharge a button and an attached staple at every stroke of the machine, substantially as set forth.

7. In a button-setting machine, the combi-

nation, with a sliding block and a raceway, of an upsetting-die supported to reciprocate horizontally, a spring to hold this die out of the path of a staple in the raceway, and a cam-post adapted to engage the free end of the shank of the upsetting-die to project the upsetting-die above a staple which has passed the die and is still retained in the raceway by a detent-spring, substantially as set forth.

8. In a button-setting machine, the combination, with a raceway, a sliding block, a bracket-head, two sliding bars, a perforated base-block, and a cam-post affixed to the top of the base-block, of an upsetting-die adapted to reciprocate in the lower end of the sliding block and engage the cam-post at one end to project it above a button-staple when the staple is to be clinched, substantially as set forth.

9. In a button-setting machine, the combination, with a bracket-head secured to a reciprocating rod, a sliding block, a raceway, and an adjustable magazine located above said raceway, of a button-feeding fork, and a finger projecting from the bracket-head and engaging the forks of the button-feeder, substantially as set forth.

10. In a button-setting machine, the combination, with a bracket-head supported to reciprocate vertically, a sliding block that reciprocates on a plunger which is attached to a limb of the bracket-head, a plunger, a raceway, and a platen which are attached to the sliding block, of a spiral spring that holds the platen and attached sliding block away from the limb of the bracket-head, substantially as set forth.

11. In a button-feeding machine, the combination, with a reciprocating bracket-head, a sliding block, and a raceway, of a button-feeding fork, a finger to engage this fork, and a detent-spring that prevents the improper escape of buttons from the lower end of the raceway, substantially as set forth.

12. In a button-feeding machine, the combination, with a staple-guiding block having diagonal grooves to deflect the points of a staple in opposite directions from a straight line, of a yoke, a spacing-tongue integral with or affixed to the yoke, and a cam-arm adapted to vibrate the tongue outwardly when a staple is to be clinched, substantially as set forth.

13. In a button-setting machine, the combination, with a base-plate and a T-head projection on the upper side of the base-plate, of two guide-rods, adapted to slide in holes in this T-head, and a staple-guiding block affixed to the upper ends of the guide-rods, substantially as set forth.

14. In a button-setting machine, the combination, with a base-plate, and a T-head projection connected to a guide-post located on the top surface of the base-plate, of a staple-guiding block, an anvil-bar, two guide-rods, a center guide-rod, and a spring to hold the staple-guiding block above the T-head piece on which the anvil-bar is secured between the guide-rods, substantially as set forth.

15. In a button-setting machine, the combi-

nation, with a base-plate, a T-head portion of the base-plate perforated to receive guide-rods, two guide-rods, a staple-guiding block, a spacing-tongue, a pivoted yoke to which the  
5 tongue is affixed, a cam-arm, a spring adapted to hold the staple-guiding block off of the T-head, and an anvil-bar, of two sliding bars, a bracket-head, a sliding block, a raceway, a platen, a magazine, a combined button-feed-  
10 ing fork and cut-off, a finger to engage this fork, a detent-spring, and an upsetting-die adapted to normally lie out of the path of a

button-staple when the bracket-head is moved upward, and to be projected over a staple when this staple is to be clinched, substantially as 15 set forth.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALEXANDER G. WILKINS.

Witnesses:

A. L. DUNBAR,  
B. F. CULP.