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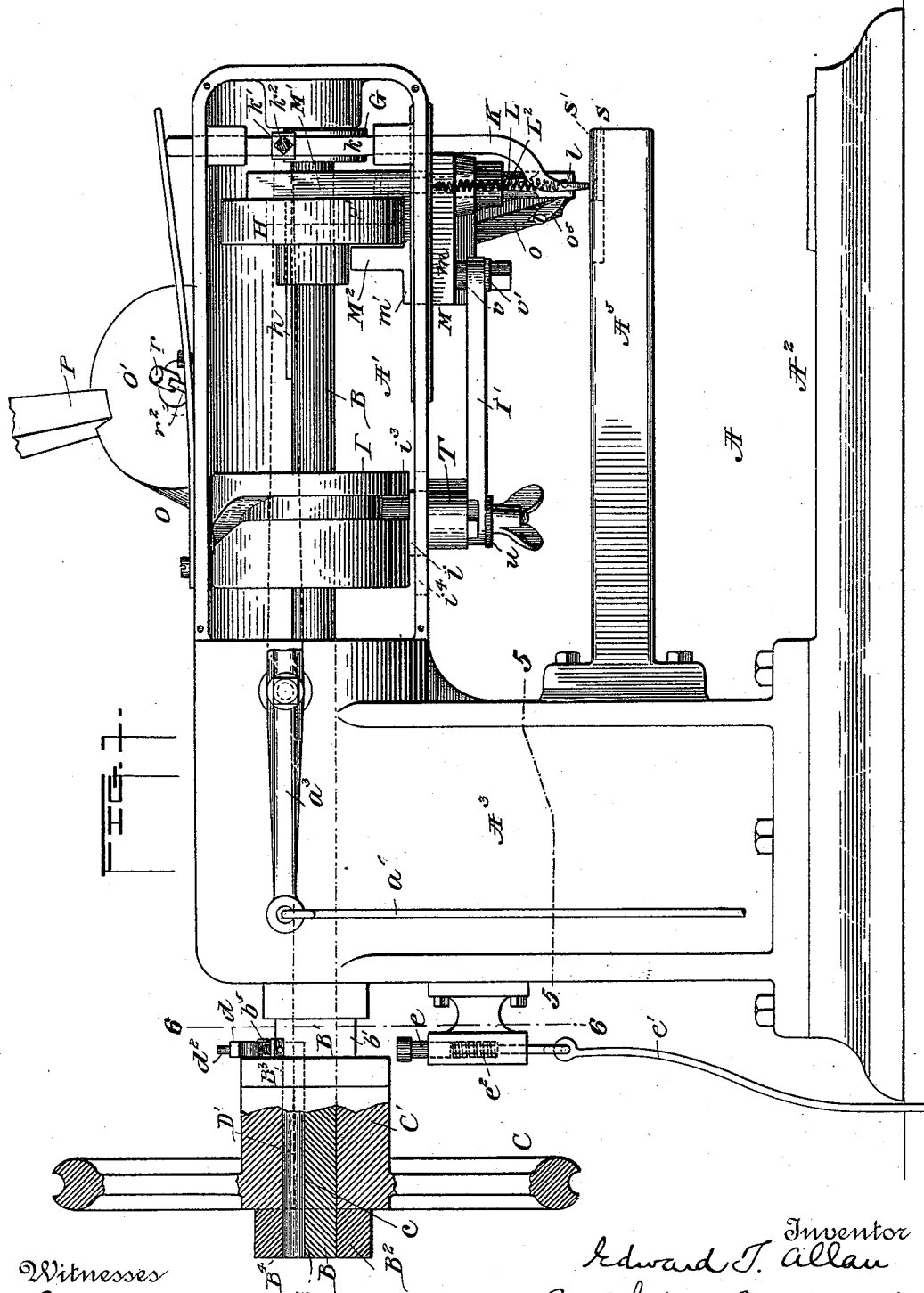
E. T. ALLAN.

4 Sheets—Sheet 1.

MACHINE FOR SECURING BUTTONS TO FABRICS.

No. 490,619.

Patented Jan. 24, 1893.



Witnesses
E. L. Moore
John B. Cleman Jr.

Inventor
Edward T. Allan
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(No Model.)

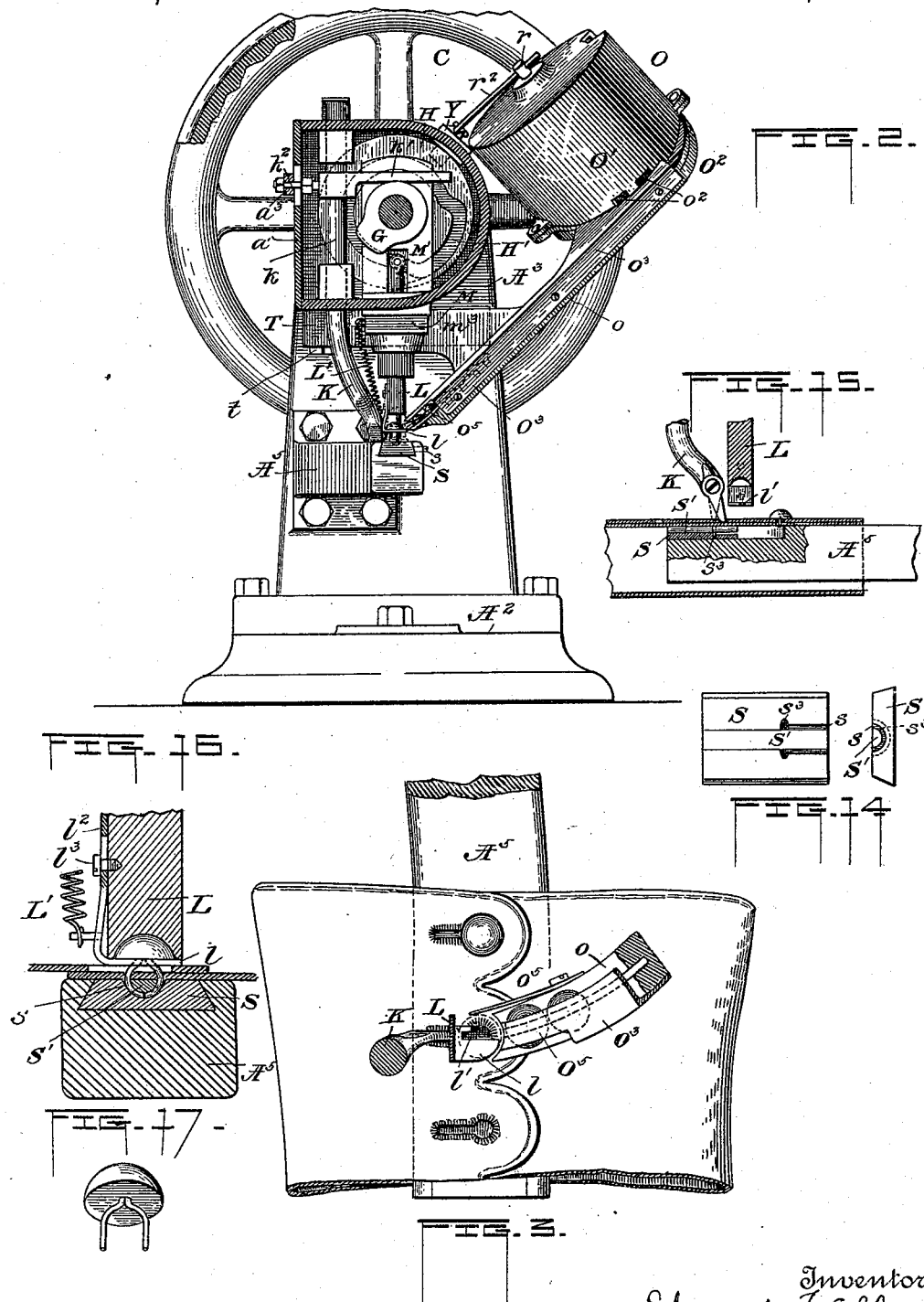
4 Sheets—Sheet 2

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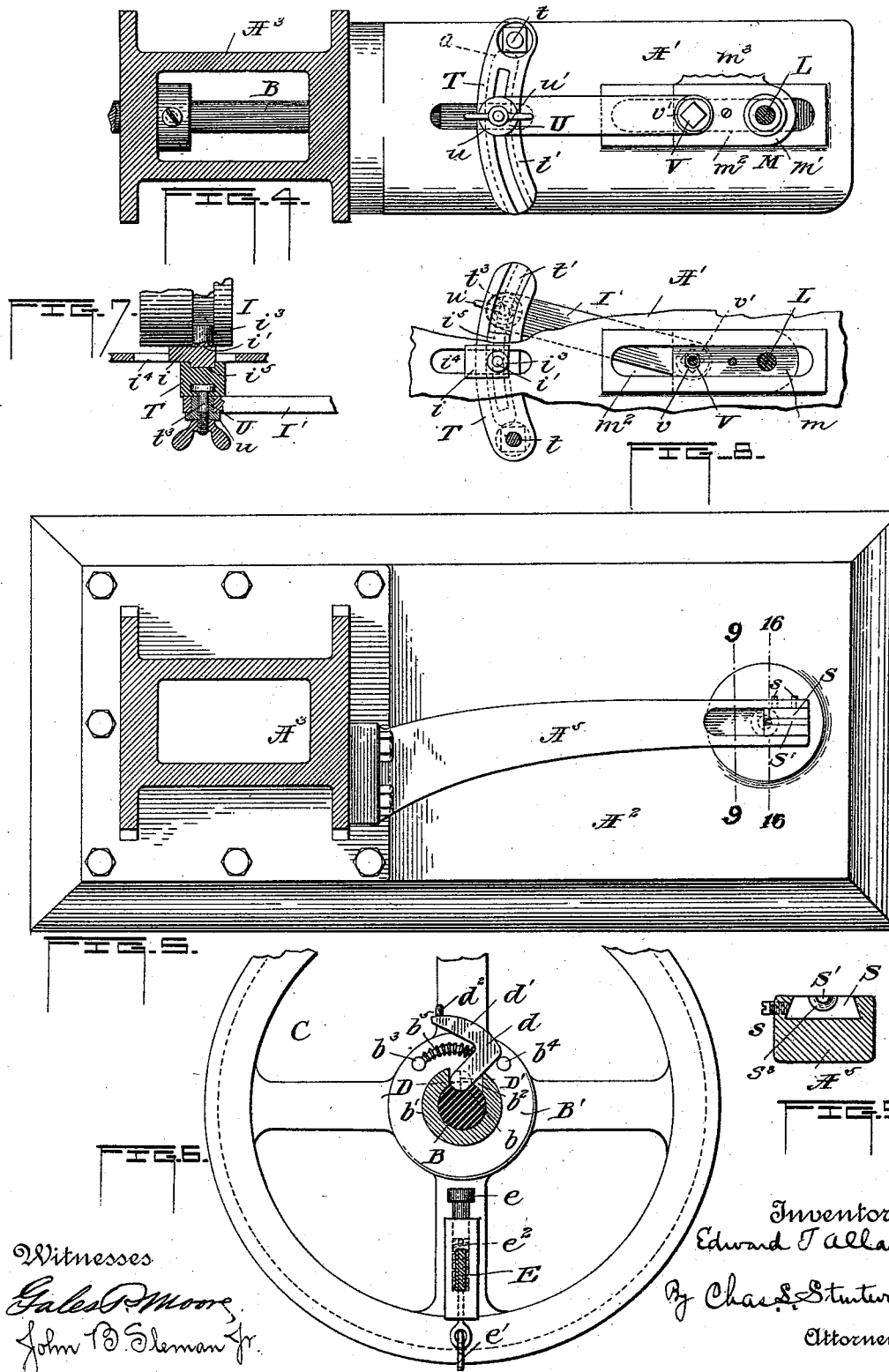
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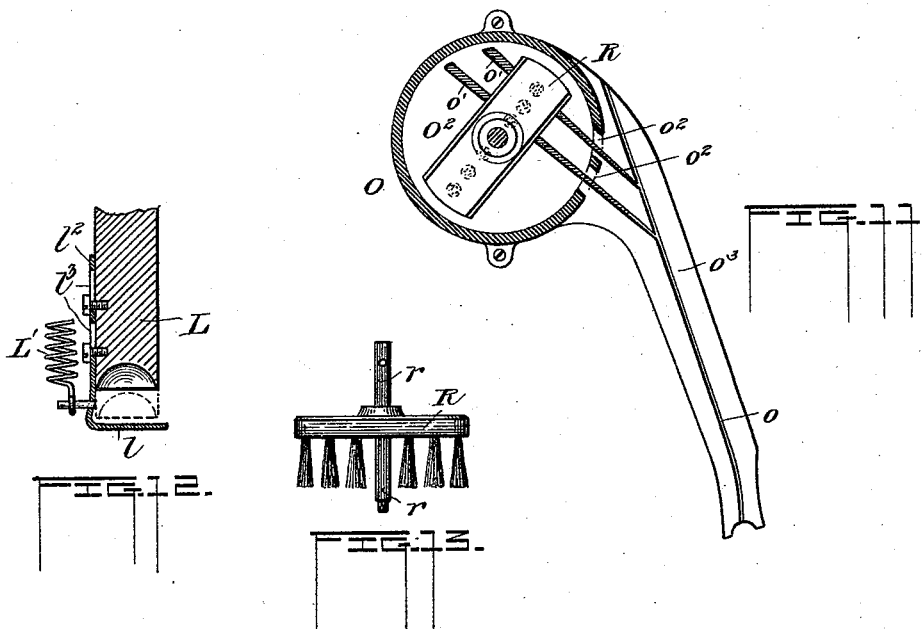
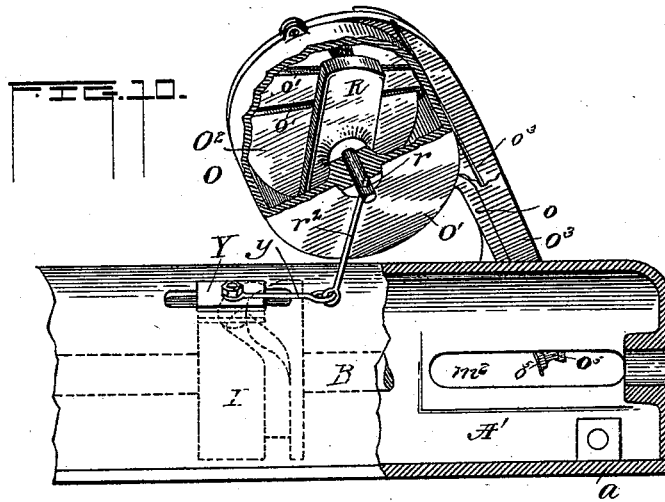
4 Sheets—Sheet 4.

E. T. ALLAN.

MACHINE FOR SECURING BUTTONS TO FABRICS.

No. 490,619.

Patented Jan. 24, 1893.



Witnesses

Gales R. Moore
John B. Slemmon Jr

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UNITED STATES PATENT OFFICE.

EDWARD T. ALLAN, OF CINCINNATI, OHIO, ASSIGNOR OF SEVEN-TENTHS, BY
DIRECT AND MESNE ASSIGNMENTS, TO ABRAHAM GODSHAW, OF SAME
PLACE, AND THOMAS JAMES, OF NEWPORT, KENTUCKY.

MACHINE FOR SECURING BUTTONS TO FABRICS.

SPECIFICATION forming part of Letters Patent No. 490,619, dated January 24, 1893.

Application filed June 9, 1892. Serial No. 436,070. (No model.)

To all whom it may concern:

Be it known that I, EDWARD T. ALLAN, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Machines for Securing Buttons to Fabrics, of which the following is a description, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention relates to improvements in machines for attaching buttons to shoes or other articles.

Heretofore in the manufacture of shoes, after the button holes have been made the flap containing the same is lapped over on the other and the places for the buttons marked so that they will register with the holes, and the buttons then placed at the positions marked. After they have been secured in position the last is put in the shoe and the shoe partly buttoned up.

My machine forming the subject-matter of the present application is designed to carry out a new method of securing buttons to fabrics which consists broadly in securing the buttons through the button hole so that the time occupied in marking the proper places is done away with. Furthermore, it will be seen that after the buttons have been put on, the shoe is already buttoned up and it only remains to unbutton a few of the top buttons so that the last can be readily inserted. So far as I am aware, I am the first to accomplish the saving of time and labor mentioned by placing the buttons in position through the button hole, leaving the garment already buttoned up, and while I make no claim to said method in the present application, it will form the subject-matter of another application and will be claimed therein broadly.

Heretofore, various machines have been devised for attaching buttons to garments but all are defective, either by reason of their inefficiency in operation, the complicated character of their mechanism, and consequent great expense, or for other causes.

The object of my invention is to make a new machine for accomplishing the desired result which shall be simple and compara-

tively inexpensive to manufacture, but which shall be capable of great speed and effectiveness in operation.

While I have shown my invention as applied for the purpose of securing buttons to shoes, it will be understood that it is capable of being applied to other uses, such as placing buttons on garments, and I therefore aim to cover the same in all the uses to which it can be put.

My invention, therefore, consists, first, in the combination with a support for the fabric, of a spreader for the button hole, a plunger, means for operating the same and means for delivering a button beneath the plunger to be acted upon thereby. Secondly, in the combination with a curved support for the fabric, of a spreader for the button hole, a plunger, means for operating the same, and means for delivering a button beneath the plunger to be acted upon thereby. Thirdly, in the combination with a support for the fabric, of a spreader for the button hole, a main shaft, a cam on said shaft for actuating the spreader, a plunger also operated by a cam on said shaft, and means for delivering a button beneath the plunger. Fourthly, in the combination with a support for the fabric, of a spreader for the button hole, a plunger, means for reciprocating the same, means for moving the plunger forward and back, and means for delivering a button beneath the plunger. Fifthly, in the combination with a support for the fabric, of a spreader for the button hole, means for moving the same vertically, a plunger and means for moving the same vertically, a suitable hopper, a chute for delivering buttons therefrom to a point beneath the plunger, a main shaft, and connections between the main shaft and the plunger and chute for giving the same a forward and backward movement in accordance with the distance between the buttons. Sixthly, in the combination of the spreader, and plunger and hopper and chute, with means for giving them the desired movements, all actuated from the main shaft, a rotating brush or stirrer within the hopper, and connections between the main shaft and stirrer for actuating the latter.

Finally, the invention comprises various

details of construction all as hereinafter fully described and referred to in the appended claims.

My invention is illustrated in the accompanying drawings, in which—

Figure 1 is a side elevation of my invention. Fig. 2 is an end view partly in section. Fig. 3 is a detail end view of the horn or work support. Fig. 4 is a bottom plan view of the overhanging arm of the machine. Fig. 5 is a section on line 5—5—, Fig. 1. Fig. 6 is a cross section on line 6—6, Fig. 1. Fig. 7 is a detail longitudinal section of the sliding block which forms part of the connecting mechanism between the main shaft and plunger and chute. Fig. 8 is a detail plan view taken from the interior of the overhanging arm. Fig. 9 is a detail cross section on line 9—9, Fig. 5. Fig. 10 is a plan view partly in section showing the button reservoir. Fig. 11 is a plan view partly in section, showing button reservoir and chute. Fig. 12 is a detail sectional view of the plunger. Fig. 13 is a detail sectional view of the brush. Fig. 14 is a detail plan and end view of the die. Fig. 15 shows a modified form of spreader. Fig. 16 is a detail section showing an enlarged view of the plunger, the die block, and a form of button used on my machine. Fig. 17 is a detail of the button.

Like letters of reference indicate like parts wherever they occur.

The frame-work of the machine A, is composed of the overhanging arm A', secured to the base A², by a standard A³. Extending lengthwise through the overhanging arm A', is the main driving shaft B, journaled in suitable bearings in said arm. At one end of the driving shaft is placed a belt wheel C, which may be thrown into and out of connection with the driving shaft. This belt wheel, or pulley, may be run as a loose or tight pulley, at the will of the operator. A groove b, is formed in the shaft B, and a groove c, is formed in the hub C', of the belt wheel. A key D, is fitted in the groove b, and is directly operated by means of an arm or lever d, secured to the end of the cylindrical portion of the key. When the belt wheel C, is driving the shaft B, the key D, stands in relation to the cylindrical key ways b, c, so that the key occupies one-half of the space formed by the ways in hub C', of the belt wheel C, and shaft B, thereby keying the wheel C, to shaft B. A collar B', is secured on the shaft B, between the belt wheel C, and the arm of the machine A', and it has a reduced portion b'. The reduced portion b', is slotted and through said slot b², the arm or lever d, formed on the end of the key D, projects. Pins b³, b⁴, project from the face of collar B'. The pin b³, acts as a stop and a spring b⁵, holds the arm d, normally in contact with it when the belt wheel is driving the machine.

Secured to the standard A³, of the machine, is a bracket arm E', and in a sleeved portion of said bracket arm is a plunger e. This plun-

ger e, is located in the path of the arm d, and as the same is rotated if the plunger e, is projected by means of a spring e², not having been depressed by the operator, by a suitable treadle, (not shown) connected to the plunger by a rod or chain e', the machine will be stopped by the plunger e, striking the cam face d', of the arm d, and by the engagement of the stop pin d², with the plunger e. The key D, will be turned so that the belt wheel will run as a loose pulley. The key D, is cylindrical at either end for a distance equal to or nearly equal to the width of the collars B', B², and completely fills the key ways B³, B⁴, in said collars respectively. The semi-cylindrical portion D', extends for a distance equal to the width of the hub C', of the belt wheel C.

Arranged at intervals upon the shaft B, are the cams G, H, and I, which control the movements of the various parts of the button securing mechanism. All these cams are situated within the hollow arm A', said arm being open upon one side, and closed by means of a plate a'. By removing the plate a', access may be had to all the mechanism, for any desired purpose.

Near the forward end of the shaft B, is rigidly secured the lifting cam G. This cam for the greater portion of its circumference, is concentric with that of shaft B, but one portion is increased in diameter to a sufficient degree to lift the button hole spreader K, out of the button hole.

The shoe or other article to be worked upon is placed upon a horn A⁵, directly under the arm A', of the machine, and the bottom edge of the button hole spreader K, touches or rests upon said horn A⁵. This button hole spreader consists of a rod which slides in bearing, formed in the arm A', and is held down by a leaf or other spring, when it is not raised therefrom by means of the lifting cam G, or by the operator using a lever a³.

Secured to the straight portion k, of the button spreader K, is an arm k', which rests upon the cam surface. A pin k², may be secured to said arm, and to the pin, one end of a lever a³, may be attached. A rod or chain a⁴, connects the other end of the lever a³, with a suitable treadle, so that the button hole spreader K, may be raised independently of the action of the cam G, in order that the work may be inserted, or taken off while the machine remains at rest. The lower portion of the button hole spreader K, is given a rearward and inward bend, as shown in the drawings, so that the blade or spreading portion is brought opposite to and in line with the button setting plunger L. The button setting plunger L, is carried by a sliding block M, which is formed in the present instance, by uniting in any suitable way two blocks m, and m', so that they will form a block slide and which will reciprocate in the slot m², in the arm A', when actuated by the feed controlling mechanism. For a portion of its length, near its forward end, the shaft B, is

provided with a key *h*. The cam *H*, which operates the button setting plunger *L*, reciprocates upon the shaft *B*, as the feeding operation takes place, its rotation being effected by the key *h*. The cam *H*, is held between upwardly extending arms *M'*, *M*², of the block *M*, and by said arms its forward and backward movements are controlled.

The arm or standard *M'*, is cut away as shown in Fig. 2, and through this opening the upper end of the button setting plunger *L*, extends, said end is provided with an anti-friction roller *L*², or stud, which engages the face groove cam *H'*, causing the plunger *L*, to rise and fall at desired intervals. The lower end of the button setting plunger is concave, and adapted to fit over the head of the button, which is fed to the plunger *L*, from a hopper *O*, through a chute *o*.

Secured to the button plunger *L*, is an angular plate *l*, which receives and holds the button until it is released by subsequent operations. The flat horizontal part of plate *l*, is slotted as shown in Fig. 3, at *l'*, and upon the tongues thus formed the button rests, its shank being confined in the slot *l'*. The upwardly extending portion *l*², is provided with a slot *l*³, and the plate *l*, is secured to the plunger *L*, by screws. A spring *L'*, is attached at one end to the plate *l*, and to block *M*, at the other. The spring *L'*, holds the plate *l*, normally in the proper position to receive a button from the chute at the completion of the operation of attaching a button when plunger is at highest point. The spring *L'*, permits of the downward movement of the plunger, the spring yielding as the button setting plunger descends, to place the button shank through the button hole flap and the under flap to which it is to be secured.

The buttons are fed from a hopper *P*, and enter the button receptacle *O*. The button receptacle *O*, is supported by a bracket arm *m*³, secured or formed integral with the sliding block *M*. A chute *o*, directs the buttons to the plate *l*, beneath the button setting plunger *L*, said chute having an inclination upwardly and rearwardly of about forty-five degrees. The upper part of the bracket arm *m*³, is widened out so that it forms the bottom of the button receptacle. The body portion *O'*, of the button receptacle is secured to the base portion by means of screws passing through lugs, and a shaft or rod *r*, runs centrally through the body portion *O'*, and the base *O*², and upon it is secured a brush *R*. The bottom of the button receptacle is provided with grooves *o'*, one or more of which are formed in such a manner that as the buttons are agitated by the brush *R*, they will, their shanks having fallen into the grooves *o'*, be directed to the openings *o*², in the side of the casing. The grooves *o'*, open into a groove *o*³, running lengthwise of the chute *o*, and said groove directs the shank of the buttons, which are fed by gravity, aided by agitation of the buttons in the button receptacle.

The means for agitating the brush *R*, will be hereinafter described. The lower end of the chute *o*, is reduced to substantially a wedge shape, and as shown in Fig. 3, is curved on the edge next to the button setting plunger in such a way as to present no hinderance to its descent. A light leaf, or other suitable spring, *o*⁵, is secured to the end of said chute on the side toward the machine standard *A*³. This spring *o*⁵, holds the button in place so that it will be properly caught by the button setting plunger *L*, as it descends. As soon as the button has been gripped between the plunger *L*, and the plate *l*, it passes below the said spring, so as to clear it. A thin sheet metal cover *O*³, is secured by screws to the chute *o*, and has a lip *O*⁵, formed at its lower end.

The end of the horn *A*⁵, upon which the shoe upper is placed, is channeled so as to receive a die block *S*, which is formed with beveled sides, fitting the channel. The proper position of the block being determined, the block is secured by means of the screws *s*. For convenience in construction, I form the die block in two pieces. The bed block *S*, and the former, or tongue part *S'*. The former or tongue *S'*, is tapered in such a manner that the split shank of the button will, after the ends have been forced together by the curved walls *s*², of the bed block *S*, securely fasten the button to the shoe upper or other article. A space *s*³, is left between the bed die and tongue, of a width equal to the thickness of the shank wire.

In Fig. 14, I show a modified form of die in which the part *S'*, or former around which the button shank is bent, is not tapered but is semi-cylindrical. The space *S*³, is increased at the rear end, to a greater depth, by a V-shaped groove, which receives the ends of the button shank, and closes them together as the plunger descends.

The feed mechanism is actuated by means of cam *I*, which is located about midway of the machine, and has a groove cut in its circumferential face. The carriage *M*, is connected to a sliding block *i*, by a link or bar *I'*. A stud *i'*, which engages the cam groove, is formed upon said block *i*, and the stud is provided with an anti-friction roller *i*³. The link or bar *I'*, which connects blocks *i*, and *M*, imparts the reciprocating motion to the latter which it receives from the cam *I*. The block *i*, slides in a slot *i*⁴, formed in the arm *A'*, of the machine. To the underside of the arm *A'*, is secured a pivoted arm *T*, upon a bolt *t*. The arm *T*, is on a curve struck from the center of the plunger *L*. Said arm has a groove *t'*, into which a lip or projection *t*⁵, from the underside of block *i*, projects and as said block reciprocates, the arm *T*, rocks on its fulcrum by the projection *t*⁵, engaging the groove *t'*. On the underside of the arm *T*, a T-shaped groove is formed, and a bolt *t*⁶, having preferably a flat head, is movable therein. The bar or link *I'*, is perforated, to receive a sleeve *U*. Said sleeve *U*, has a flange

u, and between said flange and the arm T, the end of the bar or link I', is secured. The smooth surface permits the bar or link I', to move freely. The internal bore of the sleeve U, is threaded, to receive the bolt t^3 , and a thumb-nut, or other suitable jam-nut u' , may be used to lock said bar in desired position.

It is obvious, that the length of the movement of block M, may be regulated by setting the bolt t^3 , toward or away from the pivotal point of the arm T, and as the leverage of said arm is thus determined. The end of bar I', attached to sliding block M, moves freely upon the bolt V, as a center. This end of the bar or link I', is perforated as at its other end, and a sleeve v, having a flange v' , allows of a free movement. The sleeve and by it the bar or link I', is secured to the sliding block M. A sliding block Y, having a stud engaging the groove in cam I, causes the brush R, to oscillate by means of the connecting rod y, attached to said block Y, and to the arm r^2 , of the brush shaft r, thus keeping the buttons in constant agitation, while the machine is operating.

In Fig. 15, I illustrate a modified form of button hole spreader, which is designed to automatically adjust the work, in case of a slight variation in the distance between button holes. This is accomplished by attaching a pivoted dog K', to the bottom of the spreader K, which will, as the work is fed forward, drop into the next succeeding button hole, and as the feed returns the block M, with the button plunger L, will be struck by a pin, (shown in dotted lines) upon the plate l, before the plunger L, and plate l, rise to receive the next button. As the feed has been predetermined, the plunger L, and spreader K, will sustain fixed relations, when the plunger L, has been returned to its initial position, hence, if the pin striking the dog will place the same in a vertical position ready to receive the shank of the next button, thus compensating for the variations in length of distance between button holes.

The operation is briefly as follows:—The operator having raised the button hole spreader, an upper of a shoe is placed upon the horn of machine the flaps being placed together in the proper relation. The spreader is then lowered and opens the button hole ready to receive the straight, open prongs of the button, which is held by the plate attached to the button setting plunger, on its underside, and on the side next the standard of the machine by the leaf or other spring. The key having been thrown into position so as to couple the bent wheel and main driving shaft, the shaft revolves, the button hole spreader by the action of its controlling cam drawing out just before the button setting plunger which has finished fastening the button, whose prongs have been around the former, has started to feed the shoe upper or other goods forward. The rearward movement of the plunger is regulated as hereinbefore described

and during one complete revolution of the shaft the button setting plunger has carried down a button, set it, fed the shoe forward, bringing the next succeeding button hole under the button hole spreader and just before the button setting plunger starts to return to its initial position, the button hole spreader has entered the next button hole presented, thus being in position ready to receive the next button which, until the return of the button setting plunger, has been retained in the button chute by means of the lip upon the top side of chute, and the body of the plunger. The plate supporting the under side of the button being cut away on the side toward the standard of the machine, permits the same to be readily disengaged from the button, which has just been set. It will be seen that when the operation is completed the upper is bottom up and ready for lasting. This operation is repeated until all the buttons have been placed, when the operator lifts his foot from the treadle controlling plunger e, when by contact with the arm d' , the key will be rocked so as to cause the cut away portion to lie flush with the periphery of the shaft B.

The method mentioned by me, as will be readily seen from the description and an inspection of the drawings, particularly Fig. 3, is carried out by arranging the shoe upon the horn or support with the flaps placed together, then causing the spreading of the button hole, the delivery of a button thereto and then causing the plunger to descend to drive the shank of the button through the button hole and down through the under shank, and fastening said shank to the under flap.

In the carrying out of my invention, it will of course, be understood that one shoe will be slipped over the horn from the sole end and the other from the ankle end of the shoe, the curved horn accommodating itself to both ways of feeding.

It will of course, be understood that various minor modifications and changes may be made in the construction of the machine and its various parts without in any manner departing from the spirit of my invention, and I therefore state that I do not consider the invention as limited in any way to the details shown and described, though so far as I now know, these various details of construction are important and form the subject matter of certain claims.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a machine for securing buttons to fabrics, a suitable support for the material, a button hole spreader, a plunger, mechanism for reciprocating said plunger, and means for delivering a button beneath the plunger; substantially as described.

2. In a machine for securing buttons to fabrics, a support for the fabric curved to conform to the line of buttons, a button hole

spreader, a plunger, mechanism for reciprocating the same, and means for delivering a button beneath the plunger to be acted upon thereby; substantially as described.

5 3. In a machine for securing buttons to fabrics, a suitable support for the material, a spreader for the button hole, a main shaft, a plunger, mechanism for delivering a button beneath the plunger, and connections between
10 the spreader and plunger and the main shaft whereby the former are operated; substantially as described.

4. The combination with a support for the fabric, of a spreader for the button hole, a
15 main shaft, a cam on said shaft for actuating the spreader, a plunger also operated by a cam on said shaft, and means for delivering a button beneath the plunger; substantially as described.

20 5. The combination with a support for the fabric, of a spreader for the button hole, a plunger, means for vertically reciprocating the same, means for moving the plunger forward and back, and means for delivering a
25 button beneath the plunger; substantially as described.

6. The combination with a support for the fabric, of a spreader for the button hole, means for moving the same vertically, a plun-
30 ger and means for moving the same vertically, a suitable hopper, a chute adapted to deliver buttons from the hopper to a point beneath the plunger, a main shaft, and connections between the main shaft and the plunger and
35 chute for giving the same a forward and backward movement in accordance with the distance between the buttons; substantially as described.

7. The combination with the spreader for
40 the button hole, of the plunger, the hopper and chute and means for giving them the desired movements, all actuated from the main shaft, a rotating brush or stirrer within the hopper, and connections between the main shaft and
45 stirrer for actuating the latter; substantially as described.

8. In combination with a plunger, and means for operating the same, a horn or support for the fabric having removable dies, and a
50 spreader for the button holes; substantially as described.

9. In combination with the plunger mechanism and means for operating it, a button hole spreader, a horn or support for the fabric
55 provided with a removable die, said die having a tapering finger or tongue around which the shank of the button passes; substantially as described.

10. In combination with the plunger mechanism and means for operating it, a button hole spreader, a horn or support for the fabric provided with a die having a curved groove therein and a tapering tongue or finger in
60 said groove around which the shank of the button passes; substantially as described.

11. In combination with the support for the fabric, a main shaft, a spreader, a cam on said

shaft for raising the spreader, a spring for keeping it normally down, a plunger, a second cam on said shaft for actuating the plun-
70 ger, and means for sliding said cam and plunger backward and forward; substantially as described.

12. The combination with a support for the fabric, of a spreader for the button hole, means
75 for moving the same vertically, a plunger, and means for moving the same vertically, a main shaft, and connections between the main shaft and the plunger for moving the same forward and backward; substantially as described. 80

13. The combination with a support for the fabric, of a spreader for the button hole, means for moving the same vertically, a plunger and means for moving the same vertically, a main shaft, and adjustable connections between
85 the main shaft and the plunger for moving the same forward and backward; substantially as described.

14. The combination with the main shaft, of a spreader, a cam on said shaft for actuating
90 the spreader, a plunger, a cam on said shaft for actuating the plunger, a wheel on said shaft provided with a cam groove, a slide actuated by said cam groove, and connections between said slide and the plunger for giving
95 the same a forward and backward movement; substantially as described.

15. The combination with the main shaft, of a spreader, a cam on the shaft for actuating
100 the spreader, a wheel on said shaft having a cam groove, a slide operated by said cam groove, a second slide, a plunger carried thereby, a cam sliding on said shaft operated by said second slide and engaging with the plun-
105 ger to raise and lower the same, and connections between the first and second slides; substantially as described.

16. The combination with the main shaft, of a wheel thereon having a cam groove, a slide
110 operated by said cam groove, a second slide, a plunger carried thereby, a cam sliding on said shaft and operated by said second slide and engaging with the plunger to raise and lower the same, a button chute supported by
115 said second slide, means for delivering a button to said chute, and operating connections between the first and second slides; substantially as described.

17. The combination with the main shaft, of a wheel thereon having a cam groove, a slide
120 operated by said cam groove, a second slide, a plunger carried thereby, a cam sliding on said shaft and operated by said second slide and engaging with the plunger to raise and lower the same, a hopper and button chute sup-
125 ported by said second slide, means for feeding a button down said chute, and connections between the first and second slides; substantially as described.

18. The combination with the main shaft, of
130 a wheel thereon having a cam groove, a slide operated by said cam groove, a second slide, a plunger carried thereby, a cam sliding on said shaft and operated by said second slide and

engaging with the plunger to raise and lower the same, connections between the slides, a hopper and button chute, means for delivering buttons to the action of the plunger, and
5 a rotating brush or stirrer within the hopper and connections between the main shaft and the same for actuating it; substantially as described.

19. In combination with the main shaft, 10 spreader and plunger, and means for operating the same, a suitable hopper having a plurality of grooves in its bottom, a chute into which said grooves pass, a rotating brush or stirrer within said hopper, and connections
15 between the main shaft and brush for rotating the latter; substantially as described.

20. The combination with the main shaft, of a wheel thereon having a cam groove, a slide operated by said cam groove, a second slide,

connections between the slides, a plunger carried by the second slide, a cam sliding on the shaft operated by said second slide and engaging with the plunger to raise and lower the same, a hopper and button chute supported by said second slide, a rotating brush or stirrer within the hopper to feed the buttons to the chute, and a third slide actuated by the cam groove on the main shaft, and connections between said slide and the brush whereby the latter is rotated; substantially as described. 20 25 30

In testimony whereof I affix my signature in presence of two witnesses.

EDWARD T. ALLAN.

Witnesses:

THOS. JAMES,
SCOTT BONHAM.