

(No Model.)

5 Sheets—Sheet 1.

E. PRINGLE.

MACHINE FOR SETTING BUTTONS OR EYELETS.

No. 585,832.

Patented July 6, 1897.

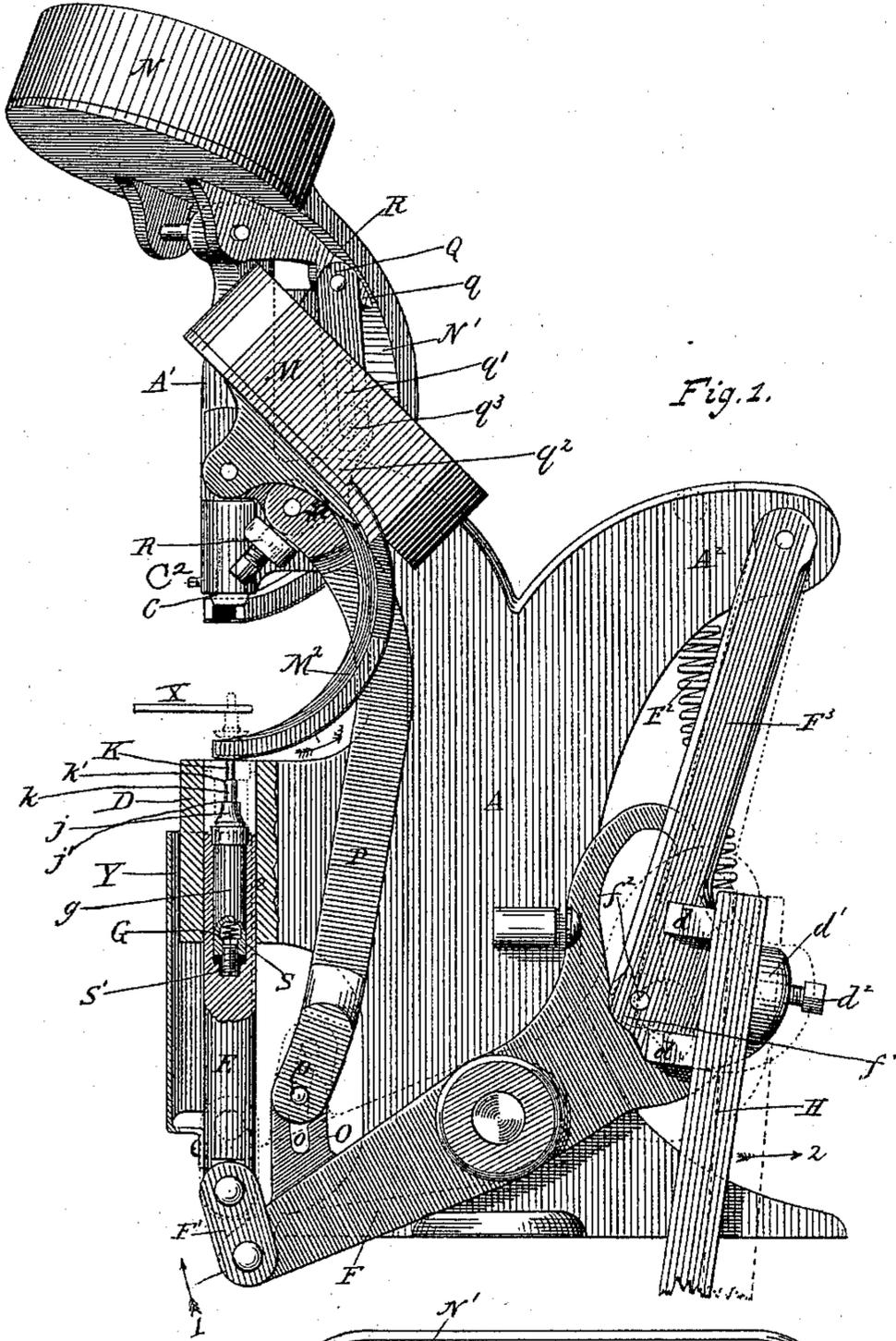


Fig. 1.

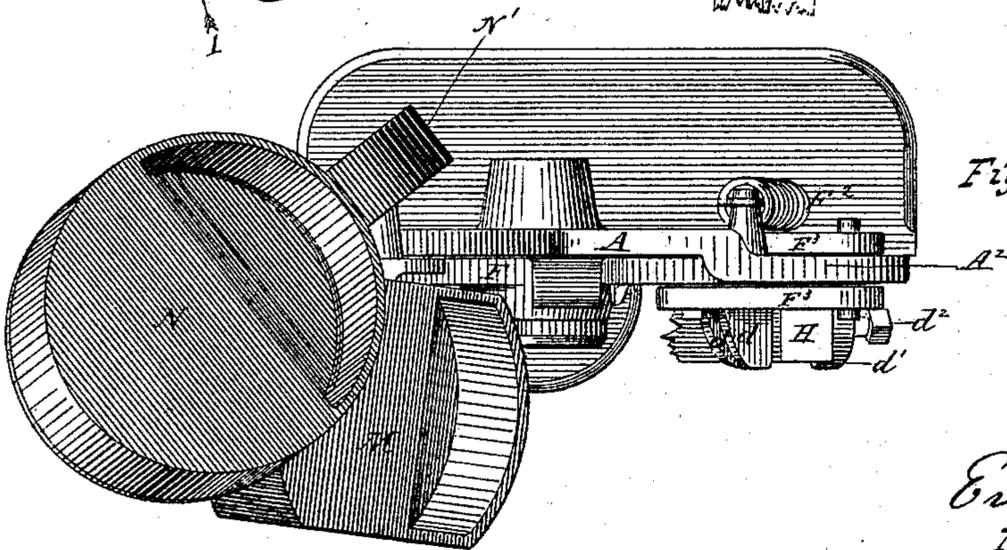


Fig. 2.

Witnesses: *Madison D. Shipman*
Charles S. ...

Eugene Pringle
 Inventor.
 by his Attorney
Alex. S. ...

(No Model.)

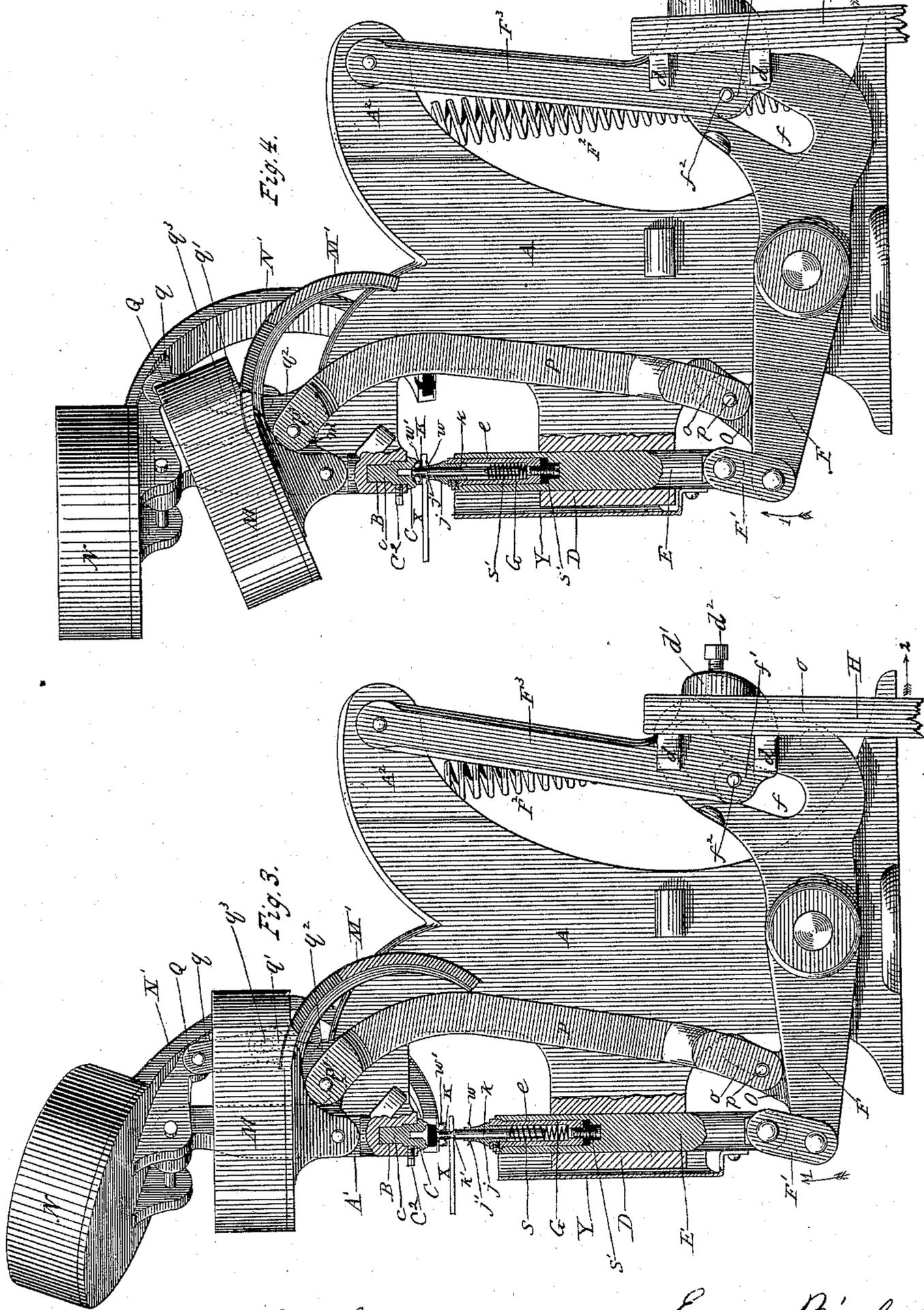
5 Sheets—Sheet 2.

E. PRINGLE.

MACHINE FOR SETTING BUTTONS OR EYELETS.

No. 585,832.

Patented July 6, 1897.



Witnesses: *Madison D. Shipman*
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(No Model.)

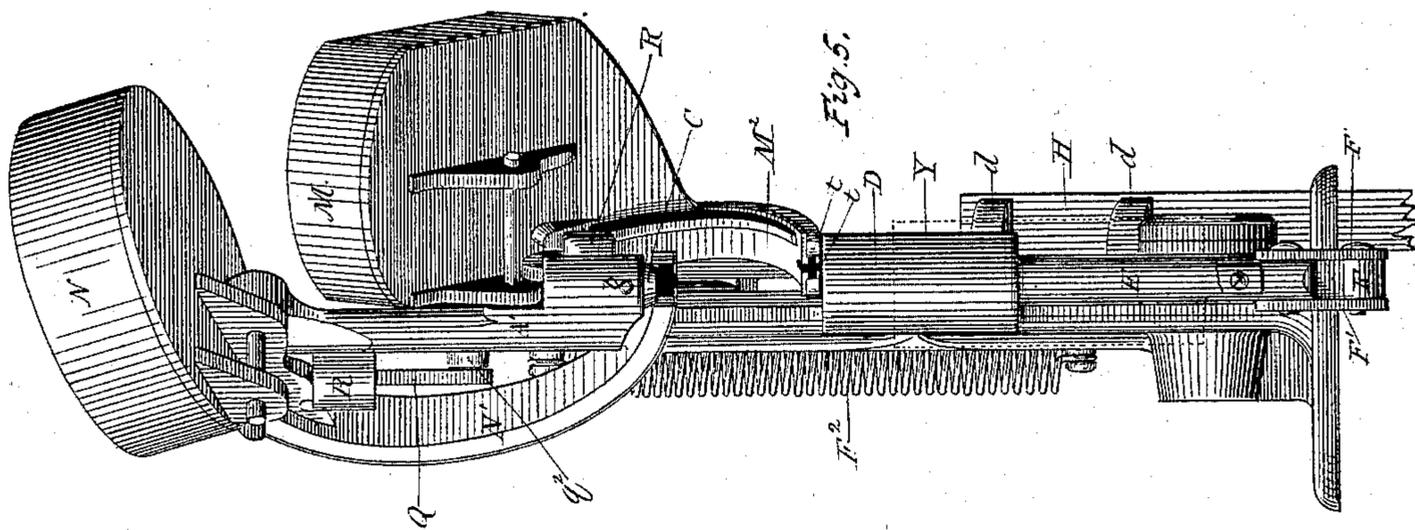
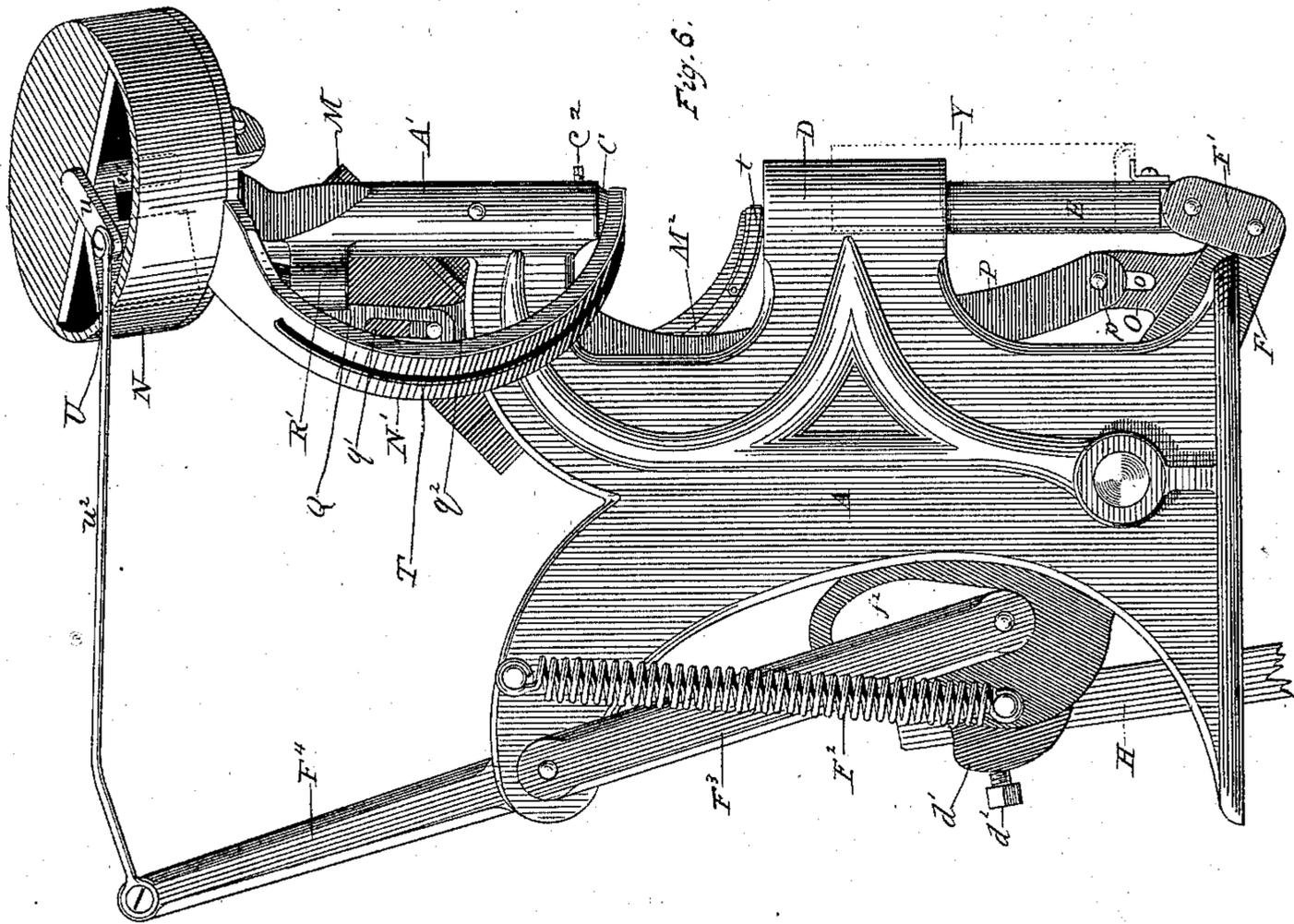
5 Sheets—Sheet 3.

E. PRINGLE.

MACHINE FOR SETTING BUTTONS OR EYELETS.

No. 585,832.

Patented July 6, 1897.



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(No Model.)

5 Sheets—Sheet 4.

E. PRINGLE.

MACHINE FOR SETTING BUTTONS OR EYELETS.

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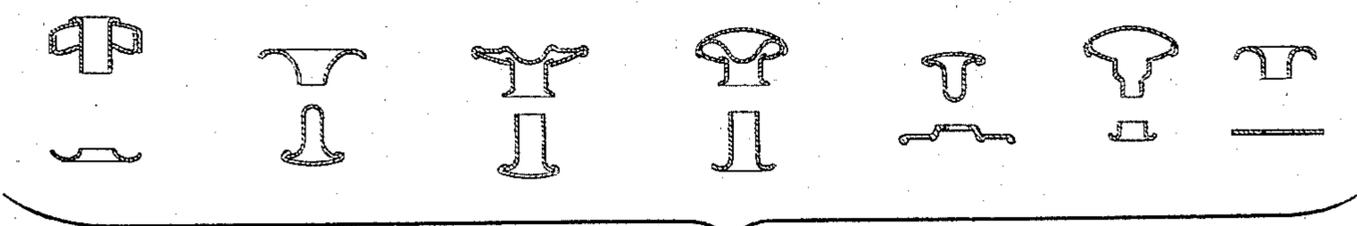
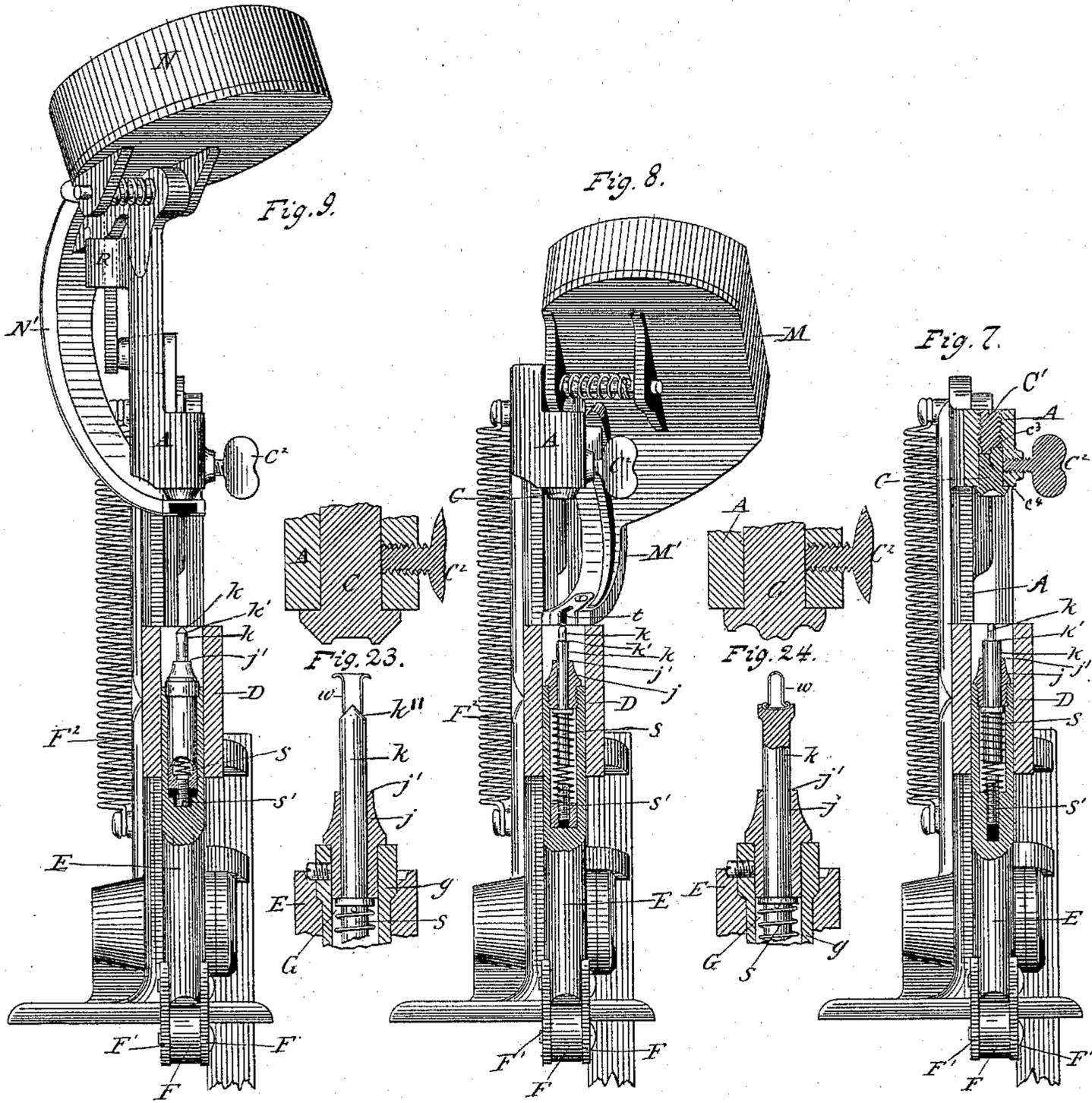


Fig. 25.

Witnesses: *Madison D. Shipman*
Charles Beckett.

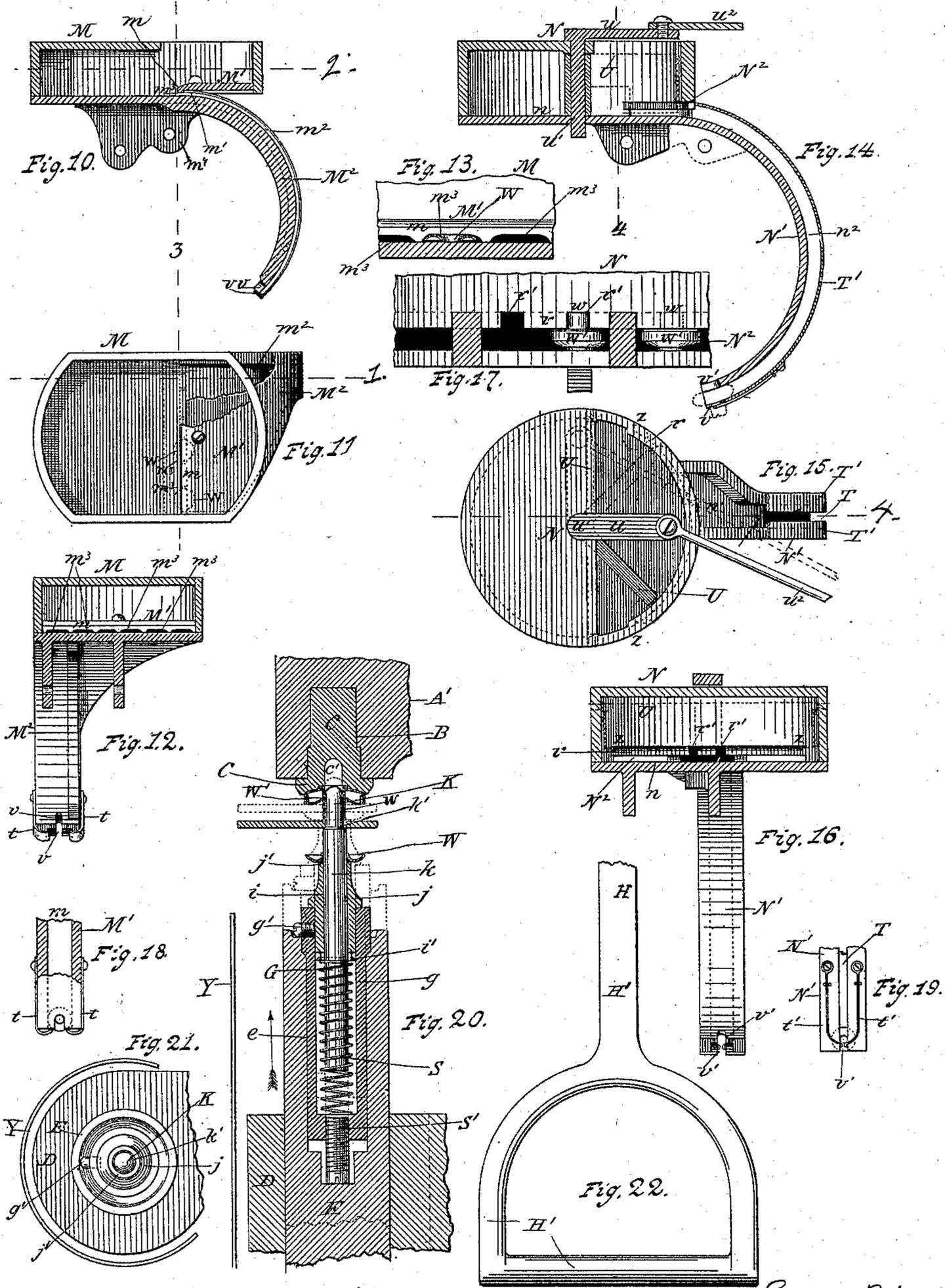
Engene Pringle
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 By his Attorney
Alex. Delkath

E. PRINGLE.

MACHINE FOR SETTING BUTTONS OR EYELETS.

No. 585,832.

Patented July 6, 1897.



Witnesses: *Madison D. Shipman*
Charles Beckwith

Eugene Pringle
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UNITED STATES PATENT OFFICE.

EUGENE PRINGLE, OF GLOVERSVILLE, NEW YORK, ASSIGNOR TO MADISON D. SHIPMAN AND CHARLES E. BRADT, OF DE KALB, ILLINOIS.

MACHINE FOR SETTING BUTTONS OR EYELETS.

SPECIFICATION forming part of Letters Patent No. 585,832, dated July 6, 1897.

Application filed April 20, 1886. Renewed January 30, 1897. Serial No. 621,349. (No model.)

To all whom it may concern:

Be it known that I, EUGENE PRINGLE, a citizen of the United States, residing at Gloversville, in the county of Fulton and State of New York, have invented certain new and useful Improvements in Machines for Setting Buttons or Eyelets, of which the following is a specification.

My invention relates to machines for setting buttons or eyelets on their washers; and it consists in the devices and elements and combination of devices and elements hereinafter particularly described, and specifically set forth in the claims.

The objects of my invention are, first, to provide an eyelet-setting device having an elastic eyelet-mandrel which will first receive the washer the eyelet is to be clenched on, and next the leather or fabric to which the eyelet is to be secured, and then receive the eyelet and draw it down through the hole in the fabric and the washer, and start the clenched of the same by a shoulder made with the mandrel and effect a finish of the clenched or setting of the eyelet on the washer by means of a shoulder or concentric anvil; second, to provide mechanism by which the eyelet-setting device will be properly held or guided when operated for setting or clenched the button-shank or eyelet on its holding-washer; third, to provide means by which an operator can at will force the moving part of the eyelet or button setting device toward the stationary part of the same; fourth, to provide automatic means for feeding washers or buttons, or both, to the setting device regularly as that device is operated; fifth, to provide automatic means by which eyelets or buttons, provided with shanks or eyelets, will be fed to the setting device at intervals regularly following the times the washers or their equivalents are fed to the same; sixth, to provide means for operating the devices for feeding the washers and the buttons or eyelets to the setting device, and, seventh, to provide specific means by which my invention will be embodied in machines for securing buttons and their parts to gloves and shoes by means of any of the preferred form of eyelets or washers or their equivalent clenched or holding devices. I attain

these objects by the means illustrated in the accompanying drawings, forming a part of this specification, in which—

Figure 1 is a side view of a machine embodying the features of my invention with the operating parts at rest and dotted lines illustrating the movement of some of the parts. Fig. 2 is a view of the machine from its upper end. Fig. 3 is a side view with some of the parts shown in section and illustrating the manner of arrangement of the same. Fig. 4 is a side view of the same with some of the parts shown in section and illustrating changes of position of some of the parts. Fig. 5 is a view of the machine from its front side. Fig. 6 is a view of the machine from its reversed side with parts in position as shown in Fig. 1 and also illustrates the mechanism operating with the hopper to prevent clogging of the same. Fig. 7 is a front view of the machine with parts shown in section with hoppers and conveyers omitted and illustrating a modified form of setting device. Fig. 8 is a front view of same with one of the hoppers and its conveyer omitted, with part shown in section and illustrating another modification of form of setting device. Fig. 9 is a front view of the machine with a different hopper from that shown in Fig. 8, with a modified form of setting device. Fig. 10 is a sectional view of the washer-hopper and its conveyer, taken at line 1 in Fig. 11. Fig. 11 is a sectional view of the same, taken at line 2, Fig. 10. Fig. 12 is a sectional view taken at lines 3 3 in Figs. 10 and 11. Fig. 13 is a view of a section of the washer-hopper, illustrating the washer-ports on an enlarged scale. Fig. 14 is a sectional view of the button (or eyelet) hopper and its conveyer, taken at line 4 in Fig. 15. Fig. 15 is a view from above with a portion of the wall of the conveyer broken away and exposing the channel of the conveyer. Fig. 16 is a sectional view taken at line 4 in Fig. 14. Fig. 17 is a sectional view of the ports leading from the button-hopper to the conveyer, taken on an enlarged scale. Fig. 18 is a view of the exit end of the conveyer of the washer-hopper and the check-springs used with the same. Fig. 19 is a view of the exit end of the conveyer of the button-hopper and the check-springs employed with the same. Fig. 20 is

a sectional elevation showing, on an enlarged scale, the reciprocating mandrel working in its sleeve, the eyelet-setting device in said mandrel, button head-piece and bracket holding the same with washer, leather, or fabric, and button and its eyelet, illustrated by full lines in position prior to being secured, and illustrating by dotted lines the movement of parts which effect a clenching of the eyelet on the washer or fabric. Fig. 21 is a view of the eyelet-setting device on the same scale and taken from above. Fig. 22 is a view of the treadle end of the foot-lever. Fig. 23 is a sectional view of a modification of the form of the eyelet, mandrel, and the face of the button head-piece. Fig. 24 is a sectional view of another modification of the form of said parts. Fig. 25 illustrates sectional views of several well-known popular buttons, (in their respective sections before being joined,) which may be secured or set with the fabrics of articles by my improvements by having ports of the machine in correspondence with the sections of the buttons to be operated with.

In the drawings, A represents a suitable frame for supporting the operating parts of the machine. A' is a post made with said frame or securely attached thereto and having in it the socket B.

C is the button or eyelet head-piece, made with stem *c*; fitting socket B and secured by set-screw C². The face of this set is made with a form corresponding with that of the top side of the button or eyelet to be secured or set.

D is a sleeve made with or secured to frame A on a plane below set C, and is so arranged in relation to the set that the center of the latter will be in line with the axial line of said sleeve.

E is a reciprocating mandrel fitting nicely in the bore of sleeve D, so as to be freely moved in the same.

F is a lever pivoted to frame A and having its forward end connected with mandrel E by link F'.

G is an eyelet-setting device fixed in the socket *e* of mandrel E for operation with the button or eyelet head-piece C for connecting the upper portion of the button with the leather or fabric. This eyelet-setting device G is made with a peculiar construction and arrangement of parts, as illustrated in Fig. 20, and consists in its essential parts of the tubular piece or body *g*, which nicely fits bore *e* of mandrel E, perforated sleeve or anvil *j*, and elastic mandrel *k*. The tubular body-piece *g* holds the other parts of this device in connection with the moving mandrel and is carried by the latter in a reciprocating manner toward and from the button head-piece C.

The perforated sleeve or anvil *j* operates to support the washer and is made with a stem which nicely fits the bore of the tubular piece *g* and is secured in the upper end of

the same preferably by set-screw *g'*, though it can be secured in any other suitable manner. This sleeve-piece *j* is provided with the central perforation *i*, having a diameter corresponding with that of the body of the eyelet-mandrel *k*, so that the latter will nicely move in said perforation. The upper end of this perforated sleeve or anvil piece *j* is preferably made with the surface *j'*, which is concentric to the eyelet-mandrel *k* and forms practically a shoulder to said mandrel. This surface or shoulder *j'*, besides acting as a support to washer W, operates as a means for turning and clenching the eyelet on the lower side of the washer.

The upper end of the eyelet-mandrel *k* extends above the shoulder-surface *j'* of the perforated sleeve *j*, and its main portion works through perforation *i* of the same into the chamber of the tubular piece *g*. The upward projection of this eyelet-mandrel above the shoulder-surface of the concentric mandrel or sleeve *j* is limited by means of pin *i'*, or equivalent stopping-piece, attached to said mandrel and having a bearing against the lower end of the washer-support, as shown in Fig. 20. This eyelet-mandrel is made elastic by means of spring S between pin *i'* and the bottom of the chamber of the tubular piece *g*.

The extent of the inward movement of the eyelet-mandrel *k* is regulated by means of screw *s'*, Fig. 20, which can be screwed toward the lower end of said mandrel or from it, as will be required to adjust its shoulder or enlargement *k'* in relation to the surface *j'* of sleeve *j*. Made with the upper portion of this eyelet-mandrel at a suitable distance above the shoulder-surface *j'* of the anvil or sleeve *j* is shoulder *k'*. The reduced or entering end portion K of this mandrel extends above shoulder *k'* to a suitable distance to receive the eyelet or button to be set. When the button to be set is provided with an eyelet form of shank and a central hole through the same, as shown in Fig. 20, the button or eyelet head-piece C is provided with the central recess *c'*, as shown in the same figure.

It should be understood that the eyelet-receiving portion K of the mandrel can be shaped in any manner suitable for operation with the buttons or parts of any particular kind preferred, and can be made with any degree of extension from the shoulder or enlargement *k'*, as the length of the eyelet or shank to be clenched may require. As it is designed that this machine shall be adapted to set any of the popular kinds of buttons found in market, I would in all cases so modify the coacting parts of the setting mechanism C G as to adapt them for use with the respective sections or parts of the buttons to be secured to the fabric or leather. In Figs. 1, 3, 4, and 20 this eyelet-setting device G is shown to have a tubular form of body *g*, which receives and holds the other parts of said device, and that this tubular body is seated

within the longitudinal perforation made in reciprocating mandrel E, yet, if preferred, this tubular body *g* can be dispensed with, and the mandrel E itself can be made to directly receive the sleeve *j*, eyelet-mandrel *k*, spring S, and adjusting-screw S', as shown in Figs. 7 and 8; but the use of this tubular body *g* is preferred when different sizes and forms of setting devices are to be used in the same machine.

The button or eyelet head-piece C, Fig. 7, is preferably provided with an adjusting-stop C', having a screw-thread and working into the screw-threaded perforation made in post A'. The lower end of this adjustable stop is made with a shouldered step *c*³. The upper end of the stem *c* of the head-piece C is provided with a corresponding coacting shouldered step *c*⁴.

When it is desired to adjust the button head-piece C, the set-screw C² is turned to release the head-piece, and the stop C' is then adjusted up or down, as desired, after which the head-piece is replaced and secured by the set-screw C².

The head-piece C is held adjustably by set-screw C².

The lever F operating mandrel E is suitably pivoted to the frame A and has made in its rearward end the cam-slot *f*.

F² is a reacting spring having its upper end connected with bracket A² of frame A and its lower end to the heel of lever F. This spring operates to carry the said lever to its normal position (shown in Figs. 1 and 6) after each complete movement of the lever has been finished.

F³ is a vibrating arm having its upper end pivoted to bracket A² of the frame and its lower end carrying the friction-roller *f*', working in the cam-slot *f* in lever F. This vibrating arm is preferably slotted, so that the rear end of lever F will work between the forks of said arm, and the friction-roller will be supported in place by the pin *f*² passing through both forks of said arm. This friction-roller cam can be dispensed with and a fixed pin working in cam-slot *f* can be substituted.

H is a foot-lever which is connected with vibrating arm F³ in any suitable manner. To render this foot-lever readily adjustable in length, I prefer to use lugs *d* *d* and *d*', made with the lower end of arm F³ and the set-screw *d*² for clamping the upper end of said foot-lever with said arm, as shown in Figs. 1, 3, 4, and 5. This foot-lever is preferably provided on its lower end with the foot-piece or stirrup H', Fig. 22, by means of which the foot of the operator will be comfortably held in place with the said lever when operating the same.

The lever F not only operates the mandrel E, but also the button and washer hoppers and their attached conveyers.

M is the washer-hopper. (Shown in Figs. 1, 3, 4, and 5 and in detail in Figs. 10, 11, 12, and 13.) This hopper is pivoted to post A' of

frame A from ears suitably attached to its lower side. This hopper has arranged in the forward portion of its chamber and slightly above its bottom proper the shelf M', Figs. 10, 11, 12, and 13, having its rear edge *m* preferably extending across from side to side of the hopper, which communicates to the passage-way *m*² of the washer-conveyer M², as shown in Fig. 7. This passage-way is made with a vertical extension equal to the vertical extension of washer W to be operated with, so that while the washers can freely move singly in this passage-way to the passage-way of the conveyer they will be prevented from clogging.

Entrance is had from the bottom of the chamber of the hopper M to the passage-way *m*' beneath shelf M' through a series of ports *m*³, made at the beveled edge *m* of said shelf, as shown by full lines in Figs. 10, 12, and 13 and by dotted lines in Fig. 11. These ports *m*³ are made in their form and extension to correspond with the form and extension of washer W in its cross direction, as shown in Fig. 11. With this form of construction of said ports, washer W will have passage through the same only when they are in position to have their forms correspond with that of the ports they are moved to, over the bottom proper of the hopper. The conveyer M² is preferably made with a curved form, as shown, and the hopper M is preferably so pivoted with the frame that its bottom will be inclined rearwardly and downwardly when in its normal position with the exit end of the conveyer over the eyelet-setting device G, as shown in Figs. 1 and 6.

O is an ear provided with a slot *o* and made with or secured to the front end of lever F.

P is a tripping-bar connected at its lower end with the slotted ear O by pivot *p*, and at its upper end to an ear *m*⁴, made with hopper M by pivot *p*'. By means of this tripping-bar hopper M will be vibrated from its normal position (shown in Figs. 1, 5, and 6) to that shown in Fig. 4, and return accordingly as lever F is operated.

N is the button-hopper. (Shown in perspective in several figures and in sectional details in Figs. 14, 15, 16, and 17.) This hopper is preferably pivoted to the upper end of post A', as shown in Figs. 1 and 5, and is provided on its rear side with conveyer N' for conducting the buttons to beneath the button or eyelet head-piece C. This hopper N is made with a plain smooth surface *n* from front to rear and leads to the surface *n*² of conveyer N', as shown in Fig. 14.

N² is a slot made through the rear side wall of hopper N between points *z z*, Fig. 15. This slot is made with a vertical extension above the plane of the floor-surface of the hopper about equal to the thickness of the button W', as illustrated in Fig. 17, so that the bodies of the buttons can freely move in the same. Made also in the rear wall of this hopper between points *z z* and from the inner surface side of

the same is a groove or recess r . (Shown by full lines in Figs. 2, 14, and 16 and by dotted lines in Fig. 15.) This recess r extends upward from slot N^2 to a distance about equal to the height the eyelet w of button W' extends above the latter, so that while the bodies of the buttons W' can readily move in slot N^2 the eyelets with the same will be freely received in the groove or recess r . Made through the wall at the inlet end of the conveyer N' are one or more exit-ports r' . (Shown by full lines in Figs. 14, 16, and 17 and by dotted lines in Fig. 15.) These ports r' are of such a form and size of parts as will correspond with the form and size of the body and eyelet and shank of the buttons to have passage from the hopper to the chamber n^2 of the conveyer. The conveyer is preferably made with a curved form, as shown, and its attached hopper is so pivoted with the frame that in its normal position it will be tilted rearwardly, while the conveyer will be in position with its exit end directly beneath eyelet or button head-piece C , as shown in Figs. 1, 3, 5, and 6. This hopper N and its attached conveyer N' are vibrated from normal positions shown in Figs. 1 and 3 to that shown in Fig. 4 and return by means of link Q , tripping-bar P , and lever F . The link Q is pivoted to an ear q , attached to hopper N or its conveyer N' . In the lower end portion of this link is made the slot q' . An ear q^2 , made with or secured to the upper end of the tripping-bar P , is pivoted to said link through its slot q' , as shown. A full throw of lever F in direction of arrow 1 in Fig. 1 will operate through bar P and link Q to vibrate hopper N to its full distance, when the reacting spring F^2 will operate through the same devices to move said hopper back to its original position.

R , Figs. 1, 5, and 6, is a stop connected with the frame and operating to prevent the hopper being moved down past the point the hopper should only be moved to for bringing the exit end of the conveyer M^2 directly over the eyelet-mandrel k for the proper discharge of the washer W on the receiving end of said eyelet-mandrel, and, if preferred, this stop can be provided with a screw for nice adjustment. By the use of this stop there is produced at each return of hopper M to its normal position, as to that shown in Fig. 1, a slight jar of the hopper, which gives a slight sudden agitation to the washers in the hopper to cause a quicker passage of the same through the ports $m^3 m^3$ and down the conveyer. R' , Fig. 6, is a similar stop for operation with hopper N to cause the exit end of conveyer N' to be stopped directly beneath the button-set C and for communicating a slight jar to the hopper and conveyer.

The walls of the exit end of conveyer M^2 of hopper M are provided with slots $v v$ for passage of the upper end of the eyelet-mandrel above the floor of the passage-way of the conveyer, and similar slot v' is made in the wall

of the exit end of conveyer N' , into which slot the upper end of the eyelet-mandrel will pass after passing through the eyelet or the button and before the withdrawal of the said exit end away from beneath the button or eyelet head-piece C .

T is a slot made in the rear side wall of conveyer N' , as shown in Figs. 6 and 15, for the passage of the eyelet w of the button.

Suitably secured to the exit end of the conveyer M^2 , Fig. 18, are check-springs $t t$, to which washers W move and by which they will be held from passing directly out when the hopper is operated to carry the exit end of said conveyer to over the eyelet-mandrel. When the exit end of this conveyer is properly over the eyelet-mandrel, these springs will have bearing against the forward edge of the washer W and hold it so that its central perforation will be relatively central over the eyelet-mandrel, so that the latter will readily pass into the same when it is moved upward. If preferred, but a single spring t can be employed.

Suitably secured to the exit end of the conveyer N' are check-springs $t' t'$, which operate with buttons W' substantially as do springs $t t$ with washers W and for the same purpose. In Fig. 19 these check-springs $t' t'$ are shown to be secured to the rear side of slotted wall T' of conveyer N' with their free ends brought toward each other so as to touch the tube of the eyelet in the button W' , as illustrated by full and dotted lines in the same figure, yet, if preferred, these check-springs $t' t'$ can be arranged similar to springs $t t$ at the side edges of the conveyer to operate with the body of button W' , or but one such spring can be used.

Arranged with hopper N is the wing U , Figs. 6, 14, and 15, which is loosely pivoted within the chamber by means of shaft u' , to which is attached crank u , which is connected by means of rod u^2 with arm F^4 . When this arm F^4 is vibrated, motion will be imparted to wing U , which will be vibrated horizontally past the ports $r r'$ and move away from the same those buttons or ports of buttons which are not in position and situation to have correspondence with said parts, while those buttons or parts of buttons which are in position to have correspondence will not be disturbed, but will have passage through said ports into the conveyer.

Y is a guard made of any thin sheet metal and connected with mandrel E , so as to be moved with the same. This guard is arranged at the sides of sleeve D and is moved up past the same to intervene between the mandrel and the fabric operated with, so that the latter will be prevented from touching the outer surface of the mandrel D and be soiled by the lubricating-oil on the same.

It should be understood that although this machine is shown to have a construction in which the operating-mandrel E , setting device G , and button or eyelet head-piece C are

in the same vertical line, yet, if preferred, the machine can be so constructed that those parts can be in a horizontal line. In such a case the other parts can be suitably modified in form and arrangement, so that the mandrel E will be properly operated and the hoppers be made to deliver the respective parts of the buttons to between the eyelet-setting device and the button or eyelet head-piece, or, if preferred, the button or eyelet head-piece may be arranged in the lower portion of the machine, while the mandrel E, carrying the eyelet-setting device, can be arranged in the upper portion of the machine and be made to work downwardly instead of upwardly, as shown. Again, the button head-piece C can be arranged in the mandrel E, while the eyelet-setting device G can be set in post A', in which case I would prefer to have the latter stationary and the former moved.

The drawings show but one tripping-bar P employed to operate both hoppers, yet, if preferred, two independent tripping-bars can be employed, when the parts coacting with such tripping-bars will be suitably modified.

The respective hoppers with their outlets and conveyers can be modified in their parts to adapt them to be used for delivering any or nearly all kinds of buttons. In some cases where the body of the button is such that it would not be desirable or advantageous to feed the same to the setting device from hopper N said hopper can be dispensed with and the button bodies can be placed by hand, while the other hopper can be employed to deliver the washers or other completing portions or parts of the fastener.

In other cases it may be desirable or advantageous to dispense with the use of hopper M and its conveyer and supplying the washer or equivalent piece or part to the setting mechanism by hand, while the other and completing portions can be advantageously supplied from a hopper.

It should be understood that the ports leading from the respective hoppers and the chambers of the conveyers are to be so shaped as to have suitable correspondence with the part or member of the button to be delivered to the setting mechanism.

The manner in which the several parts of this machine operate is as follows: A suitable number of washers W are placed in hopper M, and about a corresponding number of buttons W' are placed in hopper N, when a few of these washers and buttons can be worked through the ports m^3 and r' of the respective hoppers by the operators' fingers, so that the two conveyers will have a sufficient supply of washers and buttons for commencing operations for attaching the buttons to the leather or fabric. In the normal condition of parts of this machine the two hoppers and their respective conveyers are in positions shown in Figs. 1, 5, and 6, with the exit end of the conveyer of the washer-hop-

per M over the eyelet-mandrel of the eyelet-setting device G and the exit end of the conveyer of the button-hopper N beneath the button head-set C, as shown in Fig. 1, while the eyelet-setting device G will be wholly down below the plane of the upper end of sleeve D, within which works the mandrel E.

In the position of the exit end of conveyer M² of washer-hopper M, as shown in Fig. 1, a washer W will be in position within the exit end of said conveyer so that the central hole of the washer will be directly over the upper end of the eyelet-mandrel k , and at the same time a button W' will be in position within the exit end of conveyer N' of button-hopper N so that the eyelet w in said button will be held central in relation to the button or eyelet head-piece C and directly beneath the same, with the bore of the eyelet w directly opposite the central orifice c' in the button head-piece C. In these positions of the washer W and button W' the several parts of the machine will be as shown by full lines in Fig. 1. The gloves, shoes, or other articles which are to have the buttons attached are suitably perforated at proper points prior to the application of the buttons by this machine. Before operating with the gloves or other articles the operator will supply the respective conveyers from their hoppers with the parts of the buttons by imparting to the hoppers partial movements, so that a sufficient number of the respective parts of the buttons will be in each conveyer.

The operator will operate the mechanism by pressing with his foot on treadle H' of foot-lever H and readily moving the same rearwardly in direction of arrow 2, Figs. 1, 3, and 4. When the foot-lever is moved from normal position shown by full lines in Fig. 1 to that shown by dotted lines in the same figure, the roller (or pin) f' on arms F³ will press against the rear side of the cam-slot f of lever F, so as to effect a depression of the rear end of said lever and move the same to position of dotted lines in Fig. 1, in which the forward end of said lever will be moved in direction of arrow 1, and through link F' move mandrel E upward in sleeve D, and thereby carry the eyelet-setting device G upward to position of dotted lines in same figure. In the position of parts shown by full lines in Fig. 1 the washer-hopper M will be tilted downwardly and rearwardly, with the discharge end of its conveyer over the reduced portion or eyelet-pin K of eyelet-mandrel k . In this position of the washer-hopper and its conveyer a washer will be brought directly over the eyelet-pin K and will be held within the exit end of the conveyer by the check-springs $t t$, Figs. 5, 12, and 18. In the upward movement of lever F the slot o in ear O made with said lever will permit that lever to move the eyelet-setting device G toward the button or eyelet head-piece C until the eyelet-mandrel k has been carried upward through the hole in washer W without effect-

ing through the tripping-bar P any movement of the washer-hopper M; but when the eyelet-mandrel k is carried upward so that its shoulder k' is passed into the hole in the washer in the exit end of the conveyer the lever F will carry ear O upward so that the bottom of its slot o will strike pin p , and with a further upward movement of the forward end of said lever the pin p at the bottom of slot o will lift bar P upward and through its pivoted connection with hopper M move said hopper and its conveyer M^2 from position shown in Fig. 4 to those shown in Fig. 3. In this movement of this hopper the conveyer will be gradually oscillated rearwardly while the eyelet-mandrel k is holding with the washer it is projected through, and by this hold of said mandrel the washer will be drawn against the check-springs tt , which will yield before the pull on the washer and allow the latter to be drawn out from the exit end of the conveyer as it is moved rearwardly, so that when the exit end of the conveyer is drawn away from the mandrel k the washer will be in its place on the shoulder-surface j' of the washer-supporting piece j , with the body of the eyelet-mandrel k within the hole in the washer. When the operator of lever F has moved the eyelet-mandrel k of the setting device G upward to about the plane shown by dotted lines in Fig. 1, with the washer (also shown by dotted lines) at the shoulder j' , the exit end of the conveyer will be carried rearwardly from said mandrel and washer to such a distance as to allow the operator to readily place the fabric X or leather on the entering end or eyelet-pin K of the mandrel, as illustrated in Fig. 1, by bringing the hole previously made in the leather or fabric directly over the end of said eyelet-pin while it is being further moved upwardly. By a further upward movement of the forward end of lever F the eyelet-setting device G will be moved so as to carry the top end of eyelet-pin K of the eyelet-mandrel k to a point just below the exit end of conveyer N' of the button-hopper N, as shown in Fig. 3, when a further movement upward of the eyelet-mandrel will carry the pin K into the eyelet or button-shank, so as to hold with the same, as shown in Fig. 3. In the time of this upward movement of the eyelet-mandrel the upward movement of the tripping-bar P will carry the ear q^2 upward, so that the pin q^3 will be moved upward in slot q' in link q and be made to push upward on said link, when the hopper N will be tilted forward and its conveyer N' be drawn away from below the button head-piece, as shown in Fig. 4. When the delivery end of conveyer N' is about to be drawn away from below piece C, the button W' and its eyelet-shank w and the washer W will be brought in position for being set together, as illustrated in Fig. 3, and when the delivering end of this conveyer has been fully drawn away, as shown in Fig. 4, and the lever F is further

operated by foot-lever H the eyelet-setting device G will be forced farther upward, when the reduced end portion K of the eyelet-mandrel k will be thrust upward into the eyelet or button-shank w , and when this upward movement of mandrel k is continued the top or head end of the button or eyelet will be carried up against the face of the button head-piece C and there be resisted, so that when a still further upward movement of mandrel E is had the eyelet-mandrel k will yield before the resistance offered to it until its foot end will be brought to have bearing on the adjusting-screw S' . In this position the enlargement or shoulder k' will be brought down to a plane with the surface j' of the anvil or washer supporting piece, while the lower end of the eyelet w will be carried through the bore of washer W and then be turned outward by the enlargement or shoulder k' preparatory to final clenching. The upward movement of mandrel E being continued while the button head-piece C is against the button, the anvil or clenching surface j' of piece j will be forced upward against the partly-turned end of the eyelet or button-shank w and set or clench the same against the lower side of the washer.

In Fig. 25 there are shown several kinds of buttons (in detached parts or sections) which are popular in the trade, any of which can be set with my improved machine when its respective parts are suitably shaped and sized for operation with the respective sections of the buttons to be set. The parts of this machine to be necessarily modified in shape and size to correspond with that of the sections of the respective buttons to be operated with will generally be the ports m^3 in the washer-hopper M; groove r , opening N^2 , and ports r' in the button-hopper N^2 and slot T in the conveyer N' , the check-springs t and t' , the bearing-face of the button head-piece C, and the formative portions of eyelet-mandrel k . As the eyelets or button-shanks of these popular buttons vary in length, the portion of the eyelet-mandrel above the shoulder or enlargement k' will be lengthened or shortened to suit the length of the eyelet to be clenched. In Fig. 23 the upper end portion k'' of the eyelet-mandrel k is shown to be made with a conical form, which can be employed, if preferred, in lieu of the form shown in the mandrel in Fig. 20, and the face of the button head-piece C, same figure, is shown to be in shape and size to correspond with the head end of eyelet w shown on the conical end of the mandrel, Fig. 23. It will be readily understood that the enlarged portion of this end, as at k'' , Fig. 23, will start the spread of the lower end of the eyelet substantially as would the shoulder k' in Fig. 20. In Fig. 24 the eyelet-mandrel k is shown to have a cup-form recess made in its end for receiving the closed head end of eyelet w (of a kind popular with the trade) shown in same figure, and for clenching the upper closed end of this eyelet

with the button it is used with the face of head-piece C is made with such a suitable shape or form as will adapt it to give a clenching impress to the closed end of said eyelet to spread the same against the inclined surfaces of the central perforation of the button this eyelet is to secure to the fabric.

By my above-described improvements the two parts or sections can be automatically delivered to the setting mechanism with the greatest accuracy, both as to place and time, so that both hands of the operator will be free for advantageous and rapid handling of the articles having the buttons secured to them, and when manufacturers of gloves or other articles apply to their goods several sizes of the same kind or style of button or several styles of buttons, in whole or part, this machine can be employed to set such different sizes or styles of buttons by changing the eyelet-mandrel or head-piece, or both, and the pieces containing the ports in the hoppers, as they may be required, by reason of the forms of the sections of the buttons. Having described my invention, what I claim, and desire to secure by Letters Patent, is—

1. A setting tool or mandrel for machines of the class described, consisting of a pin having an enlargement or shoulder back of its point for receiving and supporting the tubular or clenching end of an eyelet and for carrying it through the material, said enlargement or shoulder also formed to turn or clench the eyelet, as described.

2. In a button or eyelet setting machine, the combination of a resisting-anvil to back the eyelet or button member, and a coacting mandrel having an extremity adapted to enter the opening in said member, and provided with an enlarged periphery, as compared with said extremity, to receive the open end of the shank of said member and guide it through the fabric, and a movable anvil surrounding said mandrel and adapted to clench said member, substantially as and for the purpose described.

3. In a button or eyelet setting machine, the button or eyelet supporting piece and an elastic eyelet-mandrel having a clench-starting shoulder or enlargement below its receiving-point and a sleeve-form anvil surrounding the mandrel, substantially as and for the purpose set forth.

4. In a button or eyelet setting machine, the combination, with the button or eyelet head-piece, of a double or compound eyelet or button set consisting of a shouldered elastic mandrel, and an anvil through which the mandrel works, whereby the clench of the eyelet or button-shank is started on said mandrel and completed on said anvil, substantially as and for the purpose set forth.

5. In a machine for setting buttons or eyelets, the combination of the following elements: the set or piece for supporting the head end of the eyelet or button, a washer-

supporting piece or anvil capable of movement toward the eyelet or button supporting piece and having a central perforation and provided with an annular surface which borders the outer end of said perforation, and the elastic eyelet-mandrel working in the perforation in the washer-supporting piece, and having its upper end portion reduced to enter the bore of the eyelet or button-shank, and an annular enlargement or shoulder which will start a turning of the clenching end of the eyelet or button-shank, all substantially as and for the purposes and operations set forth.

6. In a machine for setting buttons or eyelets, the combination, with an elastic eyelet-mandrel which has its upper end portion made with a reduced diameter for entrance into the bore of the eyelet or button-shank and its body portion below said reduced portion about corresponding with the central hole in the washer the eyelet is to be clenched on for starting the turning of the clenching end of the eyelet or button-shank, of a perforated washer-supporting piece having concentric anvil which will support the washer and clench the eyelet or button-shank on the lower side of the washer when it is moved toward a die or set having bearing on the head or flanged end of the eyelet or button, substantially as and for the purposes set forth.

7. In a machine for setting buttons or eyelets, the eyelet-setting device G, consisting of the combination with the tubular piece *g* and washer-supporting piece or anvil *j*, made with a central perforation and having the surface *j'* at its outer end and concentric to its bore, of the elastically-supported mandrel *k* having its body working through the perforation in the washer-supporting piece or anvil, and provided at its upper end with the reduced portion K and annular enlargement *k'*, for operations and purposes as above described.

8. In a machine for setting buttons or eyelets, the eyelet-mandrel *k* having its reduced portion made with a diameter below the end portion corresponding with that of the bore of the eyelet to be clenched, and provided with an annular enlargement or shoulder *k'*, and working in piece *j*, provided with surface *j'* for clenching the eyelet on the washer or fabric when said piece is moved toward a piece holding against the head end of the eyelet or button, substantially as and for the purposes set forth.

9. In a machine for setting buttons or eyelets, the combination of the button or eyelet head-piece C provided with perforation *c'*, the mandrel *k* having the reduced or pin portion K projecting above shoulder *k'*, the perforated anvil or piece *j* having the surface *j'* concentric to the body portion of the mandrel which works in said anvil or piece, and spring S, substantially as and for the purposes set forth.

10. In a machine for setting buttons or eyelets, a button head-piece provided with a

shouldered shank, and an adjusting stop having a corresponding shoulder, for operation as described.

11. In a button or eyelet setting machine, the combination, with the eyelet or button head-piece C, the stem of which is provided with a shouldered step, of the adjustable stop C' having a shouldered step for operation with the shouldered stem of said head-piece, and means for securing the same to its adjusted situation in relation to a coacting eyelet or button, substantially as and for the purposes set forth.

12. In a machine for setting buttons or eyelets, the combination, with the reciprocating mandrel E, of lever F, provided with the cam-slot f and arm F^3 provided with friction-roller f' operating in said cam-slot, and the reacting spring F^2 , substantially as and for the purposes set forth.

13. In a machine for setting buttons or eyelets, the combination, with lever F, jointed with the reciprocating mandrel E, which carries an eyelet-setting device, and having the cam-slot f , of arm F^3 provided with friction-roller f' which is operated in one direction at will by a foot-lever and in the opposite direction by a reacting spring, substantially as and for the purposes set forth.

14. In a button or eyelet setting machine, a tilting washer-hopper having a stationary bottom and provided with the shelf M' and ports m^3 , one or more, which lead from the said stationary bottom to the conveyer, substantially as and for the purposes set forth.

15. In a machine for setting buttons or eyelets the washer-hopper M provided with a bottom and pivoted to the frame so as to be alternately tilted in opposite directions past a horizontal plane and provided with a shelf M' having below it a chamber which communicates with the passage-chamber leading to the exit of the conveyer of the hopper, and having ports or openings m^3 , one or more, made with a form and size corresponding with that of the washer, eyelet or button operated within their cross directions, substantially as and for the purposes set forth.

16. In a machine for setting buttons or eyelets, the combination of a support for the head of a button or eyelet as C, with a yielding mandrel or set as k , having an eyelet-receiving point for conducting the end of the eyelet (or button-shank) through the material to which it is to be attached, as described, and turning or spreading the clench end of the eyelet or button-shank outwardly, substantially as and for the purpose set forth.

17. In a button or eyelet setting machine, the combination, with a yielding mandrel having one portion of diameter corresponding with that of the washer it receives, and another portion, commencing at an integral shoulder, of diameter corresponding with the bore of the stem of the button or eyelet which is to enter the hole of the washer, and a washer-support concentric to the washer-re-

ceiving portion of said yielding mandrel, of a button or eyelet hopper, provided with a conveyer which is moved to carry its discharge end opposite the die or button-head-supporting piece and the end of the mandrel which receives both the washer and the button or eyelet, substantially as and for the purposes set forth.

18. In a machine for setting buttons or eyelets, the combination, with the button or eyelet hopper of the same, of conveyer N' having slot T made in the rear side wall for passage of the tube portion of the eyelet or button-shank and slot N^2 made in the vertical wall of the hopper and in a line with its bottom groove or recess r to the chamber of the conveyer, substantially as and for the purposes set forth.

19. In a button or eyelet setting machine, the combination of two movable hoppers, containing, respectively, the two parts to be seated oppositely on the fabric, with an eyelet and washer receiving mandrel, and means for causing said hoppers to successively register with said mandrel and at each action deposit on the latter one of their aforesaid contents, substantially as and for the purpose specified.

20. In a machine for setting buttons or eyelets, the combination, with the button or eyelet die or head-piece C, and the eyelet-setting device G, of hopper M provided with the conveyer for automatically placing washers over the eyelet-pin of the said setting device prior to its commencement of upper movement, hopper N provided with the conveyer for automatically placing and holding the eyelet or button in position below or opposite the die or head-piece, and the mechanism for operating successively with the said eyelet device G and hoppers M and N, substantially as and for the purposes set forth.

21. In an eyelet or button setting machine, the combination, with a mandrel which receives both a washer and a button or eyelet to be joined, of a hopper having shelf M' for containing washers, and a conveyer which delivers the washers from said hopper to said mandrel, and a second hopper for containing buttons or eyelets and provided with a conveyer which delivers the same to the same mandrel, substantially as and for the purposes set forth.

22. In a button or eyelet setting machine, the combination, with a mandrel which receives both a washer and a button, or eyelet, to be joined, of two independent tilting hoppers having each a conveyer, one hopper for holding washers and the other for holding buttons, or eyelets, and provision for carrying the discharge ends of the respective conveyers alternately to opposite the end of the said mandrel, substantially as and for the purposes set forth.

23. In an eyelet-setting device of a button-setting machine, the combination, with the eyelet-mandrel k , having the shoulder k'

working in the anvil *j* and rendered elastic by a spring, of the adjusting-screw *S'* which can be set at will toward or from the foot end of the mandrel, substantially as and for the purposes set forth.

24. In a button-setting machine, the combination and arrangement, with the reciprocating mandrel *E* working in sleeve *D*, of the guard *Y* carried by said mandrel and closing around the sides and front surfaces of said sleeve, substantially as and for the purposes set forth.

25. In a button or eyelet setting machine, the eyelet mandrel or set *k*, that advances and recedes independently through the sleeve or collar surrounding it, as washer-supporting piece *J*, said mandrel or set having an eyelet-turning surface at or near its eyelet-receiving end, in combination with the eyelet or button head supporting-piece, substantially as and for the purpose set forth.

26. In a button or eyelet setting machine,

a mandrel having a reduced extremity adapted to enter the opening in the button or eyelet, and an enlarged periphery, back of said extremity, adapted to receive the clench end of the button or eyelet shank, to permit an aperture in the fabric to pass from the enlarged periphery over the eyelet-shank without obstruction and spread the end of said shank, substantially as shown and for the purpose described.

27. In a button or eyelet setting machine, the eyelet mandrel or set having an eyelet-turning surface at or near its end, and the washer-supporting piece or collar, surrounding and working on said mandrel, in combination with an eyelet or button head-support, substantially as and for the purpose set forth.

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