

No. 649,871.

Patented May 15, 1900.

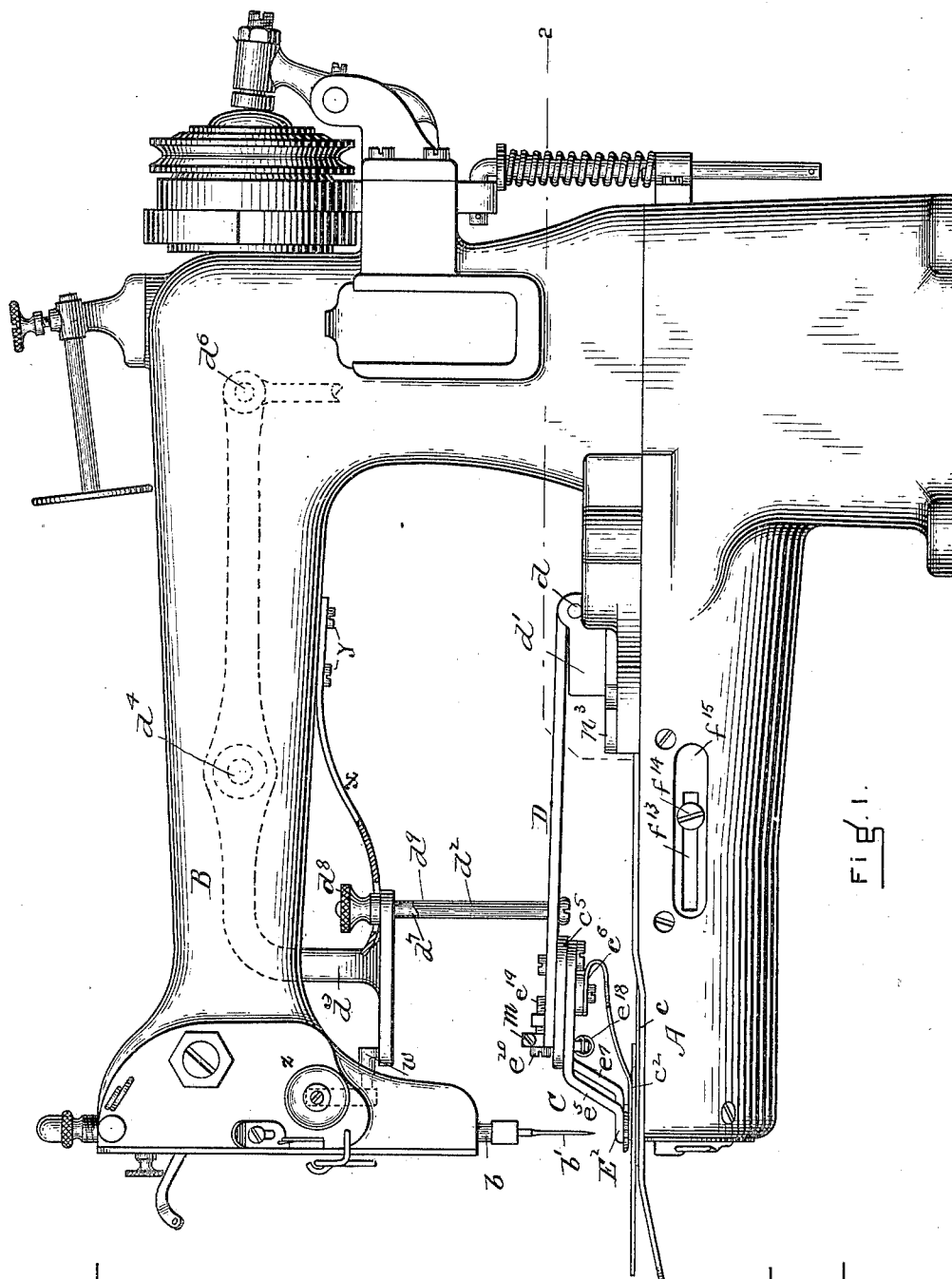
A. A. MERRITT.

MACHINE FOR SEWING ON BUTTONS.

(Application filed Jan. 26, 1897.)

(No Model.)

4 Sheets—Sheet 1.



WITNESSES

J. H. Dolan.
L. A. Walsh.

INVENTOR
Arthur C. Munn
by his atty-
Clark & Raymond

No. 649,871.

Patented May 15, 1900.

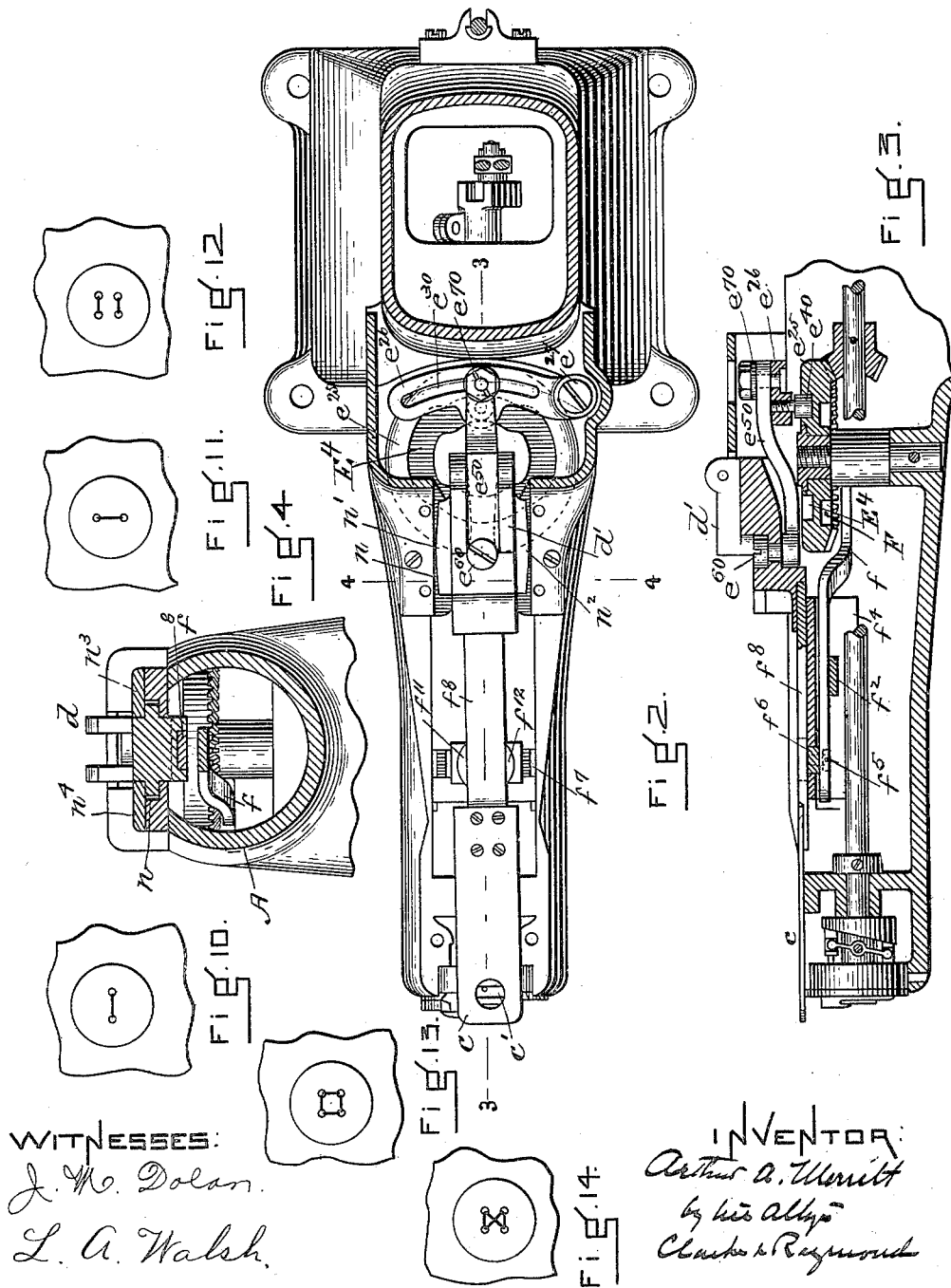
A. A. MERRITT.

MACHINE FOR SEWING ON BUTTONS.

(Application filed Jan. 26, 1897.)

(No Model.)

4 Sheets—Sheet 2.



WITNESSES:

J. W. Dolan.

L. A. Walsh.

INVENTOR:

Arthur A. Merritt
by his atty
Charles R. Reynolds

No. 649,871.

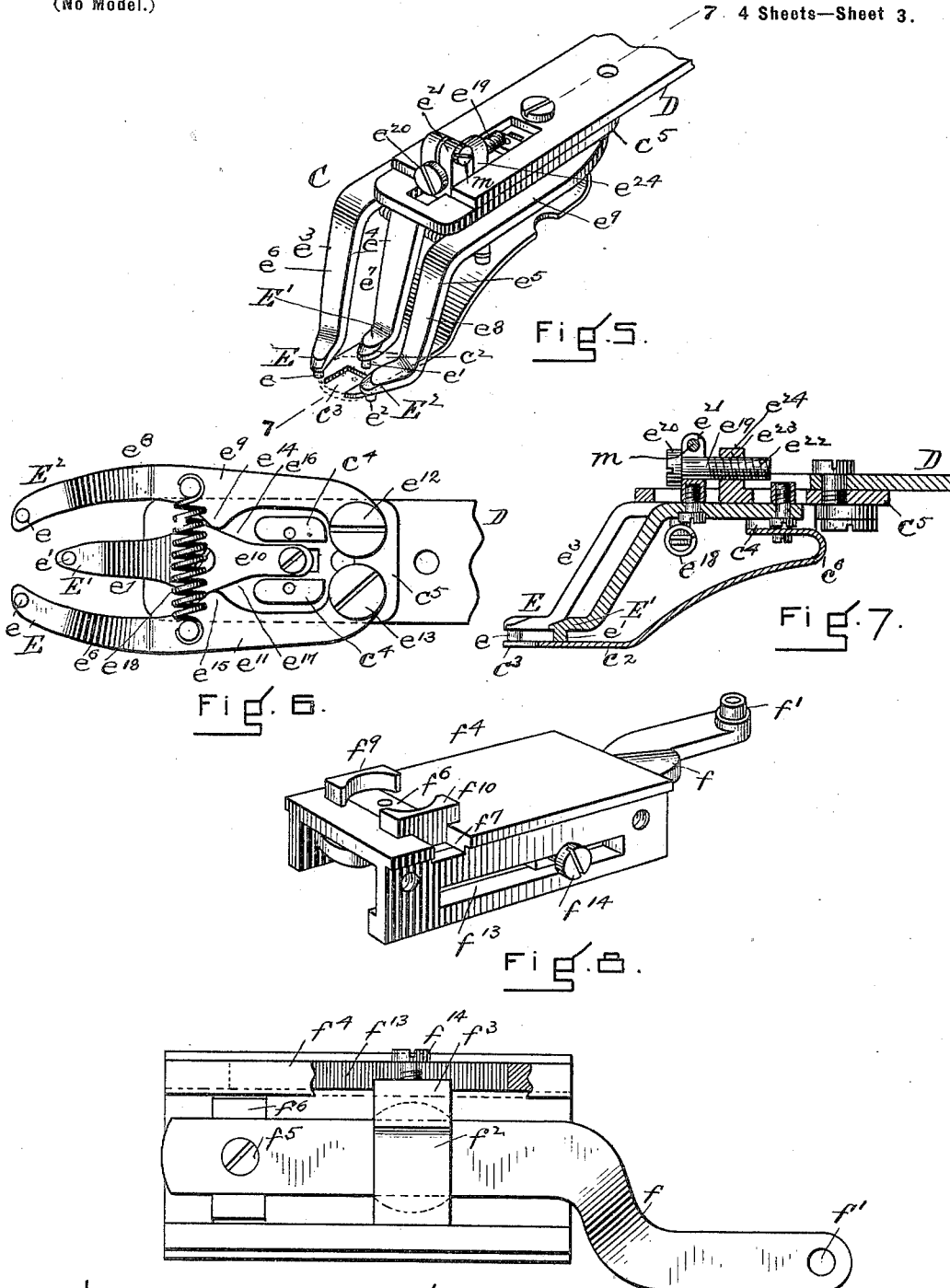
Patented May 15, 1900.

A. A. MERRITT.
MACHINE FOR SEWING ON BUTTONS.

(Application filed Jan. 28, 1897.)

(No Model.)

7. 4 Sheets—Sheet 3.



WITNESSES.

J. W. Dolan.
L. A. Walsh.

Fig. 9.

INVENTOR
Arthur A. Merritt
by his Attorneys
Charles C. Raymond

No. 649,871.

Patented May 15, 1900.

A. A. MERRITT.

MACHINE FOR SEWING ON BUTTONS.

(Application filed Jan. 26, 1897.)

(No Model.)

4 Sheets—Sheet 4.

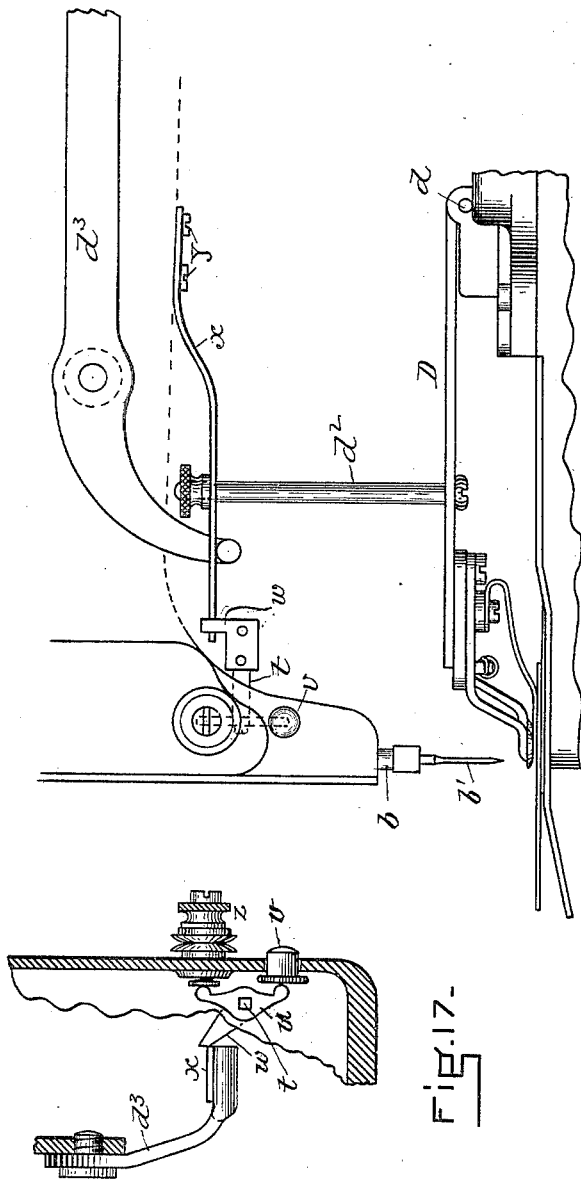


Fig. 16.

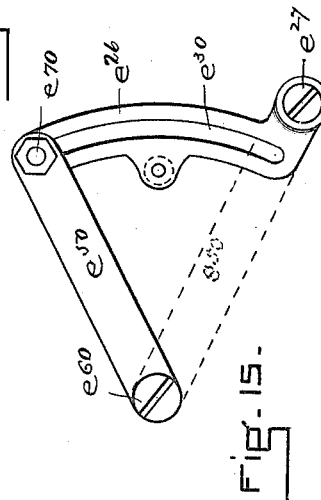


Fig. 15.

WITNESSES
J. M. Dolan.
L. A. Stalch.

INVENTOR
Arthur A. Merritt
by his atty
Charles E. Raymond

UNITED STATES PATENT OFFICE.

ARTHUR A. MERRITT, OF COHOES, NEW YORK, ASSIGNOR, BY MESNE ASSIGNMENTS, TO W. PIERREPONT WHITE, HUGH WHITE, AND CLARENCE B. CROUSE, OF UTICA, NEW YORK.

MACHINE FOR SEWING ON BUTTONS.

SPECIFICATION forming part of Letters Patent No. 649,871, dated May 15, 1900.

Application filed January 26, 1897. Serial No. 620,844. (No model.)

To all whom it may concern:

Be it known that I, ARTHUR A. MERRITT, a citizen of the United States, residing at Cohoes, in the county of Albany and State of New York, have invented a new and useful Improvement in Machines for Sewing on Flat and other Buttons, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings, forming a part of this specification, in explaining its nature.

This invention relates to various features of construction whereby the operating devices are simplified and made more accessible.

In the drawings it is represented as applied to a machine having a horn or cylinder for the support of the work and stitch-forming devices of the Standard sewing-machine; but any other suitable stitch-forming devices may be used.

In the drawings, Figure 1 is a view in side elevation of the machine equipped with my improvement. Fig. 2 is a view in horizontal section upon the dotted line 2 2 of Fig. 1, with the arm D omitted, and in plan of other parts below said line. Fig. 3 is a view in longitudinal vertical section upon the dotted line 3 3 of Fig. 2. Fig. 4 is a view in vertical cross-section upon the dotted line 4 4 of Fig. 2. Fig. 5 is a view in perspective of the button-holding devices. Fig. 6 is a view of the same above the lower supporting-plate inverted. Fig. 7 is a view in vertical section thereof upon the dotted line 7 7 of Fig. 5. Fig. 8 is a view in perspective of a box and parts carried thereby for producing and regulating or adjusting the lateral movement of the button-holder. Fig. 9 is a plan of said box and parts inverted. Fig. 10 is a view representing a flat button having two eyes attached by a single bar of stitching and by a mechanism employing a single needle and a material and button holding device which is reciprocated lengthwise the horn or cylinder only. Fig. 11 represents a flat button attached by a single bar of stitching to the material and by a single needle and the material and button holder movable transversely of the horn or bed. Fig. 12 represents a flat button attached by two bars sewed by the stitching devices, having

two needles and the reciprocating material and button holder moved lengthwise the horn or cylinder only, as in stitching the single bar of Fig. 10. Figs. 13 and 14 represent flat buttons attached by bars formed by moving the button and material lengthwise the horn or cylinder and transversely thereto, the variations in the location of the bars being effected by changing the operating-cams hereinafter referred to. Fig. 15 represents in plan, enlarged, a detail view of the lever for providing the material and button holder with longitudinal movements, its operating-cam, and the connection between the two, showing especially the means whereby the action of the cam may be made nugatory, thereby communicating no longitudinal motion to the material and button holder. Fig. 16 is a detail view representing the devices for exerting a downward yielding pressure on the button-holder, the said devices being connected with a lifting-lever and with a tension-release. Fig. 17 is a view further illustrating the connection between the said devices and the tension-release.

A is the cylinder or horn of the machine, which carries at its front end the rotary shuttle and shuttle-carrier and cooperating parts of the Standard stitch-forming devices.

B is the overhanging arm, on the forward end of which are mounted the needle-bar *b* and eye-pointed needle *b'*, the needle-bar being operated as in the Standard machine and the stitch-forming devices being of the Standard type.

C is the button and cloth holder. It comprises a plate *c*, having a hole or throat *c'* and upon which the article or thing to which the button is to be attached is placed and to which it is held by the button-holding plate *c*². The forward end of plate *c*² is thin and it has a recess *c*³ extending inward from said forward end, which is in line with the throat *c'* in the plate *c*. It is preferably extended backward and upward and united to the arm D through the medium of blocks *c*⁴ and plate *c*⁵, the inner end *c*⁶ of the plate being doubled upon itself or having a return-bend, as represented in Figs. 5 and 7, and being fastened to the blocks *c*⁴ by screws, which extend into the

plate c^5 , the plate c^5 being attached to the under surface of the arm D. The upper surface of this plate about the opening c^3 supports the button, and the button is held and centered by the feet $E' E^2$, which slightly lap upon the upper surface of the button, and the pins $e' e^2$, which extend downward from the feet sufficiently within the overlapping portions toward the plate c^2 , and these pins serve to locate the button by its edge in relation to the opening c^3 , while the feet extending over the upper surface of the button serve to prevent it from being lifted from the plate. The feet and pins are at the end of the arms $e^3 e^4 e^5$, respectively, and these arms preferably are shaped as represented in the figures—that is, they are provided with upwardly and inwardly extending sections $e^6 e^7 e^8$, respectively, which extend upward and backward from the feet, and the horizontal sections $e^9 e^{10} e^{11}$. The arms $e^3 e^4 e^5$ are attached to the ends of the arm D in a manner to permit the feet and pins to be adjustable toward and from each other in order that they may receive and hold buttons varying in diameter. This is accomplished by pivoting the arms $e^3 e^5$, carrying feet $E' E^2$, and the pins $e' e^2$ to the plate c^5 at e^{12} and e^{13} , respectively, and by also providing them with the inwardly-extending points or sections $e^{14} e^{15}$ and by providing the arm e^{10} with a horizontal movement in respect to the arms $e^9 e^{11}$, whereby the wedge-surfaces $e^{16} e^{17}$ are caused to move the arms e^9 and e^{11} , and consequently the feet $E' E^2$, outward or permit them to be moved inward, according as the arm e^{10} is moved inward or outward. The arms $e^9 e^{11}$ are closed and the projections $e^{14} e^{15}$ maintained in contact with the inclines or wedge-surfaces $e^{16} e^{17}$ by the spring e^{18} . (See Fig. 6.) The arm e^{10} is moved horizontally in either direction by means of the adjusting-screw e^{19} , having the head e^{20} , which is attached to the arm e^{10} by a clamp or other equivalent device e^{21} , in which it is adapted to turn, the clamp or similar device attaching the screw to the arm, so that the screw, clamp, and arm move together. The threaded section e^{22} of the adjusting-screw screws in the threaded hole e^{23} of a stationary nut e^{24} , attached to the plate c^5 . By turning the screw e^{19} , therefore, the feet $E' E^2$ and the pins which they carry are moved toward and from each other, while the foot E' and the pin it carries are moved inward and outward in respect to the feet first named.

The button-supporting plate c^2 and the button-holding feet are normally held down by a yielding pressure and are moved upward to permit the material to which the button is to be sewed to be placed between the plates $c' c^2$. The downward yielding pressure is communicated to the said plate c^2 and button-holding feet through the medium of the arm D, which is attached at its inner end by a hinge-section d' to the block d' and against which any suitable spring exerting a downward pressure may bear. I have represented for this pur-

pose a pressure-spring x , (see Fig. 1,) fastened at y to the machine-arm B and connected with the arm D by a connection d^2 , which extends from the arm D to the end of the lever d^3 , against which the free end of the said spring x bears. The said lever d^3 is pivoted at d^4 and is connected at its rear end d^6 by a connecting-rod with a treadle. The connection between the arm D and the spring x is represented as obtained by means of a rod d^7 , headed on its under end and which passes through a hole in the arm D and a hole in the spring x . This rod is threaded at its upper end to receive a nut d^8 , and a sleeve d^9 , through which the rod passes, is located between the lever d^3 and the upper surface of the arm D and communicates the downward stress of the spring x to the arm. In Fig. 16 I have represented the said spring x as also employed to release the tension or pressure upon the tension-disks z . This is accomplished by extending the spring as represented in Fig. 16 and by providing the shaft t to connect with the tension-releasing device as now employed and an additional arm w , adapted to extend slightly beyond one edge of the spring. Upon the movement of the lever d^3 to lift the arm D the arm w is moved sufficiently by the spring x to turn the shaft t , and thereby release the stress upon the tension-disks z . These parts—namely, the tension-disks, post, &c., the arm u , and button v —are like similar parts used upon the Standard sewing-machine. When this modification is used, the arm D is connected directly with the spring x and the lever d^3 makes engagement with the spring, as represented in Figs. 16 and 17.

The button-supporting plate c^2 is of a spring nature and has a yielding movement in relation to the button-holding foot, whereby buttons varying in thickness may be placed between its upper surface and the feet.

The arm D, the button-holder, and the plate c have reciprocating movements lengthwise the horn or cylinder A imparted to them for moving buttons having two eyes backward and forward in respect to the line of reciprocation of the needle, and they are also adapted to be moved forward and back as well for the purpose of moving a button having four eyes to the stitching devices, and the mechanism for providing the last-named movement is adapted to be made operative or inoperative at will from outside the horn or cylinder and without removing any of the parts. The first-named or reciprocating movement lengthwise the horn or cylinder is provided by the cam-groove E^4 in the cam-wheel e^{25} , which cam-groove is connected with the block d' by means of the curved lever e^{26} , pivoted at e^{27} , having a curved slot e^{30} and a cam-pin e^{40} , which enters the cam-groove E^4 , and a link e^{30} , which is pivoted at e^{60} to the block and attached to the lever e^{26} by the clamping connection e^{70} , which permits the end of the link to be moved in the slot e^{30} toward or from the fulcrum or pivotal point e^{27} , thereby adjusting the range of move-

ment of the plate *c* and button-holder. This mechanism provides the said parts with a forward-and-back movement of any desired extent lengthwise the cylinder or horn and is used for the purpose of sewing on a button having but two eyes. The curved slot *e*³⁰ is formed in the arc of a circle of which the pivotal connection *e*⁶⁰ of the link *e*⁵⁰, with the block *d'*, is the center, so that the clamping connection *e*⁷⁰ of said link in said slot may be varied without varying the position of the button-holder relative to the needle or needles, which would not be the case if the said slot were straight.

It will be observed that when the link *e*⁵⁰ is moved in the lever-slot *e*³⁰ to a position in front of its fulcrum *e*²⁷ and so that the said fulcrum, the clamping connection, and the connection *e*⁶⁰ are in a straight line (see dotted line, Fig. 15) no movement is imparted from the lever *e*³⁶ to the block *d'* and attached parts. When the link connection *e*⁷⁰ is moved toward the opposite end of the lever-slot—that is, in a direction away from the fulcrum *e*²⁷—longitudinal movement of the block *d'* and attached parts begins to take place, the length of said movement being determined by the distance of the connection *e*⁶⁰ from the fulcrum *e*²⁷.

To provide the plate *c* and button-holder with movements transverse to the longitudinal movement and such as are required in sewing a button having four holes, I employ mechanism comprising a cam-groove *F* in the under side of the wheel *e*²⁵, a lever *f* having a cam-pin *f'* to enter said cam-groove, and having also a fulcrum *f*², which is mounted upon a slide *f*³, adjustable lengthwise the box *f*⁴, and contained within the cavity of the cylinder or horn and fastened thereto. The outer end of the lever *f* is connected by a pin *f*⁵ with the slide *f*⁶, adapted to be moved laterally in the slideway *f*⁷ in the upper side of the box, and this slide is connected with the plate *c*, or rather with the arm *f*⁸, to the forward end of which said plate is attached. This arm extends over the slide *f*⁶, between the end blocks *f*⁹ *f*¹⁰ thereon, and which blocks have curved inner faces adapted to receive and hold the parts *f*¹¹ *f*¹² of a bearing in which said arm *f*⁸ is adapted to slide lengthwise the horn or cylinder. It will be understood that this bearing not only provides for the sliding movement of the arm in relation to the slide *f*⁶, but that it also provides means whereby the angle of the bearing may be varied to suit the position of the slide *f*⁶ in relation to the arm *f*⁸, the bearing-pieces *f*¹¹ *f*¹² being adapted to also turn, because of their curved outer edges, in the end blocks *f*⁹ *f*¹⁰. The slide *f*³ engages the lever *f* in the same way by means of adjustable bearing-blocks like those above specified, and it is adapted to be moved lengthwise the box and to be locked in any desired position. When moved to the outer end of the box and beneath the slide *f*⁶, it is obvious that the lever *f* becomes inoperative and that no lateral movement is

imparted to the plate *c* and button-holder. When moved backward therefrom, so that the fulcrum of the lever is moved backward from the slide, lateral movement begins to be imparted to the slide *f*⁶, and consequently a forward-and-backward movement to the plate *c* of the button-holder. The extent of this movement varies according to the distance the fulcrum *f*² is from the slide *f*⁶. The slide *f*³ is suitably supported in the box at each end, and upon one side of the box there is a long slot *f*¹³, through which projects a screw *f*¹⁴, which screws into the edge of the slide, and the head of which laps upon the side of the box on each edge of the slot and serves when screwed up against the same to hold the slide locked to the box and in a stationary position. One side of the cylinder or horn is provided with a long hole *f*¹⁵, by which the adjustment of the screw is obtained, and the fulcrum is thus reached and adjusted from outside the machine without removing any of the parts. The screw not only serves as a lock, but when loosened as a knob by which the slide may be moved lengthwise the block. Any equivalent device for the knob and lock may be employed, and the slide may be locked to the cylinder or horn case instead of to the box, if desired, in which event the end of the screw or device may extend beyond the outer surface of the horn or cylinder.

The plate *c* and button-holder when provided with the forward-and-back traversing movement, as well as lengthwise movement, may have such movement imparted to them at any desired time by constructing the cam-grooves *F* and *E*⁴ to that end or changing their construction for that purpose. Therefore a button having four eyes may be sewed with two cross-bars only or with an hour-glass stitch, in which the bars extend diagonally across or with an hour-glass stitch and two side bars in addition. The stitching devices may use two needles in lieu of one, in which case the four-eyed buttons may be attached by double bars by simply moving the button backward and forward in one direction only longitudinally of the cylinder.

It will be noticed that the adjusting-screw *e*²⁰ is represented as supported by a clamp in which it is adapted to be turned in adjusting the feet *E* *E'* *E*² and the edge gages *e* *e'* *e*² and which after such adjustment is adapted to be locked by the tightening of the clamp-screw *m*, which connects the two sections of the clamp and serves to bring them together upon the shank of the screw immediately within the head and to lock the screw.

It will be seen that the arm *f*⁸, to which the material-supporting plate is attached, and the block *d'*, to which the arm *D* is hinged or pivoted, are both attached to and carried by a slide with which the camway *E*⁴ is connected, the said slide being moved in the slideway *n* by the said camway *E*⁴ and also having the curved sides *n'* *n*², by which it may be turned in the slideway *n* when the camway *F* and le-

ver f are called into action to provide the plate c with lateral movements in addition to the movements given by the camway E^4 . The cap-plates n^3 n^4 are attached to the frame to extend upon the upper surfaces of the slide.

I do not confine myself to the type of stitch-forming device herein described and shown in the drawings, but may use any suitable stitch-forming mechanism in lieu thereof.

I would say that the construction of the camway E^4 may be so modified or changed as to provide a longitudinal movement to the button and material every other stitch only, and when the cam is so constructed the sewing devices will sew two stitches in succession in each eye of the buttonhole and produce what is called a "knot-stitch." This, however, is one of the variations contemplated by the directions already given as to the changes or modification in the construction of the cam-grooves E^4 F . To attach a two-eyed button having a single bar, as represented in Fig. 10, the button and material holder is provided with a longitudinal movement only. To sew a two-eyed button with a single bar, as represented in Fig. 11, the button and material holder is provided with a lateral movement only. To sew a four-eyed button all around, as represented in Fig. 13, the material and button holder will have both longitudinal and lateral movement imparted to it, and the same is true for attaching a four-eyed button with the hour-glass stitch, as represented in Fig. 14. For attaching a four-eyed button with a double bar, as represented in Fig. 12, two needles will be employed, and the material and button holder will have longitudinal movement only.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The combination in a button-sewing machine, of the arm D , the plate c^2 connected with said arm and having the opening c^3 , the arms e^9 , e^{10} , e^{11} having the downward extensions e^6 , e^7 , e^8 respectively, and feet E , E' , E^2 at their lower ends, each of which has an edge gage, the said arms e^9 , e^{11} being attached to the said plate c^2 by pivots and having the points e^{14} , e^{15} and the said arm e^{10} being attached to said plate to be movable lengthwise the same and having the inclined surfaces e^{16} , e^{17} , an adjusting-screw by means of which said arm e^{10} is moved backward or forward, and the spring e^{18} yieldingly connecting the said arms e^9 , e^{11} , as and for the purposes described.

2. The combination of the arm D , the spring-plate c^2 having the opening c^3 and the backward and upward extension provided with the return-bend c^6 connected to the arm D , the adjustable edge gages e , e' , e^2 arranged above said plate, and the feet by which said gages are carried and from which they project downward, the yielding movement of the said plate in relation to the said gages and feet permitting of the insertion of buttons of different thicknesses in the button-holder.

3. The combination, in a button-sewing machine, of the stitching devices, the material-supporting plate c , the button-supporting plate c^2 , the arm D extending longitudinally of the machine, the block d to which the rear end of said arm is hinged, said arm supporting said plate c^2 at its forward end, a slide by which said block is carried, the arm f^8 connecting said slide to said plate e , and the button holding and gaging devices also supported by said arm D , with the lever d^3 also extending longitudinally of the machine and connected at its forward end with the arm D , a spring to bear against the forward part of the said lever and through the connection between it and the arm D to force said arm yieldingly downward, and a rod or other device for lifting the forward end of the lever, and by its connection with the arm D to also lift the said button-plate c^2 and button holding and gaging devices carried thereby.

4. The combination, in a button-sewing machine, of a slide having curved edges, a slide-way in which said slide is adapted to be reciprocated and also turned or rocked, an arm D attached to said slide in a manner to permit its forward end to be lifted and depressed, a plate attached to said slide and the forward end of which bears operative relation to the stitch-forming devices and acts as a support for the material to which the button is to be attached, a button-supporting plate attached to the forward end of said arm D , button holding and gaging devices attached to the end of said arm, means for lifting and lowering said arm and the said devices which it supports, a cam and connecting devices for moving the slide and the parts connected therewith backward and forward, a second cam and devices connecting it with said slide whereby it is adapted to be turned slightly in its slideway to cause the material and button supporting plates and button holder and gages to be moved transversely to the line of the first-named movement, as and for the purposes set forth.

5. The combination with the movable material-support c , the button-supporting plate c^2 , the button holding and gaging devices above said button-supporting plate, and connections between said movable material-support and said button-supporting plate and button holding and gaging devices whereby said material-support, said button-supporting plate, and said button holding and gaging devices are all joined together, and are thus adapted to be moved back and forth in unison, of a cam, a horizontal lever f operated by said cam and connected at its forward end with said movable material-support c , a sliding adjustable fulcrum for the said lever f , and means for locking said fulcrum in any desired position.

6. The combination of the arm f^8 , the plate c and button-holding devices with which said arm is connected, a slide f^6 in which said arm is adapted to be moved lengthwise, and a le-

ver f connected with the slide at f^5 and having a fulcrum f^2 which is movable from a position under the slide f^6 , in which position the lever is inoperative, away to any desired extent, and adapted to be locked in both positions, and a cam for imparting movements to said lever.

7. The combination with the button-holding devices and their operating mechanism, of the arm f^3 , the slide f^6 having the end blocks or abutments f^9 , f^{10} , and the bearing-pieces f^{11} , f^{12} , with the lever f and the adjustable fulcrum-slide f^2 having end blocks or abutments and bearing-pieces between them and the said lever similar to the bearing-pieces f^{11} , f^{12} , the said fulcrum-slide being adjustable lengthwise the said lever and being provided with means for fastening it in any desired position, and a material-support operated by said lever.

8. The combination of the arm f^3 , material and button holding devices with which said arm is connected, the lever f , its operating-cam, and an adjustable fulcrum for varying the throw of the operating end of the lever or holding the said end stationary, the said lever being connected with the arm f^3 , and means, accessible from the outside of the machine-casing, for securing said fulcrum in any desired position of adjustment, said fulcrum being thus adapted to be adjusted from the outer side of the machine frame or casing without removing any of the parts thereof, as and for the purposes described.

9. The combination of the lever f , the material and button holding devices with which said lever is connected, an operating-cam for

said lever, and a sliding fulcrum-support f^2 having an outwardly-extending device accessible through a hole or slot in the frame and providing means whereby the fulcrum may be moved from one position to another, as and for the purposes described.

10. The combination of the lever f , the material and button holding devices with which said lever is connected, an operating-cam for said lever, a sliding fulcrum-support f^2 having an outwardly-extending device accessible through a hole or slot in the frame and providing means whereby the fulcrum may be moved from one position to another, and a locking device, which may be the means by which the block is moved, for locking the fulcrum-slide in any desired position.

11. The combination with the frame having a cavity, of the box f^4 arranged in said cavity and having a slideway f^7 in its top and a slideway between its sides below its top and having also a slot f^{13} in one side, a slide f^6 in said slideway f^7 , the arm f^3 with which said slide is connected, the fulcrum-slide f^2 movable in the sides of said box, the machine-frame having the opening f^{15} in its side opposite said slot, means for fastening the said box to the said frame, a fulcrum-slide, operating and locking devices extending through the slot f^{13} in the side of the box and accessible by means of the opening f^{15} , the lever f , its operating-cam, and the button-holding devices.

ARTHUR A. MERRITT.

In presence of—

W. A. METCALF,
HUGH WHITE.