

(No Model.)

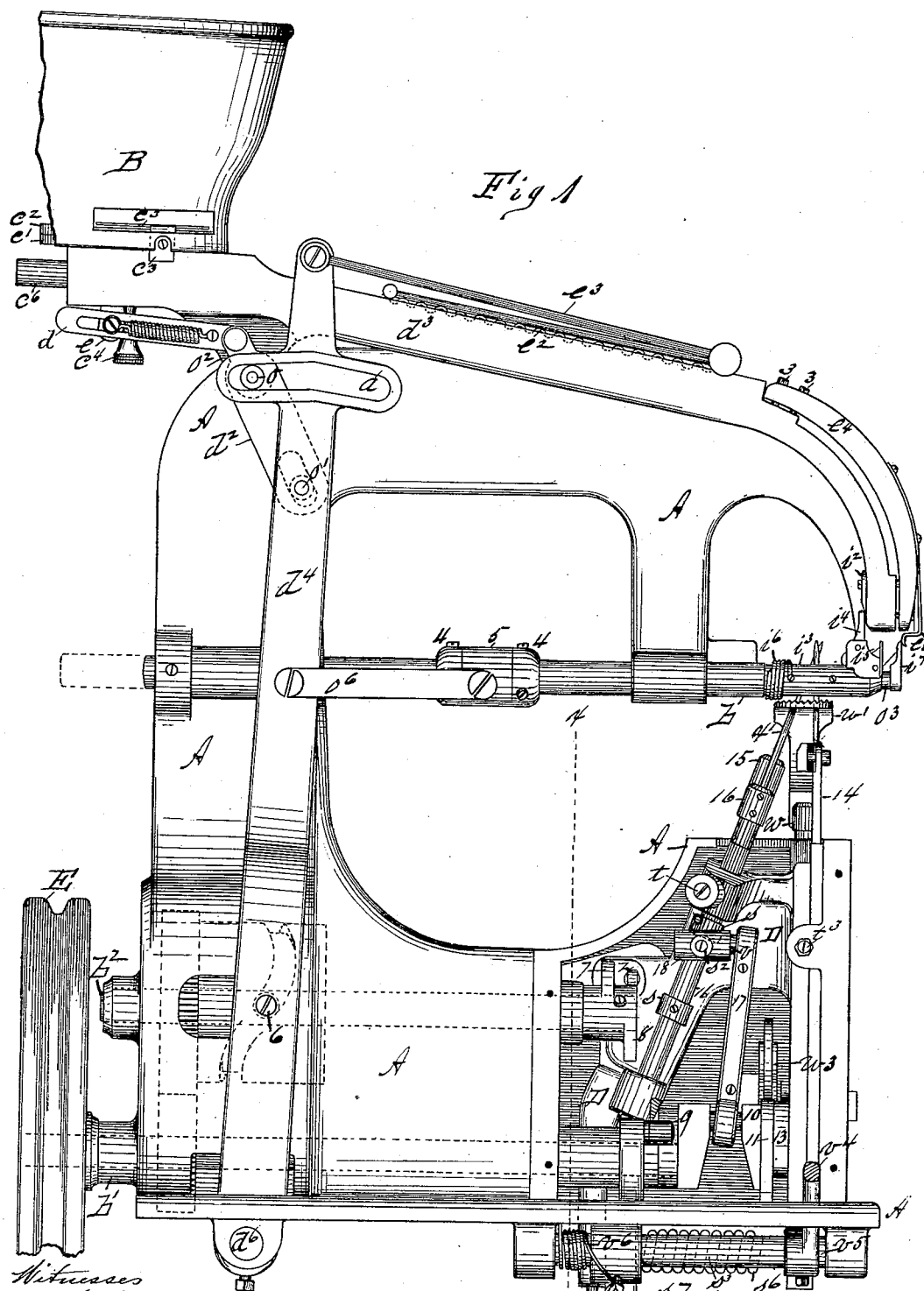
7 Sheets—Sheet 1.

J. H. MORLEY.

MACHINE FOR SEWING BUTTONS TO FABRICS.

No. 265,532.

Patented Oct. 3, 1882.



Witnesses
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C Starkweather

Inventor
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(No Model.)

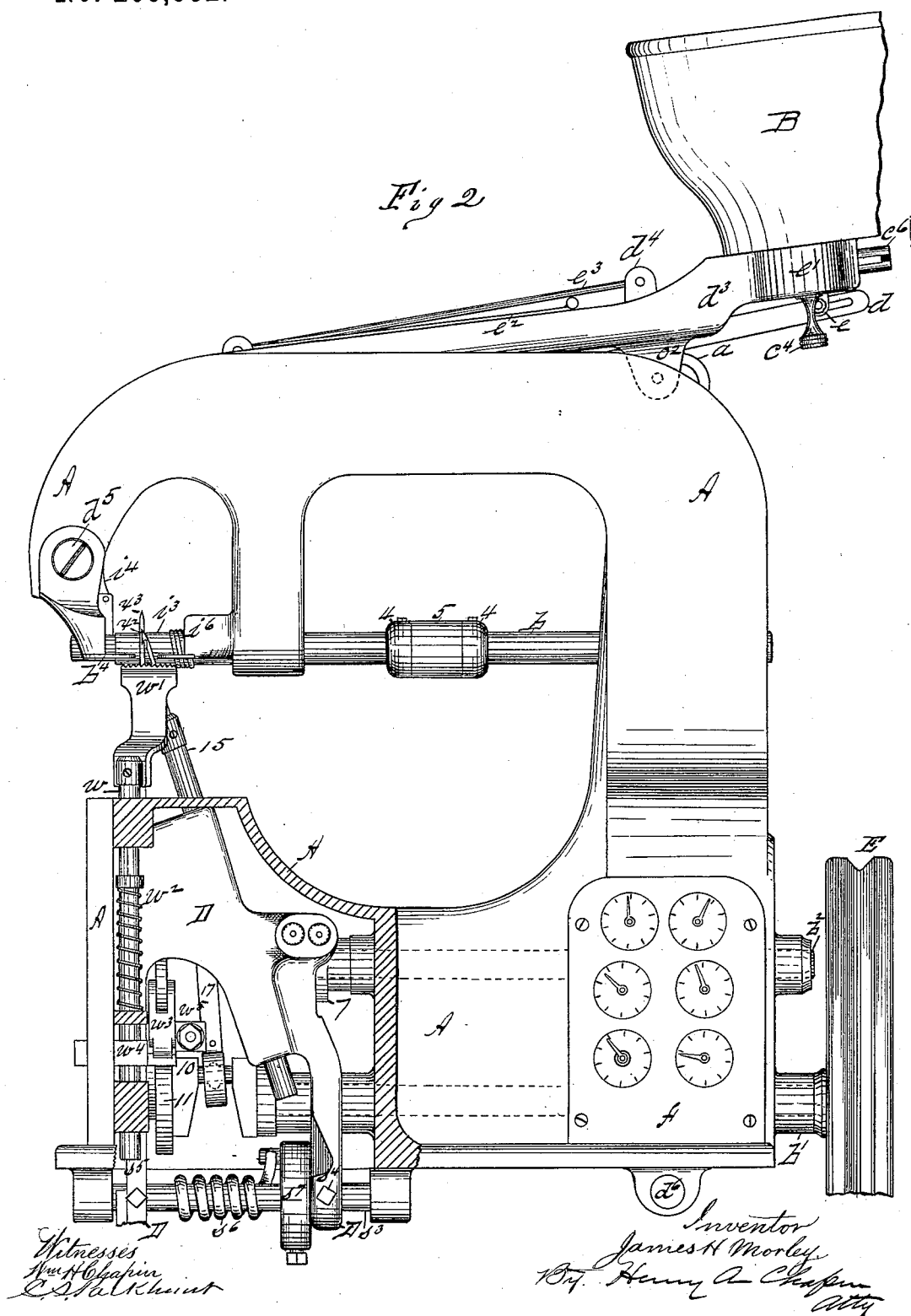
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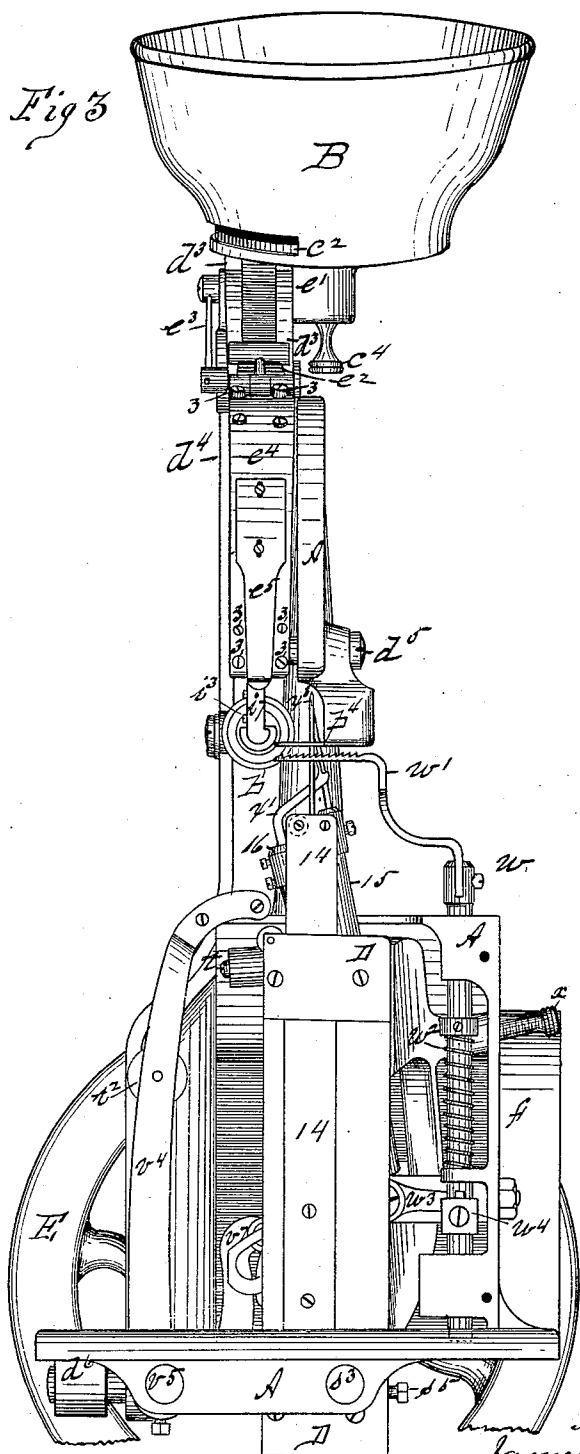
7 Sheets—Sheet 3.

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Patented Oct. 3, 1882.



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(No Model.)

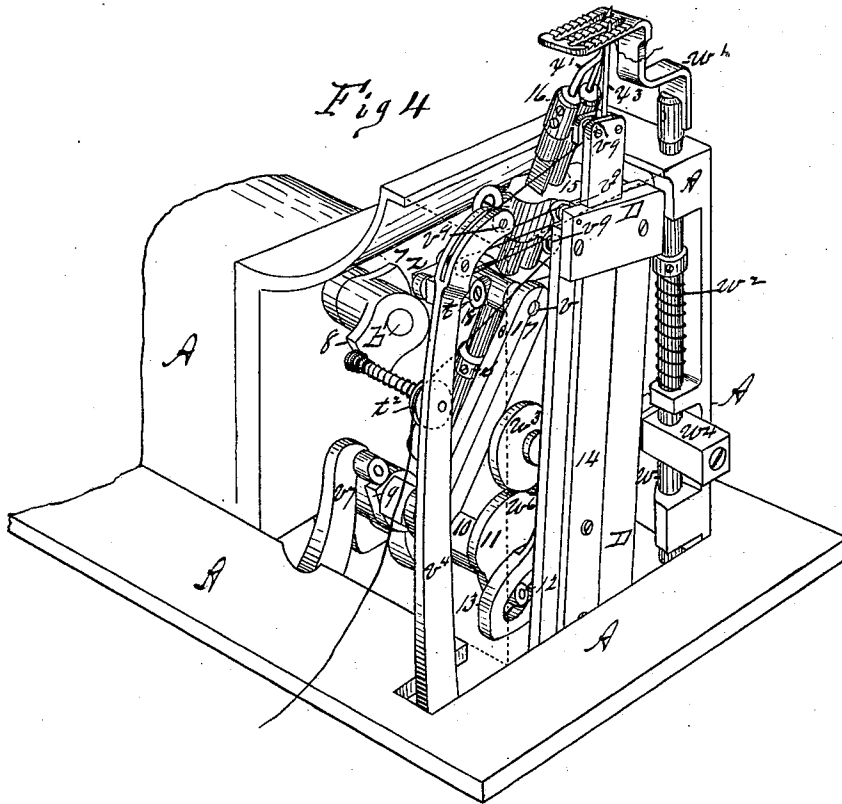
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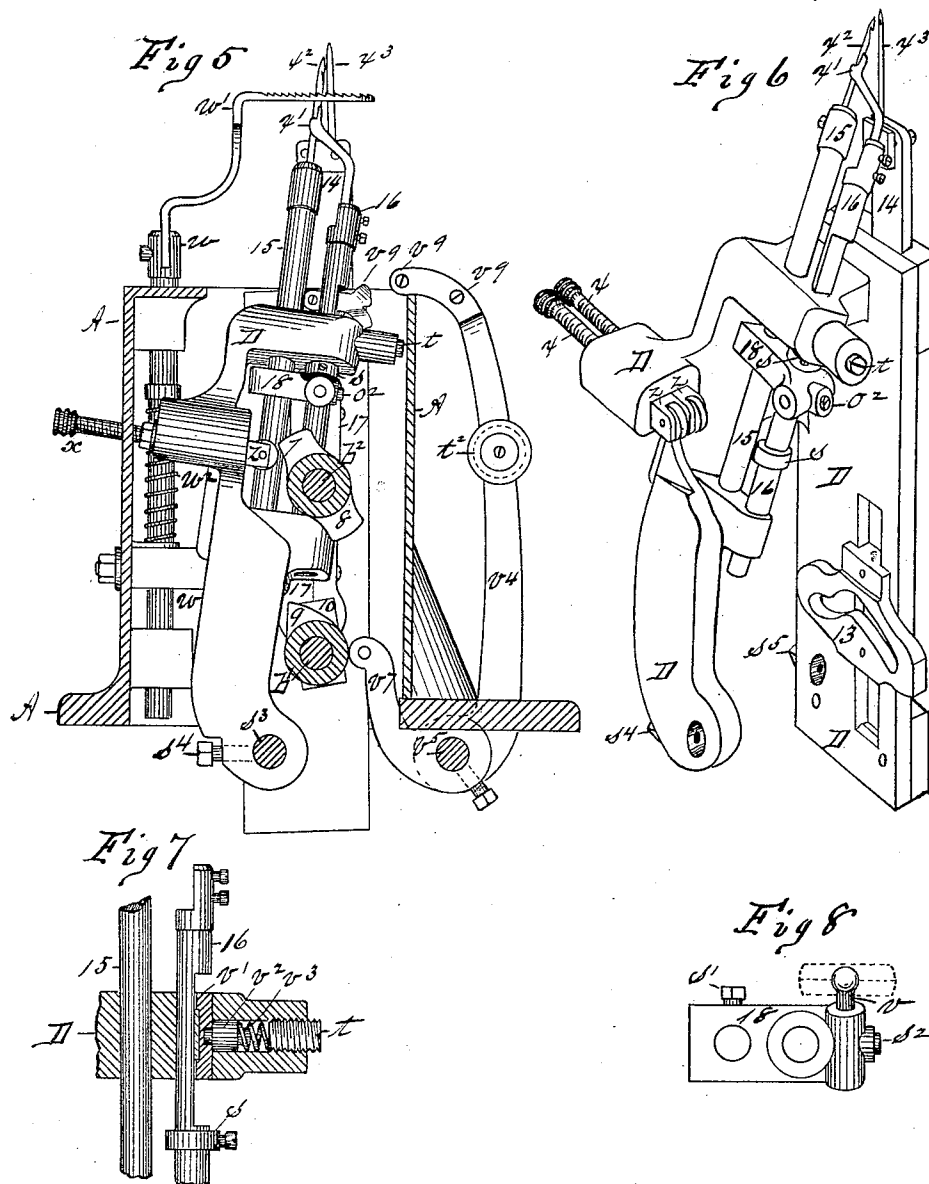
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Patented Oct. 3, 1882.



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(No Model.)

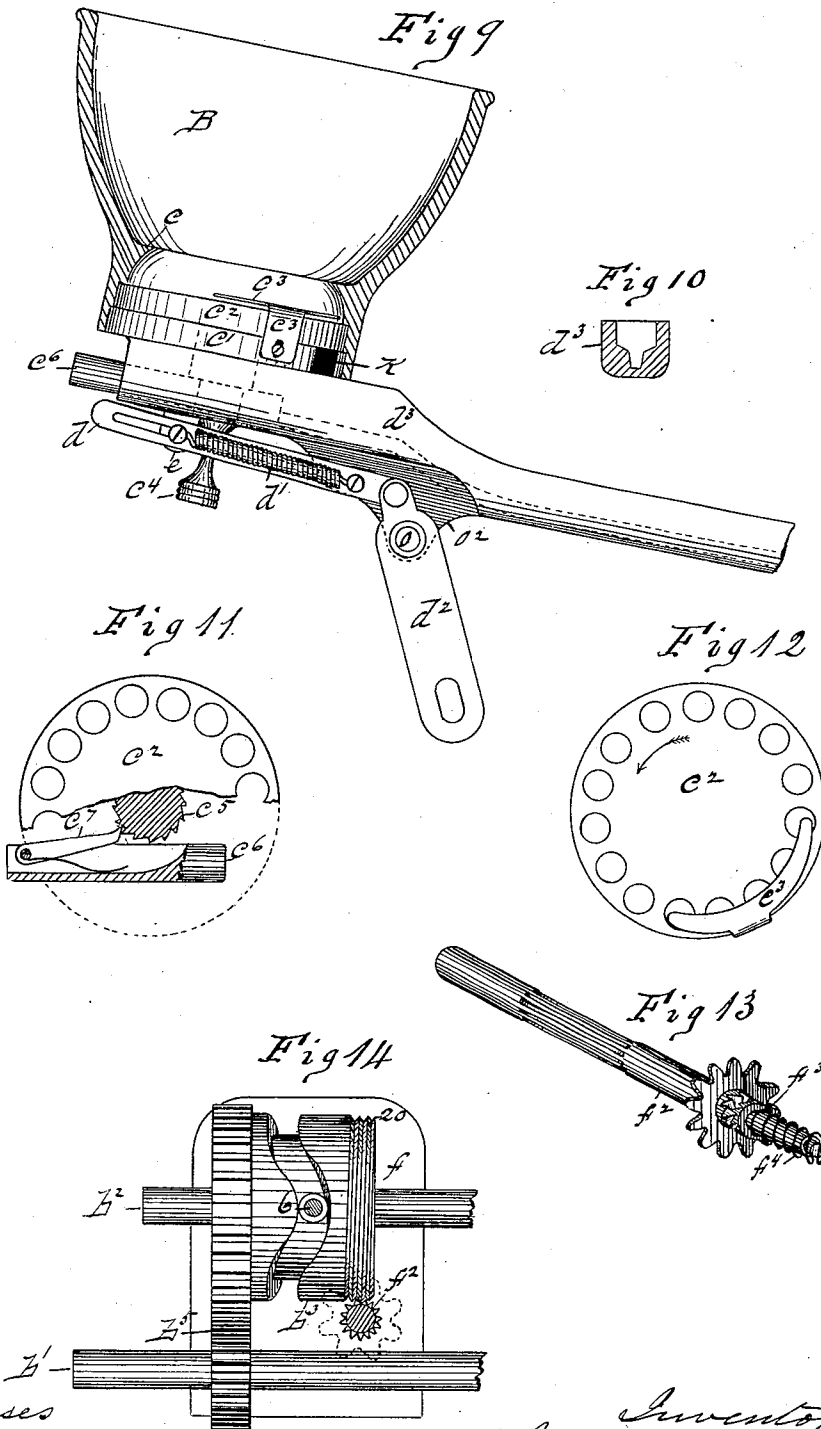
7 Sheets—Sheet 6.

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MACHINE FOR SEWING BUTTONS TO FABRICS.

No. 265,532.

Patented Oct. 3, 1882.



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(No Model.)

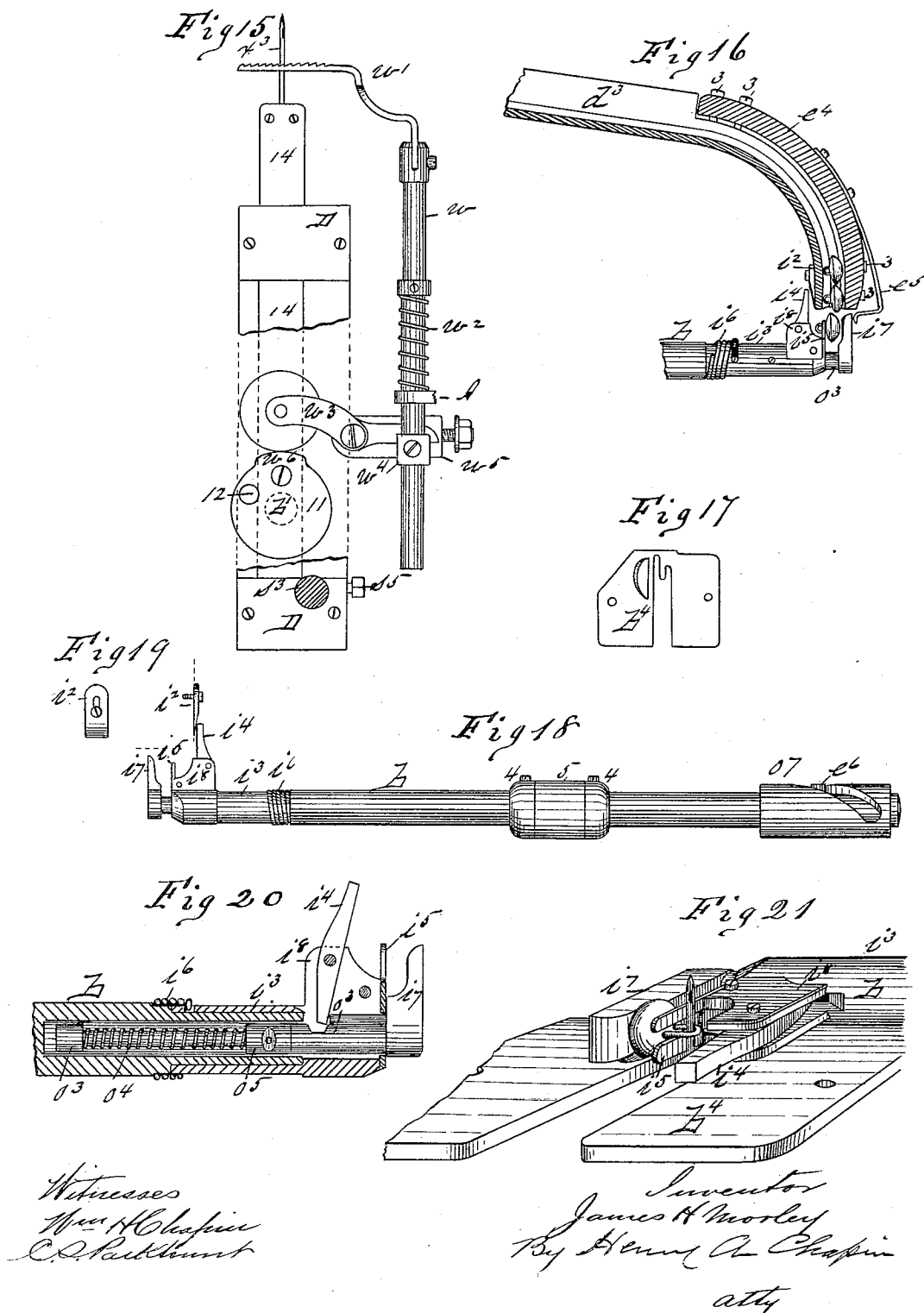
7 Sheets—Sheet 7.

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MACHINE FOR SEWING BUTTONS TO FABRICS.

No. 265,532.

Patented Oct. 3, 1882.



UNITED STATES PATENT OFFICE.

JAMES H. MORLEY, OF HOLYOKE, ASSIGNOR TO THE MORLEY SEWING MACHINE COMPANY, OF BOSTON, MASSACHUSETTS.

MACHINE FOR SEWING BUTTONS TO FABRICS.

SPECIFICATION forming part of Letters Patent No. 265,532, dated October 3, 1882.

Application filed January 16, 1882. (No model.)

To all whom it may concern:

Be it known that I, JAMES H. MORLEY, a citizen of the United States, residing at Holyoke, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Machines for Sewing Buttons to Fabrics, &c., of which the following is a specification.

This invention relates to improvements in the details of the construction of the button feeding and carrying devices of machines for sewing buttons to fabrics, &c., and of mechanism for operating the presser-foot, the cast-off bar, and of counting devices therefor, the object being to feed and carry buttons more expeditiously to the sewing devices of the machine and with less liability to obstruction from buttons of varying sizes, to operate the presser-foot independently of the vertical needle-bar, and to provide with machines of this class suitable means for determining the number of buttons which have been sewed on by the machine during a given period.

In the drawings forming part of this specification, Figure 1 is a partly-sectional side elevation of a button feeding and sewing machine embodying my invention, in which the upper end of the take-up bar and the tension are removed. Fig. 2 is a side elevation, partly in section, on the reverse side from Fig. 1. Fig. 3 is a front end elevation. Fig. 4 is a perspective view of the front end of the bed of the machine, including the sewing devices. Fig. 5 is a sectional view through the line *x x*, Fig. 1. Fig. 6 is a rear perspective view of the swinging needle-bar frame and attachments. Fig. 7 is a sectional view of portions of one needle-bar and the cast-off bar and a part of the swinging needle-bar frame in which they operate. Fig. 8 is a perspective view of the needle-bar and cast-off yoke. Fig. 9 is a view partly in section of the button-hopper and the upper end of the feed-trough. Fig. 10 is a transverse section of the feed-trough. Fig. 11 is a view partly in section of the rotating button-gate of the hopper and its actuating devices. Fig. 12 is a plan view of said button-gate and the button-guard. Fig. 13 is a perspective view of the counting-device driving-shaft. Fig. 14 is a view of the driving-

gear, parts of the two shafts, the main cam, and the rear side of the counting devices. Fig. 15 is a front elevation of the presser-foot and bar and their actuating devices and parts of the front side of the swinging needle-bar frame and the vertical needle-bar. Fig. 16 is a view partly in section of the delivery end of the button-feed trough and a side view of the front end of the button-carrier. Fig. 17 is a plan view of the needle-plate. Fig. 18 is a side elevation of the button-carrier and the button-finger adjusting-wedge. Fig. 19 is a face-view of said wedge. Fig. 20 is a view partly in section of the front end of the button-carrier. Fig. 21 is an enlarged perspective view of the cloth-plate and the front end of the button-carrier.

Like letters and numbers refer to like parts in the various figures.

This invention is in the nature of an improvement upon my Patent No. 236,350, dated January 4, 1881, to which reference may be had. In my said patent I actuated a button-carrier lever by a cam on the secondary shaft of the machine, and I employ a cam, *b*³, in the construction herein shown for a like purpose, and in addition thereto for another one, as follows, viz: A screw, 20, is cut upon the periphery of cam *b*³, and a grooved counting-device driving-shaft, *f*², is set transversely under said cam, so that the said screw thereon will engage with the grooves on said shaft and the latter be rotated when said cam revolves. Said shaft *f*² is provided with a gear near one end thereof, as in Fig. 13, and said end enters a counting device, *f*, which is attached to one side of frame A of the machine, consisting of the usual multiplying internal gear-wheels and corresponding dials and pointers; and said counting device is actuated by said shaft *f*², whose gear engages with one inside thereof.

A double ratchet device, *f*³, is fitted on said shaft *f*², the teeth of which are held in engagement with each other by a spring, *f*⁴; but said spring yields sufficiently when the machine is run backward to let said teeth revolve past each other, and so prevent the counting device from being turned backward. By the use of said counting device with the sewing and button-feeding mechanism of this machine an accurate count resulting from the revolution of

the main shaft *b* is kept of all the buttons sewed on by the machine, said counting device being so timed as to mark 1 each time a button is sewed to the fabric.

5 In my said patent the button-carrier lever is pivoted above its actuating-cam; but in this machine I pivot said lever *d*⁴ on a transverse shaft, *d*⁶, located under frame A, fixing a stud, 6, in said lever, the inner end of which en-
10 gages in the groove of cam *b*³, whereby a much easier motion is given to said lever, the latter being, unlike that in said patent, connected directly with the button-carrier *b*, on which
15 are two adjustable collars, 4 4, by a connecting-rod, *o*⁶, attached to a sleeve, 5, located between said collars.

In this machine, as in said patent, a rotating motion is given to the button-carrier *b* by the employment of the spirally-grooved sleeve,
20 *o*⁷, and a stud, *e*⁶, fixed in the button-carrier; but I locate said sleeve *o*⁷ in the rear bearing of said carrier in frame A, said carrier having a horizontal reciprocating motion in two bearings in said frame, as shown in Fig. 1.

25 In the construction herein shown the button-feeding devices are essentially improved as compared with those in said patent. The feed-trough *d*³ is pivoted to frame A at *d*⁵, Fig. 2, permitting the opposite end thereof to swing
30 or vibrate on said pivot, and while the machine is running to agitate the contents of the button-hopper bowl B. Said bowl is of the form shown, and has an inwardly-projecting button-rim, *c*, around its interior just above its base,
35 which rim is flat on its top side, and is of a semi-arched form beneath, as shown, its edge being quite thin. The fixed bottom *c'* of said hopper is attached to said trough *d*³, being rather thin. The fixed bottom *c'* of said hopper
40 has an opening, K, Fig. 9, through it directly over the button-groove in said trough.

An intermittently-rotating perforated button-gate, *e*², having a stud, *e*⁴, on its under side, upon which is formed a ratchet, *e*⁵, which fits
45 a central perforation in said bottom *c'*, as seen in dotted lines in Fig. 9, is located on said bottom, and as said gate *e*² rotates the circle of holes or perforations through it swings over said opening K, bringing one of said holes af-
50 ter the other over it.

A button-guard, *e*³, of thin metal, is secured to the edge of the bottom *c'*, and partially covers a portion of said holes in the gate *e*², standing above the surface of the latter.

55 An opening, as shown in Fig. 1, is made through the side of said hopper-bowl opposite to said guard *e*³.

A longitudinal chamber is made under the bottom *c'* and alongside of said stud *e*⁴ on the
60 gate *e*² for the reception of a pawl-carrier and button-ejector, *e*⁶. (Shown in full and in dotted lines in Fig. 9, and partly in section in Fig. 11.)

Said pawl-carrier and ejector is provided with a pawl, *e*⁷, which engages with said ratchet *e*⁵,
65 and has upon it a downhanging arm, *e*, to which is attached a slotted connecting-bar, *d*,

and spring *d*⁷, the latter being connected to said bar by one end, and having its opposite end connected to a screw which enters said arm *e*, whereby is formed a yielding connection
70 for the purpose of obviating any injury to the machine if the movement of said ejector *e*⁶ to the right should be obstructed by any derangement of the buttons while being fed, as, in the latter case, the drawing force exerted upon arm
75 *e* by the connecting-rod *d* would be only that of spring *d*⁷, said rod under said circumstances being forced to move by the side of arm *e*, while the latter remains stationary. The right-hand
80 end of said rod *d* is pivotally connected to one end of the lever *d*², the latter being hung to vibrate on a stud, *o*, fixed in an arm, *o*², under the trough *d*³, and its lower end is connected
85 with lever *d*⁴ by a stud in the latter, which enters a slot in lever *d*².

A cam-slot, *a*, is formed in the lever *d*⁴, through which projects the said stud *o* in arm *o*², so that when the upper end of said lever *d*⁴ is given a vibratory motion a rapid reciprocating motion
90 is imparted to the hopper B and the rear end of the trough *d*³.

A button-turner, *e*², substantially such as is shown in my said patent, is fitted to the top side of the button-trough *d*³, so that the lower parts of its corrugations extend downward into
95 said trough, as shown in dotted lines in Fig. 1, and said button-turner is connected, as shown, to the lever *d*⁴, whereby a reciprocating motion is given to said button-turner, between the under side of which and the bottom of said trough
100 there is room for buttons to move along when they lie with their faces up; but if in other positions they are hit by the corrugated surface of said button-turner, and are turned over faces up when they move along down the in-
105 clined trough *d*³ to the delivery end thereof, as shown in Fig. 16.

A curved cap, *e*¹, is provided for the curved delivery end of the trough *d*³, and is secured to the latter by several screws, 3, a part of
110 which enter the edges of the trough to draw the cap down, and a part of them are screwed into the cap having, their points operating against said edges to lift up said cap, so that the distance between the under face of said cap and
115 the bottom of said trough may be varied to suit buttons of different sizes.

An opening into that portion of said trough directly under said cap is made by cutting away the side of the trough at that point to
120 permit of access to the buttons therein, and for the purpose of cleaning the trough.

The operation of the above-described button-feeding devices is as follows: The hopper-bowl B is supplied with a quantity of ordinary shoe-
125 buttons; but the projection of the button-rim *c* over the holes in the rotating button-gate *e*² prevents the buttons from piling up over said holes, and preventing too great crowding of the buttons upon the gate and over its holes,
130 and insures the proper deposit of a button in each of said holes, while others may lie upon

and around said button. When, however, said button-gate is rotated, moving in the direction indicated by the arrow in Fig. 12, any buttons lying upon those which are in the holes in said gate are pushed off as said holes pass under the button-guard c^3 , and as often as one of the said holes in the gate c^2 comes around over the opening K in the bottom c^1 a button is dropped into the trough d^3 thereunder, and the ejector e^6 then moves forward against said button, pushing it farther along in said trough, the latter meanwhile being shaken, as above described, and so a line of buttons is formed therein from under said bowl to its delivery end, and made to assume the proper positions by the button-turner e^2 , as above described, sliding along in the trough with their shanks hanging down in its lower narrow groove, from whence they are taken by the button-carrier b one by one. A flexible cap-spring, e^5 , is secured to the cap e^4 , and its lower end is bent to cover the lower end of trough d^3 and prevent the buttons from dropping out until by the movement of the button-finger i^7 against it it is moved back, as shown in Fig. 16.

The button-receiving end of the button-carrier b is of an improved construction as compared with that shown in my said patent, and its operative relations to the feed-trough d^3 are shown in Fig. 16. An adjusting wedge, i^2 , is secured on the rear side of said trough, as and for the purpose hereinafter described.

The forward or button-seizing end of said carrier b is bored longitudinally to receive the shank o^3 of the button-finger i^7 , and said end is reduced in size to receive the sleeve i^3 , having the wings i^8 thereon. A finger-lever, i^4 , is pivoted between said wings on sleeve i^3 . The shank o^3 to said button-finger is notched, as in Fig. 20, to let the end of said finger-lever engage with it, and is reduced in diameter between said notched part and its rear end to receive thereon a notched sliding sleeve, o^5 , and a spring, o^4 . A slotted button-plate, i^5 , is secured to the front edges of the wings i^8 , and the button-finger i^7 stands before said plate. A spring, i^6 , surrounds the end of said sleeve i^3 at the junction of said sleeve with the carrier b , the ends of which spring are secured respectively to the said carrier and said sleeve, and where said spring is hooked to said sleeve the latter is slotted, as in Fig. 16, and a screw secured in the carrier under said sleeve projects through one end of said slot. A screw (seen in Fig. 16) is inserted through sleeve i^3 , its inner end projecting into the notch in said sliding collar o^5 . Thus when trough d^3 is provided with a supply of buttons the spring e^5 unobstructedly springs under them, keeping them from dropping down, the button-carrier, actuated by the devices heretofore described, turns from the position in which it is shown in Fig. 21 and moves toward the end of the trough d^3 , and the end of the button-finger i^7 strikes said spring e^5 , carrying it from under the buttons, and almost simultaneously with the above-de-

scribed movements the upper end of the finger-lever i^4 has been held stationary against the wedge i^2 , while the button-carrier moves along, thus causing the lower end of said lever to push the button-finger away from the slotted plate i^5 and let a button drop therebetween, as shown, the shank of the button being placed in the slot of said plate. Said button-carrier now moves back, letting the spring e^5 cover again the end of the trough, and by carrying the finger-lever i^4 away from the latter said button-finger, actuated by spring o^4 , clamps the button between it and plate i^5 , and the carrier, continuing to move back and to turn, finally causes the button to be brought to the position upon the cloth-plate b^4 shown in Fig. 21.

The said adjusting-wedge i^2 , which the upper end of the finger-lever i^4 strikes when the button-carrying devices go forward to take a button, is made adjustable vertically upon trough d^3 , so that said lever may strike its thick or thin part, and thus vary the movement of the button-finger i^7 away from the button-plate i^5 to accommodate the said parts to the manipulation of buttons of various thicknesses.

The cloth-plate b^4 is secured to the frame of the machine over the needles, as shown in several of the figures, and the buttons are turned over upon it, as in Fig. 21, the opening through their shanks being held over the slot in the cloth-plate and directly in the track of an up-moving needle, as shown.

The take-up v^4 is operated in this machine in conjunction with the swinging needle-bar frame D substantially the same as in my said patent, and the course of the thread from one to the other of said parts is the same. Said swinging needle-bar frame, however, differs in its construction and adaptation to other parts of the machine from that one shown in my said patent, and is pivoted low down in frame A on a shaft, s^3 , to obtain an easier swinging movement therefor.

In the construction herein shown the cams 7 and 8, which swing said needle-bar frame D, operate against the roller-ended adjustable plugs $z z$, which are moved out by the screws $x x$ to vary their relative positions to said cams, and the inclined needle-bar and cast-off bars 15 and 16 are located side by side in frame D in suitable bearings therein. The yoke 18, Fig. 8, is secured by the set-screw s' to said needle-bar 15, and the cast-off bar 16 passes freely through said yoke, so that the latter may have a reciprocating motion on the former. Said cast-off bar has two adjustable collars, $s s$, upon it, and is partly flattened on one side, as shown. Said flattened portion passes through a part of said frame D, Fig. 7, in which is supported and pressed against said flattened portion by piston v^2 , spring v^3 , and screw t the friction-block v' , having a face partially of leather or similar material. Said yoke 18 is moved, as hereinafter described, between said collars $s s$ on the bar 16, first against one and

then the other, giving to said bar an intermittent motion with a rest between each one, and said frictional devices hold said bar in a fixed position, while said yoke moves from one collar to the other. By said screw t and spring v^3 the said proper frictional adjustment may be had, and said cast-off bar is prevented from turning in said frame by said arrangement of frictional devices, whereby pressure is exerted against said flat side thereof.

The pitman 17, which connects the crank-shaft of the machine with the inclined needle-bar, as in said patent, has its upper end connected to a pitman-bar, v , which is secured in one end of yoke 18 by a set-screw, s^2 . Thus the reciprocating vertical movement of said pitman 17 imparts a reciprocating motion to both the needle-bar 15 and the cast-off bars 16. In this machine the inclined needle-bar carries the hook-needle x^2 , and the cast-off bar 16 carries the tubular cast-off x' , through which said hook-needle operates. The front end of said swinging needle-bar frame D has the vertical flat needle-bar 14 properly fitted and supported thereupon, so that it may freely reciprocate vertically thereon by its connection, as in said patent, with the crank-disk 11 and the cam-plate 13, secured to said needle-bar.

The presser-foot w' is operated entirely independent of the needle-bar 14 as follows: A cam, w^6 , is formed on the edge of the crank-disk 11, and a lever, w^3 , provided with proper anti-friction devices, as shown, is hung on a block, w^5 , on frame A. The presser-foot bar w is supported in a vertical position in frame A by passing through properly-pierced blocks thereon, as shown. A spring, w^2 , on said bar operates between a collar thereon and a stud on said frame to force the presser-foot up against the under side of the needle-plate b^4 . An arm or block, w^4 , is secured to said presser-foot bar, upon the top of which one end of said lever w^3 bears. Said arm or block w^4 projects through the front end of frame A and serves to prevent said presser-bar from turning in its supports. By turning back the screw in the end of the block or arm w^4 the presser-foot bar may be turned therein to properly adjust the presser-foot under the cloth-plate, and said block may be adjusted vertically on said bar, so that it will co-operate with lever w^3 to properly move the presser-foot. Thus the operation of said cam w^6 upon lever w^3 imparts the requisite vertical reciprocating motion to the presser-foot without the aid of the needle-bar.

By the above-described construction of the button-carrying end of the button-carrier b , whereby the sleeve i^3 may rotate slightly on said carrier, provision is made for allowing said sleeve and the button-finger i^7 and their directly-connected parts to turn slightly on the end of the carrier b , if the needle in passing up to go through the eye of the button, as in Fig. 21, should happen to strike the button-shank or any part of said button-handling mechanism, thus often preventing the needle

from being broken or other injury being done to the machine such as might occur if said parts were rigidly fixed on the button-carrier.

What I claim as my invention is—

1. In a machine for sewing shank-buttons to fabrics, the button-feed trough pivoted to the frame of the machine at or near its delivery end, and having the curved cap e^4 secured adjustably thereto, and the cap-spring e^5 secured to said cap, substantially as set forth.

2. In button-feed mechanism for sewing-machines, the combination, with a perforated intermittently-rotating button-gate located at the bottom of the hopper-bowl, of a button-guard to extend over a portion of the perforations in said button-gate, substantially as set forth.

3. In combination, levers d^4 and d^2 , the slotted rod d , spring d' , the button-ejector e^6 , having arm e thereon, and operating mechanism substantially as described, and the trough d^3 , substantially as set forth.

4. The combination, with the feed-trough d^3 , having a hopper-bottom, e' , thereon, provided with an opening, K, therein, of the button-ejector e^6 , having a reciprocating motion under said bottom in a line with said trough, substantially as set forth.

5. In combination, the hopper-bowl B, having the inwardly-projecting button-rim c around its interior, and the perforated rotating button-gate c^2 , substantially as set forth.

6. The combination, with the sewing and button-feeding mechanism of a machine for sewing buttons onto fabrics, of a button-counting device, f , connected by mechanism, substantially as described, with the operative parts of said machine, substantially as set forth.

7. The combination, with the button-carrier b , and with appliances, substantially as described, for imparting thereto a longitudinal and rotating reciprocating motion, of the button-finger i^7 , having a shank extending into the end of said carrier, the sleeve i^3 , having the finger-lever i^4 pivoted thereto, the plate i^5 , and springs i^6 and o^4 , substantially as set forth.

8. The adjustable wedge i^2 , secured to the trough d^3 , the button-finger i^7 , and the finger-lever i^4 , combined and operating substantially as set forth.

9. In combination with the main driving-shaft b' , the cam w^6 , the lever w^3 , pivoted to the frame of the machine, the presser-bar w , the block w^4 , adjustable on said bar w , and spring w^2 , substantially as set forth.

10. In combination, the swinging needle-bar frame D, the needle-bar 15, carrying the hook-needle x^2 , yoke 18, secured to said needle-bar, the cast-off bar 16, passing through said yoke, and having collars s thereon and carrying the cast-off x' , the needle-bar 14, carrying the eyed needle x^3 , and mechanism, substantially as described, for imparting a reciprocating motion to said needle-bars 15 and 14, substantially as set forth.

11. The combination, with the cast-off bar 16, having a flat side, and with the swinging needle-bar frame D, of the friction-block v' , bearing against said flat side of bar 16, piston v^2 , spring v^3 , and screw t , substantially as set forth. 5

12. The button-feed trough having thereon the fixed hopper-bottom, having through it the opening K, the hopper-bowl having the inwardly-projecting button-rim c around its interior, the button-gate having the ratchet c^5 thereon and a series of perforations through 10

it, the button-guard extending over a portion of said perforations, the button-ejector having the pawl c^7 thereon, and mechanism, substantially as described, for vertically vibrating said trough and hopper-bowl, and for imparting to the button-ejector a reciprocating motion, all combined and operating substantially as set forth. 15

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Witnesses:

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