

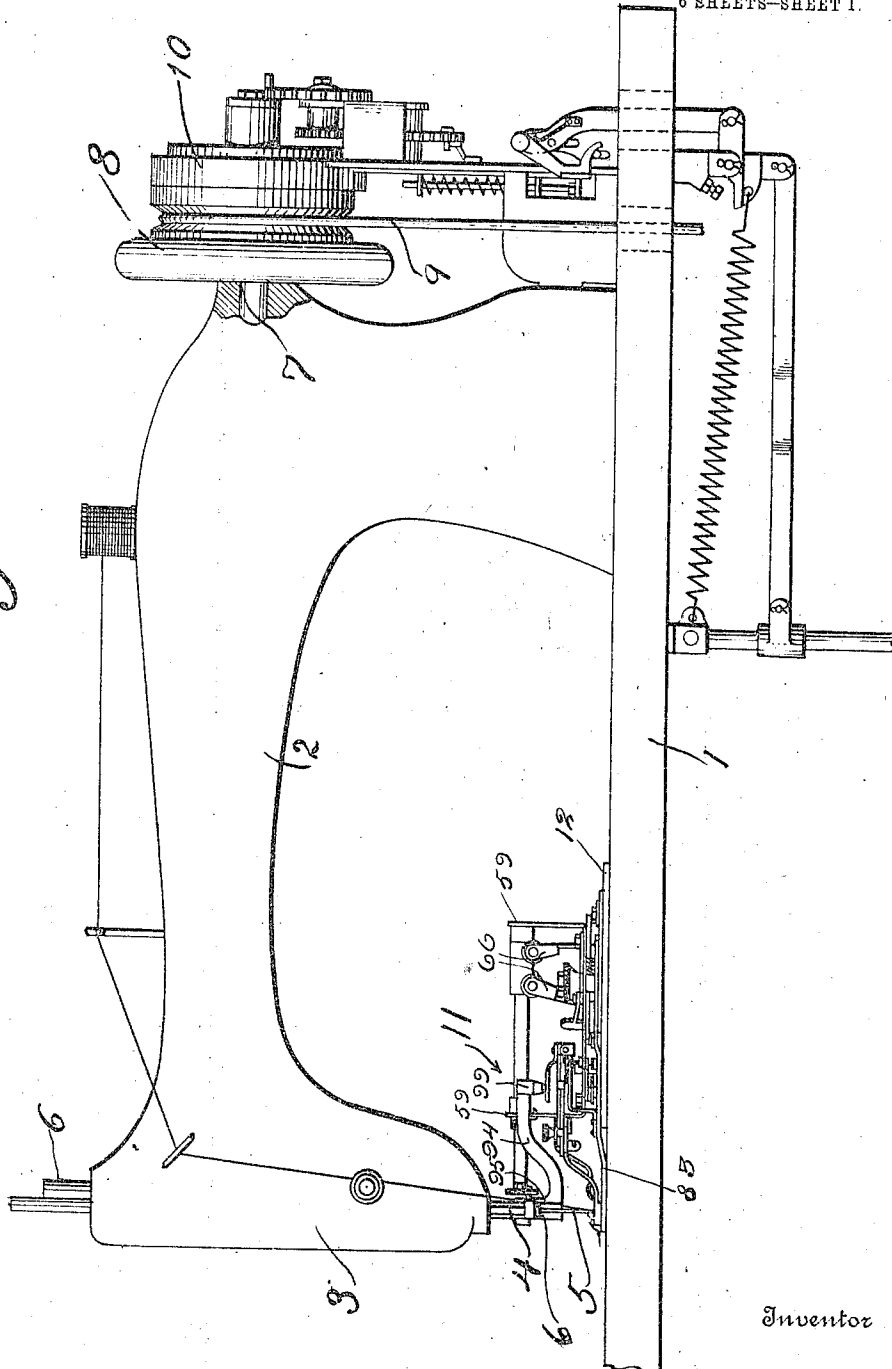
R. A. SCRANTON.  
 BUTTON SEWING ATTACHMENT FOR SEWING MACHINES.  
 APPLICATION FILED APR. 11, 1912.

1,059,642.

Patented Apr. 22, 1913.

6 SHEETS—SHEET 1.

*Fig. 1.*



Witnesses

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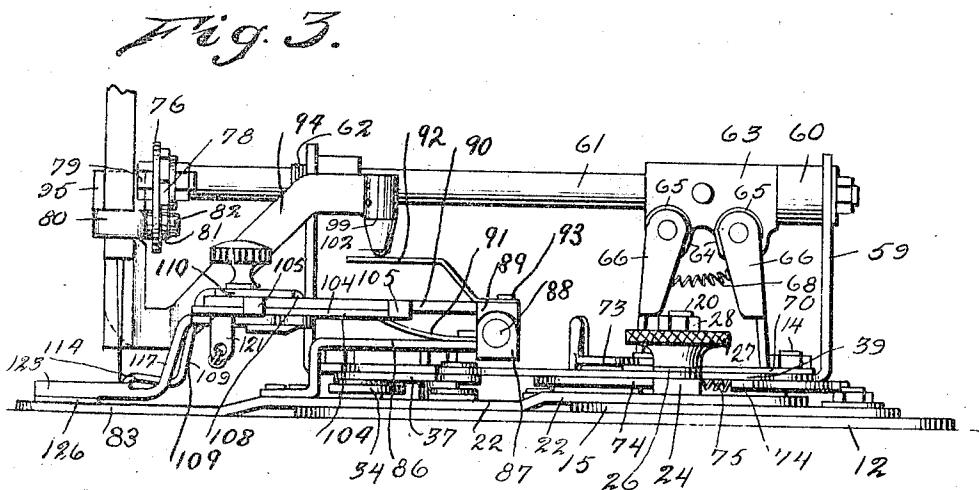
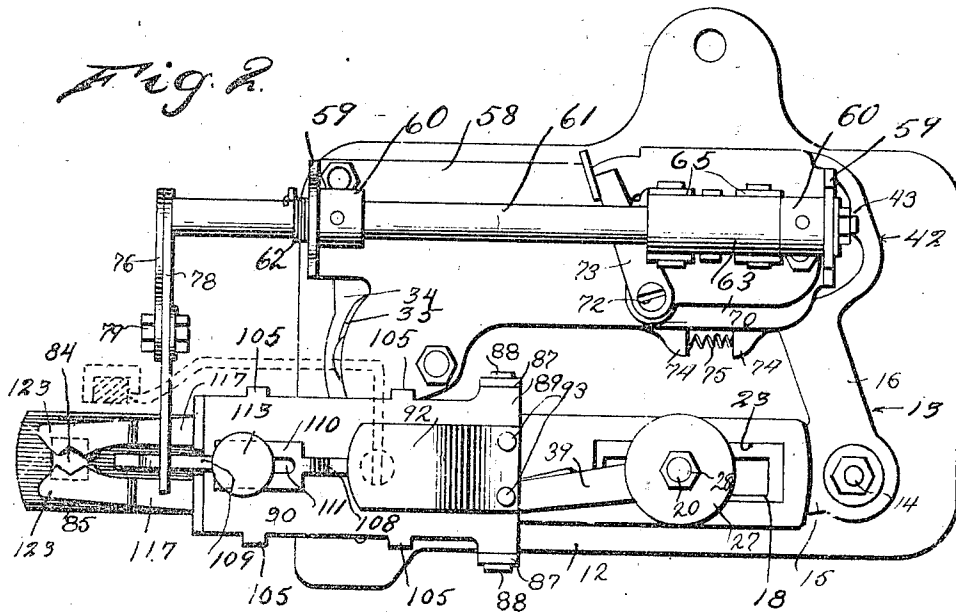
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6 SHEETS-SHEET 2



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6 SHEETS-SHEET 3.

*Fig. 4.*

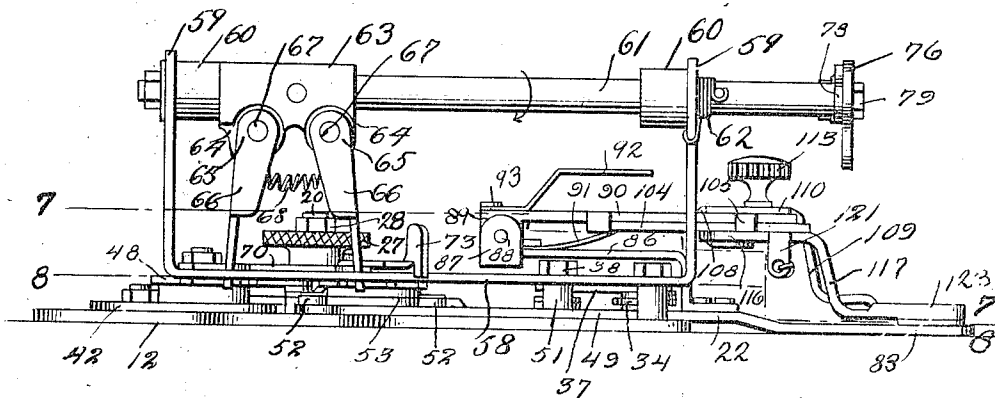


*Fig. 5.*

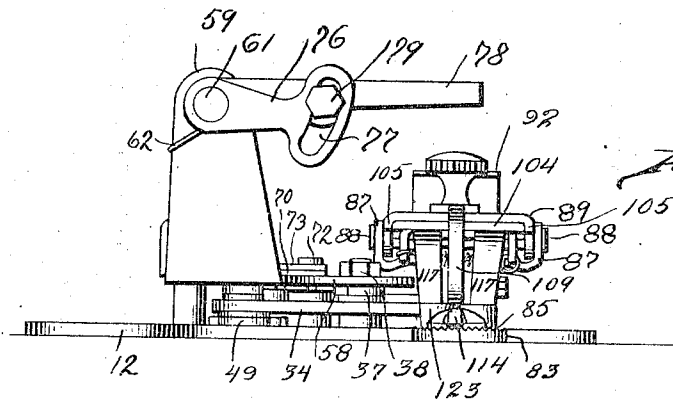
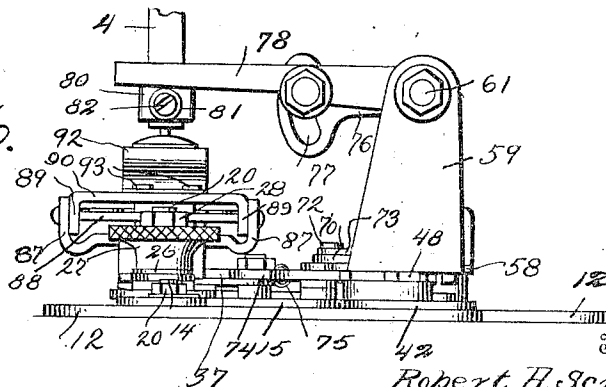


*Fig. 6.*



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6 SHEETS-SHEET 4.

Fig. 7.

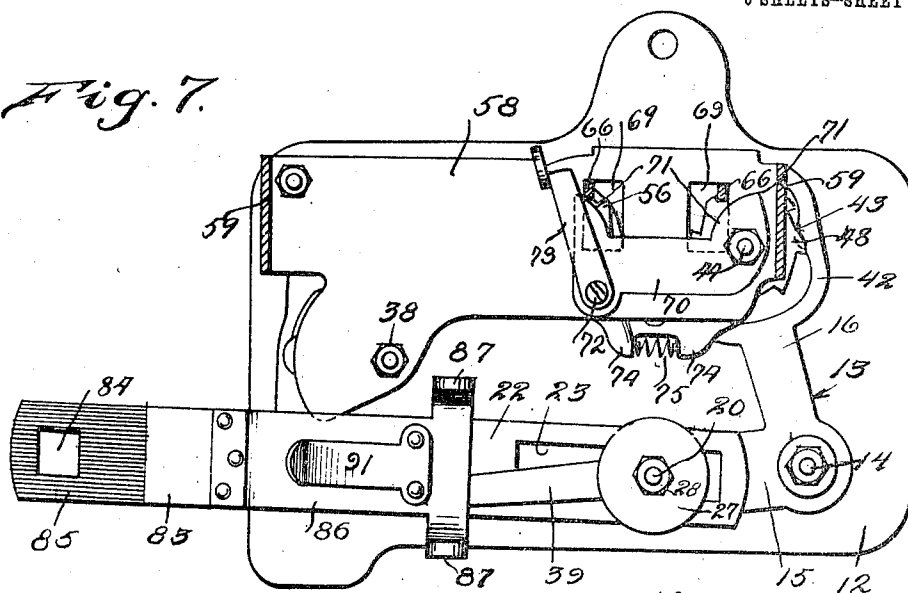
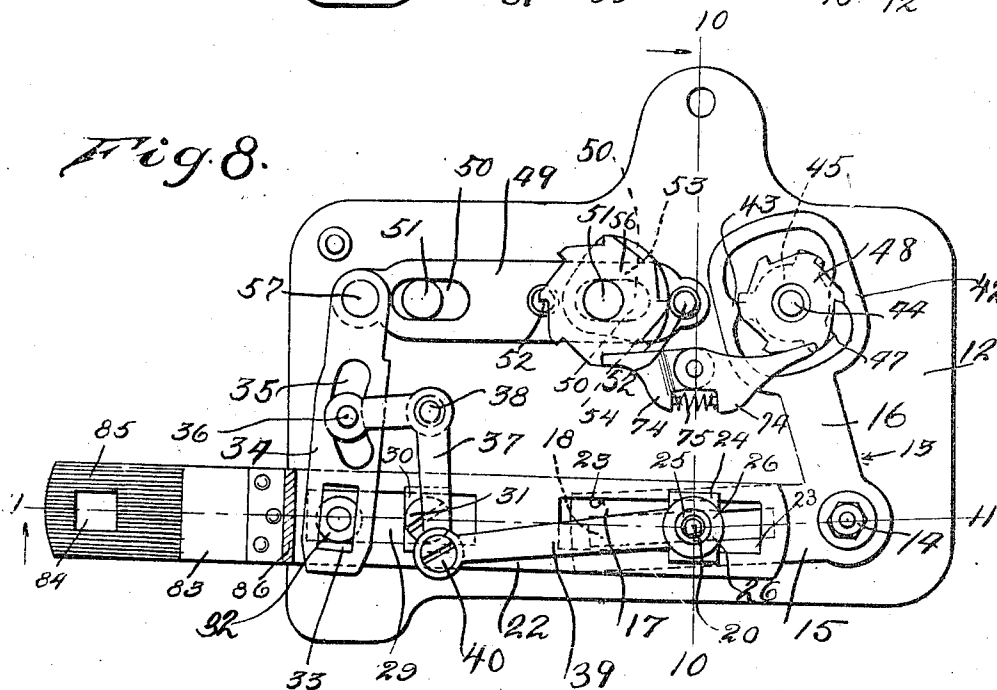


Fig. 8.



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6 SHEETS-SHEET 5.

Fig. 9.

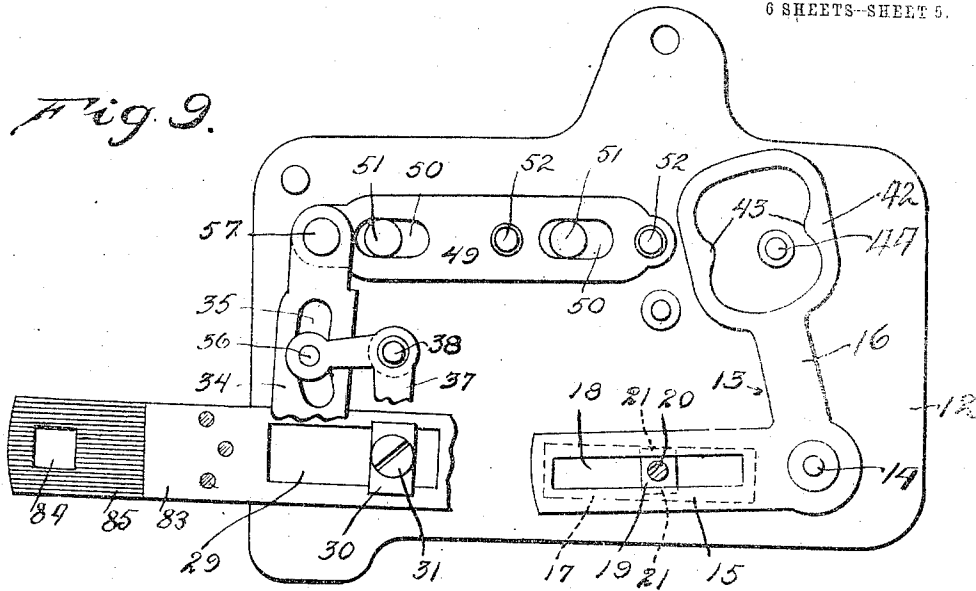


Fig. 10.

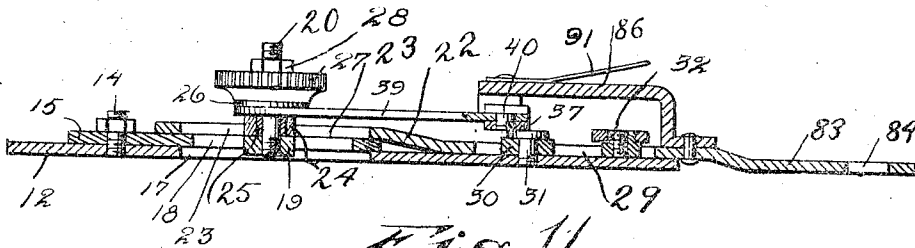
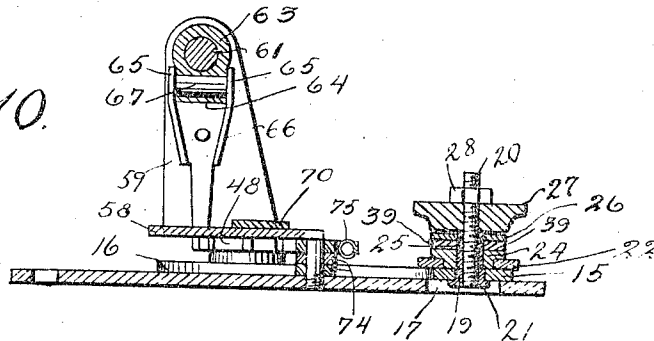


Fig. 11

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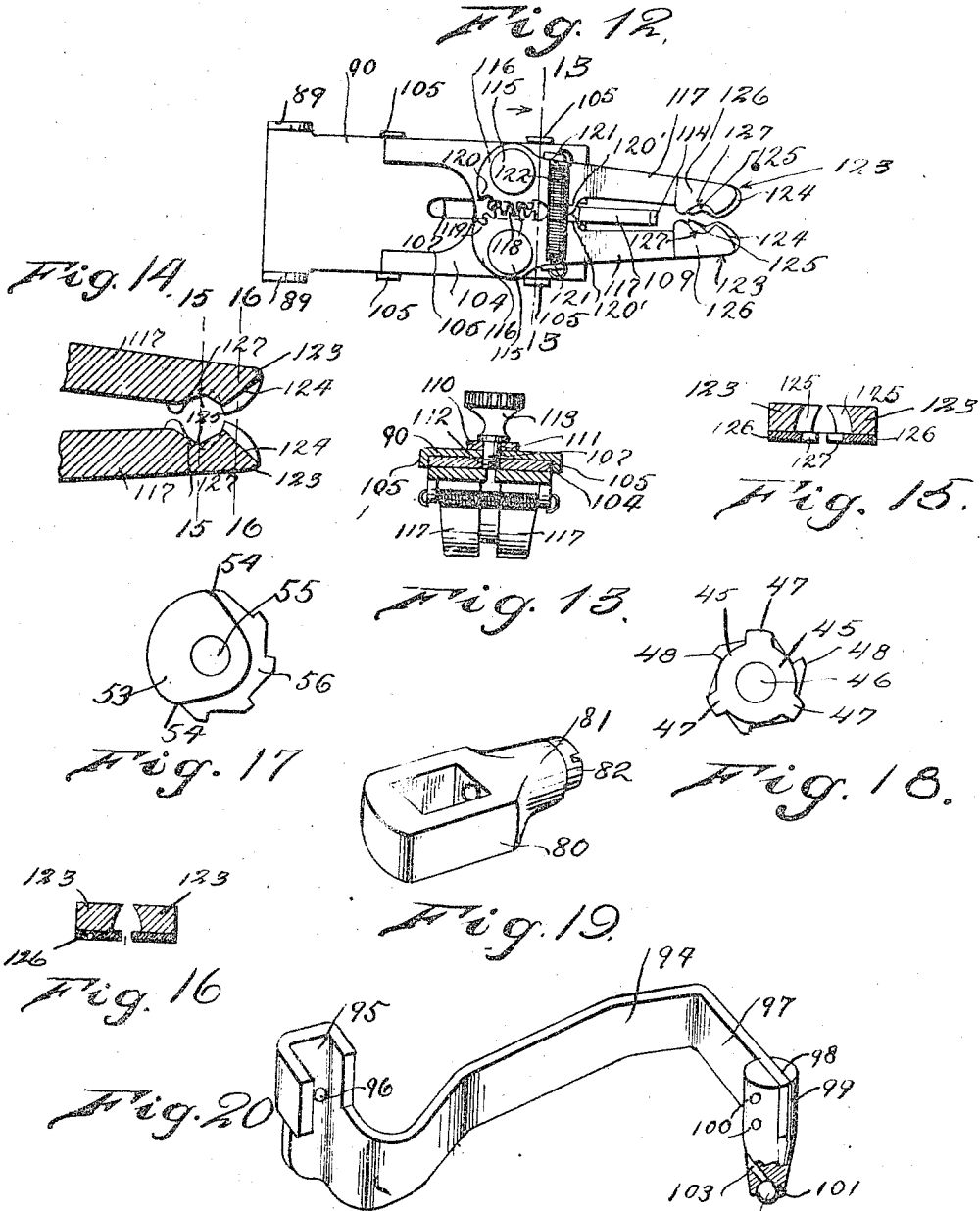
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6 SHEETS-SHEET 6.



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34

# UNITED STATES PATENT OFFICE.

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THE IMPERIAL SEWING MACHINE COMPANY, A CORPORATION OF DELAWARE.

## BUTTON-SEWING ATTACHMENT FOR SEWING-MACHINES.

1,059,642.

Specification of Letters Patent.

Patented Apr. 22, 1913.

Application filed April 11, 1912. Serial No. 690,198.

*To all whom it may concern:*

Be it known that I, ROBERT A. SCRANTON, a citizen of the United States, residing at New York, in the county of New York and State of New York, have invented certain new and useful Improvements in Button-Sewing Attachment for Sewing-Machines, of which the following is a specification.

The present invention relates to an attachment for use in connection with a preferably power driven sewing machine, for holding a button in a proper position with relation to the fabric to which it is to be attached and shifting the button and fabric so that the holes of the button will be brought into positions to allow the needle to pass through the same in sewing on said button.

An important object of the invention is to provide means of the above mentioned character including a novel form of button holding device and novel means to press this device into engagement with the fabric to which the button is to be attached, so that the button and the fabric will be shifted together.

A further object of the invention is to provide an element for attachment to the presser bar and provided with antifriction means for engagement with the button holding device, to hold such device in proper clamping engagement with the fabric and to permit of the free shifting movement of said button holding device without perceptible friction between the engaging parts.

A further object of this invention is to provide a button holding device of the above mentioned character, which is self-adjusting so that it will hold buttons of varying diameter and thickness, and will also hold a button having the diametrically opposite portions thereof irregular or of different thickness.

A further object of this invention is to provide a button holding device of the above mentioned character which will automatically center buttons of different sizes.

A further object of the invention is to provide means of the above mentioned character, which are automatic and reliable in operation, comparatively simple in construction, durable, and not liable to derangements.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a side elevation of a sewing machine equipped with automatic clutch mechanism and showing my improved button sewing attachment applied thereto, Fig. 2 is a plan view of the button sewing attachment as a whole. Fig. 3 is a side view of the same, Fig. 4 is a similar view of the opposite side of the same, Fig. 5 is an end view of the same, Fig. 6 is a similar view of the opposite end of the device, Fig. 7 is a horizontal sectional view taken on line 7—7 of Fig. 4, parts being omitted, Fig. 8 is a similar view taken on line 8—8 of Fig. 4, Fig. 9 is a view similar to Fig. 8, further elements being removed or broken away, Fig. 10 is a vertical transverse sectional view taken on line 10—10 of Fig. 8, Fig. 11 is a vertical longitudinal sectional view taken on line 11—11 of Fig. 8, Fig. 12 is a bottom plan view of the clamping jaws or button holding device, Fig. 13 is a transverse sectional view taken on line 13—13 of Fig. 12, Fig. 14 is a horizontal longitudinal sectional view taken through the clamping jaws and looking downwardly, Fig. 15 is a transverse sectional view taken on line 15—15 of Fig. 14, Fig. 16 is a similar view taken on line 16—16 of Fig. 14, Fig. 17 is a bottom plan view of one of the actuating cams, Fig. 18 is a similar view of the other cam, Fig. 19 is a perspective view of an operating element or lug which is secured to the needle bar, and Fig. 20 is a similar view of a presser arm which is attached to the presser bar.

In the drawings wherein for the sake of illustration, I have shown a preferred embodiment of my invention, the numeral 1 designates a base of a preferably power driven sewing machine. Upon this base is mounted an overhanging bracket arm 2, carrying at its forward end a head or shell 3, within which is disposed the ordinary mechanism for reciprocating a needle bar 4, provided at its lower end with a needle 5. The head 3 also carries the ordinary presser

bar 6, which is urged downwardly by a spring (not shown) as is customary. The usual means (not shown) are provided to elevate and release the presser bar 6.

5 The numeral 7 designates the operating shaft which drives the mechanism which in turn operates the needle bar. Disposed about this operating shaft is a continuous rotary driving wheel 8, engaged by a belt 9.

10 The numeral 10 designates a driven wheel, which is rigidly connected with the shaft 7, it being understood that the wheel 8 has no direct connection with the shaft 7 but drives it through the connection which it has with the driven wheel 10.

15 Automatically operated clutch mechanism is provided to disconnect the wheels 8 and 10 when the shaft 7 has made a predetermined number of revolutions. Such mechanism may be of any well known or preferred type although I prefer to employ such mechanism, as shown in my co-pending application for clutch mechanism, Serial No. 690,197, filed April 11, 1912.

20 The numeral 11 designates my improved button sewing attachment as a whole, which is located near the head 3 upon the base 1, as shown. This button sewing attachment comprises a base plate 12 to be rigidly attached to the base 1 by any suitable means.

25 Disposed upon the base plate 12 (see more particularly Fig. 9) is a lateral shifting bell-crank lever 13, pivotally connected with the base plate, as shown at 14. This bell-crank lever comprises a longitudinal and

30 transverse arms 15 and 16; which are disposed at more than an angle of forty-five degrees, as shown. Beneath the arm 15 the base plate is provided with a longitudinal opening 17 in registration with a smaller

35 longitudinal opening 18 formed in said arm 15. Longitudinally adjustably mounted within the opening 18 is a block or head 19, carried by an upstanding bolt 20. This head is provided upon opposite sides with flanges

40 21 which engage the lower surface of the arm 15. Disposed above the arm 15 is an upwardly off-set end portion of a shifting plate 22, the same being provided with a longitudinal opening 23 for receiving a

45 flanged block 24, as shown. This flanged block is provided with a central opening for receiving a spacing sleeve 25, which surrounds the bolt 20, as shown. A washer 26 is disposed about the upper end portions of

50 this spacing sleeve. The bolt 20 carries a thumb or clamping nut 27, held against accidental rotation by a locking nut 28. It is thus seen that I have provided an adjustable pivotal connection between the arm 15 and

55 the off-set end portion of the shifting plate 22. The shifting plate 22 is provided midway its ends with a longitudinal opening 29, for receiving a flanged block 30, which is pivotally connected with the base plate 12

by means of a screw 31 or the like. Pivot-

ally connected with the shifting plate 22 at the forward-end of the opening 29 is a block 32, disposed within an elongated opening 33 formed in a longitudinal shifting lever 34. This lever 34 is provided midway its ends with a segmental opening 35, for receiving a depending pin 36, which forms the pivot about which it turns.

70 The numeral 37 designates an adjusting bell-crank lever which is suitably spaced from the base plate 12 and pivotally connected therewith, as shown at 38. One arm of this adjusting bell-crank lever carries the depending pin 36 while the other arm of it is pivotally connected with a pitman 39, as shown at 40. This pitman is provided at its opposite end with an enlarged apertured head 41, which surrounds the ring 25 and is disposed between the washer 26 and the block 19, as shown. It is thus seen that by unscrewing the thumb nut 27 and moving the bolt 20 longitudinally within the opening 18, the point of pivotal connection between the shifting plate 22 and the arm 15 may be varied and at the same time the bell-crank lever 37 will be moved to shift the pin 36 and accordingly change the pivot point of the lever 34. The shifting plate 22 is moved longitudinally by the lever 34 and is swung or moved laterally about its pivot 31 by the bell-crank lever 16. The extent of these movements is regulated by changing the pivotal connections as above stated.

90 The arm 16 is provided at its free end with an enlarged head 42 provided with an opening formed therein having oppositely arranged inwardly extending shoulders 43. Disposed within the opening of the head 42 is an upstanding bolt 44, which is rigidly connected with the base plate 12 and is provided with an enlarged smooth cylindrical lower portion.

100 The numeral 45 (see more particularly Fig. 18) designates a cam having a central opening 46 and provided with three extensions or points 47. This cam is rigidly connected with a ratchet wheel 48. The cam 45 is disposed within the open head 42 and the opening 46 thereof receives the enlarged smooth portion of the bolt 44.

110 Slidably mounted upon the base plate 12 is a reciprocatory plate 49, provided with spaced elongated openings 50, for receiving stationary guides or posts 51, which are fixed upon said base plate. Disposed near and upon opposite sides of one of these stationary posts 51 are upstanding cylindrical extensions or trunnions 52, rigidly attached to the reciprocatory plate 49.

120 The numeral 53 designates (see Fig. 17) a cam having two extensions or points 54, and provided with a central opening 55. Rigidly connected with this cam 53 is a ratchet wheel 56. The cam 53 operates between and engages the trunnions 52 while the opening

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55 receives the post 51. The reciprocatory plate 49 is pivotally connected with one end of the lever 34, as shown at 57.

Disposed in spaced relation to the base plate 12 is an upper plate 58, which is suitably rigidly connected with said base plate. This upper plate has its end portions bent at right angles to form upstanding supports 59, carrying bearings 60, through which is journaled a horizontal rock-shaft 61. This rock-shaft carries a coil spring 62, having one end thereof attached to the same and its opposite end secured to the upstanding support 59. The function of this spring is to return the rock-shaft to its normal position when removed therefrom. Rigidly mounted upon this rock-shaft is a sleeve 63, carrying spaced depending knuckles 64, to be disposed between spaced knuckles 65 formed upon the upper end of depending actuating fingers or pawls 66. The knuckles 64 and 65 are pivotally connected by pintles 67. It is thus seen that the fingers or pawls 66 are free to swing longitudinally of the sleeve 63 but cannot partake of any perceptible lateral movement with relation thereto. Disposed between and suitably secured to the depending fingers or pawls 66 is a compressible coil spring 68, which urges the same away from each other. The upper plate 58 is provided with openings 69, through which the fingers or pawls 66 extend to engage the ratchet wheels 48 and 56. Rigidly mounted upon the upper surface of the plate 58 adjacent the openings 69, is a guide plate 70, having curved shoulders 71, to be engaged by the fingers or pawls 66 to cause them to swing inwardly toward each other when the rock-shaft 61 is turned. The guide plate 70 is rigidly and preferably removably connected with the plate 48 by a screw 72 and the bolt 44. When it is desired to stop the operation of the ratchet wheel 56 during the operation of the ratchet wheel 48, a lever 73 is swung into engagement with the pawl or finger 68, whereby such pawl or finger is confined or made to travel in the inner portion of the opening 69 and will not turn the ratchet wheel. This lever 73 is pivotally connected with the guide plate 70 by the screw 72. The ratchet wheels 48 and 56 are rotated in one direction by the pawls or fingers 66 and are prevented from rotating in a reverse direction by pivoted pawls 74, urged away from each other by a compressible coil spring 75.

Rigidly connected with one end of the rock-shaft 61 is a crank arm 76, provided at its end with a head having a segmental opening or slot 77 formed therein.

The numeral 78 designates an auxiliary crank-arm having one end thereof apertured to receive rock-shaft 61 to be pivotally connected therewith. The auxiliary crank-arm

78 carries a clamping bolt 79, disposed within the opening 77. It is thus seen that by proper manipulation of the clamping bolt 79 the auxiliary crank-arm 78 may be angularly adjusted with relation to the rock-shaft 61 and clamped in adjustment at a desired angular position.

The numeral 80 (see Fig. 19) designates an open frame to be rigidly connected with the needle bar 4. This frame carries an extension or boss 81, having a screw-threaded axial opening for receiving a clamping screw 82. The frame 80 is positioned upon the needle bar so that the boss 81 will be placed below and in engagement with the auxiliary crank-arm 77.

The shifting plate 22 has its forward end in the form of a downwardly off-set portion 83, provided with an opening 84 and a corrugated upper surface as shown at 85. Rigidly connected with the shifting plate 22 adjacent the portion 83 thereof is a rearwardly extending horizontal bracket 86, provided at one end with upstanding apertured knuckles 87 through which passes a pintle 88 passing through depending knuckles 89, disposed between said knuckles 88. The knuckles 89 are formed upon one end of a vertically swinging plate 90, which carries the button holding device, to be described. The plate 90 is engaged upon its lower surface by a leaf-spring 91, fixedly attached at one end to the bracket 86. The plate 90 has a suitably stiff leaf-spring 92 connected with the end thereof adjacent the pivot point, as shown at 93.

The numeral 94 designates a presser arm (see Figs. 1, 3 and 20), which is provided at one end with a socket 95, to receive the lower end of the presser bar 6. The socket 95 is provided with an opening 96 for receiving a screw or the like (not shown) which rigidly connects the socket with the presser bar. The presser arm 94 has its free end portion 97 bent at right angles, as shown, and fitted within a transverse slot 98 formed in a head 99 and rigidly held therein by pins 100 or the like. The head 98 is vertically disposed and preferably tapers toward its lower end where it is provided with a more than hemi-spherical opening 101, rotatably holding a ball-bearing 102. An oil supply opening 103 is drilled through one side of the head and leads into the opening 101, as shown. When the presser bar is lowered the ball-bearing 102 engages the leaf-spring 92 for holding plate 90 in its lowermost position.

The button holding device comprises a plate 104, placed in engagement with the lower face of the vertically swinging plate 90 and disposed between depending guide ears 105, which are preferably formed integral with the plate 90. The plate 104 is longitudinally adjustable and is provided at

one end with an opening 106, for receiving the free end of the spring 91. The vertically swinging plate 90 is provided with a longitudinal opening 107 for receiving depending extensions 108 and 109, carried upon the opposite ends of a slide block 110, which is in turn provided with a longitudinal opening 111, as shown. The plate 104 is provided with a screw-threaded opening 112 for receiving a clamping screw 113, such clamping screw passing through the two longitudinal openings 107 and 111. The depending extension 109 has its lower portion bent to extend horizontally to afford a finger for engagement with the button. At its extreme end this extension or finger is bent downwardly at right angles, forming a head 114. It is obvious that the extension or finger 109 and the plate 104 may be independently longitudinally adjusted with respect to the plate 90 and clamped in adjustment at desired positions by turning the screw 113. Pivotaly connected with the lower surface of the adjustable plate 104, as shown at 115, are enlarged heads 116, formed upon corresponding ends of oppositely arranged arms 117, which are off-set downwardly midway their ends. The heads 116 carry upon their adjacent faces pinion teeth 118, which are in engagement, as shown, whereby a movement of one of the arms 117 causes a movement of the other arm in an opposite direction. In order that the movement of the arms 117, away from each other may be positively limited so that the pinion teeth 118 cannot get out of mesh, I provide one head 116 with an enlarged tooth 119, which engages an enlarged tooth 120 of the other head and prevents further turning of the heads 116 to open the arms 117. The inward movement of the arms 117 is positively limited for the same reason by extensions 120' carried by said arms. The arms 117 carry depending apertured ears 121, which are connected by a retractile coil spring 122, serving to draw the arms together.

The arms 117 carry at their lower free ends clamping jaws 123, adapted to hold the button and to press the fabric to which the button is to be sewed into clamping engagement with the free end portion 83 of the plate 22. The jaws 123 have their free ends inwardly beveled, as shown at 124, the wedge-shaped opening between such beveled portions increasing in width downwardly. The jaws 123 are further provided near the beveled portions 124 and upon their inner faces with openings 125, which are substantially V-shaped in horizontal cross-section. These openings 125 have their walls vertically beveled or inclined to form a space therebetween which increases in width downwardly. Secured upon the lower faces of the jaws 123 are plates 126 having open-

ings 127 formed therein. The edges of these plates adjacent the openings 127 extend inwardly beyond the edges of the jaws 123, and serve as stops for the button which is forced downwardly owing to the vertical beveled walls of the openings 125. By this construction of the jaws the button can be readily inserted between the same by placing it in engagement with the beveled ends 124 of the clamping jaws and moving the button horizontally toward the jaws, which causes them to separate and allows the button to move into the openings 125. The button holding jaws automatically center the button and firmly hold it between them to be properly shifted. By having the walls of the V-shaped openings or recesses 125 vertically inclined, a button with diametrically opposite portions of different thicknesses, is just as securely held by the jaws, such button being forced downwardly to engage the plates 126. The finger or extension 109 is properly adjusted according to the diameter of the button and serves as a stop to limit the horizontal movement of the button when it is being inserted between the clamping jaws.

The operation of the device is as follows:—The driving wheel 8 is continuously rotated and the clutch mechanism normally affords an operative connection between the same and the driven wheel 10, whereby the operating shaft 7 is rotated to reciprocate the needle bar 4. Upon the upward movement of the needle bar the extension 81 of the sleeve 80 carried thereby engages the auxiliary crank arms 78 and rocks the shaft 61 in the direction as indicated by the arrow. The actuating fingers or pawls 66 engage the teeth of the ratchet-wheels 48 and 56 and also slide along the curved shoulders 71 of the guide plate 70. When the needle bar descends the spring 62 returns the rock-shaft 61 to its normal starting position. It is thus seen that the ratchet-wheels 48 and 56 are advanced a step for each complete up and down movement of the needle bar. The ratchet-wheels 48 and 56 rotate respectively the cams 45 and 53. Each step by step movement of the ratchet-wheel 48 and the cam 45 causes a swinging movement of the bell-crank lever 16 while only upon the fourth step by step movement of the ratchet-wheel 56 does the cam 53 reciprocate the plate 49. It is obvious that the cam 45 will swing the bell-crank lever 16 first in one direction and then in a reverse direction and that the cam 53 moves the plate 49 first in one direction and then in a reverse direction. The bell-crank lever 16 causes the lateral swinging or shifting movement of the plate 22 and the plate 49 through suitable connections causes the longitudinal movement of the plate 22. In this manner the plate 22 is given two lateral

movements and then shifted longitudinally and in this new position again shifted laterally twice and subsequently returned to the first longitudinal position. This operation is then repeated. By moving the bolt 14 longitudinally within the slot 17 the longitudinal and lateral throw of the plate 22 may be varied, as hereinabove explained. The button is placed between the jaws 123 and automatically centered and firmly held in place by them. The presser bar is lowered which moves the presser arm 94 downwardly so that the ball-bearing 102 engages the leaf-spring 92, swinging the plate 90 to its lowermost position and holding the jaws 123 in engagement with the fabric to clamp the same against the end portion 83 of the plate 22. In this manner the button is held near and slightly spaced from the fabric and both the button and fabric are shifted together. Assuming that the button is inserted in the button holding device and that the machine is in operation, such button holding device will be shifted to bring the button in positions so that the needle will pass through the holes thereof. After the button has been shifted a predetermined number of times and a desired number of stitches have been sewed, the clutch mechanism is automatically operated to bring the needle bar and all mechanism operated thereby to a stop. The presser bar is then raised (the needle bar stopping in its elevated position), the thread cut, and the button removed from the button holding device.

It is to be understood that the form of my invention herewith shown and described is to be taken as a preferred example of the same and that certain changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the subjoined claims.

Having thus described my invention, I claim:—

1. The combination with the needle bar, needle, and presser bar of a sewing machine, of button holding and shifting mechanism comprising a movable element, a presser arm attached to the presser bar and having a head provided at its lower end with an

approximately semi-spherical pocket, and a ball freely rotatably mounted in the pocket with its lower portion extending outwardly of the same to engage said element.

2. The combination with the needle bar, needle, and presser bar of a sewing machine, of button holding and shifting mechanism comprising a movable element, a presser arm attached to the presser bar for holding the element in a lowered position and carrying a head having a socket formed therein and an oil supply opening extending to said socket, and a ball-bearing freely rotatably within the socket.

3. The combination with the needle bar, needle, and presser bar of a sewing machine, of a button holding and shifting mechanism comprising a vertically movable plate, a leaf-spring connected therewith, a presser arm attached to the presser bar, and a ball-bearing rotatable with relation to the presser arm and disposed between the presser arm and leaf-spring.

4. In a device of the character described, the combination with a main plate, of a second plate adjustably mounted thereon, clamping jaws carried by the second plate, a finger adjustably mounted upon the main plate independently of the second plate, and means to hold the second plate and finger in adjustment at different positions.

5. In a device of the character described, the combination with a main plate having a longitudinal opening formed therein, of a second plate disposed in engagement with the lower face of the main plate and adapted to be longitudinally adjusted with relation thereto, button holding means carried by the second plate, a block slidably mounted upon the upper surface of the main plate and having a longitudinal slot and provided with a finger to serve as a stop for the button, and a clamping screw passing through the longitudinal openings and engaging the second plate.

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

ROBERT A. SCRANTON.

Witnesses:

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AUSTIN DANA.