May 29, 1928. 1,671,197

R. L. LYONS

BUTTON SEWING MACHINE

Filed July 6, 1925 4 Sheets-Sheet 1

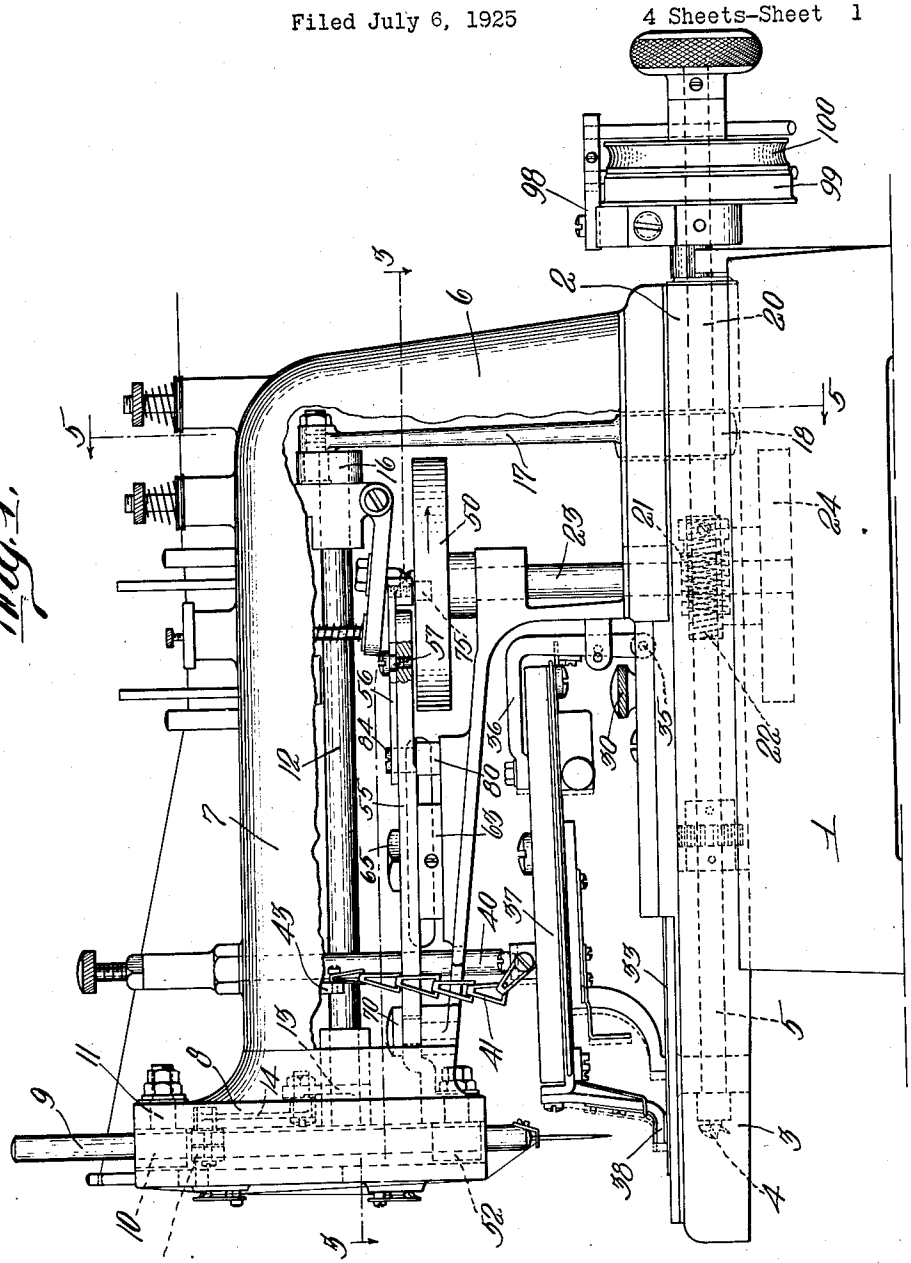


Fig. 1.

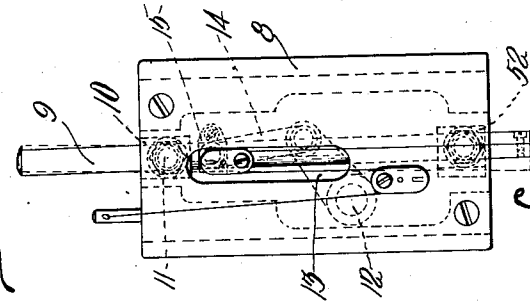


Fig. 2.

Inventor
Robert L. Lyons
by
Cushman Darby & Cushman
Attys.

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R. L. LYONS

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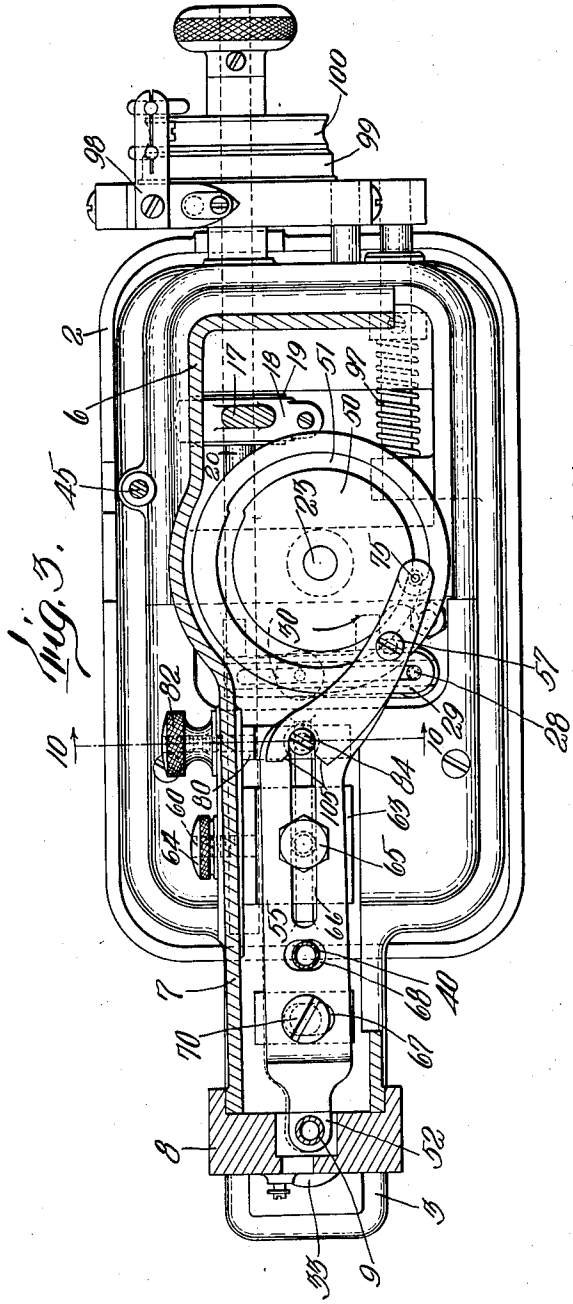


Fig. 3.

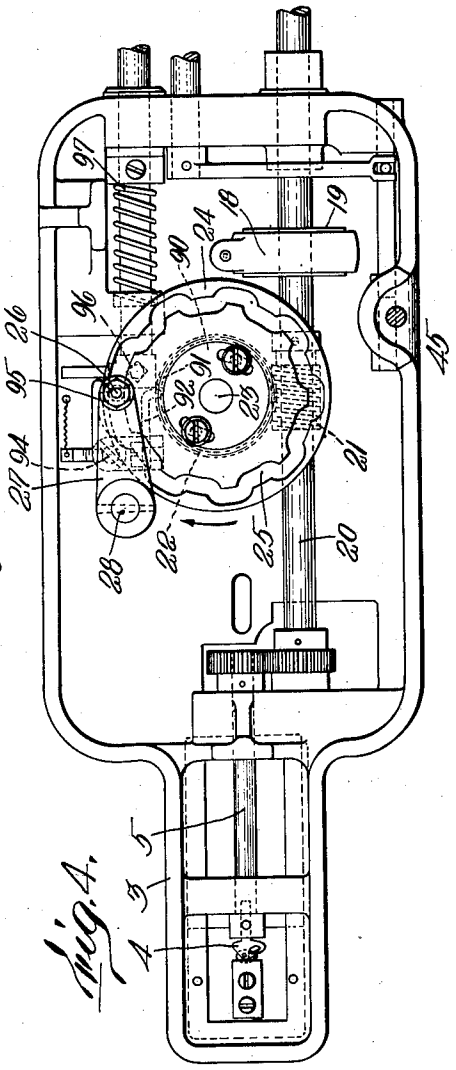


Fig. 4.

Inventor
Robert L. Lyons
by
Wright Brown Quinby & May
Attys.

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R. L. LYONS

BUTTON SEWING MACHINE

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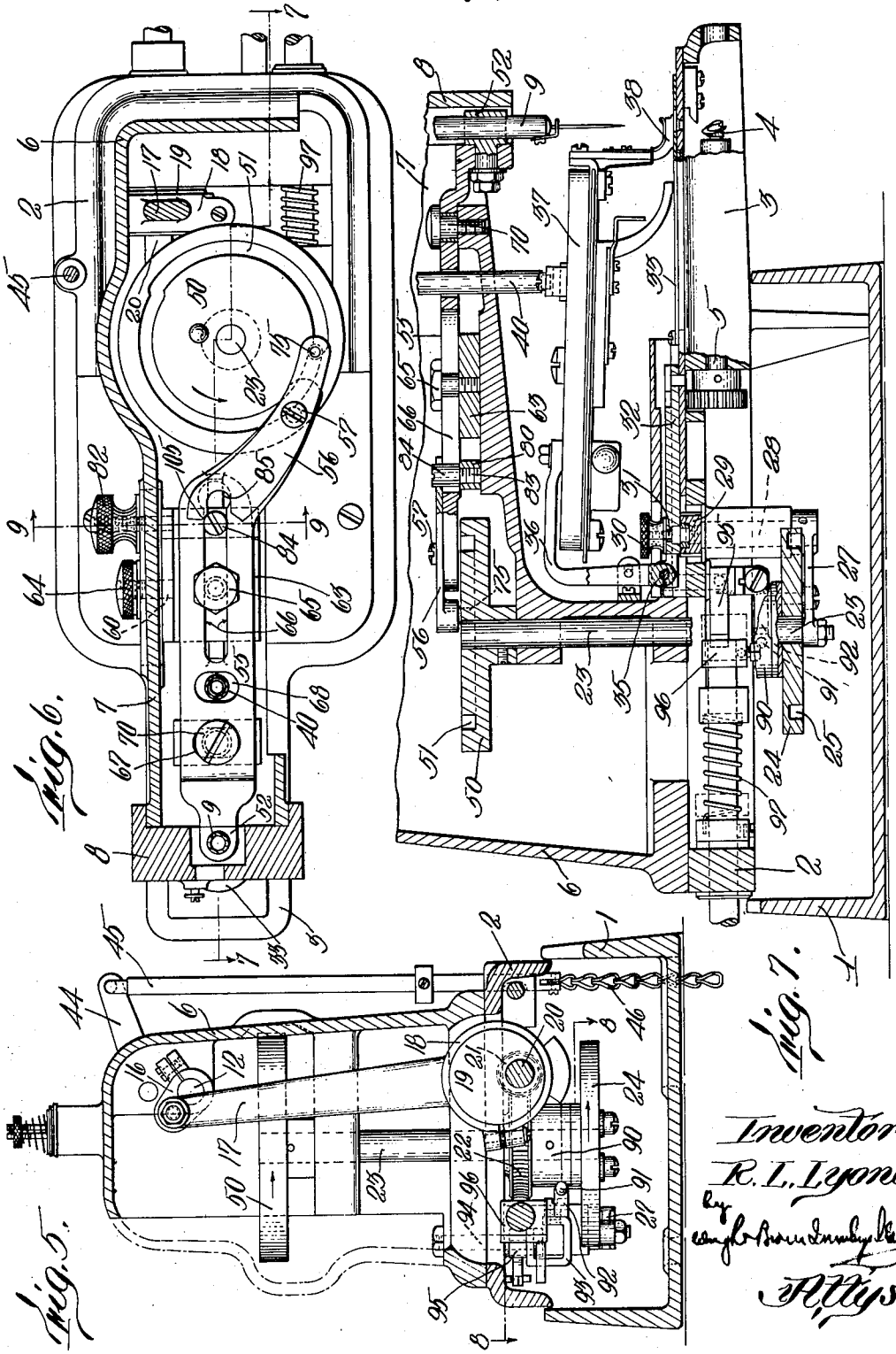


Fig. 6.

Fig. 7.

Fig. 5.

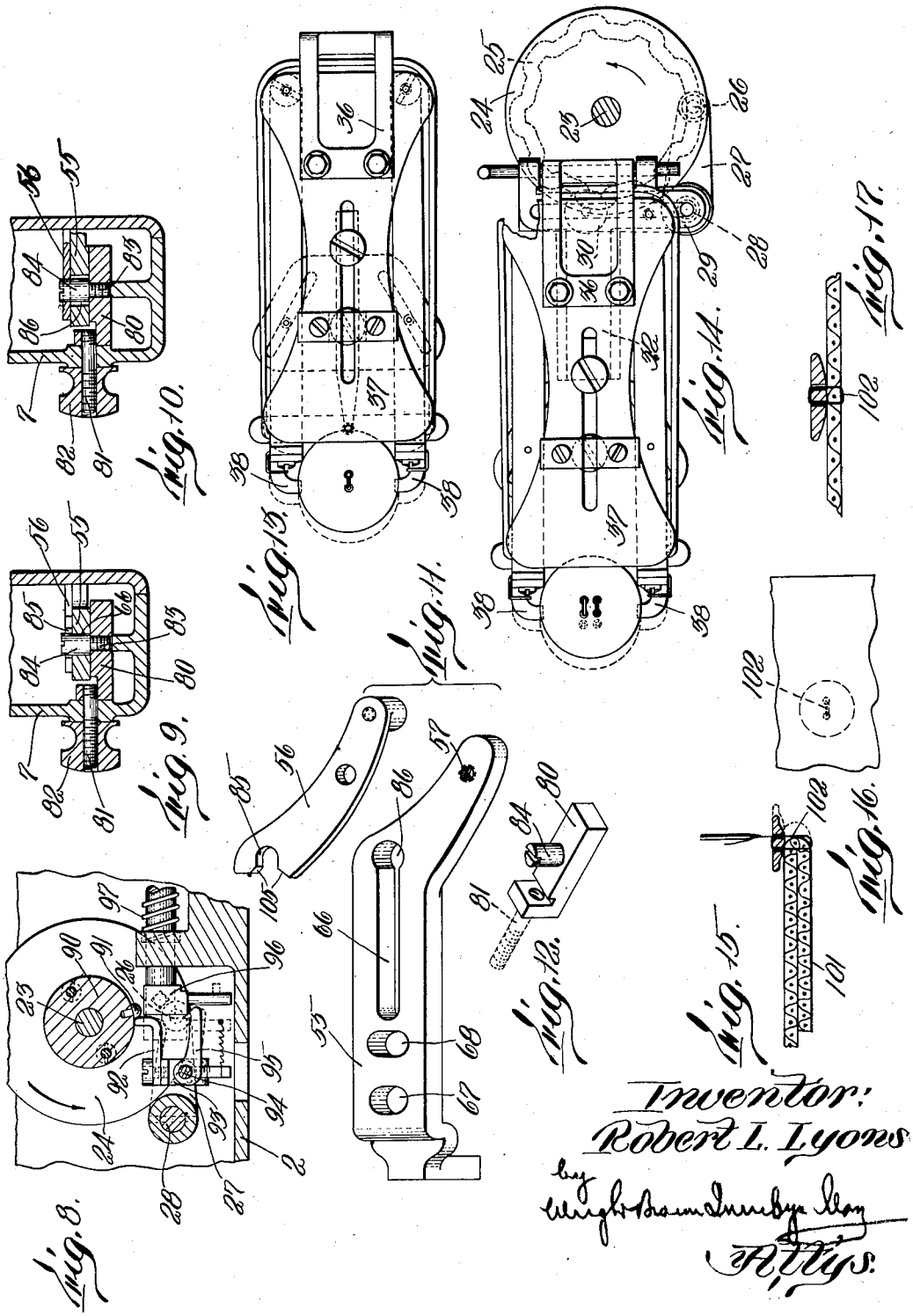
Inventor
R. L. Lyons
By
Attys.

May 29, 1928. 1,671,197

R. L. LYONS

BUTTON SEWING MACHINE

Filed July 6, 1925 4 Sheets-Sheet 4



Patented May 29, 1928. 1,671,197

UNITED STATES PATENT OFFICE.

ROBERT L. LYONS, OF WALTHAM, MASSACHUSETTS, ASSIGNOR TO FREDERICK OSANN COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

BUTTON-SEWING MACHINE.

Application filed July 6, 1925. Serial No. 41,624.

This invention relates to button sewing machines in which the lines of stitching between different holes in the button are arranged from front to back of the machine so that they extend substantially at right angles to the edge of the goods. It relates more particularly to machines of that type in which the needle is caused to vibrate laterally to move from one pair of holes to the other when four hole buttons are being sewed.

The primary object of the present invention is to provide a construction wherein the machine may be readily adjusted to sew either two hole or four hole buttons at will, the adjustment for two hole buttons causing the needle to be moved to and retained in a central position laterally of the machine in position to pass through the holes in the button. The button and the work in either adjusted condition are vibrated back and forth to bring the needle holes of each pair successively into position in alinement with the needle.

For a more complete understanding of this invention, together with further objects and advantageous details and combinations of parts, reference may be had to the accompanying drawings in which—

Figure 1 is a side elevation of the machine partly broken away.

Figure 2 is a front elevation of the needle bar housing portion.

Figure 3 is a horizontal section on line 3—3 of Figure 1 showing the parts adjusted to sew four hole buttons.

Figure 4 is an inverted plan of the machine.

Figure 5 is a vertical section on line 5—5 of Figure 1.

Figure 6 is a view similar to Figure 3, but showing the parts adjusted to sew two hole buttons.

Figure 7 is a fragmentary vertical section on line 7—7 of Figure 6.

Figure 8 is a sectional detail on line 8—8 of Figure 5.

Figures 9 and 10 are detail sections on lines 9—9 and 10—10 of Figures 6 and 3, respectively.

Figure 11 is a disassembled perspective of a lever mechanism.

Figure 12 is a detail perspective of an adjustable fulcrum block.

Figure 13 is a plan of the button clamp holding a two hole button.

Figure 14 is a similar view illustrating a four hole button and showing also the cam for moving the button clamp.

Figure 15 is a detail section illustrating the manner of blind stitching a button with the machine.

Figure 16 is an inverted plan of a portion of the goods, the position of a two hole button and its blind attaching stitches being shown dotted.

Figure 17 is a detail section showing the relative position of the work and button for sewing through the work.

As shown the machine comprises a pedestal portion 1 on which is carried a base frame member 2. One end of this base frame member is extended beyond the pedestal as shown at 3 and houses certain of the sewing instrumentalities, such as the looper 4 and its driving shaft 5. Extending upwardly from the other end of the portion 2 is a hollow post 6 having a forwardly extending frame arm 7 carrying at its forward end a housing 8 for the needle bar 9. This needle bar is capable of lateral motion to bring the needle from a position to sew through one pair of holes in the button laterally into a position to sew through the other pair of holes where a four hole button is to be sewed. For this purpose it is shown as extending through a sleeve 10 which is pivoted on a fulcrum 11 adjacent to the upper end of the housing 8.

The needle bar is given its longitudinal motion through the sleeve 10 to effect its sewing and retractive strokes through any suitable mechanism. As shown, this mechanism comprises a rock shaft 12 having an arm 13 fixed at its forward end, the outer end of this arm being connected through a link 14 pivoted thereto to a collar 15 fixed to the needle bar. This rock shaft 12 is rocked by any suitable means such as a rocker arm 16 fixed thereto to which is pivoted the upper end of a connecting rod 17 having its lower end formed as an eccentric strap 18 surrounding an eccentric 19 fixed to the drive shaft 20. This drive shaft 20 is

provided with a worm 21 meshing with a worm wheel 22 fixed to a vertical shaft 23. This shaft 23 carries a cam 24 at its lower end which acts to move the button and the work from front to back in the machine to cause stitches to pass alternately through each of a pair of holes in the button. As shown the cam 24 has a cam path 25 within which rides a follower 26 fixed to an arm 27. This arm 27 extends to a vertical rock shaft 28 at the upper end of which is positioned a slotted link 29. A thumb screw 30 threaded on a bolt 21 riding in the slot in the link 29 may be adjusted in this slot in accordance with the extent of motion desired and transmits motion therefrom through a slide 32 to a cloth plate 33 on which the work to be sewn is supported. To the rear end of the slide 32 is pivoted at 35 an angle shaped arm 36 the forward end of which is fixed to the upper face of a button clamp 37. This button clamp has jaws 38 at its forward end, as shown best in Figure 14, between which a button may be clamped and as this button clamp is fixed to the slide 32 it moves with the work in its backward and forward motions as the machine operates, the cam path 25 being so cut that alternate downward and upward strokes of the needle pass through the forwardly and backwardly arranged holes in the button. The button clamp is normally held downwardly to hold the button against the work and the work against the cloth plate by any suitable means, as herein shown a spring pressed plunger 40 resting on the upper face of the button clamp being used for this purpose. The button clamp may be raised as for the purpose of introducing or removing work from therebeneath, for this purpose a chain 41 being shown. The lower end of this chain is fixed to the button clamp and its upper end to a rocker arm 43 which may carry an arm 44 to which the upper end of a rod 45 is pivoted, the lower end of this rod extending through a connection such as the chain 46 to a treadle (not shown) by depression of which the arm 44 may be rocked, rocking the arm 43 and raising the button clamp about its pivotal connection with the slide.

When four hole buttons are being sewed it is of course necessary to cause the needle to pass through one pair of holes and then to pass through the other pair of holes to lay a substantially equal number of stitches in each, before the machine stops, while when the machine is designed to sew two hole buttons there should be no lateral motion of the needle relative to the work, but it should be centered with reference thereto since the two holes in a two hole button are arranged along a diameter. Mechanism is provided by which the movement of the needle laterally may be effected where it is desired to sew four hole buttons, and where this movement may be eliminated and the needle bar held in a central position in its lateral path of motion in position to pass through the pair of holes in a two hole button. At the upper end of the vertical shaft 23 is positioned a cam 50 having a cam path 51 cut therein. The needle bar has a sleeve 52 through which it is slidable and this sleeve is fixed to the forward end of a two-part lever mechanism comprising a lever 55 and an arm 56 pivoted at 57 adjacent to the opposite end of the lever 55 from its attachment to the needle bar. This lever 55 is suitably fulcrumed and is arranged to be rocked to impart motion to the needle bar when motion is desired for sewing four hole buttons and to hold the needle bar in its central position when two hole buttons are to be sewed.

As the space between the holes of the buttons varies with the changes in button sizes, provision is made for adjusting the position of the fulcrum of the lever 55 in order to adjust its extent of throw at the end where it is attached to the needle bar. For this purpose the frame arm 7 is provided with a slot through which extends a bolt 60 from a slide 63 positioned within the frame portion 7, the bolt 60 having threaded on its outer extremity a thumb nut 64. Extending upwardly from this block 63 is a fulcrum bolt 65 which passes through a slot 66 longitudinally arranged in the lever 55. In the forward portion of the lever 55 is a pair of slots 67 and 68. Through the slot 67 is extended the shank of a screw 70, the head of which extends over the upper face of the lever 55 and prevents it from being detached while permitting the lever to slide therebeneath. The slot 68 forms an opening through which the spring pressed plunger 40 extends, the slot being of sufficient length to permit the desired extent of movement of the lever 55 about its fulcrum 65. The arm 56 before referred to carries at its outer end a cam follower 75 which rides in the cam groove 51 of the cam 50. If now the opposite end of this arm 56 is free, the rotation of the cam 50 serves merely to oscillate the arm about its pivotal connection with the lever, the lever itself being unaffected thereby. This is the condition desired when two hole buttons are being sewed, the needle bar then having no lateral motion. By causing the oscillation of the arm 56 to take place about a fulcrum adjacent to its forward end, the pivot 57 is caused to oscillate also, this rocking the lever 55 which carries this pivot, about its own fulcrum 65. In order to accomplish this a slide 80 is provided, this slide being mounted to move lengthwise of the frame portion 7 and having a stud 81 projecting through the slot in the frame portion 7 and taking on its outer end a thumb nut 82. The slide 80 has a screw 83 threaded

therein, as shown best in Figures 9 and 10, this screw having a head 84 formed as a pin which extends through the slot 66 of lever 55 and at suitable times may be engaged in a notch 85 at the forward end of the arm 56, this notch being of maximum width substantially equal to the main portion of the slot 66 to permit the pin portion 84 to enter therein and when so positioned to hold the forward end of the arm 56 against vibration about its fulcrum 57 and to act as a fulcrum about which the arm may be rocked. The pin 84 is of a diameter substantially equal to the slot 66 forwardly of its rear end at 86 which is of enlarged diameter. When the pin 84 rests in the notch 85, it also passes through the portion 86 of the slot 66 which registers with the notch, this portion 86 being of sufficiently larger size to permit the lever 55 to be swung about its fulcrum 65 when the notched end 85 of the arm 56 is held against bodily motion. It will be seen, therefore, that the block 80 may be adjusted so that the pin 84 engages in the notch 85 and holds the forward end of the arm 56 against vibration, or it may be moved forwardly out of engagement with the notch 85 and into the narrow forward portion of the notch 66. This forward portion 66 is so related to the enlarged portion 86 that when the pin 84 is positioned therein, the lever 55 is brought to its central position relative to its path of vibration and is locked in such central position. When the mechanism is so adjusted it is in condition to sew two hole buttons, lateral rocking motion of the needle bar being prevented and the bar being brought into its central position so that the needle will pass through the two holes of the button arranged diametrically thereof. The button and the work-holder are vibrated together lengthwise of the machine to cause successive strokes of the needle to pass through each of the pair of holes in the button, the cam 24 being shown as effective for this purpose on both the button clamp and the work.

It will be seen that the adjustment from four hole buttons to two hole buttons is effected by merely loosening the thumb nut 82 and moving the slide 80, whereupon the nut is again tightened to fix the slide in adjusted position and that when the adjustment is made to fix two hole buttons in position, the lever controlling the lateral position of the needle bar is moved to its central position so that the needle will extend along the diametrical line of the button as it is illustrated in Figure 13, and that when the machine is adjusted to sew four hole buttons, the lever controlling the lateral position of the needle bar is guided laterally by the forward inclined edges 105 of the arm 56 so that the needle bar is swung away from its central position in a direction to insure the placing of the stitches through one pair of holes of the four hole button, the action of the cam 50 thereafter moving the needle bar to position the stitches through the other pair of holes.

In Figure 13 is shown the button clamp holding a two hole button, the forward position of the button clamp being shown in dotted lines.

In Figure 14 a similar view showing a four hole button is presented, it being seen that each pair of holes is positioned laterally of the longitudinal diametrical center line of the button.

The cam groove 51 in the cam 50 may be cut as shown best in Figure 3 so that when one-half of the stitches has been positioned through one pair of holes of a four hole button, the needle bar is moved laterally to cause its succeeding strokes to pass the stitches through the other pair of holes on the opposite side diametrically of the center line of the button.

Above the cam 24 and fixed to the shaft 23 is a collar 90 having a projection 91 thereon positioned angularly relative thereto at such a point that when the cam 24 has completed one revolution, this projection contacts with a finger 92 carried by a rocking mechanism 93, pivoted on a vertical axis 94 which acts to rock a catch 95 out from behind a latch block 96, releasing the latch block and permitting a spring 97 to move a stop mechanism, shown somewhat diagrammatically at 98, to shift a driving belt (not shown) from a fixed pulley 99 to a loose pulley 100 and to effect the stopping of the machine. Details of this stop motion are not herein shown as it may be of any suitable type, the stop motion indicated being that shown in the United States Letters Patent No. 1,544,025 dated June 30, 1925, of Harold W. Morris.

One of the classes of work to which a machine of this type is particularly applicable is shown in Figures 15 and 16. Where the work and the button are moved from front to rear of the machine to pass the stitches through the two holes of a pair in the button, the edge of the work may be doubled under as shown at 101 in Figure 15 along the line at which the buttons are to be attached. The button may then be sewed thereto by the stitches 102 which fix the button in position without passing through the thickness of the goods so that when the work is unfolded, as shown in Figure 16, the button stitches are not visible on its back face. Of course where the visibility of the stitches on the back face of the goods is of no consequence, the work may be put in unfolded, as shown in Figure 17, in which case the stitches will pass entirely through as shown in Figure 16 and show on the reverse side thereof.

Having thus described an embodiment of this invention it will be evident to those skilled in the art that various changes and modifications may be made therein without departing from its spirit or scope as defined by the appended claims.

I claim:

1. In a button sewing machine, sewing instrumentalities including a needle bar, means for holding a button and work in assembled relation and in operative relation to said instrumentalities, means for vibrating said holding means and needle bar relatively to cause stitches to be passed successively through both holes of a pair in a button carried by said holding means, means including a two-part lever mechanism for moving said holding means and needle bar relatively to cause stitches to be passed through both pairs of holes of a four hole button, means for rocking one of said parts, and means adjustable at will to operatively connect the parts of said lever mechanism to cause said moving means to be effective or to operatively disconnect said moving parts whereby said moving means is rendered inoperative, said adjustable means when in disconnecting position acting to hold one of said disconnected lever parts in fixed position.

2. In a button sewing machine, sewing instrumentalities including a needle bar, means for holding a button and work in assembled relation and in operative relation to said instrumentalities, means for vibrating said holding means and needle bar relatively to cause stitches to be passed successively through both holes of a pair in a button carried by said holding means, means including a two-part lever mechanism for moving said holding means and needle bar relatively to cause stitches to be passed through both pairs of holes of a four hole button, means for rocking one of said parts, and means adjustable at will to operatively connect the parts of said lever mechanism to cause said moving means to be effective or to operatively disconnect said moving parts whereby said moving means is rendered inoperative, said adjustable means acting when in disconnecting position to center one of said disconnected lever parts.

3. In a button sewing machine, sewing instrumentalities including a needle bar member, means including a member for holding a button and work in assembled relation and in operative relation to said instrumentalities, means for vibrating said members relatively to cause stitches to be passed successively through both holes of a pair in a button carried by said holding means, and means for moving said members relatively laterally of their relative direction of vibration to cause stitches to be passed through both pairs of holes in a four hole button, said moving means comprising a lever operatively connected to one of said members, an arm pivoted to said lever, means for rocking said arm, and a device movable from and to a position to cause rocking of said arm to rock said lever, said device acting to lock said lever against rocking when out of such position.

4. In a button sewing machine, sewing instrumentalities including a needle bar member, means including a member for holding a button and work in assembled relation and in operative relation to said instrumentalities, means for vibrating said members relatively to cause stitches to be passed successively through both holes of a pair in a button carried by said holding means, and means for moving said members relatively laterally of their relative direction of vibration to cause stitches to be passed through both pairs of holes in a four hole button, said moving means comprising a lever operatively connected to one of said members, an arm pivoted to said lever, means for rocking said arm, and a device movable from and to a position to cause rocking of said arm to rock said lever, said device when out of such position acting to hold said lever stationary.

5. In a button sewing machine, sewing instrumentalities including a needle bar member, means including a member for holding a button and work in assembled relation and in operative relation to said instrumentalities, means for vibrating said members relatively to cause stitches to be passed successively through both holes of a pair in a button carried by said holding means, and means for moving said members relatively laterally of their relative direction of vibration to cause stitches to be passed through both pairs of holes in a four hole button, said moving means comprising a lever operatively connected to one of said members, an arm pivoted to said lever, means for rocking said arm, a device movable from and to a position to cause rocking of said arm to rock said lever, and means for adjusting the fulcrum of said lever to determine the amplitude of motion of the member connected thereto.

6. In a sewing machine, sewing instrumentalities including a needle bar mounted with capability of lateral movement, a lever operatively connected to said bar to effect such lateral movement when said lever is rocked, an arm pivoted to said lever, a cam for rocking said arm, and an element movable between two positions in one of which the rocking of said arm acts to cause rocking movement of said lever, and in the other of which the rocking of said arm is ineffective to move said lever.

7. In a sewing machine, sewing instrumentalities including a needle bar mounted with capability of lateral movement, a lever

operatively connected to said bar to effect such lateral movement when said lever is rocked, an arm pivoted to said lever, a cam for rocking said arm, and an element movable between two positions in one of which the rocking of said arm acts to cause rocking movement of said lever, and in the other of which the rocking of said arm is ineffective to move said lever and said element acts to hold said lever stationary.

8. In a sewing machine, a frame, a needle bar carried at one end of said frame, a cam adjacent to the opposite end of said frame, a lever fulcrumed at an intermediate point to said frame and having one end operatively connected to said needle bar, an arm pivoted to said lever and having a follower for said cam at one end and a notch at its opposite end, and a pin slidable on said lever into and out of position in said notch.

9. In a sewing machine, a frame, a needle bar carried at one end of said frame and movable laterally, a cam adjacent to the opposite end of said frame, a lever fulcrumed at an intermediate point within said frame and connected to said needle bar to impart by rocking movement about its fulcrum lateral movement to said needle bar, an arm pivoted to said lever and having a follower for said cam, and means accessible from without said frame operable at will to cause rocking of said arm to rock said lever or to permit said arm to vibrate about its pivotal connection to said lever freely whereby said cam is ineffective to move said lever.

10. In a sewing machine, a frame, a needle bar carried at one end of said frame and movable laterally, a cam adjacent to the opposite end of said frame, a lever fulcrumed at an intermediate point within said frame and connected to said needle bar to impart by rocking movement about its fulcrum lateral movement to said needle bar, an arm pivoted to said lever and having a follower for said cam, and means accessible from without said frame operable at will to cause rocking of said arm to rock said lever or to permit said arm to vibrate about its pivotal connection to said lever freely whereby said cam is ineffective to move said lever, and to hold said lever against movement.

11. In a sewing machine, a frame, a needle bar carried by said frame and movable laterally, a cam, a lever fulcrumed in said frame at an intermediate point, one end of said lever being connected to said needle bar to impart by rocking movement about its fulcrum lateral movement to said needle bar, an arm pivoted to said lever adjacent to its opposite end and having a cam follower at one end engageable with said cam, the opposite end of said arm having a notch therein, said lever having a slot therein longitudinally thereof and having a widened portion registering with said notch, a slide carried by said frame, a pin carried by said slide and extending through said slot and of substantially the diameter of the narrow part thereof, said pin being movable on movement of said slide between a position in the narrower part of said slot where it holds said lever against rocking about its fulcrum, and a position in the wider part of said slot permitting rocking of said lever and in said notch to provide a fixed fulcrum at the end of said arm, whereby rocking of said arm by said cam moves its fulcrum on said lever bodily thereby rocking said lever.

12. In a sewing machine, a frame, a needle bar carried by said frame and movable laterally, a cam, a lever having a slot longitudinally thereof and connected at one end to said needle bar, a block slidably carried by said frame and having a pin riding in said slot to form a fulcrum for said lever adjustable lengthwise thereof, an arm pivoted to the opposite end of said lever, a cam follower at one end of said arm in operative engagement with said cam, the opposite end of said arm having a notch of the width of the main portion of said slot, said slot having a widened portion adjacent to said notch, a second slide carried by said frame, and an element carried by said second slide and movable on the sliding thereof between a position riding in the main portion of said slot and out of engagement with said arm, thus preventing rocking of said lever, and a position in the widened portion of said slot and in said notch to form a fixed fulcrum for said arm whereby rocking of said arm causes rocking of said lever.

In testimony whereof I have affixed my signature.

ROBERT L. LYONS.