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PATENTED JUNE 6, 1905.

W. J. SMITH.

BUTTON ADJUSTING MECHANISM FOR SEWING MACHINES.

APPLICATION FILED JAN. 11, 1905.

3 SHEETS—SHEET 1.

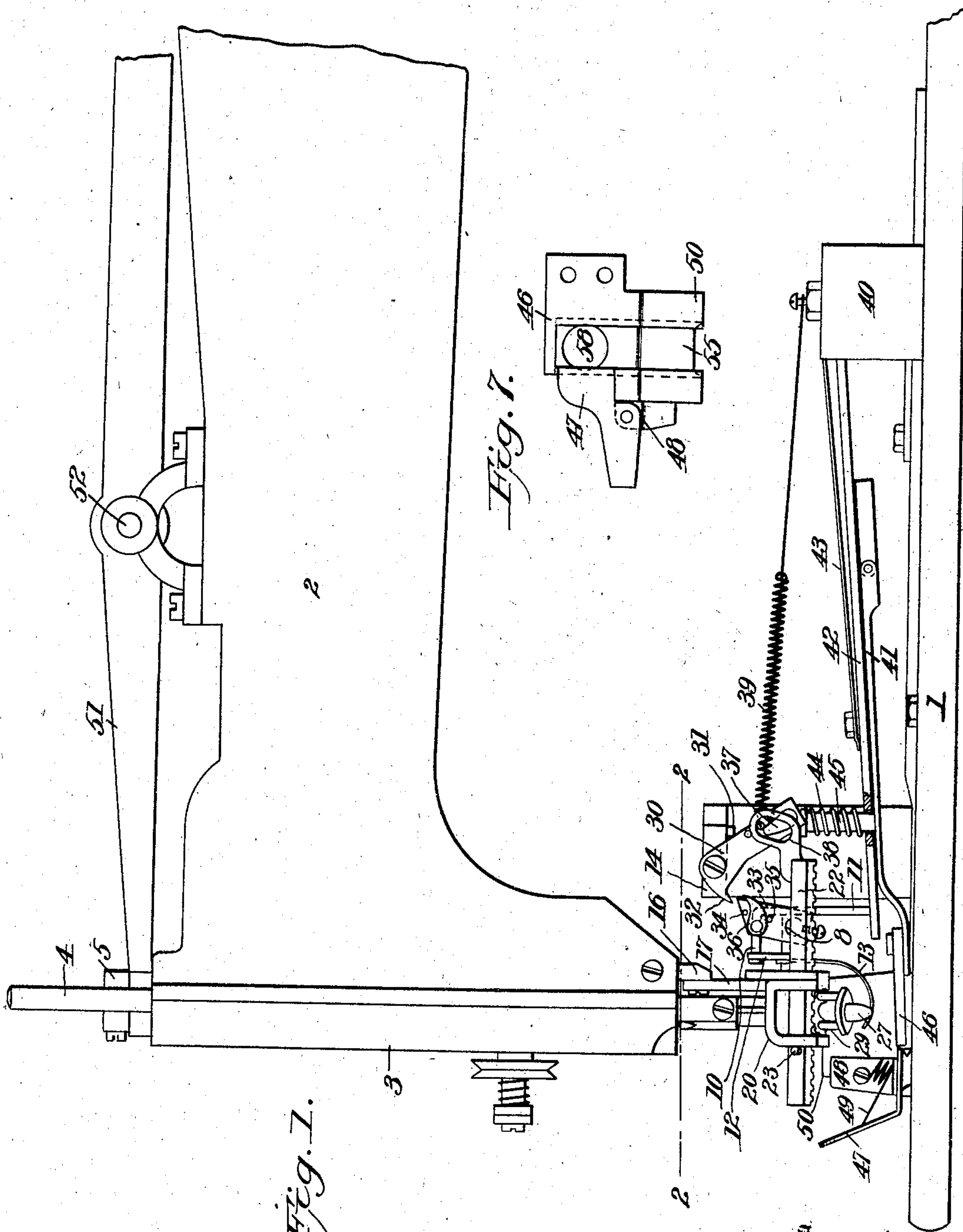


Fig. 1.

Fig. 7.

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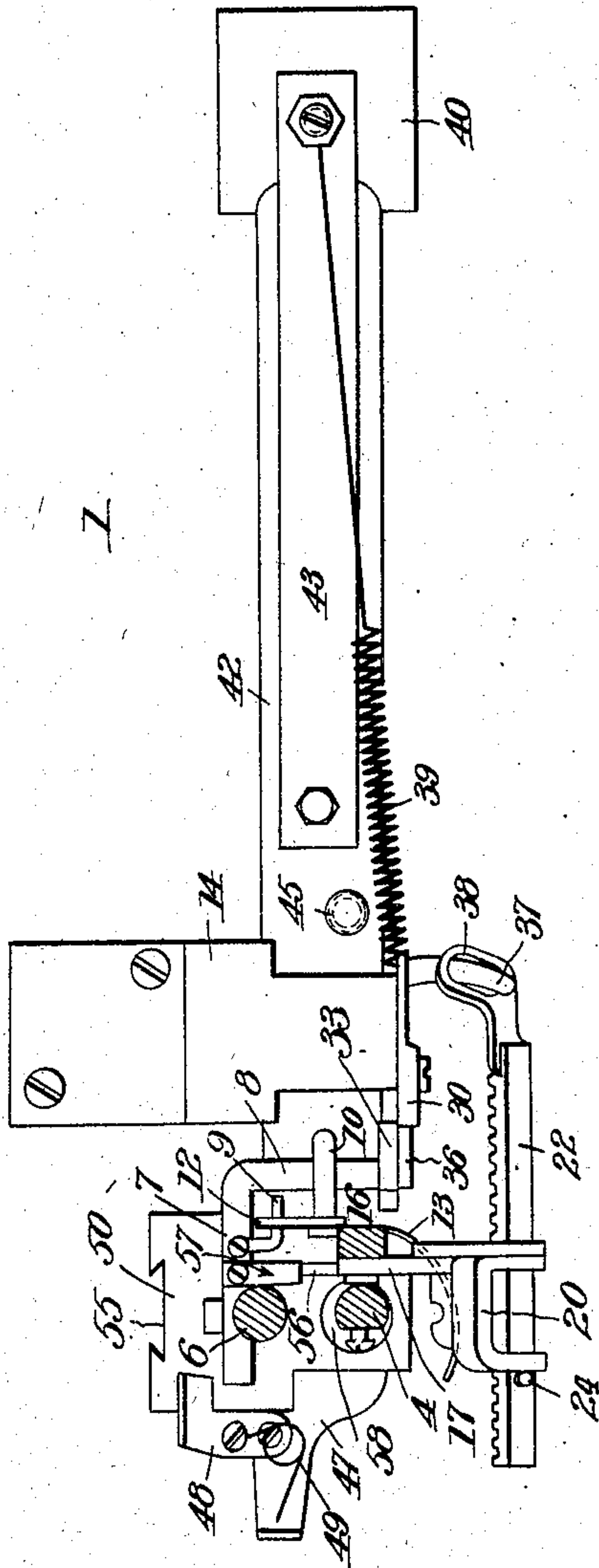
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3 SHEETS—SHEET 2.

Fig. 2.



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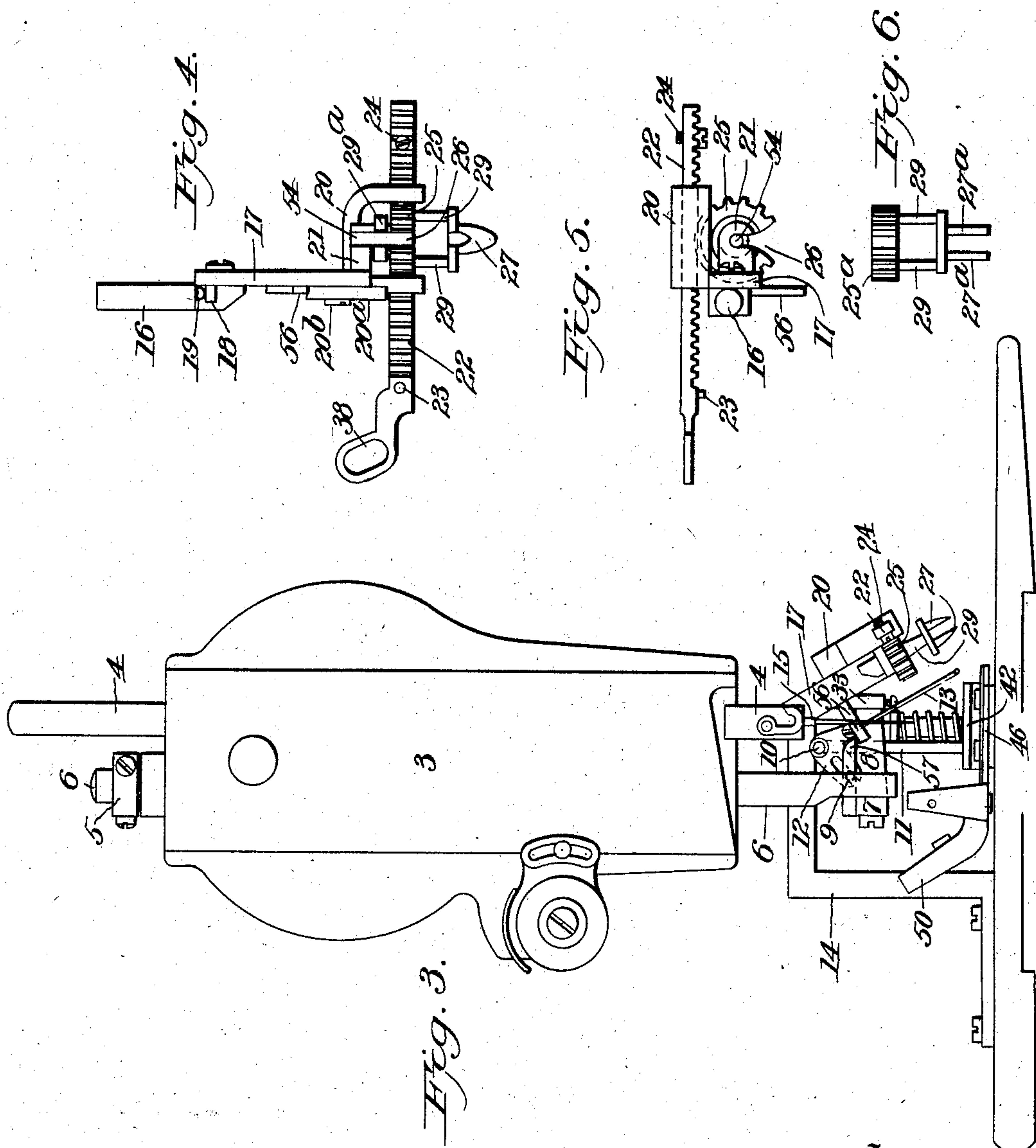
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# BUTTON ADJUSTING MECHANISM FOR SEWING MACHINES.

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3 SHEETS—SHEET 3.



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# UNITED STATES PATENT OFFICE.

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## BUTTON-ADJUSTING MECHANISM FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 791,831, dated June 6, 1905.

Application filed January 11, 1905. Serial No. 240,581.

*To all whom it may concern:*

Be it known that I, WILLIAM JAMES SMITH, a citizen of the United States, and a resident of Nashville, county of Davidson, State of Tennessee, have invented certain new and useful Improvements in Button-Adjusting Mechanism, of which the following is a specification.

My invention relates to machines for sewing buttons on garments, such as trousers and the like, and more especially to an adjusting mechanism adapted to automatically place the button as it is fed to the button-clamp in proper position for the needle for the sewing operation.

Heretofore it has been a common practice in sewing buttons on trousers and other garments for the operator to place the button in proper position for the needle by hand, and, aside from the loss of time incident to this manipulation, frequent injury results from an accidental placing of the hand in the path of the needle in attempts to adjust the button quickly and starting the machine before withdrawing the hand from the path of the needle, and also needles are often broken because of failure to properly adjust the buttons.

The objects of my invention are, first, to provide means for automatically performing the adjusting operation, and, second, to provide a device of this character which shall be certain and efficient in operation and capable of attachment to existing machines.

With these objects in view my invention consists in the novel construction and details thereof, as hereinafter described, with reference to the accompanying drawings, and more particularly pointed out in the claims.

In the drawings, Figure 1 is a side elevation of parts of a common type of sewing-machine, illustrating the application of my invention thereto. Fig. 2 is a plan view of the parts below the line 2 2, Fig. 1. Fig. 3 is an end elevation. Fig. 4 is a side elevation in detail of the button-adjusting device. Fig. 5 is a top plan view thereof. Fig. 6 is a detail of a modified form of the button prong and pinion, and Fig. 7 is a bottom plan view of the button foot or clamp.

Referring to the drawings, in which the reference-numerals relate to the same or corresponding parts in all the views, the numeral 1 indicates a bed-plate upon which is mounted the sewing-machine arm 2, carrying the head 3, in which reciprocates the needle-bar 4, carrying a needle 15, and in which also reciprocates the clamp lifter-bar 6, provided with the usual adjustable retaining-collar 5 at its upper end. This clamp lifter-bar is raised and lowered in the usual manner by a lever 51, fulcrumed at 52 on the arm, which lever is operated by a chain or link connection with the treadle, as customary, said latter-mentioned parts not being shown herein, as they form no part of the invention.

Mounted upon the lifter-bar 6 is an arm 7, having an angular extension 8, adapted to engage in the upward movement an overlapping arm 10, extending from a vertical rod 11, carried by the upper member 42 of the work-clamp, which is pivotally supported upon a block or stud 40 on the bed-plate and normally pressed over by a spring 43. The lower member 41 of said clamp is hinged to said upper member, as shown, and extends forwardly, terminating near the work-plate, and is there attached to the button-clamp 46 by suitable screws, under which clamp the work is held and shifted from time to time as successive buttons are sewed thereon. The lower member of the work-clamp has a yielding connection with the upper member through the medium of a post 45, carried by said lower member and projecting upwardly through a perforation in the upper member and provided with a spring 44, confined between the head of said post and the upper member of the work-clamp. The button-foot 46 is provided with a slideway or raceway 55 for the buttons, which may be fed therein either by hand or by any suitable automatic button-feed mechanism having its chute or raceway connected therewith adapted to feed the buttons to the clamp one at a time. This raceway is in the form of an undercut groove, as shown, and has a perforation 58, over which the button is centered for the sewing operation, such perforation being located in the



proper position for the operation of the needle and of sufficient extent to permit the lateral movements of either the needle or the work-plate in order to permit the necessary shogging movement to provide for the laying of the thread over the bar of the button if a bar-button is being used or over the webs between the several eyes of a button if an eye-button is used. On the side of the button-foot 46 is a movable member or gate 47, fulcrumed on the bracket 48 and adapted to normally close an opening in the side of the raceway at that point, but capable of being swung aside as the work is shifted by engagement of the button with the edge of said movable member or gate. A spring 49, attached to the bracket 48 and bearing upon the movable member or gate 47, automatically closes the latter after the sewed-on button has been moved a sufficient distance in the shifting of the work to release the same.

The button-adjusting device proper consists, essentially, of button points or prongs 27, carried by a pinion 25, from which extend suitable posts 29, carrying a ring from which extend two or more points 27, adapted to enter the button on each side of the button bar or web. This pinion is rotatably mounted upon a pin or spindle carried by an arm 21, attached to a link 17, pivotally connected to a bar or rod 16, the latter of which is adapted to be removably secured in a socket in the head 3 to the rear of the needle-bar. (See Figs. 1 and 4.) A split collar 29<sup>a</sup> is interposed between the bracket 21 and the pinion to properly position said pinion. The pinion is adapted to be operated by a rack-bar 22, slidably mounted in arms on the bracket 20, the latter of which is attached to the link 17 by an arm 20<sup>a</sup>, secured to said link 17 by a suitable screw 20<sup>b</sup>. When the bar 16 is in position, the link 17 is capable of swinging laterally, as shown in Fig. 3, a stop 18 on said link 17 engaging with a stop 19 on the bar 16 to limit the downward swing of said link and its attached parts, so that said link may be arrested in a vertical position when released for positioning the adjuster over the button held in the button-clamp. The rack-bar 22 is provided with stops 23 and 24, adapted to contact with the corresponding arms of the bracket 20 and limit the movements of the said rack-bar in each direction, and the said bar is provided with an upwardly-projecting portion having therein a slot 38, into which enters a pin 37, carried by a swinging lever 30, mounted upon a bracket 14, fixed to the bed-plate of the machine, the said arm being normally held in the position shown in Fig. 1 by a spring 39, connecting the said arm with a fixed part of the machine, such as a lug or block 40. The pin 37 is inclined upwardly from the arm and is of sufficient length to permit the rack-bar to occupy its extreme positions and to swing to and from the vertical position with-

out disengaging said pin from the slot 38. Carried by the arm 7 is a finger-arm 57, adapted to overlap a finger-arm 56 on the swinging link 17, so that when the work-clamp is down and the presser-bar in its lowest position, as shown in Fig. 3, the said finger-arm 57 will hold the button-adjusting device out of the path of the needle, at which time the stop 24 is in engagement with the front arm of the bracket 20, the spring 39 holding the parts in the extreme rearward position, as shown in Fig. 1. Downward movement of the lifter-bar causes the finger 57 to engage the finger 56 and swing the adjuster out of the way of the needle when a button is being sewed on, and upward movement thereof disengages said fingers and permits the adjuster to drop into vertical position. A pin 9 is also carried by the arm 7, said pin entering a slot in a bell-crank lever 12, mounted upon the angular extension 10 of the rod 11, so that during the first upward movement of the lifter-bar when the operator presses down on the treadle the said pin 9 will swing the bell-crank lever 12, and thereby cause a wiper-wire 13, carried by the other arm of the said bell-crank lever, to move across the path of the needle, which at this time is elevated, and wiping the thread out of the way in advance of the movement of the button-adjuster, which immediately follows the said wiper, and assumes a vertical position over the button as the finger 57 rises with the lifter-bar and releases the finger 56 on the adjuster. It should be noted that the first part of the upward movement of the lifter-bar and clamp is sufficient to release the work, and thereby permit the same to be shifted by the operator, so that the sewed-on button is drawn from the button-clamp and another button fed into place over the work in the button-clamp before the adjuster is released by the further upward movement of the lifter-bar and clamp to permit said adjuster to drop into position for engagement with the newly-placed button to position the same. Mounted upon the angular extension 8 of the arm 7 is a bracket 33, on which is pivotally supported a pawl 36, the downward movement of which thereon is limited by a stop 35 and its upward movement by a stop 34, said pawl being adapted as the lifter-bar is raised to engage a lip 32 on the end of the lever 30 immediately after the release of the finger 56 by the finger 57, such release occurring when the lifter-bar has been moved to such height as to permit the button-adjusting device to swing into position over the button-hole in the button-foot. As the lifter-bar continues its upward movement the pawl 36, engaging with the end lips 32, swings the lever 30 on its fulcrum, thereby causing the pin 37 to move the rack-bar 22, such movement imparting a half-turn to the pinion carrying the button points or prongs, and simultaneously with this upward movement of the lifter-bar



the button-clamp is lifted through the medium of an arm 8 engaging the arm 10, such upward lifting of the button-clamp occurring as the pawl 36 is cooperating with the lip 32 to impart a partial rotation to the button points or prongs, with the latter of which the button is brought into contact as the button-clamp is lifted, the said prongs during such movements straddling the web or bar of the button. Immediately upon release of the pawl from engagement with the lip 32 as the lifter-bar continues to rise the spring 39 draws the bar 22 to the rear, thus imparting a half-revolution in the opposite direction to the pinion 25, carrying the button prongs or points. This half-revolution turns the button into the proper position for sewing, and for each successive button it will bring the web or eye into the same relation with respect to the needle. Downward movement of the lifter-bar leaves the clamp upon the work and likewise swings the adjuster out of the way, as hereinbefore indicated. The pinion 25 is provided with a slotted side 26, which, as the pinion is swung into position, prevents contact of the needle with the same. A slot 54 in the spindle or bearing of the pinion in alignment with the slotted side of the pinion when the latter is in its normal position as it is swung into place over the button prevents contact of the needle with the supporting structure or bearing for said spindle. This slot 54 is also in alignment at such time with the space or hole between the button-adjusting points or prongs, so that any movement of the needle at that time will not be interfered with. Should the button-adjusting points come in contact with the body of the button as the button-foot rises and not immediately enter the holes in the button, the lower member 41 of the clamp will be permitted to yield under the influence of the spring 44, and thus avoid damage or breakage of the parts, such lower member being brought to normal position by the spring 44 the moment the adjusting points or prongs 27 aline with and enter the buttonholes or openings.

Instead of the comparatively broad points 27, Figs. 1 to 4, I may use narrow points 27<sup>a</sup>, Fig. 6, where eye-buttons instead of bar-buttons are sewed on, such points being mounted on the pinion 25<sup>a</sup>, as in the previously-described construction. Both forms of button-adjuster pinions may be interchangeably used in the same mechanism, for the bar 22 may be readily removed from its supporting-bracket by removal of the stop 24 and withdrawing the arm, thus permitting the ready forcing of the pinion 25 from its spindle, or the bracket 20<sup>a</sup> can be removed from its link 17 by removal of the screw 20<sup>b</sup> and the pinion turned to the proper position for readily forcing the same from its supporting-spindle.

I claim as my invention—

1. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby to which the buttons are fed and under which the work is held, and a lifter-bar for raising said clamp to release the work for shifting, of a button-adjusting device actuated by the rising movement of the lifter-bar to engage a button held in the clamp and adapted to turn the button to a predetermined position, and connections between the lifter-bar and adjuster for moving the said adjuster out of the way of the sewing-machine when the work-clamp is lowered, substantially as described.

2. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby to which the buttons are fed, and a lifter-bar for raising said clamp to release the work for shifting, of a button-adjusting device normally held out of action by the lifter-bar during sewing, and adapted to move into position over a button held in its clamp as the lifter-bar rises, means for causing said adjusting device to engage the button and turn the same to a predetermined position, as the lifter is raised, substantially as described.

3. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby to which the buttons are fed, and a lifter-bar for raising the clamp to release the work for shifting, of a button-adjusting device consisting of a rotatable pinion provided with button-engaging points, a bracket in which said pinion is mounted having a swinging connection with the head of the machine, a rack engaging said pinion, and connections between said adjusting device and lifter-bar for swinging and holding the same out of action during sewing and adapted to release the said adjusting device to permit it to move into position over a button as the clamp is raised by the lifter-bar, and means for moving the rack to cause the pinion to engage and turn the button held by the clamp into a predetermined position for the needle as the clamp is lifted to its extreme upper position by the lifter-bar, substantially as described.

4. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby to which the buttons are fed, and a lifter-bar for raising the said clamp to release the work for shifting, of a bracket hinged to the head of the machine, a rack-bar slidably mounted thereon, a pinion provided with button-engaging points carried thereby and engaging said rack-bar, a finger on the lifter-bar adapted to hold the bracket and parts carried thereby out of the way of the needle during sewing and to release the same as the lifter-bar rises with the clamp, connection between the lifter-bar



and rack for moving the latter during the first part of the upward movement of the lifter-bar for causing the pinion to turn so that its points may engage a button-head in the clamp as the latter moves upward, and means actuated by the further upward movement of the lifter-bar for moving the rack-bar in the reverse direction, and thereby cause the pinion to turn the button to the proper position for the needle, substantially as described.

5. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby to which the buttons are fed, and a lifter-bar for raising the said clamp to release the work for shifting, of a bracket hinged to the head of the machine, a rack-bar slidably mounted thereon, a pinion provided with button-engaging points carried thereby and engaging said rack-bar, a finger on the lifter-bar adapted to hold the bracket and parts carried thereby out of the way of the needle during sewing and to release the same as the lifter-bar rises with the clamp, connection between the lifter-bar and rack for moving the latter during the first part of the upward movement of the lifter-bar for causing the pinion to turn so that its points may engage a button-head in the clamp as the latter moves upward, a spring connecting said rack-bar with a fixed part and tending to move it in the reverse direction, and means for releasing the connections between the rack-bar and lifter-bar on its further upward movement, whereby the spring moves said rack-bar so as to cause the pinion to turn and thereby adjust the button for sewing, substantially as described.

6. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby to which the buttons are fed, and a lifter-bar for raising the said clamp to release the work for shifting, of a bracket hinged to the head of the machine, a rack-bar slidably mounted thereon, a pinion provided with button-engaging points carried thereby and engaging said rack-bar, a finger on the lifter-bar adapted to hold the bracket and parts carried thereby out of the way of the needle during sewing and to release the same as the lifter-bar rises with the clamp, connection between the lifter-bar and rack for moving the latter during the first part of the upward movement of the lifter-bar for causing the pinion to turn so that its points may engage a button held in the clamp as the latter moves upward, a lever pivotally mounted on a fixed part and engaging the rack-bar, a spring connecting said lever with the fixed structure, and released by the further upward movement of the lifter-bar to permit reverse movement of the said rack-bar for adjusting the button, substantially as described.

7. In a machine for sewing on buttons, the combination with the sewing mechanism, the

work-clamp and button-clamp carried thereby to which the buttons are fed, and a lifter-bar for raising said clamp to release the work for shifting, of a button-adjusting device normally held out of action by said lifter-bar, and including a pinion having button-engaging points, and a rack-bar, a lever supported by the bed-plate of the machine having one arm engaging the rack-bar, a spring normally retracting said arm, a pawl carried by the lifter-bar adapted to engage the lever in the upward movement of the lifter-bar and to release the same as the lifter-bar approaches the extreme of its upward movement, substantially as described.

8. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby, and a lifter-bar, of a button-adjusting device normally held out of action by the lifter-bar, connections between the lifter-bar and the clamp for lifting the latter, and connections between said lifter-bar and adjusting device for operating the latter, whereby upward movement of the lifter raises the clamp and button held therein and releases the adjusting device to permit it to engage the button and adjust it for sewing, substantially as described.

9. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby, and a lifter-bar, of a button-adjusting device normally held out of action by the lifter-bar, connections between the lifter-bar and the clamp for lifting the latter, connections between said lifter-bar and adjusting device for operating the latter, and a thread-wiping device actuated by the lifter-bar to wipe the thread out of the way of the adjusting device as the latter moves into active position over the button, substantially as described.

10. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby, and the lifter-bar, of a post on the clamp, an arm on the lifter-bar adapted to engage said post to lift the clamp during the rising movement of the lifter-bar, a button-adjusting device normally held out of action by the lifter-bar, a spring-actuated lever-arm connected with the button-adjusting device, a pawl carried by the lifter-bar adapted to engage said lever as the bar rises to move the adjusting device in one direction to engage the button in its clamp and adapted to release said spring-actuated lever at the upper limit of the movement of the lifter-bar, whereby said lever-arm may actuate said adjusting device to position the button, substantially as described.

11. In a machine for sewing on buttons, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby, and the lifter-bar, of a post on the clamp, an arm on the lifter-bar adapted to engage said



post to lift the clamp during the rising movement of the lifter-bar, a button-adjusting device normally held out of action by the lifter-bar, a spring-actuated lever-arm connected  
 5 with the button-adjusting device, a pawl carried by the lifter-bar adapted to engage said lever as the bar rises to move the adjusting device in one direction to engage the button in its clamp and adapted to release said spring-  
 10 actuated lever at the upper limit of the movement of the lifter-bar, whereby said lever-arm may actuate said adjusting device to position the button, a thread-wiping arm pivotally supported on the clamp, and an arm on the lifter-  
 15 bar adapted to swing said wiping-arm in advance of the movement of the adjusting device over the button for engagement therewith, substantially as described.

12. In a button-sewing machine, the combination with the sewing mechanism, the work-clamp and button-clamp carried thereby, a lifter-bar, a bracket pivoted to the head of the machine having a finger engaging the lifter-bar to normally hold the bracket out of the  
 25 path of the needle when the lifter-bar is down, a pinion having button-engaging points mounted in the bracket, a rack on said bracket engaging said pinion, a pivoted arm having a finger engaging said rack, a spring normally  
 30 tending to retract said rack, a pawl carried by the lifter-bar adapted to engage said arm as the lifter-bar rises and thereby rock the same on its pivot and move the rack against the

tension of the spring and to release said arm when the lifter reaches its upper limit of movement, and thereby permit the spring to actuate the rack and turn the pinion, substantially as described. 35

13. In a machine for sewing on buttons, the combination with the sewing mechanism, of a  
 40 clamp comprising two members held together by a yielding connection, a button-clamp carried by the lower member of said clamp, means for raising said clamp, and a button-adjusting device adapted to engage and adjust a button  
 45 held therein as the clamp is raised and means for operating said adjusting device, substantially as described.

14. In a machine for sewing on buttons, the combination with the sewing mechanism of a  
 50 clamp comprising an upper and a lower member, a spring connection between the two for normally holding them in contact, a button-clamp carried by the lower member, means  
 55 for raising said clamp, and a button-adjusting device adapted to engage and adjust a button held therein as the clamp is raised and means for operating said adjusting device, substantially as described.

In testimony whereof I have signed my name  
 60 to this specification in the presence of two subscribing witnesses.

WILLIAM JAMES SMITH.

Witnesses:

JNO. RUHM, Jr.,  
 JOHN RUHM.