

No. 766,833.

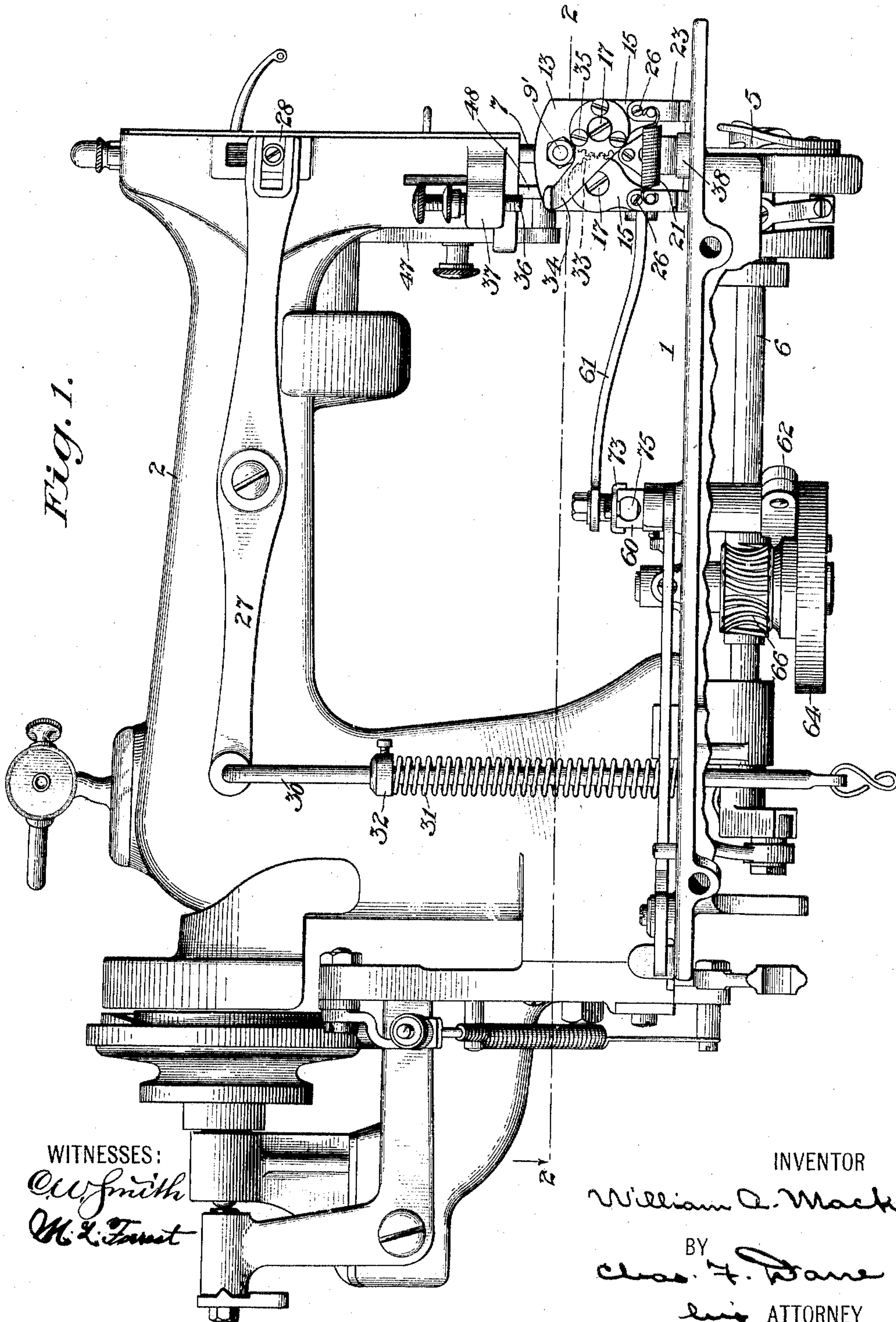
PATENTED AUG. 9, 1904.

W. A. MACK.
MACHINE FOR SEWING ON BUTTONS.

APPLICATION FILED DEC. 23, 1899.

NO MODEL.

4 SHEETS—SHEET 1.



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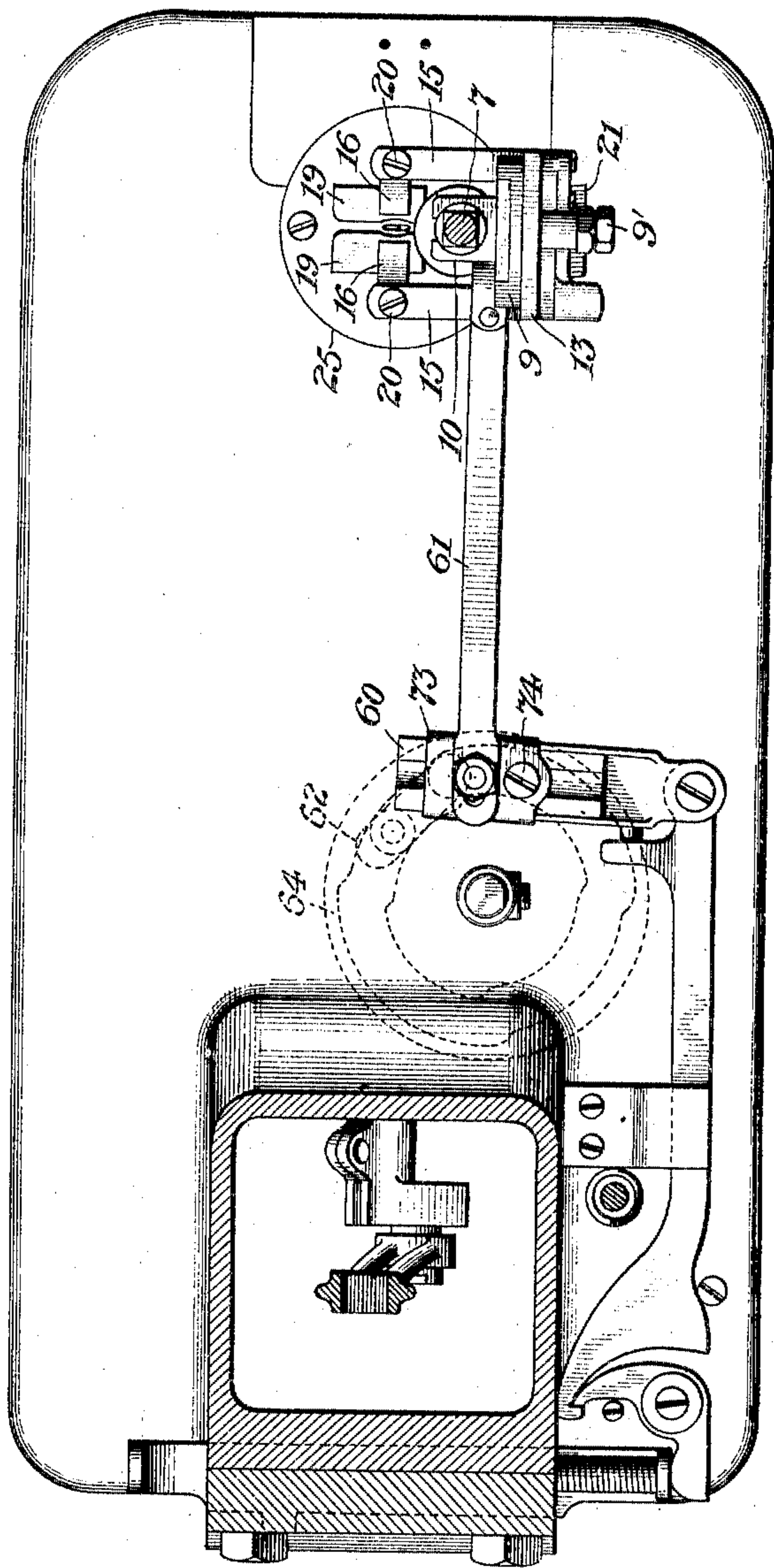
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4 SHEETS—SHEET 2.

Fig. 2.



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4 SHEETS—SHEET 3.

Fig. 4.

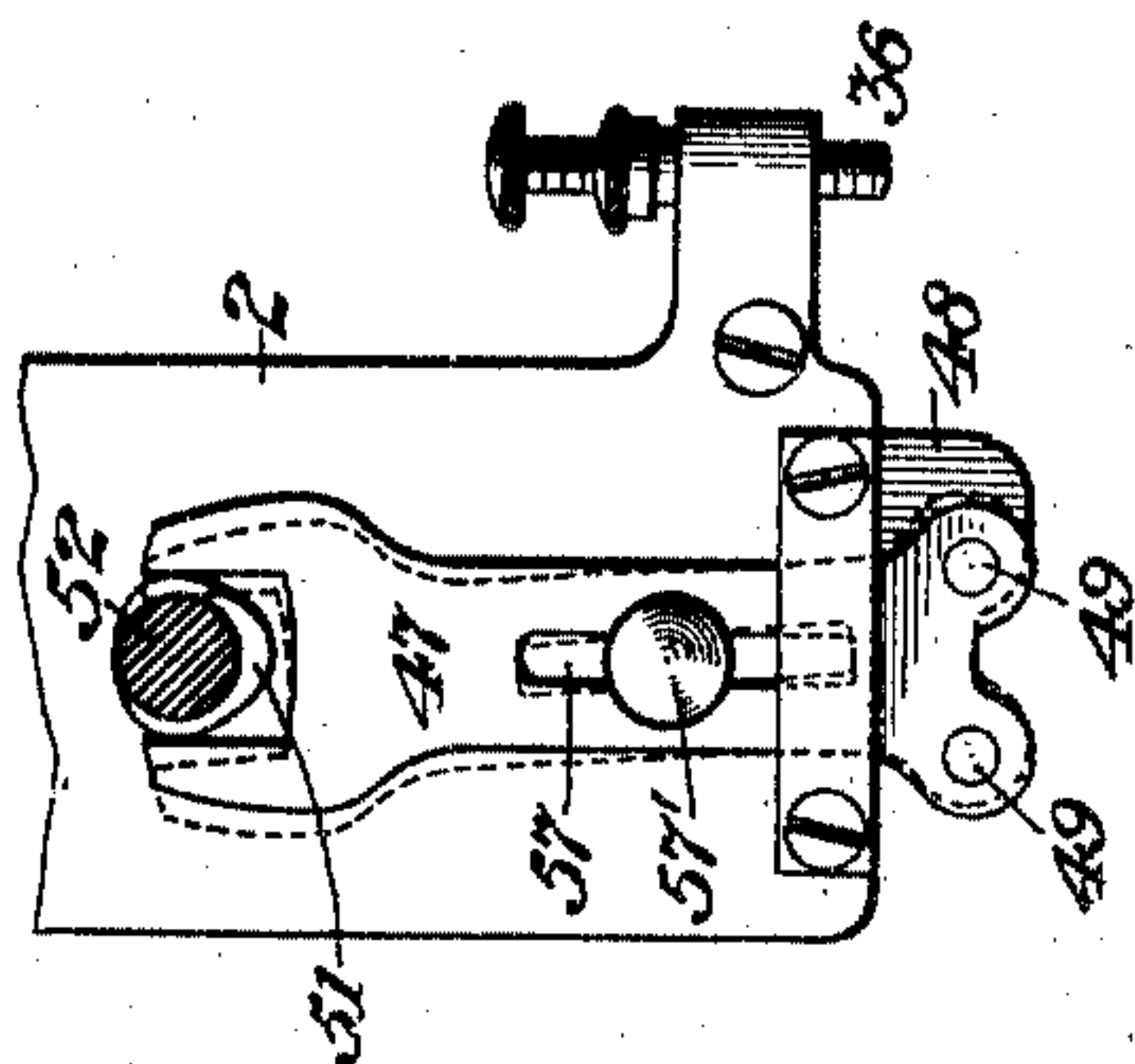


Fig. 3.

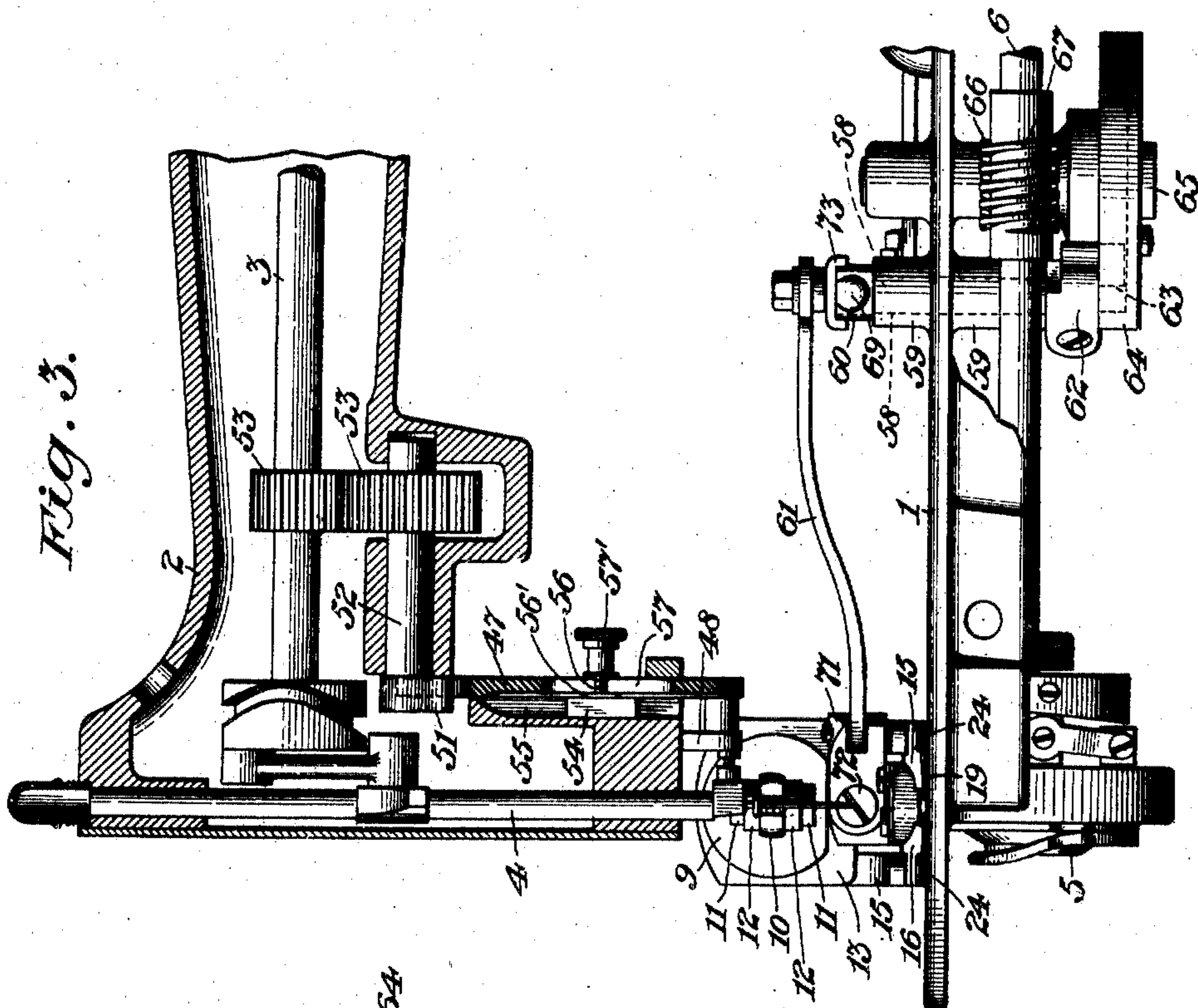
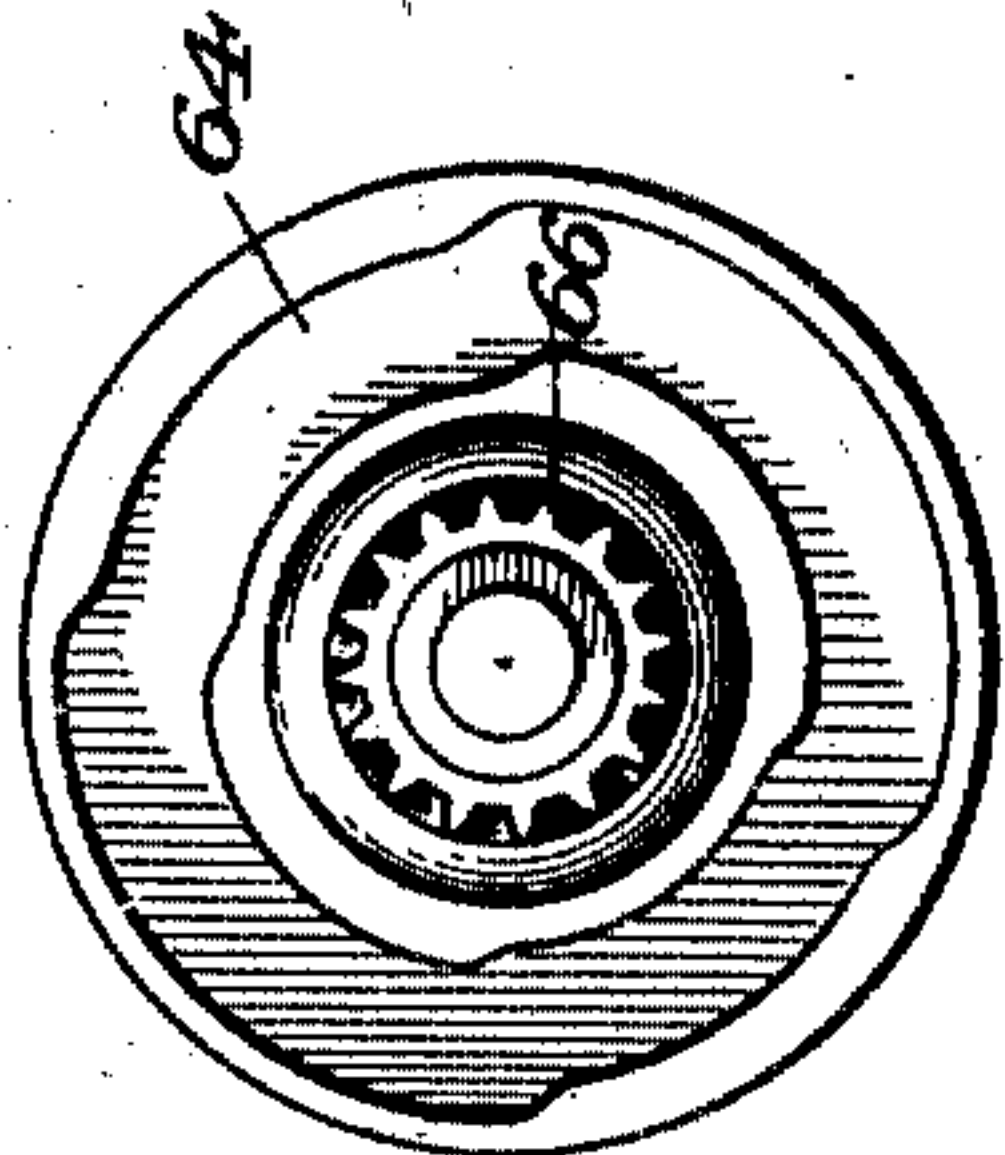


Fig. 5.



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4 SHEETS—SHEET 4.

Fig. 7.

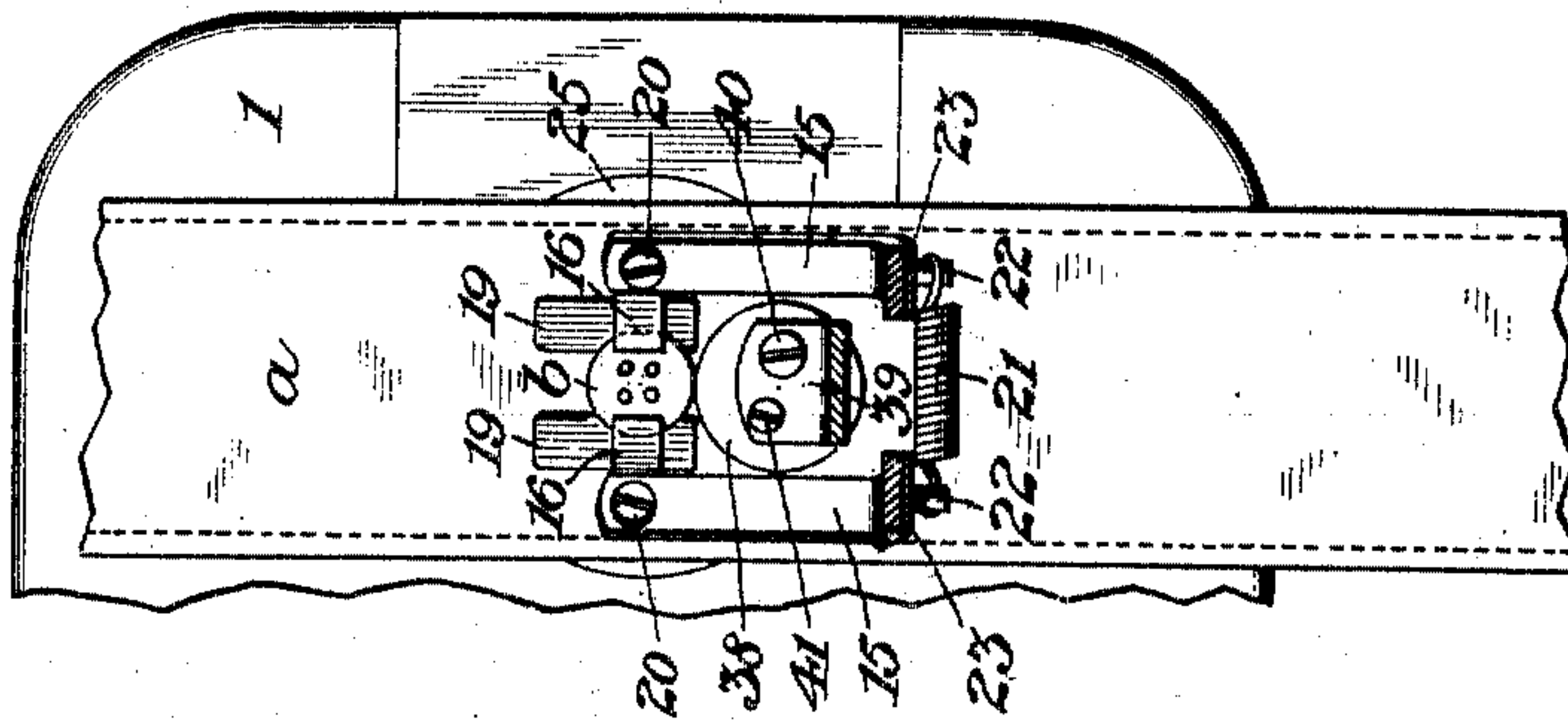


Fig. 8.

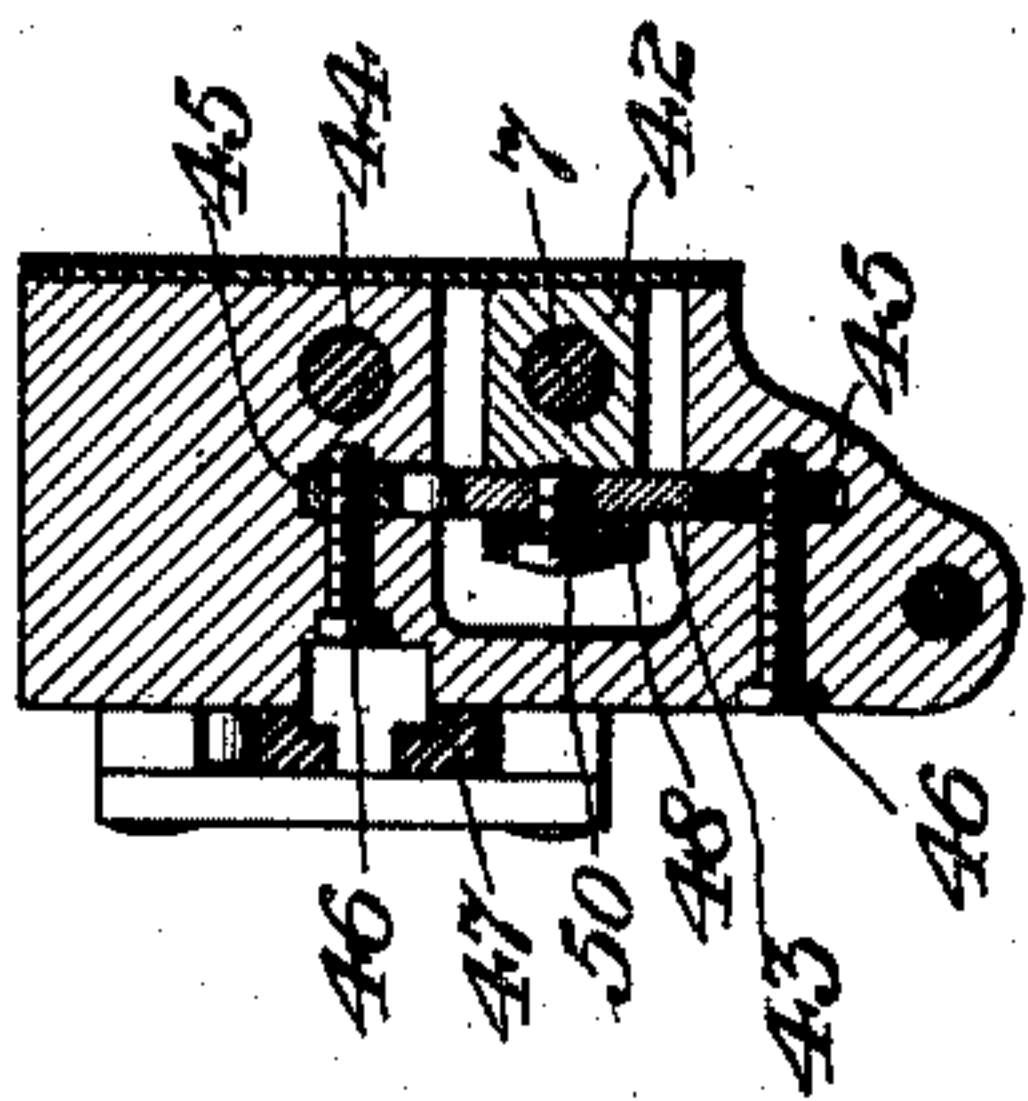


Fig. 9.

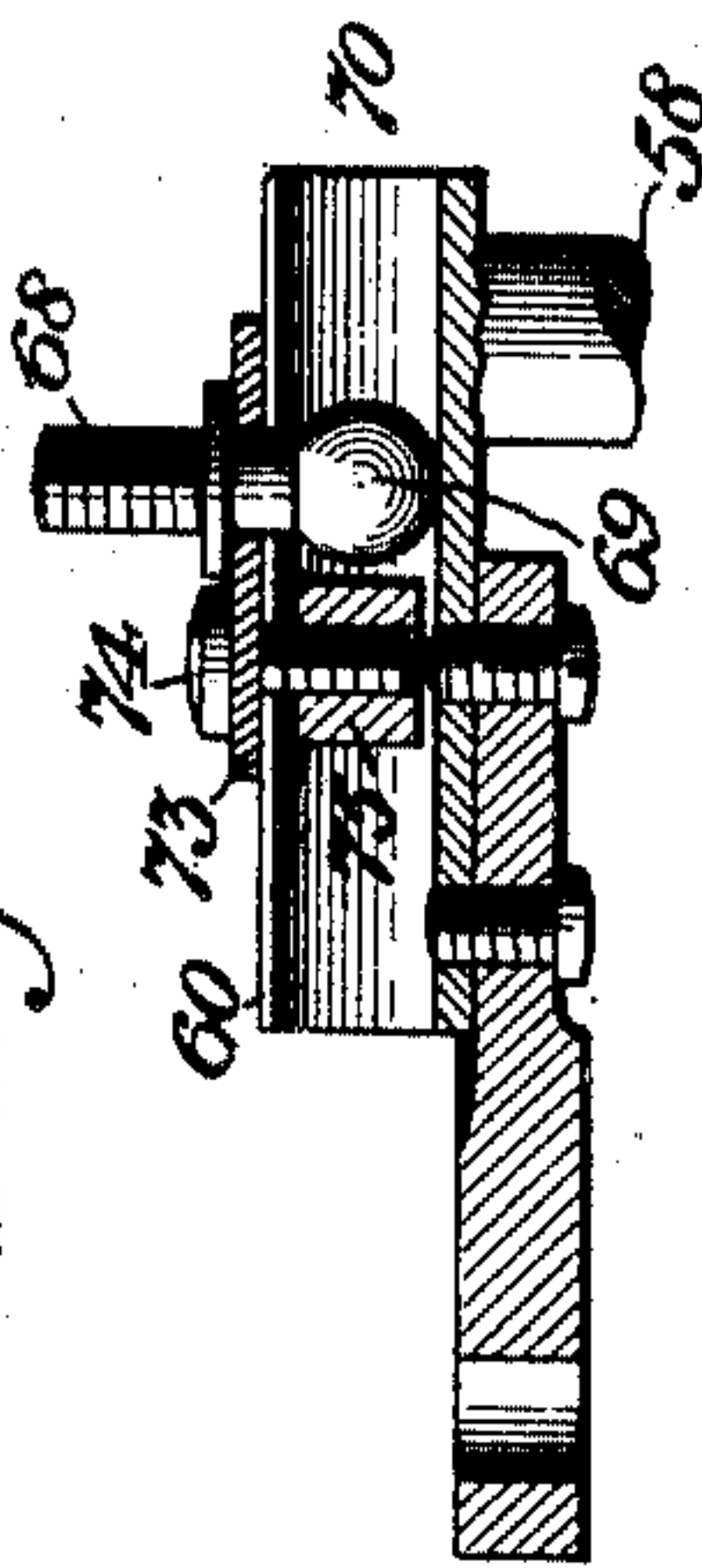
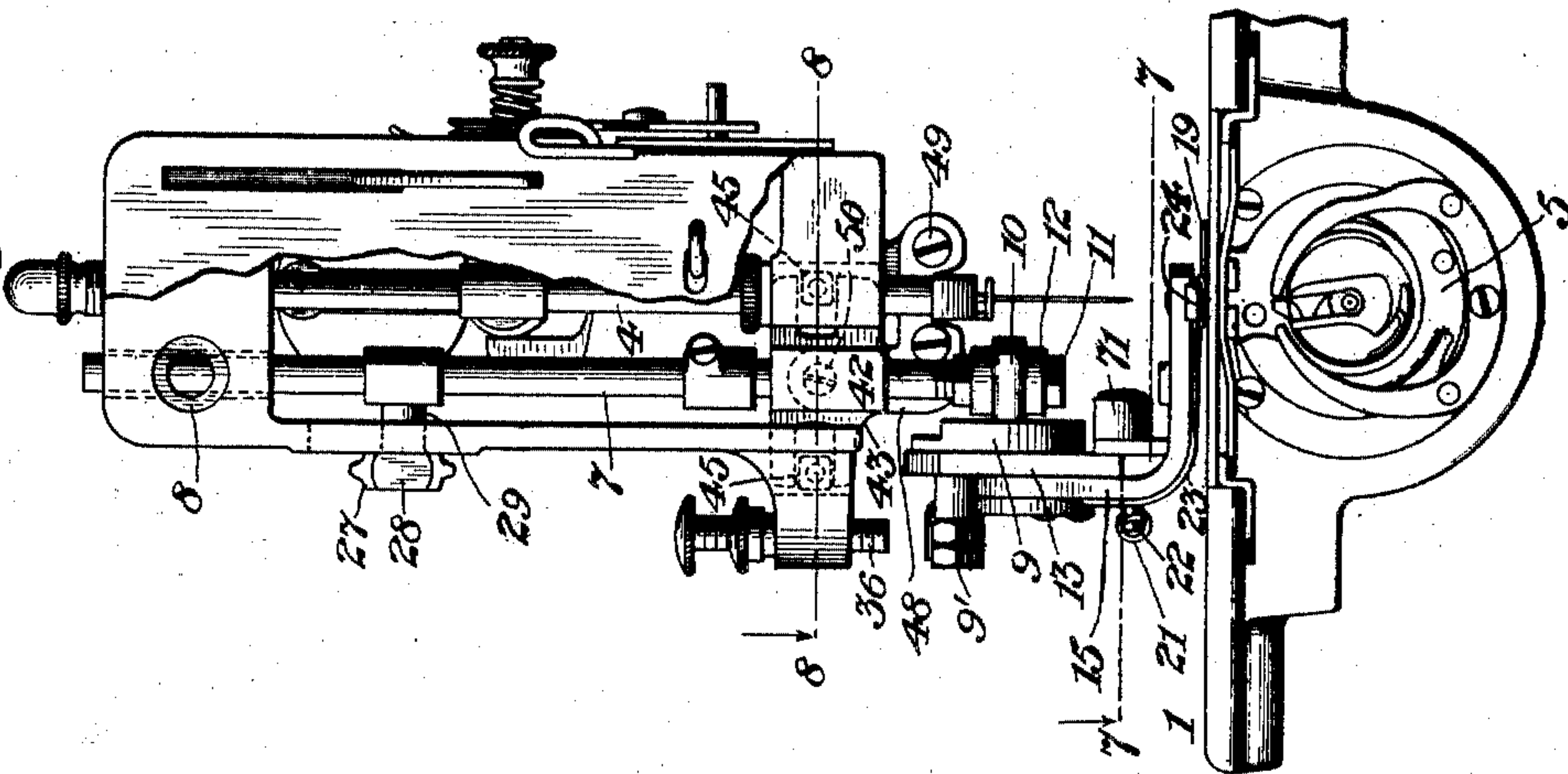


Fig. 6.



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UNITED STATES PATENT OFFICE.

WILLIAM A. MACK, OF CLEVELAND, OHIO, ASSIGNOR TO THE STANDARD SEWING MACHINE COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

MACHINE FOR SEWING ON BUTTONS.

SPECIFICATION forming part of Letters Patent No. 766,833, dated August 9, 1904.

Application filed December 23, 1899. Serial No. 741,378. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM A. MACK, a citizen of the United States, and a resident of Cleveland, Cuyahoga county, State of Ohio, have invented certain new and useful Improvements in Machines for Sewing on Buttons, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention relates to improvements in machines for sewing buttons to clothes, fabrics, and other articles, the general objects of the invention being, first, to provide an improved button holding and carrying device that will be supported above the bed-plate of the machine by means connected with the overhanging arm thereof, whereby the work may have a free and unobstructed passage over the said bed-plate; second, to provide means whereby the button-holding device when raised above the work by treadle connection or otherwise will be caused to automatically release the button held thereby and when again lowered automatically grip a button placed in position to be engaged by the same; third, to provide such button-holding device with simple and effective means for adapting the same to hold buttons of different shapes and sizes; fourth, to provide an improved mechanism for operating the button-holder whereby buttons having either two eyes or four eyes can be sewed on, and, fifth, to provide such mechanism with adjusting means whereby the same may be adapted for the sewing on of buttons having eyes at different distances apart. These objects and others to be referred to are secured by means of the construction and combination of parts, as hereinafter set forth in detail and pointed out in the claims.

Referring to the drawings, in which I have illustrated my invention as applied to one of the well-known "Standard" sewing-machines, Figure 1 is a rear side elevation of the machine embodying my invention, the web on the under side of the bed-plate being broken away to more clearly show the operating mechanism beneath said plate. Fig. 2 is a section

through line 2 2 of Fig. 1 looking down, the switch-cam on the under side of the bed-plate and the lever-arm engaged thereby for shifting the button-holder in one direction being shown in dotted lines. Fig. 3 is a view of the front end of the machine broken away, looking toward the side opposite that shown in Fig. 1, with the frame or arm in section and the web on the under side of the bed-plate broken away. Fig. 4 is a detail view showing the lever and its actuating-cam for communicating a continuous vibrating movement to the button-holder to enable the needle to enter first through one and then another of a pair of holes in the button. Fig. 5 is a detail view of the switch-cam and its connected worm-gear. Fig. 6 is a front end view of the machine with the face-plate partly broken away. Fig. 7 is a plan view of the front end of the bed-plate broken away and the button-holder in section through line 7 7 of Fig. 6, showing a button held by the gripping-jaws and a piece of work to which the button is to be sewed. Fig. 8 is a section through line 8 8 of Fig. 6, and Fig. 9 is an enlarged section taken longitudinally through the lever-arm and its connecting parts.

In said drawings, the bed-plate 1, the overhanging arm 2, the upper driving-shaft 3, supported in bearings in said arm 2, the vertically-reciprocating needle-bar 4, operated from the driving-shaft 3, the shuttle 5, and the rotary shuttle-driving shaft 6, supported in bearings on the under side of the bed-plate and operated from the upper shaft 3 through the medium of suitable operative connections, are all substantially as found in said Standard sewing-machine and adapted to operate to form stitches as in such machine. The invention, however, is also applicable to various other well-known sewing-machines.

In accordance with my invention the presser-bar 7 is pivotally supported, so that its lower end, to which the button-holder device is attached, may be capable of having a swinging or oscillating movement, such pivotal support of the presser-bar being secured in the present instance shown by passing its upper

end transversely through a circular ring 8, which is loosely seated within an opening in the arm 2, so as to turn or rock therein, as shown in Fig. 6. The button-holder device 5 carried at the lower end of said presser-bar comprises a supporting-plate 9, having a forked projection 10 on its front side, which is adapted to embrace the presser-bar and be detachably clamped in fixed connection there- 10 with between two nuts 11 11, which latter, as shown, act upon washers 12 12, interposed between the same and the forked projection 10. This plate 9 is provided on its rear side with a pin or stud 9', upon which is pivotally 15 mounted a plate 13. Upon the rear side of the latter two lever-arms 15 15 for carrying the button-gripping jaws 16 16 are pivotally secured by means of screws 17 17. These lever-arms are each formed with an angle there- 20 in, so that that end or portion of the same which carries the button-gripping jaws extends horizontally over the bed-plate, as shown.

The jaws 16 are each provided with a plate 25 or foot 19, (preferably formed of springy sheet-steel,) secured on its under side which projects beyond the edges of the same and forms an enlarged bearing-surface for resting upon the work *a*, to which the button *b* is to 30 be sewed, the adjacent ends of the said jaws being undercut, so as to receive and hold the edges of the button between the same and the lower projecting edges of the plates 19, as shown in Fig. 7. Any suitable form of 35 jaws, however, for gripping and holding the button other than that shown and described may be employed without departure from the invention, the jaws, as herein shown, being detachably connected with the lever-arms 15 40 by means of screws 20 to permit of their removal and the substitution of others in lieu of the same. A coiled spring 21, connecting at its opposite ends with pins 22 22 on the opposite lever-arms 15 15, acts to hold the free 45 ends of the latter with a yielding pressure toward each other, whereby the jaws carried thereby will be caused to firmly grip and hold a button located between the same and also be capable of being readily moved apart to 50 permit of the insertion or removal of a button into or from its position therebetween.

Movement of the button-holder is effected by means as will hereinafter be described, whereby it will be vibrated in one direction, 55 so as to enable the needle to descend first through one and then another of a pair of holes in the button at one side of its center until a certain predetermined number of stitches have been made, after which the button-holder will 60 be automatically shifted in a direction lengthwise of the machine to bring the other pair of holes in position to be vibrated and receive a like number of stitches through the same. In order that the work may be caused to move

with the button as the latter is vibrated and 65 shifted as described, I have supported a spring presser-foot 23 on the under side of each of the lever-arms 15 15, which is formed with a downwardly-curved portion 24 opposite the 70 button-gripping jaws 16, the under surface of which curved portion is roughened, as shown in Fig. 6, so as to provide a gripping-surface for engaging with the work. By this construction the work resting upon the smooth 75 surface of the throat-plate 25 and being engaged on its upper side by the said roughened presser-feet 23 and also by the plates 19, which latter grip the work adjacent to the button, the said work is caused to readily move back and forth with the button and its holder. 80 The spring presser-feet 23 are each secured at one end to the lever-arms 15 by means of a screw 26, as clearly shown in Fig. 1.

The button-holder is adapted to be normally held with a yielding downward pressure, so 85 that its presser-feet will be caused to firmly grip the work by any suitable means, the means as herein shown being as follows: A lever 27 is pivotally supported upon the arm 2, with one end being slotted and engaging with 90 a block 28, carried by an arm 29, which is rigidly connected with the presser-bar 7, and its opposite end having connection with a rod 30, which extends through an opening in the bed-plate and is adapted to be connected at its 95 lower end with a treadle connection, (not shown in the drawings,) whereby the presser-bar and connected button-holder may be elevated without requiring the aid of the operator's hands. A coiled spring 31, having a bearing at one end 100 upon the bed-plate 1 and at its opposite end against a collar 32 on the rod 30, serves to normally hold the button-holder in its lowered position.

In order that the button-gripping jaws 16 16 105 may be automatically opened or spread apart to release the button when the button-holder is raised from engagement with the work, I have formed the adjacent edges of the lever-arms 15 15 at their pivoted ends in the arc of 110 a circle and provided the same with teeth 33, which mesh with each other, as indicated by dotted lines in Fig. 1, whereby any lateral swinging movement of one lever-arm will cause a like movement of the other. The said 115 lever-arms being thus connected, one of the same is provided with an arm 34, rigidly connected therewith by means of screws 35, the end of which extends into a position whereby when the button-holder is raised it will engage 120 with the end of a stationary screw 36, supported in a lug 37 on the arm 2 and cause the lever-arms 15 15 to turn on their pivots and open or spread apart the jaws 16 16, and so release the button. Another button may then 125 be placed between the jaws, and as the button-holder is allowed to descend and the arm 34 moved from engagement with the screw 36

the jaws will be caused to move toward each other under the action of the spring 21 and firmly grip the button between the same. The stop formed by the end of the screw 36 is vertically adjustable, whereby the jaws 16 may be caused to open sooner or later after being raised above the work.

In order that the button when placed between the jaws may be quickly located therebetween with its holes in proper position to be entered by the needle, I have provided the button-holder with a stop 38, against which the edge of the button will contact when entered to its proper position between the jaws, as shown in Fig. 7. The stop 38, as herein shown, consists of a disk which is eccentrically pivoted to an arm 39 of the plate 13 by means of a screw 40 and adapted to be held in a stationary adjusted position by means of a set-screw 41. This construction permits the stop-disk to be adjusted relative to the jaws, and so allows the insertion of buttons of different sizes between the latter.

The button-holder is actuated to receive a vibrating movement and present first one and then another of a pair of holes in position to be entered by the needle in a manner as follows: The presser-bar to which the button-holder is attached extends through an opening in a block 42, which is connected with a guide-plate 43, the ends of which latter extend loosely within openings in the arm 2 and are slotted to embrace blocks 45 45, which are supported within said openings by screws 46 46, as more clearly shown in Figs. 6 and 8. This construction serves to support and guide the lower end of the presser-bar during its vibrating movement. A vibrating lever 47 for communicating like movement to the presser-bar and its attached button-holder is supported in the rear of the front end of the arm 2, with its lower end having an arm 48 rigidly connected therewith by means of screws 49 49, the end of which arm is pivotally connected with the guide-plate 43 by means of a screw 50. The upper end of the vibrating lever 47 is bifurcated and embraces an actuating-cam 51, (see Fig. 4,) located on a short counter-shaft 52, which is supported in bearings in the arm 2 and driven from the main driving-shaft 3 through the medium of gears 53 53, as clearly shown in Fig. 3. In order that the length of vibrations of the button-holder may be varied for buttons having holes at different distances apart, the fulcrum for the lever 47 is made adjustable, so that by changing its position the throw of the said lever will be varied accordingly, as will be obvious. The fulcrum for the lever 47, as shown in Fig. 3, consists of a block 54, which is supported to slide within a groove 55 in the arm 2 and having seated therein one end of a threaded pin 56, which latter extends through an elongated slot 57 in the lever 47

and is adapted to be clamped in a stationary adjustable position relative to the lever by means of a fixed collar 56' thereon engaging with one side of the latter and an adjusting or clamping nut 57' engaging the opposite side of the lever. By loosening the nut 57' the pin 56, with the connected fulcrum-block, may be adjusted relative to the lever 47 and be secured in its adjusted position by again tightening the nut 57'.

After the button-holder has been vibrated to enable a certain predetermined number of stitches to be made through one pair of holes in the button carried thereby its pivotally-supported plate 13 is then automatically moved or swung in a lateral direction or at right angles to the path of its vibrating movement, so as to present the other pair of holes in position to be sewed. Such lateral movement of the button-holder is communicated thereto from a rotary switch-cam 64, as follows: A short vertically-arranged shaft 58 extends through the bed-plate 1 and has a bearing at opposite sides thereof in lugs 59 59, projecting from said bed-plate. This shaft is provided at its upper end with a rigidly-connected grooved arm 60, which has an operative connection with the plate 13 of the button-holder through the medium of a connecting-rod 61, and at its lower end the said shaft 58 is provided with a second arm 62, which is provided with a pin having an anti-friction-roll 63 thereon, (shown by dotted lines in Fig. 3,) extending within the groove of the said cam 64, which latter is mounted in a horizontal position upon a stud 65, depending from the under side of the bed-plate and provided with a connected worm-gear 66, which meshes with a worm 67 on the rotary driving-shaft 6, whereby the cam is given its rotary movement. The cam 64, acting upon the arm 62, will cause a rocking or oscillating movement of the shaft 58 in its bearing, and thereby communicate a lateral movement to its upper arm 60 and the connected button-holder. In the operation of the machine the cam 64, through the medium of the connections described, acts to hold the button-holder laterally stationary while the same is being vibrated to receive stitches through one pair of holes in the button carried thereby, then moves the same laterally to present the second pair of holes in position to receive a predetermined number of stitches, and then returns the button-holder to its original position, the lateral swing of the arm 60 occurring upon such return movement of the button-holder causing a stopping mechanism to be brought into action, whereby the machine will be brought to an immediate stop upon the completion of the sewing on of the button and with the button-holder in starting position ready to receive the next button. Any suitable mechanism for securing such automatic

stopping of the machine upon the completion of the sewing on of a button may be employed in connection with my improved machine. The means which is preferably employed in
 5 connection with the same, however, will form the subject-matter of another application to be filed.

In order to allow for the vibratory and vertical movements of the button-holder relative
 10 to the connecting-arm 60, I have provided a threaded pin or bolt 68; with which one end of the rod 61 is connected, having a rounded or ball end 69, (see Fig. 9,) which is loosely fitted to slide and rock in the groove 70 of the
 15 arm 60. The opposite end of the rod 61, as more clearly shown in Fig. 3, has a horizontally-pivotal connection with one end of a link 71, which latter is pivotally connected with the plate 13 of the button-holder by
 20 means of a screw 72. Such described construction and arrangement of parts forming the connection between the arm 60 and the button-holder permits the free movement of the latter without any undue binding or
 25 cramping of the connecting parts, as will be obvious.

In order that the lateral movement of the button-holder as given by the arm 60 may be adjusted for buttons in which the pairs of
 30 holes are at different distances apart or for buttons having only one pair of holes, I have secured the pin or bolt 68 in longitudinally-adjustable connection with the lever-arm 60, whereby it may be moved either toward or
 35 away from the fulcrum-point of the latter, and so vary the throw of the button-holder accordingly. If a button with only one pair of holes is to be sewed, the pin 68 is moved to a position centrally above the shaft 58 and at
 40 the fulcrum-point of the arm 60, in which position there will of course be no movement of the same, and the button-holder will consequently be rendered laterally stationary.

The means for holding the pin 68 in its adjusted position relative to the arm 60 consists
 45 of a plate 73, which loosely embraces the upper side of the arm 60 and is provided with an opening therein through which the pin 68 loosely extends. This plate is adapted to be
 50 secured in clamped connection with the arm 60 by means of a screw 74, (see Fig. 9,) which passes through an opening in the plate and engages with a block 75, which is loosely fitted within the groove of the arm 60, with its
 55 sides engaging the concaved sides of said groove. By loosening the screw 74 the plate 73 may be moved back and forth on the arm 60 until the connecting-pin 68 has been located in the desired position, after which the
 60 plate 73 may be clamped in such position by again tightening the screw 74.

Having thus set forth my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

65 1. In a machine for sewing on buttons, the

combination, with the sewing mechanism, of a button-holder, a vibrating bar pivotally supported adjacent to its upper end in the arm of the machine and having said button-holder attached thereto at its lower end, a vibrating
 70 lever arranged parallel with said bar and having operative connection therewith to actuate the same and the attached button-holder, and an adjustable fulcrum for said lever, for the purpose set forth. 75

2. In a machine for sewing on buttons, the combination, with the sewing mechanism, of a button-holder, a vertically-movable presser-bar pivotally supported in the arm of the machine and having said button-holder attached
 80 thereto, a vertically-stationary block or sleeve loosely connected with said presser-bar, means for supporting and guiding said block in a laterally-movable position, and a vibrating lever having operative connection with said
 85 block or sleeve to communicate a vibrating movement thereto, for the purpose set forth.

3. In a machine for sewing on buttons, the combination, with the sewing mechanism, of a button-holder, comprising a supporting-
 90 plate and a second plate carrying button-gripping jaws pivotally connected with said supporting-plate, means carrying said supporting-plate of the button-holder and communicating a vibrating movement thereto, and
 95 means connecting with said pivoted plate of the button-holder and communicating a lateral movement thereto independent of the supporting-plate at certain predetermined times, for the purpose set forth. 100

4. In a machine for sewing on buttons, the combination, with the sewing mechanism, of a pivotally-supported presser-bar, means for vibrating said presser-bar, a button-holder, comprising a supporting-plate attached to said
 105 presser-bar and having a second plate carrying button-gripping jaws pivotally connected therewith, and means for communicating a lateral movement to said pivoted plate at certain predetermined times, for the purposes set forth. 110

5. In a machine for sewing on buttons, the combination, with the sewing mechanism, of a button-holder, comprising a supporting-plate, two lever-arms pivotally connected with said
 115 plate and each being provided with a button-gripping jaw, a spring movably holding said jaws in gripping relation to each other, and means connecting the lever-arms whereby their free ends will be caused to move laterally in unison with each other, a vertically-movable presser-bar carrying said button-holder, and a stop device arranged to engage
 120 one of said lever-arms subsequent to the raising of the button-holder above the bed-plate and operating to automatically open the jaws, for the purpose set forth. 125

6. A button-holder, comprising a supporting-plate, two laterally-movable button-gripping jaws pivotally connected with said plate, 130

an eccentrically-pivoted disk supported adjacent to said jaws and at one side thereof against which the edge of the button contacts when placed between the jaws, and means for holding said disk in adjusted position.

7. A button-holder, comprising a supporting-plate, and two button-gripping jaws each being provided with a foot for engaging with the work adjacent to the button held therebetween, and with a second work-engaging presser-foot in a position at one side of the first-mentioned foot, both of said feet being arranged to engage with the work at the upper side thereof, for the purpose set forth.

8. A button-holder, comprising a supporting-plate, and two button-gripping jaws each being provided with a spring-foot for engaging with the work adjacent to the button held therebetween, and with a second work-engaging spring presser-foot in a position at one side of the first-mentioned foot, both of said feet being arranged to engage with the work at the upper side thereof, for the purpose set forth.

9. In a sewing-machine, the combination

with a button-holding clamp having a plurality of coacting members, of a lever adapted to be actuated by a treadle and connected with the shank or support of the button-holding clamp, a projection on one of the said members of the button-holding clamp and a projection on the sewing-machine arm for coacting with the first-named projection to open the button-holding clamp when the latter is raised.

10. In a sewing-machine, the combination with a button-holding clamp having a plurality of coacting members, of a lever adapted to be actuated by a treadle and connected with the shank or support of the button-holding clamp, a projection on one of said members of the button-holding clamp, and a vertically-adjustable projection on the sewing-machine arm for coacting with the first-named projection to open the button-holding clamp when the latter is raised.

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