

(No Model.)

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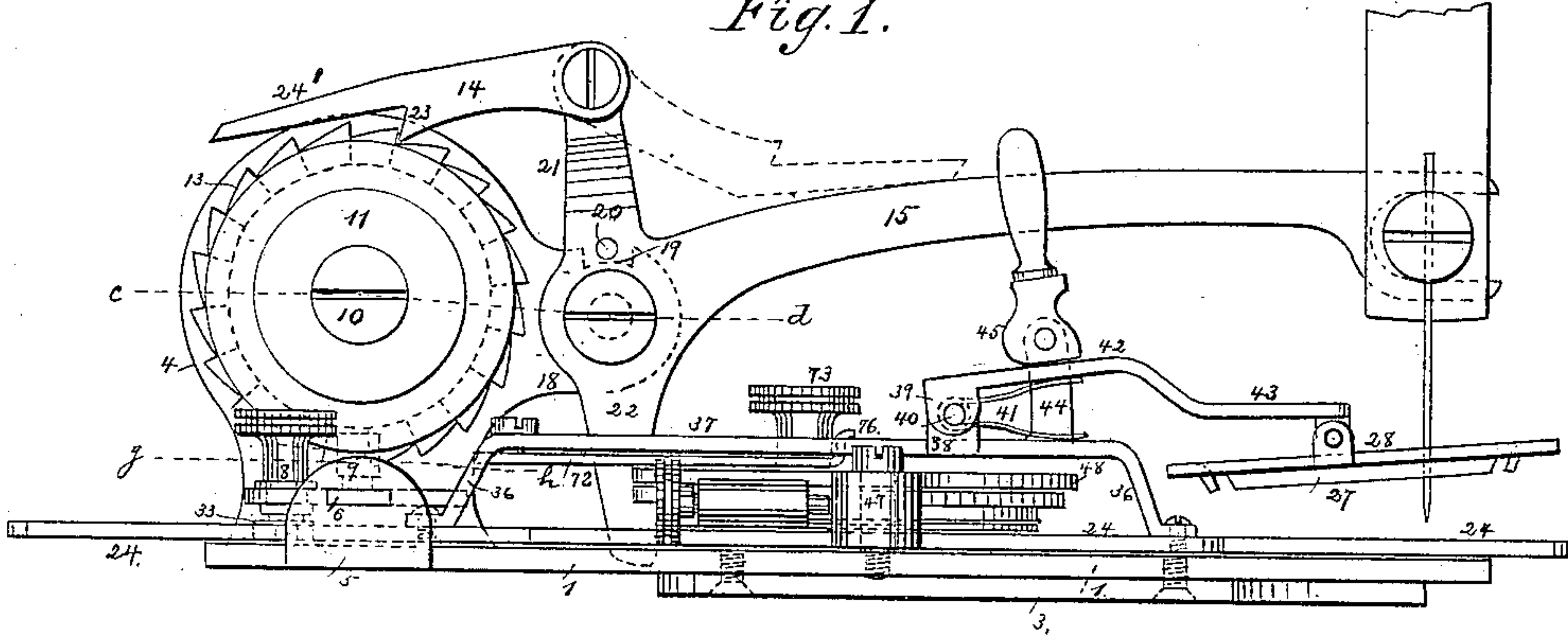
J. R. HEBERT.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

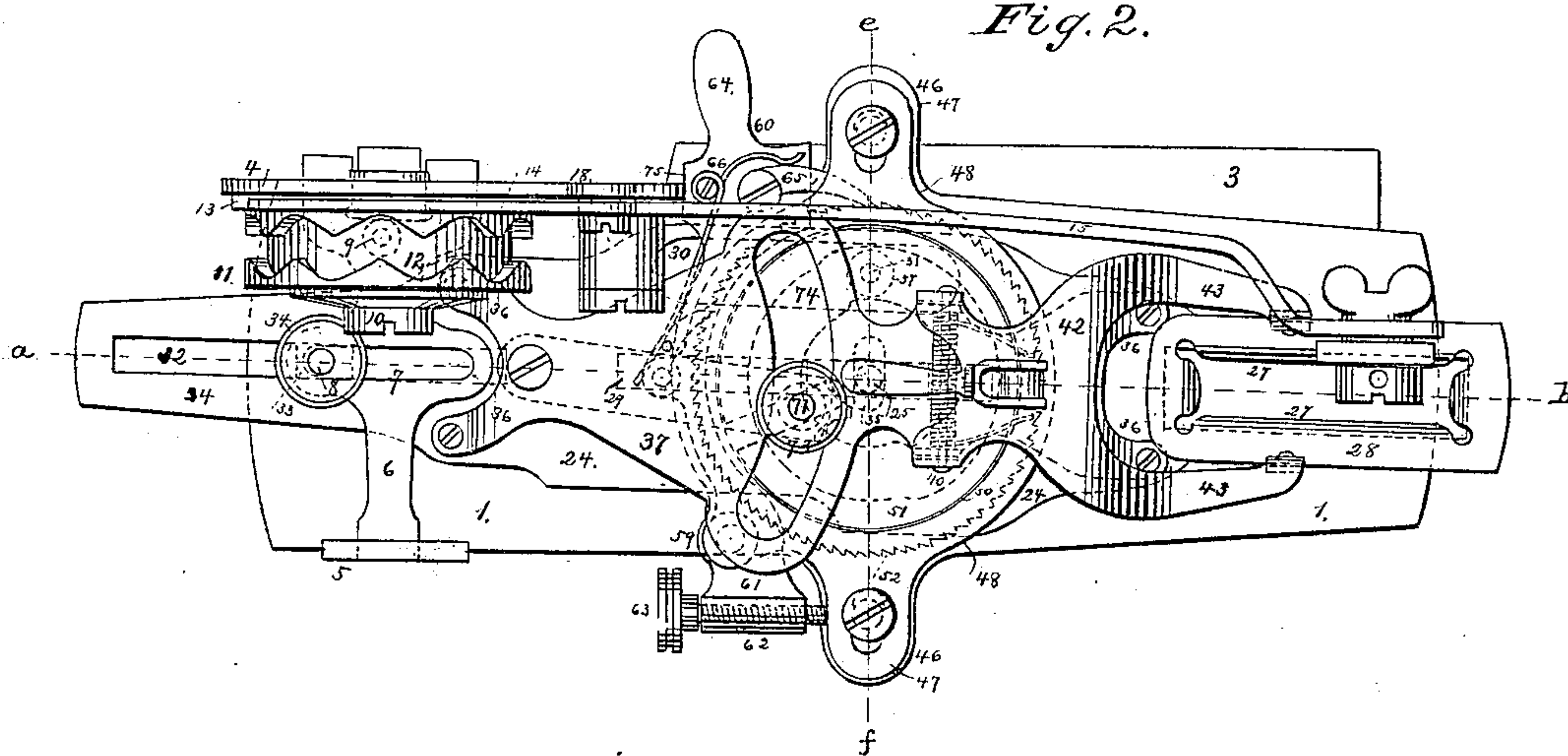
No. 362,745.

Patented May 10, 1887.

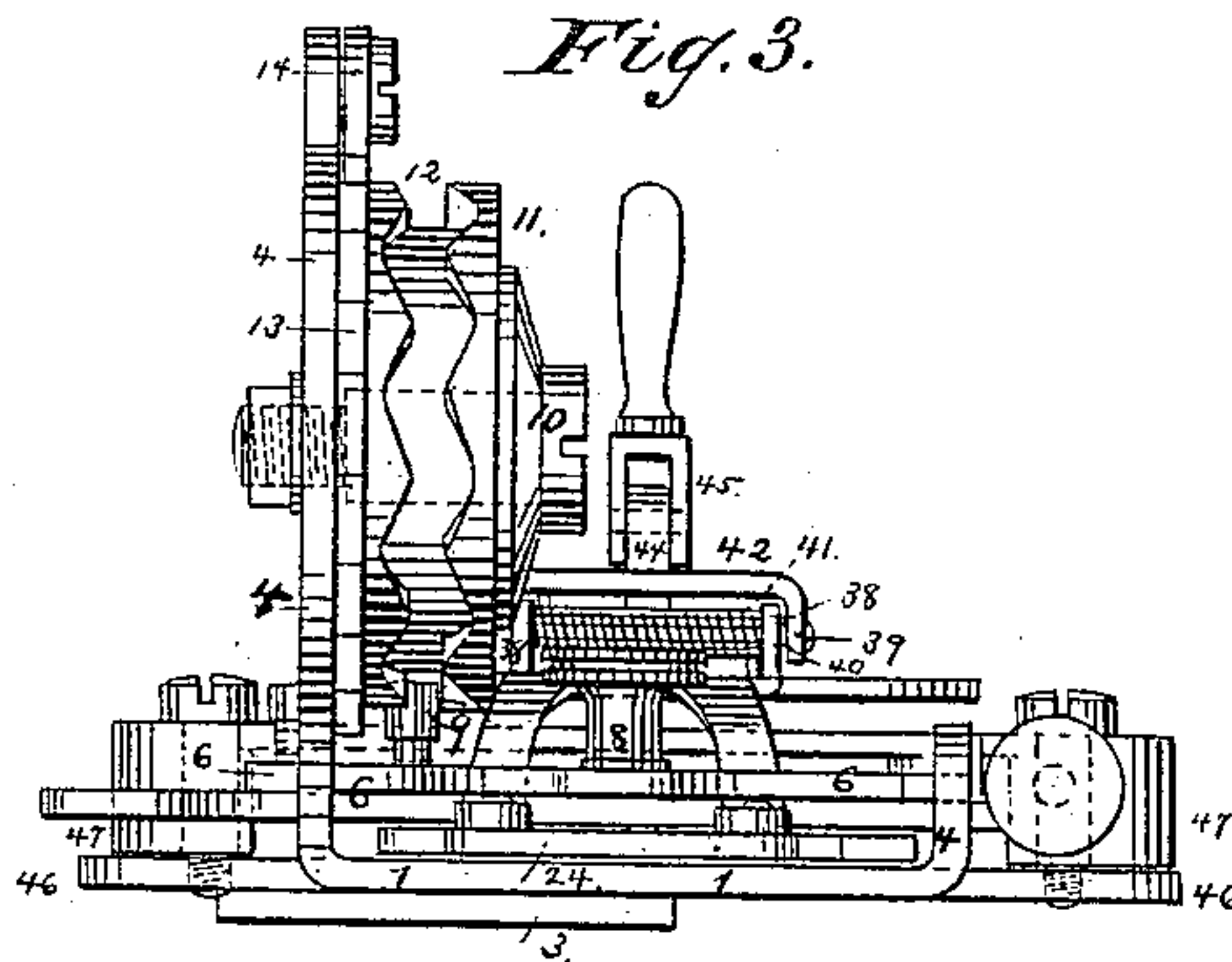
*Fig. 1.*



*Fig. 2.*



*Fig. 3.*



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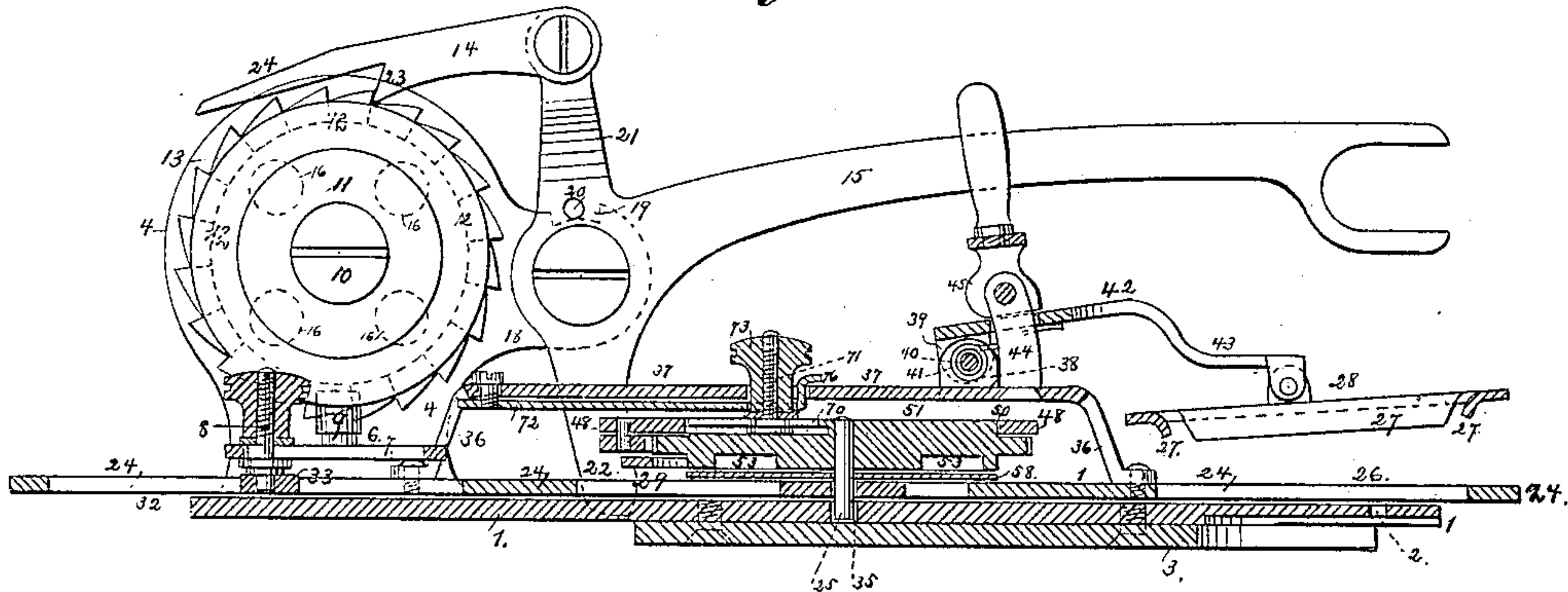
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BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

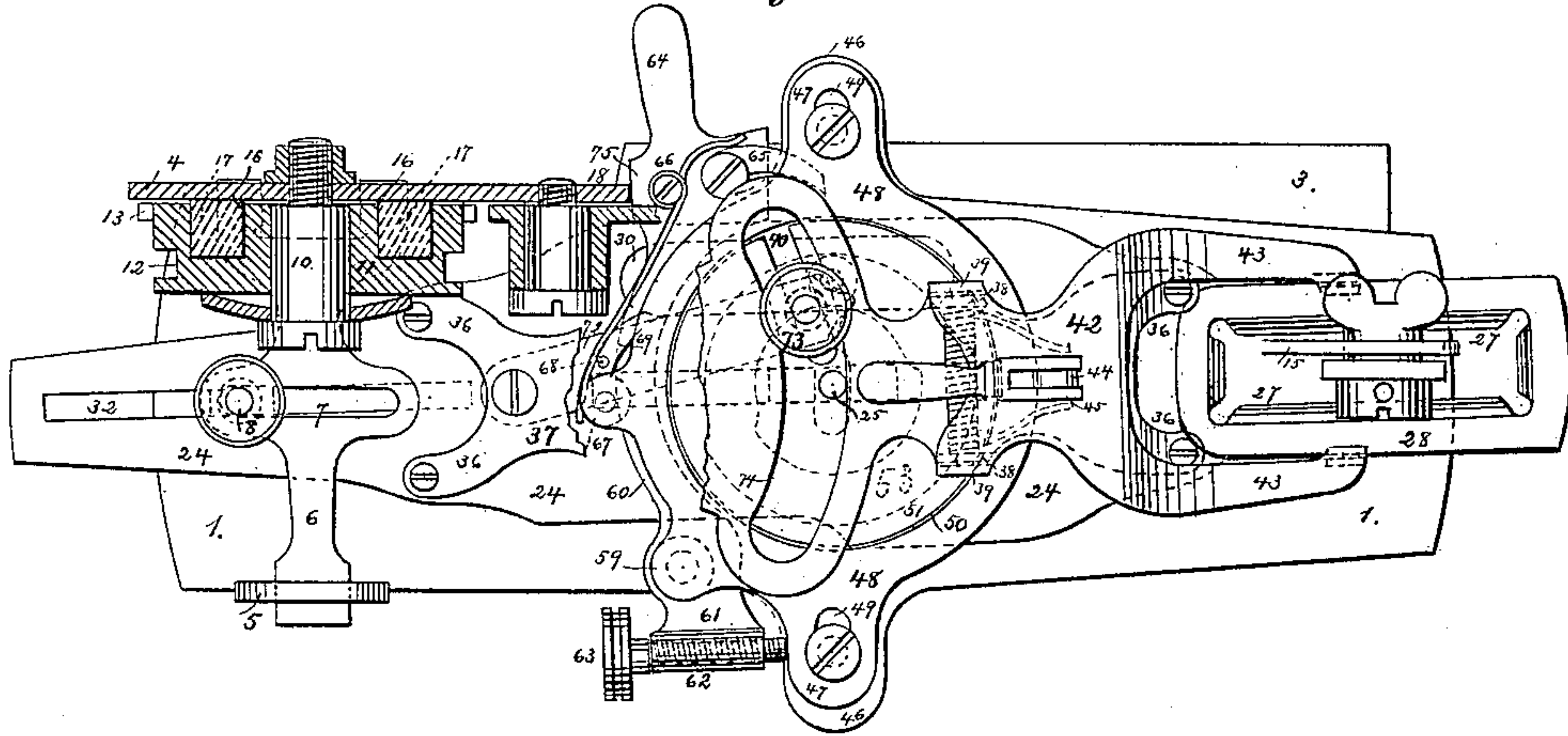
No. 362,745.

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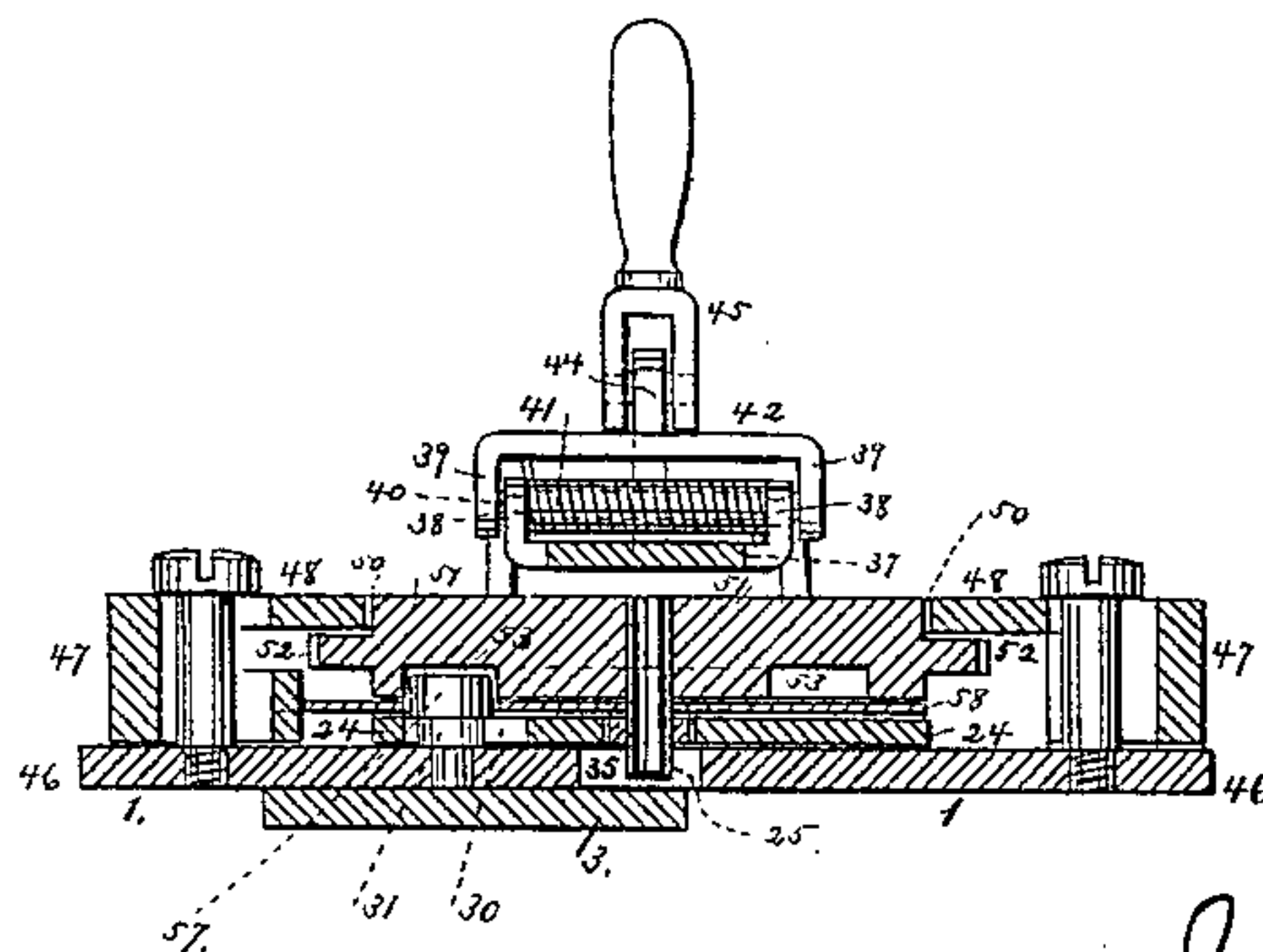
*Fig. 4.*



*Fig. 5.*



*Fig. 6.*



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(No Model.)

4 Sheets—Sheet 3.

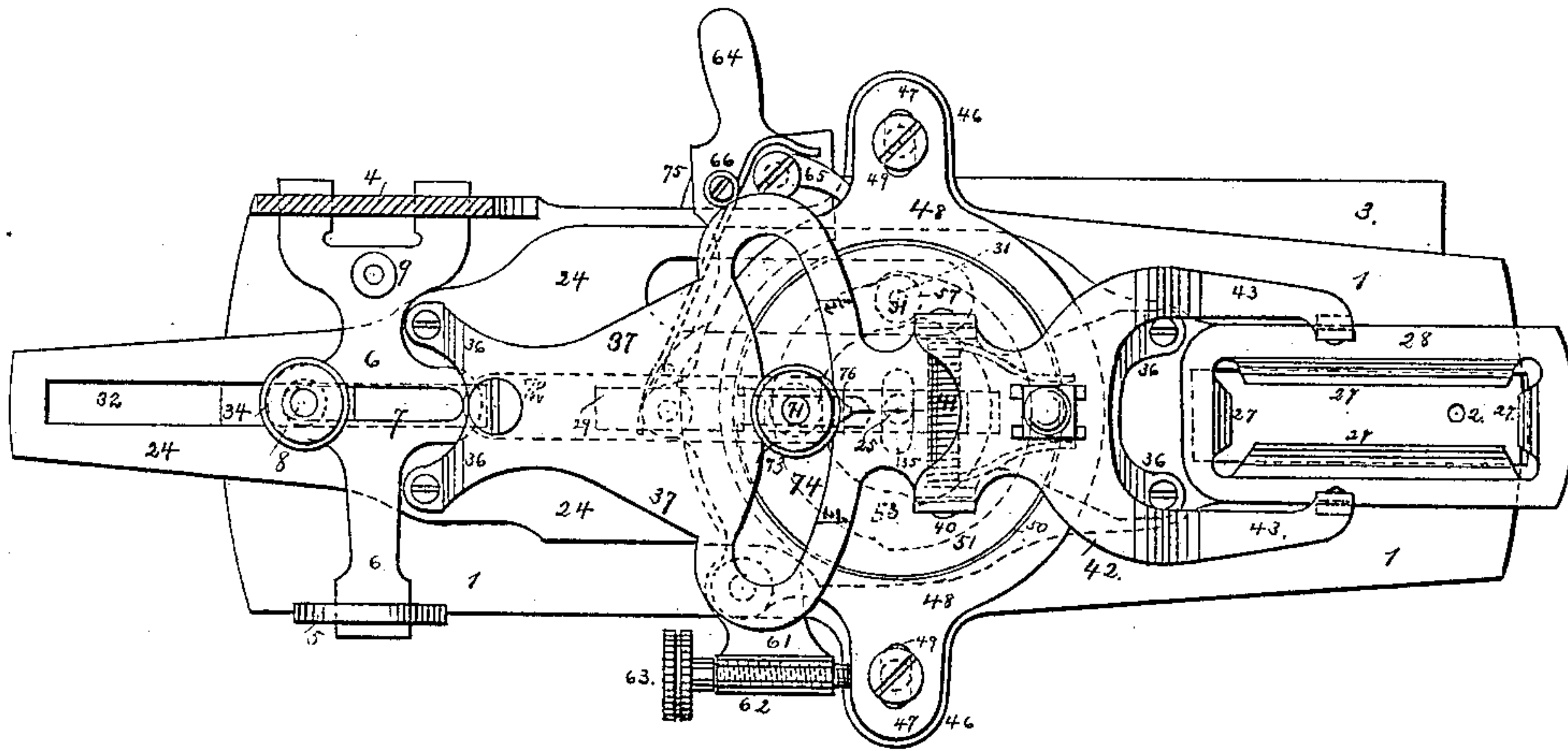
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BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

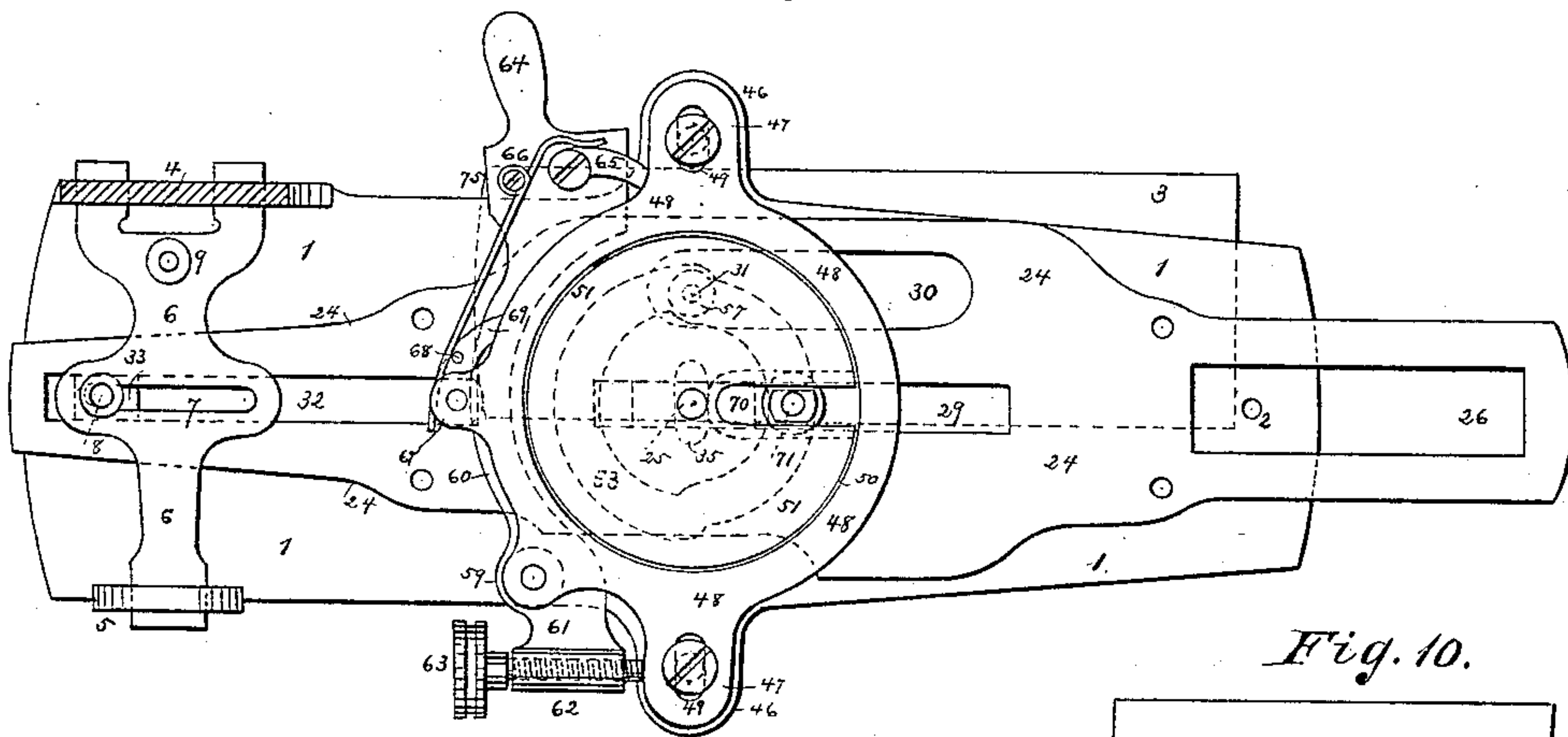
No. 362,745.

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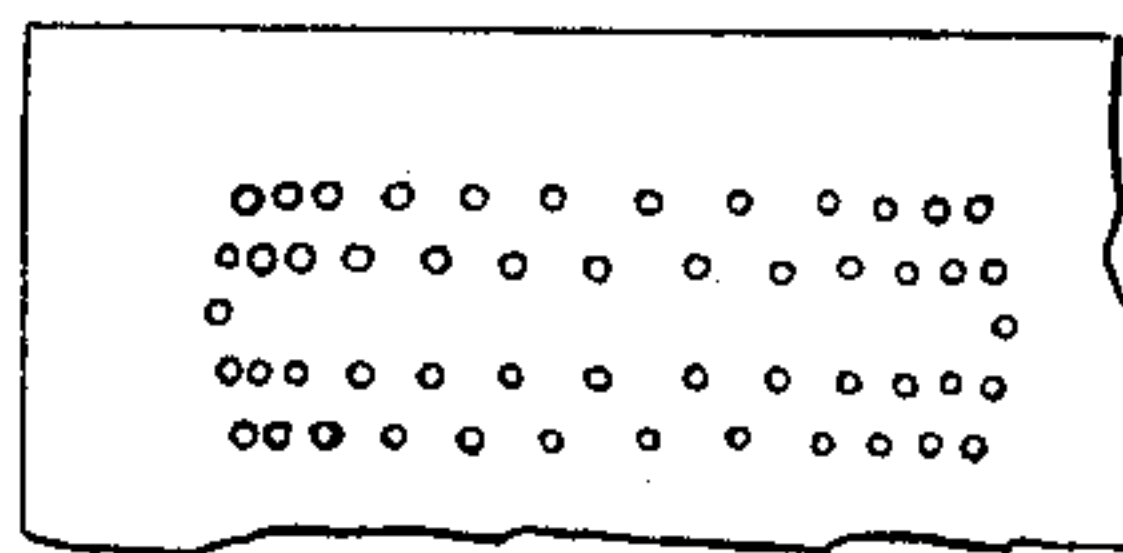
*Fig. 7.*



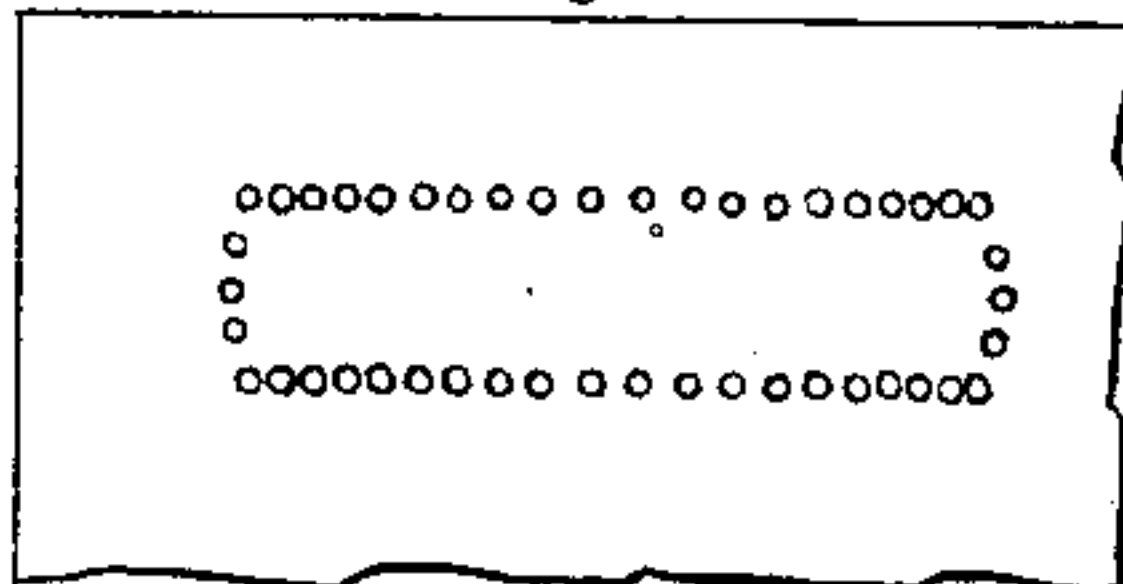
*Fig. 8.*



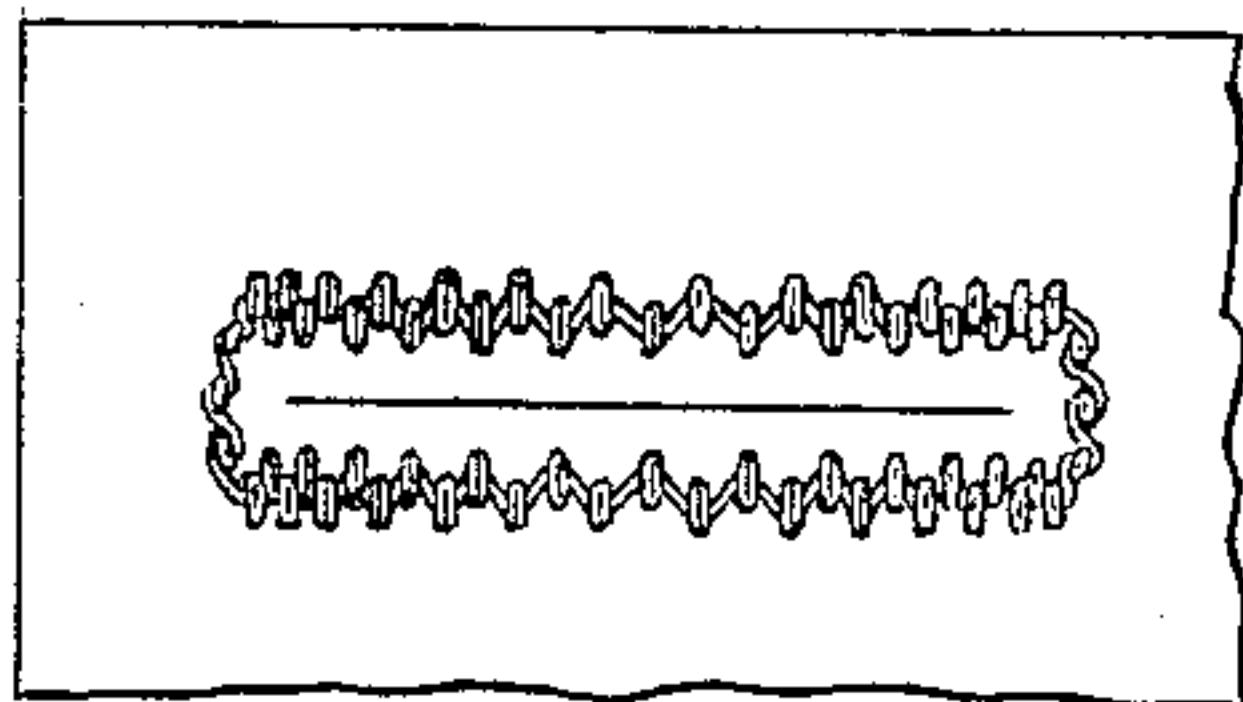
*Fig. 10.*



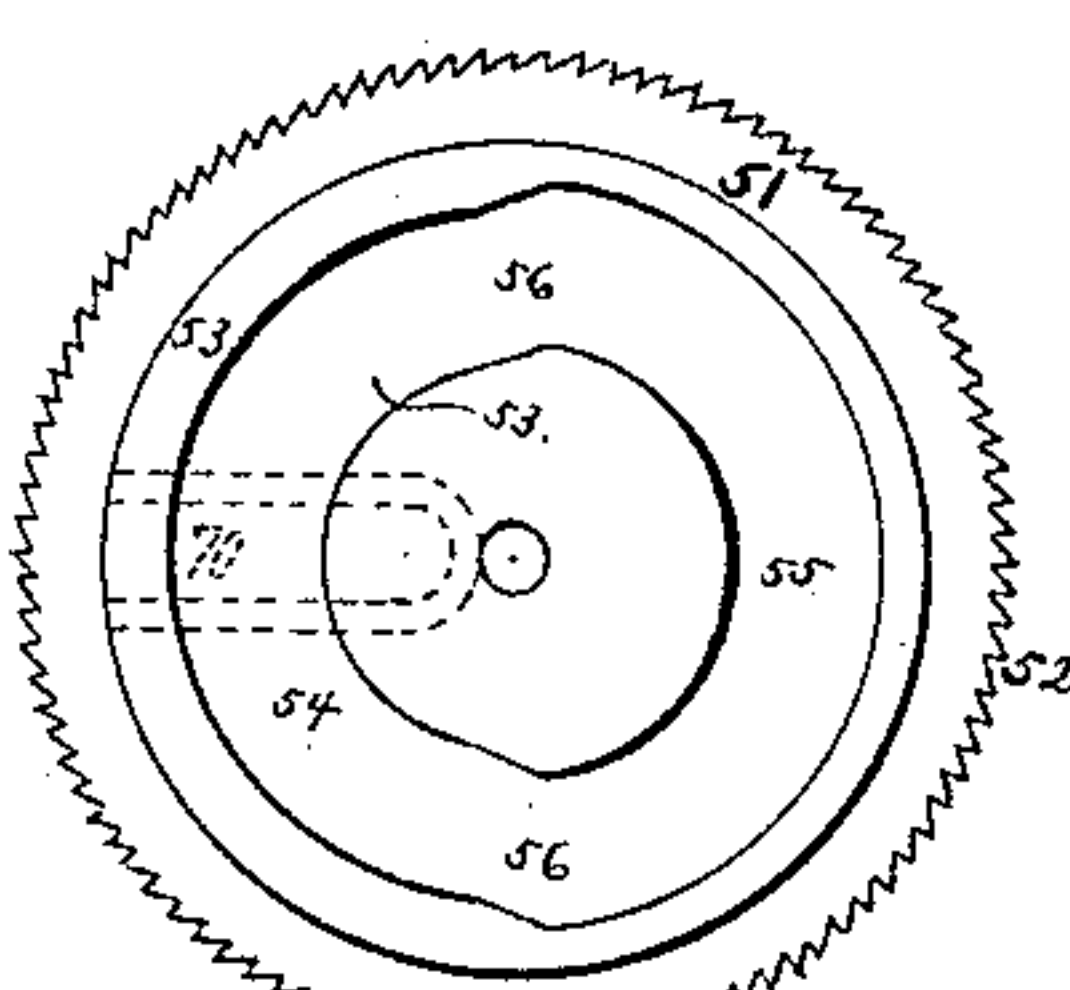
*Fig. 11.*



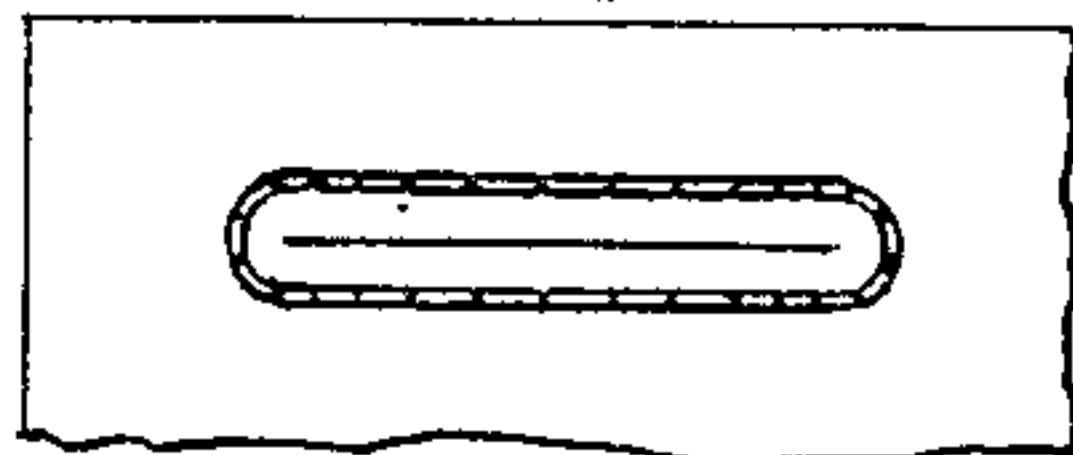
*Fig. 12.*



*Fig. 9.*



*Fig. 13.*



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(No Model.)

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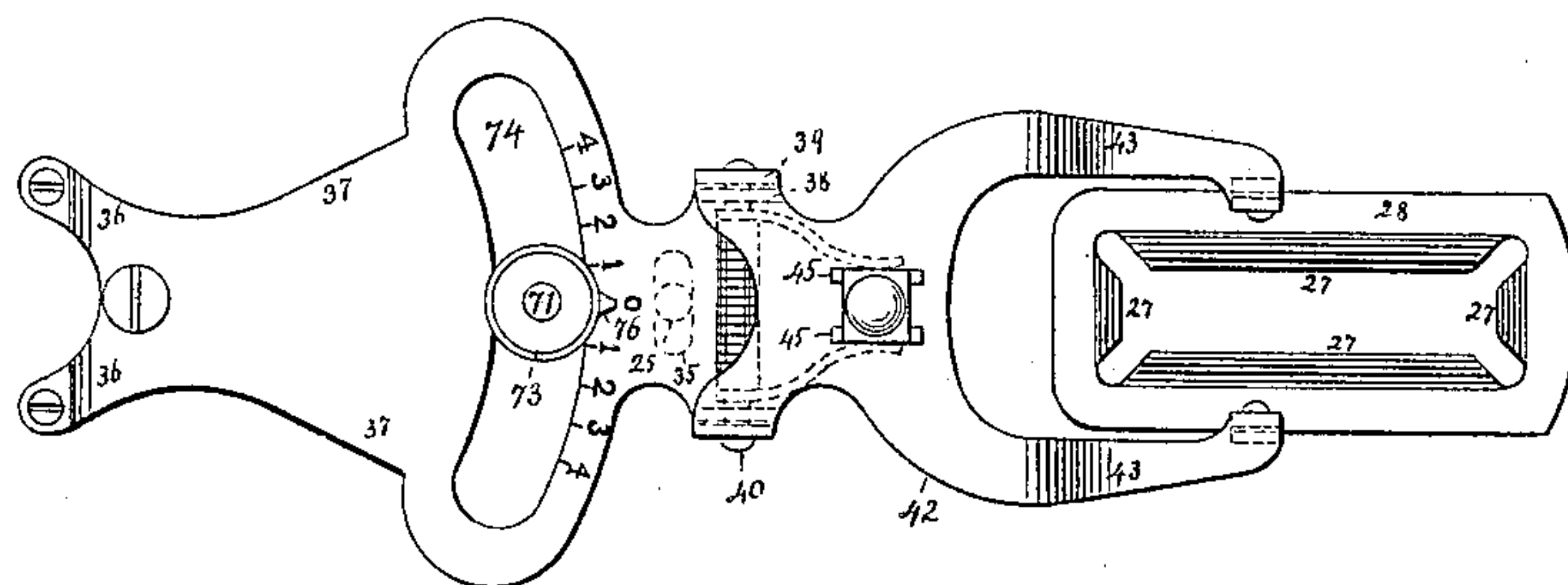
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*Fig. 14.*



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# UNITED STATES PATENT OFFICE.

JOSEPH R. HEBERT, OF BROOKLYN, NEW YORK.

## BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 362,745, dated May 10, 1887.

Application filed September 11, 1884. Renewed September 14, 1886. Serial No. 213,541. (No model.)

*To all whom it may concern:*

Be it known that I, JOSEPH R. HEBERT, a citizen of the United States, and a resident of Brooklyn, in the county of Kings and State of New York, have invented certain new and useful Improvements in Button-Hole Attachments for Sewing-Machines, of which the following is a specification, reference being made to the accompanying drawings, forming a part of this specification.

The invention relates to improvements in button-hole attachments for sewing-machines; and it consists in the elements hereinafter described, and particularly pointed out in the claims.

The invention will be described in detail, reference being had to the accompanying drawings, in which—

Figure 1 is a side elevation of a button-hole attachment for sewing-machines embodying the elements of the invention. Fig. 2 is a top view of same. Fig. 3 is a rear end view of same. Fig. 4 is a central vertical longitudinal section of the attachment on the line *a b* of Fig. 2. Fig. 5 is a top view of the attachment, one portion of which being shown in section on the line *c d* of Fig. 1, and illustrating certain parts in a different position from that shown in Fig. 2. Fig. 6 is a vertical transverse section on the line *e f* of Fig. 2, looking toward the front end of the attachment. Fig. 7 is a top view of the attachment, a portion of same being omitted, and illustrating a position of the parts assumed during the operation of forming a button-hole, as hereinafter described. Fig. 8 is a similar view, the upper portion of the cloth-clamp being omitted for the purpose of clearly illustrating the lower parts of the attachment. Fig. 9 is a view of the under face of the ratchet-wheel by which the cloth-clamp is fed forward. Figs. 10 and 11 are enlarged diagram views of two forms of button holes capable of being produced by means of the attachment sought to be protected by this application. Fig. 12 is a view of the under side of a finished button-hole made after the pattern illustrated by diagram in Fig. 10. Fig. 13 is a view of a button-hole made of straight stitches according to the diagram shown in Fig. 11; and Fig. 14 is a detached top view of the bridge and upper half of the cloth-clamp.

Referring to the drawings, 1 designates the bed-plate of the attachment, in the forward portion of which is provided a needle-hole, 2, and upon the under side of the forward portion of which is secured a plate, 3, by which the attachment may be applied to various styles of sewing-machines. The plate 3 will be of suitable dimensions to cover the shuttle-race of the machine, and will be varied according to the style of the machine to which the attachment is to be applied. At the sides of the rear end of the bed-plate 1 are formed the lugs or brackets 4 5. The brackets 4 5, at a suitable distance above the bed-plate 1, are slotted to receive the lateral reciprocating plate 6, as shown more clearly in Figs. 7 and 8. The plate 6 is provided at its longitudinal center with a slot, 7, in which is adjusted the set-screw 8, for the purpose hereinafter described, and upon the upper surface of the plate 6, adjacent to the bracket 4, is provided the friction-roll 9.

Upon the inner face of the bracket 4 is secured upon a screw, 10, the wheel 11, having upon its periphery the cam 12, which is corrugated in outline and of sufficient dimensions between its two walls to receive and move over and actuate the friction-wheel 9, secured upon the plate 6. Between the cam 12 and the bracket 4 the wheel 11 is provided with a series of teeth, 13, forming a ratchet-wheel, by means of which (and the pivoted pawl 14 and bell-crank lever 15) the wheel 11, with its cam 12, is caused to rotate from the needle-bar of the sewing-machine to which the attachment may be applied. The teeth 13 are of such size that the length of two of them is equal to the length of one of the corrugations in the cam 12; hence, when the wheel 11 is rotated the distance of one tooth of the ratchet 13, the cam 12 will move upon the roll 9 the distance of one-half of one of its corrugations, moving the plate 6 accordingly either toward one side or the other of the bed-plate 1. Upon the revolution of the wheel 11 the roll 9 (shown in dotted lines in Fig. 2) will move from the higher point of the cam down the incline to the adjacent lower point of same, causing the plate 6 to be likewise moved, and then upon the continued revolution of the wheel 11 the distance of another tooth of the ratchet-wheel 13 the wheel 9 will move up the next adjoining in-



cline to the higher point of the cam and return thereby the plate 6 to its former position, being that shown in Fig. 2.

Upon the inner face of the wheel 11 are drilled cavities 16, in which are firmly packed appropriate pieces of felt 17, or similar substance, which will exert, when the screw 10 is applied, an elastic pressure against the face of the bracket 4, and thus afford a suitable tension for the wheel 11, preventing it from moving unduly when actuated by the pawl 14, and securing a firm, regular revolution. Any suitable number of the cavities 16, with their filling of material 17, may be employed, according to the wish of the manufacturer. Upon one side of the bracket 4 is formed the ear 18, to which the lever 15 is pivoted, and upon the upper edge of which is cut a slot, 19, as shown in dotted lines in Figs. 1 and 4, in which slot moves a pin, 20, secured upon the lever for the purpose of controlling the extent of movement of the latter. The lever 15 has the upwardly and downwardly extended arms 21 and 22, in the upper end of the former of which is pivoted the pawl 14, supplied with the detent 23 and the extension 24'.

The pawl 14 may be thrown from contact with the ratchet 13, as indicated in dotted lines in Fig. 1, and its extension 24' is of great importance, since when the lever 15 is depressed by the needle-bar of the sewing-machine the extension will rest upon the teeth 13 and preserve the detent 23 from contact therewith; but when said lever 15 is elevated by the movement of the needle-bar the extension will slide over the teeth of the ratchet 13 until the detent 23 reaches the teeth of the ratchet almost centrally over the screw 10, whereby the ratchet 13 will be rotated a distance of about one tooth, notwithstanding the extent of the movement of the needle-bar and lever 15. If the extension 24' were omitted from the pawl 14, it is probable that the detent would engage the tooth ahead of that intended to be acted upon, and, if so, would rotate the wheel 11, with its cam and ratchet, the distance of at least two of the teeth, and thus destroy the functions of the wheel. The purpose of the lower arm, 22, of the lever 15 will be described hereinafter in connection with the devices which are actuated by it.

Upon the bed-plate 1 is arranged the plate 24, (see Fig. 8,) the forward portion of which constitutes the lower half of the cloth-clamp, and which has a horizontal pivotal movement upon the pin 25 when actuated by the cam 12 through the plate 6 and adjusting-screw 8, as hereinafter described. In the forward end of the plate 24 is cut the slot 26, which is of suitable dimensions to receive the downwardly-turned lips 27 on the upper half, 28, of the cloth-clamp, and at the longitudinal center of the plate 24 is cut the elongated slot 29, whereby the said plate is permitted to have a forward and backward movement on the plate 1 without obstruction from the pin 25. At one side of the slot 29 the plate 24 is provided

with a slot, 30, which encompasses the pin 31, and the walls of which, by coming in contact with said pin, prevent any undue lateral movement of the plate 24. In the rear portion of the plate 24 is cut the longitudinal slot 32, which is centrally below the slot 7 in the transverse plate 6, and contains a follower, 33, in which is set the lower end of the adjusting-screw 8, the upper end of the screw being supplied with a suitable nut, 34. The rotation of the cam 12 operates to give the plate 6 a lateral reciprocating motion, as aforesaid, and this movement is communicated to the rear end of the plate 24 through the screw 8, whereby said plate has a horizontal pivotal movement. The purpose of said screw 8 is to adjust the point at which the plate 6 shall act upon the plate 24 to give it its proper movement. When the screw 8 is moved to the extreme rear end of the slot 7, as illustrated in Fig. 8, the force exerted upon the plate 24 will then be at the farthest point from the pivot or pin 25, and under this condition the forward end of the plate 24 will have the smallest lateral movement that can be imparted to it, and consequently the cloth in the clamp will be carried but a slight distance laterally across the needle-hole 2, and the stitches made by the sewing-needle will as a result be slight in length. When, however, the screw 8 is moved toward the opposite end of the slot 7—that is, toward the sewing-needle—it will be nearer to the pivot 25, and hence the plate 24 will be given a more extensive movement upon its pivot, and consequently the cloth will be carried a greater distance on each side of the needle-hole 2, and the stitches will under this condition be greater in length than when the adjusting-screw 8 is at the rear of the slot 7. The longitudinal adjustment of the screw 8 is permitted by the slot 32, which, in connection with slot 29, permits the plate 24 to move longitudinally upon the plate 1 without altering its lateral movement. Notwithstanding the longitudinal position of the plate 24 upon the plate 1, its lateral movement will remain the same, since the distance between the pivot 25 and the screw 8 will not vary except when the operator moves the same when it is desired to make button-holes having stitches greater or less in length. The lower end of the pin 25 moves in a transverse slot, 35, cut in the plate 1, while the upper end of said pin is held and moved positively. Hence, when said pin is moved either to one side or the other, it will change the fulcrum of the plate 24 and cause the formation of the opposite sides of the button-hole, as hereinafter explained.

Over the central portion of plate 24 is secured, by means of the legs 36, the bridge 37, upon opposite sides of the forward portion of which are the upwardly-turned lugs 38, upon the outer sides of which depend the lugs 39, formed on the plate 42 of the cloth-clamp, and through the said lugs 38 and 39 is passed a pin, 40, around which is coiled the spring 41, one end of which rests upon the bridge 37, while



the upper end impinges against the under surface of the plate, whereby said plate is given an upward tension. The forward portion of the plate 42 is formed into the arms 43 between lugs, at the extremities of which is pivoted the upper half, 28, of the cloth clamp, as illustrated in Figs. 1 and 2. Upon the forward part of the bridge 37 is rigidly affixed the post 44, which extends upward through a slot in the plate 42, and has pivoted upon its upper end the cam 45, having a suitable handle, which, when turned downward toward the rear, operates the cam to depress the plate 42, and at the same time the upper half, 28, is clamped upon the cloth placed between it and the forward end of the plate 24, whereby the cloth is securely held. When the handle of the cam 45 is elevated to the position illustrated in Fig. 1, the spring 41 will elevate the plate 42 and upper half, 28, of the cloth-clamp, at which time the goods may be withdrawn from the attachment.

Upon opposite sides and at about the center of the plate 1 are formed the ears or lugs 46, upon which are secured the depending lugs 47, supporting the frame 48. (See Fig. 6.) The lugs 47 have elongated apertures 49, through which screws pass into the plate 1, and the purpose of these apertures 49 is to permit the frame 48 to move a slight distance laterally without altering the position of the plate 1. The frame 48 approximates to the form of a circle in outline and has its center removed, forming a circular aperture, 50, in which is placed the upper reduced edges of the wheel 51, which, adjacent to the lower surface of the frame 48, has a circular line of teeth, 52, as indicated in Figs. 2, 6, and 9. The wheel 51 has a lateral movement upon the pin 25, which it carries, and the lower end of which projects into the elongated slot 35, formed in the plate 1, before described. In the lower surface of the wheel 51 is cut a cam groove, 53, consisting of the parts 54 and 55, both parts being in the arc of a circle, and the latter slightly larger than the former and connected with it by the inclined portions 56 at opposite sides of the cam, as shown in Fig. 9. When the wheel 51 is in position in the frame 48, as indicated in Fig. 6, the cam-groove 53 will be over the friction-roll 57, and during the rotation of said wheel 51 it will be affected as to its lateral movement by the fact of its cam 53 traveling over said friction-roll. The friction-roll 57 is stationary and will move the wheel 51 and frame 48 laterally, according to the formation of the parts of the cam.

Between the wheel 51 and the plate 24 is placed a washer, 58, consisting of thin metal having a hole at its center through which the pin 25 may pass, and an aperture to one side thereof to permit of its being placed over the friction-roll 57. Upon one side of the frame 48 is formed a lug, 59, to the under side of which is pivoted the lever 60, the short end 61 of which terminates in a sleeve, 62, in which is placed an adjusting-screw, 63, the point of

which terminates adjacent to the lug 47 of the frame 48. The other or longer end of the lever 60 passes in the arc of a circle upon the rear portion of the wheel 51 and transversely across the attachment, terminating in a handle, 64, and squared shoulder or heel 75, the latter being in a suitable position to be acted upon by the arm 22 of the lever 15 when the attachment is in use.

Upon the handle end of the lever 60, and in line with the heel 75, is pivoted the pawl or detent 65, adjacent to which is secured upon a pin or screw the spring 66, one end of which is in contact with the pawl 65, while the other end is in contact with the pin 68, secured on the pawl 69. The effect upon the pawl 69 of the spring 66 is to retain it in contact with the teeth of the ratchet 52, and to prevent during the movement toward the rear of the lever 60 any reversal in the movement of the ratchet 52. The ratchet is given its rotary movement by means of the pawl 65 during the forward movement of the handle end of the lever 60, the said ratchet being stationary at all other times.

The movement of the lever 60 may be regulated at will by adjusting the screw 63 either toward or from the lug 47.

It will appear obvious that by adjusting the screw 63 toward the lug 47 the lever will be capable of having a smaller sweep or movement than it would have were the screw moved from the lug 47. By restricting the movement of the smaller end 61 of the lever 60 its other end is likewise controlled. The regulation of the movement of the lever 60 controls the extent of the rotation of the ratchet 52 on the wheel 51, whereby said ratchet may be caused to rotate the length of one, two, or more of its teeth with the forward throw of the lever 60, according as the screw 63 is adjusted toward or from the lug 47. The adjustment of the lever 60, and the consequent regulation of the rotation of the ratchet 52 on the wheel 51, is of great importance, since by it the distance between the stitches of the button hole is controlled, as hereinafter explained.

The teeth of the ratchet 52 may be of any suitable size, and their size will regulate in part the character of the button-hole produced. For small button-holes the teeth will preferably be fine. Any suitable number of teeth may be employed according to the size of the button-holes to be sewed.

In the upper surface of the wheel 51 is formed the T-groove 70, which extends from a point adjacent to the pin 25 to the periphery of the wheel. Within the groove 70 is placed the screw 71, which has a head conforming to the contour of the groove and adapted to slide freely therein. The screw 71 passes upward through an aperture in the forward end of the arm 72, and is provided with a nut, 73, by which it may be secured in any set position in the groove 70. (See Figs. 4 and 8.) The adjustment of the screw in the



groove 70 regulates the distance the plate 24 and bridge 37, carrying the upper half of the cloth-clamp, shall travel forward and rearward upon the plate 1, and consequently regulates the length of the button-hole formed in the fabric. The arm 72 is pivoted at its rear end to the bridge 37, as shown in Figs. 4 and 5, and its front end moves with the screw 71, and is provided with an index end, 76, which denotes on the front edge of the slot 74 the center of the screw 71. When the screw 71 has been adjusted in any set position in the groove 70, and the wheel 51 is rotated by the ratchet 52 and pawl 65, the nut 73 will retain the screw in such position, and consequently as the wheel rotates, said screw will travel in the line of a circle, and will move laterally within the segmental slot 74, formed in the transverse center of the bridge 37. The extent of the movement of the nut 73 in the slot 74 will vary with the distance the screw 71 is adjusted from the center of the wheel 51. When the screw 71 is set in the inner end of the groove 70, the smallest button-hole will be produced, and the nut 73 will have the minimum extent of movement in the slot 74, and as the screw 71 is adjusted in the groove 70 toward the periphery of the wheel 51 the size of the button-hole produced will be increased, and the movement of the nut 73 in the slot 74 will be proportionately extended.

Upon the rotation of the wheel 51 the nut 73 is carried against the front and rear walls of the slot 74, and operates to force the bridge 37 and plate 24 either forward or rearward a distance equal to twice the radius from the center pin, 25, to the screw 71, and this distance is the length of the button-hole that will be produced. A series of figures may be placed on the front edge of the slot 74, as shown in Fig. 14, as a guide to the operator in adjusting the screw 71 for producing a button-hole of the desired size—for instance, (the figures being one-eighth of an inch apart, and the figure 4, which denotes four-eighths, being at each side of and equally distant from the longitudinal center of the slot 74,) when the groove 70 is in a transverse position to the length of the attachment and the index-point 76 is on the figure 4, it will denote that a button-hole an inch long will be made, since the figures will indicate that it is one-half of an inch from the center pin, 25, to the screw 71. This is one-half of the length of the longitudinal movement of the cloth-clamp.

In the operation of forming the button-hole the cloth is placed over the front end of the plate 24 and the upper half of the clamp 28 closed down upon it by the operation of the cam 45. The attachment is applied over the shuttle-race of the sewing-machine, and the shank of the needle-screw is inclosed in the bifurcated extremity of the lever 15. Upon the sewing-machine being set in motion the lever 15 will be actuated and will cause, through its pawl 14 and the ratchet 13, the revolution of the wheel 11 and cam 12, as hereinbefore de-

scribed, the result being that the cam 12 will act upon the plate 6 to cause a horizontal lateral movement of the plate 24 upon the pin 25, whereby, as aforesaid, the cloth is moved laterally over the needle-hole 2, in order that the needle may enter the goods at points separated from each other, and this is the prime object of giving the plate 24 its pivotal movement aforesaid. During the horizontal pivotal movement of the plate 24, carrying the goods laterally across the needle-hole 2, the arm 22 of the lever 15 at each upward stroke of said lever comes in contact with the heel 75 of the lever 60 and causes the rotation of the ratchet 52, forming a part of the disk or wheel 51. The revolution of the wheel 51 causes, through the screw 71, groove 70, and nut 73, a longitudinal sliding movement of the plate 24 and bridge 37, carrying the goods forward or rearward in position to be acted upon by the sewing-needle. The revolution of the wheel 51, in connection with the stationary friction-roll 57 in the cam 53, also operates to shift the frame 48 laterally at the completion of each half of the button-hole sewed, and the shifting of the frame 48 moves at the same time the plate 24 and bridge 37 and intermediate devices. The shifting of the frame 48 is permitted by the elongated slots 49 and by the slot 35, formed in the plate 1. The lateral movement of the frame 48 occurs at the moment when the wheel 57 has traveled a sufficient distance to bring the inclined portions 56 of its cam 53 in contact with the friction-roll 57. After the smaller part, 54, of the cam 53 has traveled over the roll 57, and the said roll enters the larger part, 55, of the cam, the said cam, and through it the frame 48, will be moved a short distance outward in the direction of the said larger part of the cam, and the reverse of this is true when the friction-roll 57 enters the smaller part, 54, of the cam. Thus as the wheel 51 is rotated it and the frame 48 will be moved a short distance, first to one side and then to the other, at different intervals, and since the parts of the cam 54 and 55 are equally divided in length these intervals will be after the wheel 51 has made one-half of a revolution and at the time the sewing-needle has reached the ends of the button-hole, whereby after one side of the button-hole has been sewed during the forward movement of the bridge 37 and plate 24 the cam 53 causes the frame 48 to shift its position, and at this time, the rotation of the wheel 51 continuing, the plate 24 will move in a reverse direction to that above described, whereby the other half of the button-hole will be formed.

The length of the button-hole will be regulated, as aforesaid, by adjusting the screw 71 in the groove 70. The distance between the stitches of the button-hole will be controlled by adjusting the screw 63 on the short end of the lever 60, and the length of the stitches may be regulated at will by adjusting the screw 8 in the slot 7.

Upon the disengagement of the pawl 14 from



the ratchet 13 and the working of the lever 60 and ratchet 65, the cloth-clamp will be moved directly forward on one side of the button-hole, making straight stitches, as shown in Fig. 13, and then shift and move directly rearward on the other side thereof. At any time, if during the sewing of a button hole the thread has become broken, it will be found an easy matter to stop the sewing-needle and cause (by working the lever 60 by hand) the movement of the goods until the part where the thread was broken has come over the needle-hole 2, at which time the sewing of the button-hole may be continued. When the attachment is operated in the regular manner—that is, by the lever 15 from the needle-bar of the machine without the pawl 14 being in contact with the ratchet 13—straight stitches will be formed, as above specified, and shown in Fig. 13, and when the pawl 14 engages the ratchet 13 the diagonal style of stitch will be produced, as shown by diagram view, Fig. 10. The horizontal lateral movement of the plate 24 is caused by the rotation of the wheel 11 from the pawl 14, and hence it is plain that this movement may be pursued independently of or conjointly with the longitudinal movement of said plate; and it is likewise true that the plate 24 may be moved longitudinally without regard to its lateral movement.

It will be observed upon reference to Figs. 10 to 13, inclusive, that the spaces between the stitches gradually narrow toward the ends of the button-hole; and this is a matter of importance, since by thus forming them the ends of the button-hole are made very strong, and are able to resist the strain upon them when in use without losing their shape. This formation of the button-hole stitches is due to the fact that the plate 24 and bridge 37 move less rapidly while the stitches toward the end of the button-hole are being sewed.

It will be remembered that the longitudinal movement of the plate 24 and bridge 37 is due to the revolution of the wheel 51, carrying the set-screw 71, the latter moving in the segmental slot 74 of the bridge. When during the rotation of the wheel 51 the screw 71 is approaching or leaving the longitudinal center of the slot 74, it will move the bridge less rapidly than when it is at the ends of the slot, and thus at these times the cloth will be moved less rapidly, and the machine will have opportunity to make an increased number of stitches in a given length of the goods. When the screw 71 is in the ends of the slot 74, the leverage between the screw and the center of the wheel 51 will have its greatest sweep against the bridge, and as the screw approaches the center of the slot this effect is gradually lessened.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. In a button-hole attachment for sewing-machines, the bed-plate, longitudinal plate 24, having at its rear end slot 32, cloth-clamp, transverse plate 6, having slot 7, screw 8,

passing downward through slots 7 and 32, and the friction-roll 9, in combination with the cam 12, ratchet 13, secured to said cam, and pawl 14, actuated from the needle-bar of the sewing-machine, substantially as set forth.

2. The actuating-lever 15, having the arm 21, to which is pivoted the pawl 14, provided with a detent, 23, and extension 24', in combination with the ratchet-wheel 13, cam 12, plate 24, cloth-carrying clamp, and intermediate mechanism between the cam and the plate, substantially as set forth.

3. In a button-hole attachment for sewing-machines, the cloth-carrying clamp, the plate 24, retained upon a pin, 25, and having a longitudinal slot, 32, in combination with the transverse plate 6, having a slot, 7, and adjusting-screw 8, and intermediate mechanism for communicating a transverse reciprocating motion to the plate 6 from the needle-bar, substantially as set forth.

4. In a button-hole attachment for sewing-machines, the wheel 11, having the cam 12 and ratchet 13, and having cavities containing packing 17, in combination with the bracket 4, transverse plate 6, adapted to be actuated by the cam 12, the cloth-carrying clamp, and the plate 24, connected at its rear end with the plate 6, substantially as set forth.

5. In a button-hole attachment for sewing-machines, the operating-lever 15, pawl 14, wheel 11, carrying the cam 12 and ratchet 13, in combination with the plate 24, the cloth-carrying clamp, and intermediate mechanism between said cam and the plate 24, whereby the latter is actuated, substantially as set forth.

6. In a button-hole attachment for sewing-machines, the cloth-carrying clamp, in combination with the rotating wheel 51, having around its upper peripheral edge an annular recess, the shifting frame 48, inclosing the wheel and fitting within said recess, the cam-groove 53, formed in the under side of said wheel concentric with the pivot on which it turns, and consisting of the connected parts 54 and 55, differing from each other in size, and each constituting about one-half of the cam-groove, and the fixed roll 57, substantially as and for the purposes set forth.

7. In a button-hole attachment for sewing-machines, the bed-plate and cloth-clamp, in combination with the substantially-circular shifting frame 48, the wheel 51, having a recess around its upper peripheral edge to receive said frame, and ratchet-teeth 52 on its periphery beneath the frame, the cam-groove 53, formed on the under side of the wheel 51, concentric with the pivot on which it turns, and consisting of the connected parts 54 and 55, differing from each other in size, and each constituting about one-half of the cam-groove, the roll 57, and pawl 65, substantially as and for the purposes set forth.

8. In a button-hole attachment for sewing-machines, the cloth-clamp, in combination with the shifting frame 48, wheel 51, carrying the cam and ratchet, and the pivoted lever 60,



provided at one end with the pawl 65 and at its other end with the adjusting-screw 63, substantially as and for the purpose set forth.

9. In a button-hole attachment for sewing-machines, the cloth-clamp, in combination with the pivoted lever 60, adjusting-screw 63, pawls 65 and 69, the wheel 51, mounted in the shifting frame 48 and carrying the pin 25, cam 53, and ratchet 52, the lower end of the pin 25 being inclosed in a transverse slot cut in the plate 1, substantially as set forth.

10. The plate 24, having a horizontal pivotal movement, and the cloth-clamp, in combination with the shifting frame 48, wheel 51, having the cam 53 and ratchet-wheel 52, the pivoted lever 60, carrying the adjusting-screw 63 and pawl 65, the stationary friction-roll 57, and pin 25, the lower end of which terminates in a transverse slot, 35, formed in the plate 1, substantially as set forth.

11. In a button-hole attachment for sewing-machines, the cloth-clamp having a lateral pivotal movement, and the bridge 37, forming a rigid part of said clamp and provided with the transverse curved slot 74, in combination with the rotating and laterally-shifting wheel 51, provided on its upper face with the undercut radial groove 70, and the screw 71, extending from said groove upward through and being adjustable in the said slot 74, and having the nut 73, substantially as and for the purposes set forth.

12. The plate 24, the cloth-carrying clamp, and bridge 37, having the slot 74, in combination with the rotating wheel 51, having the guide-slot 70 and adjusting-screw 71, and the

arm 72, the forward end of which is carried by the screw 71, substantially as set forth.

13. In a button-hole attachment for sewing-machines, the cloth-carrying clamp, the bridge 37, having a slot, 74, the wheel 51, carrying a pin, 71, which has a movement in said slot, and the arm 72, having an index-point and connected with the pin 71, suitable indicating characters being arranged adjacent to the slot and in proper relation to said index-point, substantially as set forth.

14. In a button-hole attachment for sewing-machines, the cloth-carrying clamp, the lever 15, having arms 21 and 22, and pawl 14, in combination with the ratchet-and-cam mechanism for giving the cloth-clamp a lateral pivotal movement, and pawl-and-ratchet mechanism for giving the clamp a longitudinal movement, substantially as set forth.

15. In a button-hole attachment for sewing-machines, the bed-plate, the cloth-carrying clamp, the lever 15, having arms 21 and 22, and pawl 14, in combination with the ratchet-and-cam mechanism for giving the cloth-clamp a lateral pivotal movement, pawl-and-ratchet mechanism for giving the clamp a longitudinal movement, and ratchet-and-cam mechanism for shifting the clamp laterally, substantially as set forth.

Signed at New York, in the county of New York and State of New York, this 9th day of September, A. D. 1884.

JOSEPH R. HEBERT.

Witnesses:

CHAS. C. GILL,  
HERMAN GUSTOW.