

(No Model.)

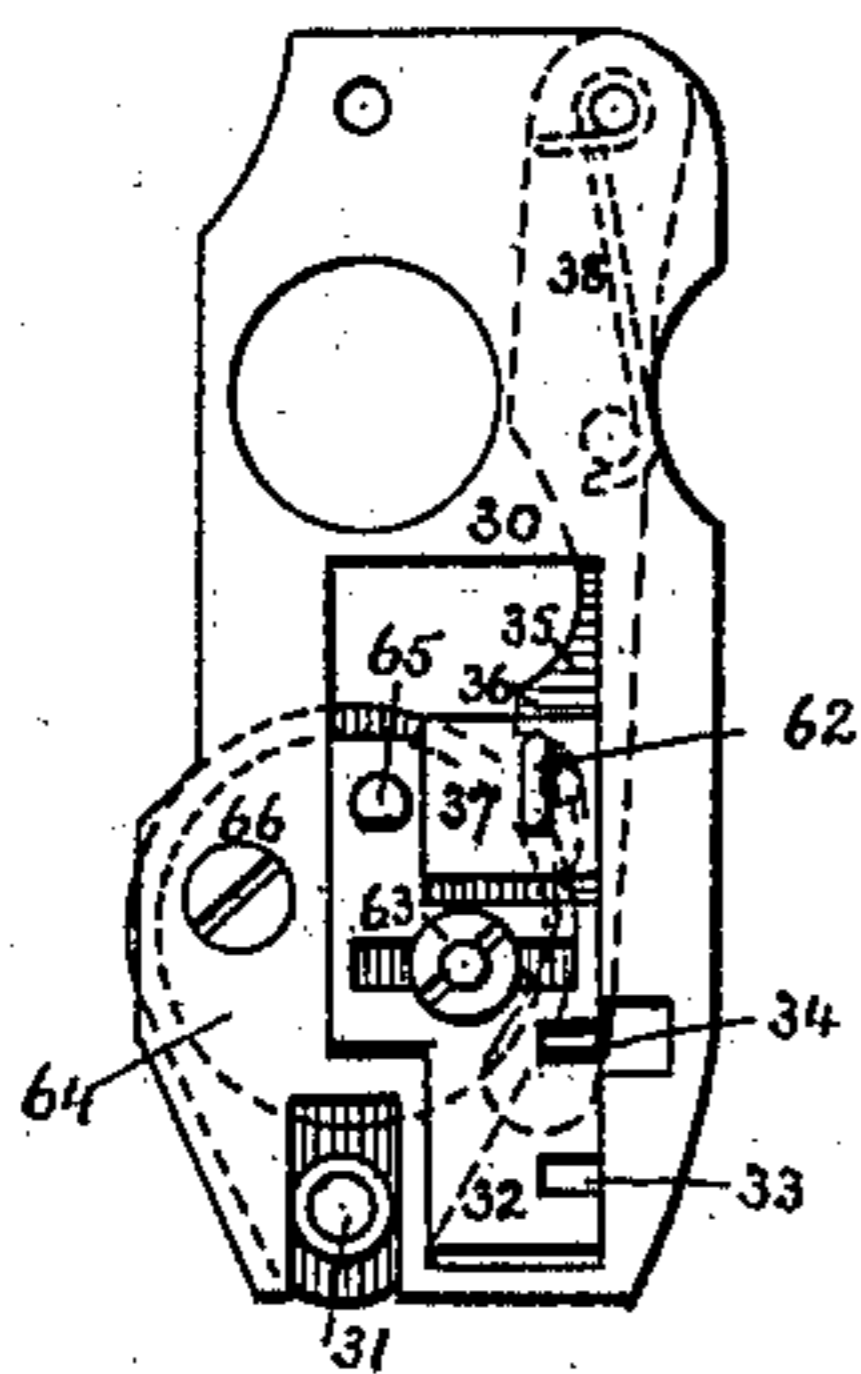
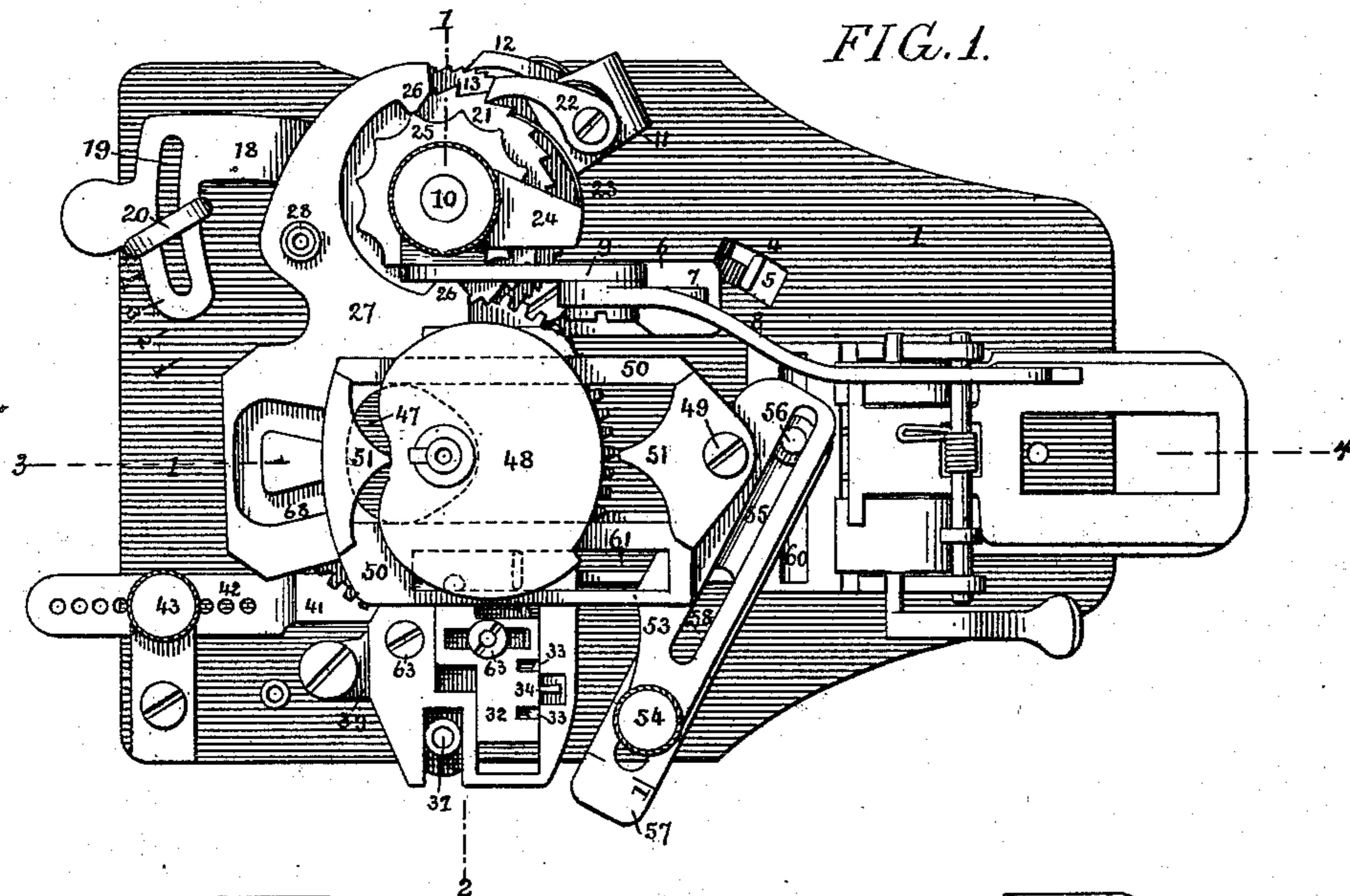
4 Sheets—Sheet 1.

W. WALLICK.

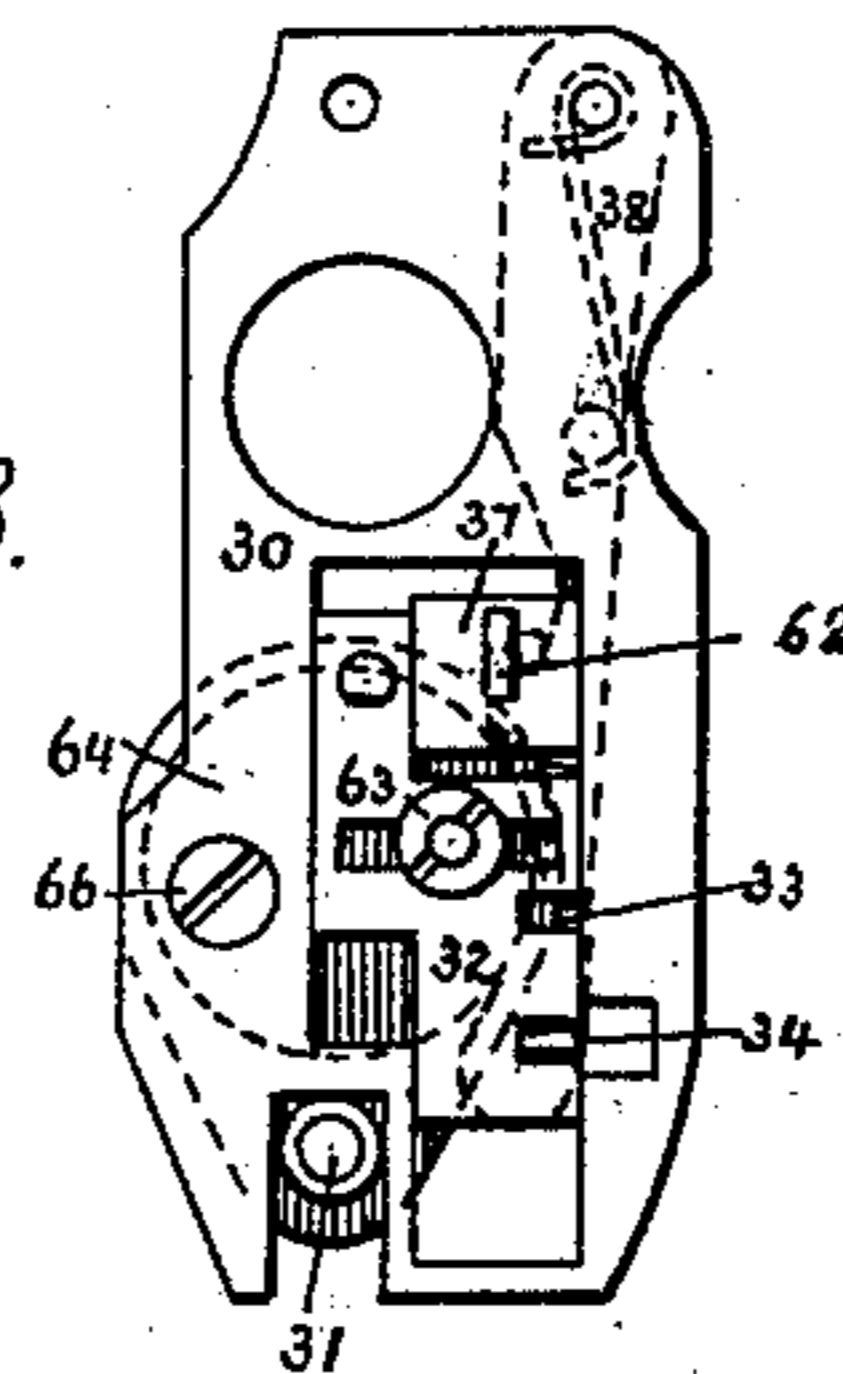
BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 406,799.

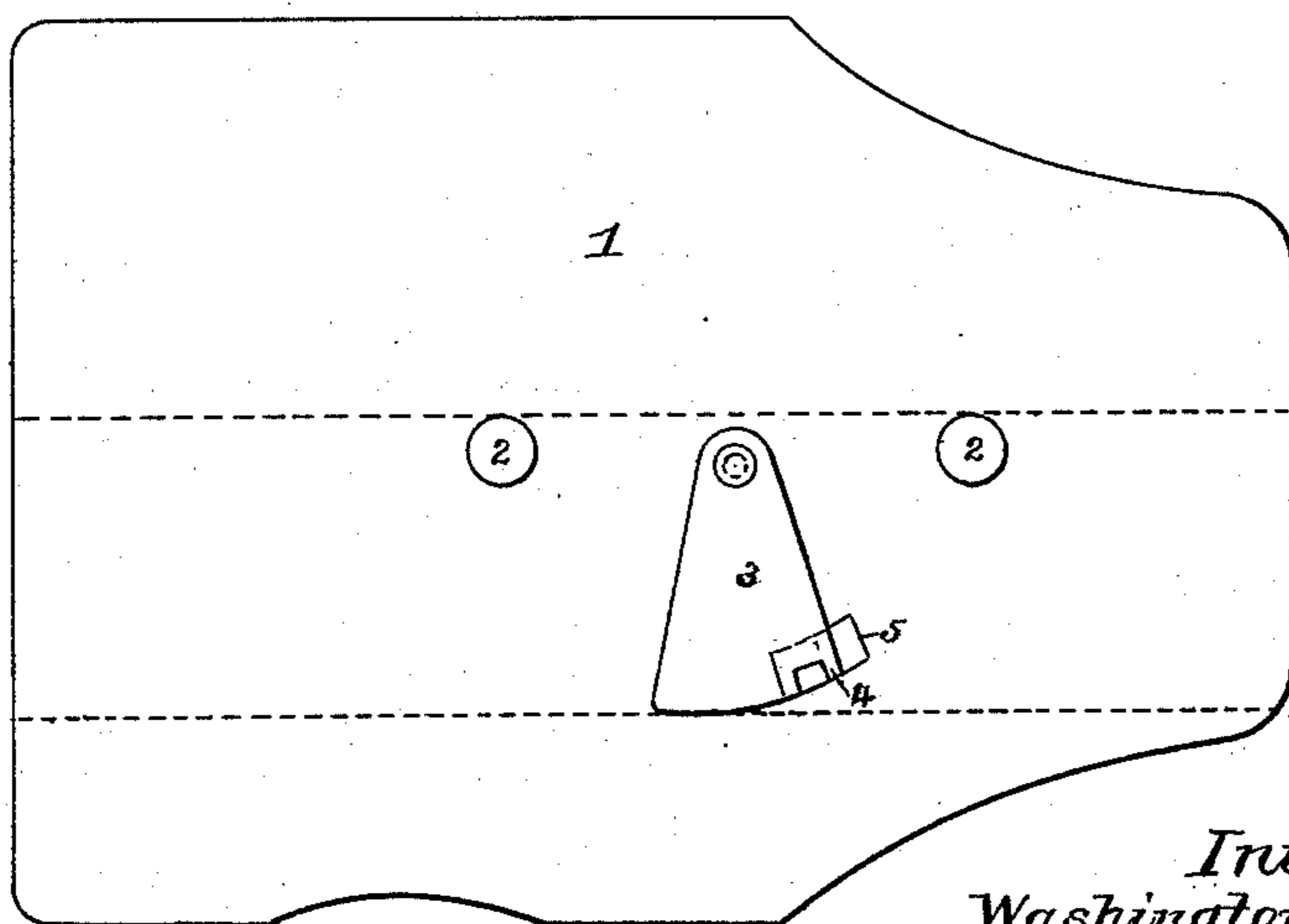
Patented July 9, 1889.



*FIG. 8.*



*FIG. 5.*



Witnesses:

*Alex. Barkoff*  
*David S. Williams*

*Inventor:*  
*Washington Wallick*  
*by his Attorneys*

*Hawson & Hawson*

(No Model.)

4 Sheets—Sheet 2.

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BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 406,799.

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FIG. 4

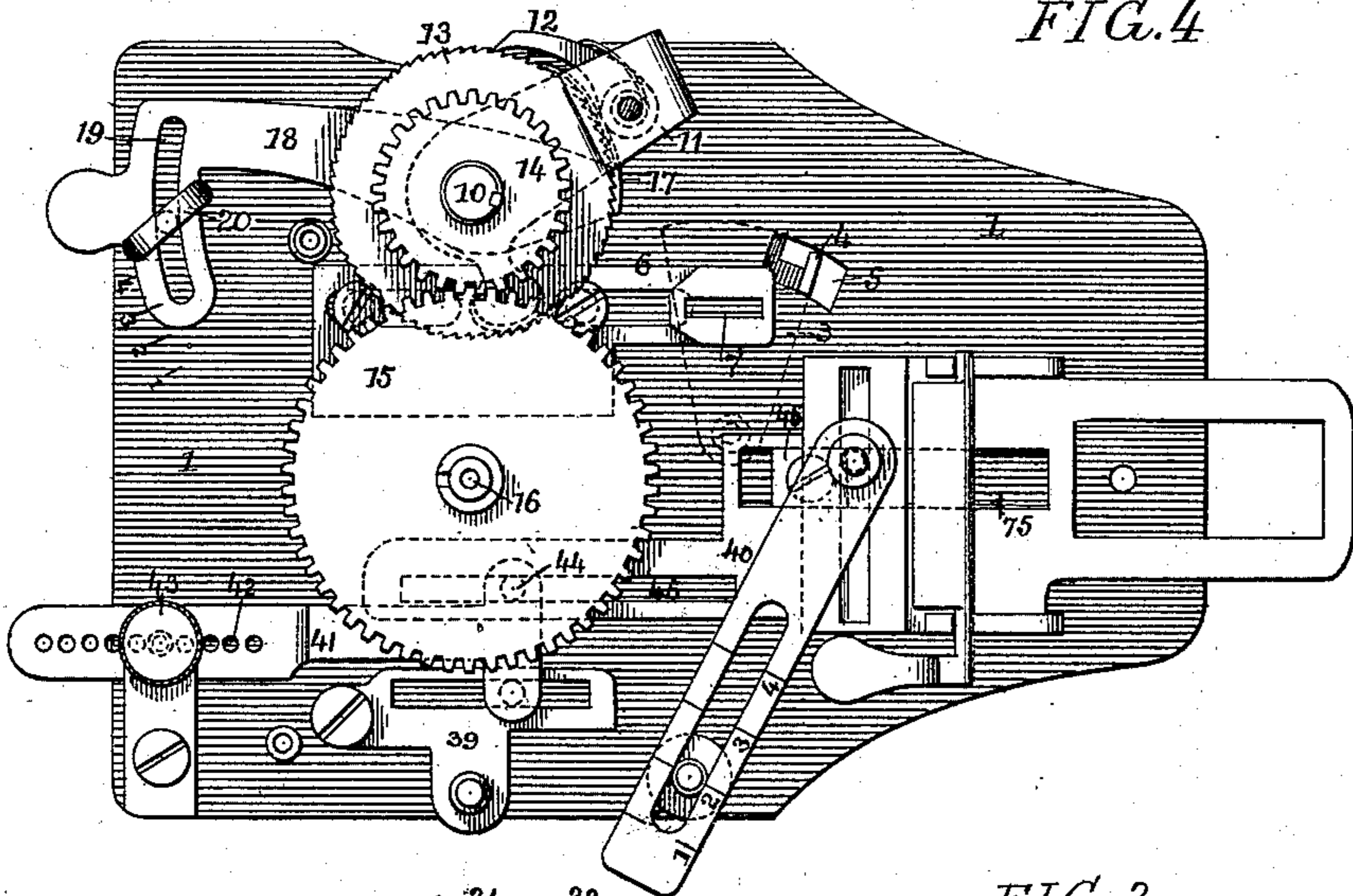


FIG. 3

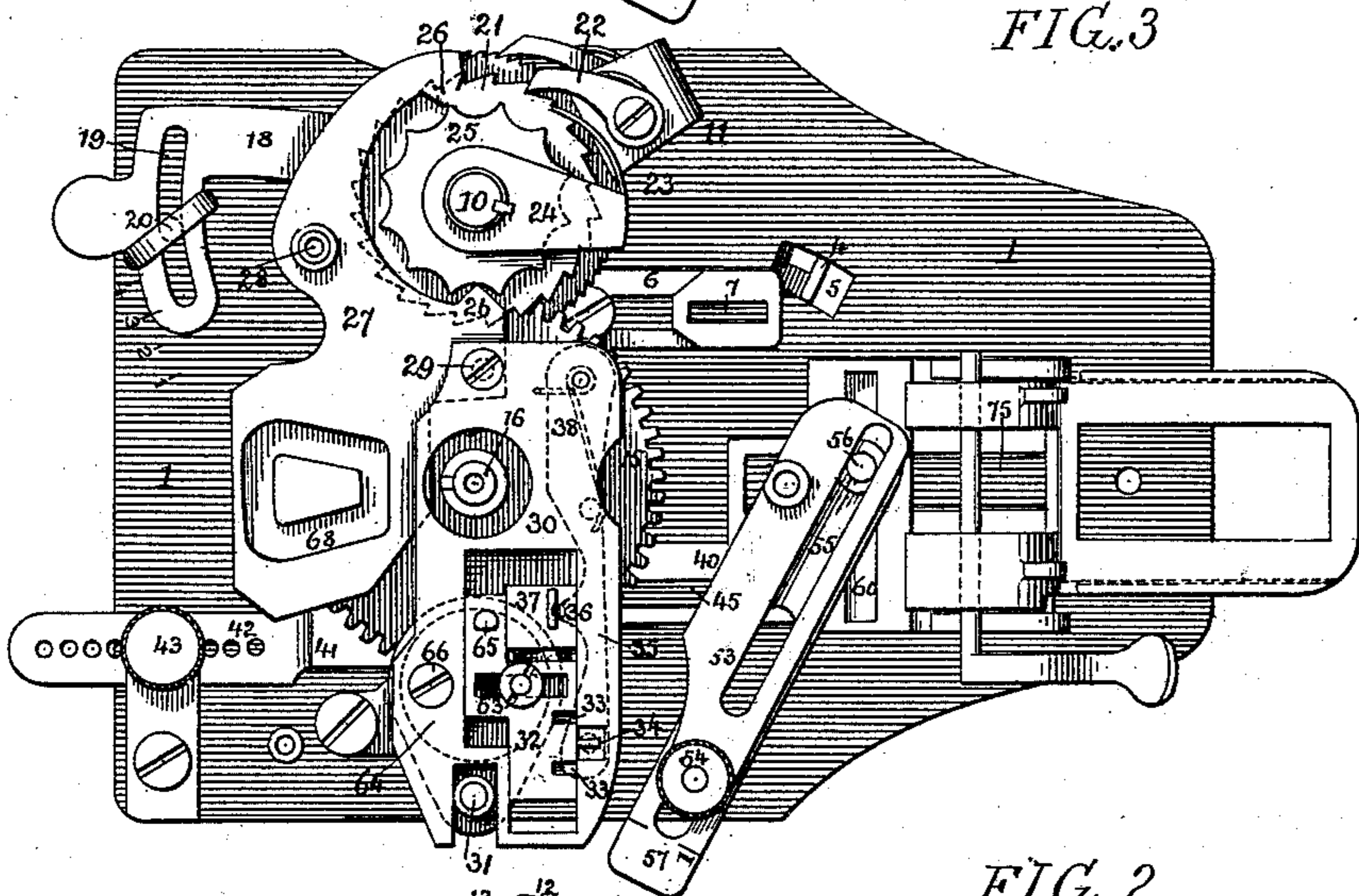
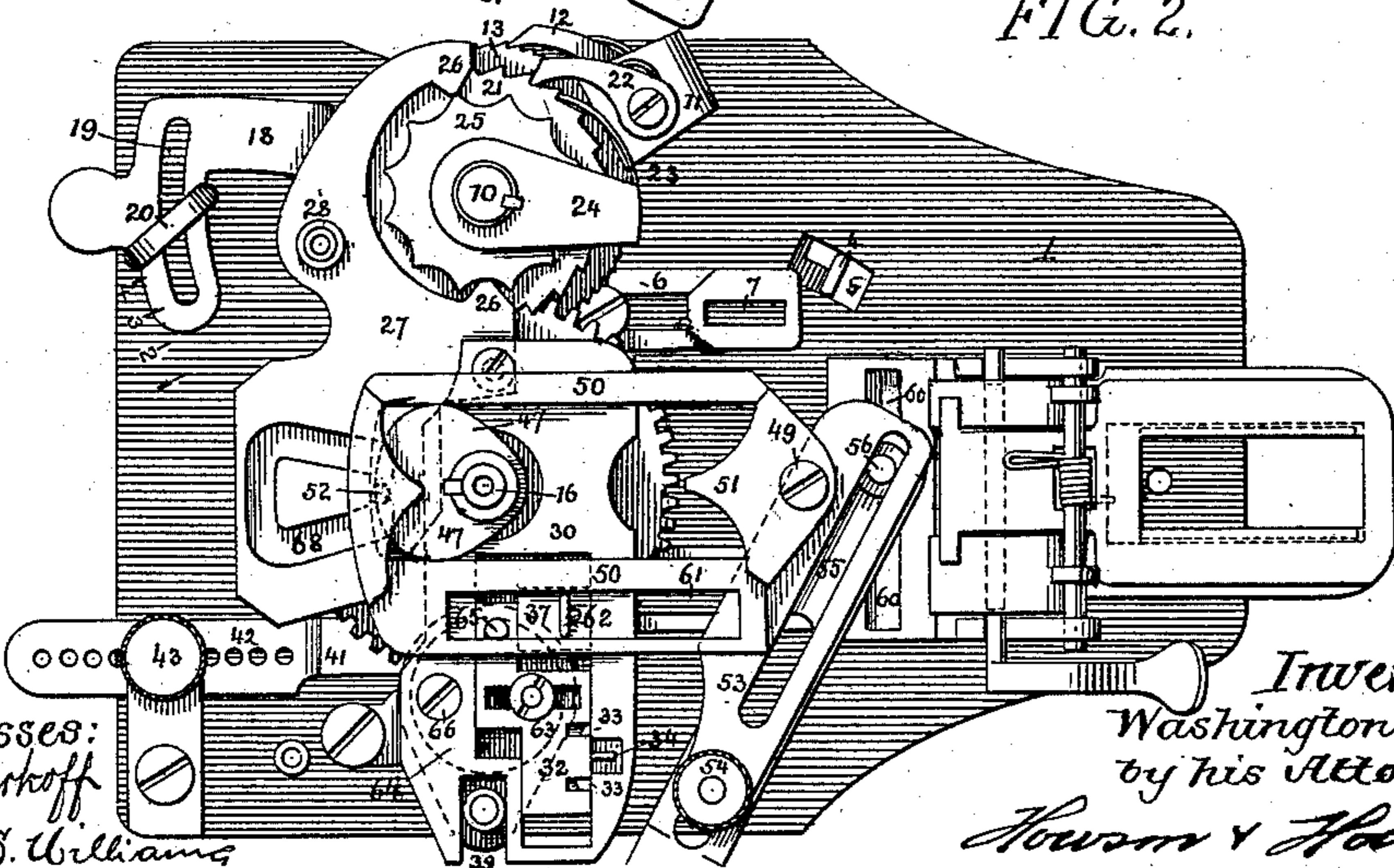


FIG. 2



Witnesses:  
Alley Barkoff  
David S. Williams

Inventor:  
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(No Model.)

4 Sheets—Sheet 3.

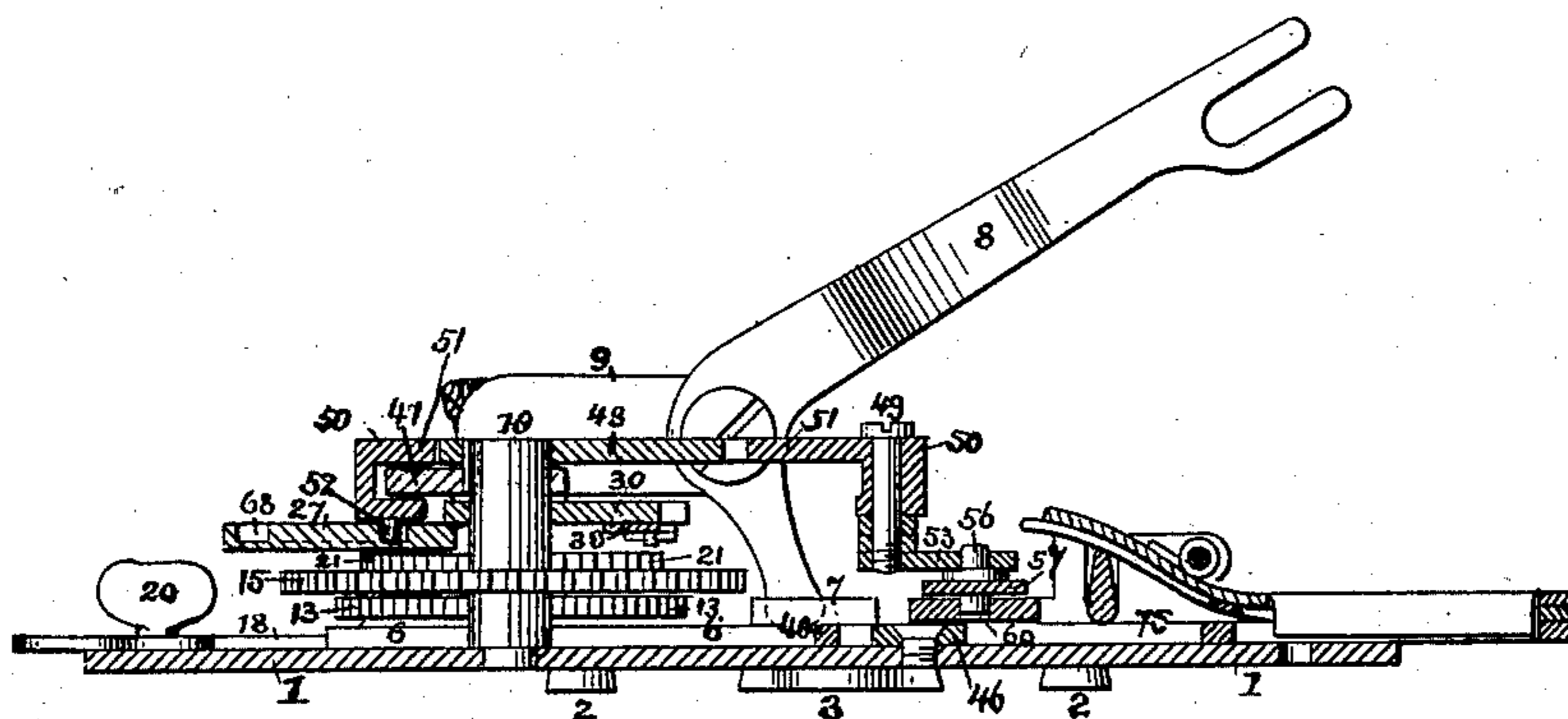
W. WALLICK.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 406,799.

Patented July 9, 1889.

FIG. 5½.



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Alex. Barkoff  
John E. Parker.

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Howson & Howson

(No Model.)

4 Sheets—Sheet 4.

W. WALLICK.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 406,799.

Patented July 9, 1889.

FIG. 6.

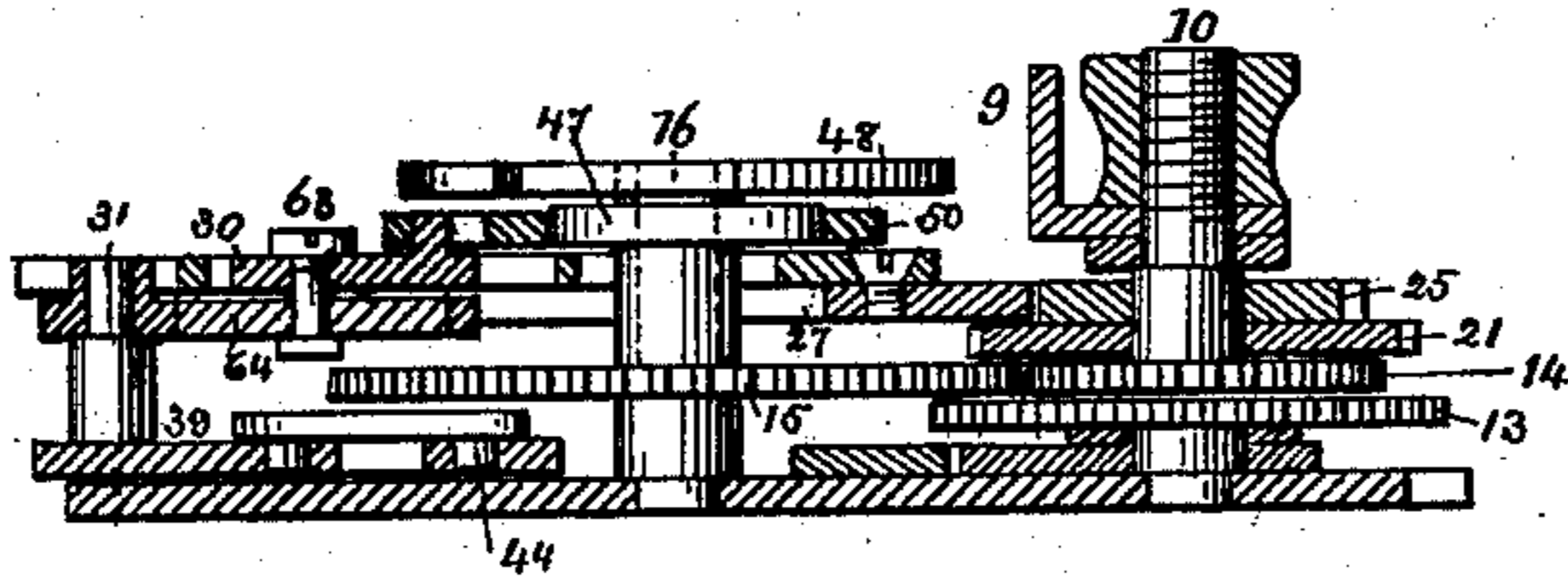


FIG. 9.

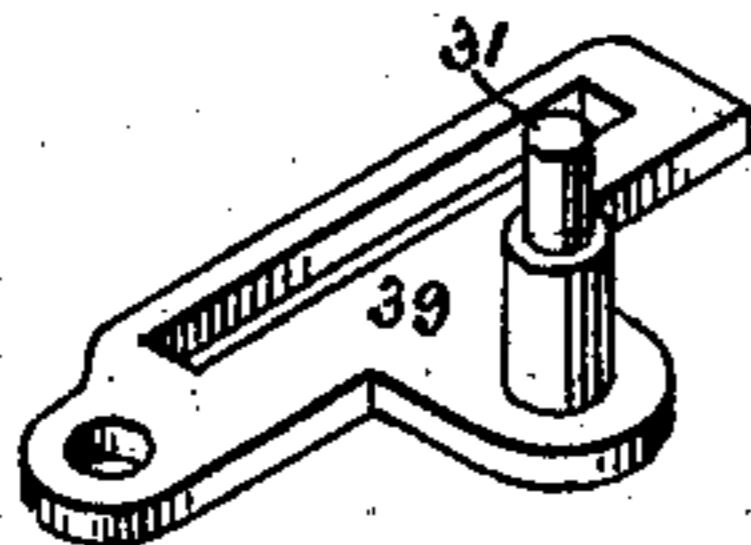


FIG. 10.

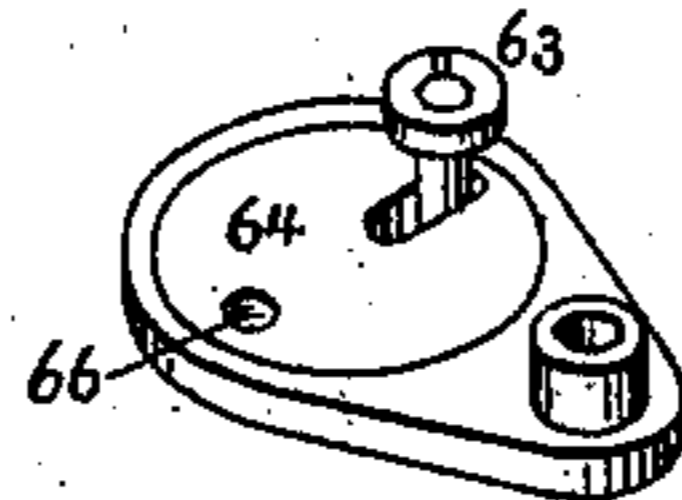


FIG. 12.

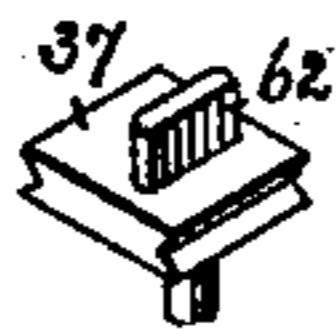


FIG. 11.

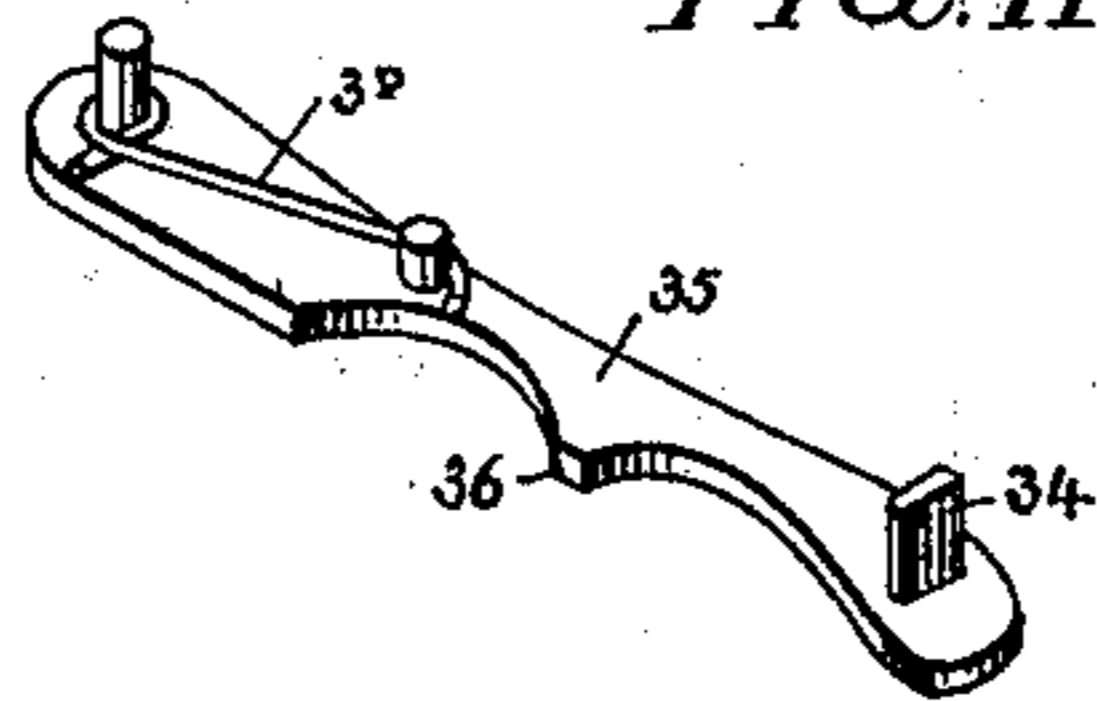


FIG. 13.

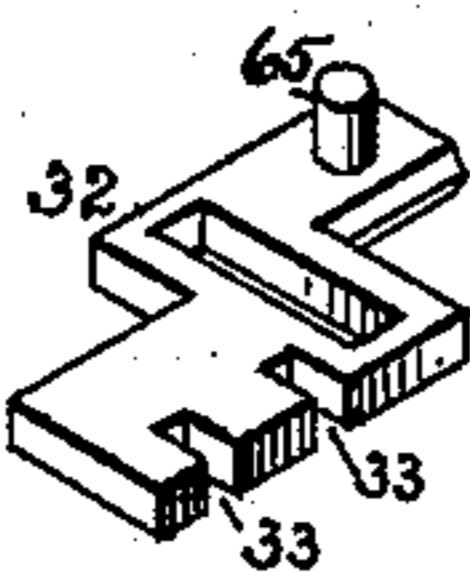


FIG. 14.

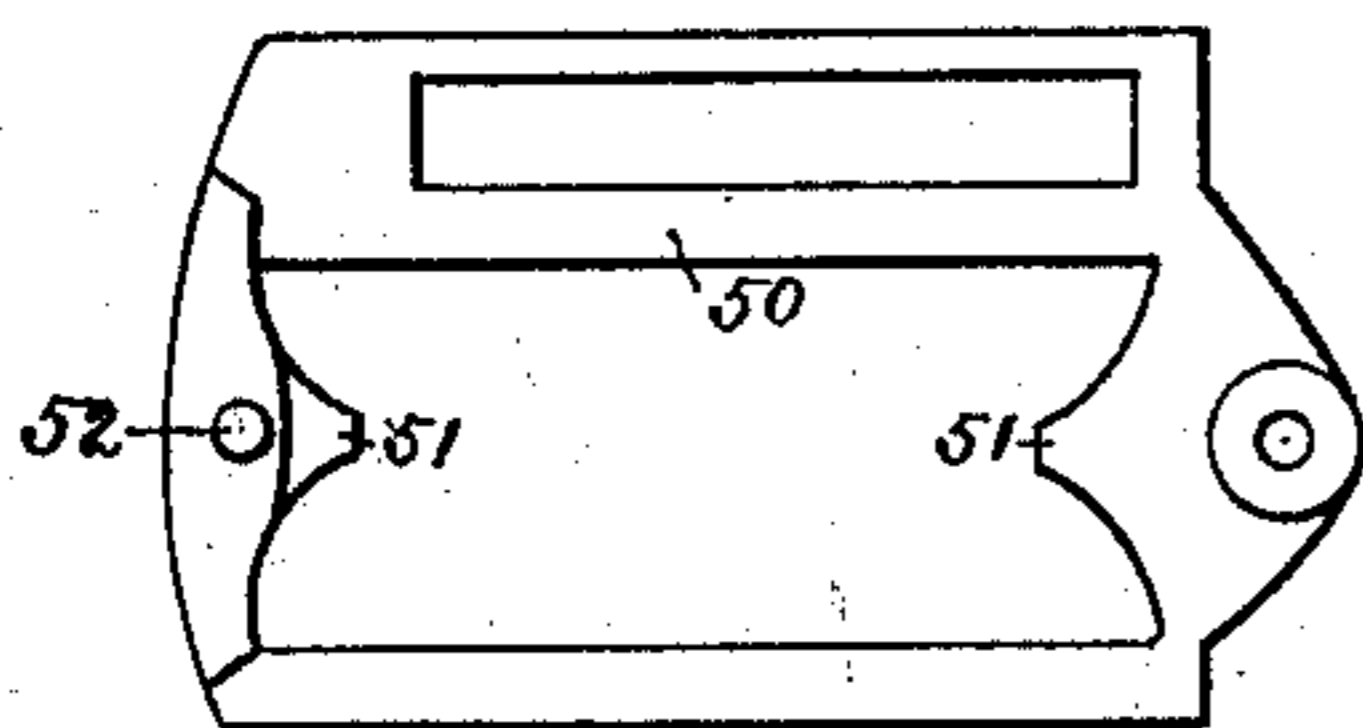
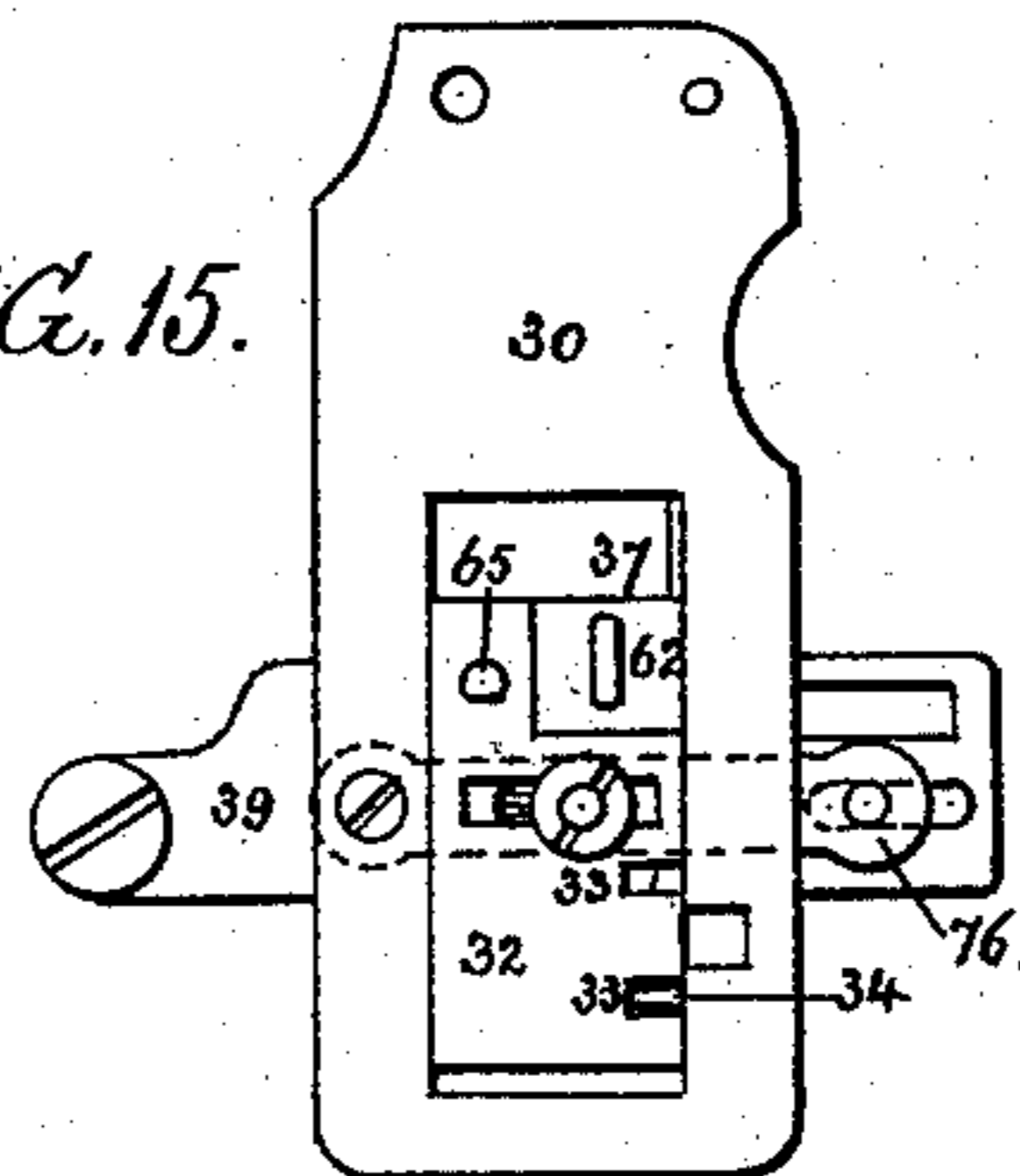


FIG. 15.



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Alex. Bartoff,  
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Inventor:  
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by his Attorneys  
Horsman & Horsman

# UNITED STATES PATENT OFFICE.

WASHINGTON WALLICK, OF PHILADELPHIA, PENNSYLVANIA.

## BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 406,799, dated July 9, 1889.

Application filed January 28, 1888. Serial No. 262,198. (No model.)

*To all whom it may concern:*

Be it known that I, WASHINGTON WALLICK, a citizen of the United States, and a resident of Philadelphia, Pennsylvania, have invented certain Improvements in Button-Hole Attachments for Sewing-Machines, of which the following is a specification.

My invention relates to a sewing-machine attachment for the automatic sewing of button-holes, the invention consisting of certain features, fully described hereinafter, whereby the formation of a continuous series of stitches around a button-hole of any ordinary size is effected, and whereby, also, the length and character of the stitches produced may be accurately regulated.

In the accompanying drawings, Figure 1 is a plan view of the sewing-machine attachment complete. Figs. 2, 3, and 4 are similar views showing various parts of the mechanism removed to more fully illustrate those beneath. Fig. 5 is an inverted view of the attachment. Fig. 5½ is a view of the attachment, partly in elevation and partly in longitudinal section, on the line 3 4, Fig. 1; Fig. 6, a transverse section on the line 1 2, Fig. 1; and Figs. 7 to 15 are detached views of parts of the mechanism.

The base-plate 1 of the machine has on the under side projecting binder-lugs 2, (see Fig. 5,) and pivoted to the under side of said base-plate, at a point midway between these lugs, is a swinging binder-cam 3, which has a lug 4, projecting up through a slot 5 in the base-plate, so that in adapting the attachment to the throat-plate slot of a sewing-machine work-plate the lugs 2 2 will bear against one edge of said throat-plate slot, and the cam-plate 3 can be adjusted so as to bear against the opposite edge of said slot at a point midway, or thereabout, between the bearings of the lugs 2, a three-point bearing being thus produced and the secure confinement of the attachment to the work-plate of the machine effected, irrespective of the width of the throat-plate slot in said work-plate or any irregularities in alignment of the opposite sides of the slot.

Suitably guided on the base-plate is a primary slide 6, having a slot 7, with which engages the short arm of the primary lever 8, Fig. 1, said lever being operated by a suitable

projection on the needle-bar of the machine, as usual, and being hung to a bracket 9, secured to a stud 10, projecting upward from the base-plate 1 of the attachment. To said stud is also hung a pawl-lever 11, the short arm of which engages with a recess in the slide 6, so that as said slide is reciprocated a vibrating movement will be imparted to the lever 11, and the pawl 12, carried by the long arm of said lever, will be caused to engage with the teeth of a ratchet-wheel 13, hung to the stud 10 and carrying a spur-wheel 14, which meshes into a spur-wheel 15, turning on a central stud 16 on the base-plate.

The extent of vibration of the pawl-lever 11 is always uniform; but the extent of movement of the ratchet-wheel 13 and spur-wheels 14 and 15 on each reciprocation of said lever may be governed by the adjustment of a cut-off plate 17, carried by a lever 18, hung to the stud 10, the long arm of this lever having a slot 19, through which passes the stem of a clamping or retaining screw 20, a pointer on the lever serving, in connection with a graduated scale on the base-plate, to indicate the proper adjustment of said lever.

Hung to the stud 10 is another ratchet-wheel 21, with which engages a pawl 22, also carried by the lever 11, the extent of movement imparted to the wheel 21 being governed by a fixed cut-off plate 23, carried by an arm 24, secured to the upper end of the stud 10, so that on each vibration of the lever 11 the wheel 21 will be moved to the extent of one tooth.

Secured to the ratchet-wheel 21 is a star-wheel 25, which acts upon the forks 26 of a vibrator-lever 27, hung to a stud 28 on the base-plate, the movement of the wheel 25 being such that when one fork is acted upon by a projection of the wheel the other fork will enter a recess in said wheel, a vibrating movement being thus imparted to the lever 27.

Hung to the vibrator-lever 27 by a pin 29 is a vibrator-plate 30, and guided in a slot in this vibrator-plate is a slide 32, which has notches 33 for the reception of a lug 34 on a locking-bolt 35, hung to the vibrator-plate and having a tongue 36, which may be acted upon by a projection on a trip-plate 37, so as to throw the lug 34 out of engagement with the notches 33, as shown in Figs. 1, 2, and 3, the lug being normally held in engagement

with one or other of said notches, however, by the action of a spring 38, so as to lock the slide 32 to the vibrator-plate.

A bolt 63 passes through and is adjustable laterally in a transverse slot in the slide 32 and a like slot in an eccentric 64, which is located beneath the vibrator-plate 30 and is hung thereto by a pin 66, the strap of said eccentric being connected to a pin 31 on a link 39, pivoted to the base-plate, as shown in Fig. 4.

Parallel slots 45 in the link and in the clamp-plate 40 receive pins 44 on a bar 41, which has a series of openings 42, any one of which may receive a pivot-pin 43, the clamp-carrying plate 40 being hung to a pivot-stud 46 on the base-plate of the attachment, which stud fits snugly in a longitudinal slot 75 in the clamp-plate, whereby the latter may be shifted longitudinally, or "traversed," as I term it, without interfering with its vibratory movement.

The movement of the vibrator-plate is, it will be observed, transmitted to the clamp-plate through the medium of the vibrator-slide 32, eccentric 64, link 39, and regulator 41; hence by adjusting the latter so as to carry its pins 44 nearer to or farther from the fulcrum of the clamp-plate the extent of the short and rapid vibratory movements of the latter, which I call the "stitch-vibrations," can be readily and accurately governed and the size of the stitches thus regulated.

Secured to the hub of the spur-wheel 15 are two cams 47 and 48, which I term, respectively, the "shifter-cam" and the "traverse-cam," and both of these cams act upon a shifter-frame 50, the cam 47 acting upon the opposite side bars of said frame to effect lateral movement of the same, and the cam 48 acting upon opposite projections 51 on the frame to impart a longitudinal movement thereto, this longitudinal or traverse movement being for the purpose of determining the length of the button-hole, and the lateral movement being for the purpose of carrying the stitches across and around the ends of the button-hole, which movement I term the "side-to-side vibration."

The frame 50 is hung by a pin 49 to an arm 53, which I term the "traverse-arm," said arm being pivoted to a stud 54 on the base-plate and having a slot 55, which receives a pin 56, projecting from a traverse-regulating bar 57, said bar having a slot 58 for the reception of the pivot-stud of the arm 53, whereby the bar can be adjusted longitudinally in respect to the pivot of said arm.

The pin 56 of the bar 57 also enters a transverse slot 60 in the clamp-plate 40; hence it will be seen that by longitudinally adjusting said bar 57, and thus shifting the pin 56 of the same nearer to or farther from the fulcrum of the arm 53, the extent of longitudinal or traverse movement imparted to the clamp-plate can be readily governed to suit the length of button-hole to be sewed, the bar 57 being provided with a graduated scale, as shown in Fig. 4, to facilitate the proper adjustment of the same.

It will thus be seen that the scale on the traverse-regulating bar 57 determines the length of button-hole, while the scale for the lever 18 regulates the spacing of the stitches, so that by adjusting the bar and the lever to the corresponding graduation on each scale the spacing of the stitches will be made to accord properly with the length of the button-hole, the stitches being uniformly spaced whether the button-hole is long or short.

The transverse slot 60, for engagement with the traverse mechanism, is formed in a plate located above that portion of the clamp-plate which contains the longitudinal slot 75, for the reception of the pivot-stud 46, so that the two slots cross each other. By this means I am enabled to make the clamp-plate, and consequently the whole attachment, much shorter than it would have to be if the transverse slot were formed in the clamp-plate at the end of the longitudinal slot 75.

During the time that the clamp-plate is receiving the side-to-side vibration, so as to carry the stitches around the ends of the button-hole from one side of the same to the other, said clamp-plate should be released from the control of the vibrator-plate 30; hence I form in the shifter-frame 50 a slot 61, with which engages a lug 62, projecting from the upper face of the trip-plate 37, so that as soon as the shifter-frame commences to move crosswise under the influence of the cam 47 the trip-plate 37 will also be moved and the pin on the under side of the same will act on the bolt 35, so that, as shown in Figs. 1, 2, and 3, it will withdraw the lug 34 from the locking-notch of the slide 32, which it had previously occupied, as shown in Fig. 7, the slide being thereby released from the control of the vibrator-plate.

In order now to impart the side-to-side movement to the clamp-plate, the vibrator-slide must be moved so as to actuate the vibrator-eccentric 64, link 39, and bar 41, and thus move the clamp-plate. To effect this movement of the slide, the latter has a pin 65, which enters the slot 61 of the shifter-frame, but is considerably less in width than the same, so as to permit the lost motion necessary in order to insure the previous operation of the trip-plate 37 and moving back of the bolt 35. As soon as the bolt is retracted, however, the shifter-frame acts on the pin 65 and shifts the slide, say, from the position shown in Fig. 7 to that shown in Fig. 8, the movement being transmitted to the clamp-plate by the mechanism just described.

If all button-holes were of the same width, the vibrator-slide might be connected directly to the link 39; but as the holes vary in width I provide the slots in the vibrator-slide and eccentric for the reception of the bolt 63, by adjusting which nearer to or farther from the fulcrum of the eccentric the throw of the latter may be varied, as will be readily understood.

It will be evident that a simple arm or

equivalent device—such, for instance, as the arm 76 in Fig. 15—might be substituted for the eccentric; hence in the term “eccentric” I include any such modification.

5 While the clamp-plate is having the side-to-side movement imparted to it there should preferably be a series of short longitudinal or stitch vibrations imparted thereto in order to dispose the stitches radially around the  
10 ends of the button-hole, and for this reason the under side of the shifter-frame 50 has a stud 52, which projects into a slot 68 in the vibrator-lever 27, this slot having opposite inclined sides and straight end portions, as  
15 shown in Figs. 1, 2, and 3, so that when the pin 52 is traversing said end portions of the slot longitudinal movement will be imparted to the shifter-frame 50, and thence, through the medium of the arm 53 and bar 57, to the  
20 clamp-plate, while when the pin is traversing the side portions of the slot no such longitudinal movement will be imparted thereto, as the pin will not be affected by the vibrations of the lever 27.

25 Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination of the clamp-plate having a transverse slot, the traversing cam for  
30 said plate, transmitting mechanism comprising a slotted and pivoted traverse-arm and a traverse-regulating bar slotted to receive the pivot-pin and having pins entering the slots of the clamp-plate and traverse-arm, ratchet  
35 mechanism for operating the traverse-cam, a stop-plate and regulating-lever, whereby the extent of movement of the ratchet is controlled, and graduated scales, whereby corresponding adjustments of said regulating-lever  
40 and traverse-governing bar are facilitated, all substantially as specified.

2. The combination of the clamp-plate, the shifter-frame, and the traverse-cam for operating the latter with connecting devices comprising a slotted and pivoted traverse-arm  
45 connected to the frame and a traverse-regulating bar adjustable longitudinally in respect to its fulcrum, said bar being connected to the clamp-plate and having a pin engaging  
50 the slot in the pivoted traverse-arm, all substantially as specified.

3. The combination of the clamp-plate, the vibrator-lever having a portion swinging longitudinally or in the same direction as the  
55 traverse motion of the clamp-plate, the shifter-cam, the shifter-frame connected to the clamp-

plate, a pin carried by said frame, and a slot formed in the longitudinally-moving portion of the vibrator-lever for the reception of said pin, said slot comprising opposite longitudinal side portions and transverse end portions, whereby the shifter-frame is brought under control of the vibrator-lever while said frame is being shifted laterally, all substantially as specified. 65

4. The combination of the clamp-plate, the vibrator-lever, the vibrator-plate, the vibrator-slide guided in the plate, the lever and bolt for locking said slide to the vibrator-plate, the trip-plate having a lug for acting  
70 on the locking-bolt lever, the shifter-frame engaging with projections on said trip-plate and vibrator-slide, and means for connecting the vibrator-slide to the clamp-plate, all substantially as specified. 75

5. The combination of the pivoted clamp-plate, the vibrator-plate and means for operating the latter, a transmitter-link 39, connected to the vibrator-plate, a longitudinally-adjustable regulating-bar, and slot-and-pin  
80 connections between said regulating-bar and the clamp-plate and transmitter-link, all substantially as specified.

6. The combination of the clamp-plate, the vibrator-lever, the vibrator-plate, the vibrator-slide, the lever hung to the vibrator-plate and having a locking-bolt for the slide, the trip-plate for the lever, the shifter-frame engaging with projections on said trip-plate and vibrator-slide, the eccentric hung to the  
90 vibrator-plate, a connection between the vibrator-slide and eccentric adjustable from and toward the fulcrum of the latter, and means for connecting the eccentric to the clamp-plate, all substantially as specified. 95

7. The combination of the traversing mechanism for the clamp-plate with a pivot-stud and a clamp-plate having a longitudinal slot for the reception of said pivot-stud, and a transverse slot for engagement with the traversing mechanism, said transverse slot being  
100 formed in a portion of the plate located above and crossing the longitudinal pivot-slot, all substantially as specified.

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

WASHINGTON WALLICK.

Witnesses:

WILLIAM D. CONNER,  
HARRY SMITH.