

(No Model.)

3 Sheets—Sheet 1.

W. WALLICK.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 406,800.

Patented July 9, 1889.

FIG. 2.

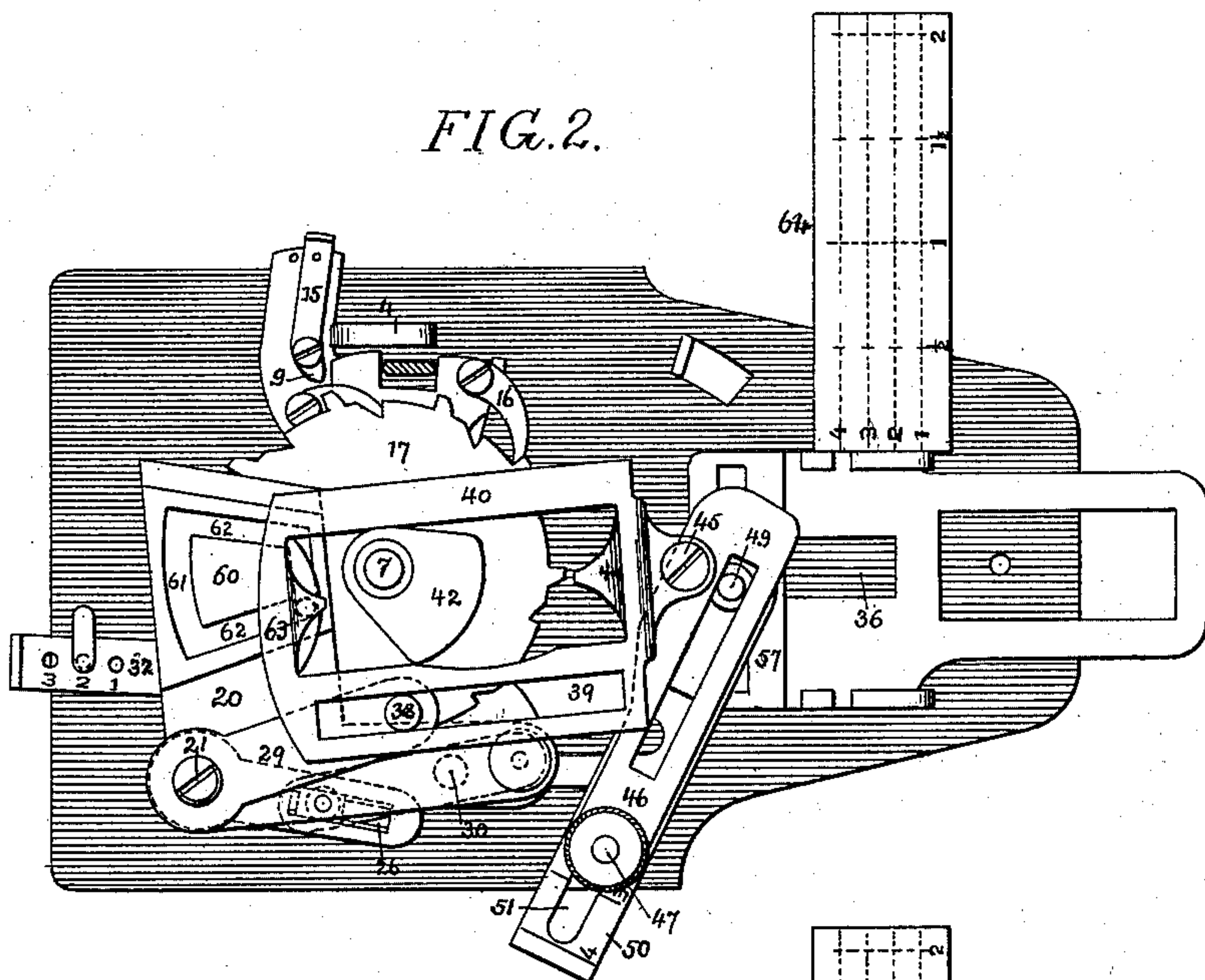


FIG. 1.

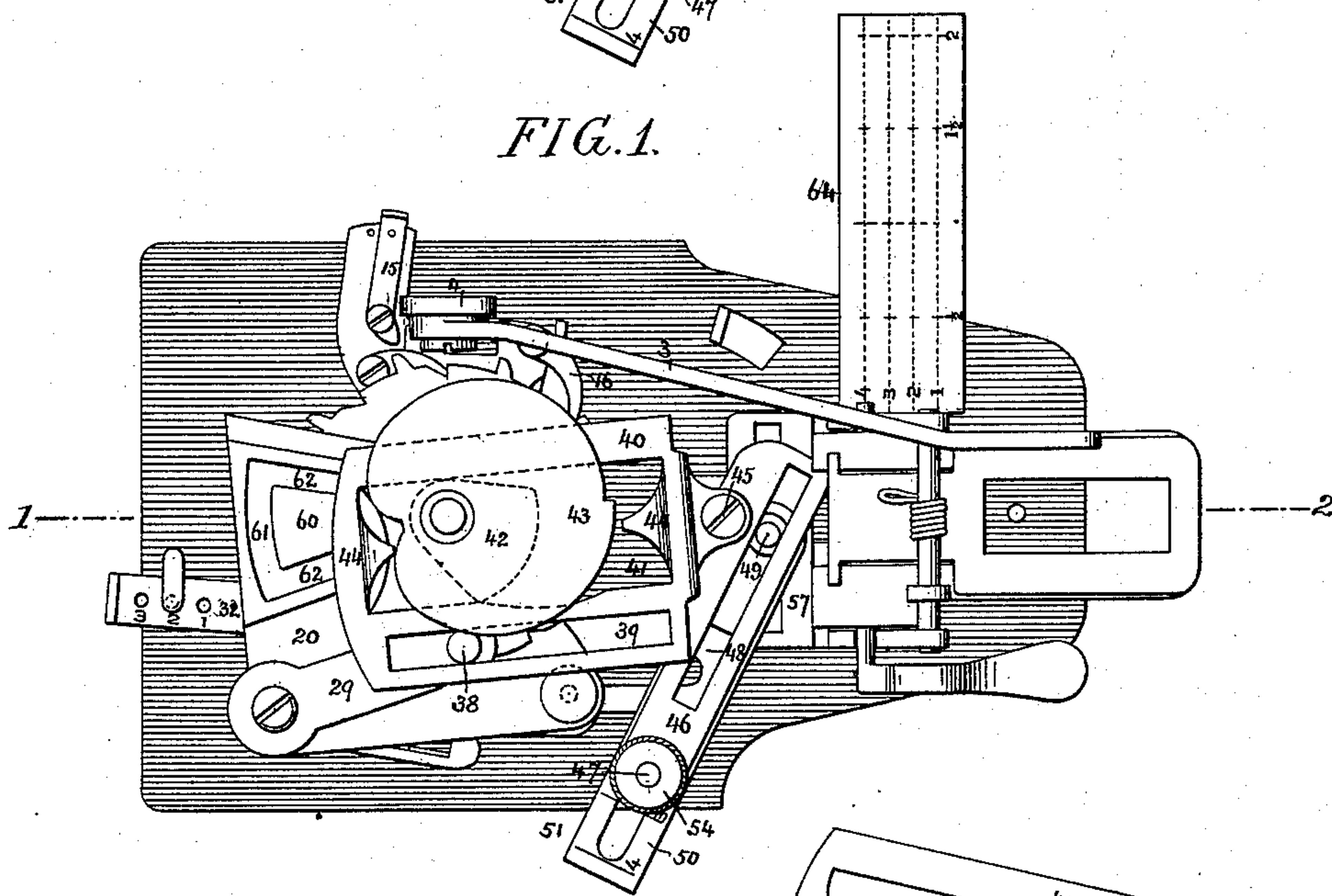
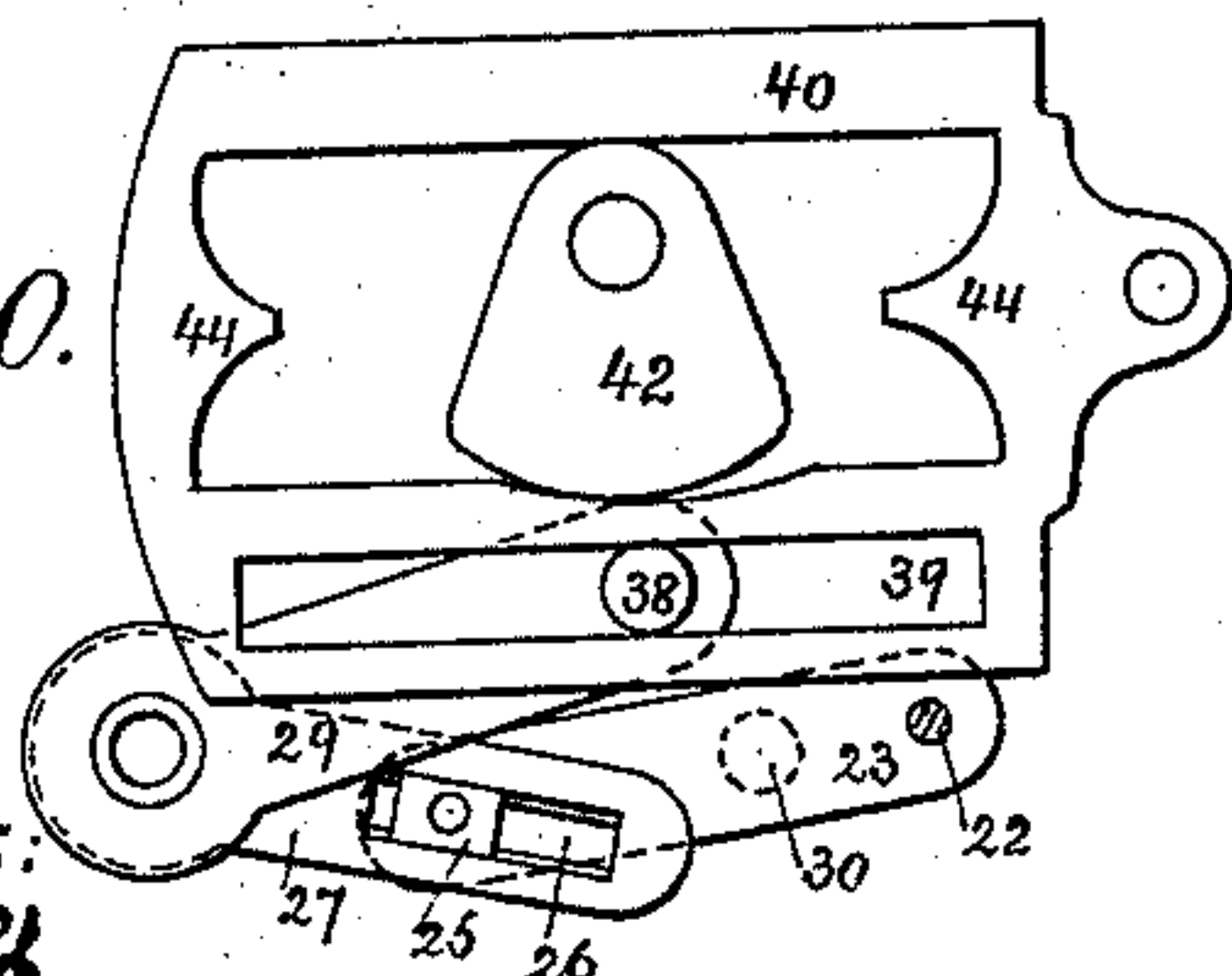
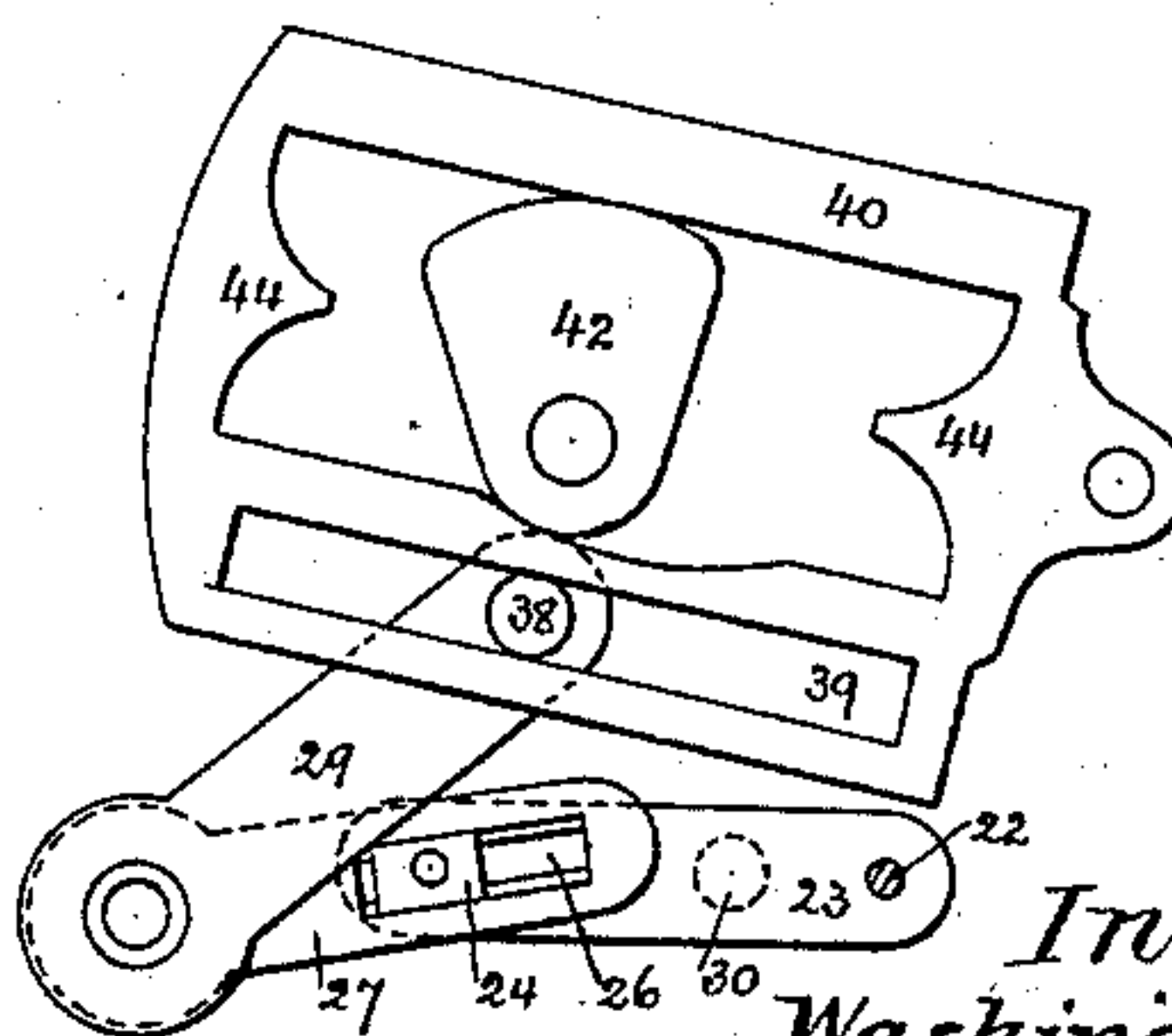


FIG. 10.



Witnesses:  
Alex. Barkhoff  
David S. Williams

FIG. 11



Inventor:  
Washington Wallick  
by his Attorneys  
Howson & Howson

(No Model.)

3 Sheets—Sheet 2.

W. WALLICK.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 406,800.

Patented July 9, 1889.

FIG. 4.

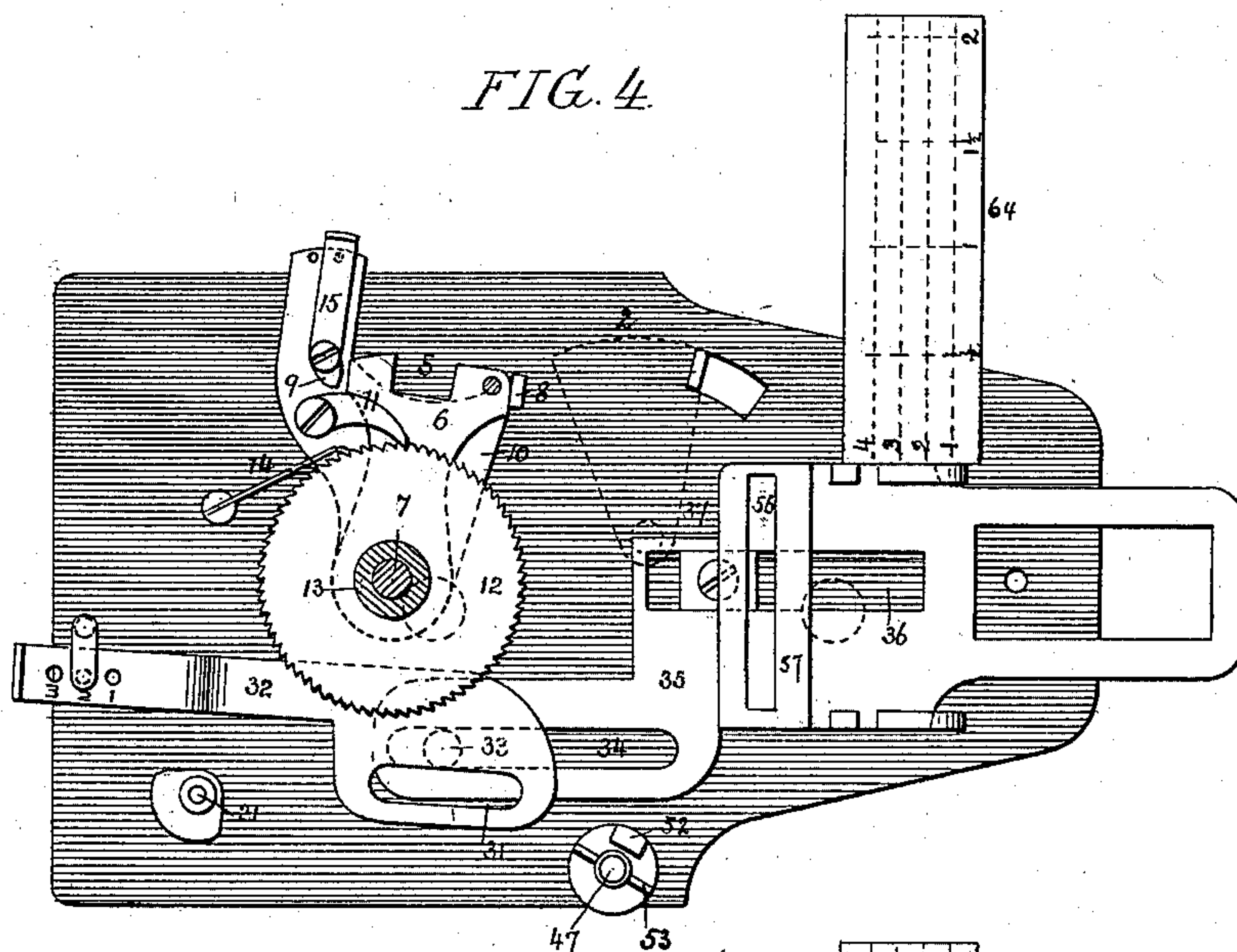
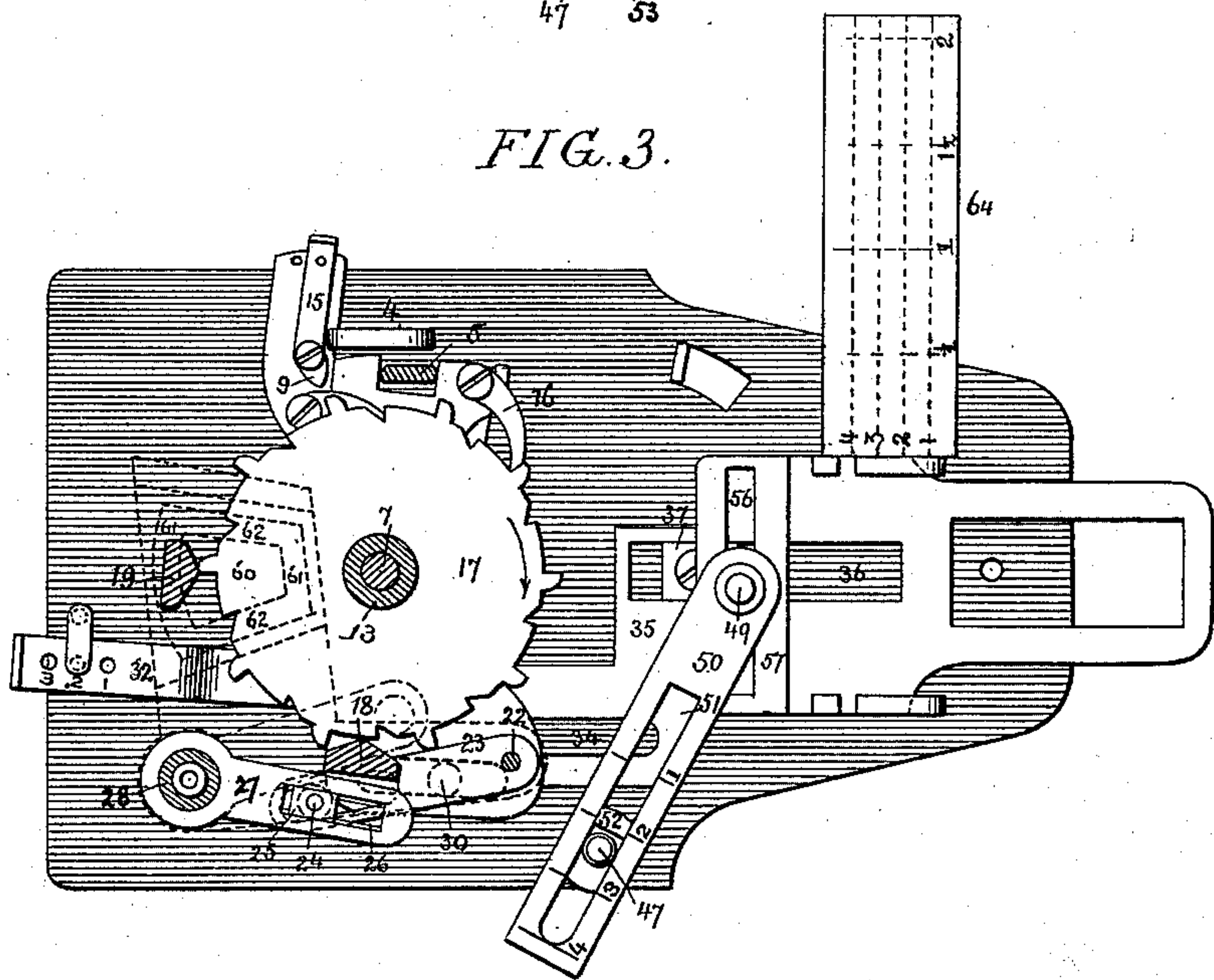


FIG. 3.



Witnesses:  
Alex. Barkoff  
David S. Williams

Inventor:  
Washington Wallick  
by his Attorneys  
Howson & Howson



(No Model.)

3 Sheets—Sheet 3.

W. WALLICK.

BUTTON HOLE ATTACHMENT FOR SEWING MACHINES.

No. 406,800.

Patented July 9, 1889.

FIG. 5

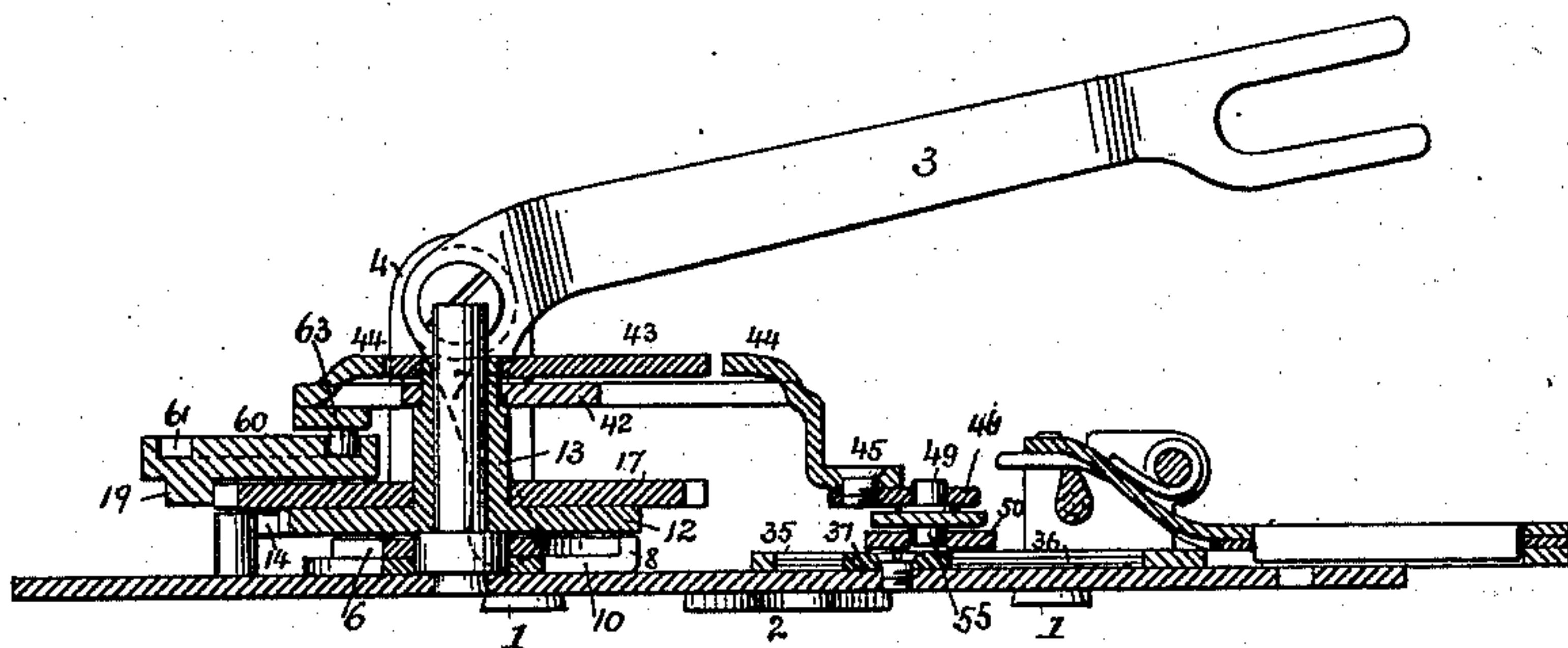


FIG. 6.

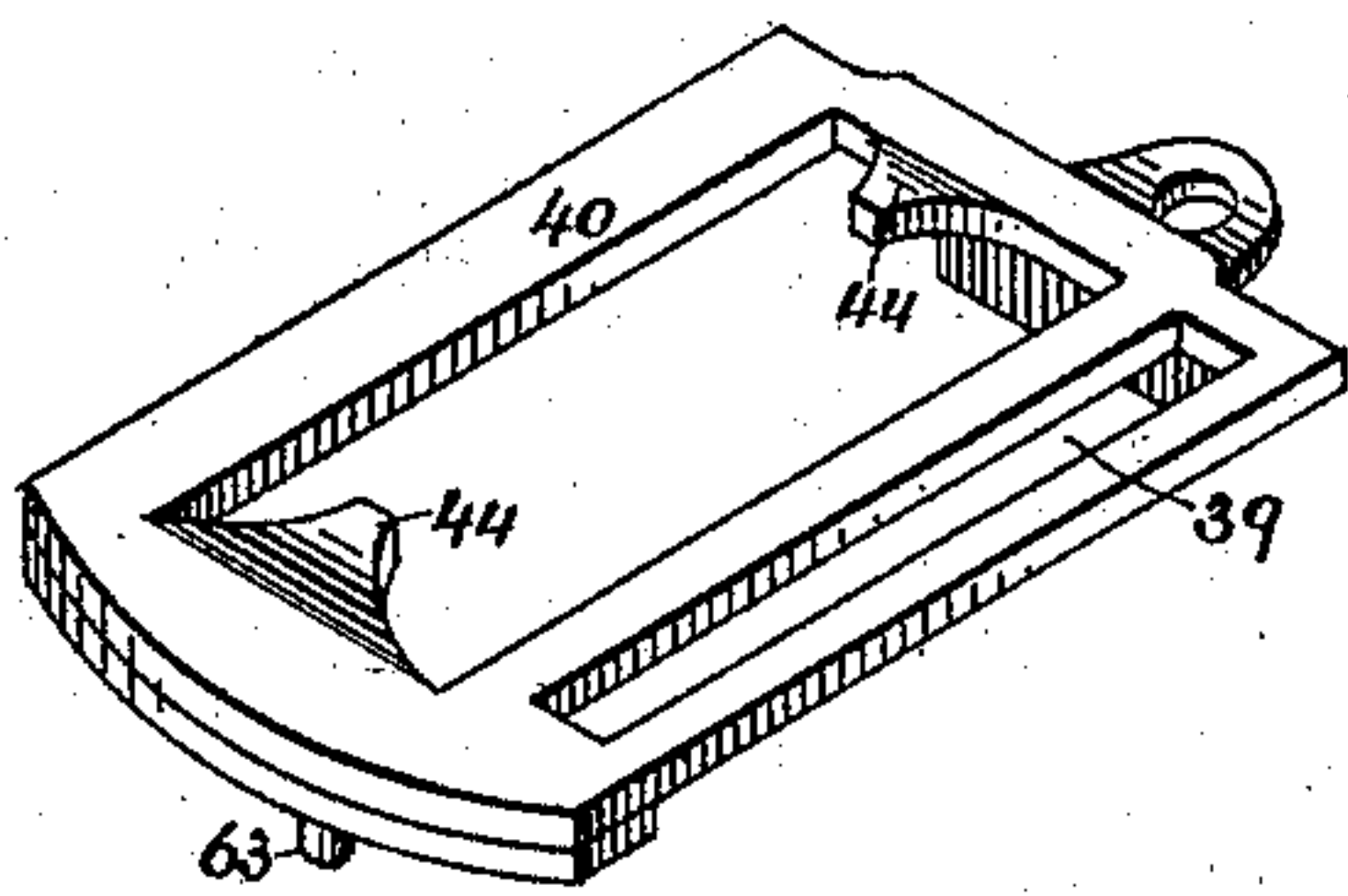


FIG. 7.

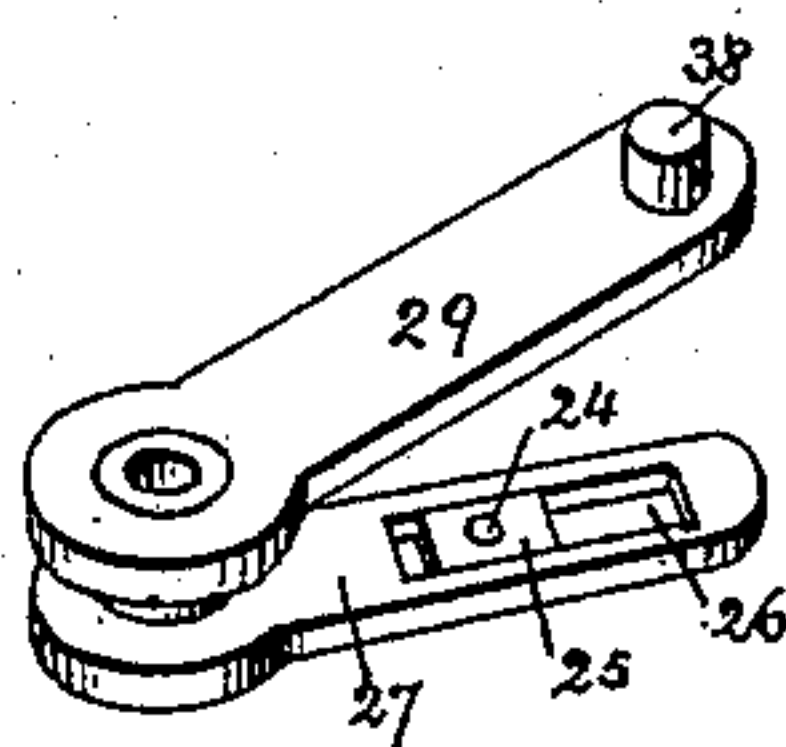


FIG. 8.

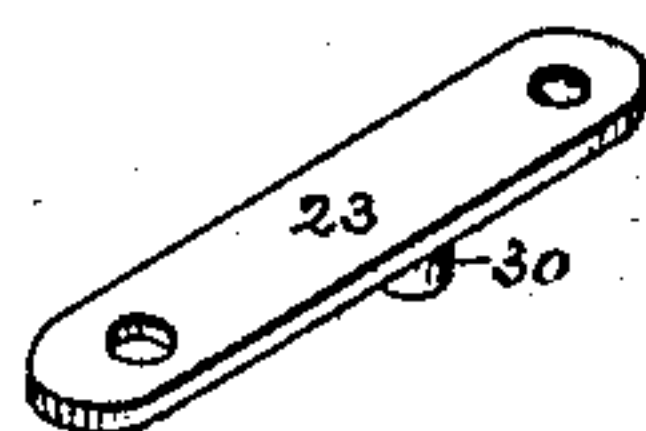
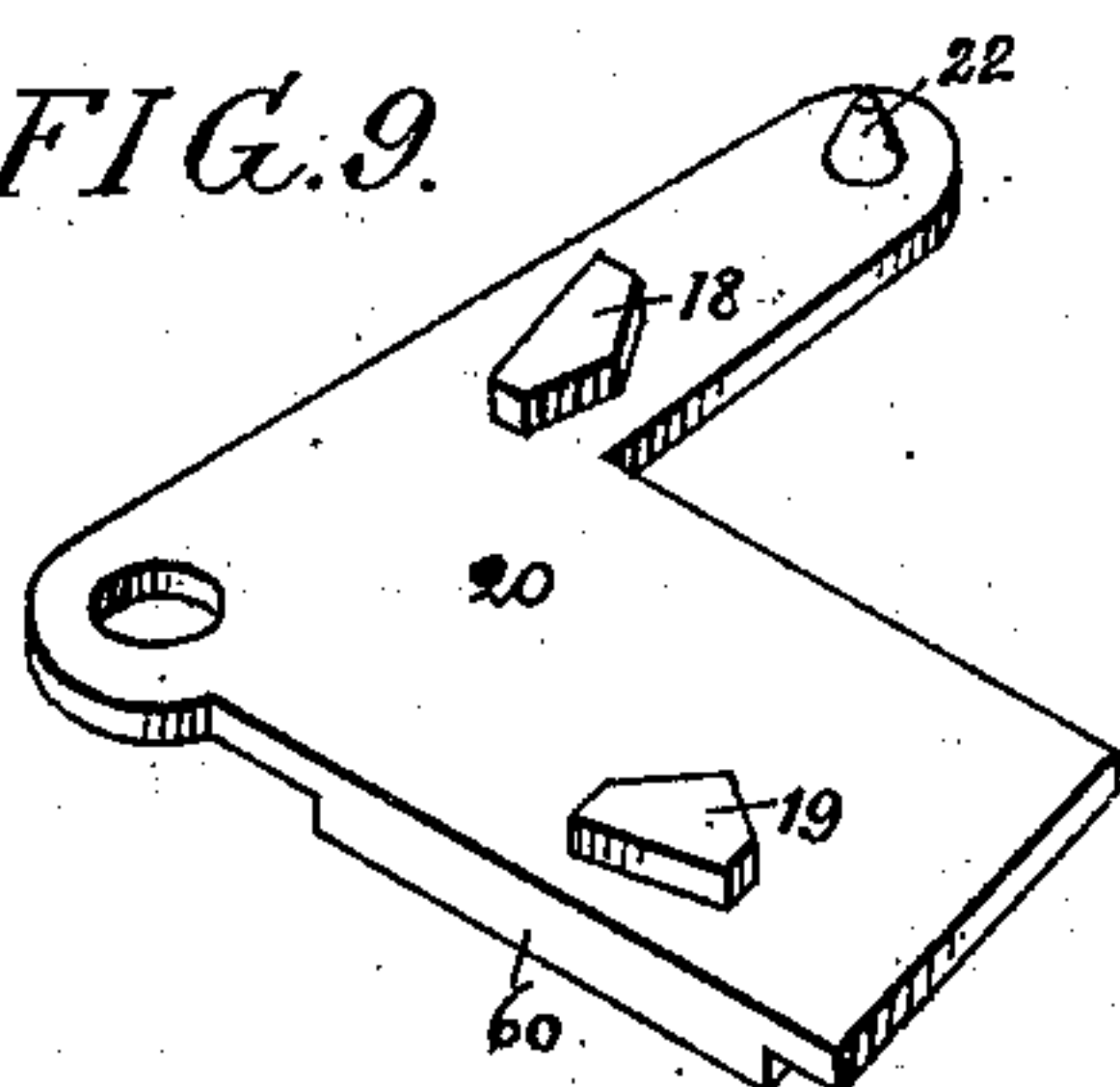


FIG. 9.



Witnesses:  
Alex. Sarkoff  
David S. Williams

Inventor:  
Washington Wallick  
by his Attorneys  
Howson & Howson



# UNITED STATES PATENT OFFICE.

WASHINGTON WALLICK, OF PHILADELPHIA, PENNSYLVANIA.

## BUTTON-HOLE ATTACHMENT FOR SEWING-MACHINES.

SPECIFICATION forming part of Letters Patent No. 406,800, dated July 9, 1889.

Application filed July 3, 1888. Serial No. 278,953. (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.

One object of my invention is to construct a button-hole sewing attachment of simple construction and having comparatively few parts, a further object being to provide means for readily regulating the size of the button-hole and the character of the stitching. These objects I attain in the manner herein-after set forth, reference being had to the accompanying drawings, in which—

Figure 1 is a plan view of the complete attachment. Figs. 2, 3, and 4 are like plan views showing parts of the mechanism removed. Fig. 5 is a longitudinal section of the attachment on the line 1 2, Fig. 1. Figs. 6 to 9 are detached perspective views of parts of the attachment, and Figs. 10 and 11 diagrams illustrating the opposite extremes assumed by certain of the parts of the attachment.

The base-plate of the attachment is secured in the throat or opening in the bed of the machine by means of a cam-lever 2 (shown by dotted lines in Fig. 4) and fixed lugs 1 on the under side of the plate, as shown in Fig. 5, these devices being substantially similar to those set forth in my application for patent, Serial No. 262,198, filed January 28, 1888.

The operating-lever 3 of the attachment receives motion from a lug on the needle-arm of the machine, as usual, and is pivoted to a stud 4 on the base-plate, the short arm of this lever being adapted to a recess 5 in an arm 6, which is loosely hung to a stud or pin 7, projecting upward from the base-plate, the outer end of the arm 6 projecting between a fixed stop 8 and an adjustable stop 9 on a lever 10, (hereinafter called the "pawl-lever,") which is also loosely hung to the stud or pin 7, said pawl-lever having a pawl 11, which engages with the teeth of a ratchet-wheel 12, secured to or forming part of a sleeve 13, adapted to and free to turn on the stud 7, back movement of the ratchet-wheel being prevented by means of a spring retain-

ing pawl or catch 14, which also serves as a cut-out to limit the number of teeth upon which the pawl can act on each vibration of the lever.

The movement of the arm 6 is always uniform; but the use of the adjustable stop 9 provides for more or less lost motion of the outer end of said arm 6, so that the movement of the pawl-lever 10 may be regulated by the adjustment of said stop 9—that is to say, the less the lost motion of the outer end of the arm 6 the greater will be the extent of vibration of said pawl-lever 10, and the greater the lost motion the less will be the extent of said vibration.

In the present instance the adjustable stop 9 forms the short arm of a lever 15, hung to a pin on the pawl-lever 10, so that by properly adjusting the outer end of the long arm of this lever 15, the extent of movement of the lever 10 can be readily governed. Hung to said lever 10 is another pawl 16, which acts upon the teeth of a vibrator-cam 17, the latter being in the form of a ratchet-wheel, alternate teeth of which project radially beyond the intermediate teeth, and these projecting teeth act alternately upon lugs 18 and 19, each carried by one of the arms of a vibrator-lever 20, which is in the form of a bell-crank, hung to a stud 21 on the base-plate.

The outer end of one arm of the bell-crank vibrator-lever 20 is connected by a pin 22 to a transmitter-lever 23, which is pivoted to a stud 24, carried by a block 25, the latter being adapted to a longitudinal slot 26 in one arm 27 of a shifter-lever, the hub 28 of which is free to turn on the stud 21 and carries at its upper end the other arm 29 of the shifter-lever, this arm being located above the vibrator-lever 20, and the arm 27 being located beneath the said vibrator-lever.

The lever 23 has on the under side a projecting pin 30, which is adapted to a slot 31 in a vibrator-regulator 32, the latter consisting of a longitudinally-adjustable slide having on the under side a projecting pin 33, adapted to a longitudinal slot 34 in the clamp-plate 35, another longitudinal slot 36 in which receives the pivoted fulcrum-block 37, so that said clamp-plate is not only free to swing on said block as its pivot, but can also be adjusted longitudinally in respect to said block.



It will therefore be seen that, as the vibrator-cam is moved to the extent of one tooth on each vibration of the operating-lever 3, the projecting teeth of the cam will act first on the block 18 and then on the block 19 of the vibrator-lever 20, and this lever will consequently be caused to rock on the stud 21, the movement being transmitted through the medium of the lever 23 and slide 32 to the clamp-plate, the slide causing an augmented or decreased movement of the latter, depending upon the adjustment of the pin 33 of the slide nearer to or farther from the fulcrum-block 37 of said clamp-plate.

The upper arm 29 of the shifter-lever has a pin 38, which is adapted to a slot 39 in a frame 40, the latter having a central opening 41, in which works a cam 42, (termed a "shifter-cam,") carried by the sleeve 13, the upper end of said sleeve having another cam 43, which is hereinafter called the "traverse-cam," and which acts upon toes or projections 44 on said frame 40.

The frame 40 is pivoted by a pin 45 to a lever 46, hung to a stud 47 on the base-plate, and forming one element of the traverse-regulator, the other element of which is a slide 50, having a slot 51 for the reception of the stud 47, and a guide-lug 52 adjacent thereto. On the slide 50 are two pins 49 and 55, (see Fig. 5,) the former being adapted to a slot 48 in the lever 46, and the pin 55 being adapted to a transverse slot 56 in a plate 57 on the clamp-plate 35. The slide 50 can be adjusted longitudinally in respect to the stud 47, ribs 53 on the base of the stud serving, in connection with a thumb-screw 54 at the top of the same, to secure the slide in position, and a gage on the slide serving as a means of determining the proper position of the same in respect to the stud.

Any longitudinal movement imparted to the outer end of the slide 50 is transmitted to the clamp-plate 35, and the extent of this longitudinal movement is governed by the adjustment of the slide, whereby its pin 49 is moved nearer to or farther from the fulcrum 47 of the lever 46, which is actuated by the traverse-cam 43 through the medium of the frame 40.

The cam 42 acts at proper intervals to cause a lateral swinging or shifting of the frame 40, and this movement is transmitted through the medium of the arms 29 and 27 of the shifter-lever to the lever 23, the pin 22 during this movement serving as a pivot and the movement being transmitted through the slide 32 to the clamp-plate.

The diagrams, Figs. 10 and 11, show the opposite extremes of movement of these parts, Fig. 10 showing the position of the parts when the stitches are being formed along one side of the button-hole, and Fig. 11 showing the position of the parts when the stitches are being formed along the other side of the same.

It will be seen that the longitudinal or traverse movement of the clamp-plate is effected

by the traverse-cam 43 through the medium of the frame 40, lever 46, and slide 50, and that the extent of this movement, which determines the length of the button-hole, is dependent upon the adjustment of said slide 50, while the short and rapid transverse vibrations of the clamp-plate to form the stitches along the sides of the button-hole are effected by the vibrator-cam 17 through the medium of the vibrator-lever 20, transmitter-lever 23, and regulator-slide 32, a slow vibration of greater extent being imparted to the clamp-plate at each end of the button-hole by reason of the shifter-cam 42, acting through the medium of the swinging frame 40, shifter-levers 29 27, transmitter-lever 23, and slide 32.

In order to provide for the radial disposition of the stitches at the ends of the button-holes in crossing from side to side of the same, a rapid longitudinal reciprocation is imparted to the clamp-plate during the time that the slow transverse vibration of the same at the ends of the button-hole is being effected, this result being accomplished by means of a cam 60, carried by one arm of the vibrator-lever 20, and having opposite transverse slots 61, and longitudinal or slightly-inclined connecting-slots 62, for receiving a pin 63, projecting from the under side of the frame 40, the transverse portions 61 of the slot receiving said pin while the frame is being swung laterally at each end of the longitudinal traverse of the clamp-plate, so as to impart a rapid reciprocating movement to the plate at such times, and the longitudinal portions 62 of the slot receiving the pin during the time that the clamp-plate is being traversed longitudinally by the cam 43, so as to steady the frame 40 and prevent any vibrating movement of the clamp-plate except that due to the operation of the vibrator-cam 17, vibrator-lever 20, transmitter-lever 23, and slide 32.

On the clamp-plate is a laterally-projecting gage-plate 64, having a scale the graduations of which extend both longitudinally and transversely of the plate, and thus serve to facilitate the proper adjustment of the material in the clamp, the transverse graduations serving to gage the distance apart of the button-holes, and the longitudinal graduations gaging the distance of the end of the button-hole from the edge of the fabric, it being the custom to set the wide-spaced button-holes farther from the edge of the fabric than those which are closer together.

It will be observed that my improved button-hole attachment has but few parts, which are of simple construction, so that the attachment can be cheaply manufactured, and is not liable to get out of order when in use.

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

1. The combination of the clamp-plate, operating mechanism therefor having as one of its elements a ratchet-wheel, the operating-lever, the pawl-lever, a swinging arm engag-



ing with the operating-lever, and stops for the free end of said arm, one of said stops consisting of a short arm of an adjustable lever hung to the pawl-lever, substantially as specified.

2. The combination of the clamp-plate, the pawl-lever and its pawl, a vibrator-lever the arms of which have projecting lugs, mechanism for operating the pawl-lever and for transmitting the movement of the vibrator-lever to the clamp, and a ratchet-wheel having teeth the faces of which are engaged by the pawl, the backs of some of the teeth acting upon the lugs of the vibrator-lever to impart a vibrating movement thereto, substantially as specified.

3. The combination of the clamp-plate, the

vibrator-lever, the swinging shifter-frame, operating mechanism for said lever and frame, the pivoted shifter-lever having two arms, one of which engages with the shifter-frame, and a transmitter-lever connected to the clamp-plate and pivoted at one end to the vibrator-lever and at the opposite end to the other arm of the shifter-lever, whereby said pivots may both serve as fulcrums for the transmitter-lever, substantially as specified.

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

WASHINGTON WALLICK.

Witnesses:

EDWARD M. RILEY,  
HARRY SMITH.