

No. 794,134.

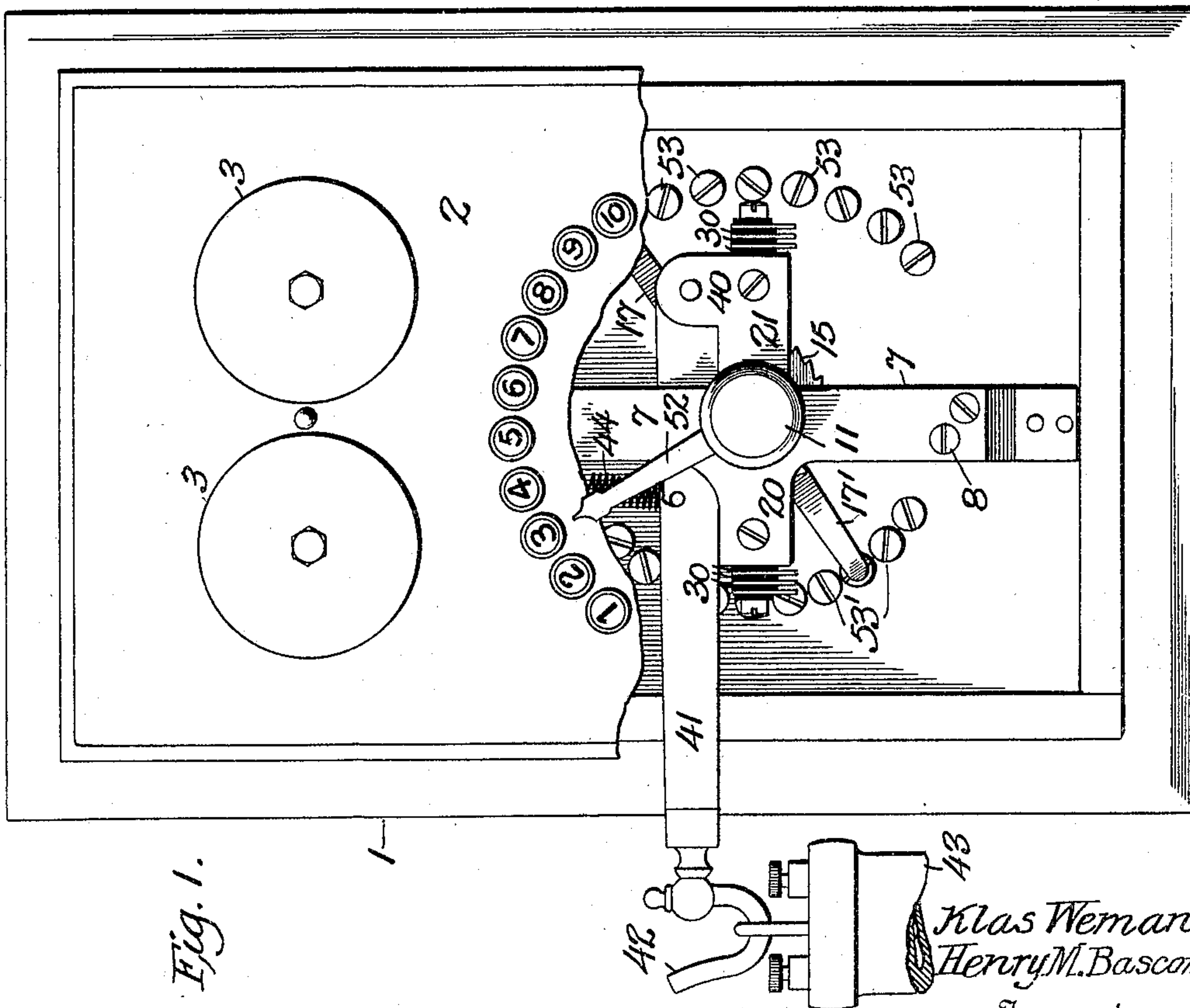
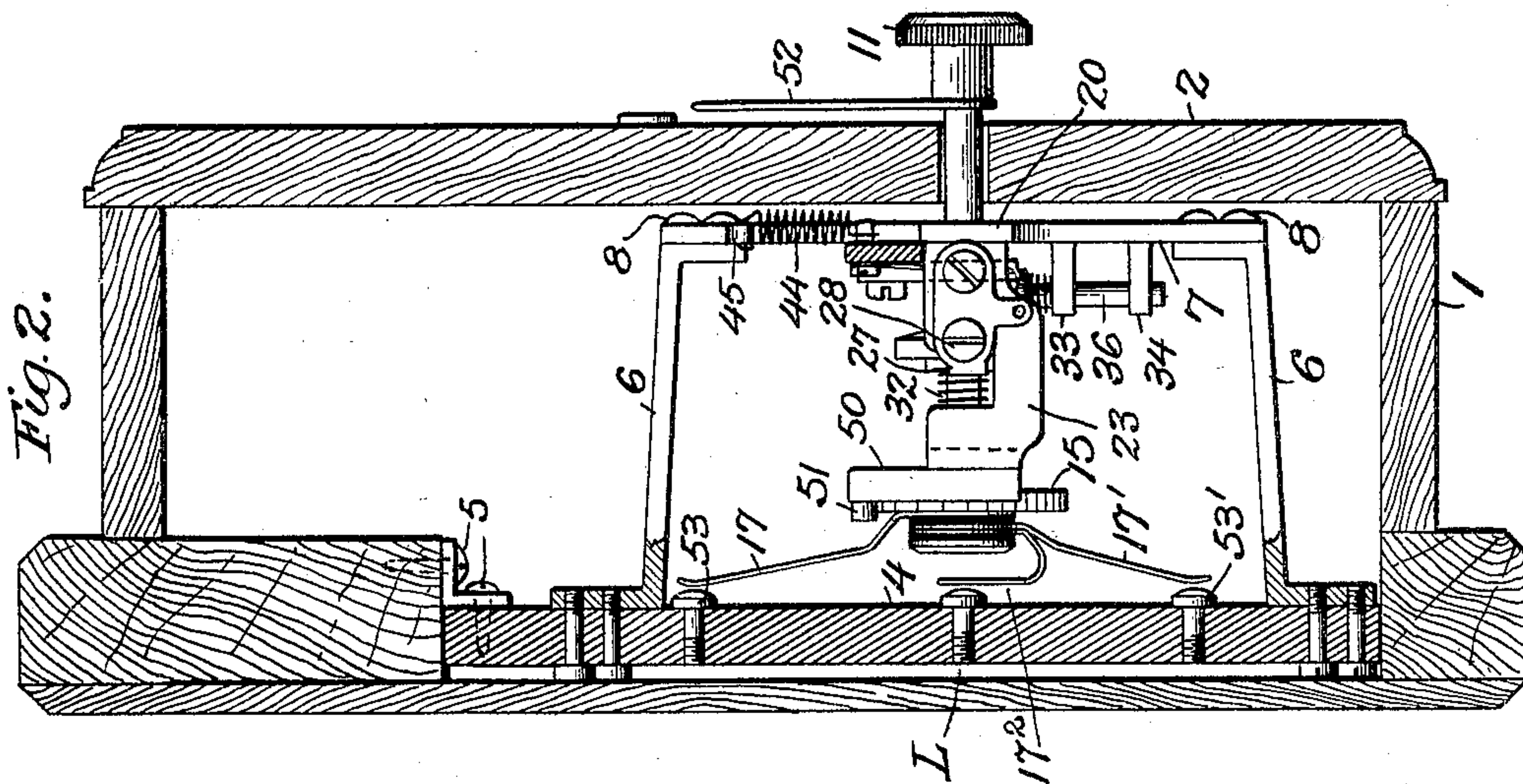
PATENTED JULY 4, 1905.

K. WEMAN & H. M. BASCOM.

TELEPHONE SWITCH.

APPLICATION FILED OCT. 16, 1903.

3 SHEETS—SHEET 1.



Witnesses  
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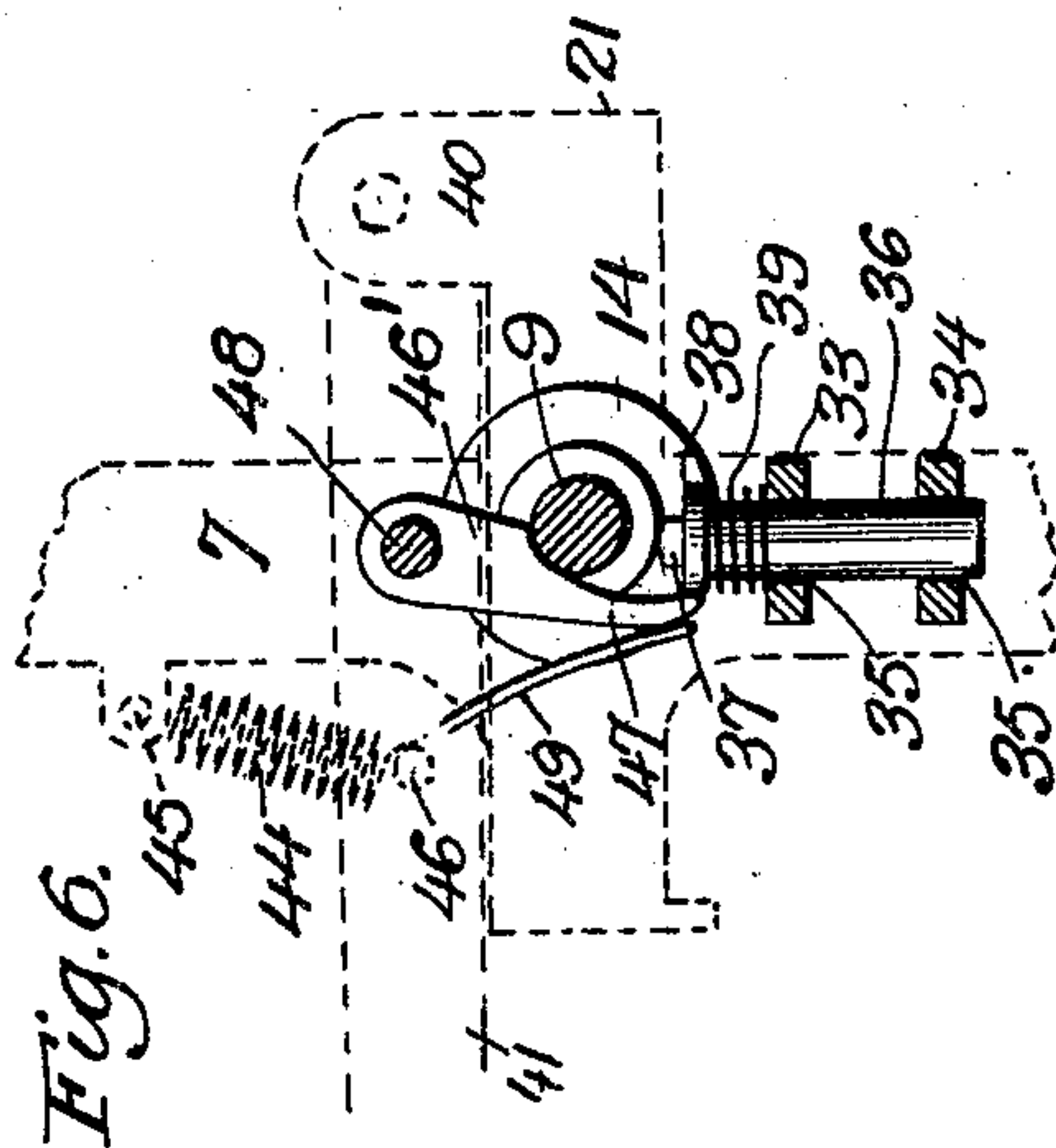
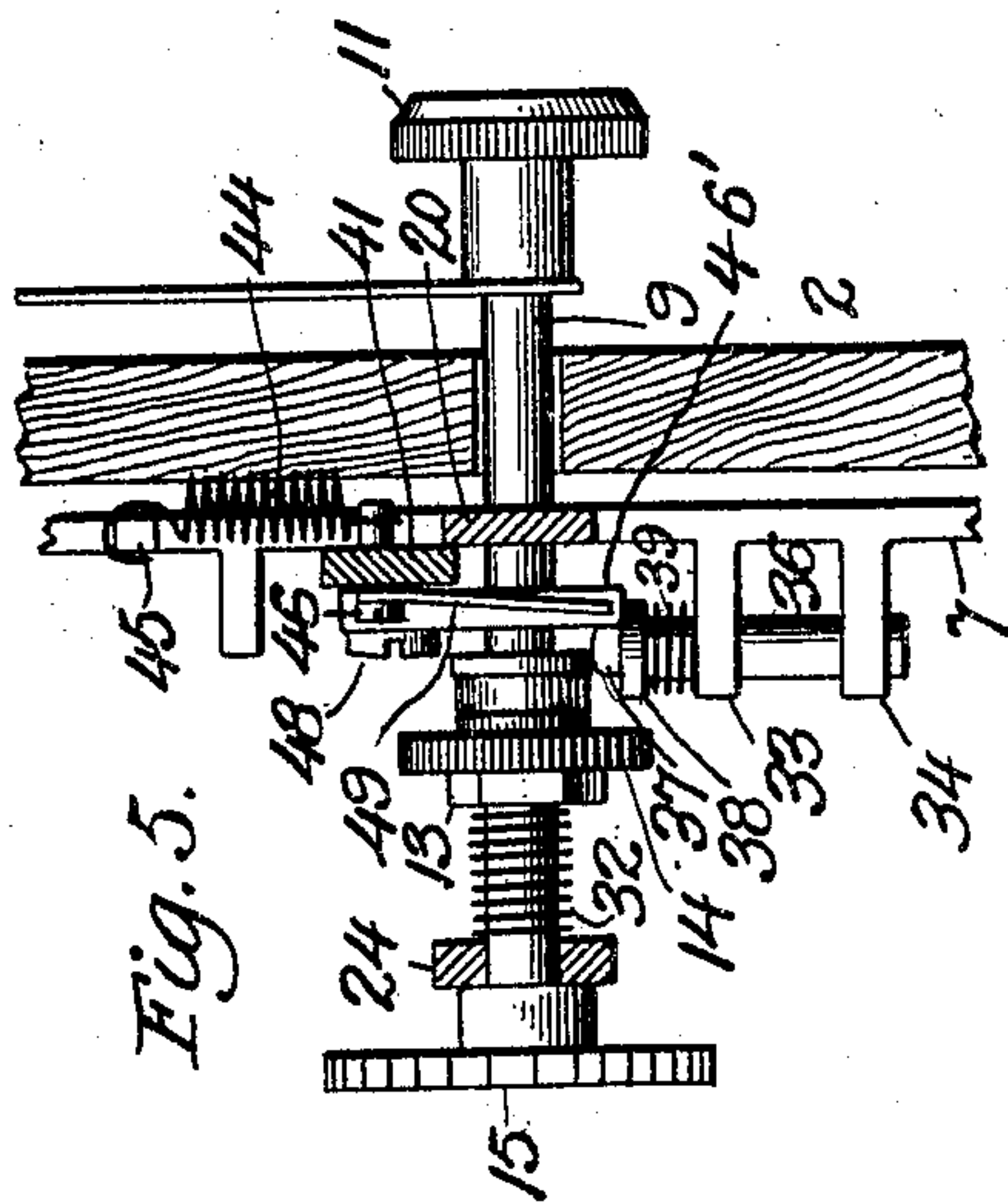
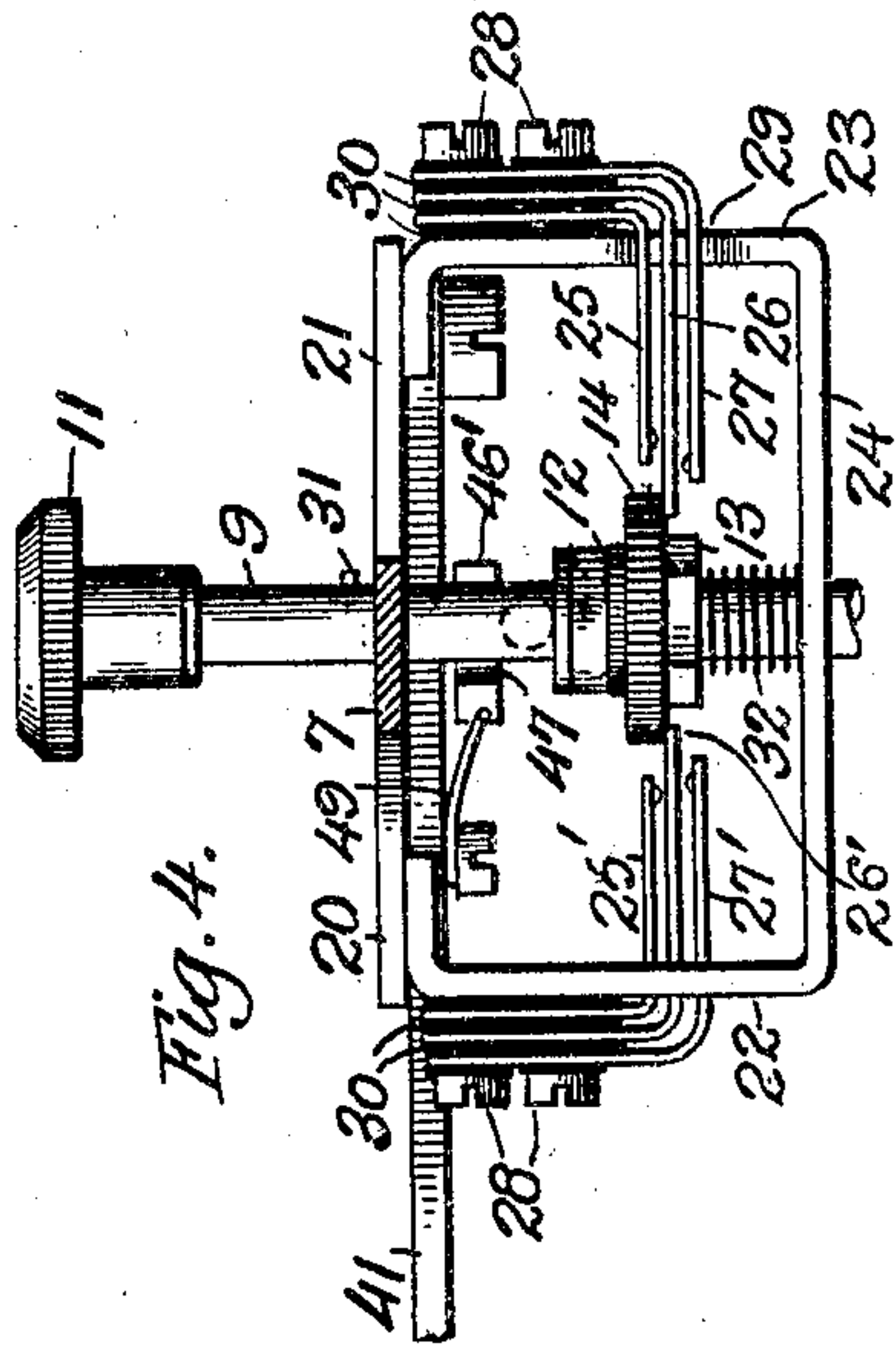
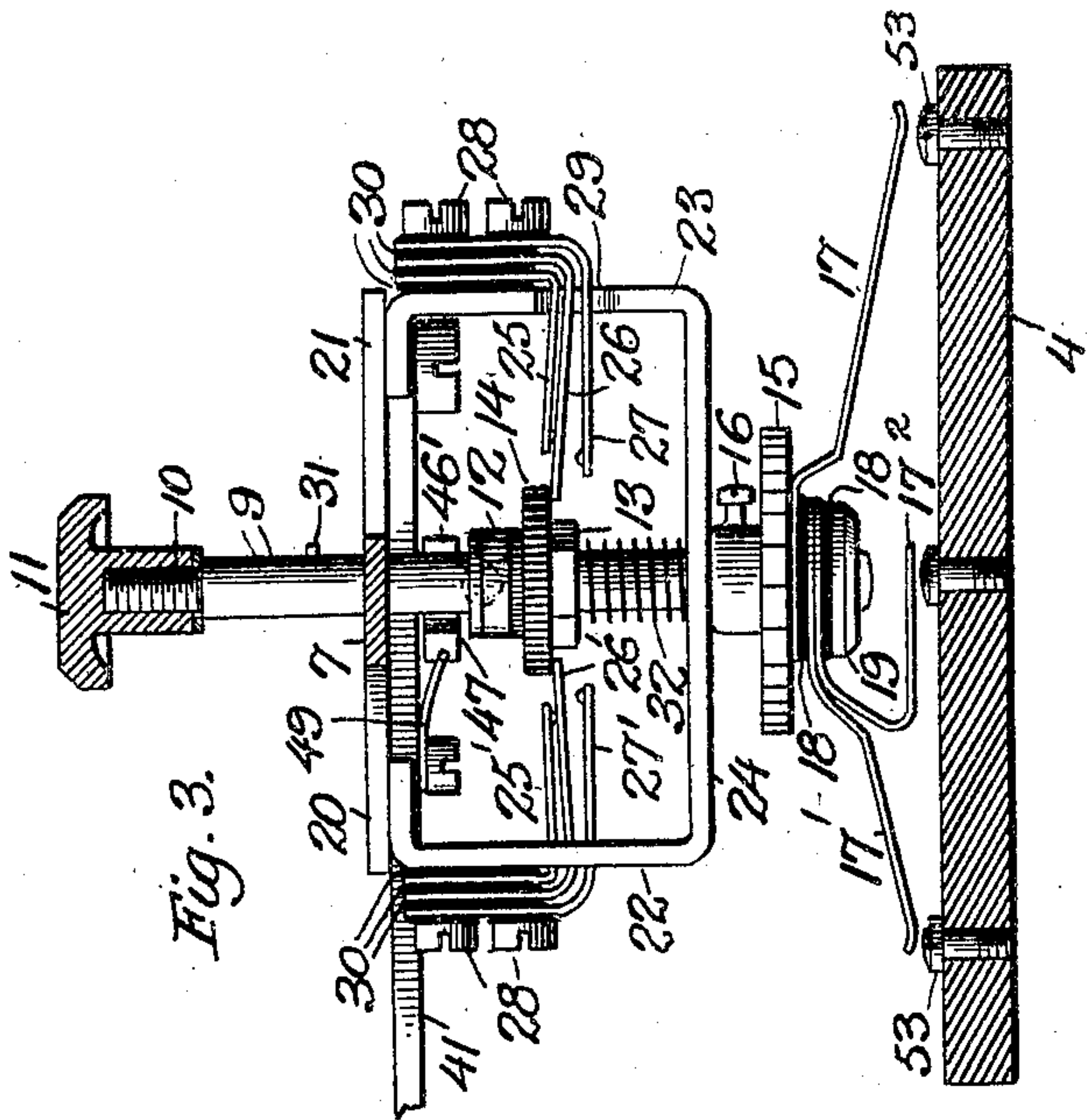
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3 SHEETS—SHEET 2.



Witnesses

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# UNITED STATES PATENT OFFICE.

KLAS WEMAN AND HENRY MELVIN BASCOM, OF NEW YORK, N. Y.

## TELEPHONE-SWITCH.

SPECIFICATION forming part of Letters Patent No. 794,134, dated July 4, 1905.

Application filed October 16, 1903. Serial No. 177,333.

*To all whom it may concern:*

Be it known that we, KLAS WEMAN, a subject of the King of Sweden and Norway, residing in the city and county of New York, and HENRY MELVIN BASCOM, a citizen of the United States, residing in the city of New York, county of Kings, State of New York, have invented certain new and useful Improvements in Telephone-Switches, of which the following is a full, clear, and exact specification.

Our invention relates to telephone-switches, particularly to switches of intercommunicating telephones, and has for its object to so construct a switch that the hanging up of the receiver will without the need of returning the switch to any particular point automatically restore the switch to the receiving position and that speaking connection may be established and the desired number called whether the telephone-hook is up or down.

It is also our object to use but one push-button to establish telephonic connection with any of the intercommunicating lines and to so construct the switch that the contact-springs will not stop between contact-points, but directly upon them.

Another object of the invention is to adapt the same to both metallic and common return systems and to so construct it that the number of contact-points may be increased up to the full capacity by the mere addition of two contact-screws for each additional point, such addition requiring no modification to be made in the switch.

A further object of the invention is to make the switch perfectly self-contained and complete in itself, so that it may be used in connection with any telephone apparatus.

Other objects of this invention will appear from the following description, in which reference is had to the accompanying drawings, illustrating our invention, and in which like reference characters indicate like parts throughout the several views.

Figure 1 is a top plan view of our invention, part of the upper plate being broken away. Fig. 2 is a side elevational view looking at the side where the switch-hook is secured, the

containing-case and other parts being in section. Fig. 3 is a front elevation, partly in section, showing the position of the contacts when the switch is at rest. Fig. 4 is a view similar to that shown in Fig. 3, the switch being in "talking position." Figs. 5 and 6 are details representing the spring-actuated pin and pawl and associated parts used to automatically return the switch. Fig. 7 is a diagram of the electrical connections.

In the drawings, 1 represents the containing-case, having upon its upper face 2 numbers "1, 2, 3, 4, 5," &c., corresponding to the number of stations, and bells 3 for giving the call.

4 is a base-plate of insulating material secured to the lower interior part of the case 1 by screws 5 or other like appropriate means. Mounted upon the plate 4 are legs 6, connected by cross-piece or bridge 7, which is held to the legs by screws 8. Passing approximately centrally through the cross-piece 7 is a rod 9, having a screw-thread 10 at the upper portion for receiving a button 11. About the rod 9 and intermediate its ends is a sleeve having a collar 12. An insulating-ring 14 is threaded on the sleeve and held in position by nut 13. Near the lower end of the rod 9 a ratchet-wheel 15 is secured by means of screw 16. Below the ratchet-wheel and fastened to the rod are contact-springs 17, 17', and 17'', the latter two being always in engagement with each other and both insulated from the spring 17 by the insulating-rings 18. At the lower end of the rod 9 are nuts 19 for retaining the ratchet-wheel and contact-springs in position.

Projecting outwardly from the sides of the cross-piece 7 are arms 20 and 21, from which a substantially oblong-shaped frame depends, consisting of two shorter sides 22 and 23 and a lower longer side 24. To the sides 22 and 23 are fastened, respectively, by means of screws 28, sets of contact-springs 25 26 27 and 25' 26' 27'. The contact-springs extend through apertures 29 in the sides 22 and 23 in the direction of the rod 9, and are insulated from each other by insulating-pieces 30. The downward movement of the rod 9 is limited by a pin 31 and the rod is returned to its normal position, in a manner



hereinafter described, by a spring 32, surrounding the rod and interposed between the side 24 and the nut 13.

Depending from the lower face of one of the sides of the cross-piece 7 are lugs 33 and 34, having eyes 35, in which a pin 36 slides. The pin is provided with a rounded end 37 and has a collar 38 thereon. Interposed between the collar 38 and the lug 33 and surrounding the pin is a spring 39, which has a tendency to press against the collar and force the pin in the direction of the rod 9.

Pivoted in a lug 40 of the arm 21 is the switch-lever 41, having the hook 42 for supporting the receiver 43. A spiral spring 44 extends from a lug 45 of one arm of the cross-piece 7 to a pin 46 on the switch-lever 41. Under the action of the spring the lever is drawn upward when the receiver 43 is lifted from the hook 42.

Pivoted to one face of the switch-lever 41 is a catch 46, rounded or scooped at 47 to permit of its riding freely against the rod 9. The catch is pivoted on a screw 48 or other like device. In order to keep the catch 46 constantly in engagement with the rod 9, we provide a spring 49, which extends from the lower part of pin 46 against the outer face of the catch 46'.

To prevent the contact-springs from stopping between contacts, we provide upon arm 22 of the oblong frame a spring pawl or detent 50, Fig. 2, the head 51 of which engages with the teeth of the ratchet-wheel 15. Secured below the button 11 is a pointer or index 52, and upon the insulating-plate 4 are binding-screws 53, 53', and L, to which the wires are fastened, the screws 53 and 53' being connected to the line-wires, while the screw L is connected to one of the local wires, as shown in the diagram Fig. 7.

In the diagram Fig. 7 we have shown two stations connected, at each of which there is a telephone instrument having receiver 43, transmitter T, hook-switch contacts *e*, *f*', *g*, and *h*, ringer B, generator G, and induction-coil I, and at each station our switch mechanism is connected to the telephone instrument, as shown.

The operation is as follows: Assuming that a call is to be sent from station No. 1 to station No. 2, Fig. 7, the pointer 52 is turned to the number "2" on the face-plate 2 by means of button 11 and the button pressed down as far as it will go. By this operation the contacts 17 17' 17<sup>2</sup>, which normally do not engage the screws 53, 53', and L, are forced against these screws, the contact-springs 26 and 27 and 26' and 27' contact with each other, and the pin 36 being released from its pressure against collar 12 will be forced outward and over the upper face of the collar 12 by the pressure of the spring 39 against the collar 38. From this it will be seen that pin 37 will keep the button 11 depressed independently of the re-

ceiver-hook. This operation will connect the source of ringing-current to line, when the ringing-circuit may be traced as follows: From the source G to spring 27' 26', contact L, spring 17<sup>2</sup>, contact 53', line *c*, on to station No. 2, through the ringer B, the springs *g*, spring *f*, the springs 26 and 25 at that station, and back over line *d* to the instrument at station No. 1 through screw 53, spring 17, frame 23, springs 27, and 26 back to the source G. When the pressure on the rod 9 is released, this rod will return upward until the bushing 12 reaches the pin 37. It will then be held in this position by the pin 37 until released by the downward movement of the receiver-hook, as hereinafter described. The springs 25, 26, and 27 and 25', 26', and 27' will then be in the talking position at station No. 1, in which they occupy the relative positions shown in Fig. 4. When station No. 2 receives the call, both parties take down their receivers and converse, the rod 9 at station No. 2 not being changed from its normal position. The talking-circuit (secondary) between the receivers may be traced as follows: Starting from the receiver 43 of the instrument at station No. 1, the circuit passes through the induction-coil I to screw L, spring 17<sup>2</sup>, screw 53', line *c*, the springs 25' and 26' at station No. 2, induction-coil I, receiver 43, springs *e* and *f*, springs 26 and 25, and back over the line *d*, screw 53 at station No. 1 through the spring 17, frame 23, springs *f* and *e* back to the receiver 43. Assuming now that the conversation is completed, the receivers at each of the conversing-stations, which had been lifted from their hooks 42, are replaced thereon. In replacing the receiver upon the hook the switch-lever 41 is pulled against the tension of the spring 44, the catch 46 will ride against the rod 9, being held there by the spring 49, and will strike the collar of pin 36, forcing it backward, the rod 9 and its associated or coacting parts being automatically returned to their initial positions by the action of the spring 32. From this it will be seen that the switch will automatically return to the receiving position as soon as the receiver is returned to the hook without the necessity of first returning the switch to a particular position. During the revolution of the rod 9 by the button 11 the head 51 of the spring-detent 50 is in contact engagement with the teeth of the ratchet-wheel, and thus prevents the contact-springs 17 from stopping at points other than directly upon the screws 53. When station No. 2 desires to call station No. 1, the operation at the former station is the same as described with relation to station No. 1, except that the calling and talking circuits are over line-wires *a b* in the case illustrated instead of the wires *c d*. Obviously for every station connected to one of the switches there would be two screws 53 53'.



It will be understood that in the accompanying drawings we have illustrated but one of the forms which our invention may take and that in practice the details may be materially varied without departing from the scope of our invention.

Having now described our invention, what we claim as new, and desire to secure by Letters Patent, is—

10 1. In a telephone-switch the combination of a laterally and rotatably movable rod carrying a series of contacts near its lower end, a push-button at its upper end, contact-points with which the contacts are adapted  
15 to contact, means for making contact between the points and contacts, and means for automatically breaking the contact, substantially as described.

2. In a telephone-switch the combination  
20 of a rod carrying contact-points, a sleeve about the rod having an insulating-ring secured thereto, a series of contacts, means for making contact between the points and contacts, and means for automatically breaking  
25 the contact, substantially as described.

3. In a telephone-switch the combination of a base-plate, legs upon the base-plate carrying a cross-piece, a frame depending from the cross-piece, contact-springs secured to  
30 said frame, a rod carrying an insulating-ring passing through the cross-piece, the insulating-ring being adapted to actuate the contact-springs, substantially as described.

4. In a telephone-switch the combination  
35 of a cross-piece, a rod passing therethrough, a sleeve about the rod, a pin sliding in lugs depending from the cross-piece, said pin being adapted to slide over the upper face of the sleeve and hold the rod in a lowered po-  
40 sition, substantially as described.

5. In a telephone-switch the combination of a cross-piece, a rod passing therethrough, a sleeve about said rod, lugs depending from said cross-piece, a pin having a collar near  
45 one of its ends said pin sliding in the lugs and a spring interposed between the collar and one of the lugs for moving the pin forward, substantially as described.

6. In a telephone-switch the combination  
50 of a cross-piece, a switch-lever pivoted to a lug of the cross-piece, a spring for normally pulling the switch-lever upward, a spring-pressed catch secured to the face of the lever, a spring-actuated pin depending from the  
55 cross-piece, and a rod passing through the cross-piece, said catch being adapted to push the pin backward and permit the upward passage of the rod, substantially as described.

7. In combination the rod carrying con-  
60 tacts, a base-plate having contact-points thereon, a pin for holding the rod in a depressed position, and a catch for releasing the pin and permitting the return of the rod

to its initial position, substantially as de- 65 scribed.

8. In combination the rod having contacts near its lower end, a ratchet-wheel, a pin for holding the rod in a depressed position, a spring-pressed catch, scooped out on its in- 70 ner edge, for releasing the pin, and a spring-detent coacting with the ratchet-wheel, substantially as described.

9. In a telephone-switch of the character described, the combination with a support- 75 ing-frame, of a spindle rotatably mounted therein and capable of longitudinal movement, means carried by said spindle for imparting longitudinal movement thereto and rotating the same, a plurality of switch-con- 80 tact members carried by said spindle, a plurality of fixed line-contacts arranged to be engaged by said contact members, the said members being brought into line with the de- 85 sired contacts by the rotation of said spindle and into and out of engagement therewith by the lateral movement of the same, contacts to establish calling connection to line through a pair of said line-terminal contacts when  
90 said spindle is moved laterally in the direction to bring said contact members into engagement with said terminal contacts, contacts to normally maintain connection to line for receiving a call and for completing the talking-circuit when called, and means co- 95 operating with said spindle to make and break electrical connection through said contacts by the lateral movement of said spindle.

10. In a telephone-switch of the character described, the combination with a longitudi- 100 nally and rotatably movable spindle and means controlled thereby for establishing calling and talking connection to line, of a spring arranged to be placed under compression by the longitudinal movement of said 105 spindle to effect a call and acting to send said spindle longitudinally back toward its initial position when the pressure to effect said movement is released, a collar carried by said spindle, a spring-catch acting to engage said 110 collar and retain the parts of the switch in the talking position independent of a telephone-receiver, a pivoted lever arranged to support a telephone-receiver, a catch pivoted to said lever and adapted to engage said first catch 115 and to disengage the same from said collar when the receiver is returned to its supporting-lever, whereby said spring, placed under compression by the longitudinal move- 120 ment of said spindle, is allowed to return the parts of the switch to their initial positions.

In witness whereof we have hereunto set our hands in presence of two witnesses.

KLAS WEMAN.

HENRY MELVIN BASCOM.

Witnesses:

ETHEL C. SMITH,

JOHN A. PERCIVAL.