

No. 883,447.

PATENTED MAR. 31, 1908.

H. S. BULLOCK, JR.

CALL BOX.

APPLICATION FILED DEC. 15, 1906.

3 SHEETS—SHEET 1.

Fig. 1,

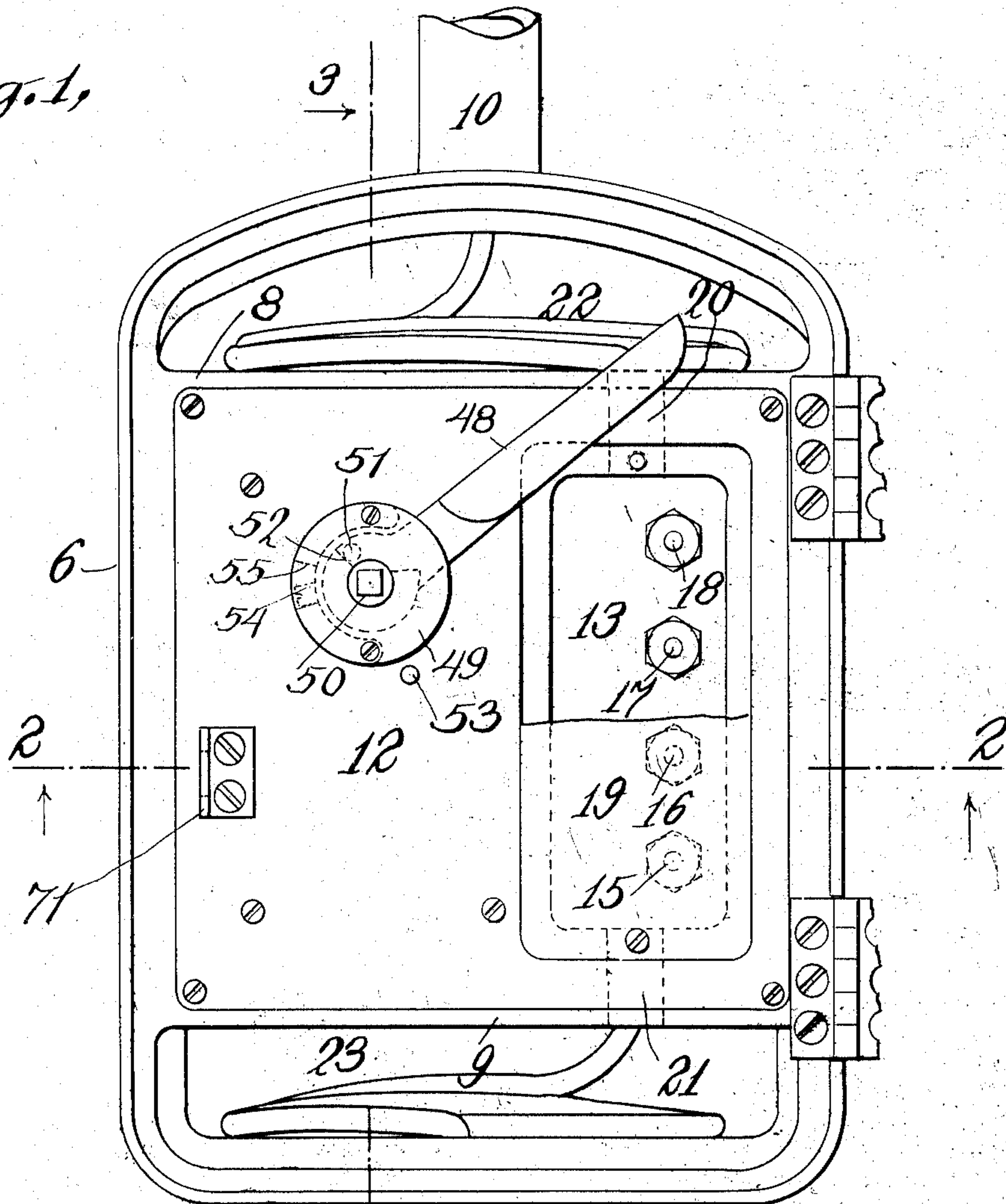
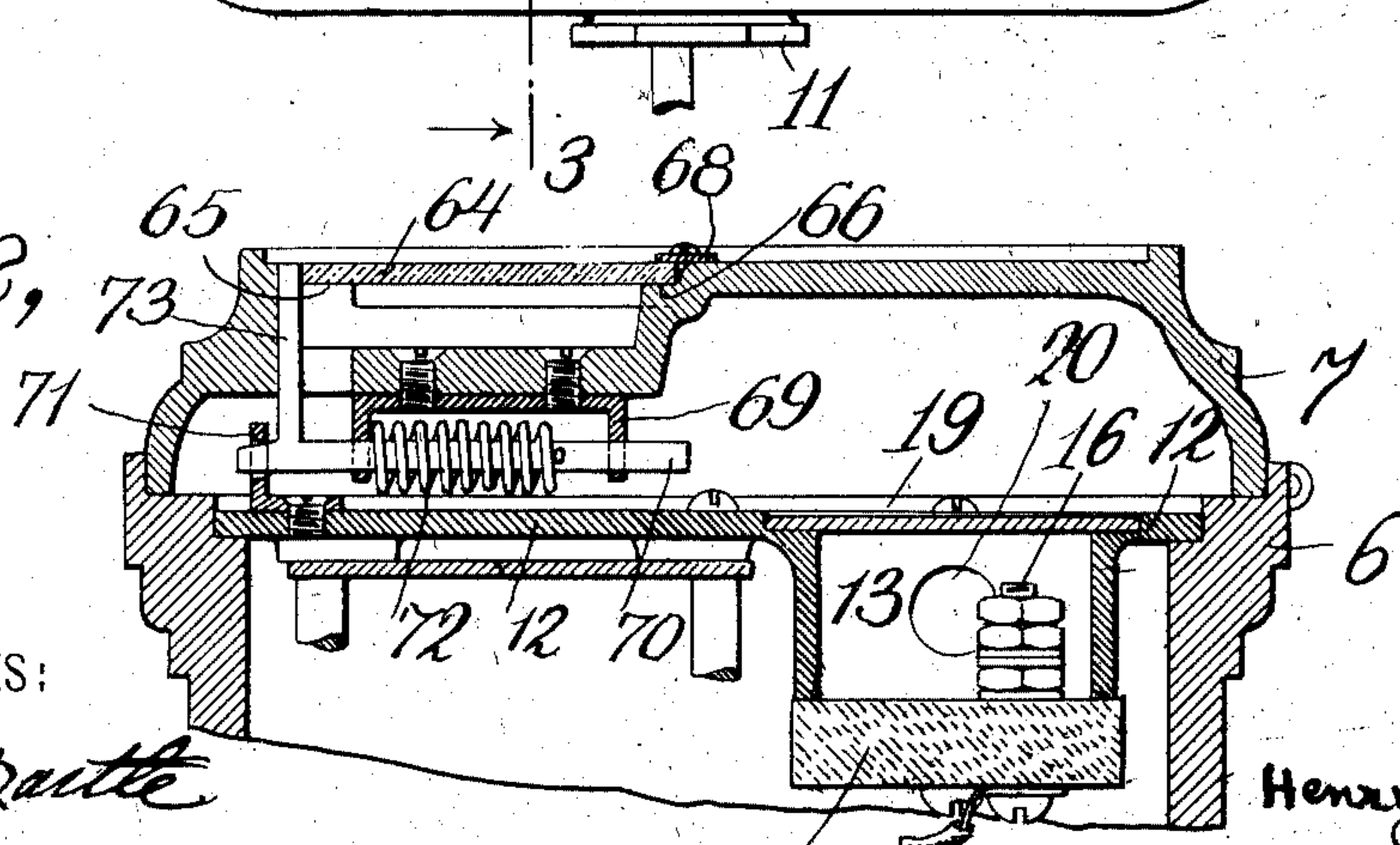


Fig. 2,



WITNESSES:

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*Alfred M. Houghton*

INVENTOR

*Henry S. Bullock Jr.*

BY

*Marble & McSherry*  
ATTORNEYS



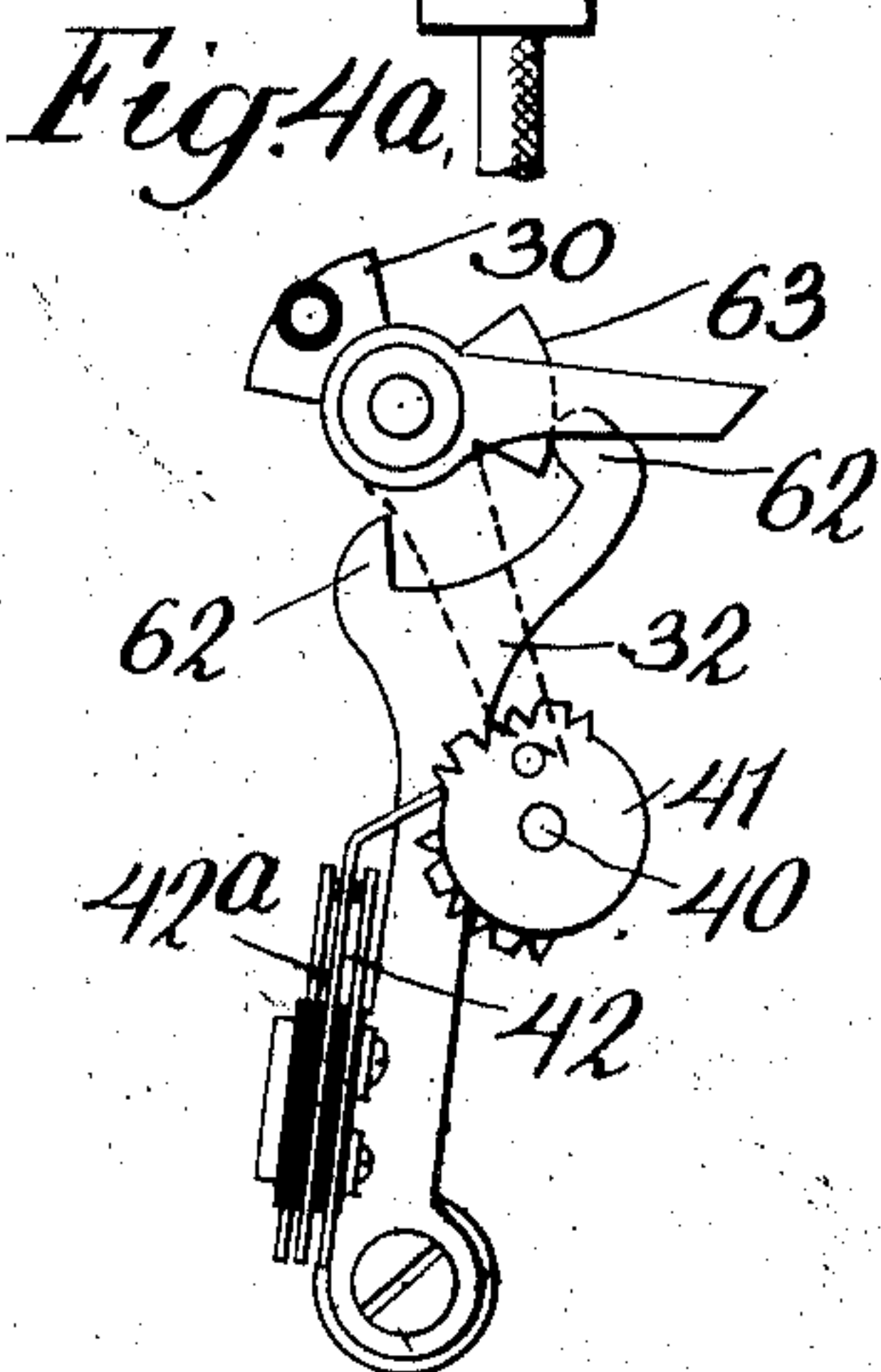
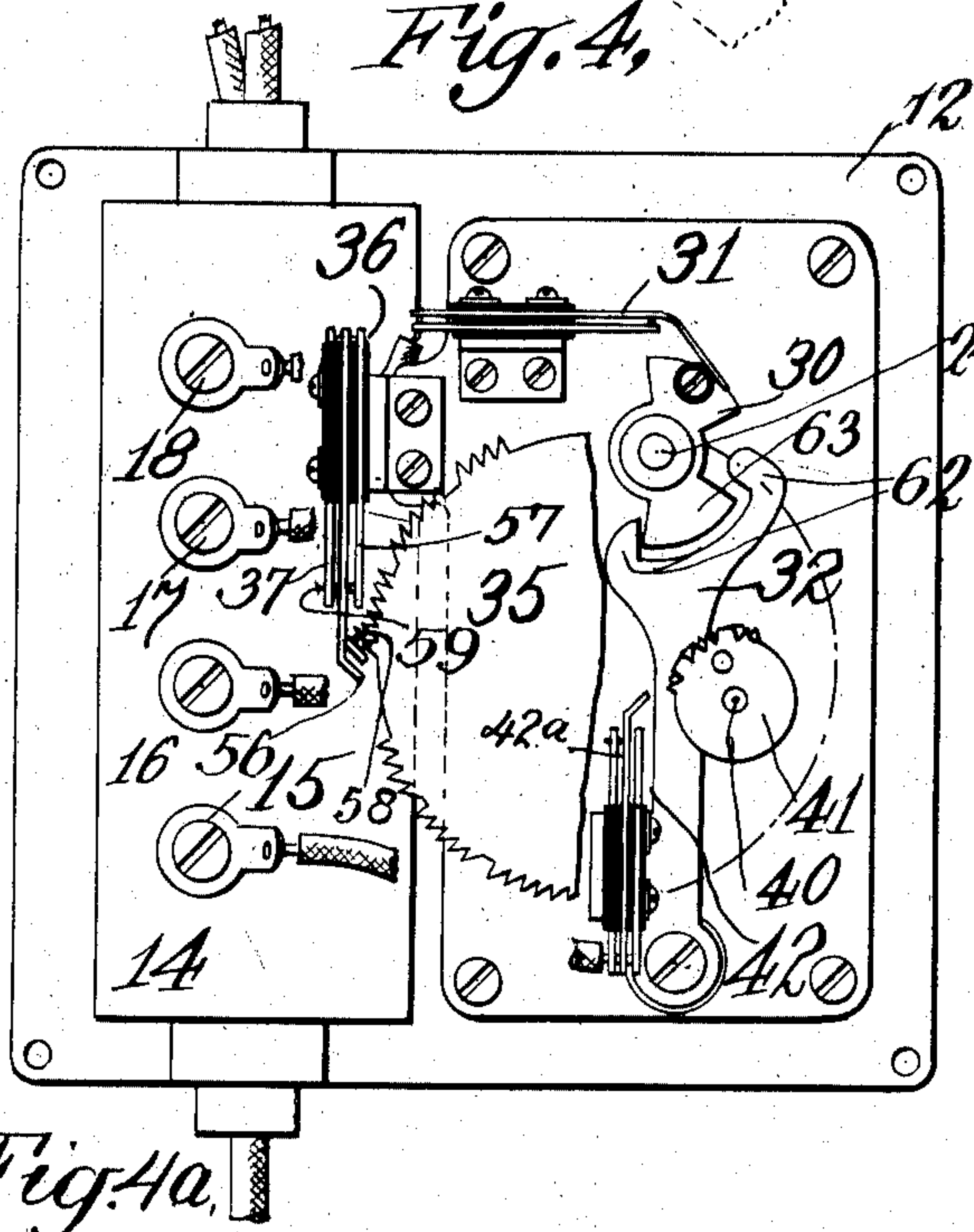
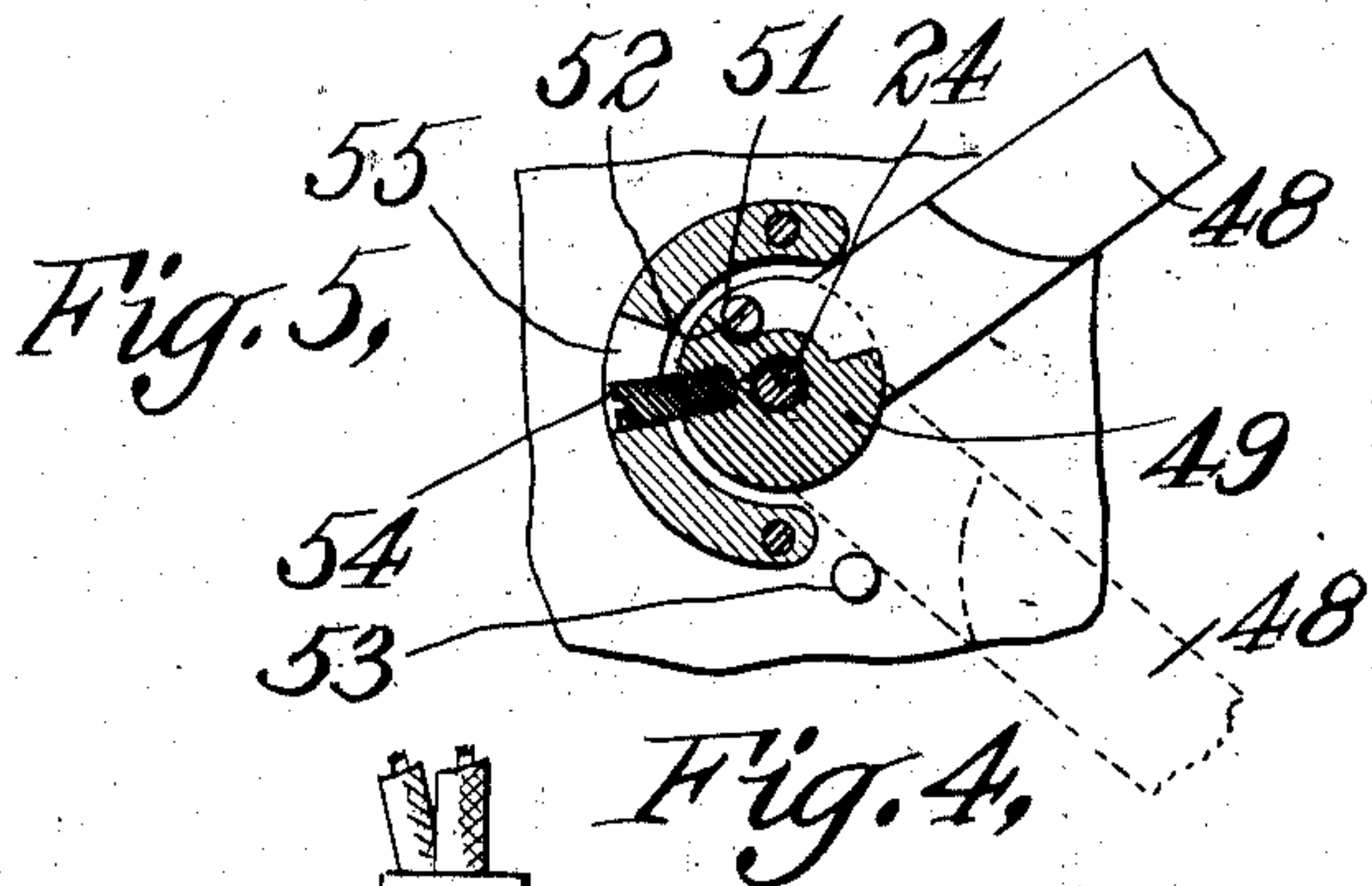
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3 SHEETS—SHEET 2.

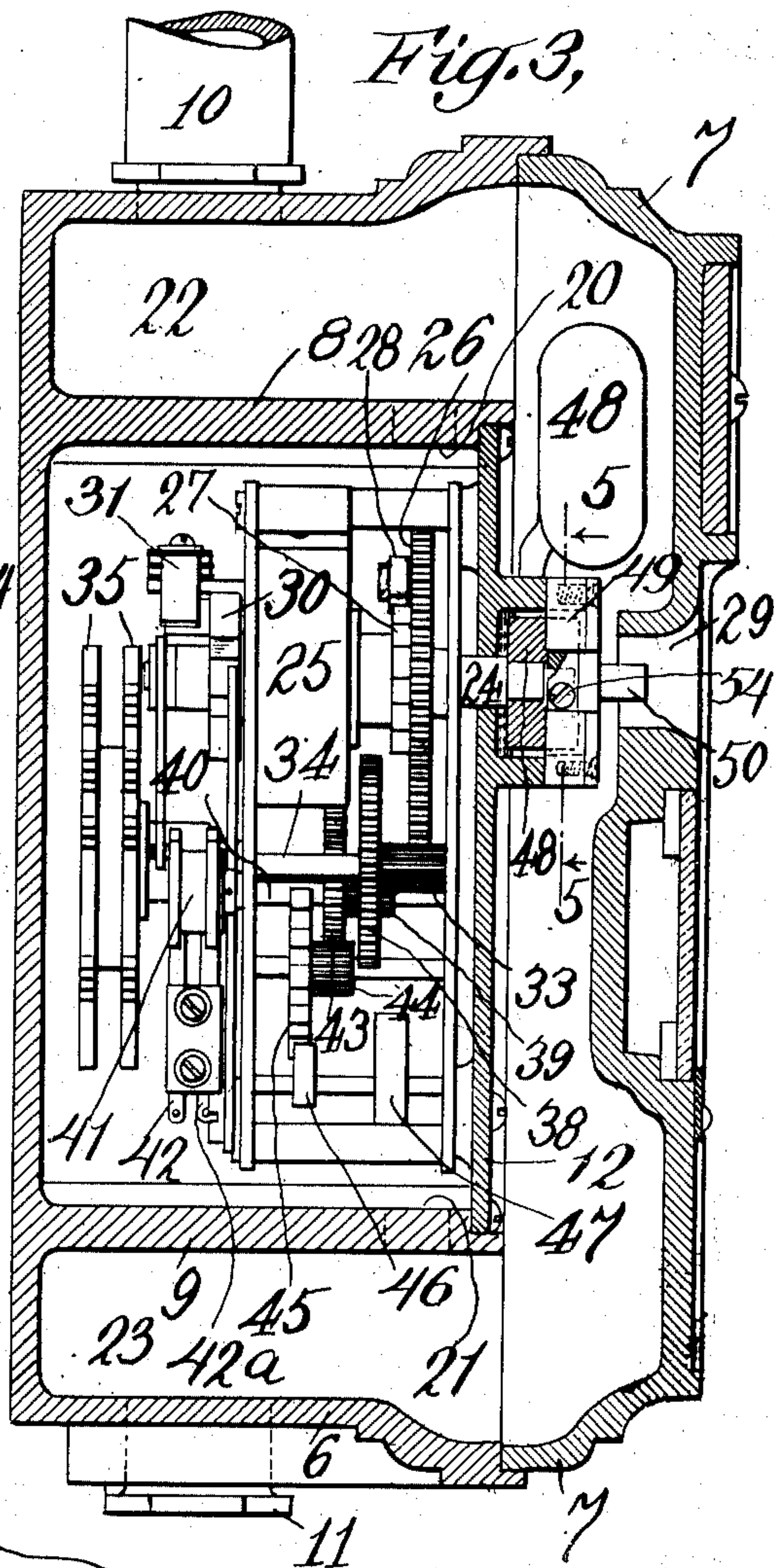
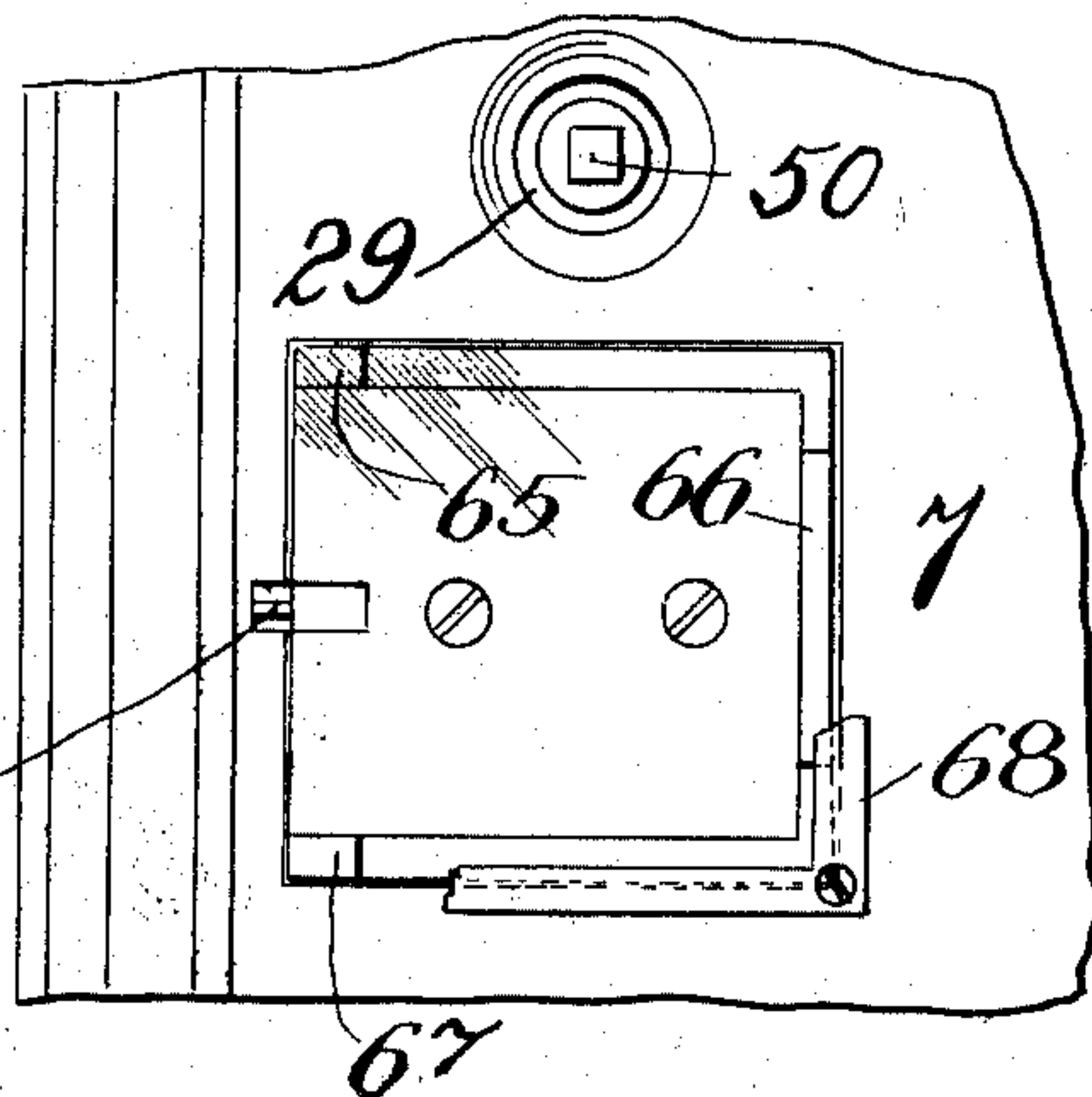


WITNESSES:

*Novell Battle.*

*Alfred M. Houghton.*

*Fig. 6,*



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3 SHEETS—SHEET 3.

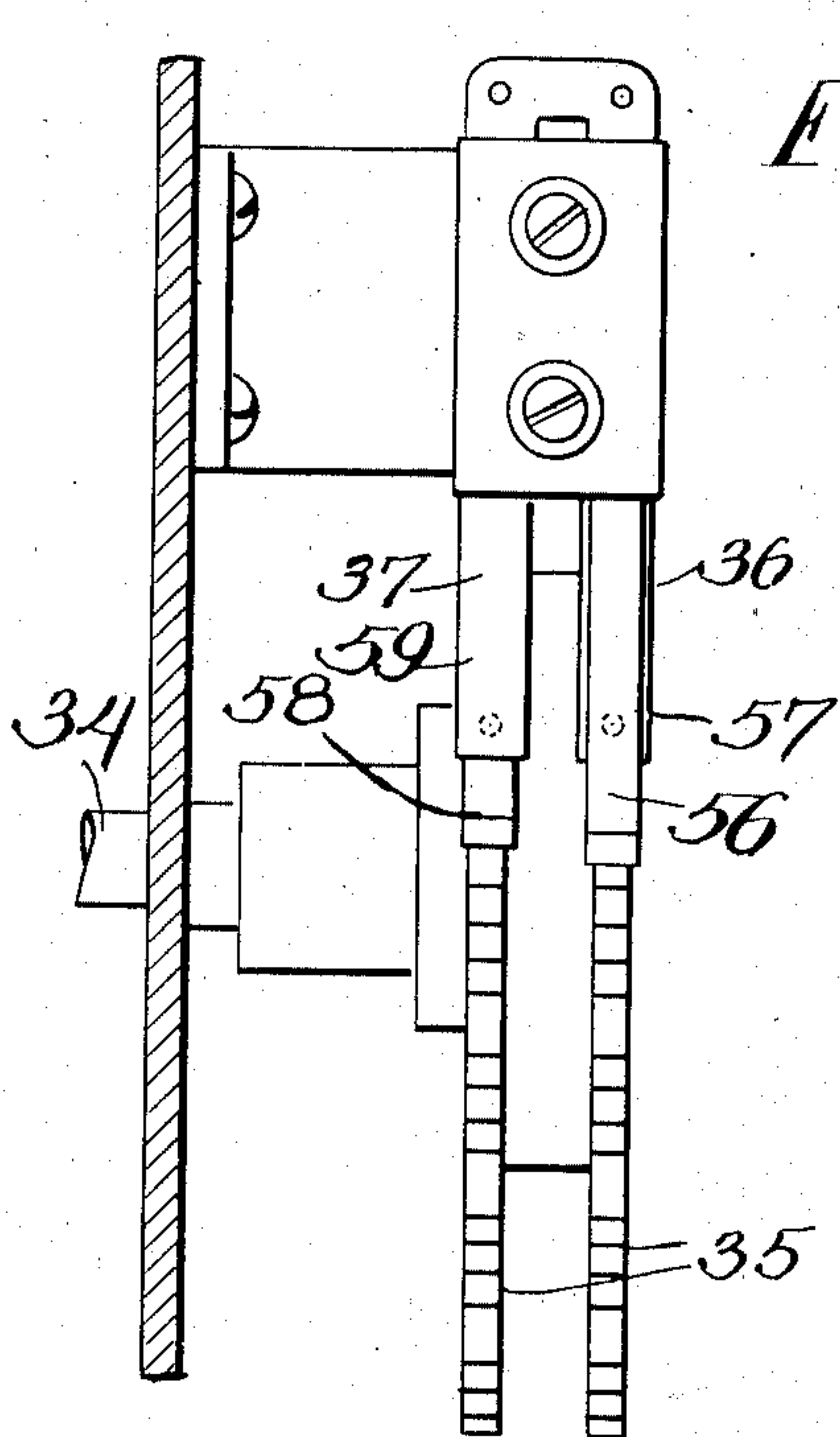


Fig. 7.

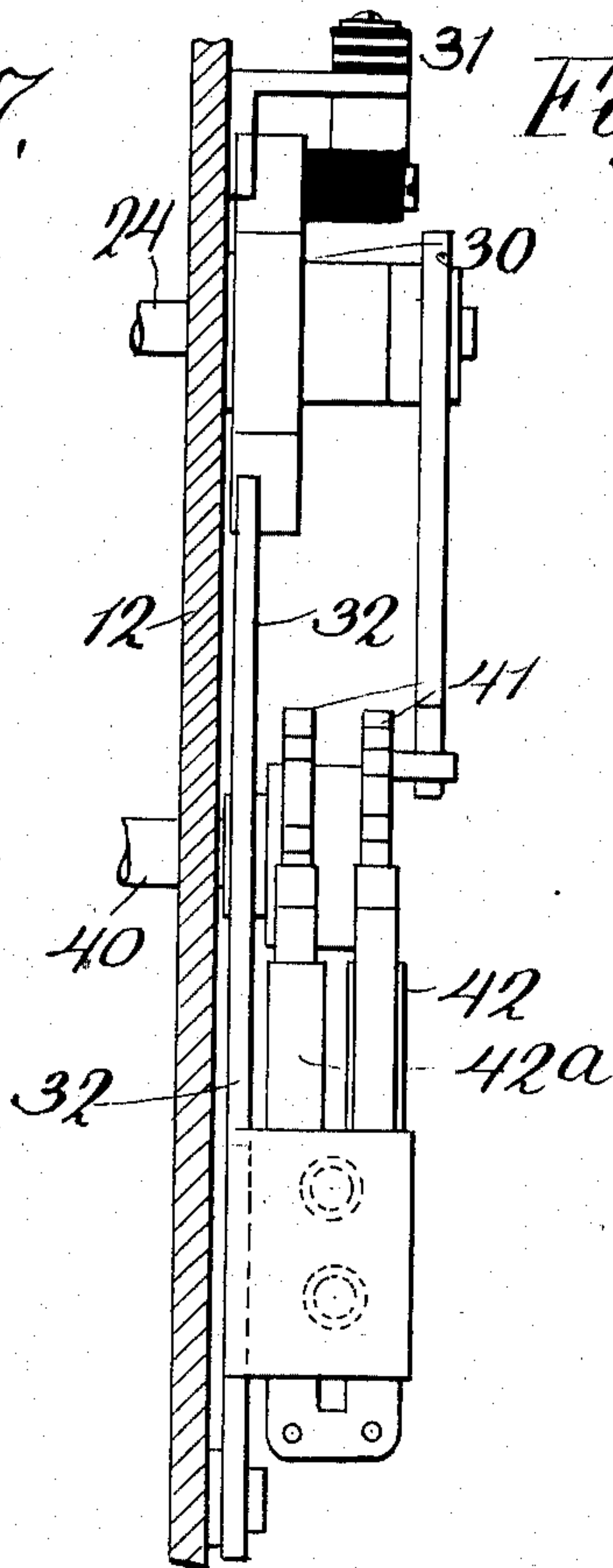


Fig. 8.

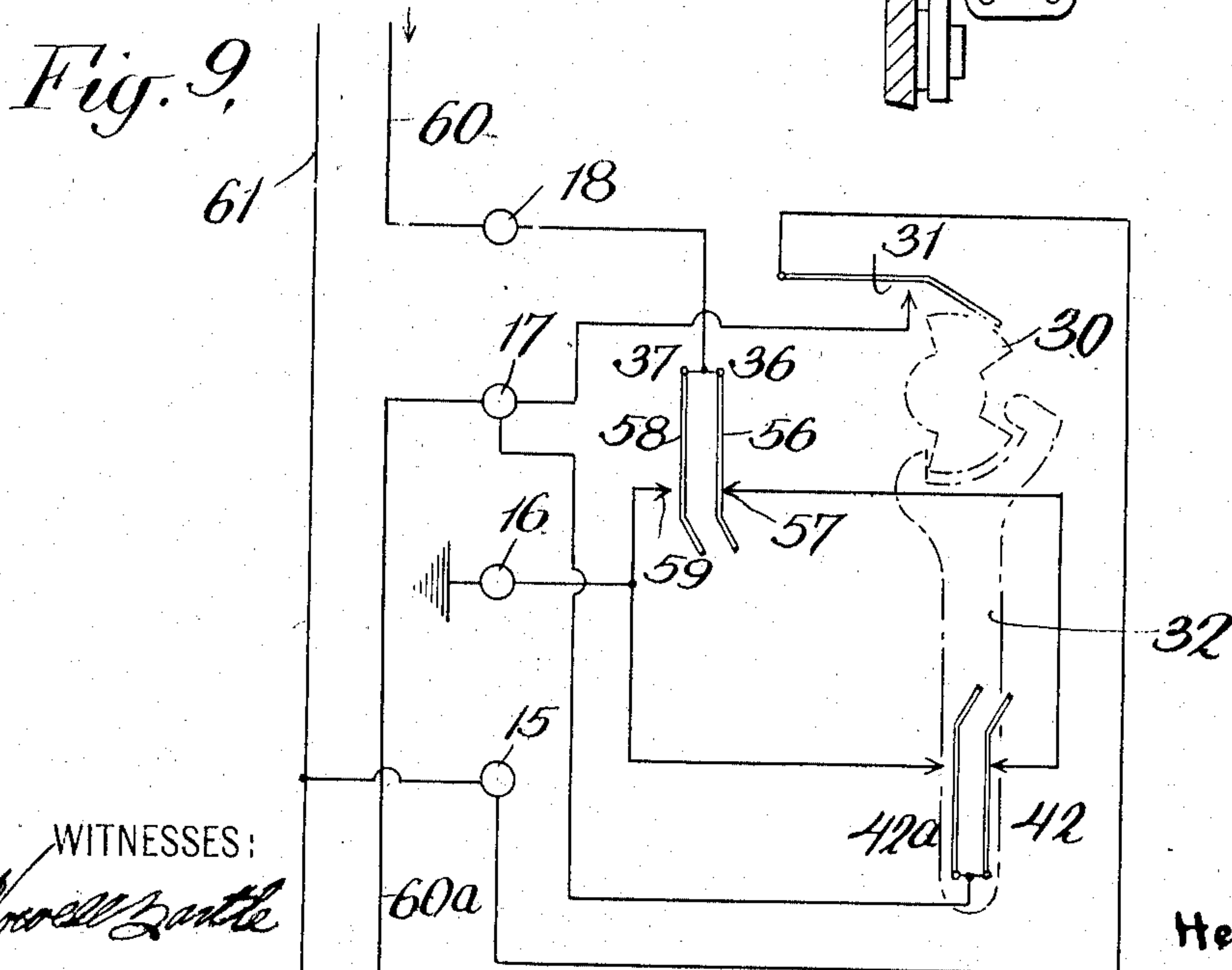


Fig. 9.

WITNESSES:

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# UNITED STATES PATENT OFFICE.

HENRY S. BULLOCK, JR., OF NEW YORK, N. Y., ASSIGNOR TO AMERICAN DISTRICT TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

## CALL-BOX.

No. 883,447.

Specification of Letters Patent.

Patented March 31, 1908.

Application filed December 15, 1906. Serial No. 347,945.

*To all whom it may concern:*

Be it known that I, HENRY S. BULLOCK, Jr., a citizen of the United States, residing at New York, in the borough of Manhattan, county of New York, and State of New York, have invented certain new and useful Improvements in Call-Boxes; and I do hereby declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in call boxes or transmitters such as are used in combined services, as for example combined watchman signal and fire alarm systems, and which are required to give two classes of signals. The patents to John C. Barclay, Nos. 761,026 dated May 24, 1904, and 777,327, dated December 13, 1904, describe boxes or transmitters of this class. Such boxes or transmitters usually comprise means for sending in a station signal (usually the number of the box) and, to distinguish one class of signals from the other, means for sending in an additional distinctive signal. In a combined watchman and alarm system, for example, the distinction between the character of signals transmitted is usually made by sending in only the number of the box for the watchman's signal, and by sending same in only once or a very small number of times, each time the box is operated for a watchman's signal; and, for the alarm signal, by sending in both the box number and a distinctive Morse or other code letter or designation, and causing the box number and this distinguishing character to be repeated a number of times.

The box number or station signal, and the said distinctive signal or Morse code letter, have customarily been transmitted by the same transmitting mechanism, and in fact by the same break wheels and pens or contact brushes; and to prevent the said distinctive signal or Morse code letter from being sent in while the watchman's signal is being transmitted, contact means have been provided for shunting the break wheels and pens during the time the portions of the break wheels containing said distinctive signal are passing the pens. On the break wheels, the distinctive signal has followed the box number. Also for sending in the watchman's signal the boxes have been

operated by a key. It has been found in some cases that the watchman, in withdrawing his key carelessly before the contact mechanism has come to rest, may turn his key backward somewhat, and thus open the shunt, cutting out the distinctive signal, thereby permitting such distinctive signal to come in; it being possible in such case to mistake the watchman's signal for an alarm signal. In the call box illustrated in the accompanying drawings I have provided means whereby possibility of false transmission of the distinctive signal is avoided. I have further substituted a mechanical cutout for the electric cutout to prevent the distinctive signal being sent in during the transmission of the watchman's signal. I have also so constructed the box that the mechanism thereof (clock train and contact mechanism) is very accessible and is readily removable from the box itself without breaking connections; and I have further provided an improved junction-box construction within the signal box and have made other improvements all as more fully hereinafter stated.

The accompanying drawings illustrate one form of call box embodying my invention.

In said drawings: Figure 1 shows a front view of box open, the door of the box having been removed. Fig. 2 shows a transverse horizontal section of the box including the door, the latter closed, and shows particularly the junction box, and the latch for holding the door closed until a glass or like breaking piece in said door is broken, the section being taken on a line 2—2 of Fig. 1. Fig. 3 shows a transverse vertical section of the box taken on the line 3—3 of Fig. 1. Fig. 4 shows a detail elevation of the contact mechanism looking from the left of Fig. 3, the main break wheel being partly broken away. Fig. 4<sup>a</sup> is a detail side view of the contact mechanism for giving the distinctive or alarm signal. Fig. 5 is a detail view showing partly in elevation and partly in section on the line 5—5 of Fig. 3, how the operating handle is connected to the winding staff of the clock train. Fig. 6 is a detail front view of a portion of the door showing the glass breaking piece and the key hole. Fig. 7 shows a detail side view of the main line-circuit break-wheel and pens. Fig. 8 is a similar view of the break-wheel and pens for transmitting the distinctive signal, the



cutout shunt contact device, and associated parts. Fig. 9 is a diagram showing the circuit connections.

In said drawings numeral 6 designates the box casing, 7 the door thereof, 8 and 9 upper and lower horizontal partitions in said box, and 10 and 11 tubes through which wires may be led into and out of the box. The clock train, comprising the contact mechanism, is mounted upon the back of a plate 12, secured to these cross partitions 8 and 9; said plate 12 being provided with a recessed junction box 13, the bottom of which is a block 14 of insulating material, carrying a plurality of terminal screws 15, 16, 17 and 18. This terminal box is normally closed by a removable plate 19. At the two ends of the terminal box are openings 20 and 21 leading respectively to the spaces 22 and 23 in the upper and lower parts of the main box 1, through which openings 20 and 21, wires may be led to and from the terminals in the junction box. It will be observed that chambers 22 and 23 provide room for the coiling up of a considerable amount of slack in the wires, so that when desired, the plate 12 with all parts thereon, may be taken out of the box 1 and turned around and inspected and even repaired to a considerable extent, without breaking connections or straining the wires; and at the same time the partitions 8 and 9 make it impossible that any portion of the slack wire shall get into the mechanism so as to interfere with its operation, after said plate 12 and the parts thereon have been returned to place. This is in practice a very important point, as will be appreciated readily.

The clock train comprises the usual main winding staff 24, said staff having mounted upon it the usual spiral clock spring 25 and a gear wheel 26, the latter being driven from the staff through a ratchet and pawl, 27 and 28, in the ordinary manner. In the door 7 there is a key hole 29 through which a key may be inserted to operate the staff 24. Upon staff 24 there is also mounted a cam 30 (Fig. 4) arranged to operate a shunt contact device 31 and also to operate a mechanical shunt device 32 for cutting out the distinctive signal as above referred to. Gear 26 drives, through pinion 33, the second staff 34 upon which is mounted the main or line signal or break wheel 35; this latter wheel being double, as is common in boxes of this sort which operate according to the well known McCullough system, embodying both line and ground circuit connections. Two contact devices 36 and 37 (Figs. 4 and 7) engage the two disks of the break wheel 35. The second staff 34 drives, through gear wheel 38 and pinion 39, the third staff 40, upon which is a second break wheel 41 for giving the distinctive signal referred to; the contact devices 42 and 42<sup>a</sup> for this second break wheel

being mounted upon the mechanical cutout lever 32 above mentioned. The third staff 40 drives, through gear 43 and pinion 44, the usual escapement 45 having the usual escapement anchor 46 and pendulum 47.

Upon main spring winding staff 24 is a hand lever 48 for operating the box. As shown particularly in Figs. 3 and 5 there is, in front of the hub of said hand lever 48, a disk 49, mounted upon the same staff 24 and having a square projecting portion 50 adapted to receive a key inserted through the key hole 29 in the cover. Hand lever 48 has a pin 51 adapted to be engaged by shoulder 52 of part 49 so that when said part 49 is rotated it will carry with it the hand lever and therefore will rotate the winding staff 24; but as will be seen from Fig. 5, hand lever 48 may be moved through a considerable range (corresponding to several repetitions of the box signal) before it engages the stop 53. A screw 54 carried by part 49 and working in a slot 55 limits the motion of disk 49 to such extent that when the disk 49 is operated by a key, the box signal is sent in only once or at the most, a limited number of times. When the hand lever 48 is depressed, however, the winding staff 24 is rotated through a much greater arc, as indicated in Fig. 5 by full-line and dotted-line representations of said lever. When the box is operated by means of lever 48, therefore, the signal of the box is repeated many more times than when the box is operated by a key engaging stem 50.

The contact devices 31, 36, 37, 42, and 42<sup>a</sup> are all similar and comprise spring contact pieces arranged to make and break contact with each other, such contact devices being mechanically operated by the cam 30, the break wheel 35, or the break wheel 41, as the case may be. Such mechanically operated contact devices are in many respects preferable to and more reliable than contact brushes making contact with the break wheels or shunt cam 30, such as might be employed. Contact device 36 comprises a pen 56 and contact spring 57, normally in contact but separated when the teeth of break wheel 35 pass the end of 56. Contact device 37 comprises a similar pen 58 and contact spring 59, normally out of contact but placed in contact when the teeth of wheel 35 pass the end of 58. The two contact devices, 42 and 42<sup>a</sup>, carried by lever 32, are similar to 36 and 37 respectively, one being a normally open contact, the other a normally closed contact. Contact device 31 consists of a pen and contact spring, normally held out of contact with each other by cam 30, but which make contact when staff 24 is rotated for an alarm signal.

Fig. 9 shows the circuits of the instrument. 60 and 61 are two lines wires, one connected to binding post or screw 18 and thence to pens 56 and 58 of contact devices 36 and 37;



the other connected to binding post 15 and thence to one spring of contact device 31, the other spring of which is connected to line wire 60<sup>a</sup> (wire 60 continued). Contact points 57 and 59 are connected to the contact springs of contact devices 42 and 42<sup>a</sup>, and contact 59 is also connected to terminal screw 16 and so to ground. The brushes of contact devices 42 and 42<sup>a</sup> are connected to terminal screw 17 and so to line 60<sup>a</sup>.

The operation of the call box is as follows: To send in one of the two classes of signals of which the box is capable—we will suppose it to be a watchman's signal, a key is inserted through the keyhole into engagement with the extension 50 of winding staff 24 and the key is turned as far as it can be turned and then withdrawn. This winds up the spring 25, and rotates the cam 30 far enough to permit the number of the box to be sent in a limited number of times (once, we will say) but does not rotate the cam 30 far enough to permit contact to be closed at 31, or to move cutout lever 32 far enough to bring its contact devices 42 and 42<sup>a</sup> into contact with break wheel 41. As soon as the key is released or withdrawn, break wheel 35 begins to rotate, operating the contact devices 35 and 37, and sending in the number of the box in the well-known manner. It will be noted that the contact mechanism 41—42—42<sup>a</sup> not having been brought into action, it is impossible that the distinctive alarm signal on wheel 41 shall be sent in when the box is operated by the key and the staff 24 turned through the limited range permitted by the pin 54 working in the slot 55 (Fig. 5). To send in the other signal, which we will suppose to be an alarm signal, the cover of the box is opened and the lever 48 pulled down as far as it will go. This winds up the spring 25 enough to send in the box number many more times than before, and also moves the cam 30 far enough to bring the contact devices 42 and 42<sup>a</sup> into engagement with break-wheel 41 and to cause the contact device 31 to close the shunt between terminals 15 and 17 shown in Fig. 9, thereby cutting out all boxes in circuit 60<sup>a</sup> or beyond. As soon as the hand-lever is released the break wheels 35 and 41 begin to rotate. The teeth and blank spaces of these two wheels are so placed relatively that the contact devices 36—37, and 42—42<sup>a</sup> are operated alternately, thus sending in the number of the box and the character on wheel 41 alternately; it being immaterial, in a broad sense, whether the number of the box or the character on wheel 41 (the "distinctive signal" above mentioned) is sent in first. In practice, the handle 48 is usually arranged to be moved through such an arc that the number of the box and the distinctive signal will be repeated a large number of times, when the alarm is sent in.

It will be noted that the cutout lever 32 carrying the contact device 42—42<sup>a</sup> has lugs 62 embracing a cam-projection 63 of cam 30, so that said cam 30 moves the cutout lever 32 positively in both directions; also, as lug 63 moves out of the recess between lugs 62 when the handle 48 is operated as described, its face, engaging the end of one lug 62, prevents the arm 32 from rotating so as to disengage contact device 42—42<sup>a</sup> from break wheel 41 until, in the last round of the signal, the lug 63 enters the space between lugs 62 and then moves the lever 32 away from wheel 41; the construction being similar to the well-known "Geneva stop-motion". This box gives the same signals precisely, whether working on complete metallic circuit, or when working on grounded circuit, *i. e.*, the circuit through the ground-terminal 16; the two disks of break-wheel 35, being exactly alike, that for the open-circuit contact 37 set slightly in advance of that for the closed circuit contact 36, so that the completion of contact through 37 and the breaking of contact at 36 shall be practically simultaneous. In the break wheel 41, both disks are likewise exactly alike, but the disk which coacts with contact device 42<sup>a</sup>, *i. e.*, the "McCullough" disk, is so set that its pen does not engage the teeth in it until the pen of contact device 42 has ceased to make contact with the teeth of its corresponding disk. By placing the box number wheel 35 on the second staff, instead of upon the third staff, as has been customary in call boxes of the same general type heretofore, I obtain more power for the operation of this wheel and its contact devices, and owing to the greater spring-pressure rendered possible in contact device 36, (the main-line contact through which other boxes further on in the circuit must operate) insure a better circuit for the boxes to operate through.

One feature of my invention relates to the latch for holding the door 7 closed except when it is desired to send in an alarm. It is customary in boxes of this sort to have the door held closed by a latch comprising a breaking piece, such as a piece of glass, which must be broken before the door can be opened.

Referring to Figs. 2 and 6, 64 designates a glass plate, set within a recess in the door 7, and resting upon three lugs, 65, 66 and 67, seen through the glass, in Fig. 6. The glass is held in place by a thin metal frame 68 held in place by screws, as indicated. On the under side of the door is a bracket 69, having bearings for a sliding, spring-pressed bolt 70, normally engaging a lug 71 secured to plate 12 and so holding the door closed. The spring 72 of said bolt tends to retract it from said lug 71, this being prevented normally by the engagement of a lug 73 of said bolt with the edge of the glass 64. But when the glass is broken, the spring 72 automatically re-



tracts bolt 70, thus permitting the door to open.

It is exceedingly important, in devices of this sort, that the glass shall be held in such manner that it may be broken readily, and that when broken no splinter shall remain in such position as to prevent unlocking of the door. In this device, the three-point support of the glass makes it very easy to break the glass, and at the same time the glass is quite free under the frame 68, so that the portion of the glass adjacent to the lugs 73, if not broken with the rest, will be pushed back instantly by the spring 72 and lug 73. It will be noted that the lug 73 presses edgewise against the glass; the glass acting, therefore, in the direction of its greatest strength, to resist the action of the spring 72, until said glass is broken.

What I claim is:

1. A signal transmitter comprising in combination transmitting means for transmitting successively and in alternation two different signals, mechanism arranged to operate said transmitting means a greater or less number of times at will, and a mechanical cutout preventing the transmission of one of said signals, but not the other, during a selected period of the operation of said transmitting means.

2. A signal transmitter comprising in combination transmitting means for transmitting successively and in alternation two different signals, mechanism arranged to operate said transmitting means a greater or less number of times at will, and a mechanical cutout preventing the operation of means for transmitting one of said signals during a selected period of the operation of the transmitter.

3. A signal transmitter comprising in combination two transmitting devices and operating mechanism arranged to cause same to operate successively and in alternation a greater or less number of times at will, and a mechanical cutout throwing one of said transmitting devices out of operation during a selected period of the operation of the transmitter.

4. A signal transmitter comprising in combination two transmitting devices and operating mechanism arranged to cause same to operate successively and in alternation a greater or less number of times at will, and a mechanical cutout for one of said transmitting devices throwing same out of operation during the last round of signals.

5. A signal transmitter comprising in combination two transmitting devices and operating mechanism arranged to cause same to operate successively and in alternation a greater or less number of times at will, and a mechanical cutout having mounted thereon a member of one of said transmitting devices and operated by said operat-

ing mechanism to hold said member out of operative position during a selected period of the operation of the transmitter.

6. A signal transmitter comprising in combination two transmitting devices, each comprising a break-wheel and pen operating mechanism arranged to cause same to operate successively and in alternation a greater or less number of times at will, and mechanical cutout means comprising a movable member having mounted upon it one of the members of one of said transmitting devices, and operated by said mechanism to hold such transmitting member out of operative position.

7. A signal transmitter comprising in combination two transmitting devices each comprising a break-wheel and pen, operating mechanism therefor, and mechanical cutout means comprising a member having mounted upon it one of the members of one of said transmitting devices, and operated by said mechanism to hold said transmitting member out of operative position.

8. A signal transmitter comprising in combination two transmitting devices, each comprising a break-wheel and pen, a clock-train for operating said transmitting devices, and mechanical cutout means comprising a member having mounted upon it one of the members of one of said transmitting devices, and operated by said clock-train to at times hold said transmitting member out of operative position.

9. A signal transmitter comprising in combination two transmitting devices, each comprising a break-wheel and pen, a clock-train for operating said transmitting devices, comprising a cutout-operating cam, and mechanical cutout means comprising a member having mounted upon it one of the members of one of the said transmitting devices, said cutout member operated positively by said cam in both directions.

10. A signal transmitter comprising in combination two transmitting devices, each comprising a break-wheel and pen, a clock-train for operating said transmitting devices comprising a cutout-operating cam, and mechanical cutout means comprising an arm having mounted upon it one of the members of the said transmitting devices, said arm and cam comprising intermeshing portions positively connecting them.

11. A signal transmitter comprising in combination a case, a removable mechanism-plate secured thereto, transmitting mechanism upon said plate, and a closed terminal-box mounted upon said plate and removable therewith and containing contact terminals for said transmitting mechanism.

12. A signal transmitter comprising in combination a case, provided with a mechanism plate having a recess forming a terminal-box, transmitting mechanism upon said plate, insulating material at the bottom of



said terminal-box recess, and terminals for said transmitting mechanism upon said insulating material.

13. A signal transmitter comprising in combination a case provided with transverse partitions forming chambers for containing circuit leads and an intermediate mechanism-chamber and provided also with a mechanism-plate covering said chamber, and transmitting mechanism upon said plate and circuit leads therefor passing through said lead-chambers.

14. A signal transmitter comprising in combination a case provided with transverse partitions forming chambers for containing circuit leads and an intermediate mechanism-chamber and provided also with a mechanism-plate covering said chamber, transmitting mechanism upon said plate, and a terminal box between said partitions, having terminals for said mechanism, said partitions having openings for the passage of circuit leads to said terminal box.

15. A signal transmitter comprising in combination a case provided with transverse partitions forming chambers for containing circuit leads and an intermediate mechanism-chamber, a removable mechanism-plate over said chamber, transmitting mechanism upon said plate, and a terminal block of insulating material on said plate provided with terminals for said mechanism.

16. A signal transmitter comprising in

combination a case, a door therefor having a recess to receive a breaking-piece, latching mechanism for said door comprising a movable locking member, and a breaking-piece therefor in said recess, said latching mechanism having a projection normally engaged and held in the locked position by said breaking-piece.

17. A signal transmitter comprising in combination a case, a door therefor having a recess to receive a breaking-piece, latching mechanism for said door comprising a bolt and a spring tending to retract same from locking position, and a breaking-piece in said recess, said bolt having a projection normally engaged and held in the locked position by said breaking-piece.

18. A signal transmitter comprising in combination a case, a door therefor having a recess to receive a breaking piece, latching mechanism for said door comprising a member adapted to be engaged and held in locked position by a breaking piece in place in said recess, and a breaking piece in such recess, said recess having three-point supporting means for said breaking piece.

In testimony whereof I affix my signature in the presence of two witnesses.

HENRY S. BULLOCK, JR.

Witnesses:

ROGER H. LYON,  
H. M. MARBLE.