

(No Model.)

2 Sheets—Sheet 1.

C. SCHWENNICKE.
ELECTRIC SIGNAL DEVICE.

No. 503,709.

Patented Aug. 22, 1893.

Fig. 1.

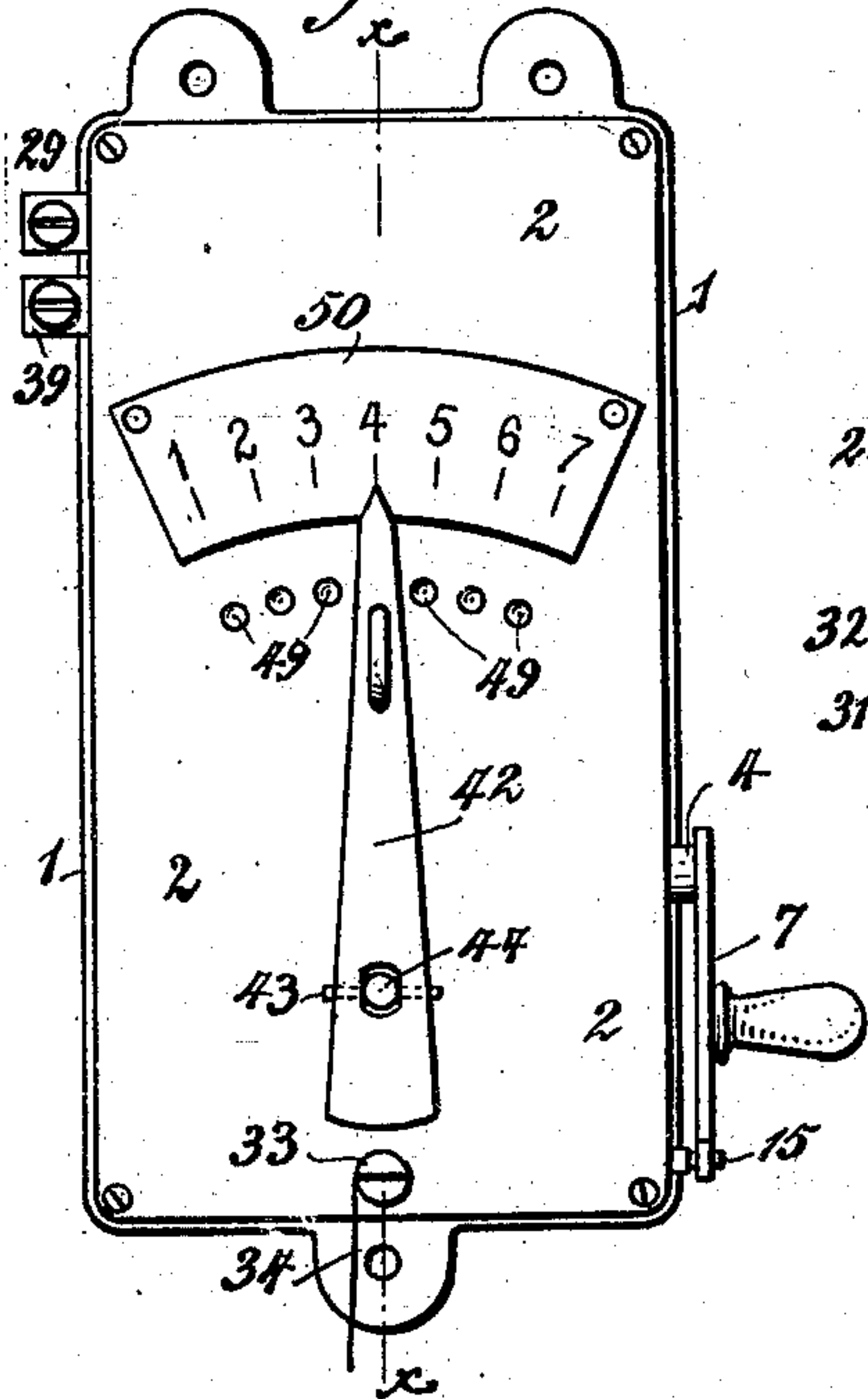


Fig. 2.

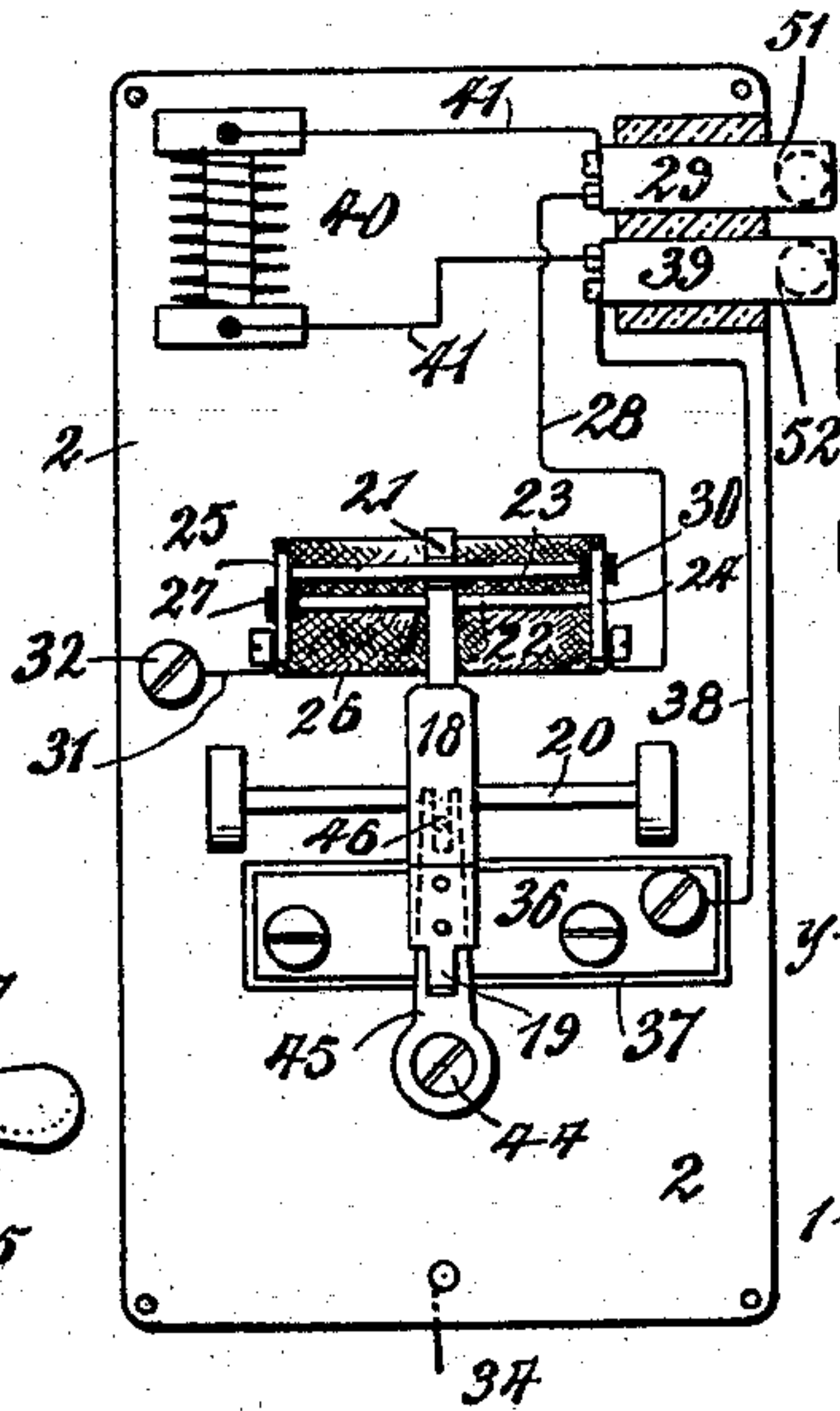


Fig. 3.

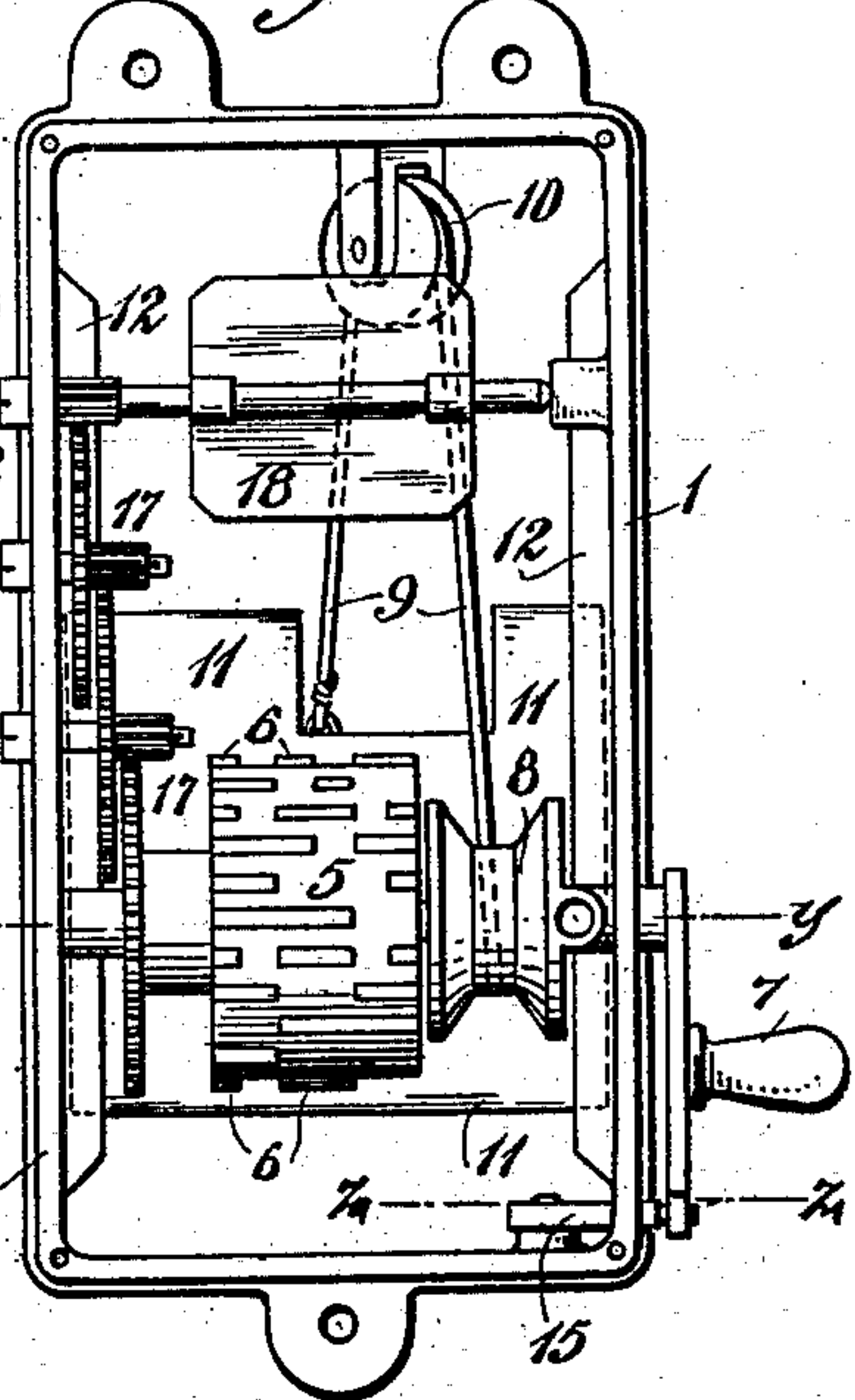


Fig. 4.

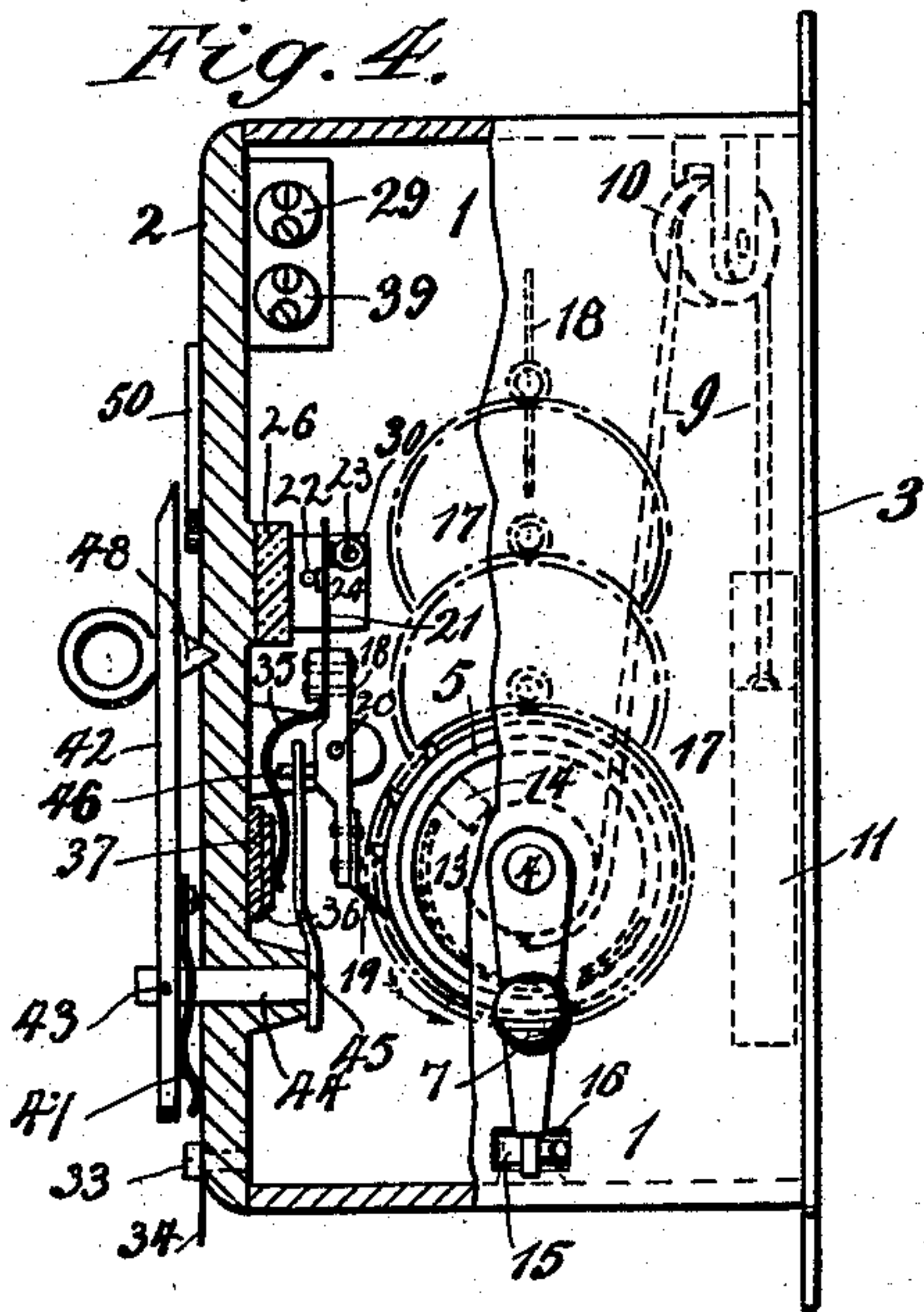


Fig. 5.

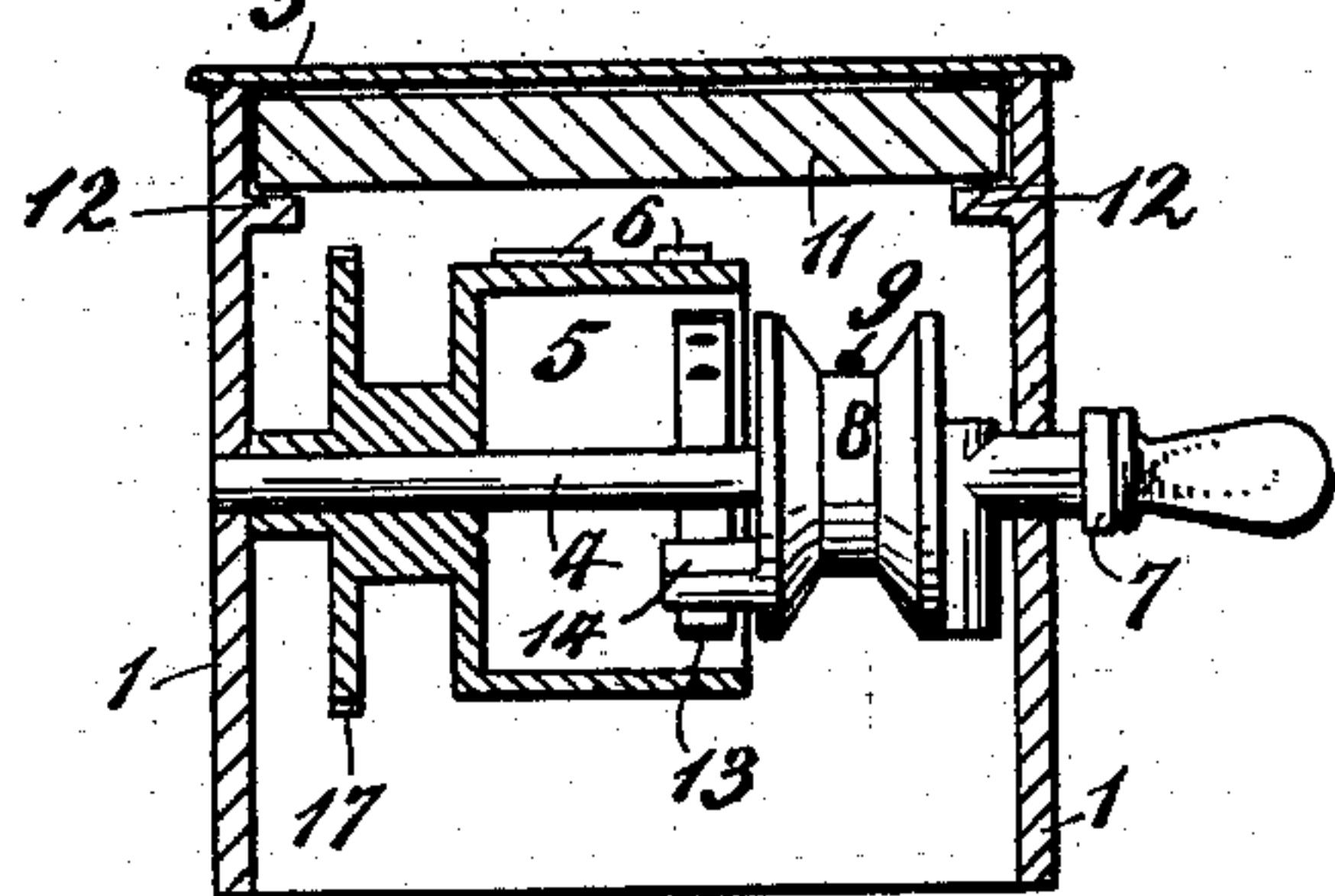
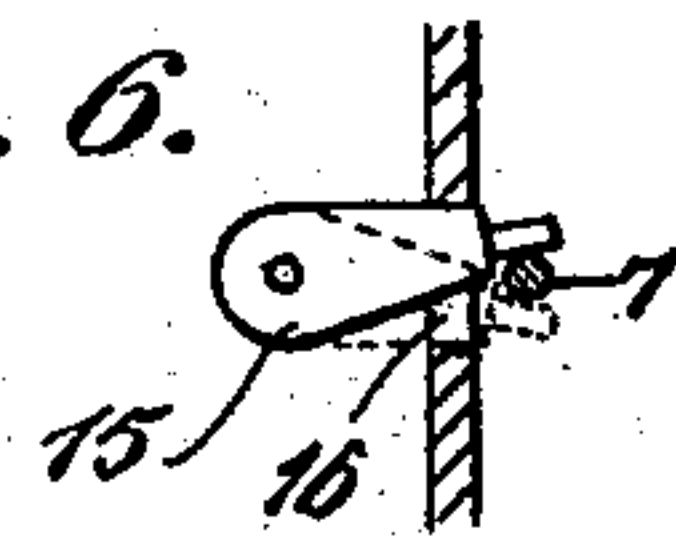


Fig. 6.



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Fig. 7.

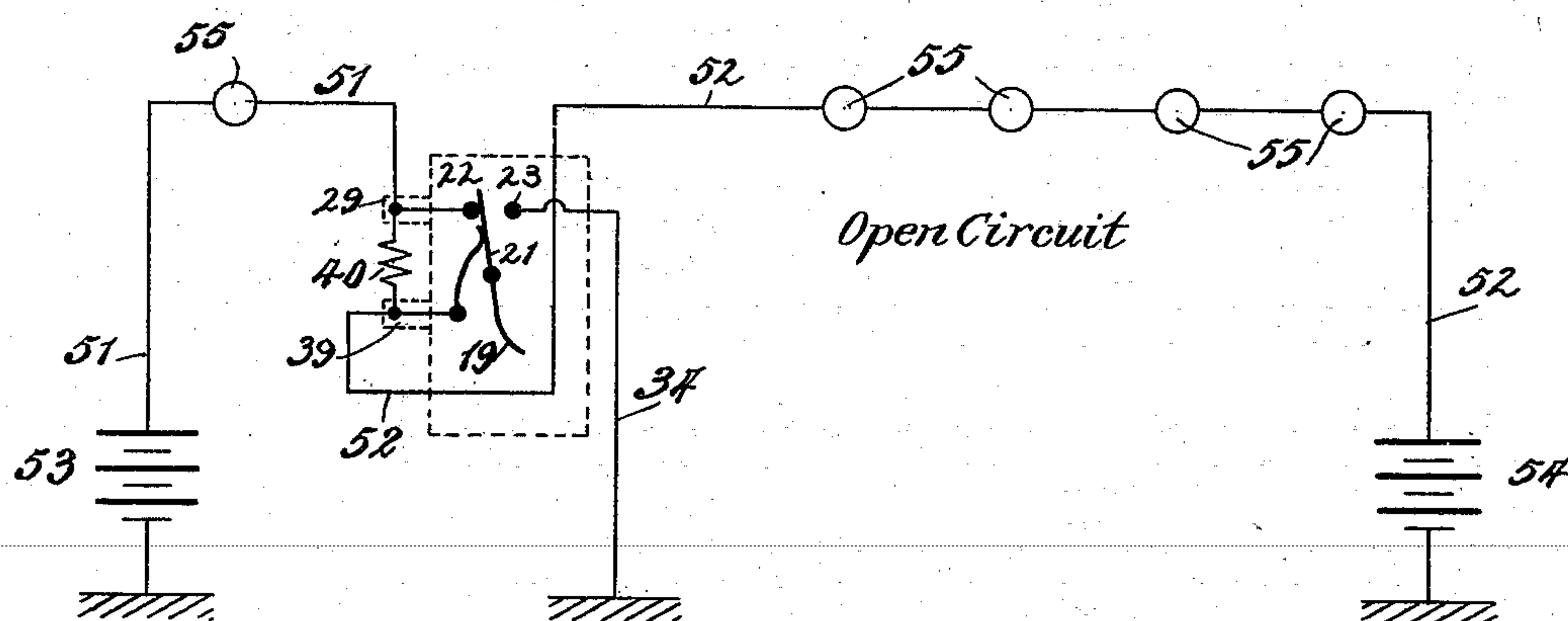
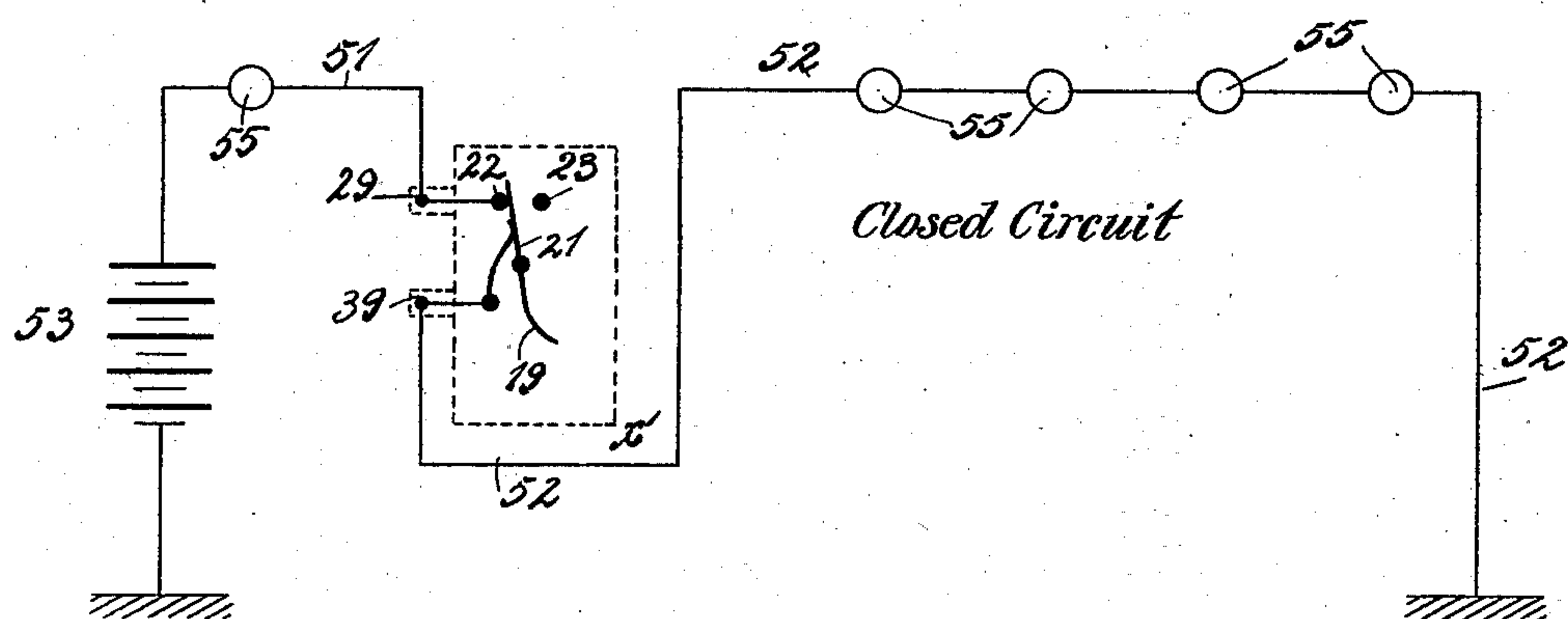


Fig. 8.



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UNITED STATES PATENT OFFICE.

CARL SCHWENNICKE, OF BERLIN, GERMANY, ASSIGNOR TO SIEMENS & HALSKE, OF SAME PLACE.

ELECTRIC SIGNAL DEVICE.

SPECIFICATION forming part of Letters Patent No. 503,709, dated August 22, 1893.

Application filed March 30, 1893. Serial No. 468,336. (No model.)

To all whom it may concern:

Be it known that I, CARL SCHWENNICKE, a subject of the King of Prussia, German Emperor, residing at the city of Berlin, Kingdom of Prussia, German Empire, have invented new and useful Improvements in Electric Signal Devices, of which the following is a specification.

My invention relates to electric signaling devices or apparatus adapted for giving a variety of signals by the aid of a rotating toothed wheel acting with an adjustable electrically connected contact lever.

In prior devices of this character, the parts have been arranged within their protecting casing in a manner not allowing easy accessibility for examination or adjustment.

My invention has for its chief object to construct and relatively combine or arrange the parts of a signal device of this character in such manner as shall provide for ready accessibility to all its parts, both mechanical and electrical, to facilitate examination, adjustments or repairs.

The invention will first be described and then will be particularly defined in claims hereinafter set forth.

Reference is to be had to the accompanying drawings, forming a part of this specification, and in which similar numerals indicate like parts in the several views.

Figure 1 is a front or outside elevation of my improved electric signaling device. Fig. 2 is an elevation of the rear or inner face of the cover and attached parts. Fig. 3 is a front elevation of the main body of the casing and contained parts, the cover being removed. Fig. 4 is a side view, partly in vertical section, on the line x, x , in Fig. 1. Fig. 5 is a detail sectional plan view, taken on the line y, y , in Fig. 3. Fig. 6 is a detail plan view, taken on the line z, z , in Fig. 3, and Figs. 7 and 8 are diagrams of the electric circuits.

The box or casing of the signaling device comprises a body portion 1, a removable front lid or cover 2, and a back plate 3, which also may be and preferably is removable. Within the box is placed revolvably upon a transverse shaft 4, a wheel 5 having varying circumferential series of signal-giving teeth or prominences 6, and adapted for rotation in

one direction, by means of a crank 7, which is fixed to the shaft 4. This shaft also has fixed to it a grooved pulley 8, to which is connected one end of a cord 9, which runs over a guide pulley 10, held at the top of the box, and thence to a weight 11, moving in a vertical groove or slideway provided between flanges 12, 12, and the rear wall or plate 3 of the box.

The signal wheel 5 is preferably made hollow and within its periphery is fixed one end of a curved spring 13, the other end of which normally stands off from the periphery. A stud 14 is fixed to the cord pulley 8, and as said pulley is turned to the right hand one complete revolution, the stud will press the free end of the spring 13 outward to the wheel periphery and pass by the spring. A stop 15, which is pivoted for horizontal movement inside the box or casing, protrudes through a slot 16 of the front cover plate 2, and is actuated to the right and left hand by the crank 7, to adjust the stud 14 relatively with the signal wheel spring 13, as hereinafter more fully explained. A train of gear wheels 17, one of which is connected with the wheel 5, also rotates a fly or fan 18 which is journaled in the box above the wheel and properly retards rotation of the wheel when it is actuated by the falling weight 11.

A lever 18 made of suitable non-conducting material carries a lower trip plate 19, adapted for action by the signal wheel teeth or projections 6. This lever 18 may move laterally along and rock upon a transverse shaft 20, which is held to suitable bearings on the cover 2. At its upper end the lever carries a metallic contact plate 21, which projects upward between two laterally ranging metallic contact rods or shafts 22, 23, which are sustained by metal end bearings 24, 25, which are fixed to a non-conducting plate 26, fastened to the cover 2.

The contact rod 22 is supported at or from the bearing 25 by an insulation 27, and has electric connection with the other bearing 24 and through the latter and a wire 28, with the binding post 29; and the contact rod 23 has a support at or from the bearing 24 in an insulation 30, but has electric connection with the other bearing 25, and through it by a wire

31 and a screw 32, the metallic cover 2, and a binding post or screw 33, in the latter with a wire 34 adapted for connection with or in a ground circuit.

5 A spring 35 held to the lever 18 acts on a metal conducting plate 36, to normally hold the lever contact 21 to the rod contact 22, and this plate 36 is fastened to an insulating plate 37, fixed to the front cover 2 of the casing. A
10 wire 38 electrically connects the plate 36 with the other binding post 39. The lever contact 21 thus is in constant electrical connection with the binding post 39 at any lateral adjustment of the contact, and a suitable resistance coil or device 40, by its terminal wires
15 41 is adapted to be switched into circuit *via* the binding posts 29, 39. It will be noticed that these two binding posts, as also the resistance coil 40, are all held to the cover or
20 lid 2 of the casing 1, and as this lid also carries the lever 18, contacts 21, 22, 23, 35, 36, and their adjusting mechanism, the entire electrical portions of the instrument, aside from the signal wheel 5, are held to the cover and are
25 removable therewith to give free access especially to the electrical devices and also to all other parts of the instrument.

The contact lever 18 may be adjusted laterally on the rod 20, to adapt its plate 19 to
30 be tripped by any circumferential series of signal wheel detents 6, by means of a hand lever 42, which is outside the box or casing and is pinned at 43 to a short shaft 44, which is journaled in the box cover 2, and at its inner
35 end carries a tappet arm 45, the upper forked end of which straddles a pin 46, fixed to the lever 18, and whereby as the outside lever 42 is rocked to one side or the other, the arm 45 will shift the contact lever 18 correspondingly to cause its plate 19 to engage any
40 desired circumferential series of the signal wheel detents to give the required signal. A spring 47 behind the lever 42, and preferably held to it, gives frictional contact with the box
45 cover 2, and also holds a stud 48 on the lever into any one of a series of recesses 49, made in the cover. Seven recesses 49 are shown in the drawings to correspond with a like number of different signals which may be given
50 by the wheel 5. An indicator plate 50, fixed to the front of the box cover and bearing numerals or other characters, identifying the different signals, serves as a gage to set the lever 42 at the proper place to cause the required
55 signal to be given.

The operation of the device is as follows: When the weight 11 has run down after having given one full turn toward the left hand of the signal wheel 5, to cause sounding of one
60 particular bell signal, the crank 7 will have thrown the pivoted stop 15 over to the right hand end of the box slot 16, and to the normal position shown in Fig. 4 and in full lines in Fig. 6 of the drawings. To adjust the parts
65 for giving the next signal, the front lever 42 will be shifted to the desired recess or notch 49 to cause the inner tappet arm 45 to shift

the contact lever 18, 19, 21 laterally with relation to the wheel 5, to give the corresponding required signal, as the wheel rotates the
70 next time toward the left hand. After the lever 42 is thus adjusted, the crank 7 will be turned around upward and toward the right hand, and about the time the crank completes a full revolution, it will strike the stop
75 15 and move it over to the dotted position shown in Fig. 6, and until it strikes the left hand end of the box cover slot 16, when the stud 14 on the pulley 8 will have passed by the free end of the signal wheel spring
80 13, whereupon the spring will jump behind the stud ready to engage it as soon as the hand crank 7 is released. This right hand motion of the crank winds the cord 9, on the pulley 8, and thereby lifts the weight 11
85 which, after the crank 7 is released, falls gradually, under control of the gearing 17, and retarding fan 18, and causes the signal wheel 5 to turn once around to the left hand and, by its teeth or prominences 6, to actuate
90 the contact lever 18, 19, 21, to complete electric circuits to the bell or other signal, and as this left hand rotation is completed, the hand crank 7, which had been turned around by and with the wheel 5, will again strike the
95 stop 15, and move it back again to the first described position, or that shown in Fig. 4, and in full lines in Fig. 6 of the drawings. The stop 15 thus limits the rotation of the hand crank in both directions and also gages
100 the setting of the pulley stud 14 relatively to the free end of the signal wheel spring 13, to assure turning of the wheel to the left hand as the weight 11 falls. One signal wheel 5 may be removed and another wheel, having
105 different signal giving detents, may be substituted for it, as may be necessary.

With reference to diagrammatic Figs. 7 and 8 of the drawings, a brief explanation only is necessary to illustrate a few uses of the above
110 described signaling devices. In Fig. 7, the line wire 51 runs from the binding post 29 to the battery 53, and the wire 52 runs from the binding post 39 to the battery 54, and the line wire 34 is grounded between the grounded
115 terminals of the batteries 53, 54, and the resistance 40 is employed, this being for an arrangement when two battery currents are opposed in an open circuit. In Fig. 8, the ground wire connection from the contact 23, and also
120 the resistance 40, are omitted and the arrangement is for use with a single battery current in a closed circuit. With the circuits of Fig. 7, the currents from the batteries 53, 54 will oppose each other, and so long as the contact
125 21 of lever 8 is against the contact rod 22, the bells 55 in the two circuits will not ring, but should lever 8 be actuated by the signal wheel 5, to cause intermittent engagements of the contacts 21, 23, the currents from both bat-
130 teries will run to ground through the wire 34, and all the bells would ring. Should the circuit from either battery be broken by a key, or otherwise, the bells of the other circuit will

ring. With the continuous closed circuit of Fig. 8, when the contacts 21, 22 are engaged as shown, the bells 55 are arranged not to ring, but when the contacts 21, 23 are engaged by action of the signal wheel 5, the bells will ring. Should the circuit be broken, the bells would be inoperative.

I claim as my invention—

1. An electric signaling device, comprising a casing, a signal wheel and mechanism rotating it located within the body of the casing, laterally ranging contacts on the casing cover and independent of the signal wheel, a contact lever also on the cover and movable bodily and laterally thereon and along said contacts, and electrical connections to said contacts, substantially as described.

2. An electric signaling device, comprising a casing, a signal wheel and mechanism rotating it located within the body of the casing; and a laterally adjustable contact lever for the signal wheel and laterally ranging contacts for said lever comprising two opposing insulated rods and a third insulated contact plate held to the removable cover of the casing; and electrical connections to said laterally ranging contacts, substantially as described.

3. An electric signaling device having a casing containing a signal wheel, mechanism rotating the wheel, and electrical connections held to the removable cover of the casing and comprising a laterally adjustable contact lever adapted to the signal wheel, two opposing insulated contact rods and a third insulated contact plate for said lever, two line wire binding posts, and wires leading therefrom to one of two opposing rod contacts and to the third contact plate, substantially as described.

4. An electric signaling device having a casing containing a signal wheel, mechanism rotating the wheel, and electrical connections held to the removable cover of the casing and comprising a laterally adjustable contact lever adapted to the signal wheel, two opposing insulated contact rods and a third insulated contact plate for said lever, two line wire binding posts, wires leading therefrom to one of the two opposing rod contacts and to the third contact plate, and wire connections to the other contact rod for a ground circuit, substantially as described.

5. An electric signaling device having a casing containing a signal wheel, mechanism rotating the wheel, and electrical connections held to the removable cover of the casing and comprising a laterally adjustable contact lever adapted to the signal wheel, two opposing insulated contact rods and a third insulated contact plate for said lever, two line wire binding posts, wires leading therefrom to one of the two opposing rod contacts and to the third contact plate, wire connections to the other contact rod for a ground circuit, and a resistance wired to the two line wire binding posts, substantially as described.

6. The combination, in an electric signaling device, of a signal wheel having circum-

ferential series of signaling detents, mechanism rotating the wheel, and electrical connections comprising a laterally adjustable contact lever adapted to the wheel detents, two opposing insulated contact rods and a third insulated contact plate for said lever, two line wire binding posts and wires leading therefrom to one of the two opposing rod contacts and to the third contact plate, substantially as described.

7. The combination, in an electric signaling device, of a signal wheel having circumferential series of signaling detents, mechanism rotating the wheel, and electrical connections comprising a laterally adjustable contact lever adapted to the wheel detents, two opposing insulated contact rods and a third insulated contact plate for said lever, two line wire binding posts, wires leading therefrom to one of the two opposing rod contacts and to the third contact plate, and wire connections from the other contact rod to a ground circuit, substantially as described.

8. The combination, in an electric signaling device, of a signal wheel having circumferential series of detents, mechanism rotating the wheel, and electrical connections comprising a laterally adjustable contact lever adapted to the wheel detents, two opposing insulated contact rods and a third insulated contact plate for said lever, two line wire binding posts, wires leading therefrom to one of the two opposing rod contacts and to the third contact plate, wire connections from the other contact rod to a ground circuit, and a resistance wired to the two line wire binding posts, substantially as described.

9. The combination in a signaling device, of a signal wheel 5, having a spring 13, and circumferential series of detents adapted to a lever, retarding mechanism geared with the wheel, a drum or pulley having a stud 14, adapted to the spring 13, and mechanism turning the drum in opposite directions, substantially as described.

10. The combination, in a signaling device, of a signal wheel 5, having a spring 13, and circumferential series of detents adapted to a lever, a drum or pulley having a stud 14 adapted to the spring 13, mechanism automatically turning the wheel in one direction, a crank 7 on the drum or pulley, and a pivoted stop 15 to which the crank is adapted, substantially as described.

11. The combination, in a signaling device, of a shaft 4, a signal wheel 5 loose thereon and having circumferential series of detents and a spring 13, retarding mechanism geared with the wheel, a pulley 8 having a stud 14 adapted to the spring 13, a cord and weight 9, 11, connected to the pulley, a crank 7, on the shaft 4, and a pivoted stop 15 to which the crank is adapted, substantially as described.

12. In an electric signaling device, the combination with a signal wheel, of a lever 18, of insulating material and carrying metallic con-

tacts 19, 21, 35, two opposing insulated contact rods 22, 23, and an insulated contact plate 36, two line wire binding posts 29, 39, a wire 28, connecting the contact 22 and post 29, and a
5 wire 38, connecting the contact 36 and post 39, substantially as described.

13. In an electric signaling device, the combination with a signal wheel, of a lever 18, of insulating material and carrying metallic con-
10 tacts 19, 21, 35, two opposing insulated contact rods 22, 23, an insulated contact plate 36, two line wire binding posts 29, 39, a wire 28, connecting the contact 22 and post 29, a wire 38, connecting the contact 36 and post 39, a
15 ground circuit wire 34, connected to the rod contact 23, and a resistance wired to the posts 29, 39, substantially as described.

14. In an electric signaling device, the combination with a casing, a signal wheel and
20 mechanism rotating it held within the body portion of the casing; and a laterally movable contact lever for the signal wheel and laterally ranging contacts for said lever held to the removable cover of the casing, of a hand
25 lever held to and outside the casing cover, and an arm connected to said hand lever and engaging the interior contact lever to adjust the latter from outside the casing, substantially as described.

30 15. In an electric signaling device, the combination with a casing, a signal wheel and mechanism rotating it held within the body portion of the casing; and a laterally movable contact lever for the signal wheel and later-

ally ranging contacts for said lever held to 35 the removable cover of the casing, of a hand lever outside the casing formed as a pointer and engaging the contact lever to adjust the lever from outside the casing, and an index plate on the casing to which the pointer on 40 the lever is adapted to indicate the position of the contact lever relatively to the signal wheel, substantially as described.

16. In an electric signaling device, the combination with the casing and a laterally mov- 45 able contact lever therein having a pin 46, a shaft 44, an exterior lever 42 pivoted to the shaft and having a stud 48, adapted to a series of recesses 49 in the casing, and an interior arm 45 on the shaft 44, engaging the con- 50 tact lever pin 46, substantially as described.

17. In an electric signaling device, the combination with the casing and a laterally movable contact lever therein having a pin 46, a shaft 44, an exterior lever 42 pivoted to the 55 shaft and having an index pointer and a stud 48, adapted to a series of recesses in the casing, an interior arm 45 on the shaft 44, engaging the contact lever pin 46, and an index plate 50 on the casing, substantially as 60 described.

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

CARL SCHWENNICK.

Witnesses:

GUSTAV STARZEL,
MAX WAGNER.