

F. A. LUNDQUIST.

CALLING DEVICE FOR TELEPHONE EXCHANGES.

(Application filed May 17, 1899.)

(No Model.)

2 Sheets—Sheet 1.

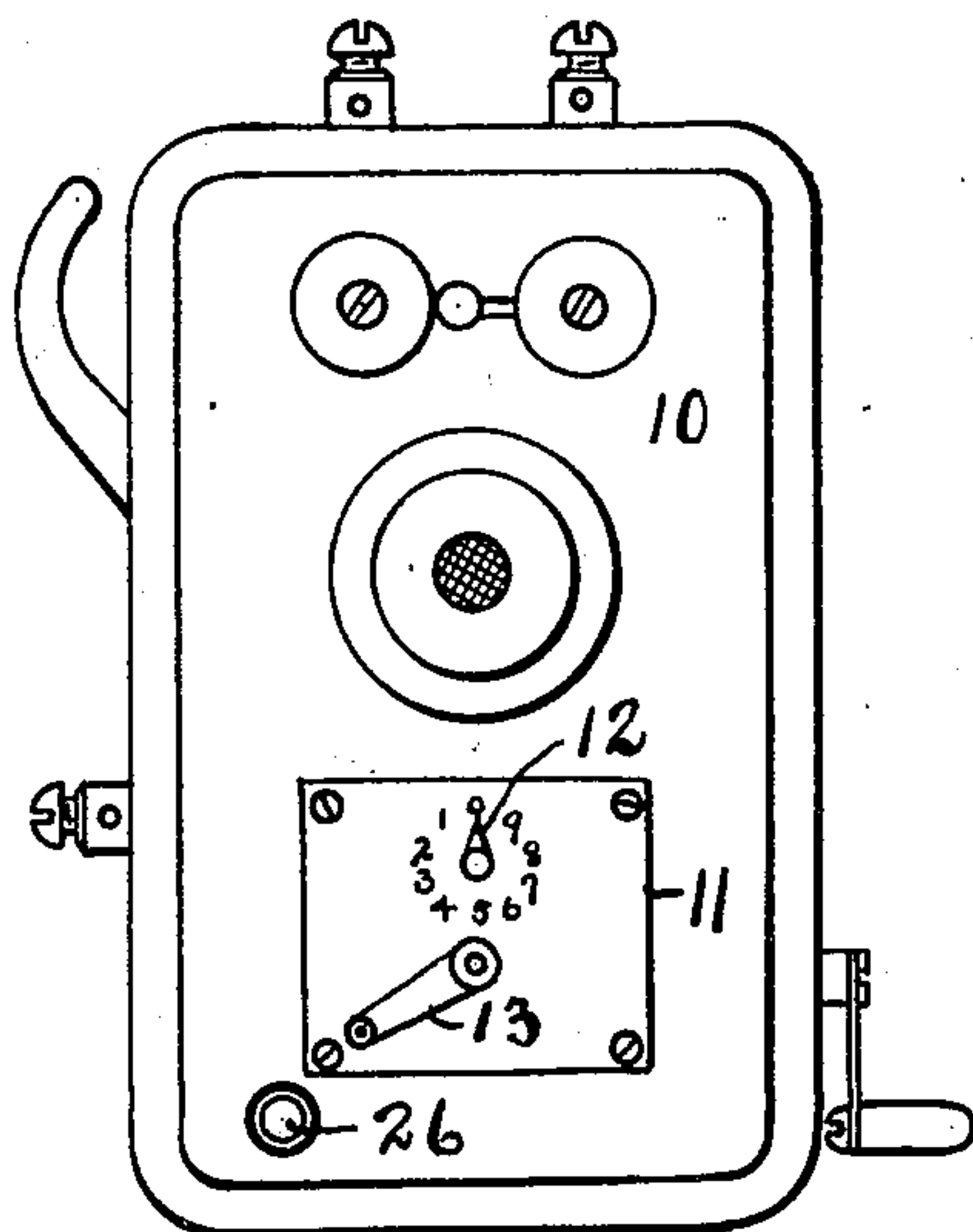


FIG. 1.

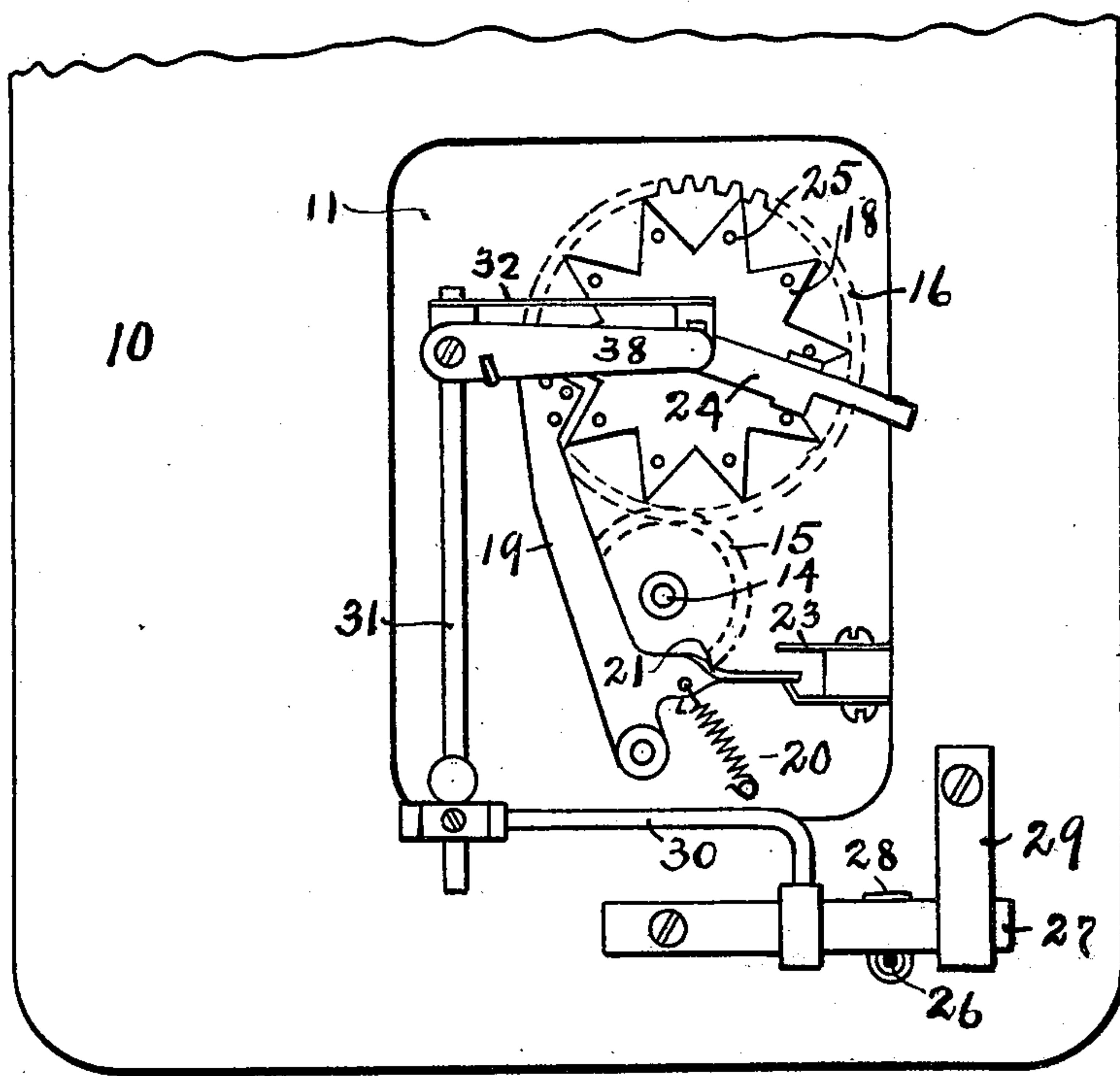


FIG. 2.

WITNESSES:

Howard A. Redfield
Herman E. Schmabel

INVENTOR:

Frank A. Lundquist
BY Casper L. Redfield.
ATTORNEY.

F. A. LUNDQUIST.

CALLING DEVICE FOR TELEPHONE EXCHANGES.

(Application filed May 17, 1899.)

(No Model.)

2 Sheets—Sheet 2.

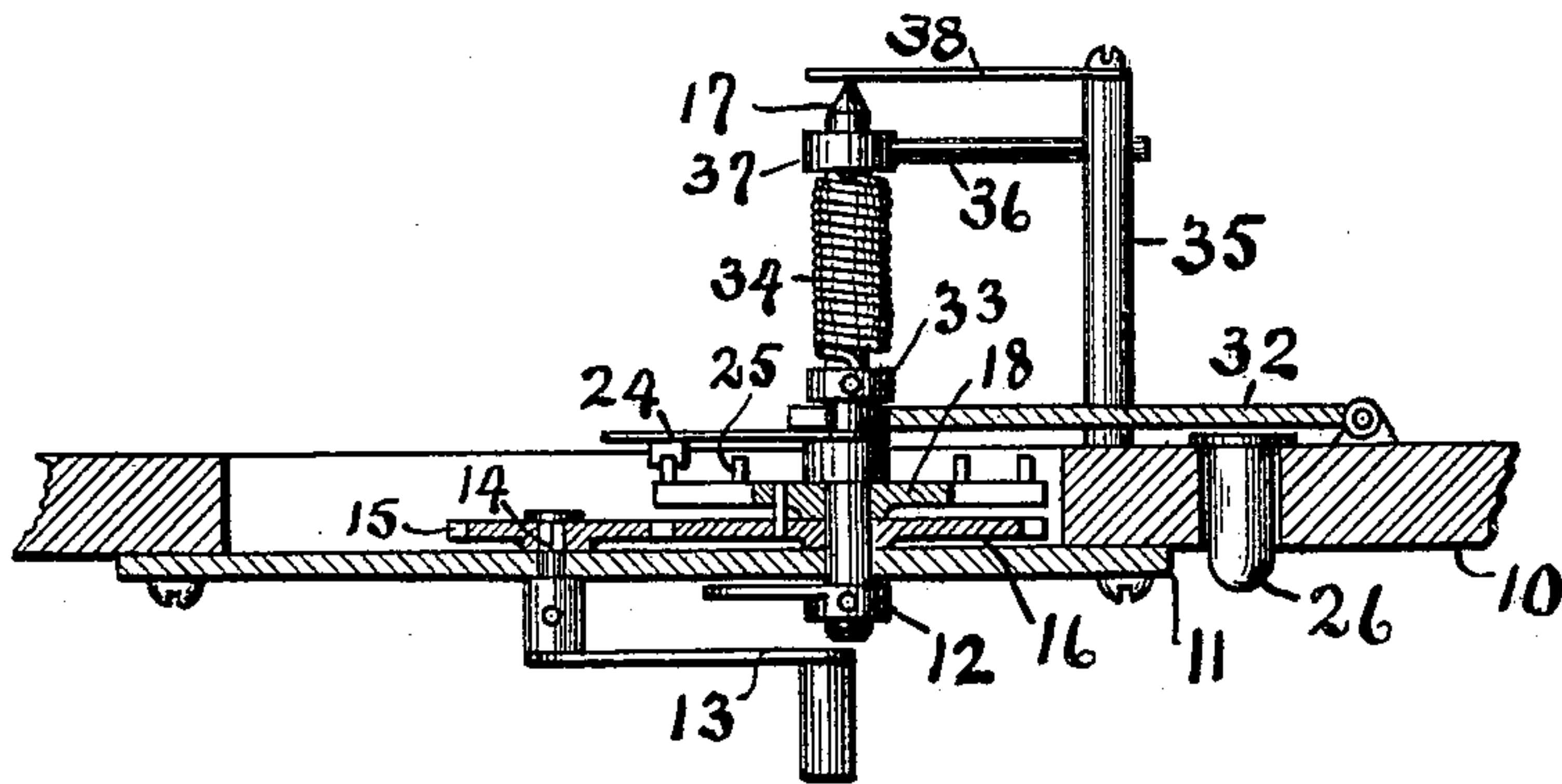


Fig. 3.

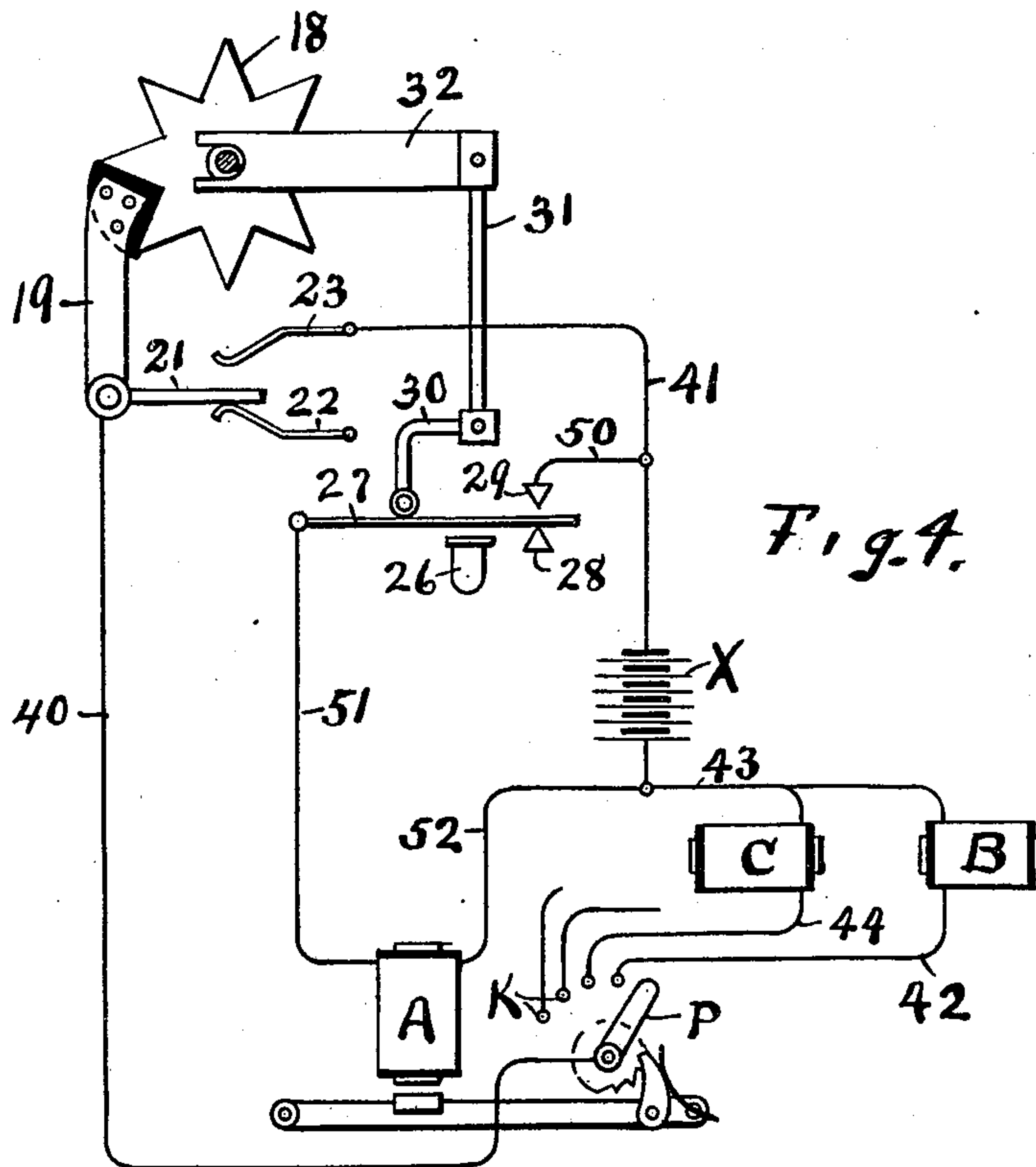


Fig. 4.

Witnesses:
 Howard A. Redfield,
 A. Lee Short.

Inventor:
 Frank A. Lundquist
 By Casper L. Redfield,
 Attorney.

UNITED STATES PATENT OFFICE.

FRANK A. LUNDQUIST, OF CHICAGO, ILLINOIS, ASSIGNOR TO M. E. RICHARDSON, TRUSTEE, OF STERLING, KANSAS.

CALLING DEVICE FOR TELEPHONE-EXCHANGES.

SPECIFICATION forming part of Letters Patent No. 679,029, dated July 23, 1901.

Application filed May 17, 1899. Serial No. 717,147. (No model.)

To all whom it may concern:

Be it known that I, FRANK A. LUNDQUIST, a citizen of the United States of America, and a resident of Chicago, county of Cook, State of Illinois, have invented certain new and useful Improvements in Calling Devices for Telephone-Exchanges, of which the following is a specification.

My invention relates to calling devices for telephones, which may be brought into telephonic connection through an automatic exchange, and has for its object the construction of certain devices which will increase the certainty of proper selection. Located at each telephone are certain devices by the manipulation of which a series of electrical impulses are sent through successive magnets located at a central exchange, which magnets operate other devices for making the desired connection.

In a previous application for patent by me I placed on the front of a telephone-box a pointer and a dial, and to the pointer I made connections, so that when the pointer was moved by hand to a given point on the dial and released it would run back to its normal position. In thus running back it would make electrical connections which would send as many electrical impulses through a given magnet in the central exchange as the given point on the dial indicated, and then automatically switch the connections to another magnet.

In the present application I have made a different form of indicating device and have transferred the switching to a different part of the mechanism.

In the drawings, Figure 1 is a front elevation of a telephone-box. Fig. 2 is an enlarged view of the interior of the front cover to the telephone-box. Fig. 3 is a sectional elevation, partly diagrammatic, showing the details of structure; and Fig. 4 is a general diagram showing the connections from the telephone to the magnets located at the central exchange, the upper portion of which diagram represents the local-station apparatus and the lower portion the central-office apparatus.

In the said drawings, 10 is the cover of the telephone-box, on the front of which is a plate

11, provided with a dial having on its face the figures "0" to "9," inclusive. A pointer 12 is adapted to sweep over the face of the dial. Just below the dial is a crank 13, connected to a spindle 14, on the inner end of which is a gear 15, that meshes with a gear 16, loosely mounted on the spindle 17, that carries the pointer 12. Loosely mounted on the spindle 17, but secured to the gear 16, is a ten-pointed star-wheel 18, which on being turned is adapted to vibrate a lever 19 once for each point or tooth that passes under the said lever. A spring 20 keeps the lever 19 in contact with the star-wheel 18 and an arm 21 in contact with a contact-strip 22. Another contact-strip 23 is located adjacent to the arm 21, so as to come into electrical connection therewith when the lever 19 is vibrated by the star-wheel 18. Secured to the spindle 17 is an arm 24, adapted to come into contact with the pins 25 on the teeth of the star-wheel 18. The construction is such that turning the crank 13 turns the arm 24, which in turn rotates the star-wheel 18, so as to vibrate the lever 19 and make electrical connection between 21 and 23. As there are ten points on the star-wheel and ten figures on the dial it will be evident that the pointer 12 will indicate the number of times electrical connection is made between 21 and 23.

At a suitable place on the cover 10 is a push-button 26, which serves to push a contact-strip 27 away from a contact-point 28 and into connection with another contact-point 29. Resting on the strip 27 is the end of an arm 30, which is secured to a shaft 31. On the other end of the shaft 31 is another arm 32, which engages the under side of a collar 33, secured to the spindle 17. This combination of devices is such that when the button 26 is pushed the lever 32 will raise the spindle 12, so that the arm 24 will clear the pins 25 on the star-wheel 18. A spring 34, secured to the collar 33 and supported from the post 35 by means of the rod 36 and loose collar 37, serves as a means for returning the arm 24 and pointer 12 to their normal positions. These normal positions are determined by the arm 24 coming into contact with the post 35 and the pointer 12 resting at the point on the dial marked "0." A spring 38, carried on the

post 35, serves as a means for depressing the spindle 17, so as to bring the arm 24 into contact with the pins 25 on the star-wheel 18 when the button 26 is released.

5 From the lever 19 and contacts 23 and 29 are electrical connections to the central office. There are also other connections from 22 and 28, but as they are not necessary to the present explanation they are omitted. At the
10 central office are magnets A B C, &c., and a pointer P and a series of contact-points K. The pointer P normally rests at the position shown in Fig. 4, and the magnet A is for the purpose of moving it step by step over the
15 contact-points K. The magnets B and C are for moving other devices, which are immaterial to the present description beyond the statement that they are for the purpose of making connections to other telephones.
20 With the pointer P at the normal position the vibration of the lever 19 will be without effect, because the said pointer is not on one of the contact-points K; but if the button 26 is pushed so as to make connection between 27
25 and 29 a current will flow from battery X, 41, 50, 29, 27, 51, and 52 to X. Then if the lever 19 be vibrated, so as to make connection between 21 and 23, a current will flow from X, 41, 23, 21, 40, P, 42, B, 43 to X. This cur-
30 rent will be repeated for each vibration of the lever 19. If the button 26 be pushed again, so as to cause the magnet A to move the pointer P to the second contact K, then the vibration of the lever 19 will send a cur-
35 rent similar to the one just described, except that it will pass through the line 41 and the magnet C and be repeated for each vibration. Assuming that it is telephone No. 345 which a subscriber wishes to call and that
40 the system of numbering is such that the telephone-number indicates the manner of operating the calling device, then the operation would be in the following order: he would push button 26 once, turn crank 13
45 until pointer 12 rested on figure "3" on the dial, push the button to return the pointer to normal position, turn pointer to the figure "4," return it to normal, and then turn it to the figure "5." These operations by the sub-
50 scriber would result in the following automatic operation: The first push on button 26 would move pointer P to the first contact K. Turning the pointer 12 to the figure "3" would vibrate lever 19 three times and send three
55 electrical impulses through magnet B. The

second push on the button to return pointer 12 to normal position would also move pointer P to the next contact-point. Moving pointer 12 to the figure "4" would send four impulses through magnet C. Again pushing the button 60 26 to return pointer 12 to normal position would also move pointer P to the next contact-point, and moving pointer 12 to the figure "5" would send five impulses through the next magnet of the series. 65

What I claim is—

1. A dial and a pointer therefor, a crank detachably connected to said pointer, a contact-closing device operated by the movement of said crank, a second contact-closing device operated by means independent of said crank, a separate electric circuit connected to each contact-closing device, means where- 70 by the rotation of said crank will send a series of electrical impulses over the circuit connected to the first-mentioned contact-closing device and will cause said pointer to indicate on said dial the number of such im- 75 pulses, and means whereby the operation of the second contact-closing device will cause 80 an electrical impulse to be sent over the circuit connected thereto and will also release said pointer from said crank so that said pointer may be returned to its normal po- 85 sition.

2. A dial and a pointer therefor, a crank detachably connected to said pointer for turning it, a contact-closing device also connected to said crank and operated thereby, an electrical connection from said contact-closing 90 device to a switch, a magnet for moving said switch, a second contact-closing device provided with electrical connections to said magnet, means whereby the operation of the first-mentioned contact-closing device will 95 send a series of electrical impulses through said switch, and means whereby the operation of the last-mentioned contact-closing device will move said switch so as to cause 100 succeeding impulses to flow over a different line and will also detach said pointer from said crank so as to permit it to return to its normal position.

Signed by me at Chicago, Illinois, this 11th day of May, 1899.

FRANK A. LUNDQUIST.

Witnesses:

CHAS. O. HATCH,
CHAS. M. SAWYER.