No. 847,461.

PATENTED MAR. 19, 1907.

C. T. BRADSHAW.

TELEPHONE CALL METER.

APPLICATION FILED SEPT. 27, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

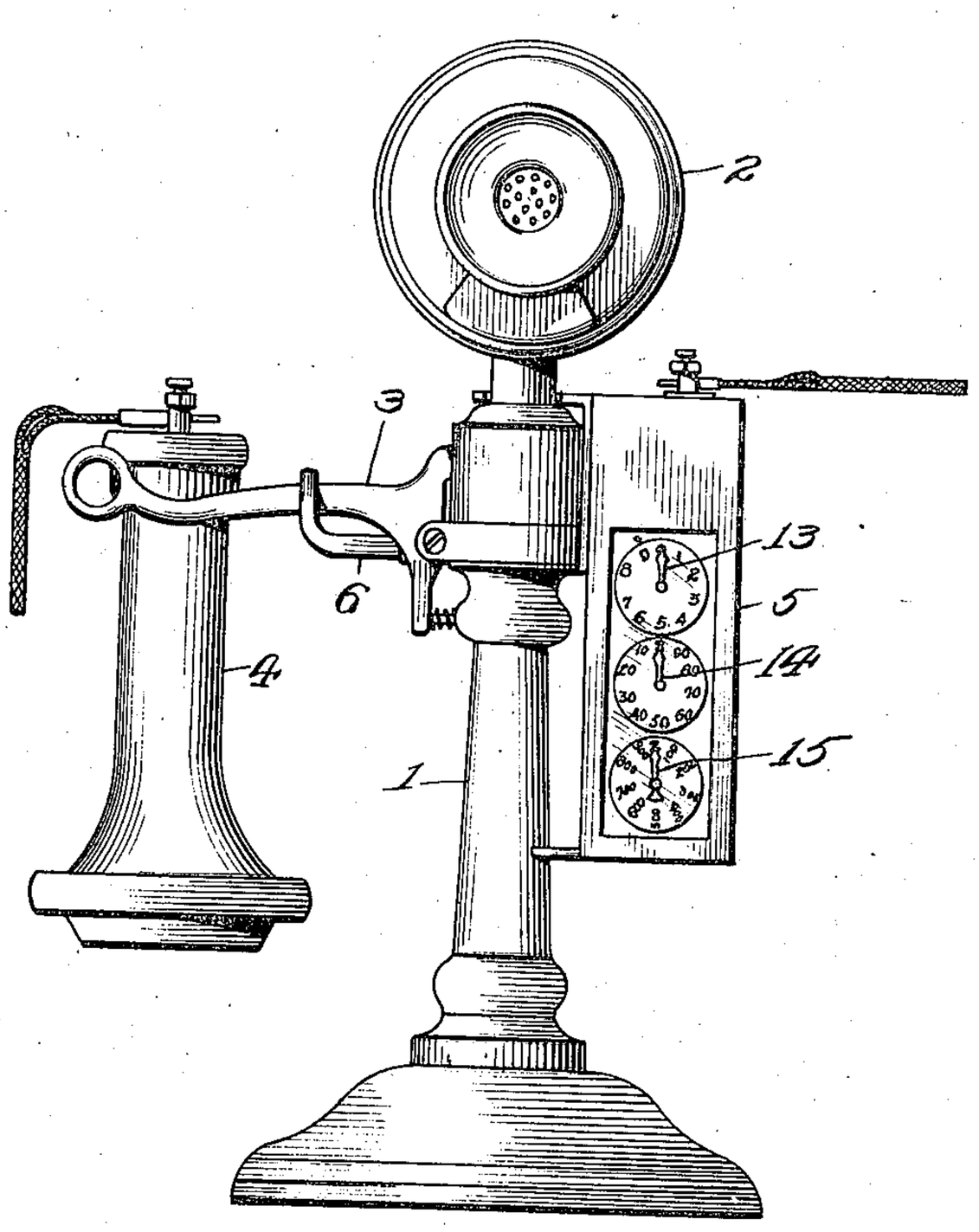
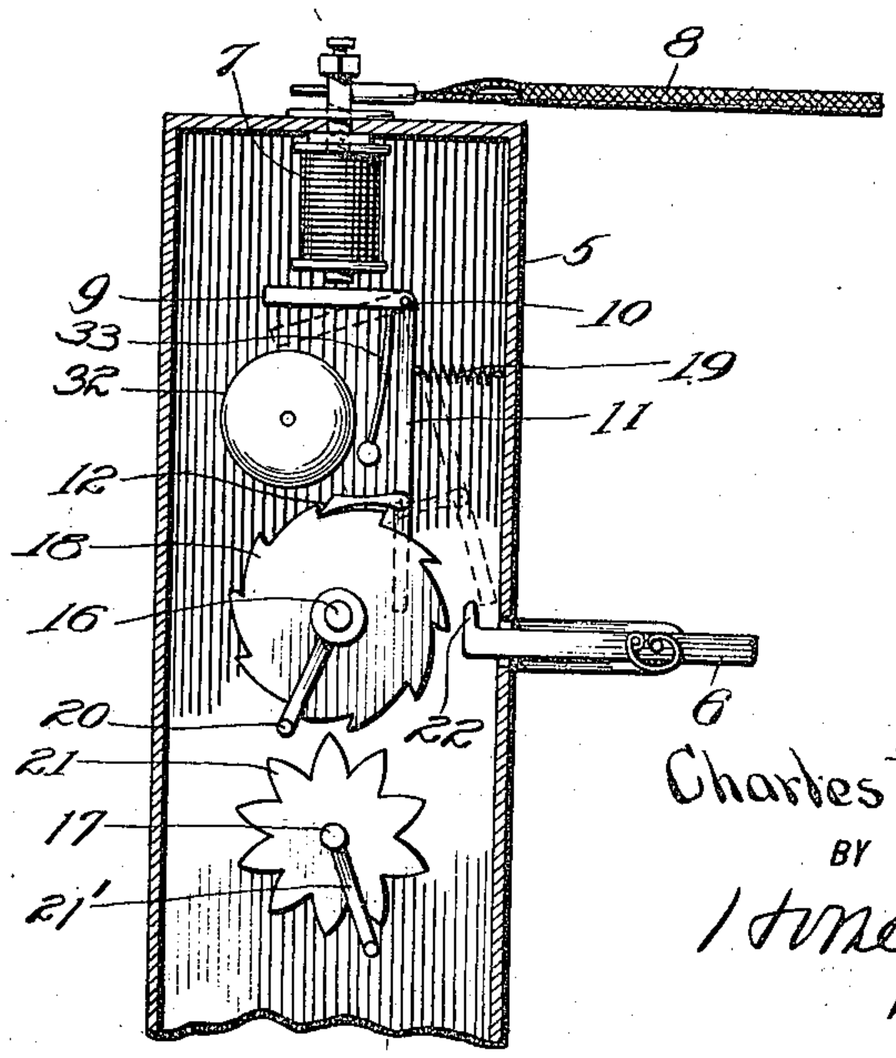


Fig. 2.



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2 SHEETS—SHEET 2.

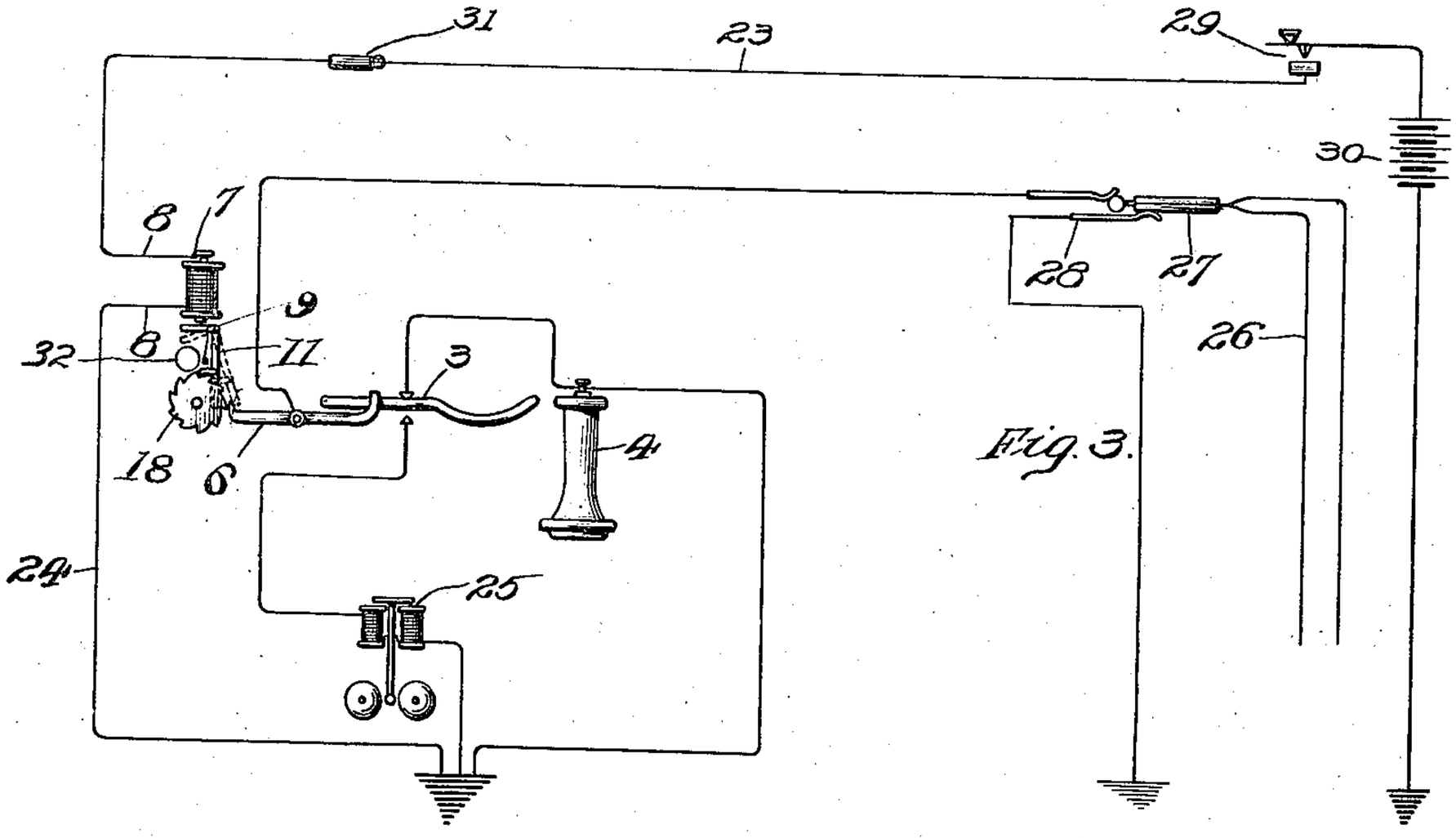

Fig. 3.

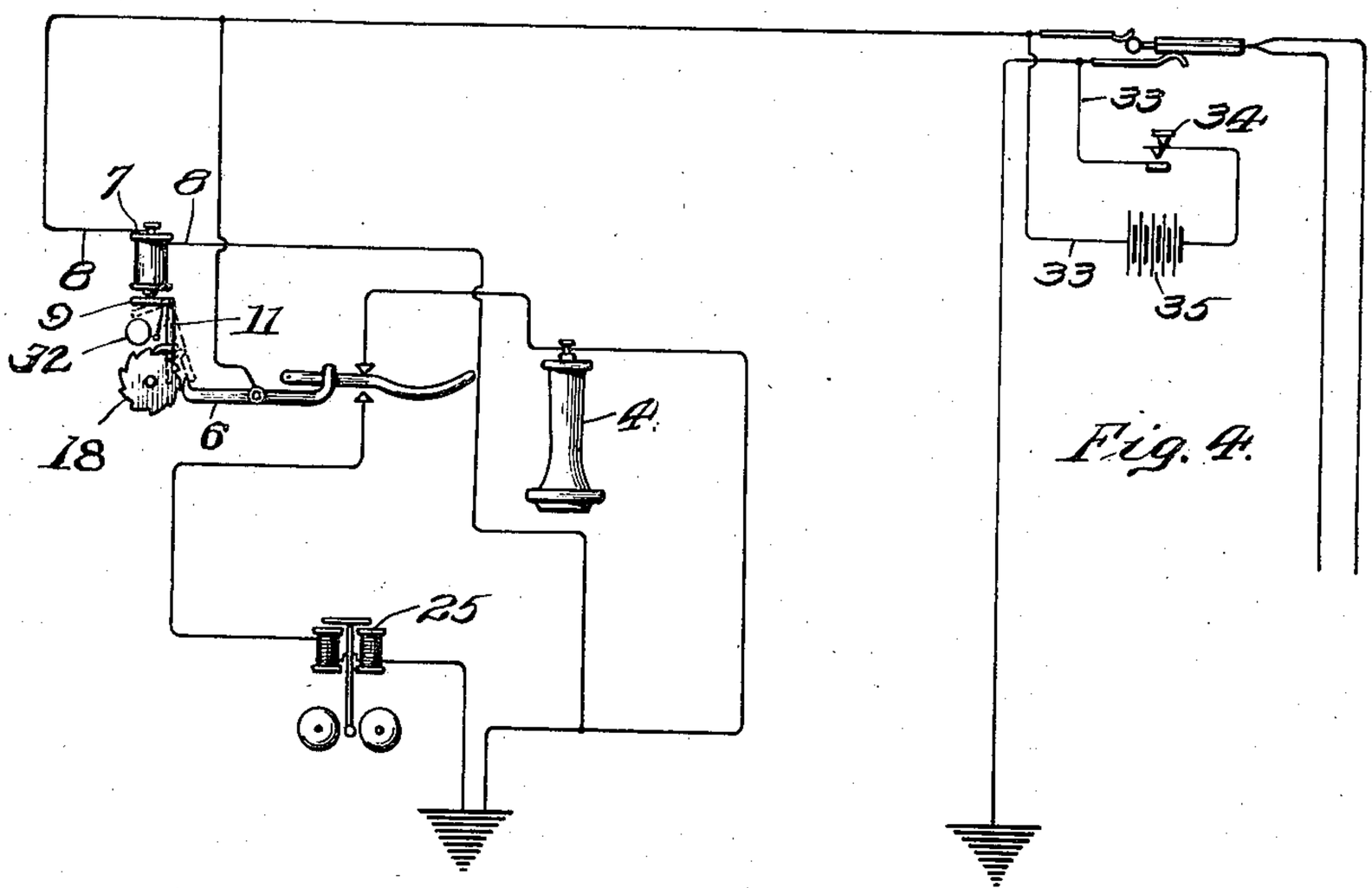

Fig. 4.

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TELEPHONE-CALL METER.

No. 847,461. Specification of Letters Patent. Patented March 19, 1907.

Application filed September 27, 1904. Serial No. 226,142.

To all whom it may concern:

Be it known that I, CHARLES T. BRADSHAW, a citizen of the United States, and a resident of the city of Philadelphia, State of Pennsylvania, have invented certain new and useful Improvements in Telephone-Call Meters, of which the following is a full, clear, and complete disclosure.

My invention relates to means for registering telephone-calls, and more particularly to devices whereby the subscriber may keep track of and check the number of calls charged up to him at the central office, thereby preventing mistakes and overcharges by the telephone company.

Briefly stated, my invention comprises a meter or registering device which may be attached to a telephone instrument in such a manner as to be operated magnetically by the operator at the central station at the time the telephone is being used and also includes means for preventing the registering device from being operated when the telephone is not in use.

The invention herein described is a modification of that described in my prior application filed October 3, 1903, Serial No. 175,566. The form shown in said application is one in which the registering device is operated manually by the subscriber.

For a full, clear, and exact description of preferred forms of my invention reference may be had to the following specification and to the accompanying drawings, forming a part thereof, in which—

Figure 1 is an elevation of a telephone transmitter and receiver in the form of a desk instrument, showing my recording or registering device applied thereto; Fig. 2, a sectional view of the recording portion of the instrument, showing the parts in the position immediately after a call has been registered. Fig. 3 is a diagram of the circuits in one form of my invention in which an auxiliary line is used to operate the magnet of the register. Fig. 4 is a diagram showing the circuits in a modification of my invention wherein the auxiliary line is done away with, the magnet of the recorder being operated by a current of different character from those employed to operate the other features or parts of the instrument.

Referring to the drawings, the numeral 1 indicates a supporting post or standard for the transmitter 2. The numeral 3 indicates the usual switch-lever, pivoted to the standard 1 and adapted to support the receiver 4 when the instrument is not in use. These parts are those usually provided with what is known as a "desk instrument."

Attached to the standard 1 is a casing 5, which contains the recording mechanism.

6 indicates a lever connected to the switch 3 and extends into the casing and coöperates with the recording mechanism in a manner to be hereafter described.

At the top of the casing 5 on its interior is fixed a magnet 7. This magnet has leads 8, which are adapted to convey the current to the magnet 7. The magnet 7 has an armature 9, which is pivoted at 10, so as to move away from and toward the magnet 7. Connected to the armature 9 is a downwardly-extending arm 11, which carries slightly removed from its lower end a pawl 12.

The recording mechanism or registering apparatus consists of a plurality of indicating-dials, which are arranged in the usual manner of meters and other recording instruments on the front of the casing 5. The hands or indicators 13, 14, and 15 are mounted upon shafts 16 17, &c., respectively. The shaft 16 carries a ratchet-wheel 18, with which the pawl 12 is adapted to coöperate to move said ratchet-wheel step by step as the impulses are given to the armature 9 by the magnet 7. A spring 19 holds the arm, and therefore the pawl 12, in their retracted positions. The shaft 16 also carries a radial arm 20, which is adapted to coöperate with a star-wheel 21 in the manner of the usual transferring mechanism. The shaft 17 also carries a radial arm 21′, which in turn cooperates with the next adjacent star-wheel.

Of course it is obvious that any number of dials and hands may be used, according to the number of calls desired to be registered, without resetting the recording mechanism.

The inner end of the arm 6 is provided with an upturned portion 22, which projects into the path of the end of the arm 11, so that when the receiver is in position upon the lever 3 and the arm 11 is retracted by the spring 10 said arm will be locked in its retracted position and thereafter cannot be operated or withdrawn by the magnet 7 until the receiver has been again removed.

The mechanical features of the invention heretofore described are the same in both modifications of the invention shown in Figs.

3 and 4, the difference between these modifications being in the manner of supplying the energizing-current to the magnet 7.

In the form shown in Fig. 3 the numeral 23 indicates an auxiliary line, which passes to one of the leads 8 of the magnet 7 from the other of said leads 8 to the ground through the wire 24. 31 is a switch at the subscriber's station by which he may break the line 23, so as to prevent the recording mechanism from being operated by the magnet 7. Other circuits and connections shown in this figure are the same as in the telephone systems commonly in use, the receiver only being shown for simplicity, it being understood that the transmitter is included in the usual way in actual working lines. The numeral 25 indicates the usual polarized magneto call-bell; 26, the so-called "cord-circuit;" 27, the plug; 28, the plug-socket. 29 indicates a switch or button at the central or exchange station adapted to close the circuit through the lines 23 and 24, so that the current from the battery 30 or other source of electric energy will energize the magnet 7. A bell 32, mounted upon the casing 5, is adapted to be struck by a hammer 33, connected with the armature 9. When the magnet 7 is energized to make the record of a call, said bell will be rung, and since the casing 5 is phonetically connected with the transmitter 2 the ringing of said bell may be heard by the operator at the central station.

It will now be seen that when a subscriber has been called at the station desired and has answered the call the operator at the central station closes the circuit through the wire 23 and 24 by means of the button 29, and thereby registers the call through the recording mechanism controlled by the magnet 7. It will be seen that at other times when the receiver 4 is carried by the arm 3 a call cannot be registered, because the arm 11 is locked in its retracted position by the arm 6. When the operator at the central station closes the circuit to register a call, the bell at the subscriber's station will also be rung, and since this bell is mounted upon a casing of the register, which in turn is phonetically connected with the receiver, said operator will be audibly informed that the record of the call has been made. Therefore there will be no opportunity of the person speaking at the subscriber's station preventing the operator at the central station from knowing that a call has been properly registered. This feature is also true of the modification about to be described.

In the modification shown in Fig. 4 the auxiliary line to the magnet 7 is done away with and said magnet is connected with the usual leads, so that the operator may energize said magnet 7 by throwing into said leads a current to which said magnet will respond. This current may be of the same character as that to operate another part of the instrument at the subscriber's station—as, for instance, the magneto-current previously used to ring the bell 25—or said current may be of a different character from that required to operate the other parts of the apparatus at said station, the magnet 7 being designed to respond to such current. For example, if the current used to operate the magneto-bell 25 is an alternating current of moderate frequency, then the current used to energize the magnet 7 may be one of higher frequency, or it may be a direct current of a different voltage from that required to operate the receiver and transmitter.

For supplying the current having different characteristics to the telephone-line I provide a local circuit at the central station including the wire 33, the button 34, and the battery or other source of electric energy 35.

Even when a current of special character is supplied to the leads in the second modification such current would not interfere with the operator at the central station hearing the audible signal, for the metal of the bell at the register would continue to vibrate after the current which operated the register and hammer had been discontinued and the operator's receiver connected with the subscriber's line by the listening-key. The operator in this manner would be sure of the correct register of a call as well as in the first form, where the current for operating the register is sent over the auxiliary line.

Other changes may be made in the form and arrangement of my device without departing from the spirit and scope of my invention, and

What I claim, and desire to protect by Letters Patent of the United States, is—

1. In a telephone registering system, a subscriber's set including a receiver-support, in combination with an electromagnet, an audible signal, recording mechanism, an independent electric circuit having a circuit-closer therein at the exchange-station, a lever under the control of said magnet for operating said signal and recording mechanism and a locking device connected with the receiver-support for locking said lever against influence of said magnet when the telephone is not in use.

2. In a telephone system, a subscriber's set including a receiver-support, in combination with an electromagnet, recording mechanism, and an independent electric circuit having a circuit-closer therein at the exchange-station, means actuated by said magnet for operating said recording mechanism and a locking device with said receiver-support for preventing said recording mechanism from being operated when the telephone is not in use.

3. In a registering device for telephones a register at the subscriber's station, electromagnetic means for actuating said register

from the central station, and means controlled from the subscriber's station for locking said actuating means when the telephone is not in use.

4. In a registering device for telephones, the combination with a subscriber's set, of a register attached to one part of said set, an audible signal carried by said register, electromagnetic means for operating said register and said signal from the central station without interfering with the transmission of said audible signal to the central station, and means for preventing said register from being operated when the telephone is not in use.

5. In a telephone system, a subscriber's set including a receiver-support, in combination with an electromagnet, recording mechanism, an alarm, an independent electric circuit, having a circuit-closer therein at the exchange-station, a bell-crank lever having one arm under the control of said magnet and its other arm carrying means to actuate said recording mechanism, the said lever being held normally away from said magnet by a spring and carrying a hammer for sounding the said alarm and a hook connected with said receiver-support to engage said last-mentioned arm for the purpose of holding the lever out of operation when the telephone is not in use.

6. In a registering device for telephones, the combination with a subscriber's set and a switch-arm therefor, a register, electromagnetic means for actuating said register from the central station, and a locking-lever connected to said switch-arm forming a stop to prevent the movement of said electromagnetic-operated means.

In witness whereof I have set my hand this 26th day of September, A. D. 1904.

CHARLES T. BRADSHAW.

Witnesses:
JOHN F. GRADY,
EDW. W. VAILL, Jr.