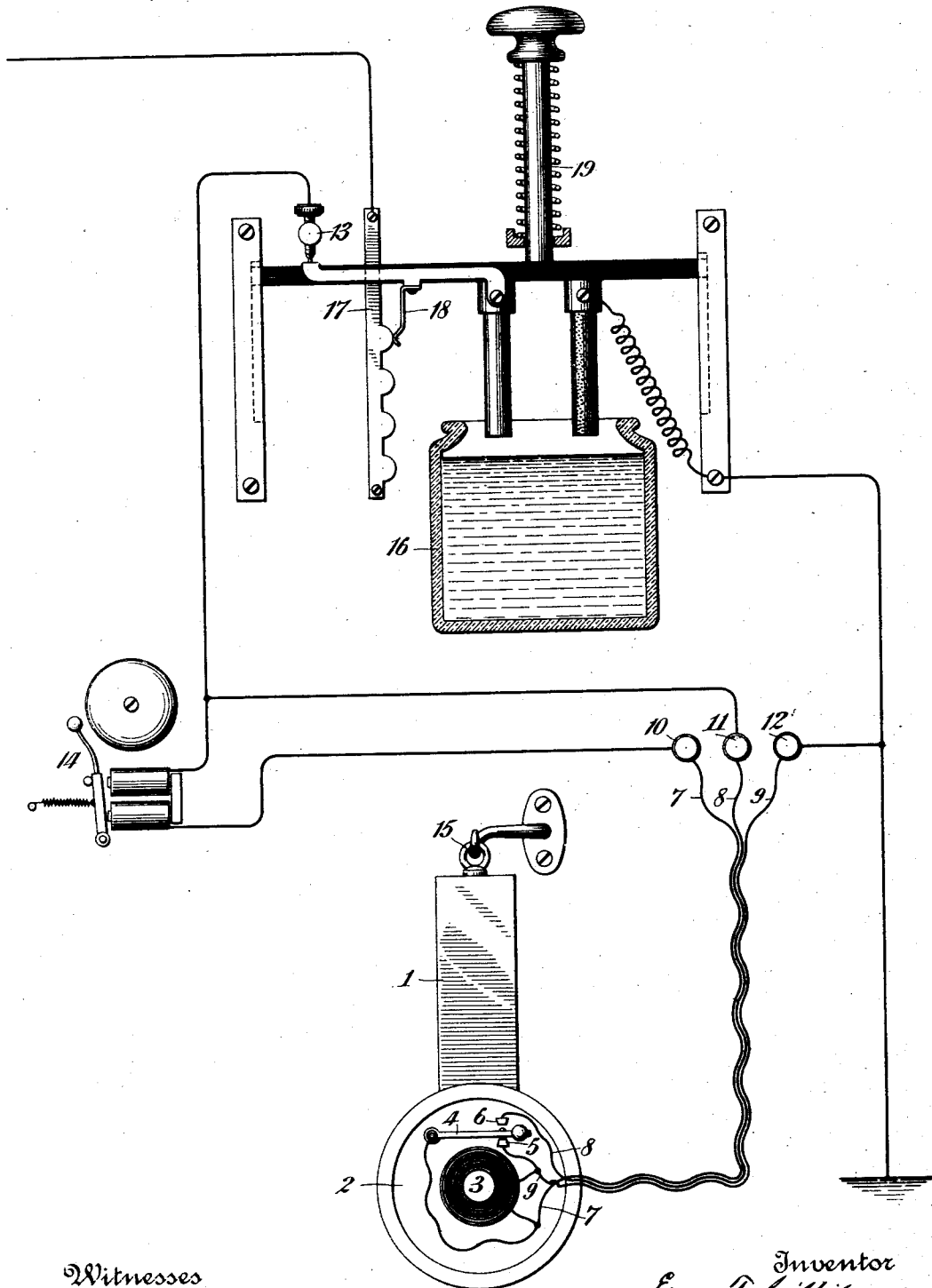


(No Model.)

E. T. GILLILAND.
TELEPHONE CALL SYSTEM.

No. 525,703.

Patented Sept. 11, 1894.



Witnesses
C. E. Ashley
W. W. Lloyd

Inventor
E. T. Gilliland
By his Attorneys
Peckham & Rogers

UNITED STATES PATENT OFFICE.

EZRA T. GILLILAND, OF PELHAM MANOR, NEW YORK, ASSIGNOR TO THE
AMERICAN BELL TELEPHONE COMPANY, OF BOSTON, MASSACHUSETTS.

TELEPHONE-CALL SYSTEM.

SPECIFICATION forming part of Letters Patent No. 525,703, dated September 11, 1894.

Application filed January 11, 1894. Serial No. 496,490. (No model.)

To all whom it may concern:

Be it known that I, EZRA T. GILLILAND, a citizen of the United States, residing in Pelham Manor, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Telephony, of which the following is a specification.

This invention relates to telephony. It has for its object to automatically change the circuits at a telephone station accordingly as the telephone is in or out of use so as to leave in the line circuit only the resistance of the call-receiving instrument or of the telephone. It is desirable to cut out of circuit the resistance of the telephone coil in the normal condition of the apparatus at a telephone station, so that the energy imposed upon line at the distant calling station may have a maximum effect upon the call-receiving apparatus at the called station. It is usual to produce this result by a gravity switch capable of assuming two positions to include in the line circuit the call-receiving instrument or the telephone instrument, the weight of the telephone normally resting upon the gravity switch and cutting out the telephone coil. I accomplish this result automatically by using as the controlling factor the position of the telephone coil when in or out of use.

In carrying out my invention I mount upon the telephone receiver a circuit-changer capable of assuming two positions according to the position in which the telephone stands under the action of gravity, and I so construct the receiver that one who uses it will necessarily hold it in a position to cut in the telephone coil. I effect this result by mounting the switch so that gravity will act upon it in a line passing parallel or approximately parallel to the handle, placing the mouth-piece preferably in the plane of the handle so that in using the mouth-piece it will necessarily be on a higher plane or level than the handle, and provide the instrument with a supporting device so related to it that the mouth-piece will normally occupy a lower level than the handle, thus maintaining the switch in a position to cut out the telephone coil and cut in call-apparatus. I also employ a special type of calling battery, in which

the electrodes are normally out of the solution and complete the connections for the home calling instrument, but when immersed in the solution the battery is interposed in line.

The several features of novelty of the invention will be more particularly hereinafter described and will be definitely indicated in the claims appended to this specification.

The accompanying drawing shows an organization embodying my improvements.

1 represents a permanent magnet and 2 the case of a telephone, the diaphragm and mouth-piece being removed for clearness of illustration. A soft-iron core 3 is mounted upon the permanent magnet at right angles to the axial line of the magnet, and supports a telephone coil as shown. A pivoted lever 4 is mounted in the case in a plane to vibrate axially with the magnet. Co-operating with the lever are two contact stops 5, 6, flexible conductors 7, 8, 9 leading to binding posts 10, 11, 12. Post 12 connects with ground; post 11 with a contact stop 13 normally connected to line; and post 10 with a single-stroke bell 14 and thence with stop 13. Conductors 7 and 9 connect with the terminals of the telephone coil, and conductor 8 with stop 6 normally disconnected electrically with lever 4. Lever 4 normally short-circuits the coil through conductors leading to the pivotal point of lever 4 and stop 5. The handle of the telephone formed in this case of the magnet is provided with an eye 15 or other supporting device by which it may be suspended upon a fixed support. Between ground and line is placed a dip battery 16 the electrodes of which may be depressed into the solution by a handle. The electrodes are mounted upon a sliding frame and are normally held above the solution by a spring as shown. One electrode connects with ground and the other with a contact of a mechanical interrupter one part of which connects with line. Any suitable organization for throwing the battery current to line when the electrodes are dipped into the solution may be adopted. The interrupter may be any device for making and breaking the circuit a number of times during depression of the electrodes; as shown it comprises a fixed member 17 of con-

ducting material provided with a series of ridges adapted to form a plurality of contacts with a movable spring 18. The battery may be of any suitable type. Excellent results may be attained with zinc and carbon electrodes and a solution of bichromate of soda in water and sulphuric acid fifteen to one.

With the organization described it will be seen that in the normal position of the parts the apparatus is in condition to receive a call from line, the line currents proceeding through the battery and interrupter at a distant station and entering the called station through contact 13, passing thence through bell 14, binding post 10, cord 7, over the short-circuit around the telephone coil, through lever 4, and contact 5 to cord 9, and thence to ground by binding post 12. The called operator takes the telephone from its support, and in placing it to his mouth or ear naturally holds it so that the mouth or ear piece stands on a higher level than the handle. The lever 4 will then drop away from contact 5 and engage contact 6, thus cutting into circuit the telephone coil over two branches, one by way of bell, binding post 10, and cords 7 and 9, and the other by way of binding post 11, cord 8, stop 6, lever 4, and cord 9. Conversation may then be exchanged between the two operators, the telephones acting as magneto-transmitters. To adapt the system for use with an induction coil and carbon transmitter suitable commutation of the transmitter circuit would also have to be effected. In calling up a distant station, handle 19 is depressed. The telephone apparatus is thus first cut off by opening the circuit at contact 13. The electrodes are then immersed, and simultaneously a series of interrupted currents are sent to line through interrupter 17, 18. The bell 14 might of course be placed on the line side of the circuit so that the home bell would

ring as well as the distant bell in calling. I prefer, however, to put the bell on the ground side of contact 13 so that its resistance will not be added to the circuit when the bell is not needed.

In lieu of the specific organization herein described for automatically shifting the connections when the instrument is taken from its support, other suitable organizations may be adopted.

Having thus described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A telephone call system comprising a normally closed circuit including a call-receiving instrument, a dip battery for transmitting calling current, and connections for opening the circuit and cutting in the battery during immersion of its electrodes.

2. A telephone call-apparatus comprising a call-receiving instrument in normally closed relation to the line terminals, a dip battery means for opening the circuit and interposing said battery during the immersion of its electrodes, and an interrupter adapted to be actuated simultaneously with the electrodes for producing a plurality of current impulses during immersion.

3. A telephone system comprising call-apparatus normally connected to line, an automatic switch for cutting in the telephone coil when the telephone is in use, a dip battery, and means for opening the branch through the telephone apparatus and closing the battery on line when its electrodes are immersed.

In testimony whereof I have hereunto subscribed my name this 6th day of January, A. D. 1894.

EZRA T. GILLILAND.

Witnesses:

ROBT. H. READ,
JOHN T. MURPHY.