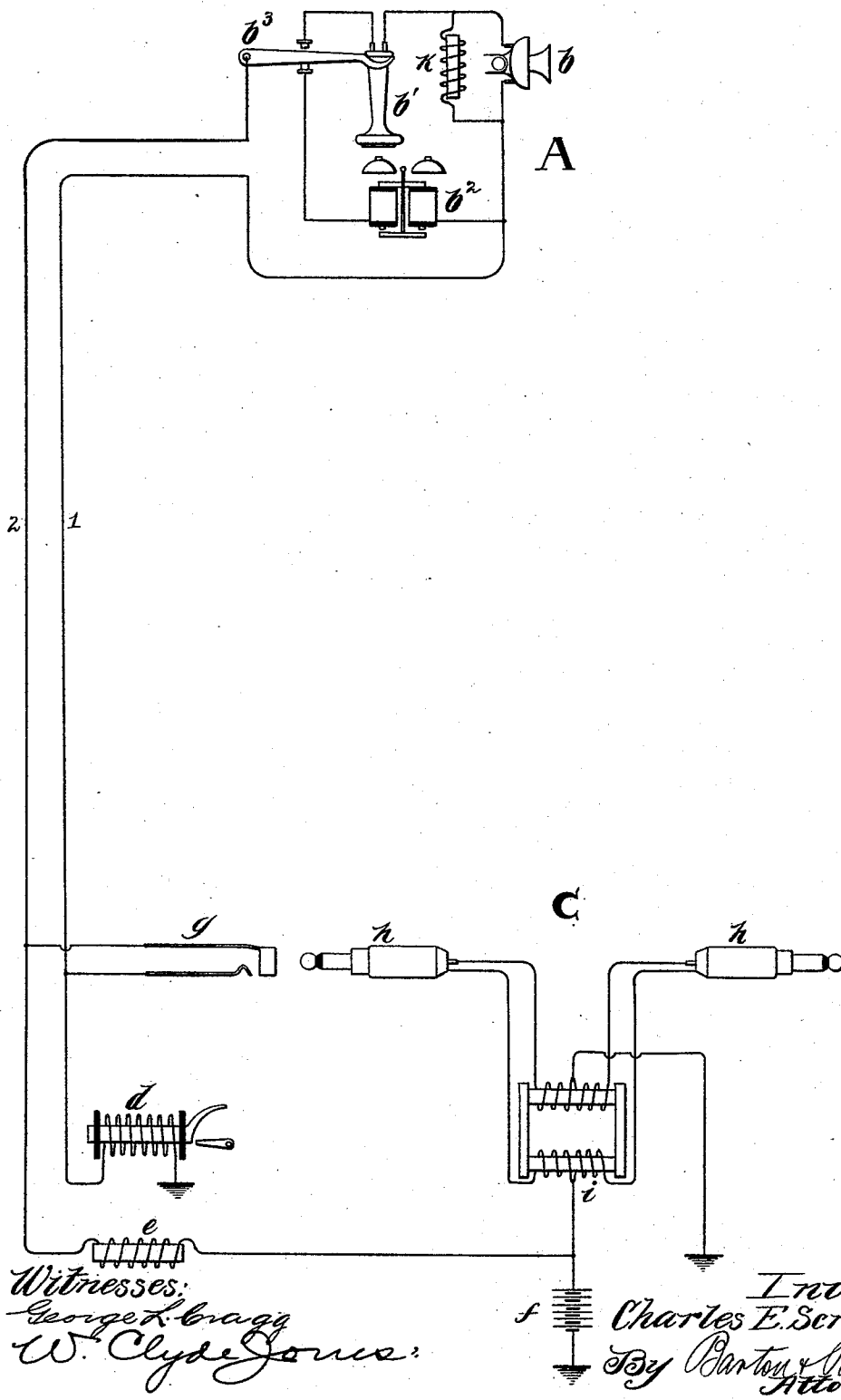


(No Model.)

C. E. SCRIBNER.
TELEPHONE CIRCUIT.

No. 572,222.

Patented Dec. 1, 1896.



UNITED STATES PATENT OFFICE.

CHARLES E. SCRIBNER, OF CHICAGO, ILLINOIS, ASSIGNOR TO THE WESTERN ELECTRIC COMPANY, OF SAME PLACE.

TELEPHONE-CIRCUIT.

SPECIFICATION forming part of Letters Patent No. 572,222, dated December 1, 1896.

Application filed August 1, 1895. Serial No. 557,825. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. SCRIBNER, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented a certain new and useful Improvement in Telephone-Circuits, (Case No. 388,) of which the following is a full, clear, concise, and exact description, reference being had to the accompanying drawing, forming a part of this specification.

My invention applies to telephone-circuits in which the transmitting and receiving telephones are included serially in a line-circuit. It is an adjunct to the transmitting-telephone, its object being to prevent the diminution of the current in the circuit below a predetermined value by the transmitting-telephone.

In telephone-exchange practice it is frequently desirable to operate signals at a central station automatically in the use of the substation-telephone. This has been accomplished in the case of telephone-lines provided with high-resistance transmitting-telephones and receiving-telephones connected in series in the line by permitting the flow of current through the telephones during their use to operate suitable electromagnetic annunciators in the line-circuit, the current through the telephonic appliances being interrupted, if desired, by the switch hook or support of the receiving-telephone when the latter is replaced upon it. It has been found, however, that in practice the transmitting-telephone, by its wide variations of resistance during its use, may interfere more or less with the operation of the signaling instruments by occasionally reducing the current through them below that which is required for their excitement. The normal resistance of such a transmitting-telephone may be one hundred ohms; but the resistance will be found to rise to fifteen hundred or two thousand ohms when particularly rapid sound-vibrations impinge upon the transmitter, or if the sound last striking the transmitter were of high pitch, as the rising intonation at the termination of a sentence, the transmitter might be left with such a high resistance until again used. It is obvious that in any such case the current created in the line-circuit might be insufficient to operate the signaling instruments.

My invention consists in a shunt, which may preferably be an inductive resistance or impedance coil, connected about the transmitting-telephone. For example, I have found that an impedance-coil of ordinary type having a resistance of one hundred ohms may be thus placed in shunt about the transmitter without appreciably affecting the efficiency of transmission from it, while insuring the passage in the line of sufficient current for operating the signals. It will be understood that this device might be applied in any case in which it was necessary to excite an electromagnet or other responsive instrument in a circuit including a variable-resistance transmitter. The employment of it in the organization which I have mentioned is, however, representative, and I have illustrated the invention in connection with such a system in the accompanying drawing.

In the diagram substation A is equipped with a transmitting-telephone *b*, a receiving-telephone *b'*, a signal-bell *b''*, and a switch-hook *b'''*, which controls the connection of the telephonic appliances in the line-circuit. The bell *b''* may have a resistance of five thousand ohms. The receiving-telephone, for such use as that here shown, commonly has a resistance of about twenty-five ohms and the transmitting-telephone a normal resistance, when quiescent, of about one hundred ohms. These instruments are connected by line conductors 1 and 2 with apparatus in a switchboard at a central station C. The conductor 1 includes an electromagnetic signal or annunciator *d* and is connected with earth. The line conductor 2 is extended through an impedance-coil *e* to one pole of a source *f* of current whose other pole is grounded. The line conductors are united with contact-pieces of a spring-jack *g* in the switchboard. The usual connecting-plugs *h* are provided for the operator to effect connection with the line by means of the spring-jack, the different members of a pair of plugs being united through the helices of an induction-coil *i*. Branches from ground and from the pole of battery *f* are led to points of connection of the helices of this induction-coil, so that when connection is made with the line battery *f* is brought into a bridge of the line-circuit, including the in-

duction-coil helices, in a manner well known in the art.

My invention consists in an impedance-coil k , connected in shunt of the transmitting-telephone b at the substation. As I have stated, this impedance-coil may have a resistance of one hundred ohms, more or less, as desired.

In the normal condition of the apparatus, the receiving-telephone b' being upon its switch-hook b^3 , the circuit from battery f is completed at the substation through the high-resistance bell b^2 . The signal d should be so constructed that the current through it shall be insufficient to cause it to display its indicator. When the telephone is brought into use, the switch-hook b^3 closes the circuit through the low-resistance path of the telephone, and thus permits the flow of sufficient current to excite the signal d .

In the use of transmitting-telephone b its resistance varies, in accordance with the sound-impulses which strike its diaphragm, from one hundred to two thousand ohms, so that it correspondingly varies the current passing through it. Rapid undulations are thus produced in the line-circuit, which are not appreciably affected or diminished by the presence of impedance-coil k in shunt of the trans-

mitting-telephone on account of the self-induction of the coil. At the same time the interruption or the diminution of the current below the value necessary for the retention of signal d in its displayed position is prevented.

I claim as my invention—

1. The combination in an electric circuit, of a source of current, a variable-resistance transmitting-telephone, an inductive resistance in shunt of the telephone, and an electromagnetic responsive instrument requiring for its operation a current greater than the maximum resistance of the transmitter would permit, as described.

2. In combination in a telephone-line, a source of current, an annunciator, a receiving-telephone, a variable-resistance transmitting-telephone, and a resistance-coil in shunt of the transmitting-telephone adapted to permit said source of current to create in the circuit a current sufficient to operate the annunciator, substantially as described.

In witness whereof I hereunto subscribe my name this 13th day of June, A. D. 1895.

CHARLES E. SCRIBNER.

Witnesses:

ELLA EDLER,

MYRTA F. GREEN.