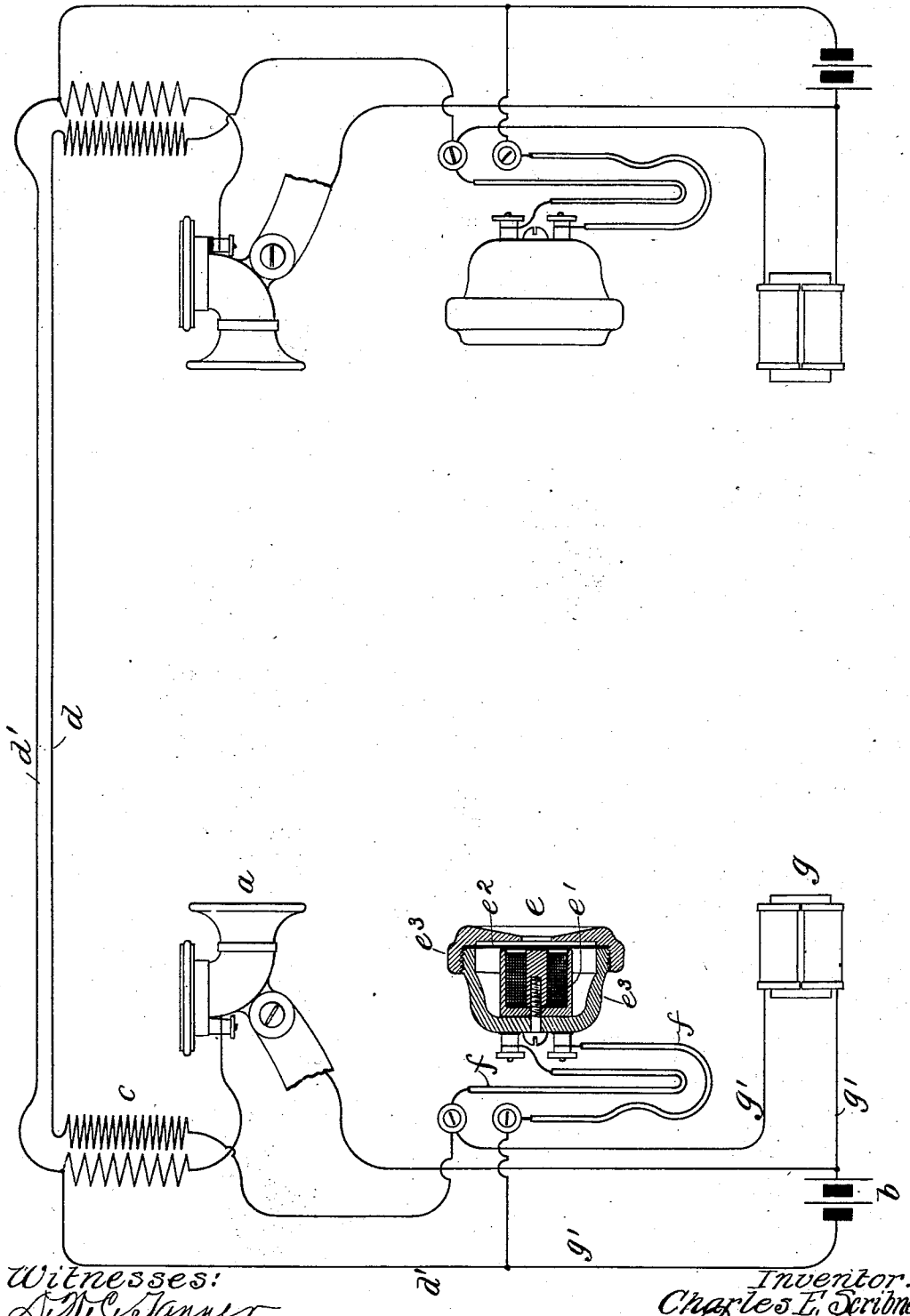
(No Model.)

C. E. SCRIBNER.

TELEPHONE.

No. 571,907. Patented Nov. 24, 1896.



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UNITED STATES PATENT OFFICE.

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

TELEPHONE.

SPECIFICATION forming part of Letters Patent No. 571,907, dated November 24, 1896.

Application filed February 7, 1893. Serial No. 461,389. (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 Telephones, (Case No. 320,) 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 relates to electric speaking-telephones. Its object is to produce a simple, compact, and efficient electromagnetic telephone-receiver, being more particularly directed to providing new means for securing a normal constant magnetization of the core of the electromagnet.

As is well known in the art to which my invention pertains, it is desirable that the electromagnet which acts upon the diaphragm of the telephone should have a certain amount of constant magnetization in which fluctuations may be produced by the varying magnetizing forces of the telephonic currents. This arises from the fact that unmagnetized or very feebly magnetized iron is much less responsive to feeble fluctuations of the magnetizing force, such as that of the feeble telephonic currents, than iron which already possesses a considerable magnetization approaching semisaturation. Heretofore this constant magnetization of the core of the telephone-electromagnet has been produced either by a permanent magnet in whose field the core of the electromagnet has been placed or by an auxiliary coil upon the electromagnet, in circuit with a battery. In the first instance the efficiency of the instrument is somewhat reduced by the inferior susceptibility of the steel which constitutes a part of the magnetic circuit of the telephone-electromagnet and in the latter instance by the opposing effect of the currents which are induced in the closed local-battery circuit by the undulating telephonic current. In both cases, also, the bulk of the instruments is unnecessarily increased.

In my invention I provide a simple electromagnet, adapted to act upon the diaphragm, and a retardation-coil in different parallel branches of the line-circuit, a battery being included in one of the branches. The two parallel branches form a closed local circuit including the telephone-electromagnet and a battery. A continuous current thus flows from the battery through the local circuit, finding unobstructed passage through the retardation-coil, while the telephonic currents are largely or almost wholly prevented from passing through that branch of the line-circuit by the high impedance of the retardation-coil; or, in other words, the rapid variations of the difference of potential between the points of junction of the branch circuits produce variations in the current through that branch containing the telephone-magnet, but are prevented from producing any perceptible variations in the current through the retardation-coil. The telephone-electromagnet is thus given a normal constant magnetization, which is varied or caused to fluctuate by the undulations of the telephonic currents. This normal constant magnetization may be adjusted to any suitable amount by adjusting the strength of the normal current in the local circuit. By this arrangement I am enabled to employ a small electromagnet of the greatest attainable permeability and to adjust it to the maximum sensitiveness to feeble fluctuations of the magnetizing force, and thus to produce a very efficient instrument.

My invention is illustrated in the accompanying drawing and may be more fully set forth in connection therewith.

I have shown two telephone sets, each comprising a telephone-receiver constructed and arranged in accordance with my invention, a microphone, and the induction-coil thereof, the two telephone sets being connected together by a telephone-line.

An ordinary long-distance transmitter *a* is shown connected in circuit with a battery *b* and the primary helix of an induction-coil *c*, whose secondary helix is included in the line-circuit *d d'*. The telephone-receiver *e* is shown in longitudinal central section. It comprises a tubular electromagnet *e'*, the

telephone-diaphragm e^2 opposite the poles of the magnet, and the inclosing case e^3, which serves also to hold the parts in place.

The electromagnet e' is connected in one branch f of the line-circuit d d'. A retardation-coil g is connected in another parallel branch g' of the line-circuit, as described. The battery b, which serves as the microphone-battery, is included in the branch g', containing the retardation-coil g. The line-circuit may thus be traced from the line-wire d through the secondary helix of induction-coil c to one terminal of the branch circuits f g'. At that point it divides, and one circuit may be traced through the conductor f and through the telephone-receiver e to the other side, d', of the line-circuit. The other branch circuit may be traced through the conductor g', retardation-coil g, and battery b to the other side, d', of the line-circuit. The battery b is by this means provided with a local circuit through the branch g' and the retardation-coil g to the branch f, thence through the telephone-receiver e to the other side of the branch f, and thence through the corresponding portion of the branch g', returning to battery b. The magnet e' is thus energized by a continuous current from battery b, which current is also rendered constant by the retardation-coil g, whose impedance prevents any sudden fluctuations of the current. At the same time the undulating telephonic current from the line-circuit d d' finds circuit only through the branch f containing the telephone-receiver, being prevented from passing through the branch g' by the impedance of retardation-coil g.

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

1. The combination with the electromagnet of a telephone-receiver, of an electromagnetic coil not one of the telephone-coils, and circuits connecting the telephone-receiver and the said electromagnetic coil in different parallel branches of a line-circuit, and a source of electricity in one of said branches, whereby the battery and telephone-coil are included in a local circuit and the passage of telephonic currents through the battery is prevented by the impedance-coil, substantially as described.

2. The combination with the coil of a telephone, included in one branch of a circuit, of a separate retardation or impedance coil included in a second branch, and a source of electricity in one of said branches, whereby the battery and telephone-coil are included in a local circuit and the passage of telephonic currents through the battery is prevented by the impedance-coil; substantially as described.

In witness whereof I hereunto subscribe my name this 6th day of January, A. D. 1893.

CHARLES E. SCRIBNER.

Witnesses:
ELLA EDLER,
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