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MICROPHONE AND TELEPHONE INSTALLATION.

(Application filed Apr. 3, 1901.)

(No Model.)

2 Sheets—Sheet 1.

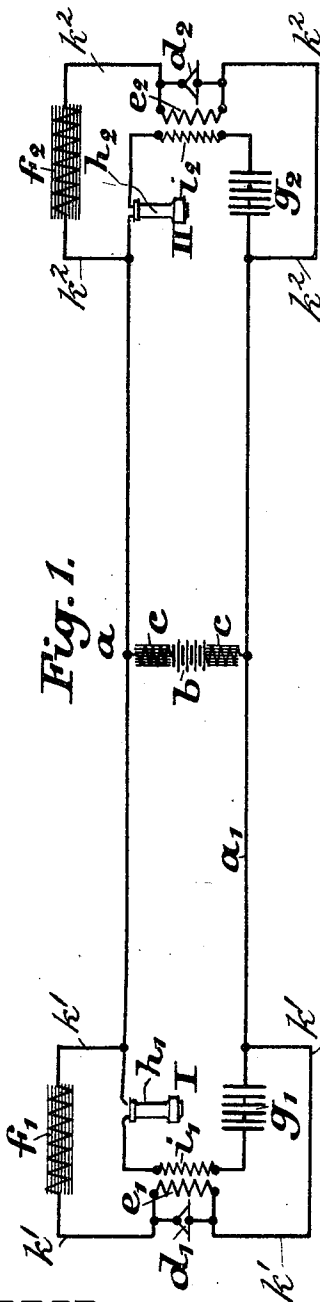


Fig. 1.

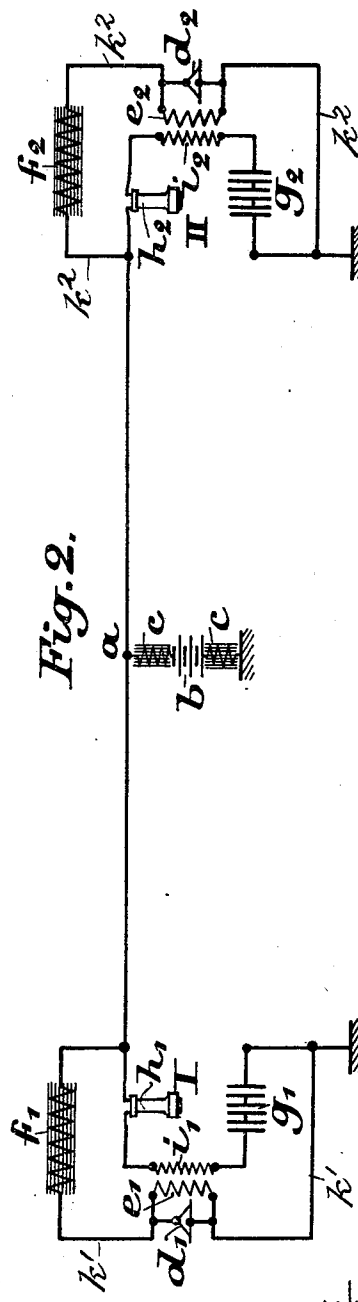


Fig. 2.

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MICROPHONE AND TELEPHONE INSTALLATION.

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2 Sheets—Sheet 2.

Fig. 3.

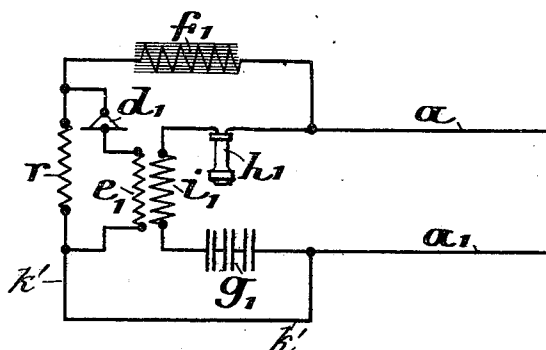


Fig. 4.

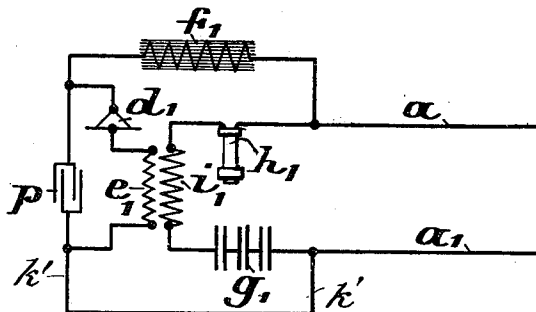
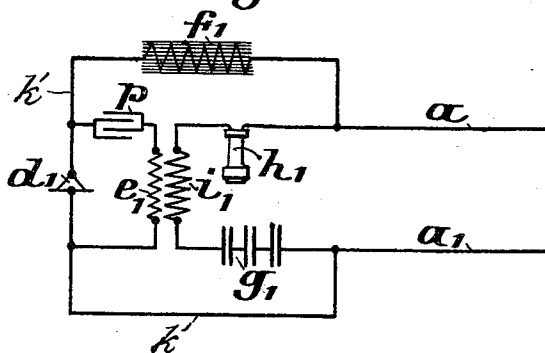


Fig. 5.



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LIPA POLINKOWSKY, OF BERLIN, GERMANY, ASSIGNOR TO SIEMENS & HIALSKE AKTIENGESSELLSCHAFT, OF SAME PLACE.

MICROPHONE AND TELEPHONE INSTALLATION.

SPECIFICATION forming part of Letters Patent No. 681,374, dated August 27, 1901.

Application filed April 3, 1901. Serial No. 54,142. (No model.)

To all whom it may concern:

Be it known that I, LIPA POLINKOWSKY, mechanical engineer, a subject of the Emperor of Russia, residing at Berlin, 11 Neuenburgerstrasse, Germany, have invented certain new and useful Improvements in Microphone and Telephone Installation; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to improvements in central-energy telephone systems.

The object of my invention is to provide a central-energy telephone system in which only one main circuit is required.

With this broad object in view and some others which will be obvious to those skilled in the art my invention consists in the features, details of construction, and combination of parts which will first be described in connection with the accompanying drawings and then particularly pointed out in the claims.

In the drawings, Figure 1 is a diagrammatic view of a system embodying one form of my invention as applied to an all-metallic circuit; Fig. 2, a similar view showing the invention as applied to a grounded return-circuit, and Figs. 3 to 5 diagrammatic detail views of modifications which may be made without departing from the spirit of my invention.

Referring to the drawings, and in particular to Fig. 1, I and II indicate two substations in connection with each other ready for conversation. The line-wires connecting the two substations are indicated at a and a' , respectively, the latter wire a' being the return-wire.

The central source of energy is indicated at b , this source consisting in the present instance of a battery. The said source is located in a bridge across the two main-line wires a a' , this bridge including also means for barring the bridge against telephonic or alternating currents, while at the same time permitting the passage of continuous currents—as, for example, self-induction devices, such as choking-coils c , arranged one at each side of the source, whereby the passage of telephonic currents across the bridge will be prevented, and, on the other hand, the

current from the source of electricity may pass to the line, as will be fully understood by those skilled in the art.

At h' and h^2 , respectively, are shown telephone-receivers, while i' i^2 indicate the secondary windings of induction-coils of any usual or desirable form. The said telephone-receivers and the secondaries i' i^2 are included in and form part of the main talking-circuit which connects the substations. Suitable means are employed for barring the receivers against continuous currents while permitting the passage of alternating or telephonic currents to said receivers. For this purpose I may employ condensers or polarizing-cells, as indicated at g' g^2 , which are also included in the main talking-circuit.

A telephone-receiver, a secondary of an induction-coil, and means for barring the receiver against continuous currents form a set of devices, with one of which sets each substation is supplied. At each substation is provided a local circuit in the form of a branch circuit, which is in parallel with its respective set of devices above referred to, the conductors forming said local circuits being indicated at k' k^2 , respectively. In each branch circuit is included means for barring the branch or local circuit against alternating or telephonic currents, consisting, for example, of a self-induction device, such as a choking-coil f' f^2 , respectively. Each branch or local circuit is in turn provided with two branches in parallel with each other, as shown in the drawings, and in each local circuit in one of these branches is located the primary of the respective induction-coil, as indicated at e' e^2 , these primaries being arranged to co-act with the corresponding secondaries i' i^2 for a purpose hereinafter described.

In the construction shown in Fig. 1 the other parallel branch of each local circuit includes a transmitter or microphone, as indicated at d' d^2 , which transmitters of course are thus located in parallel with the respective primaries e' e^2 of the corresponding induction-coils.

The operation of this apparatus is as follows: The current from the central source b upon reaching the two line-wires a a' divides into two branches and passes on to the two

substations I and II. Here it flows only over the branch or local circuits containing the transmitters, the primary windings of the induction-coils, and the choking-coils. None of the current from the source can traverse the ends of the main talking-circuit beyond the points of connection of the local circuits with the main talking-circuit, because the current is barred by the condensers or polarizing-cells g' g^2 , respectively. When now, for instance, the transmitter d' at the substation I is struck by a sound-wave, and changes in resistance are thereby produced in the local circuit, every increase of such resistance will cause an increase of current in the primary of the induction-coil and every decrease of such resistance will cause a decrease of such current; but these variations of current will not cause any appreciable disturbance in the line-circuit, because they are limited to the local or branch circuit by the self-induction of the choking-coil f' . They will act, therefore, with unweakened strength upon the primary winding e' of the induction-coil. In the secondary i' of said induction-coil alternating currents will be induced which will freely pass over the polarizing-cells g' along the line, but will not be able to traverse the bridge containing the central source b , since said bridge is protected by the choking-coils c . At the other substation II the telephonic currents will actuate the telephone-receiver h^2 and will reproduce the sound received by the transmitter or microphone d' , but such telephonic currents will not be able to traverse the local circuit or branch at substation II, because said branch is protected by the choking-coil f^2 .

The construction shown in Fig. 2 differs from that of Fig. 1 only in having a grounded return instead of an all-metallic talking-circuit, and hence no specific description of this view will be necessary.

Referring now to Figs. 3 to 5, it will readily be seen by those skilled in the art that the described effect may be obtained without arranging the apparatus in the branch or local circuits in exactly the same manner as is shown in Figs. 1 and 2. For example, as illustrated in Fig. 3, the transmitter may be placed in series with the primary winding of the induction-coil in one of the parallel branches of the local circuit, the other of said parallel branches being provided with suitable means for limiting the flow of current through it—as, for example, by inserting a resistance r in said other branch.

In certain cases I have also found it advantageous to introduce a condenser or polarizing-cells into that one of the parallel branches which serves as a shunt for the transmitter. This can be done either by placing the transmitter and the primary winding of the induction-coil in series in one of the parallel branches and inserting a condenser p or polarizing-cells into the other parallel branch, as shown in Fig. 4, or by placing the condenser

p and the primary winding in series in one parallel branch and inserting the transmitter in the other parallel branch, as shown in Fig. 5.

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

1. In a central-energy telephone system, the combination, with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil and means for barring the receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, a transmitter in each branch circuit, and the primary windings of the respective induction-coils included in the corresponding branch circuits and arranged to coact with the corresponding secondaries.

2. In a central-energy telephone system, the combination, with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil and means for barring the receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, the branch circuits being in parallel with their respective sets of devices, a transmitter in each branch circuit, and the primary windings of the respective induction-coils included in the corresponding branch circuits and arranged to coact with the corresponding secondaries.

3. In a central-energy telephone system, the combination, with a main talking-circuit connecting substations, a source of continuous current bridging the main talking-circuit intermediate the substations, a pair of choking-coils included in said bridge, one at each side of said source, a plurality of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil and means for barring the receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, a transmitter in each branch circuit, and the primary windings of the respective induction-coils included in the corresponding branch circuits and arranged to coact with the corresponding secondaries.

4. In a central-energy telephone system, the combination, with a main talking-circuit connecting substations, a source of continuous current bridging the main talking-circuit intermediate the substations, a pair of choking-coils included in said bridge, one at each side of said source, a plurality of sets of devices included in the talking-circuit, one set

at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil and means for barring the receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, the branch circuits being in parallel with their respective sets of devices, a transmitter in each branch circuit, and the primary windings of the respective induction-coils included in the corresponding branch circuits and arranged to coact with the corresponding secondaries.

5. In a central-energy telephone system, the combination, with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil and means for barring the receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, a transmitter in each branch circuit, the primaries of the respective induction-coils included in the corresponding branch circuits and arranged to coact with the corresponding secondaries, and means in each branch circuit for barring the said branch against alternating currents.

6. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit and a plurality of sets of devices included in the main talking-circuit, one set at each substation, each set comprising the secondary of an induction-coil, a telephone-receiver and means for barring said receiver against continuous currents, of a local circuit branching from the main talking-circuit at each substation, each local circuit having two parallel branches, a primary winding of the respective induction-coil included in each local circuit, in one of the parallel branches thereof, and arranged to coact with its corresponding secondary, the other parallel branch serving as a shunt to said primary winding, means for barring each local circuit against alternating currents, and a transmitter included in each local circuit.

7. In a central-energy telephone system, the combination, with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the main talking-circuit, one set at each substation, each set comprising the secondary of an induction-coil, a telephone-receiver and means for barring said receiver against continuous currents, of a local circuit branching from the main talking-circuit at each substation, each local circuit having two parallel branches, a primary winding of the respective induction-coil included in each local circuit and arranged to coact with its corresponding secondary, means for barring each local circuit against alternating currents, a transmitter

included in one of the parallel branches of the respective local circuit, and means for opposing the flow of current through the other parallel branch of each local circuit.

8. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the main talking-circuit, one set at each substation, each set comprising the secondary of an induction-coil, a telephone-receiver and means for barring said receiver against continuous currents, of a local circuit branching from the main talking-circuit at each substation, each local circuit having two parallel branches, a primary winding of the respective induction-coil included in each local circuit and arranged to coact with its corresponding secondary, means for barring each local circuit against alternating currents, a transmitter included in one of the parallel branches of the respective local circuit, and means for opposing the flow of continuous current through the other parallel branch of each local circuit.

9. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit and a plurality of sets of devices included in the main talking-circuit, one set at each substation, each set comprising the secondary of an induction-coil, a telephone-receiver and means for barring said receiver against continuous currents, of a local circuit branching from the main talking-circuit at each substation, each local circuit having two parallel branches, a primary winding of the respective induction-coil included in each local circuit and arranged to coact with its corresponding secondary, means for barring each local circuit against alternating currents, a transmitter included in one of the parallel branches of the respective local circuit, and means for preventing the flow of continuous current through the other parallel branch of each local circuit.

10. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit and a plurality of sets of devices included in the main talking-circuit, one set at each substation, each set comprising the secondary of an induction-coil, a telephone-receiver and means for barring said receiver against continuous currents, of a local circuit branching from the main talking-circuit at each substation, each local circuit having two parallel branches, a primary winding of the respective induction-coil included in each local circuit and arranged to coact with its corresponding secondary, means for barring each local circuit against alternating currents, a transmitter included in one of the parallel branches of the respective local circuit, and

a condenser in the other parallel branch of each local circuit.

11. In a central-energy telephone system, the combination with a main talking-circuit 5 connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, a primary of the respective induction-coil in 15 each branch circuit and arranged to coact with its corresponding secondary, and transmitters in parallel with the corresponding primaries of the respective induction-coils.

12. In a central-energy telephone system, 20 the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, 30 means for barring the branches against alternating currents, a primary of the respective induction-coil in each branch circuit and arranged to coact with its corresponding secondary, and transmitters in parallel with the corresponding primaries of the respective induction-coils. 35

13. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of 40 energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, 45 said branches being in parallel with their respective sets of devices, a primary of the respective induction-coil in each branch circuit and arranged to coact with its corresponding secondary, and transmitters in parallel with the corresponding primaries of the respective induction-coils. 50

14. In a central-energy telephone system, 55 the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from 60 the main talking-circuit at each substation said branches being in parallel with their respective sets of devices, means for barring

the branches against alternating currents, a primary of the respective induction-coil in each branch circuit and arranged to coact 70 with its corresponding secondary, and transmitters in parallel with the corresponding primaries of the respective induction-coils.

15. In a central-energy telephone system, the combination with a main talking-circuit 75 connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, 80 a primary of the respective induction in each branch circuit and arranged to coact with its corresponding secondary, means for preventing the flow of continuous current through the primary of the induction-coil, and transmitters in parallel with the corresponding 85 primaries of the respective induction-coils. 90

16. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, 100 means for barring the branches against alternating currents, a primary of the respective induction-coil in each branch circuit and arranged to coact with its corresponding secondary, means for preventing the flow of continuous current through the primary of the induction-coil, and transmitters in parallel with the corresponding primaries of the respective induction-coils. 105

17. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous 120 currents, of a branch circuit from the main talking-circuit at each substation, said branches being in parallel with their respective sets of devices, a primary of the respective induction-coil in each branch circuit and arranged to coact with its corresponding secondary, means for preventing the flow of continuous current through the primary of the induction-coils, and transmitters in parallel with the corresponding primaries of the respective induction-coils. 125

18. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of

energy for energizing said circuit, and a plurality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, said branches being in parallel with their respective sets of devices, means for barring said branches against alternating currents, a primary of the respective induction-coil in each branch circuit and arranged to coact with its corresponding secondary, means for preventing the flow of continuous current through the primary of the induction-coils, and transmitters in parallel with the corresponding primaries of the respective induction-coils.

19. In a central-energy telephone system, the combination with a main talking-circuit connecting substations, a central source of energy for energizing said circuit, and a plu-

ality of sets of devices included in the talking-circuit, one set at each substation, each set comprising a telephone-receiver, the secondary winding of an induction-coil, and means for barring said receiver against continuous currents, of a branch circuit from the main talking-circuit at each substation, said branches being in parallel with their respective sets of devices, means for barring said branches against alternating currents, a primary of the respective induction-coil in each branch circuit and arranged to coact with its corresponding secondary, a condenser in series with each primary winding, and transmitters in parallel with the corresponding primaries of the respective induction-coils.

In testimony whereof I have affixed my signature in presence of two witnesses.

LIPA POLINKOWSKY.

Witnesses:

HENRY HASPER,
WOLDEMAR HAUPT.