

No. 652,432.

Patented June 26, 1900.

C. C. GOULD.
TELEPHONE SYSTEM.
(Application filed Feb. 12, 1900.)

(No Model.)

Fig. 1.

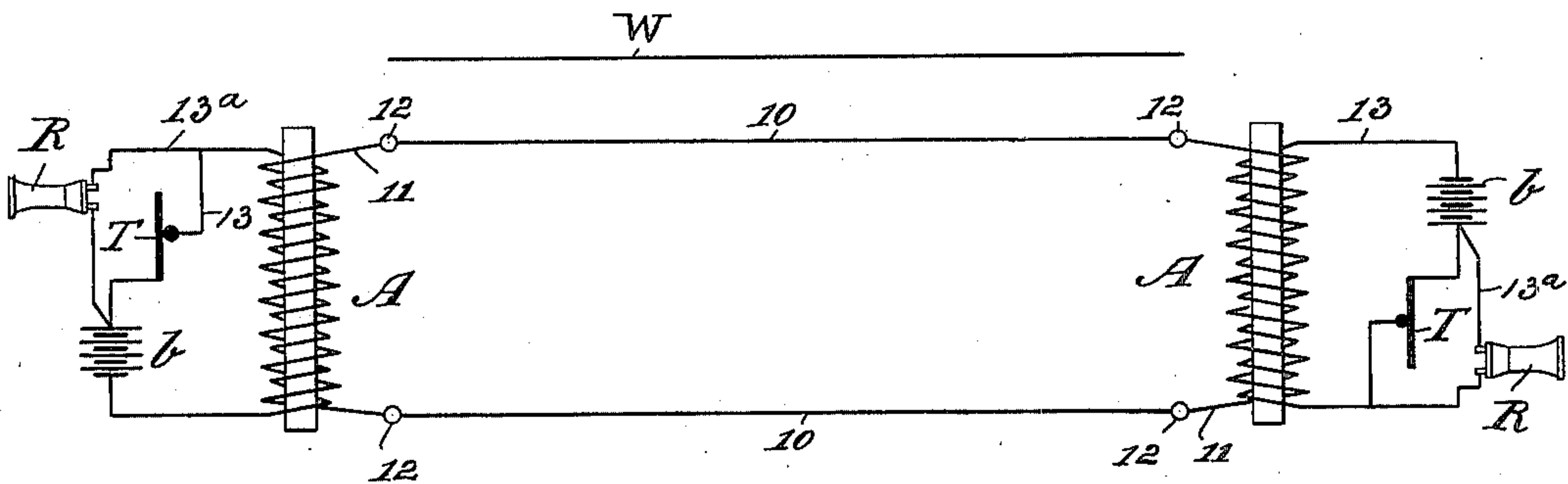


Fig. 2.

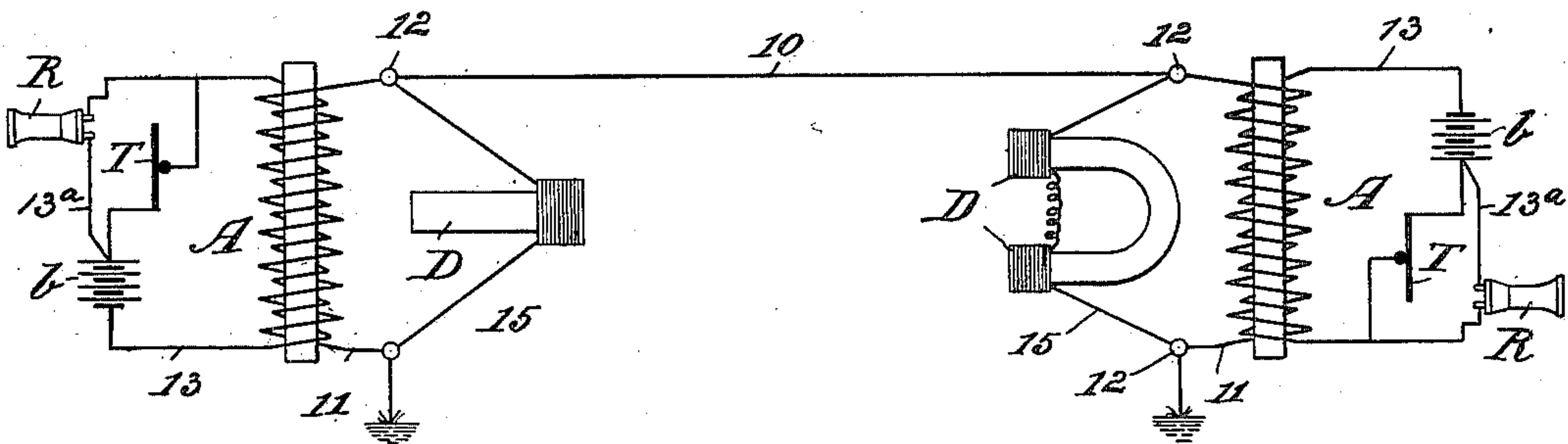


Fig. 3.

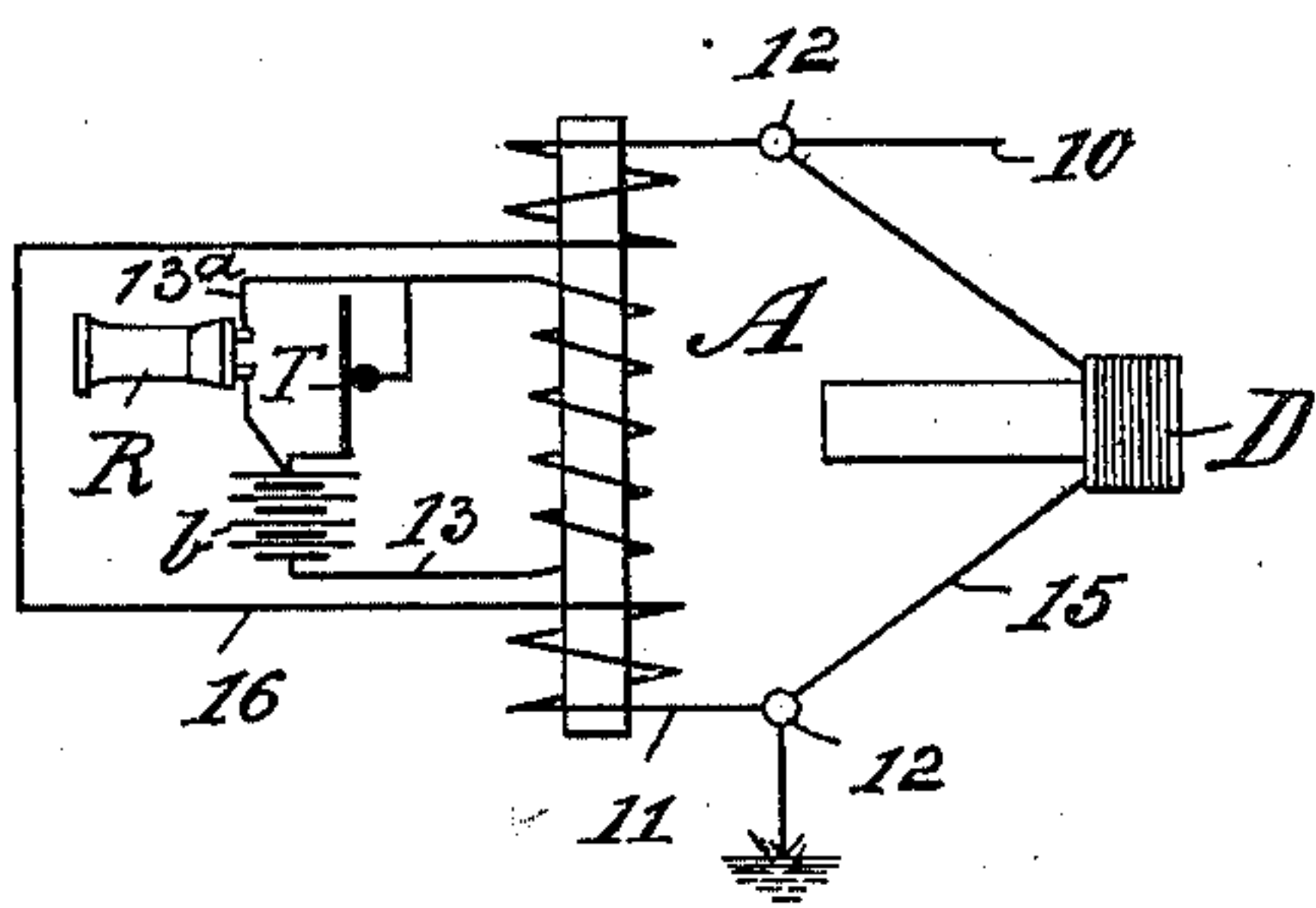


Fig. 4.

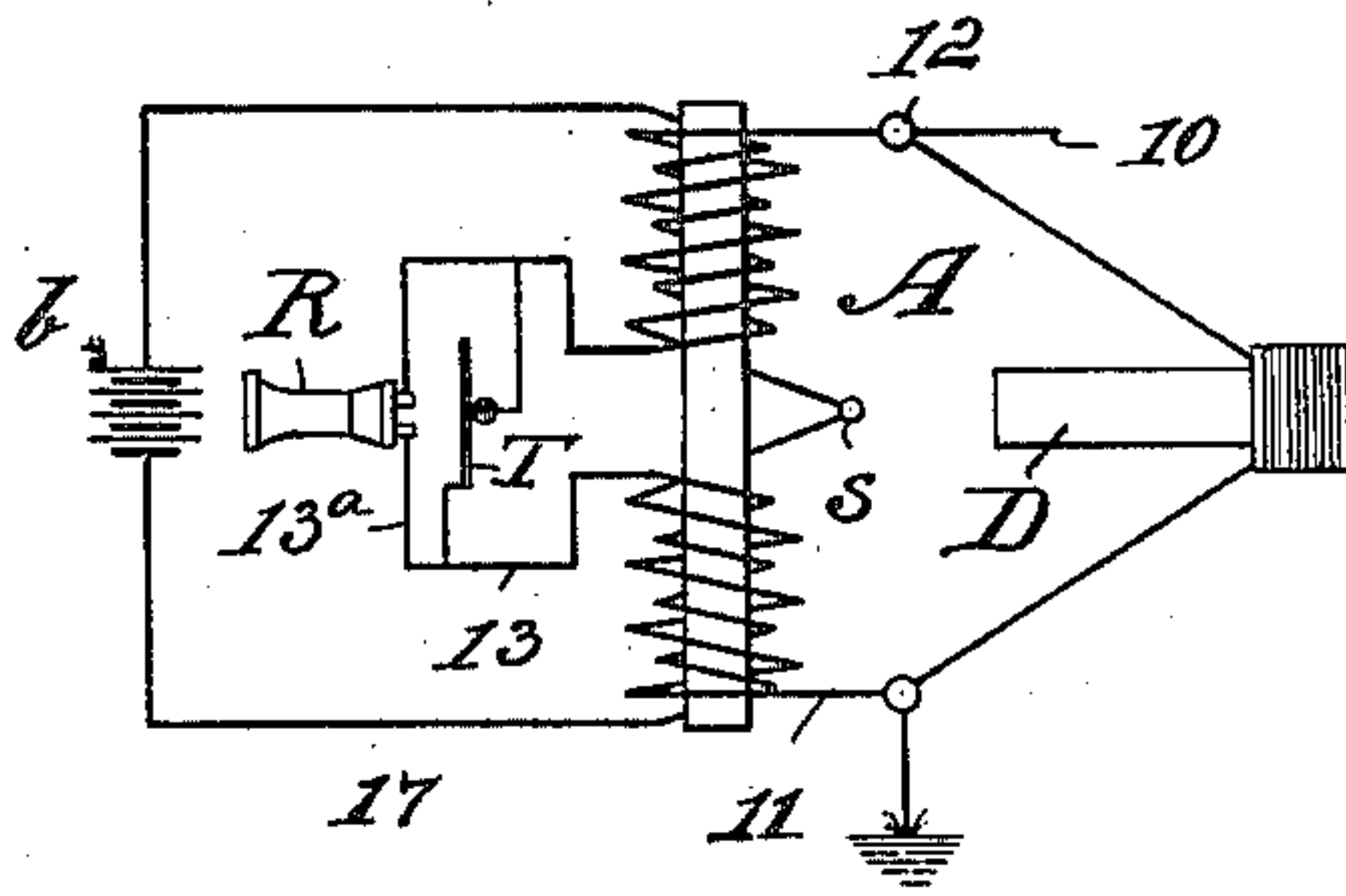
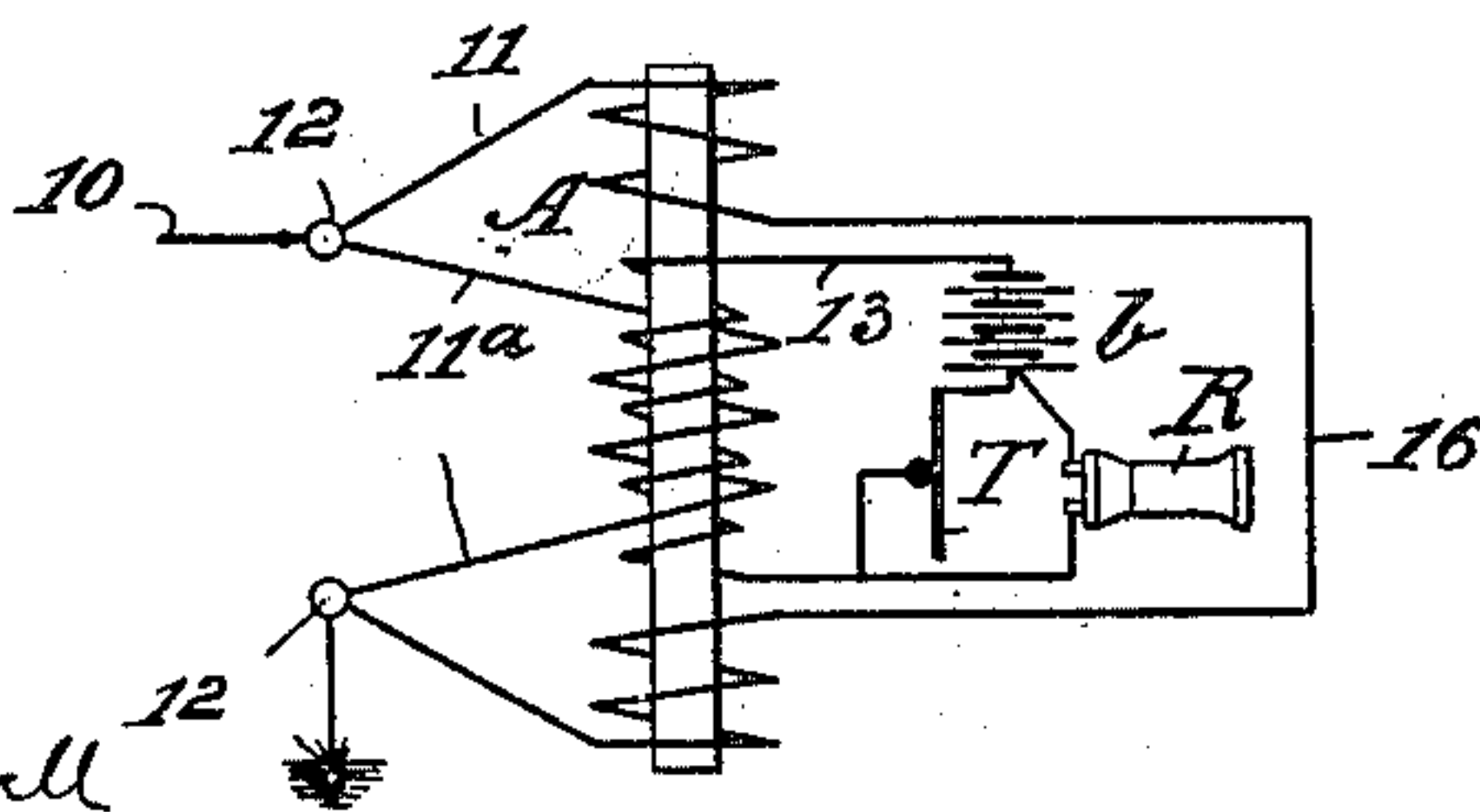


Fig. 5.



Witnesses:
Thomas M. Smith.
Richard C. Maynard

Inventors:
Cornelius C. Gould,
J. Walter Douglas
Attorneys

UNITED STATES PATENT OFFICE.

CORNELIUS C. GOULD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY DIRECT AND MESNE ASSIGNMENTS, TO THE GOULD TELEPHONE COMPANY, OF WILMINGTON, DELAWARE.

TELEPHONE SYSTEM.

SPECIFICATION forming part of Letters Patent No. 652,432, dated June 26, 1900.

Application filed February 12, 1900. Serial No. 4,862. (No model.)

To all whom it may concern:

Be it known that I, CORNELIUS C. GOULD, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Telephone Systems, of which the following is a specification.

My invention has relation to means for materially suppressing or practically dispelling in telephone-circuits inductive disturbances or noises in the transmission of articulate speech; and in such connection it relates to improvements upon the means described and claimed in an application for Letters Patent filed by me January 21, 1899, Serial No. 702,950; renewed February 23, 1900, Serial No. 6,305.

In the application for Letters Patent Serial No. 702,950, above referred to, a means for increasing the clearness as well as the volume of sound-wave reproductions in a telephone system was illustrated, described, and claimed, which means consisted, essentially, in placing in each branch of a main circuit one of a pair of inductive resistance-coils and connecting in multiple with said main circuit a transmitter and with a receiver connected in series with the main circuit.

In my present invention the secondary of an induction-coil is wound around a resistance and is in series with the main circuit, while the primary of the coil is in series with a local-battery circuit, and in this local-battery circuit the transmitter and receiver are connected in multiple with each other and in series with the battery of the local circuit.

My invention consists, first, in providing a main circuit, the secondary coil of an inductive resistance included in series in said main circuit, a local-battery circuit, the primary coil of said inductive resistance included in series in said local-battery circuit, a transmitter and receiver connected in multiple with each other and in series with the battery in said local circuit, and, second, in providing, in addition to the main circuit, the local-battery circuit and the included mechanisms, an electromagnet in multiple with the main circuit.

My invention further consists of the improvements in telephone-circuits and their accessories for practical working of telephone instruments in circuit, as hereinafter more fully described and claimed.

The nature and scope of my invention will be more fully understood from the following description, taken in connection with the accompanying drawings, forming part hereof, in which—

Figure 1 is a diagrammatic view of a metallic circuit with the features of my invention embodied therein and with the transmitting and receiving instruments included, respectively, in multiple with each other and in series with a local battery. Fig. 2 is a similar view of a modified form of my invention, showing a single-line ground-circuit, with an electromagnet included in multiple in the main circuit and also with the receiving instrument and the transmitting instrument arranged, respectively, in multiple with each other and in series with the battery of a local circuit; and Figs. 3, 4, and 5 are similar views showing modifications in the windings of the secondary and primary circuits around the induction-coil, but in each instance, as to these modifications, with the transmitting and receiving instruments included in the local-battery circuit, as before illustrated.

Referring to the drawings, my invention has been illustrated in exemplification of the underlying principle thereof in metallic and ground circuits and with single and double lines coupled with the employment of secondary and primary circuits and with in each instance the receiver arranged in proximity to the transmitter, and practice has demonstrated that the best results are obtained by such an arrangement of the instruments, in that inductive disturbances and noises are dispelled or suppressed by a peculiar phenomenon in the operation of the circuits as so arranged, so that the electrically-reproduced articulate speech at the receiver is clear, loud, and distinct and delivered without sluggishness in the reproductions of sound-waves sent over or through the lines to the receiving instruments at the respective stations in circuit.

Referring particularly to Fig. 1, which shows a metallic circuit, 10 is the main line, and 11 11 are the secondary coils of an inductive resistance A A, connected at the posts or junctions 12 12 with the line-circuit. W in Fig. 1 represents a high-tension-current line carrying electric light or power currents adapted to induce induction upon the telephones and to produce disturbances or noises in the receiving instruments in which the reproduction of speech is greatly interfered with. This wire W has not been shown in the other figures, although its presence is to be assumed. 13 and 13 are the local-battery circuits, in which the primary coils of the inductive resistances A A are included, each local circuit being provided with a battery b. The transmitting instrument T and receiver R are connected in multiple with each other in the local-battery circuit 13, the receiver R being included in a loop 13^a of the local circuit and the transmitter and receiver being in series with the battery of the local circuit. In practice it has been found that by arranging the transmitter and receiver in the manner explained practically all inductive disturbances and other foreign noises are relieved from the primary or local circuit, and therefore the sound-wave reproductions of the voice are distinct or sharply defined in the electrical reproductions thereof in the receivers and without sluggishness in respect to the character of their reproduction by such electrical undulations.

The foregoing arrangement is very effective in a metallic circuit such as hereinabove described.

In Fig. 2 is illustrated a single-line ground-circuit in which 10 represents the main line, 11 11 the secondary coil, 13 13 the primary or local circuits, A A the inductive resistance, b the primary-battery circuit, and T the transmitting instrument connected in multiple in the local-battery circuit with the receiving instrument R, which is connected by loops 13^a 13^a in series in said local-battery circuit. D D represent suitably-wound permanent magnets connected in multiple by the branches 15 of the main circuit, and also to ground, to aid with the inductive resistance or coils A A.

Figs. 3, 4, and 5 show modifications of my invention with respect to the windings of the secondary and primary coils of the inductive resistances A A. In Fig. 3 the secondary wire is wound around the outer end portions of the core and leads therefrom into an oblong loop 16. The primary coil is wound around the inner portion between the secondary coils and then leads to the wire 13, including the battery b and the transmitter T, and the loop 13^a of the wire 13 includes the receiver R. In Fig. 4 the secondary coil 11 extends from one junction 12 of the main line 10 around the core A to a binding-post s, from the latter again around the core A to

the other junction 12 with the main line 10. The primary coil is wound on the core in divided branches connected by a loop 17, in which the battery b is included, and the two inner ends from the branches of the wire of the primary coil are formed into a loop 13, in which the transmitter T is included, and in rear of this circuit is a branch 13^a, in which is included the receiver R. In Fig. 5 the respective ends of the secondary coil by two branches extend from and to the binding-posts or junctions 12 with the main line 10, then around the core A, and from the outer end portions of the core A they extend in a loop 16, and the other branch 11^a extends from and to the binding-posts or junctions 12 of the main line 10, after being coiled around the middle portion of the core A. The two portions of the primary coil 13, after being coiled around the middle portion of the core A in between the branches of the secondary coil, are extended to the battery b, including the transmitter T therein, and from the battery the branch or loop 13^a of the said circuit includes the receiver R. By either of said arrangements in a single ground or metallic circuit the same results are obtained as in the arrangement of the conductors and their accessories illustrated, respectively, in Figs. 1 and 2, to dispel inductive disturbances or other foreign noises and leave the reproduced sound-wave undulations of the voice electrically sent over the line from one receiving-station to another distinct, more audible, and without any degree of sluggishness apparent in the receiving of such legitimate sound-waves of the voice by the receiving instruments of such stations in circuit.

The arrangement of the receiver as hereinbefore described avoids bridging in the main line, whether the circuit be a metallic or a ground circuit. It also does away with the connecting of the receiver in the main line in series or bridging in a metallic circuit. These advantages of my invention are highly desirable and render far more efficient than at present the working of telephone-receivers from different stations, and especially in congested cities, in which the service is much interfered with by the constant abnormal induction encountered in the operation of telephones due to the presence in a marked degree of inductive influence or disturbances from sources of electric energy inductively related to such circuits in the operation of telephone systems.

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

1. In a telephone system, a main circuit, an inductive resistance, the secondary coil whereof is in series with said main circuit, a local-battery circuit, the primary coil of the inductive resistance connected in series in said local-battery circuit, a transmitter and a receiver in multiple with each other and in

series with the battery of said local circuit, substantially as and for the purposes described.

2. In a telephone system, a main circuit
5 and a local-battery circuit, an induction-coil between the two circuits, and a transmitter and a receiver in multiple with each other and in series with the battery of the local circuit, substantially as and for the purposes
10 described.

3. In a telephone system, a main circuit, an electromagnet connected in multiple in said main circuit, a local-battery circuit, an

induction-coil between the two circuits, and a transmitter and a receiver in multiple with
15 each other and in series with the battery of the local circuit, substantially as and for the purposes described.

In testimony whereof I have hereunto set my signature in the presence of two subscrib- 20
ing witnesses.

CORNELIUS C. GOULD.

Witnesses:

J. WALTER DOUGLASS,
THOMAS M. SMITH.