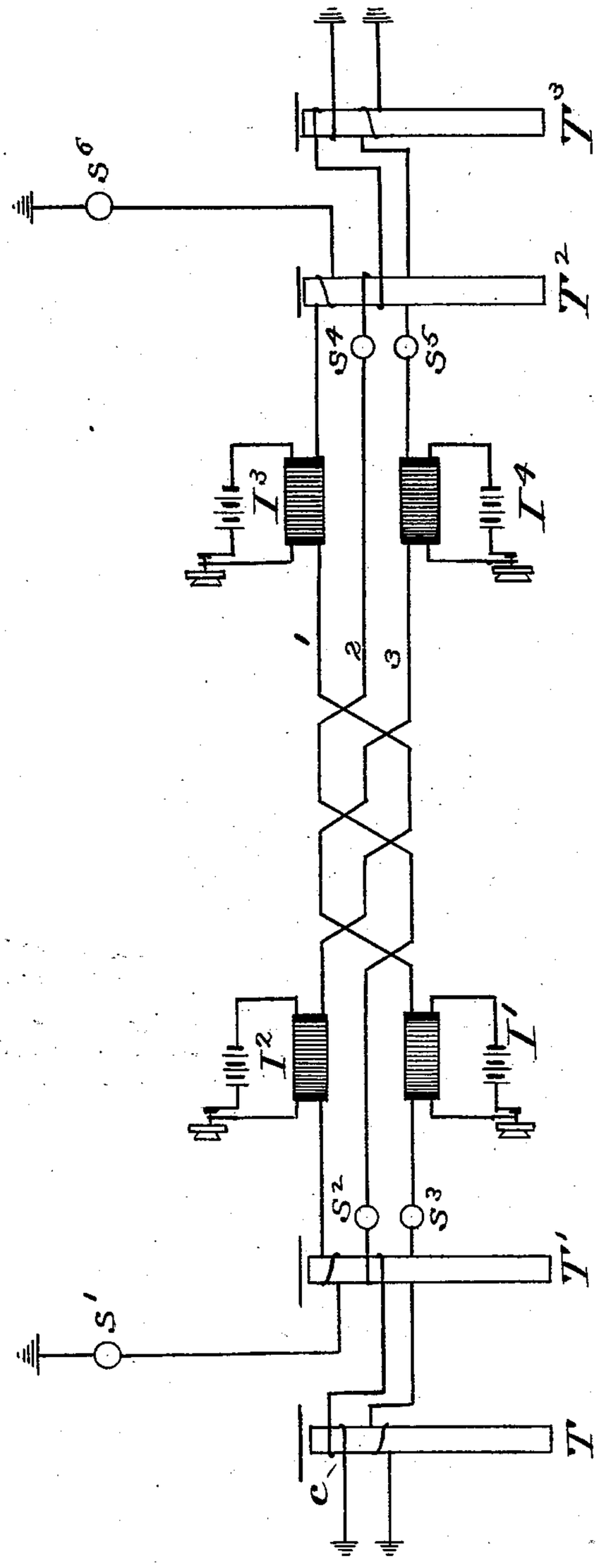
(No Model.)

C. A. SHEA.

TELEPHONIC METALLIC CIRCUIT.

No. 534,085. Patented Feb. 12, 1895.



WITNESSES

J. M. Dolan.

INVENTOR

Christopher A. Shea

UNITED STATES PATENT OFFICE.

CHRISTOPHER A. SHEA, OF BOSTON, ASSIGNOR OF ONE-THIRD TO FREEBORN F. RAYMOND, 2D, OF NEWTON, MASSACHUSETTS.

TELEPHONE METALLIC CIRCUIT.

SPECIFICATION forming part of Letters Patent No. 534,085, dated February 12, 1895.

Application filed July 30, 1892. Serial No. 441,744. (No model.)

To all whom it may concern:

Be it known that I, CHRISTOPHER A. SHEA, a citizen of the United States, residing at Boston, in the county of Suffolk, in the State of Massachusetts, have invented a new and useful Improvement in Telephone Metallic Circuits, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing, forming a part of this specification, in explaining its nature.

The invention relates to a telephone circuit of three wires (two of which are line or talking wires, and one of which is a dead wire) arranged in such relation to each other that the single dead wire acts to balance the inductive disturbances in both the live or talking wires.

There is employed in connection with this invention the invention which I have described in my application for Letters Patent of the United States of even date herewith, marked Case B, Serial No. 441,742.

Referring to the diagram, T T′ T^2 T^3 represent ordinary telephones.

I' I^2 I^3 I^4 are induction coils with ordinary primary and secondary circuits.

1 is a live or talking wire connecting telephone T′ with telephone T^2. 3 is a live or talking wire connecting telephone T with telephone T^3. Both of these wires at their respective ends wind around their telephones and are grounded.

The wire 2 is a dead wire, and is connected with all the telephones T T′ T^2 T^3 by a winding the reverse of the winding of the live wire of such telephones, and is then grounded at each end.

The wires are strung in relation to each other to occupy an inductive relation to each other and to any parallel disturbing wires, and the three wires are brought into proper balanced relation with each other by the use of resistances where needed; and I have represented in the diagram, the employment of resistances in the lines 1, 2 and 3, S' S^2 S^3 S^4 S^5 and S^6 being resistance coils, each of which is a spool of wire surrounding a permanent magnet. The spool S′ is of the same resistance as the coil C of the telephone T. Spools S^2 S^4 serve as a mean balance in the line 2 for the secondary coils. The spools S^3 S^5 S^6 serve the same purpose as the spool S′.

It is to be understood that the wire 2 is dead at all times. It is used for the purpose of balancing the other two wires, and no currents whatever traverse it.

Assuming that T′ is talking to T^2, the currents flow out on wire 1 to telephone T^2 and to earth, and no sound will be heard in T or T^3, because wires 2 and 3 maintain a balance in them. When T talks to T^3 no disturbing sounds will be heard in T′ or T^2, wires 1 and 2 neutralizing all cross-talk. These three wires are so disposed in relation to each other that each telephone has a balanced pair of them which neutralize all inductive effects.

It will be understood of course that wire 3 does not touch telephones T′ T^2.

Having thus fully described my invention, I claim and desire to secure by Letters Patent of the United States—

1. The telephone system herein described comprising the two telephones at each station, the live wires 1 and 3 connected with their respective telephones at the stations and thence to earth, and the dead wire 2 connected with all of said telephones and to earth, and inductively arranged in relation to the wires 1 and 3, and means for balancing said wires to the same resistance, as and for the purposes described.

2. The combination of two live wires between two stations, each wire being provided with means for transmitting and receiving an electrical impulse therealong, said means including at each end a core and a coil of said wire around it, with a third wire between said stations wound round said cores in succession in the opposite direction to the live coils round said cores, as and for the purposes described.

3. The combination of the telephones or telephone converters T T′ T^2 T^3, the wire 1 connecting the coils of telephones T′ T^2 and passing from said coils to earth, the wire 3 connecting coils of telephones T T^3 and extending to earth, and the wire 2 connected with coils upon the telephones T T′ T^2 T^3 and to earth, the coils of which telephones connected with wire 2 being wound reversely to

those of the actuating coils of said telephones, substantially as described.

4. The combination of the telephones or telephone converters T, T′, T², T³, the wire 1 connecting the coils of telephones T′, T², and passing from said coils to earth, the wire 3 connecting the coils of telephones T, T³, and extending to earth, and the wire 2 connected with coils upon the telephones T, T′, T², T³, and to earth, the coils of which telephones connected with wire 2 being wound reversely to those of the actuating coils of said telephones, and means for balancing said wires to the same resistance, as and for the purposes described.

CHRISTOPHER A. SHEA.

Witnesses:
F. F. RAYMOND, 2d,
J. M. DOLAN.