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OPERATOR'S TELEPHONE CIRCUIT

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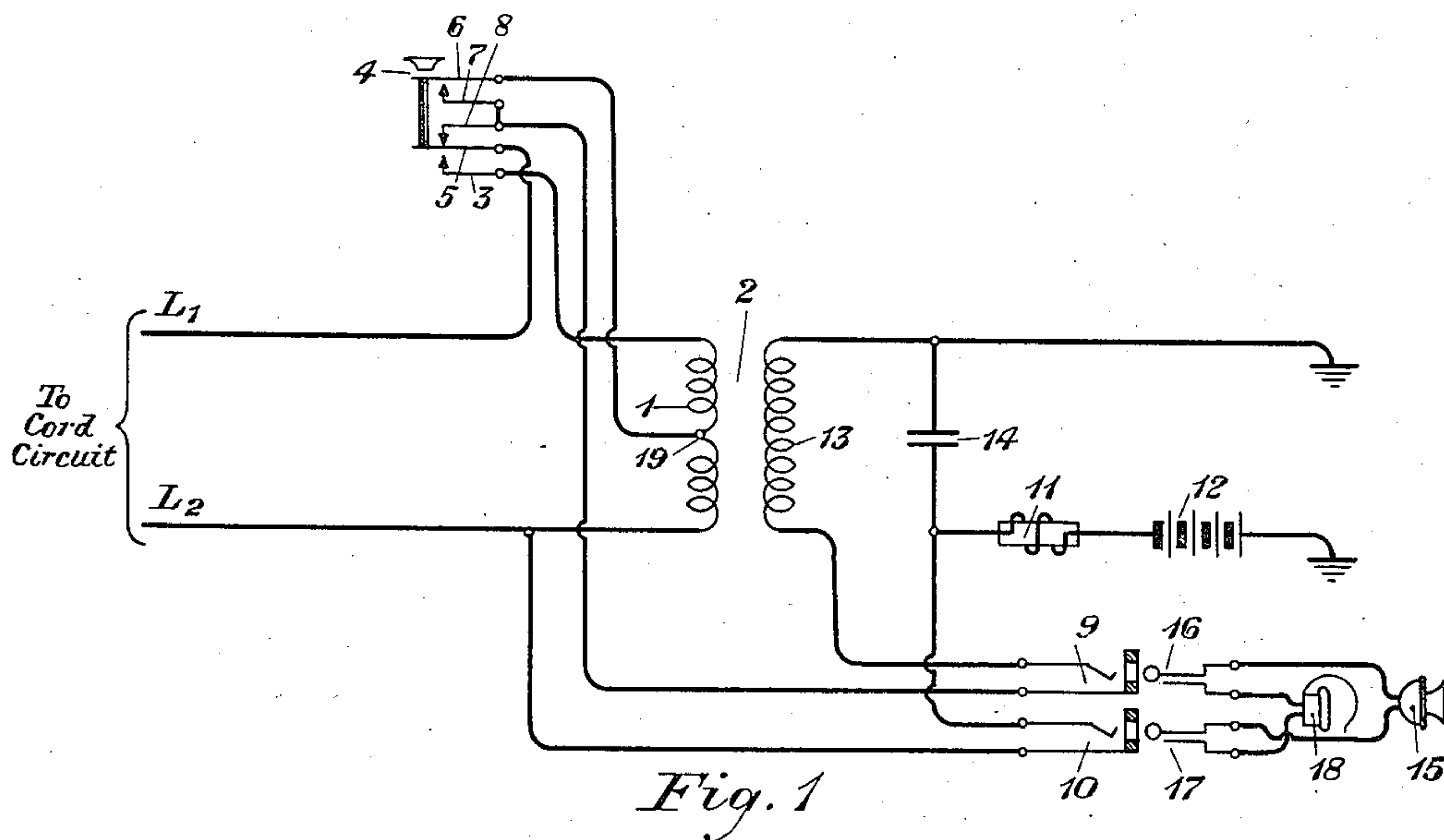


Fig. 1

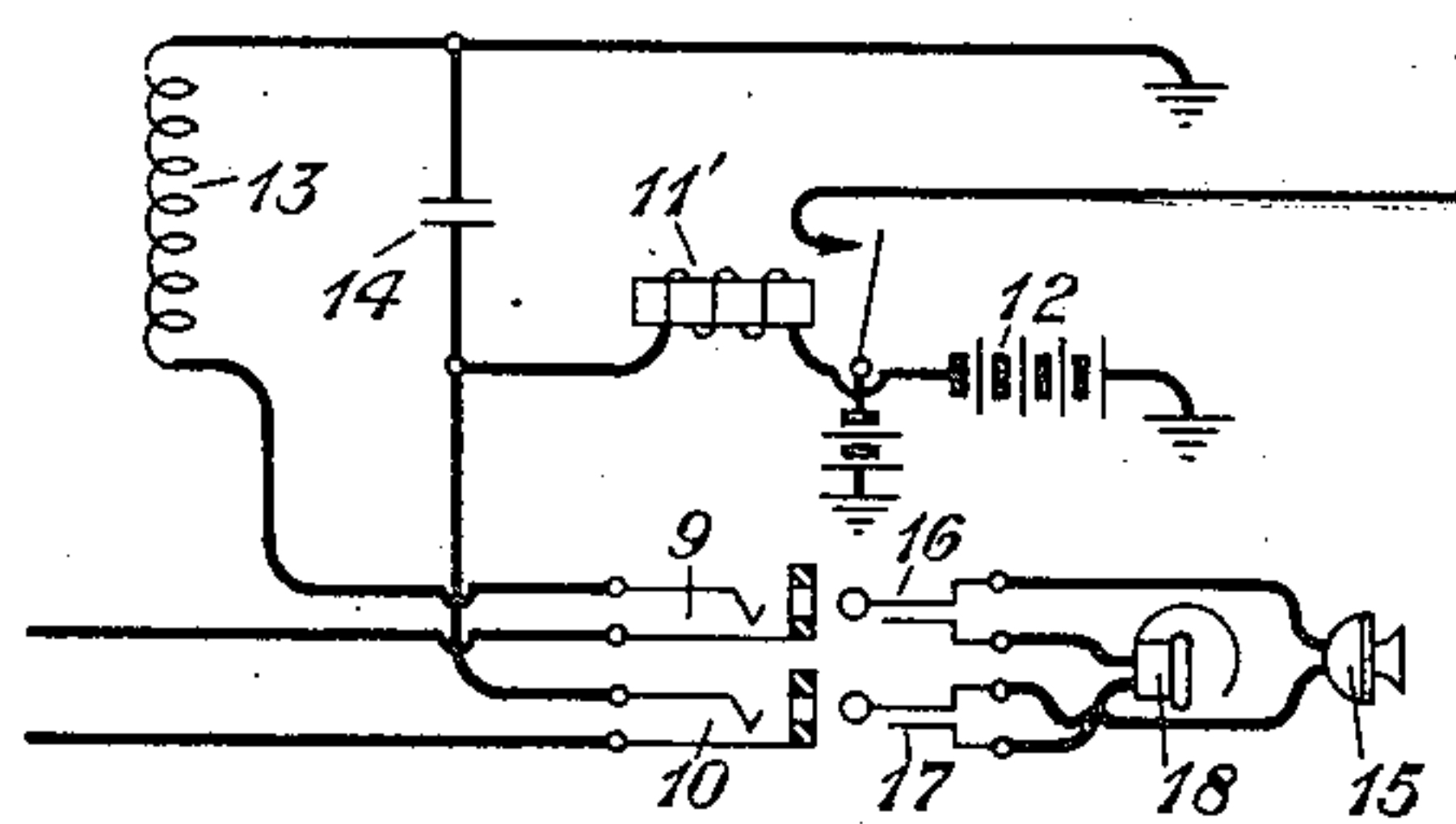


Fig. 1a

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OPERATOR'S TELEPHONE CIRCUIT

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4 Claims. (Cl. 179—51)

This invention relates to operators' telephone circuits, and particularly to means for improving the transmission efficiency of such circuits by cutting out the transmitter of the operator's set, thereby eliminating the pick-up of room noise by the transmitter and thus improving the reception by such set.

In accordance with present practice the work of a considerable proportion of operators consists in receiving messages from subscribers or other operators and setting up circuits in accordance with these messages, by the connection of cords into jacks at the switchboard or by the operation of keys at the keyshelf. These operators require the use of a transmitter only occasionally. In the commonly employed operator's telephone set circuit, however, both the transmitter and receiver are connected at all times. Under these conditions any noise that exists in the operating room is picked up by the operator's transmitter and repeated into the operator's receiver where it interferes with the reception of incoming speech or signals on the part of the operator. The noise in the receiver produced in this way at times is considerable and may prevent the operator from understanding messages given her over the circuit, thus requiring the operator to ask for repetitions, or in other cases may lead to misunderstanding on the part of the operator, resulting in wrong numbers being set up by this operator and other undesirable mistakes. In accordance with the principles of my invention, the transmitter in the case of these operators is connected in circuit only when it is used. At other times it is eliminated from the circuit and the interfering noise avoided thereby.

Furthermore, the arrangement for cutting out the transmitter causes no clicks on the circuit during the operation of the device, and also the position remains operative after the transmitter has been cut out.

In the preferred embodiment of my invention the operator's receiver is connected directly across the telephone line when the transmitter cut-out key is operated, thereby increasing the intensity of the received signals and thus improving the quality of operation.

This invention will be fully understood from the following description when read in connection with the attached drawing of which Figure 1 shows one form of embodiment of the invention; and Fig. 1a shows in fragmentary form a modification of the arrangement shown in Fig. 1.

In Fig. 1, L_1 and L_2 are two conductors that extend to a cord circuit and are usually connected

thereto with a key, which, when thrown, serves to connect the operator's telephone circuit to the cord circuit and through that to any circuit that may be connected thereto, thereby enabling the operator to receive instructions from subscribers or other operators and to talk with them whenever necessary. The conductor L_2 is connected to one of the terminals of the winding 1 of the induction coil 2. The other terminal of that winding is connected to the lower spring 3 of the key 4, the purpose of which is to effectively cut out or cut in the transmitter. The conductor L_1 is connected to the movable spring 5, which is mechanically connected with the upper movable spring 6 in order that both springs 5 and 6 may be moved together by a button or other suitable device. The spring 6 is connected to a suitable terminal upon the winding 1 to produce the desired volume of sound in the receiver of the operator's set under normal talking conditions. The springs 7 and 8 are strapped together and both are connected to the sleeve contact of the jack 9. The corresponding sleeve contact of the jack 10 is connected permanently to the conductor L_2 . The tip contact of the latter jack is connected to the retardation coil 11 and the grounded battery 12. Similarly, the tip contact of jack 9 is connected to one of the terminals of the grounded winding 13 of the induction coil 2. A condenser 14 is connected between the retardation coil 11 and a grounded terminal of the latter winding. The operator's transmitter 15 is connected to the tip contacts of the plugs 16 and 17 and the receiver 18 is connected to the sleeve contacts of those plugs. When the operator is sitting at the switchboard the plugs 16 and 17 will be inserted in the jacks 9 and 10, respectively, and current will flow from the battery 12 through the retardation coil 11, thence through the transmitter 15 and the winding 13 of the induction coil 2 to ground, thereby energizing the transmitter. If the operator is at that instant merely receiving instructions from subscribers or other operators, the key 4 would be open, that is, in the position shown in the figure. Under such condition the receiver 18 would be connected directly across the conductors L_1 and L_2 , the circuit extending from L_1 through the contact between springs 5 and 6, thence through the receiver and to the conductor L_2 . This produces the best reception since the voltage across L_1 and L_2 is applied directly to the receiver 18. If the operator desires to speak to the party or other operator connected to the circuit to which L_1 and L_2 are effectively connected, she will operate the key 4 which will cause the

springs 5 and 6 to move downward and close the contacts with the springs 3 and 7, respectively. The closing of the contact between the springs 5 and 3 connects the conductor L_1 to the upper terminal of the winding 1 of the induction coil 2. Consequently, any current variations produced in winding 13 by the sounds impressed upon the transmitter 15 will be induced in winding 1 and transmitted over the conductors L_1 and L_2 to the distant line. The opening of the contact between springs 5 and 3 disconnects the receiver 18 from conductor L_1 ; and the closing of the contact between springs 7 and 6 serves to connect the receiver effectively between conductor L_2 and the terminal 19 of the winding 1 of the induction coil 2. This establishes the normal connection of the telephone receiver for the condition where the operator wants to converse with other operators or parties connected to the line to which the conductors L_1 and L_2 lead.

Since the upper terminal and the intermediate terminal 19 of winding 1 of the induction coil are normally open at the contacts of the key 4, no current will flow from the winding 1 as a result of noise or other sounds picked up by the transmitter 15, and consequently during the interval in which the operator is merely listening no sounds from her own transmitter can reach her receiver. Obviously this enables the operator to more clearly understand the instructions being given to her by parties or other operators, and thereby tends to improve the operation of the system as a whole. Since the transmitter battery supply circuit is not broken, positions that are connected to the line by means of a relay such as 11' of Fig. 1a which is operated by the flow of current from battery 12 through the operator's transmitter are not disconnected by the operation of the key 4. Furthermore, since the key switches only lead to the operator's telephone circuits that have no battery current flowing through them, no clicks are produced by the operation of this key.

While the invention has been disclosed as applied to an operator's telephone circuit, it is not so limited but is applicable to a large variety of telephone circuits for both operators and telephone subscribers, where such circuits are employed for listening a large part of the time and for talking only occasionally.

The invention is obviously capable of embodiment in other and different forms without depart-

ing from the spirit and scope of the appended claims.

What is claimed is:

1. In an operator's telephone circuit arranged to prevent the picking up of room noise during the time when an operator is merely listening upon a telephone connection, the combination with a transmitter of a receiver, an induction coil having a primary winding and a secondary winding, a source of potential connected to said transmitter and primary winding forming a transmitter circuit, conductors leading to an external circuit and a key-switch to effectively disconnect the secondary winding of said coil from said conductors thereby disconnecting the transmitter circuit from said conductors and connecting said receiver across said conductors.

2. In an operator's telephone circuit arranged to prevent the picking up of room noise during the time when an operator is merely listening upon a telephone connection, the combination with a transmitter of a receiver, an induction coil having a primary winding and a secondary winding, and conductors leading to an external circuit, and switching means, operable at will to disconnect said receiver from said conductors and to connect it across a portion of the secondary winding of the induction coil.

3. A system such as that defined by claim 2 characterized by the effective connection of the transmitter to said conductors whenever the receiver is connected across a portion of said winding as stated.

4. In an operator's telephone circuit arranged to prevent the picking up of room noise during the time when an operator is merely listening upon a telephone connection, the combination with a transmitter of a receiver, an induction coil having a primary winding and a secondary winding, a source of potential connected in series with said transmitter and said primary winding, conductors leading to an external circuit, and switching means operable at will arranged for one position, to bridge said receiver across said conductor and to simultaneously disconnect said secondary winding from said conductors, and for another position, to transfer the connection of the said receiver from said conductors to a portion of said secondary winding simultaneously with the connection of said secondary winding to the said conductors.

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