

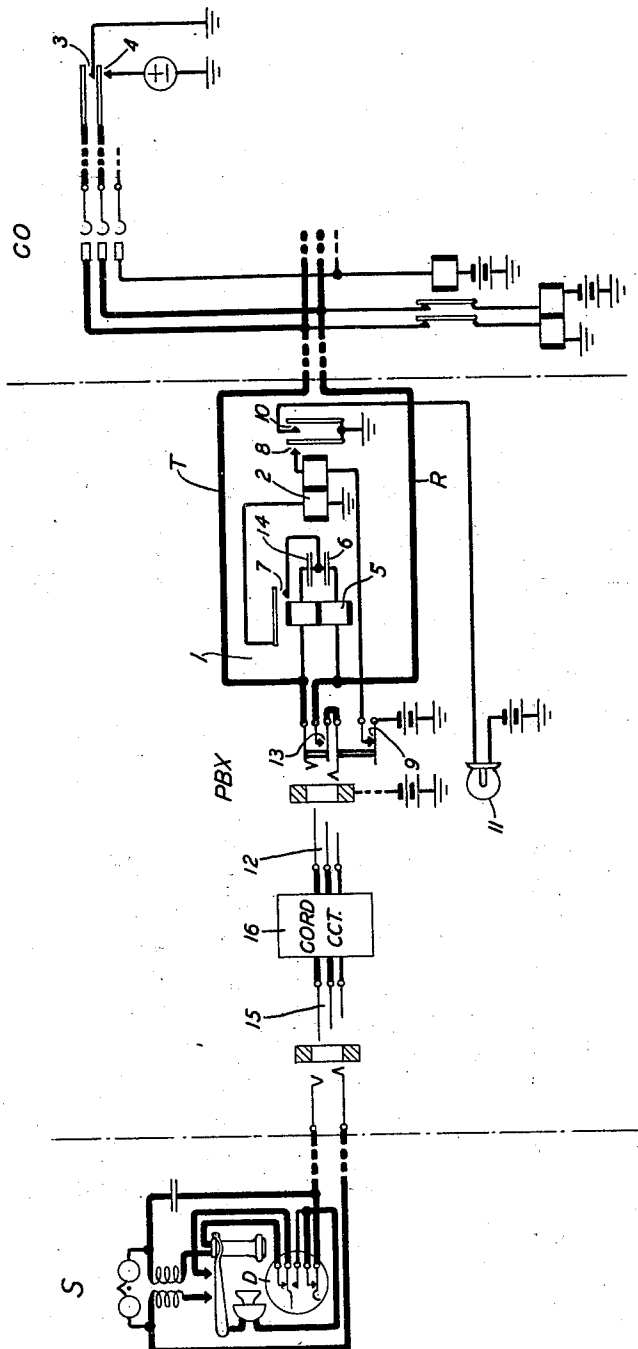
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M. E. KROM

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SIGNALING SYSTEM

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INVENTOR

M. E. KROM

BY

John A. Hall

ATTORNEY

UNITED STATES PATENT OFFICE

MYRON E. KROM, OF MADISON, NEW JERSEY, ASSIGNOR TO BELL TELEPHONE LABORATORIES, INCORPORATED, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK

SIGNALING SYSTEM

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This invention relates to improvements in signaling systems and more particularly to means for preventing dial impulses or battery reversals from effecting alternating current responsive signal devices associated with telephone lines.

An object of the invention is to prevent the false operation of alternating current ringing relays or ringers, associated with telephone lines, when direct current impulses are transmitted thereover.

A feature of the invention is a capacity bridge placed across a two conductor line between the mid-point of which and ground the alternating current responsive device is connected. By this arrangement direct current flowing in the two conductors will not affect the device while alternating current projected over one, the other or simultaneously over both of the conductors will find an effective path through the device to ground.

A further feature of the invention resides in a relay in series with the capacity bridge so constructed and arranged that the alternating current device is normally disconnected from the bridge and only connected thereto in response to, and during the application of alternating current.

The invention will be understood from the following description when read in connection with the accompanying drawing which represents a trunk circuit, arranged in accordance with the present invention.

It will be first assumed that the trunk circuit 1 has been seized and ringing current applied thereto at the central office CO for the purpose of signaling the P. B. X. operator. Under this condition a source of grounded alternating ringing current is applied to the tip and ring conductors T and R of the trunk in the usual manner thereby causing the operation of relay 5 in a circuit which can be traced from the contacts 3 and 4, the two windings of relay 5 and condensers 6 and 14. Relay 5 closes its contact 7 thereby connecting the grounded left-hand winding of ringing relay 2 to a point between the duplicate condensers 6 and 14. Ringing current on the ring conductor R of the trunk now traverses

the lower winding of relay 5, condenser 6 and the winding of relay 2, causing its operation. Relay 2 locks up to battery through its right-hand winding from ground over its contacts 8 and contacts 9 of the trunk jack. Contacts 10 of relay 2 are closed at this time causing the line lamp 11 to light.

When the operator at the P. B. X. answers, by inserting plug 12, into the jack of the calling trunk, contacts 9 are opened thereby releasing relay 2. This opens contacts 10 and extinguishes the line lamp 11. Contacts 13 of the jack are closed at this time, thereby completing the talking conductors of the trunk through to the cord.

From the foregoing it will be noted that a ring received over the trunk from the central office operates relay 2. It will also be obvious that it is immaterial which side of the line is grounded as the relay 2 would operate equally well if ground was applied to the ring conductor and ringing current to the tip conductor.

Now let it be assumed that the line of subscriber S, whose station is equipped with a dial D has, at the request of the subscriber, been connected through to the trunk leading to the distant dial central office CO, by means of the P. B. X. cord circuit 16. It is also assumed that the cord circuit 16 is arranged to permit dialing by the subscriber S through to the dial office CO.

With the subscriber S connected through to the trunk and the receiver off the switch, direct current flows from the dial office over the trunk conductor and through the subscriber's telephone set. Movement of the subscriber's dial causes this direct current circuit to be periodically interrupted, thereby causing a corresponding periodic charge variation of the condensers 6 and 14 in the ringing bridge, which, if in series with a ringing relay would cause the line lamp to light, thereby giving a false signal to the P. B. X. operator.

In the present invention, as before pointed out, the ringing relay 2 is connected between ground and the mid-point of the capacity bridge which comprises the condensers 6 and 14, and although relay 5 may operate in re-

response to the pulses, due to the varying charge on condensers 6 and 14, relay 2 will not operate due to the fact that it is connected at the mid or balance point of the bridge.

What is claimed is:

1. In a signaling system a line, a grounded source of alternating ringing current adapted to be connected to said line, a capacity bridge across said line and an alternating current responsive device connected between the mid-point of said bridge and ground.

2. In a signaling system, a line, a grounded source of alternating ringing current adapted to be connected to said line, a bridge including a double wound relay and two condensers in series across said line, and a ringing current responsive device adapted to be connected between ground and a point in the bridge intermediate the two condensers upon the operation of said relay in response to application of ringing current to the line.

3. In a signaling system, a line, a grounded source of direct current in bridge of said line at one end thereof, a circuit interrupting device adapted to be associated with the other end of the line, a grounded source of alternating ringing current adapted to be connected in bridge of said line in substitution of said direct current source, and a grounded alternating current responsive device connected to said line intermediate the ends thereof by means of condensers in such a manner that said device will respond to the application of said alternating ringing source to the line but will be unresponsive to the action of said interrupting device.

4. In a telephone system a line terminating at one end in an automatic exchange, and at the other end in a dial, a grounded source of alternating ringing current adapted to be connected to said line at the automatic exchange, a capacity bridge across said line intermediate the ends thereof, and an alternating current responsive device connected between ground and the electrical mid-point of said capacity bridge.

5. In a telephone system, a line terminating at one end in an automatic switch circuit including a source of direct current, a dial for association with the other end of the line, a source of alternating current adapted to be connected to said line at the exchange, a capacity bridge across said line intermediate the end thereof and an alternating current responsive device connected between the electrical mid-point of said bridge and one terminal of each of said sources of current.

In witness whereof, I hereunto subscribe my name this 9th day of August, 1930.

MYRON E. KROM.