

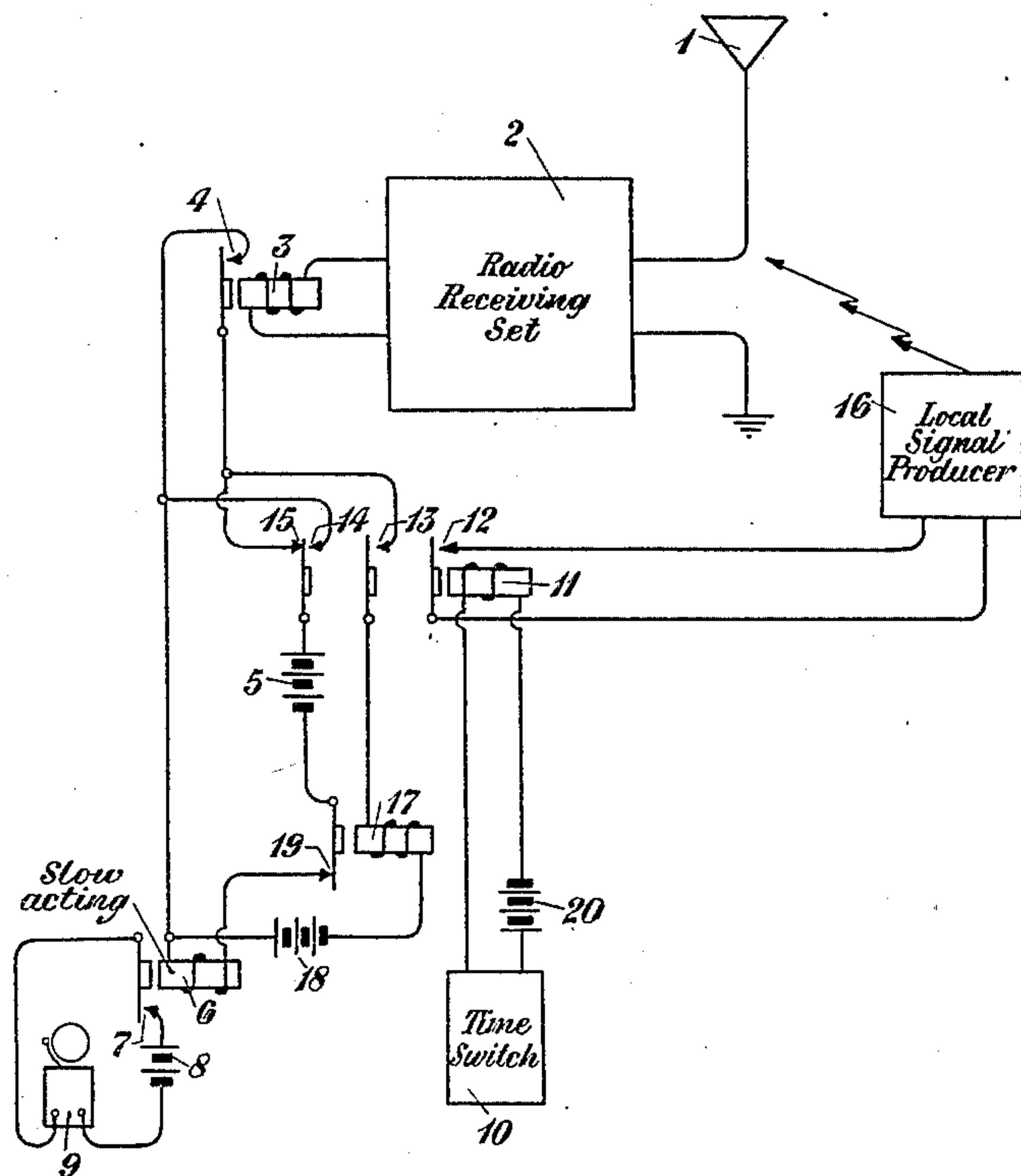
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R. BOWN

TROUBLE ALARM SYSTEM FOR RADIO RECEIVING SETS

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BY

INVENTOR
R. Bown
J. F. Johnson
ATTORNEY

UNITED STATES PATENT OFFICE.

RALPH BOWN, OF EAST ORANGE, NEW JERSEY, ASSIGNOR TO AMERICAN TELEPHONE AND TELEGRAPH COMPANY, A CORPORATION OF NEW YORK.

TROUBLE-ALARM SYSTEM FOR RADIO RECEIVING SETS.

Application filed October 5, 1923. Serial No. 666,824.

To all whom it may concern:

Be it known that I, RALPH BOWN, residing at East Orange, in the county of Essex and State of New Jersey, have invented certain Improvements in Trouble-Alarm Systems for Radio Receiving Sets, of which the following is a specification.

This invention relates to radio receiving sets, and more particularly to radio receiving sets equipped with so-called "trouble alarms."

It is the principal object of the invention to provide, in connection with a radio receiving set, improved methods of and means for continually and automatically testing the set and giving an alarm in case the set for any reason becomes inoperative.

The invention is applicable to any radio receiving set which may need to be kept in continuous operation, but more particularly to sets which are to be kept in such operation without attendance.

The invention involves the essential idea of causing a local signal to be transmitted periodically to the receiving set, causing to be set in operation simultaneously therewith means for giving an alarm, and causing the local signal to set in operation means for preventing the giving of the alarm if the receiving set is in order. Briefly, the desired result is attained by the use of a local signal producer; means for periodically and simultaneously setting in operation this local signal producer and making a series of local circuit connections—which latter operation causes an alarm to be given unless the connections are immediately thereafter re-broken; and means for promptly re-breaking the connections if the receiving set is in operative condition, thus preventing the giving of the alarm under such a condition.

It is proposed to describe more fully, for the purpose of illustration, the application of the invention to a receiving set designed to receive radio ringing or calling signals, in which specific arrangement the ringer or other annunciator intended to give the calling signals is employed to give the trouble alarm signal as well. It is to be understood, however, that the scope of the invention is not limited by this illustrative description of a specific application, but is defined by the appended claims.

The following detailed description of the application of the invention to a receiving set designed to receive radio ringing or calling signals is to be read with reference to the accompanying drawing, which shows diagrammatically one desirable arrangement of the circuits.

With reference to the details of the drawing, the character 1 designates the antenna. The radio receiving set 2 is connected in circuit with the winding of an electromagnet 3 forming part of a relay, hereinafter referred to as the "first relay." With the receiving set 2 in operative condition, a distant calling signal results in the energizing of the electromagnet 3 and the actuation of the first relay, closing the normally open contact 4. The closing of this contact completes a circuit including the battery 5 and the winding of the electromagnet 6 of a slow acting relay, hereinafter referred to as the "second relay." Upon actuation of this second relay, contact 7, normally open, is closed, completing a circuit including a battery 8 and a signal annunciator device, represented in the drawing by the ringer 9.

An automatic time switch 10 is arranged to close periodically—say, for ten seconds every five minutes. In circuit with this time switch are a battery 20 and the winding of the electromagnet 11 forming a part of a third relay. Upon the energizing of the electromagnet 11 as a result of the closing of the time switch 10, this third relay is actuated and closes a triple pole switch, making contacts at 12, 13 and 14, all normally open, and breaking the normally closed contact 15.

The closing of contact 12 completes the circuit of a local signal producer 16, which thereupon sends a signal into the antenna 1, of the same nature as a distant calling signal. If the receiving set is in operative condition, this local signal, acting through the receiving set, energizes the electromagnet 3 and actuates the first relay, closing contact 4. The closing of this contact completes a circuit (through contact 13, closed simultaneously with the opening of contact 15 by the actuation of the third relay upon operation of the time switch 10) including a battery 18 and the winding of an electromagnet 17 forming part of a fourth relay. The energizing of

electromagnet 17 actuates the fourth relay, opens the normally closed contact 19, and breaks the circuit including the winding of the electromagnet 6 of the slow acting second relay, thus preventing the closing of the circuit including the ringer 9. As a result no signal is given.

On the other hand, if the receiving set is for any reason inoperative, the first relay remains unoperated, and the contact 4 remains open. Since contact 4 is open, the fourth relay is unaffected, and contact 19 remains closed. With contact 19 closed and contact made at 14 upon actuation of the third relay as a result of the closing of the time switch, a circuit is completed through contact 14, battery 5, contact 19, and the winding of electromagnet 6 of the slow acting second relay, resulting in the actuation of this second relay, the closing of contact 7, and the operation of the ringer 9 as a trouble alarm.

What is claimed is:

1. In association with a radio receiving set, a signal producer designed to transmit a local signal to the receiving set, a slow acting relay, means controlled by said slow acting relay for giving an alarm, means for periodically setting in operation said signal producer and simultaneously therewith setting in operation means for actuating said slow acting relay, and means—responsive to the local signal when the receiving set is in operative condition—for preventing the actuation of said slow acting relay.

2. In association with a radio receiving set, a normally open alarm circuit, a slow acting relay designed upon actuation thereof to close said alarm circuit, a normally open local circuit including a signal producer designed to transmit a local signal to the receiving set, means for periodically closing said local circuit and simultaneously therewith setting in operation means for actuating said slow acting relay, and means—responsive to the local signal when the receiving set is in operative condition—for preventing the actuation of said slow acting relay.

3. In association with a radio receiving set, a normally open alarm circuit, a slow acting relay designed upon actuation thereof to close said alarm circuit, a normally open local circuit including a signal producer designed to transmit a local signal to the receiving set, a periodically closing time switch, said time switch, upon closing, operating a common means for simultaneously closing said local circuit and setting in operation means for actuating said slow acting relay, and means—responsive to said local signal when the receiving set is in operative condition—for preventing the actuation of said slow acting relay.

4. In association with a radio receiving

set a normally open alarm circuit, a slow acting relay designed upon actuation thereof to close said alarm circuit, a normally open local circuit including a signal producer designed to transmit a local signal to the receiving set, means for periodically closing said local circuit and simultaneously therewith setting in operation a series of relays, the operation of the relays of said series serving to actuate said slow acting relay when the receiving set is inoperative, and a relay—responsive to said local signal when the receiving set is in operative condition—serving upon actuation thereof to prevent the actuation of said slow acting relay.

5. In association with a radio receiving set, a normally open alarm circuit, a slow acting relay operating upon actuation of the same to close said alarm circuit, a local circuit including a signal producer designed to transmit a local signal to the receiving set, a periodically closing time switch, said time switch, upon closing, operating a common means for simultaneously closing said local circuit and setting in operation a series of quick acting relays, the operation of said quick acting relays serving to energize the electromagnet of said slow acting relay, and a relay in circuit with the receiving set and consequently actuated only when the receiving set is in operative condition, said last named relay upon actuation serving to break the circuit including the electromagnet winding of said slow acting relay, thus preventing the closing of said alarm circuit when the receiving set is in operative condition.

6. In association with a radio receiving set, a normally open alarm circuit, a slow acting relay designed to complete said alarm circuit upon operation of said slow acting relay, a local signal producer in a normally open circuit, designed to transmit a local signal to the receiving set, a time switch designed to close periodically a local circuit including a relay, a multiple pole switch operated by said relay and designed to complete the circuit including said local signal producer and simultaneously to complete a circuit including the winding of said slow acting relay, and means for re-breaking the circuit including said slow acting relay before the actuation of the same when the receiving set is in operative condition.

7. In association with a radio receiving set a normally open annunciator circuit, a slow acting relay operating upon actuation of the same to close said annunciator circuit, means for actuating said slow acting relay in response to a distant signal impressed upon the receiving set, a normally open local circuit including a signal producer designed to transmit a local signal to the receiving set, means for periodically closing said local circuit and simultaneously therewith setting in operation means for energizing the electro-

magnet of said slow acting relay, and means
—responsive to said local signal when the
receiving set is in operative condition—for
breaking the circuit including the electro-
5 magnet winding of said slow acting relay,
thus preventing the actuation of said slow
acting relay in response to the local signal
when the receiving set is in operative con-
dition. In testimony whereof, I have signed my 10
name to this specification this 3rd day of
October 1923.

RALPH BOWN.