

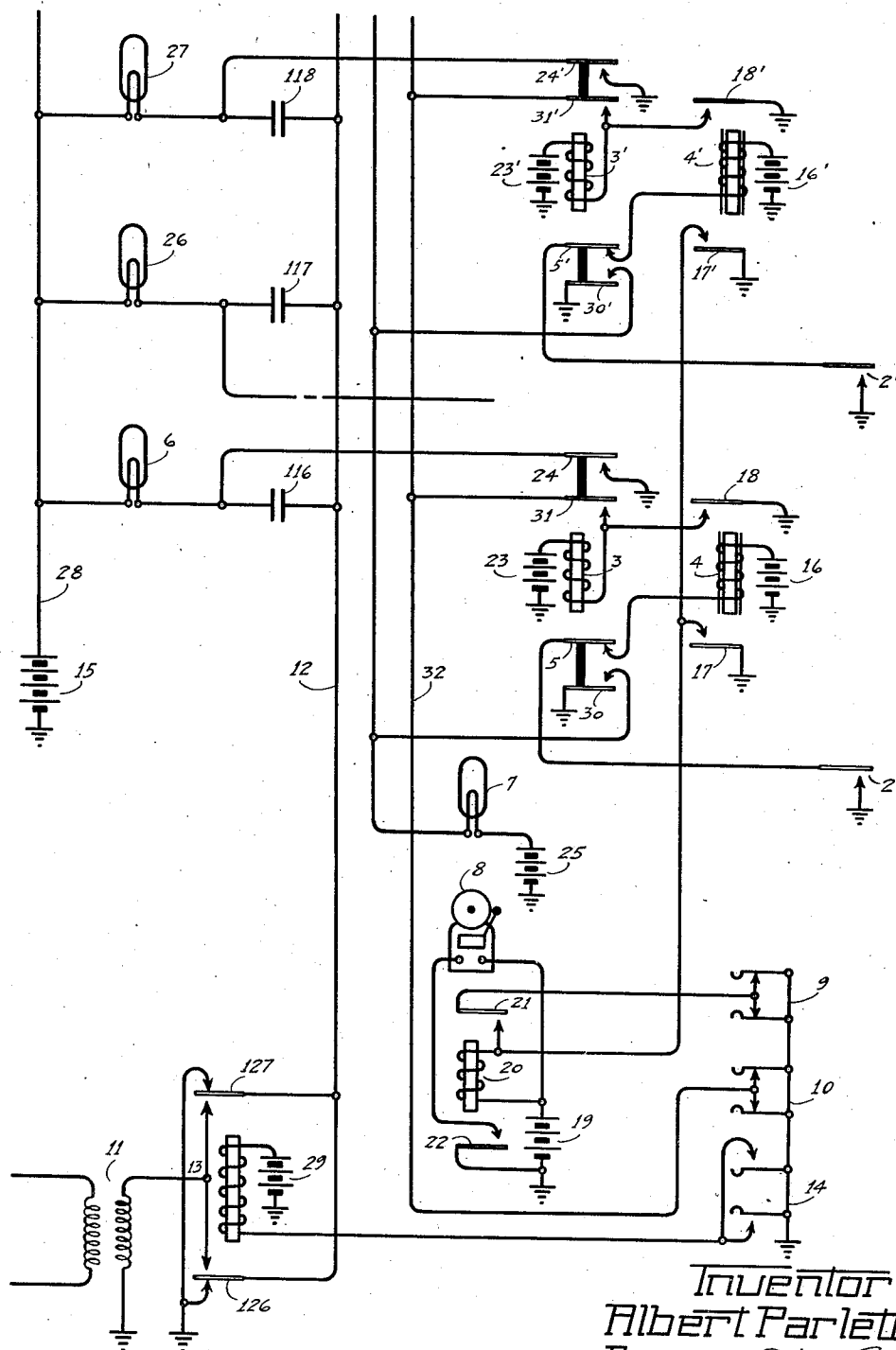
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ANNUNCIATOR SYSTEM

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ANNUNCIATOR SYSTEM

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3 Claims. (Cl. 177-311)

My invention relates to annunciator circuits and more particularly to such as are used in electric systems and power stations or the like for announcing the occurrence of accidental or undesirable conditions in such systems. A device of this type, however, is applicable to many other uses.

When in a central station, or other system, an electric line is accidentally grounded, or a short circuit occurs, or a bearing becomes hot, or a machine accidentally stops, or any other unusual occurrence happens it is desirable to inform the attendant immediately of such occurrence. For the purpose of performing this function I have arranged a simple but an efficient system comprising a combination of electric signal lamps, alarm bell, relays, and sources of electric current, the said signal lamps and alarm bell being lighted and actuated by an initial electric current arising whenever any of the above mentioned or other conditions occur, and adapted to be controlled and tested from a central location. My device may be used in general to give a warning of any changed condition.

An object of my invention is to provide means whereby any occurrence whether accidental or intended which can be adapted to give rise to an electric current or to raise an electric current to an operative value through the medium of contacts, relays, thermostatic couples, and the like, can be brought to the attention of the attendants.

Another feature of my invention is the provision of means for checking the soundness of the individual lamps in an annunciator system having a plurality of such lamps.

This application is a divisional of my application for U. S. Letters Patent, Serial No. 397,030, filed October 3, 1929, now abandoned.

The above features as well as others not specifically pointed out are described more in detail in the ensuing specification and diagrammatically illustrated in the accompanying drawing, in which 2 is a contact which is closed when an abnormal condition arises, 3 and 4 are relays the last of which is a copper sleeved starting relay, whose winding communicates electrically with the contact 2 through the medium of an armature contact 5 of relay 3. 6 and 7 are electric lamps adapted to be lighted through the instrumentality of the relays 3 and 4. 8 is an electric bell capable of being set in motion by the operation of relay 4. Lamp 7 and bell 8 may be common to the system. A pair of relays 3 and 4 may be provided for each contact 2; such as

relays 3' and 4' associated with contact 2'. 9 and 10 are switches in the form of keys whose function is to reset the lamps and the bell at the will of the operator after they have been lighted and set in motion by the closing of a contact 2. 11 is a transformer having its primary winding connected to a suitable source of alternating current and with one side of its secondary grounded and adapted to energize the line 12 through the instrumentality of the relay 13, and the switch or key 14 is for the purpose of testing the soundness of the lamps connected between the line 12 and the battery 15 through the medium of the condensers 116, 117 and 118. A single battery or a plurality of batteries may be used.

Coming now to the mode of operation, the contact 2 offers a path to ground for the current from the battery 16 through the medium of contact 5 of the relay 3. This current energizes the copper sleeve electromagnet of the relay 4 closing the contacts 17 and 18. The closing of 17 offers a path to ground for the current from the battery 19 energizing the relay 20 with the result that the relay 20 closes its contacts 21 and 22, the last of which closes a circuit for the bell 8.

Going back to relay 4, the above mentioned closing of the contact 18 offers a path to ground for the current from the battery 23, energizing the relay 3, the latter attracting its armature and closing contacts 30, 31 and 24 and opening contact 5. The effect of the opening of contact 5 is to disconnect the starting relay 4 from its initial energizing circuit. Since, however, the electromagnet of the relay 4 is provided with a copper sleeve, in spite of its being disconnected it will continue to hold its armature attracted for the requisite amount of time needed to effect the operation of the relays connected with it, as well known in the art.

Another effect of the attraction of the armature of the relay 3 is to offer a path through contact 30 to ground for the current from the battery 25 lighting the master alarm lamp 7.

We have now seen that the contact 2' will set in operation the alarm bell 3 and light the alarm lamp 7 whether the contact 2 is closed momentarily or for a period of time. Returning now to the contact 31 of the relay 3 which as aforesaid had also been operated by relay 3, one of the effects is to offer through the medium of the individual reset key 10 another path to ground for the current from the battery 23, instead of the former which had been interrupted by the release of relay 4, thus keeping the lamp 7 lighted.

Another of the effects of the attraction of the armature of the relay 3 is to offer a path to ground for the current from the battery 15 through contact 24 lighting another signal lamp 6, whose additional function is hereafter to be described.

Returning now to the relay 20 the closing of contact 21 offers through the medium of the reset key 9 another path to ground for the current from the battery 19 instead of the former which had been interrupted by the release of the relay 4, thus keeping the bell 8 ringing. From the above it is seen that relay 20 locks itself to ground through its armature contact 21 and key 9, and that relay 3 locks itself to ground through its contact 31 and key contact 10.

Having indicated that the currents energizing the relays 3 and 20 and keeping the lamps 6 and 7 lighted and the bell 8 ringing had been brought under the control of the keys 10 and 9 respectively, the function of these keys is, when desired, to reset the lamps and the bell and revert the system to its normal conditions by breaking individually the paths leading to ground and releasing the operated relays 3 and 20.

Should the contact 2 prove to be of an instantaneous or transient nature and be open at the time of resetting the keys 9 and 10, the system would return to its original non-energized condition. Should, on the other hand, the contact 2 prove to be continuous the resetting of key 10 and releasing of relay 3 would once more enable the starting relay 4 to be energized and the operation as described above would reoccur. The conductor 32 may be common to the relays 3, 3' etc.

In an annunciator system it is usually desired to have arrangements made for a number of contacts similar to 2 from the various critical points of the system under operation. Under these circumstances it would be advisable to have an individual signal for each of these critical points. This is the function of the lamps 6, 26, 27, etc., each of which is connected to an individual relay such as 3 or 3'. The remainder of the apparatus described including the pilot alarm lamp 7, the electric bell 8, the relay 20, the reset keys 9 and 10 may be common to the whole system. The key 14, the relay 13, the battery 29 and the transformer 11 are also common to the whole system. Their function will now be described.

Should it happen that the bell 8 rings and the pilot lamp 7 lights, but all of the signal lamps 6, 26, 27, etc. remain dark indicating that the lamp associated with the source of trouble is defective, then it is still possible to discover which of the signal lamps is not functioning and locate the source of trouble. This is effected by closing the key 14 which causes the energizing of relay 13

and the closing of the contacts 126 and 127, thus permitting the line 12 to be energized from the secondary winding of the transformer 11 whose one side is grounded. Since the line 28 feeding the lamps 6, 26, 27, etc. is also grounded through the battery 15 the closing of the contacts 126 and 127 permits an alternating current to pass through the condensers 116, 117 and 118 and through the lamps 6, 26, 27, etc. lighting the latter, with the exception of the one which is defective.

The function of the condensers 116, 117 and 118 is to keep the line 12 normally dissociated from the system with respect to direct currents from the batteries acting in the system.

While I have illustrated and described a particular embodiment of my invention, it is to be understood that I do not wish to be limited by the particular structure described and illustrated, but aim to cover all such changes and modifications as come within the spirit and scope of the appended claims.

Having described my invention, what I claim as new and desire to secure by United States Letters Patent is:

1. A signaling system including signaling devices, a source of direct current, means for selectively connecting said direct current to said signaling devices to operate the same, a plurality of condensers, each in series with one of said signaling devices, a source of alternating current, and means including a single switch and lead for connecting said source of alternating current to said signaling devices through said condensers to determine whether or not said signaling devices are operative.

2. A signaling system including signaling devices, a source of direct current, means for individually and selectively connecting said direct current through said devices to operate the same, a source of alternating current, a plurality of condensers each in series with one of said signaling devices and said source of alternating current and means including a single switch and lead for simultaneously connecting said source of alternating current to all of said devices to determine whether or not said devices are operative.

3. A signaling system including lamps, a source of direct current adapted to be selectively and individually connected to said lamps to cause the same to glow, a source of alternating current, a plurality of condensers each connected in series with one of said lamps and said source of alternating current, and means including a single switch and lead for connecting said alternating current to said lamps while said lamps are in their normal operating circuits.

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