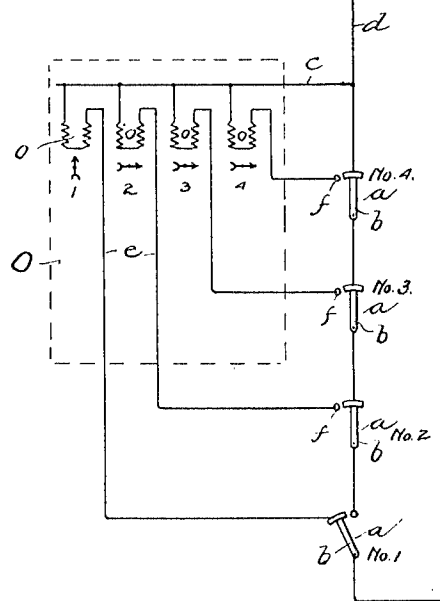
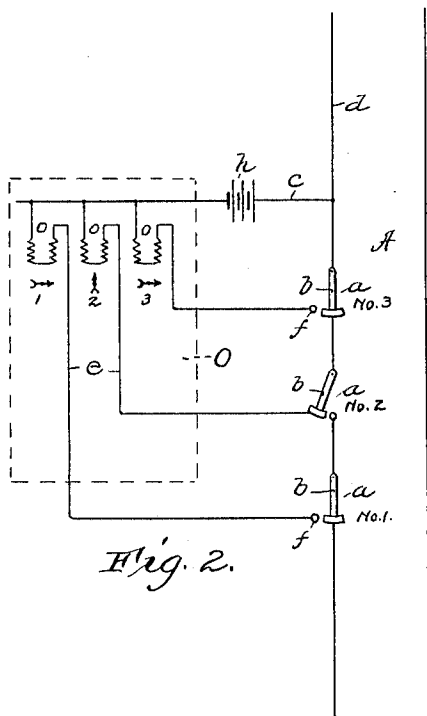
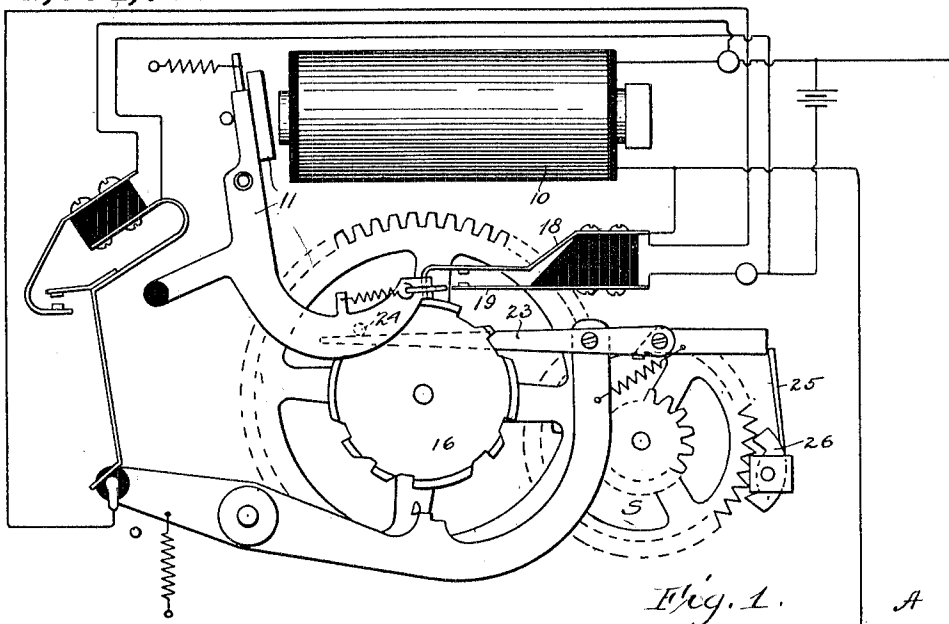


1,084,780.

Patented Jan. 20, 1914.



Witnesses:
C. J. Schmidt
S. N. Pond

Inventors:
Clarence E. Beach
Herman W. Doughty
By Offield, Gaul, Evans & Offield,
Attys.

UNITED STATES PATENT OFFICE.

CLARENCE E. BEACH AND HERMAN W. DOUGHTY, OF BINGHAMTON, NEW YORK,
ASSIGNORS TO GEORGE O. KNAPP, OF NEW YORK, N. Y.

SIGNALING SYSTEM.

1,084,780.

Specification of Letters Patent.

Patented Jan. 20, 1914.

Application filed April 9, 1912. Serial No. 689,587.

To all whom it may concern:

Be it known that we, CLARENCE E. BEACH and HERMAN W. DOUGHTY, both of Binghamton, in the county of Broome and State of New York, have invented new and useful improvements in Signaling Systems, of which the following is a specification.

Our invention relates to signaling systems, and particularly to signaling systems in which auxiliary circuits are associated with main circuits.

Although our invention can be applied in many ways, it is particularly adaptable in fire alarm systems where auxiliary alarm circuits are associated with a main circuit. For example, our invention is adaptable in connection with the signaling mechanism disclosed by Clarence E. Beach in his application Serial No. 629,415, filed May 25th, 1911, and particularly where the auxiliary circuit, extending to auxiliary stations remote from the main signal box, is in the form of a normally closed shunt or short path about the winding of the non-interference electro-magnet in the box. In such auxiliary circuit suitable switch mechanisms are provided for opening the circuit to thus allow sufficient current flow through the non-interference electro-magnet so that the box is able to start and operate in a normal manner to send in an alarm, and where there are a great number of auxiliary circuit controlling switch mechanisms, it would be desirable to ascertain which of the switch mechanisms was actuated to instigate an alarm, so that proper re-setting and restoration to normal condition can be quickly made without the necessity of visiting each of the various auxiliary stations.

The broad object of our invention is, therefore, to provide indicating means in connection with the auxiliary line and stations so that it can be quickly ascertained which auxiliary station was the one actuated.

Another object is to provide simplified mechanism for carrying out the broad feature of the invention.

We preferably provide an annunciator device having an annunciator outfit for each of the several auxiliary stations of the auxiliary line, and the arrangement is preferably such that when any of these auxiliary stations is actuated, circuit will be closed through the corresponding annun-

ciator outfit so that the particular auxiliary station pulled can be instantaneously identified by examination of the annunciator.

The nature of our invention and its various features can be readily understood by reference to the accompanying drawings, of which—

Figure 1 more or less diagrammatically represents signaling apparatus within a main box and the auxiliary circuit emanating therefrom, and having associated therewith annunciator mechanism, and Fig. 2 shows a modified arrangement of annunciator mechanism.

In Fig. 1 of the drawings, substantially the same box mechanisms are shown as in the co-pending application referred to. The electro-magnet 10 has the armature structure 11 provided with a pin 24 for co-operating with the detent lever 23. This detent lever coöperates with extension 25 of the pallet mechanism 26, which coöperates with the escapement wheel of the signal train S. The signal train drives the signal wheel 16 which controls the signaling contacts 18 and 19. In accordance with our invention, the winding of the non-interference electro-magnet 10 is bridged by the auxiliary circuit A and auxiliary circuit switch mechanisms are serially included and normally closed so that the auxiliary circuit will substantially short-circuit the non-interference electro-magnet so that the armature structure will be prevented from being attracted to swing the detent lever and release the signaling train.

The switch mechanism *a* may be of any desired construction, and as shown, each comprises an ordinary switch lever *b* included serially in the auxiliary circuit. In practice, these various stations *a* are dispersed throughout a building, for example, and unless some indicating mechanism is provided it would be necessary to visit each of the stations to ascertain which one was actuated.

The purpose of our invention is to provide efficient indicating mechanism so that from one point indication may be had as to which of the auxiliary stations was actuated and such actuated station can then be quickly re-set and re-adjusted to normal without any loss of time.

As shown in Fig. 1, an annunciator box O is situated at any convenient place, as, for

example, at the entrance of the building to be protected, so that firemen entering the building can immediately ascertain which auxiliary station was pulled, the origin of the fire being usually near the pulled station.

One terminal of the various windings of the annunciator outfits *o* connects with the common conductor *c* connected with the limb *d* of the auxiliary circuit, the other terminal of each annunciator outfit extending through a separate conductor *e* to an alternate contact *f* provided for each of the switch arms *b*. Normally, all the switch arms *b* are included serially in the auxiliary line so that this line practically short-circuits the electro-magnet 10. If, now, one of these switch arms is pulled, as for example, at station No. 1, the alternate current path *c e* will be closed and the switch mechanism and the winding of annunciator outfit No. 1 will be connected in parallel with a portion of the auxiliary circuit when the switch-arm engages with alternate contact *f*, and such parallel portion of the auxiliary circuit will be broken when the switch-arm leaves the contact with which it is normally connected, and thus the indicator mechanism No. 1, such as an arrow, will move to indicating position, to show that station No. 1 was actuated. In the same manner, if any of the other auxiliary station switches have been actuated, the corresponding annunciator outfit would indicate the fact. The resistance of the annunciator magnet windings is such that when the winding is included in the auxiliary circuit, the resistance of the circuit will be sufficiently increased so that enough current may flow from the main line through the main electro-magnet 10 to attract its armature to allow the box to operate. After the alarm has been given by the box, the auxiliary station switch mechanism which was actuated can be quickly re-set to put the auxiliary circuit into normal condition.

In the arrangement of Fig. 1 just described, the annunciator outfits are actuated by current flow from the main line. In the modified arrangement of Fig. 2, the annunciator outfits are controlled by a local source of current flow. In the common conductor *c* for the annunciator outfits, a battery *h* or other current source is included, and when a switch *b* is moved to its alternate contact, a local circuit will be closed through the corresponding annunciator outfit, this local circuit including the battery and a section of the auxiliary circuit. In view of the arrangement of Figs. 1 and 2, should several auxiliary stations be actuated, at least one annunciator outfit will respond.

In order to insure closure of the indicating circuits when the auxiliary circuit is opened, the various switch arms and contacts should

be so proportioned that the auxiliary circuit cannot be opened until the corresponding indicator circuit has been closed.

We thus provide simple and efficient indicator mechanism for auxiliary circuits of the nature described, which will indicate which of a plurality of auxiliary stations has been actuated, so that the location of trouble, such as a fire, can be quickly determined and re-setting of the auxiliary circuit quickly accomplished without loss of time.

We do not, of course, desire to be limited to the precise arrangements which we have shown and described, as changes and modifications are possible which would still come within the scope of the invention, and

We therefore claim the following:—

1. In a signaling system, the combination of mechanism having a normally de-energized electro-magnet for controlling the starting thereof, a circuit for controlling the energization of said electro-magnet, a plurality of switch mechanisms for controlling the opening and closure of said circuit, and an electro-magnetic indicating device for each switch mechanism having its circuit closed by the operation of said switch mechanism.

2. In an electrical system, the combination of mechanism having a normally de-energized electro-magnet for controlling the starting thereof, a circuit for controlling the energization of said electro-magnet, a plurality of switch mechanisms in said circuit normally maintaining closure of said circuit, an electro-magnetic indicating device for each switch mechanism, and a circuit for each indicating mechanism closed by the actuation of the associated switch to open the controlling circuit.

3. In an electrical system, the combination of mechanism having a normally de-energized electro-magnet for controlling the starting thereof, a circuit for controlling the energization of said electromagnet, a plurality of switch mechanisms in said circuit normally maintaining closure of said circuit, a plurality of shunt paths about parts of said circuit, each of said shunt paths being controlled by one of said switch mechanisms, and an electro-magnetic indicating device included in each shunt circuit which is operatively connected by the associated switch mechanism when actuated to close the shunt path and to open that part of the controlling circuit about which said shunt path is connected.

4. In a signaling system, the combination of mechanism having a normally de-energized electro-magnet for controlling the starting thereof, a circuit for controlling the energization of said electro-magnet, a plurality of switch mechanisms serially included in said circuit and normally main-

taining closure of said circuit, a plurality of indicator circuits each containing indicator mechanism, each of said indicator circuits being controlled by one of said switch mechanisms and closed by the actuation of its controlling switch mechanism to open the

5. In an electrical system, the combination of mechanism having an electro-magnet for controlling the starting and stopping thereof, a circuit for controlling the current conditions for said electro-magnet, switches in said circuit for controlling the opening and closure thereof, said switches being normally positioned to maintain direct closure of said circuit to thereby short-circuit said electro-magnet to render it inoperative, an indicating circuit associated with each switch and containing electro-magnetic indicating mechanism, actuation of any switch to open said electro-magnet controlling circuit causing closure of the associated indicating circuit whereby the indicating mechanism in said circuit will be actuated.

6. In an electrical system, the combination of mechanism having an electro-magnet for controlling the starting and stopping thereof, a circuit for controlling the current conditions for said electro-magnet, switches in said circuit for controlling the opening and closure thereof, said switches being normally positioned to maintain direct closure of said circuit to thereby short-circuit said electro-magnet to render it unresponsive to current flow, an indicating circuit associated with each switch and containing electro-magnetic indicating mechanism, actuation of any switch causing opening of said direct short circuit thereby rendering operative both the indicating mechanism and the controlling electro-magnet.

7. In a signaling system, the combination of a signaling train, an electro-magnet for controlling the starting and stopping of said train, a current supply circuit for said electro-magnet, an auxiliary circuit for controlling the current flow through said electro-magnet, said auxiliary circuit being connected in bridge of the controlling electro-magnet and normally closed to shunt away from said electro-magnet the current flow from the supply circuit, switch mechanisms for opening said auxiliary circuit at various points, electro-magnetic indicator mechanisms associated with said switch mechanisms, and circuits for said indicating mechanisms closed by said switch mechanisms upon actuation thereof to open the auxiliary circuit, said indicator mechanisms serving to indicate which of the switch mechanisms were actuated.

8. In a fire alarm system, the combination of a signaling box having a normally deenergized electro-magnet for controlling the starting and stopping of said box, a main

current supply circuit for said electro-magnet, an auxiliary circuit in the form of a shunt about said electro-magnet, switch mechanisms for controlling the opening and closure of said auxiliary circuit, and electro-magnetically controlled indicating devices for indicating which switches have been actuated.

9. In an electrical signaling system, the combination of a signaling train, an electro-magnet for controlling the operation of said train, a current supply circuit for said electro-magnet, one auxiliary circuit of relatively low resistance normally connected in shunt to said electro-magnet, a plurality of normally closed switches in said auxiliary circuit, a plurality of additional auxiliary circuits of relatively high resistance as compared with the first auxiliary circuit, each adapted to be connected in shunt to said electro-magnet and each containing an electro-magnetic indicating mechanism and a contact which is mounted in proximity to one of the switches in said low resistance auxiliary circuit, means whereby one of the auxiliary circuits of relatively high resistance can be placed in shunt to said electro-magnet, and means whereby said relatively low resistance shunt can be broken, to effect the operation of both the electro-magnetic indicating mechanism and the electro-magnet.

10. In a signaling system, the combination of a signaling train, an electro-magnet for controlling the operation of said train, a current supply circuit for said electro-magnet, an auxiliary circuit normally connected in shunt to said electro-magnet, a plurality of normally closed switches in said auxiliary circuit, a plurality of additional auxiliary circuits each adapted to be connected in shunt to said electro-magnet and each containing an electro-magnetic indicating mechanism, means for placing one of said electro-magnetic indicating mechanisms in shunt to said electro-magnet, and means whereby the auxiliary circuit normally connected in shunt to said electro-magnet can be thereafter broken, to effect the operation of both the electro-magnetic indicating mechanism and the electro-magnet.

11. In an electrical system, the combination of mechanism having a normally deenergized electro-magnet for controlling the starting and stopping thereof, a circuit for controlling the current conditions for said electro-magnet, switches in said circuit for controlling the opening and closure thereof, and an indicating circuit associated with each switch and containing electro-magnetic indicating mechanism, actuation of any switch causing the operation of both the electro-magnetic indicating mechanism and the electro-magnet.

12. In an electrical system, the combina-

tion of mechanism having an electro-magnet for controlling the operation thereof, a circuit for controlling the current conditions for said electro-magnet, switches associated with said circuit for controlling the opening and closure thereof, said switches being normally so positioned that said electro-magnet is deenergized, an indicating circuit associated with each switch and containing electro-magnetic indicating mechanism, actuation of any switch simultaneously energizing both the said electro-magnet and the electro-magnetic indicating mechanism in the associated indicating circuit.

13. In a signaling system, the combination of a signaling train, an electro-magnet for controlling the operation of said train, a current supply circuit for said electro-magnet, an auxiliary circuit for controlling the current flow through said electro-magnet, said auxiliary circuit being so connected as normally to deenergize said electro-magnet, a plurality of switch mechanisms for controlling said auxiliary circuit, electro-magnetic indicator mechanisms associated with said switch mechanisms, and circuits for said indicating mechanisms, said indicating mechanism being energized by the operation of its associated switch to energize said electro-magnet.

14. In an electrical signaling system, the combination of a signaling train, an electro-magnet for controlling the operation of said train, a current supply circuit for said electro-magnet, one auxiliary circuit of relatively low resistance normally connected in shunt to said electro-magnet, a plurality of normally closed switches in said auxiliary circuit, a plurality of additional auxiliary circuits of relatively high resistance as compared with the first auxiliary circuit, each containing an electro-magnetic indicating

mechanism, means whereby one of the auxiliary circuits of relatively high resistance can be included in said low resistance auxiliary circuit, to effect the operation of both the electro-magnetic indicating mechanism and the electro-magnet.

15. In an electrical signaling system the combination of a signaling train, an electro-magnet for controlling the operation of said train, a current supply circuit for said electro-magnet, an auxiliary circuit normally connected in shunt to said electro-magnet, a plurality of normally closed switches in said auxiliary circuit, a plurality of additional auxiliary circuits each containing an electro-magnetic indicating mechanism, and means for including one of said electro-magnetic indicating mechanisms in said first auxiliary circuit, to effect the operation of both the electro-magnetic indicating mechanism and the electro-magnet.

16. In a signaling system, the combination of a signaling train, a normally deenergized electro-magnet for controlling the starting of said train, a current supply circuit for said electro-magnet, an auxiliary circuit normally shunting said electro-magnet, switch mechanisms for opening said auxiliary circuit, electro-magnetic indicator mechanisms associated with said switch mechanisms, and circuits for said indicating mechanisms closed by said switch mechanisms when actuated to open the auxiliary circuit.

In witness whereof, we hereunto subscribe our names, this 5th day of April A. D., 1912.

CLARENCE E. BEACH.
HERMAN W. DOUGHTY.

Witnesses:

HENRY W. STRONG,
CHARLES J. SCHMIDT.