M. LEVISON.

SIGNAL DEVICE.

APPLICATION FILED AUG. 28, 1907.

1,048,978.

Patented Dec. 31, 1912.

2 SHEETS—SHEET 1.

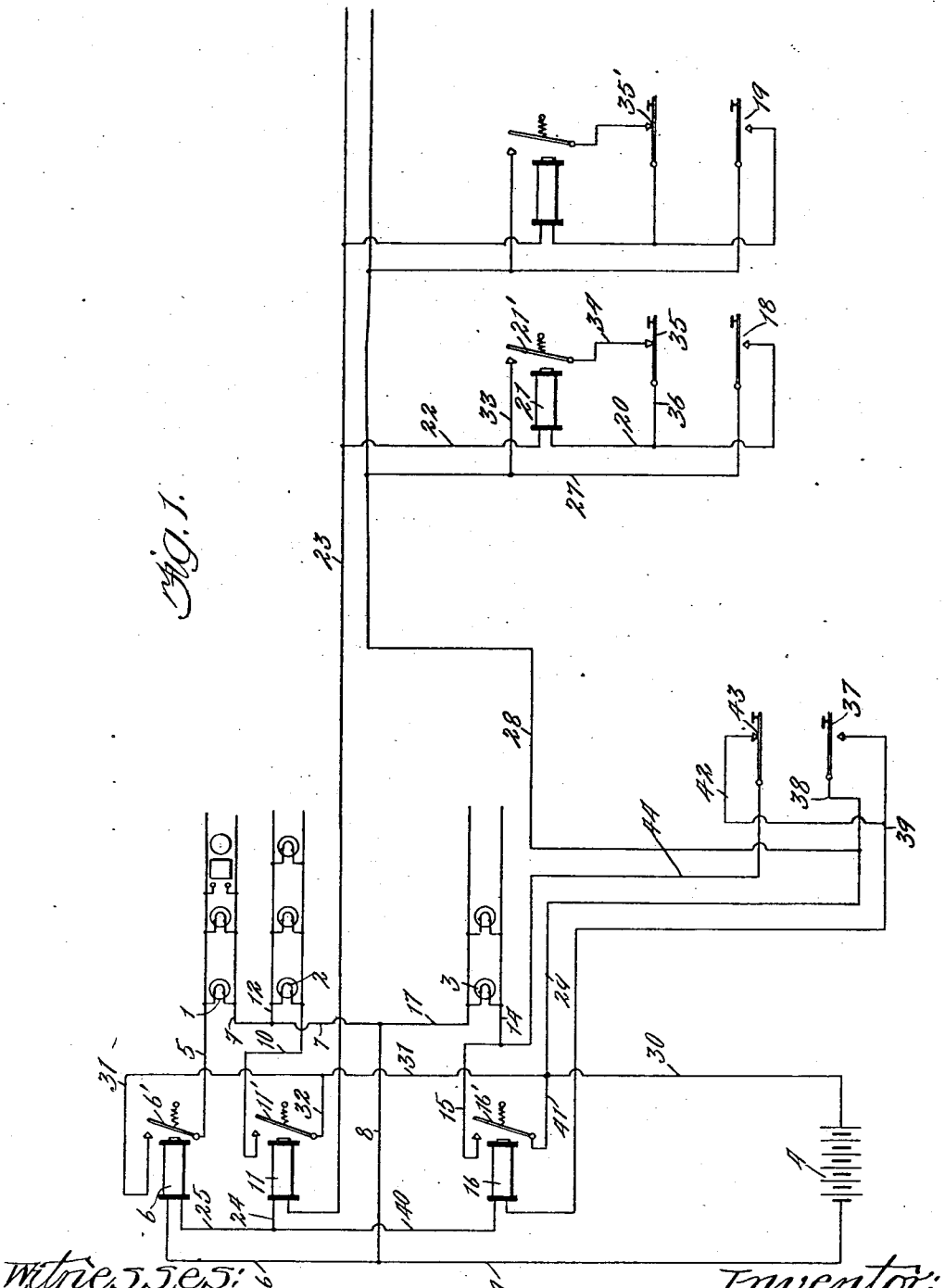

Fig. 1.

Witnesses:
Robert A. Weir
L. V. Donahue Jr.

Inventor:
Maurice Levison
By Hill & Hill
Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

M. LEVISON.

SIGNAL DEVICE.

APPLICATION FILED AUG. 28, 1907.

1,048,978.

Patented Dec. 31, 1912.

2 SHEETS—SHEET 2.

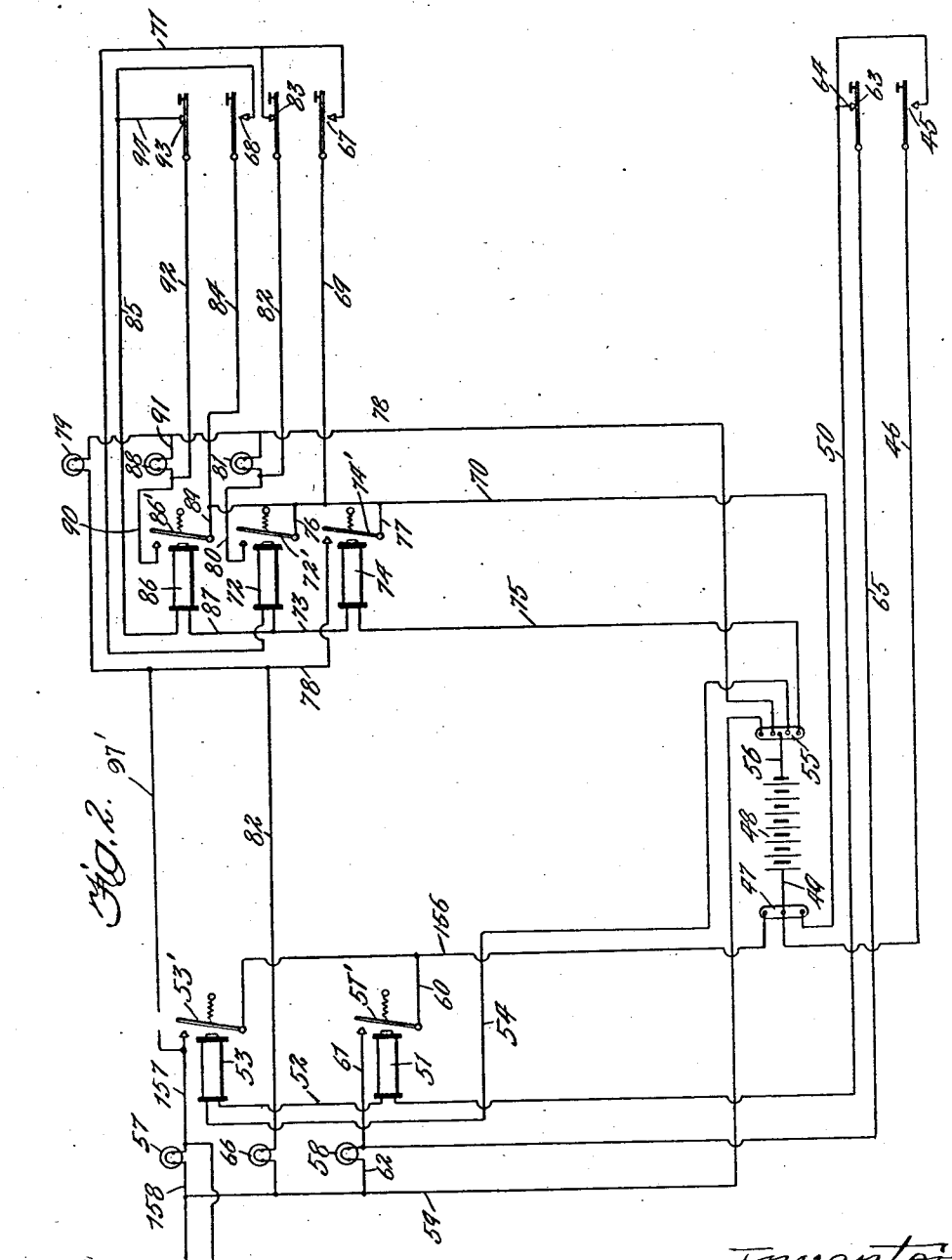

Fig. 2.

Witnesses:
Robert H. Weir
L. V. Donahue Jr.

Inventor:
Maurice Levison
By Hill & Hill
Attys.

COLUMBIA PLANOGRAPH CO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

MAURICE LEVISON, OF CHICAGO, ILLINOIS, ASSIGNOR OF SIX-TENTHS TO WILLIAM P. CROCKETT, OF CHICAGO, ILLINOIS.

SIGNAL DEVICE.

1,048,978. Specification of Letters Patent. Patented Dec. 31, 1912.

Application filed August 28, 1907. Serial No. 390,431.

To all whom it may concern:

Be it known that I, MAURICE LEVISON, a citizen of the United States, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Signal Devices, of which the following is a description.

My invention relates to a signal system adapted for use in elevators, hospitals or other places in which it is desirable to operate a signal from various points and maintain the same in operation until an attendant arrives at the point from which the signal was operated, or some other predetermined event takes place.

The object of my invention is to provide a device of the kind described wherein a central signal may be operated from any desired point and the party answering the signal is obliged to go to the place from which the particular signal was operated or to some other predetermined point to reset the device, each of said resetting points being particularly located in relation to its individual setting point.

To this end my invention consists in the novel construction, arrangement, and combination of parts herein shown and described and more particularly pointed out in the claims.

In the accompanying drawings wherein like or similar reference characters indicate like or corresponding parts, Figure 1 is a diagrammatic view of one form of my device. Fig. 2 is a similar view of a slightly modified form.

In the preferred form shown in the drawings any desired number of signal lamps, 1, 2 and 3 may be provided each suitably connected to a source of electric energy, as for example, the battery 4, the circuit to each lamp being normally open. A suitable switch or equivalent means is provided for each signal circuit, each so connected in an auxiliary circuit that by closing the auxiliary or operating circuit to which the switch is attached, the lamp upon the particular circuit controlled by that auxiliary circuit will be lighted, or any other signal mechanism connected therewith will be operated. Obviously however, with such an arrangement, as usually constructed the lamp or other signal device will only be operated while the switch is closed, and my present invention is for the purpose of obviating this difficulty and to provide automatic means connected in the circuit for holding the circuit closed until the signal is answered and the mechanism is intentionally released. Any suitable means may be provided for this purpose, the arrangement shown in the drawings being preferred. As shown, a lamp 1 is connected by a conductor 5 to one pole of an electric switch or relay 6, while the conductor 7 attached to the opposite pole of the lamp 1 is connected by conductors 8 and 9 to one pole of the battery 4. The lamp 2 is similarly connected by means of a conductor 10 to one pole of the electric switch or relay 11 while the opposite pole of the lamp is connected by means of a conductor 12 to the conductor 7 which is in turn connected to the battery 4 as above described. The lamp 3 is similarly connected by conductors 14 and 15 to one pole of the relay 16 while the opposite pole of the lamp is connected by means of the conductor 17 to the conductor 8.

In the form shown the operating circuits for the several lamps or other signal devices are arranged as follows:—The lamps 2 and 3 are so connected that they will be operated independently of each other while the lamp 1 is so arranged that it will be operated with either the lamp 2 or 3 as the case may be. The lamp 2 is adapted to be operated by either of the set switches 18 or 19 which are substantially the same in detail and a description of the connections to one therefore will answer for both. One pole of the switch 18 is connected by conductor 20 to an automatic electric switch or relay 21, thence by conductor 22 to a main operating conductor 23, extending to the coils of the relay 11, thence by conductors 24 and 25 to the coils of the relay 6 and thence by conductors 26 and 9 to one pole of the battery 4. The opposite pole of the switch 18 is connected by conductors 27, 28, 29 and 30 to the opposite pole of the battery 4 thus completing the circuit, energizing the relays, and operating their respective armatures 11′ and 6′ which are arranged to serve as switches in the signal circuits which are respectively closed when the armatures are attracted.

When operated as above described, current for the lamp 1 will flow from one pole of the battery 4 by conductors 9, 8 and 7 to the lamp and by means of the conductor 5,

armature 6′ and the conductors 31 and 30 to the opposite pole of the battery completing the circuit and operating the lamp or signal. The movement of the armature 11′ closes the circuit to the lamp 2 in a substantially similar manner, that is, the lamp is connected to one pole of the battery 4 by conductors 9, 8, 7 and 12, and to the opposite pole by the conductor 10, armature 11′ conductors 32 and 30. The closing of the switch 18 also energizes the relay 21 attracting its armature 21′ thereby closing the circuit between the conductors 27 and 20 through the conductor 33, armature 21′, conductor 34, reset switch 35 and conductor 36, thus when the switch 18 is released the operation of the relay 21 will hold the circuit closed and maintain the operation of the lamps or other signal mechanism as long as may be desired. Obviously however, by operating the reset switch 35 the circuit will be opened and the relays 6, 11 and 21 will be deenergized and the lamps or other signal mechanism put out of operation. The operation of the switch 19 will accomplish substantially the same results as above described and further description is therefore unnecessary.

The lamp 3 is controlled by an operating switch 37. One pole of this switch is connected by means of a conductor 39 to the coils of the relay 16 thence by conductors 40 and 25, relay 6 and conductors 26 and 9 to one pole of the battery, the opposite pole being connected by means of the conductors 30, 29 and 38 to the opposite pole of the switch. The circuit thus completed when the switch is closed energizes the relays 6 and 16, operating their respective armatures 6′ and 16′ and closing the circuits to their respective signal mechanisms.

The circuit to the lamp 3 comprises the conductors 14 and 15, armature 16′ and conductors 41 and 30 for one pole and the conductors 17, 8 and 9 for the opposite pole. The conductor 39 is also connected by the conductor 42, reset switch 43 and conductor 44 to the conductor 15 so that after the switch 37 is closed and the relays 6 and 16 operate, to close the signal circuits, the operating circuit will not be opened by the release or opening of the operating switch 37, thus operating the lamps 3 and 1 in substantially the same manner as before described for the lamps 2 and 1. The operation of the switch 43 opening a circuit between conductors 39 and 15 and putting the lamps or signal devices 3 and 1 each out of operation substantially as before described for the lamps 1 and 2.

In the drawings a plurality of lamps or other signal devices which may be as widely separated as desired are shown arranged in multiple in each circuit so that where desired signals may be simultaneously operated at a plurality of widely distant points, thus for example in case my device is in a hospital a switch connected in the manner described for the switch 37 may be provided for each individual room, or where a number of patients are in a single room, as for example, in a ward, a switch similar to 18 or 19 may be provided for each bed, their respective reset switches 43, 35 and 35′ being each preferably arranged near their operating switch so that the nurse or other attendant whose duty it is to answer the signal may reset the same only near the point from which the signal was operated. The several signals shown in each circuit may be arranged in any desired manner for example, one may be positioned in the corridor adjacent the rooms, another if desired, in the nurse's assembly room, superintendent's office or other desired points where the attendants are in the habit of assembling or where it is convenient to note the punctuality of attendance upon the patients.

As thus described, it is obvious that when either the switch 18 or 19 is operated, there are no means of determining which may have been employed to close the circuit and therefore which reset switch it is necessary to operate to stop the operation of the signal and in case a large number of these switches are arranged to operate a single signal it may cause considerable inconvenience to determine which switch was employed so that that particular circuit may be opened to reset the signal. To avoid this difficulty the arrangement shown in Fig. 2 may be provided. In this form the operating switch 45 is arranged to approximately correspond to the switch 37 shown in Fig. 1 and is connected by a conductor 46 to a busbar 47 which in turn is connected to a battery 48 or other suitable source of electric energy by conductor 49, the other pole of the switch 45 being connected by means of the conductor 50 to the coils of an electric switch or relay 51 thence by a conductor 52 to the coils of a second electric switch 53 and thence by the conductor 54 to a busbar 55 attached to the opposite pole of the battery 48 by the conductor 56, thus closing the circuit through the coils of the relays 51, and 53 and attracting their respective armatures 51′, 53′ and closing the circuits to the signal device 57 and 58. The circuit controlling the signal 57 comprises a conductor 156 attached at one end to the busbar 47 and at the opposite end to the armature 53′. A conductor 157 is attached to one pole of the signal 57 and is connected by conductors 158 and 59 to the busbar 55 thus completing the circuit through the lamp 57. The circuit for the lamp 58 comprises a conductor 60 attached to the conductor 156, armature 51′ and the conductor 61, the opposite pole is connected to the conductor 59 by conductor 62. The reset switch 63 for this circuit is

connected to conductor 50 by means of a conductor 64 and the opposite pole is connected to the conductor 61 by means of a conductor 65 thus operating substantially as before described to prevent opening the circuit when the operating switch 45 is released or opened. The lamp or signal 66 is arranged to be operated from a plurality of points substantially the same as before described, the principal difference being that means are provided for operating an additional signal to indicate the particular operating switch controlling the main signal. As shown in the drawings the operating switches 67 and 68 are each arranged to operate signal 66 and incidentally auxiliary signals arranged to indicate which of the switches have been employed for this purpose. One pole of the switch 67 is connected by means of conductors 69 and 70 to the busbar 47 while the opposite pole is connected by conductor 71 to the coils of an electric switch 72 thence by conductor 73 to the coils of the electric switch 74 and thence by the conductor 75 to the busbar 55 thus completing the circuit when the switch 67 is closed and attracting the armatures 72′ and 74′ respectively. The movement of the armatures 72′ and 74′ close the signal circuits. Conductors 76 and 77 are provided for connecting the armatures 72′ and 74′ respectively to the conductor 70.

The armature 74′ is arranged to close the circuit between the conductor 77 and a conductor 78 extending to the signal 79 and thence to the busbar 55. The armature 72′ is arranged to connect the conductor 76 to a conductor 80 extending to the signal 81 and thence by the conductor 78 to the busbar 55 as before, thus also closing the circuit to the signal 81. A conductor 82′ is connected to the conductor 78 extending to the lamp 66 thence to the conductor 59 thereby operating the signal 66 simultaneously with the signals 79 and 81. The operation of the armature 72′ closing the circuit from the battery by means of conductor 70, 76, armature 72′, conductor 80, conductor 82, reset switch 83, conductor 71 to the coils 72, thence by conductor 73 and coils of the switch or relay 74 and conductor 75 back to the battery thus retaining the signal mechanism in operation and the circuits closed when the switch 67 is released. If it is desired to put the signal mechanism out of operation it is only necessary to open the circuit by means of the reset switch 83 thus breaking the circuit and de-energizing the relays 72 and 74.

The operation of the circuit controlled by the switch 68 is substantially similar to that just described, one pole of the switch being connected by means of conductors 84 and 70 to one pole of the battery. The other pole of the switch is connected by conductor 85 to the windings of the electric switch or relay 86, thence by conductors 87 and 73 to the relay 74, thence by the conductor 75 to the opposite pole of the battery, thus closing the circuit and energizing the relays 86 and 74 and attracting their respective armatures 86′ and 74′ thus closing the circuits to the lamps or signal device 88 and 79 respectively. The lamp 88 is connected in the circuit by means of the conductors 70 and 89, armature 86′ and conductor 90 to one pole of the lamp, the opposite pole being connected by conductors 91 and 78 to the opposite pole of the battery. The lamp or signal 79 is connected the same as before described. Current is supplied to the switches or relays 86 and 74 when their respective armatures are attracted, by the conductors 70, 89, armature 86′, conductors 90 and 92, reset switch 93, conductors 94 and 85 to the coils of the relay 86, thence by the conductor 87 to the coils of the relay 74, thence by conductor 75 to the opposite pole of the battery. The lamp or signal 66 being operated as before described through the conductors 78 and 82 to one pole of the lamp and the conductor 59 to the opposite pole of the battery, the circuit in this case being opened when desired by the reset switch 93. The result obtained by this arrangement is that the lamp or signal device 79 is displayed simultaneously with the lamp 66 and either the lamp 81 or 88 as the case may be when either the switch 67 or 68 is operated. The lamps 81 and 88 indicate respectively which switch has been operated and the lamp 66 indicates at a distant point the same as the lamp 79.

In case it is desired to operate the lamp 57 simultaneously with the lamp 66 any convenient means may be provided for connecting the same in a circuit either directly in the same circuit with the lamp 66 or in a substantially independent circuit as for example, by means of a suitable conductor 97′ connecting the conductor 78 and 157 as shown in broken lines in the drawings.

The several lamps or signal devices may be arranged separately and in any desired position such for example as at the doors of the various rooms or other convenient places to indicate the point from which the signal has been operated, or if desired a suitable annunciator or similar device for grouping the lights or other indicating mechanism may be provided.

In the foregoing specification while my device is described as installed in a hospital, hotel, or similar institution wherein the switches may be manually operated for signaling for the services of an attendant, it is evident that the same or similar mechanism may be used to as good advantage in connection with passenger or freight elevators or similar devices where one or both of the switches are arranged to be mechanically operated to indicate the operation, or the desired operation of the device.

The switches for operating my device may be of any desired form or construction. In the foregoing drawings entirely separate switches are shown for closing and opening each operating circuit but it is obvious that if preferred a duplex switch may be employed having a single bar arranged to either make or break the circuit as desired by its movement. Obviously also, the number of switches or signal devices which each switch is arranged to operate may be altered as desired and the various parts of the mechanism changed to adapt the same to the varying conditions under which they may be required to operate. Hence I do not wish to be understood as limiting myself to the exact form and construction shown.

What I claim as new, and desire to secure by Letters Patent is:—

1. In a call-signal system, the combination of a main circuit divided into a plurality of branches extending to different transmitting stations; an annunciator for each circuit branch, all of said annunciators being arranged at a common receiving station and each having an electromagnet included in its circuit branch; means for each circuit branch to establish and maintain for the electromagnet of said branch an energized circuit, said means including a device at each transmitting station for the initiation of an annunciator call; and means at each transmitting station, operable manually and without movement of the call-initiating means, for rupturing said energized circuit for the electromagnet of said branch, whereby the circuit-rupturing operation for release of a call may be independent of the operation which initiates the call.

2. In a call signal system, the combination of a main circuit divided into a plurality of normally open branches extending to a plurality of transmitting stations; a signal circuit divided into a like plurality of normally open branches, each said branch including a lamp, said lamps arranged at a common signal-receiving station; in each main circuit branch an electromagnet having a single winding, and acting upon closure of its circuit to close the corresponding lamp-containing signal circuit branch; means for each main circuit branch to establish and maintain an energized circuit for the corresponding magnet, each said means including at its proper transmitting station a manually operable call-initiating circuit-closing device; and at said transmitting station a means manually operable without movement of the call-initiating means, to rupture said energized circuit for the electromagnet, whereby the control of the call-releasing operation is removed from the call-initiating device.

3. In a signal system of the character described, the combination of a main circuit, a signal circuit, and a holding circuit, each normally open, means in the main circuit to close the same at a transmitting station, a signal lamp in the signal circuit at a distant signal receiving station, electro-responsive means common to the main and holding circuits for closing the signal and holding circuits, and a normally closed switch in the holding circuit at the transmitting station manually operable without movement of the main-circuit-closing means to rupture said holding circuit.

4. In a signal system, the combination of a pilot relay, an annunciator controlled thereby, a plurality of signal-receiving magnets, respective annunciators controlled thereby, a plurality of circuits, having a portion, including the windings of the pilot relay, in common, and each said circuit including respectively one of the signal-receiving magnets, signal initiating switches located at different transmitting stations normally opened and included in the respective circuits to establish, when closed, an energized circuit for the corresponding signal-receiving magnet and the common pilot relay, a switch for each said circuit automatically responsive to closure of the circuit to establish an energized holding circuit for the corresponding signal-receiving magnet, and the pilot relay; and a manually-operable normally-closed "reset" switch at each transmitting station, included in said holding-circuit connections and operable without movement of the signal-initiating switches.

5. In a signal system, the combination of a pilot relay, an annunciator controlled thereby, a plurality of signal-receiving relays, respective annunciators therefor, a plurality of main circuits having a portion, including the windings of the pilot relay, in common, and each said circuit including one of the signal-receiving relays; a plurality of signal circuits for the respective annunciators, each controlled by the corresponding relay, means for each said main circuit arranged to establish and maintain an energized circuit for the corresponding signal-receiving relay and the common pilot relay, each said means including a manually operable switch arranged at a transmitting station local to the circuit; and at each said transmitting station manually operable releasing means operable without movement of the signal initiator to rupture said energized circuit for the signal-receiving relay.

6. In a signal device of the character described, the combination of a main circuit having a plurality of normally-open main circuit branches, suitable means of current supply therefor; at a common signal-receiving station, magnets each local to a branch of said circuit; means to establish and maintain a closed circuit for each branch, said

means for each branch comprising at a signal transmitting station for the corresponding branch a calling means operable to close the circuit for the magnet, and "reset" means operable without movement of the calling means to break said circuit; and a plurality of signal circuit branches arranged in parallel, a signal lamp for each said signal circuit branch, and a switch for closing each said signal circuit branch, said switch for each signal circuit branch being controlled by the magnet of the corresponding main circuit branch.

7. In a device of the kind described, and in combination, a plurality of circuits arranged in pairs, a pair of switches for each pair of circuits, one switch normally open and arranged in one circuit and the other switch normally closed and arranged in the other circuit, a signal circuit for each pair of circuits, said signal circuit provided with a switch therein, each pair of circuits provided with electro-responsive means included in common in both circuits of the pair for operating its respective signal circuit switch, a signal circuit common to all of the pairs of circuits provided with a switch therein, an electro-responsive means common to all of the pairs of circuits for operating the switch of said common signal circuit, the electro-responsive means common to all of the pairs of circuits and the electro-responsive means individual to a single pair of circuits being arranged for actuation by the closure of the normally open switch of said pair and release by the opening of the normally closed switch of said pair.

8. In a system of the character described and in combination, a plurality of normally open circuits arranged in pairs, a pair of switches for each pair of circuits, one switch normally open and arranged in the first circuit of the pair and the other switch normally closed and arranged in the other normally open circuit of the pair, a normally open signal circuit for each pair of circuits, a normally open signal circuit common for all of said pairs of circuits, signal mechanism in each signal circuit and controlled thereby, all of the pairs of circuits having in common therein an electro-responsive device for closing the common signal circuit when and while either circuit of any pair is closed, and each pair of circuits provided with electro-responsive means common to both circuits of the pair for closing its respective signal circuit and the second circuit of the pair upon the closure of the normally open switch in the first said circuit of the pair, said electro-responsive means arranged to maintain said signal circuit and said second circuit closed until the opening of the normally closed switch in the second circuit of the pair.

9. In a signal system, the combination of a source of current supply, a main circuit therefrom including a normally open call-switch; an electromagnet in said circuit, a switch controlled by the magnet, an annunciator, an annunciator circuit parallel to the main circuit including the annunciator and the magnet controlled switch, a normally closed "reset" switch and connections connecting it from a point of the main circuit between the call-switch and the magnet to a point of the annunciator circuit between the annunciator and the magnet-controlled switch.

10. In a signaling system, a source of current supply, a pair of normally open circuits having parts of their wiring in common, switches located at the same sending station, one said switch being normally open, and arranged in one normally open circuit for operation to close the same, and the other switch being normally closed and arranged in the second normally-open circuit; a normally-open signal circuit including an annunciator; and relay means in the common portion of the pair of circuits, for closing the annunciator circuit and the circuit including the normally closed switch when energized by closure of the said normally open switch.

In testimony whereof, I have hereunto signed my name in the presence of two subscribing witnesses.

MAURICE LEVISON.

Witnesses:
JOHN W. HILL,
CHARLES I. COBB.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."