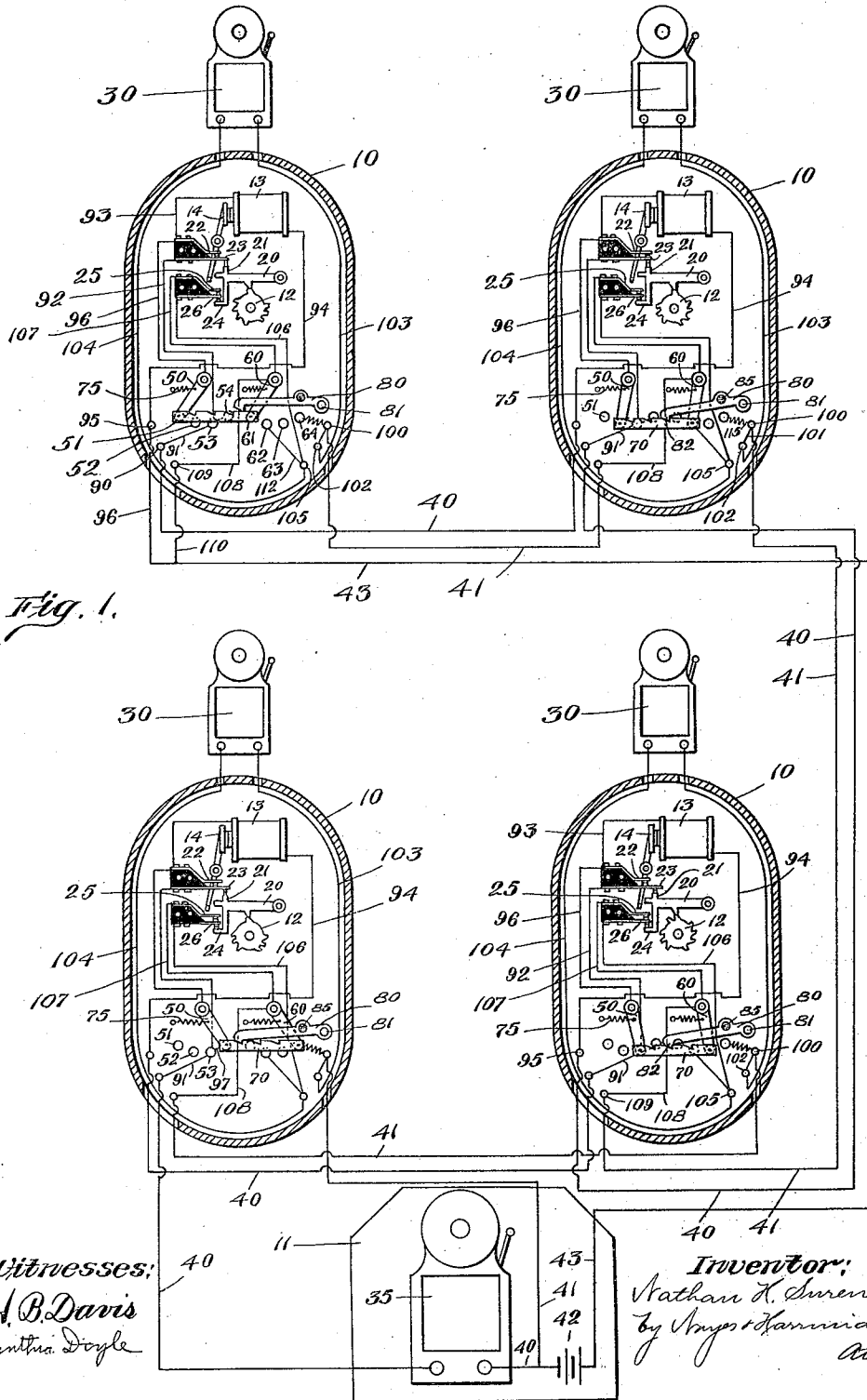


N. H. SUREN.
FIRE ALARM SYSTEM.
APPLICATION FILED MAR. 7, 1912.

1,132,499.

Patented Mar. 16, 1915.

2 SHEETS-SHEET 1.

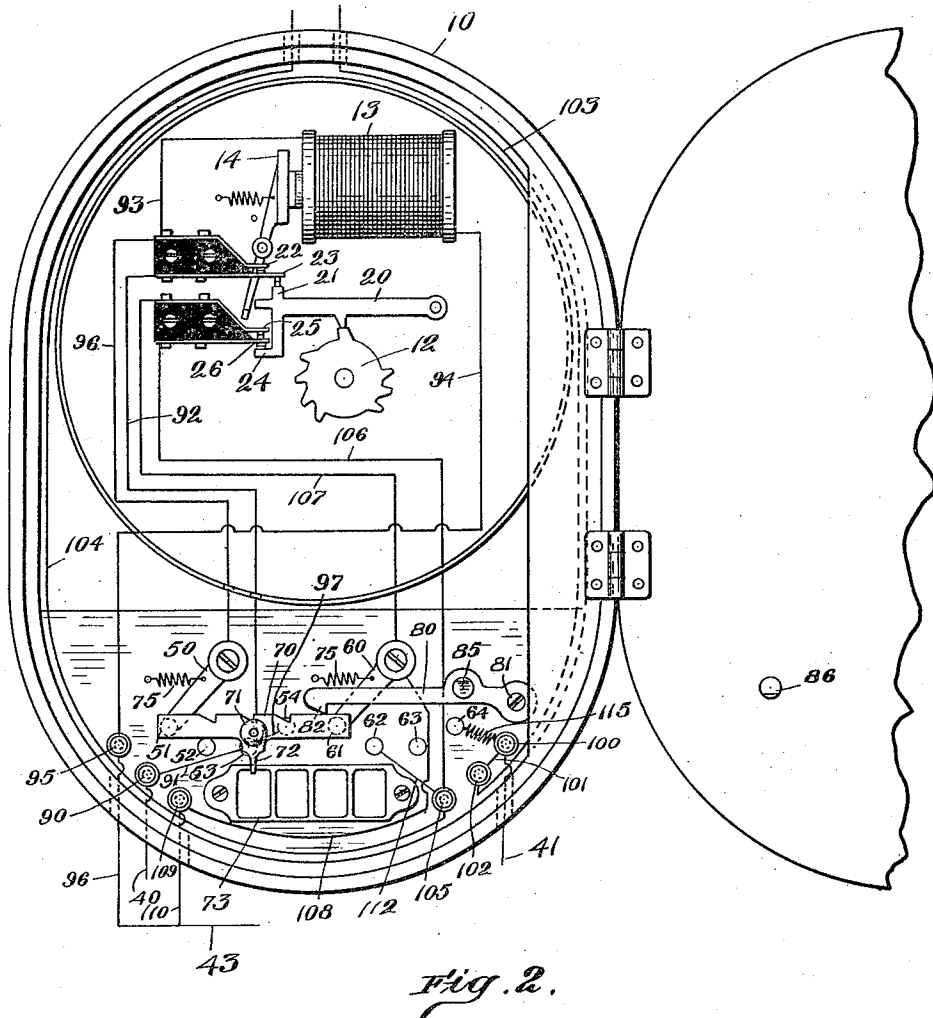


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2 SHEETS—SHEET 2.



Witnesses:

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UNITED STATES PATENT OFFICE.

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FIRE-ALARM SYSTEM.

1,132,499.

Specification of Letters Patent.

Patented Mar. 16, 1915.

Application filed March 7, 1912. Serial No. 682,214.

To all whom it may concern:

Be it known that I, NATHAN H. SUREN, a citizen of the United States, residing at Needham, in the county of Norfolk and State of Massachusetts, have invented an Improvement in Fire-Alarm Systems, of which the following is a specification.

This invention relates to fire-alarm systems especially adapted for large manufacturing establishments, railway yards and the like, and which may be separate and distinct from the usual fire-alarm system of the city or town or a part of it. Such establishments, yards, etc., are usually equipped with portable fire-extinguishing apparatus which may be conveyed to any of the buildings, and some of the employees are drilled in operating said apparatus, a local fire-brigade being organized for this purpose.

One of the objects attained by my present invention is the sounding of a general alarm in case of a fire.

Another object is the sounding of a drill-alarm by which the local fire-brigade is called to attend a drill.

Another object is the sounding of a general drill-alarm in response to which all of the employees are required to leave the buildings in order.

Another object is the sounding of a local drill-alarm by which the employees of any building or floor of a building are required to leave the building in order.

The alarm-system embodying this invention is especially designed to meet these requirements, it being arranged to sound these various alarms according to the needs.

In the present embodiment of my invention signal-boxes are arranged in the different buildings or stations throughout the establishment or yards, which are connected in circuit with a central station, or headquarters. A local-alarm, such as a gong, is associated with each signal-box, and an electro-magnetically operated gong, tower-striker or whistle is connected in circuit at the central-station or some convenient place, and each signal-box has the capability of sending its box-number signal, and also of operating the local alarms and the central-station alarm in different ways, according to the needs, the box-number of the sending-box being tapped on the gongs and sounded

on the central-alarm. As an illustration the signaling-mechanism of each box may be set to send its box-number signal and cause all of the local-alarms and the central-station alarm to respond; or cause the central-station alarm only to respond; or cause all of the local-alarms to respond, the central-station alarm remaining silent; or cause only that local-alarm to respond which is associated with the signal-box which, is being operated. Thus four different signals are provided for. The first is the fire-signal; the second, a drill-signal for the fire-brigade; the third, a drill-signal for the employees; and the fourth, a drill-signal for the employees of a building or floor of a building. Different manufacturing establishments may vary this arrangement somewhat to more fully meet their particular requirements, but in general they will follow this plan. Smaller establishments, however, may not use all of the signals herein provided, or will vary the signals according to their particular needs.

Figure 1 is a diagram of a fire-alarm system embodying this invention, four signal-boxes being represented, each with its alarm-controller set in a different position for the sounding of four different alarms. Fig. 2 is a front elevation of one of the signal-boxes, with its door open, the parts being represented in their normal positions.

10, represent the signal-boxes, four being here shown, for the purpose of illustrating my invention. They are connected in an electric-circuit with a central-station represented at 11. The several signal-boxes are made alike and one will now be described.

12 is the box-number signal-wheel of any usual or suitable form of signaling-mechanism, herein also referred to as signal formulating mechanism, and 13 the non-interference magnet, the armature 14 of which operates any well-known or suitable means to control the sending of the signal. The signal-wheel 12, as here shown, is arranged to operate two circuit-controllers, and to accomplish this result a pivoted lever 20, engages the signal-wheel which may have a bifurcated end portion, one of the arms, as 21, of which is arranged to operate the circuit-controller 22, 23, and the other arm, as 24, of which is arranged to operate a circuit-

controller 25, 26. Each time a box is pulled both circuit-controllers are operated to control circuits for sending the box-number.

A local alarm, such for instance, as an electro-magnetic gong 30 is associated with each signal-box, and a general alarm, such for instance as an electro-magnetic gong 35, or it may be a tower-striker or whistle, is arranged at the central-station 11, although it is obvious that as many local-alarms and general alarms as desired may be associated, respectively, with the signal-boxes and the central-station. Electric-circuits connect the several signal-boxes with the central-station, and a variable alarm-controller is associated with each signal-box arranged to control the circuits in such manner that the alarms may be caused to respond to the signals in four different ways, according to the position it is set. As here shown, two circuit-wires 40 and 41 lead from one side of the battery 42, or other current supply mechanism, to the several signal-boxes, and a common return-wire 43, leads from the several boxes to the opposite side of the battery, thereby employing three main circuit-wires. As a variable alarm-controller which may be employed, and which is associated with each signal-box, a pair of four-point switches are here shown, which may be connected together, so as to be moved together.

50 and 60 represent the two pivoted switch-arms; 51, 52, 53, 54, the contact-points with which the switch-arm 50 coöperates, and 61, 62, 63, 64, the contact-points with which the switch-arm 60 coöperates.

70 represents a bar connecting the two switch-arms 50 and 60 together, and 71 a knob which is arranged on said bar, which may be engaged by hand for the purpose of moving the bar longitudinally to move the switch-arms to engage different contact-points; and said bar also has arranged on it a point 72, which points to one or another indicator-plate 73 as the bar is moved. Springs 75 are attached to the switch-arms which act to move them in a direction opposite to that moved by the bar 70, and to hold them in normal position, said springs serving particularly to return the bar and switch-arms connected thereto to normal position after a signal has been sent. Means are also provided for holding the bar 70 and switch-arms in the different positions they may be set, which is adapted to be operated automatically by the closing of the door of the box to release the bar and switch-arms and permit them to be returned to normal by the springs 75. The means here shown for accomplishing this result comprises a detent-lever 80, pivoted at 81, and bearing a detent 82, said lever being arranged above the bar 70, and the top of the bar 70 is formed with notches, three being here shown arranged to receive the detent, thereby to

hold the bar in three different abnormal positions. Said detent-lever has arranged on it a bevel-ended stud 85, and a bevel-ended stud 86 is arranged on the inside of the box-door, which, when the door is closed engages the stud 85 and lifts the detent-lever high enough for its detent to disengage the bar 70.

In Fig. 2 the switch-arms 50 and 60 are represented in their normal positions and in engagement with contact-points 51, 61, respectively. When the box-door is opened the bar 70 may be moved in a direction toward the right to cause the switch-arms to engage any of the other contact-points desired, and when so moved the detent 80 will engage the bar and hold it while the signal is being sent, but when the box-door is closed the bevel-ended pin 86 on the inside of the door will engage the bevel-ended pin 85 on the detent-lever and will lift said lever and cause its detent to disengage the bar 70, whereupon said bar and the switch-arms connected therewith will be restored to normal by the springs 75.

One arrangement of circuits and switches is here shown for the sake of illustrating my invention, by which the alarms may be sounded in four different ways, that is to say, all of the alarms which are associated with the signal-boxes and the alarm at the central-station may be sounded; or the alarm at the central-station only may be sounded; or all of the alarms associated with the signal-boxes may be sounded, the alarm at the central-station remaining silent; or only the alarm which is associated with the particular box which is being operated may be sounded. The arrangement of the circuits in connection with the switches whereby these results are accomplished will now be described.

The circuit-wire 40 with the common return-wire 43 is employed as the central-station or general alarm-circuit, and the circuit-wire 41 with the common return-wire 43 is employed as the local alarm-circuit. The two box-number circuit-controllers which are arranged in each box are connected, respectively, in said circuits, the circuit-controller 22, 23, being connected in the central-station alarm-circuit, and the circuit-controller 25, 26 being connected in the local alarm-circuit. Both box-number circuit-controllers are arranged to be operated simultaneously or thereabout, during the operation of a box to control their respective circuits. The variable alarm-controller or switch-mechanism is herein arranged to control the electrical connections of the box-number circuit-controllers with their circuits, so that they may or may not operate their circuits to cause the alarms controlled thereby to sound. The circuit-connections in each box being alike one only need be described.

Referring particularly to Fig. 2, the main circuit-wire 40, leads to a binding-post 90, a circuit-wire 91 leads from said post to the contact-point 53, a circuit-wire 92 leads from said contact-point to the circuit-controlling member 23, a circuit-wire 93 leads from the circuit-controlling member 22 to the non-interference magnet, a circuit-wire 94 leads from said magnet to the binding-post 95, and a circuit-wire 96 leads from said binding-post to the common return-wire 43. As the circuit is normally closed the non-interference magnet is normally included in a closed circuit. A circuit-wire 96 also leads from the circuit-controlling member 22 to the switch-arm 50, and said arm normally rests on the "dead" contact-point 51. The contact-point 52 is also "dead," but the contact-point 54 is connected by circuit-wire 97 to the contact-point 53. The main circuit-wire 41 leads to a binding-post 100; a circuit-wire 101 connects said binding-post with the binding-post 102; a circuit-wire 103 leads from said binding-post 102 to the local-alarm 30; a circuit-wire 104 leads from the other side of the local-alarm to the binding-post 105; a circuit-wire 106 leads from said binding-post 105 to the circuit-controlling member 26; a circuit-wire 107 leads from the circuit-controlling member 25 to the switch-arm 60; a circuit-wire 108 leads from said switch-arm to the binding-post 109, and a circuit wire 110 leads from said binding-post to the common return-wire 43. The switch-arm 60 normally rests on the "dead" contact-point 61. A circuit-wire 112 connects the contact-point 62 with the binding-post 105. The contact-point 63 is "dead". The contact-point 64 is connected with the binding-post 100 by or through a resistance 115, or wire including a resistance. Said resistance is approximately equal to the resistance of the magnet of the local-alarm 30.

With the alarm-controller in its normal position, as represented in box marked "No. 1" Fig. 1, the apparatus is in condition to send a box-number signal and to cause the central-station alarm and all of the local-alarms to respond. Normally the switch-arm 50 rests on the "dead" contact 51, and the switch-arm 60 rests on the "dead" contact 61, and as the box-number circuit-controllers are operated the central-station alarm and all of the local-alarms are sounded. The central-station alarm-circuit is as follows: battery 42; circuit-wire 40, including the central-station alarm; circuit-wires 91, 92; box-number circuit-controller 22, 23; circuit-wires 93, 94, 96; common return-wire 43 to battery. Said circuit is operated by the box-number circuit-controller 22, 23, and the box-number is sounded on the central-station alarm 35. The local-alarm circuit is as follows: battery 42; main

circuit-wire 41; circuit-wires 101, 103, including local-alarms 30; circuit-wire 104, 106; box-number circuit-controller 25, 26; circuit-wires 107, 108, 110, and the common return-wire 43 to battery. Said local alarm-circuit is operated by the box-number circuit-controller 25, 26, and the box-number is sounded on the local-alarms 30. In view of the fact that all of the boxes are connected with the circuits when in their normal positions and their local-alarms 30 are normally responsive, it will be noted particularly that the box-number will be sounded on all the local-alarms 30 of all the boxes, in conjunction with the central-station-alarm, thus a general alarm or fire-signal is sounded.

It is needless to separately trace the circuits of all of the other alarms, hence they will be more briefly alluded to. When the alarm-controller is moved one step to the right, as represented in box marked "No. 2" Fig. 1, it is set in position to send a box-number signal and to cause the central-station alarm only to respond. Referring to said view, the switch-arm 50 is moved onto the contact-point 52, which is a "dead" contact-point, and the switch-arm 60 is moved onto the contact-point 62, and by circuit-wire 112 and switch-arm 60, the box-number circuit-controller 25, 26, is shunted, so that although operated by the signaling-mechanism the local alarm-circuit including the main circuit-wires 41, 43, is not operated, hence the local-alarms will not respond, but the central-station alarm will respond to the operation of the box-number circuit-controller 22, 23. When the alarm-controller is moved another step to the right, as represented in box marked "No. 3", Fig. 1, it is set to send a box-number signal and to cause all of the local-alarms to respond, the central-station alarm remaining silent. When in this position the switch-arm 50 rests on the contact-point 53, and the switch-arm 60 rests on the contact-point 63, the latter being "dead", and by circuit-wire 96 and switch-arm 50, the box-number circuit-controller 22, 23 is shunted, so that although operated by the signaling-mechanism the central-station alarm circuit 40, 43 is not operated, hence the central-station alarm will not respond, but all of the local-alarms will respond to the box-number circuit-controller 25, 26. When the alarm-controller is moved another step to the right, as represented in box marked "No. 4" Fig. 1, it is set to send a box-number signal and to cause only the local-alarm to respond which is associated with the box which is being operated. When in this position the switch-arm 50, rests on the contact-point 54, and the switch-arm 60 rests on the contact-point 64, and the box-number circuit-controller 22, 23 is shunted, as in box marked "No. 3",

and the resistance 115 is included in parallel with said local-alarm 30, and the box-number circuit-controller 25, 26, and as a result said local-alarm only is caused to respond, all the other local-alarms remaining silent.

I do not desire to limit my invention to the particular arrangement of circuits here shown, as it is obvious that they may be changed and yet the results herein set forth accomplished. While ordinarily the signal-boxes will be provided with non-interference means to control the operation of the signaling-mechanism, yet it is obvious that said means may or may not be employed.

If employed, however, it is important that they shall be so arranged that precedence is given to actual fire or general alarms, so that even though the local alarms are operated from any of the stations the fire or general alarm will immediately and correctly respond in case a fire or general alarm signal is sent in from any other station. The results which are desired in this particular are as follows:—

1st: If, when the system is in normal condition, the mechanism at any one of the stations is actuated, such station will immediately take control of the entire system, and will cause response of all the alarm devices, both local and general.

2nd: If, when the system is in normal condition, the mechanism at one of the stations is operating to send an alarm over the system to be received on all of the alarm devices, attempt is made to send in a signal from some other station, the alarm transmitted from the station first actuated will remain in control of the system and the correct transmission of this fire alarm will not be interrupted as a result of actuation of mechanism at such other station. The local alarm devices and the central or brigade calling mechanism will give the signal of the station first actuated, and there can be no interference with such signal as a result of an attempt to send in an alarm from another station.

3rd: If the system is being used for drill purposes and is set at one station to select one or all of the local alarm devices for operation and to exclude the general alarm mechanisms, and at another station the system is controlled for sending in an alarm of fire, the station thus actuated for fire will immediately take control and continue the operation of the selected local alarm devices and at the same time will cause transmission of its fire alarm number to the fire brigade or central station without interference.

4th: If the system is being used for drill purposes and is selectively controlled from one of the stations to cause response only of the general alarm or brigade calling mechanism, and an actual alarm of fire is sent in

from another station, the station using the system for drilling will retain control until its signal has been sounded on the general alarm mechanism, and the station attempting to send in an alarm of fire will then take control and will cause the sounding of all the local alarm devices and of the general alarm mechanism and will cause no incorrect signal or interference in the action of the general alarm mechanism while such mechanism is responding to the drill conditions set up at the station first actuated.

By arranging the non-interference mechanism 13 in the general alarm circuit, as here shown and described, and its cooperating armature structure 14 for controlling the movement of the lever 20, as here shown and described, these results will be obtained, the general alarm circuit through the non-interference mechanism controlling the local alarm circuit at all times.

I claim:—

1. In a signaling-system, the combination of a general alarm circuit including general alarm mechanism, a local alarm circuit including one or more local alarm mechanisms, a plurality of stations, circuit-controllers at each station in the general and local alarm circuits, respectively, signal formulating mechanism at each station for operating both circuit-controllers, and an alarm-controller at each station having means to variably control the responsive action of the alarm-mechanism, substantially as described.

2. In a signaling-system, the combination of a general alarm circuit including general alarm mechanism, a local alarm circuit including local alarm mechanisms, a plurality of stations, circuit-controllers at each station in the general and local alarm circuits, respectively, a signal formulating-mechanism at each station for operating both circuit-controllers, an alarm-controller at each station having means adapted to be set to cause response of all the local alarm mechanisms and the general alarm mechanism, the setting of said alarm-controller to another position causing response of only the local alarm mechanisms, substantially as described.

3. In a signaling system, the combination of a general alarm circuit including general alarm mechanism, a local alarm circuit including local alarm mechanisms, a plurality of stations, circuit-controllers at each station in the general and local alarm circuits, respectively, signal formulating mechanism at each station for operating both circuit-controllers, an alarm-controller at each station having means adapted to be set to cause response of all the local alarm mechanisms and the general alarm mechanism, setting of said alarm-controller to another position at one station causing response of all the local alarm mechanisms upon actuation of the

signal formulating mechanism at said station, and setting of the alarm-controller at one of said stations to another position causing response of only the local alarm mechanism associated with the signal formulating mechanism which is being actuated, substantially as described.

4. In a signaling-system, the combination of a general alarm circuit including general alarm mechanism, a local alarm circuit including local alarm mechanisms, a plurality of stations, circuit-controllers at each station in the general and local alarm circuits, respectively, signal formulating mechanism at each station for operating both circuit controllers, an alarm-controller at each station having means adapted to be set to cause response of all the local alarm mechanisms and the general alarm mechanism, setting of said alarm-controller to another position at one station causing response of all the local alarm mechanisms upon actuation of the signal formulating mechanism at said station, and setting of the alarm-controller at one of said stations to another position causing response of only the local alarm mechanism associated with the signal formulating mechanism which is being actuated, and setting of the alarm-controller to another position causing response of only the general alarm mechanism upon actuation of the signal formulating mechanism at said station, substantially as described.

5. In a signaling-system, the combination of a general alarm circuit including general alarm mechanism, and a local alarm circuit including local alarm mechanisms, a plurality of stations, circuit-controllers at each station in the general and local alarm circuits, respectively, signal formulating mechanism at each station for operating both circuit-controllers, an alarm-controller at each station having means adapted to be set to cause response of the general alarm mechanism upon actuation of the signal formulating mechanism, the setting of said alarm-controller to another position causing response of the local alarm mechanism which is associated with the station upon actuation of the signal formulating mechanism at said station, substantially as described.

6. In a signaling-system, the combination of a general alarm circuit including general alarm mechanism, and a local alarm circuit including local alarm mechanism, a plurality of stations, circuit-controllers at each station in the general and local alarm circuits, respectively, signal formulating mechanism at each station for operating both circuit-controllers, an alarm-controller at each station having means adapted to be set to cause response of the general alarm mechanism upon actuation of the signal formulating mechanism, the setting of said alarm-controller to another position causing re-

sponse of the local alarm mechanisms, upon actuation of the signal formulating mechanism, substantially as described

7. In a signaling system, the combination of a plurality of stations, a general alarm circuit running through said stations, general alarm mechanism therein, a local alarm circuit running through said stations, local alarm mechanism at each station for said local alarm circuit, circuit-controlling contacts at each station connected with said general alarm circuit, circuit-controlling contacts at each station connected with said local-alarm circuit, and a signal-wheel at each station adapted to control both contact sets thereat, said circuits including suitable current supply mechanism, substantially as described.

8. In a signaling system, the combination of a plurality of stations, a main circuit extending to said station, signaling-mechanism for said main circuit, a local circuit extending to said stations, a local signaling device at each station connected with said local-circuit, a set of contact members at each station connected with said main circuit for controlling the opening and closure thereof, a second set of contact members at each station connected with said local circuit for controlling the opening and closure thereof, signal formulating mechanism at each station connected with both sets of contact-members thereat for actuating said contact-members to control the opening and closure of said circuits, switch-mechanism at each station and circuits controlled thereby for rendering the main-circuit contact-members ineffective, and switch-mechanism at each station and circuits controlled thereby for rendering the local contact-members at said station ineffective, and suitable current supply mechanism for said circuits, substantially as described.

9. In a signaling-system, the combination of a plurality of stations, a main circuit extending to said stations, main alarm-mechanism included in said circuit, a local circuit extending to said stations and local signal-receiving mechanism at each station included in said local-circuit, a set of contact-springs at each station, said contact-springs at the various stations being normally positioned to close the main-circuit, a second set of contact-springs at each station and said springs at the various stations being normally in position to close the local circuit, signal formulating-mechanism at each station operatively connected with both sets of contact-springs thereat to control the opening and closure thereof and thus cause response of all the local signal receiving devices and the main signaling mechanism, and means at each station for rendering the main circuit contact-springs ineffective whereby upon operation of the signal

formulating mechanism the local circuit will be opened or closed, each of said circuits including suitable current supply mechanism, substantially as described.

5 10. In a signaling-system, the combination of a plurality of stations, a main circuit extending to said stations, main alarm mechanism included in said circuit, a local circuit extending to said stations including
10 local signal receiving mechanism at each station, a set of contact springs at each station, said contact-springs at the various stations being normally positioned to close the main circuit, a second set of contact-springs at each
15 station and said springs at the various stations being normally in position to close the local circuit, signal formulating mechanism at each station operatively connected with both sets of contact-springs thereat to control the opening and closure thereof and
20 thus cause response of all the local signal receiving devices and the main signaling mechanism, and means at each station for rendering the local circuit contact-springs thereat ineffective whereby upon actuation
25 of the signal formulating mechanism the local circuit will remain closed and only the main circuit controlled, said circuits including current supply mechanism, substantially
30 as described.

11. In a signaling-system, the combination of a plurality of stations, a main circuit running serially through said stations including a main signal receiving device, a
35 set of contact-members at each station normally closing said main circuit, a local circuit extending serially through said stations including a local signal receiving device at each station, a second set of contact-members
40 at each station normally closing said local circuit, signal formulating mechanism at each station coöperating with both sets of contact-members to actuate said contact-members to open and close said circuits to
45 cause said signal receiving devices to respond, means at each station adapted to be set to close the main circuit independently of the main circuit-contacts thereat whereby upon operation of the signal formulating
50 mechanism only the local circuit-contacts will be effective, means at each station for closing the local circuit in bridge of the local signal receiving device and the local contact-members at said station whereby
55 the local signal receiving devices at all the other stations will remain silent upon actuation of the signal formulating mechanism at the one station, a resistance at each station included in said local signal receiving
60 device holding-circuit upon closure thereof, the local signal receiving-device and the local contact-members at the station at which the local holding-circuit is closed being included in a shunt about the resistance at said
65 station whereby upon actuation of the signal

formulating mechanism at said station said shunt circuit will be opened and closed and the local signal receiving-device at said station will respond, said circuits including suitable current supply mechanism, substantially as described. 70

12. In a signaling-system, the combination of a plurality of stations, a main circuit running serially through the stations and including main signal receiving devices, a set
75 of contact-members at each station normally closing said main circuit, a local circuit running serially through the stations and including a local signal device at each station, a second set of contact members at each station
80 normally closing said local circuit, said signal receiving devices responding upon openings of their respective circuits, signal formulating mechanism at each station for both sets of contact members thereat to open
85 and close said circuits, and switch mechanism at each station adapted to be set to close a holding-circuit for all of the local signal receiving devices, setting of said switch-mechanism at any station causing
90 closure of said holding-circuit independently of the local circuit contact-members thereat whereby upon actuation of the signal formulating mechanism at said station all the local signal receiving devices will remain
95 silent and only the main signal receiving devices actuated upon control of the main circuit by the main circuit contact-members at the said station, each of said circuits including suitable current supply
100 mechanism, substantially as described.

13. In a signaling-system, the combination of a plurality of stations, a main circuit running serially through the stations and including main signal receiving devices,
105 a set of contact-members at each station normally closing said main circuit, a local circuit running serially through the stations and including a local signal device at each station, a second set of contact-members at
110 each station normally closing said local circuit, said signal receiving devices responding upon openings of their respective circuits, signal formulating mechanism at each station for both sets of contact-members
115 thereat to open and close said circuits, and switch-mechanism at each station adapted to be set in various positions to adjust the circuits to variably control the responsive action of the alarm devices upon actuation
120 of the associated signal formulating mechanism, substantially as described.

14. In a fire-alarm system, the combination of a plurality of signal-boxes connected by two electric-circuits with a central-station,
125 each signal-box having signaling-mechanism including two circuit-controllers, one for each circuit, to send a box-number signal over each circuit, an alarm associated with each box arranged in one of said cir- 130

circuits, an alarm at the central-station arranged in the other circuit, and an alarm-controller at each box having means to variably control the responsive action of said

5 alarms, substantially as described.

15. In a fire-alarm system, the combination of a plurality of signal-boxes connected by two circuits with a central-station, each signal-box having signaling-mechanism including two circuit-controllers, one for each circuit, to send a box-number signal over each circuit, an alarm associated with each box arranged in one of said circuits, an alarm at the central-station arranged in the
15 other circuit, and an alarm-controller having movable means to separately shunt said circuit-controllers, thereby to cause the alarms at the boxes or the central-station to sound according to the position of the alarm-controller, substantially as described.

16. In a signaling system, the combination of a plurality of stations each having signal formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits for connecting said various mechanisms, and switch mechanism at each station adapted to be set to adjust the circuits to cause response of all the alarm devices upon actuation of the associated signal formulating mechanism, the switch mechanism at any station being adapted to be set to adjust the circuits to cause response of only the local alarm devices upon actuation of the associated signal formulating mechanism.
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17. In a signaling system, the combination of a plurality of stations each having signal formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits for connecting said various mechanisms, and switch mechanism at each station for adjusting the circuit conditions of the system, setting of the switch mechanism at one station causing adjustment of the circuits to cause response of all the alarm devices upon actuation of the signal formulating mechanism at said one station, setting of the switch mechanism to another position at one station effecting adjustment of the circuits to cause response of all the local alarm devices only upon actuation of the signal formulating mechanism at said station, setting of the switch mechanism at one of said stations to another position effecting adjustment of the circuits to cause response of only the local alarm device of the said station upon actuation of the signal formulating mechanism at the said station.
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18. In a signaling system, the combination of a plurality of stations each having a signal formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits for connecting said various mechanisms and switch
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mechanism at each station for adjusting the circuit conditions of the system, setting of the switch mechanism at one station causing adjustment of the circuits to cause response of all the alarm devices upon actuation of the signal formulating mechanism at said one station, setting of the switch mechanism to another position at one station effecting adjustment of the circuits to cause response of all the local alarm devices only upon actuation of the signal formulating mechanism at said station, setting of the switch mechanism at one of said stations to another position effecting adjustment of the circuits to cause response of only the local alarm device of the said station upon actuation of the signal formulating mechanism at the said station, and setting of the switch mechanism to another position at one of said stations effecting adjustment of the circuits to cause response of only the general alarm devices upon actuation of the signal formulating mechanism at the said station.
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19. In a signaling system, the combination of a plurality of stations each having signal formulating mechanism and a local alarm device, general alarm mechanism, current supply mechanism, circuits connecting said various mechanisms and devices, and selective switch mechanism at each station, the switch mechanisms at the stations being normally set to adjust the circuits to cause response of all the alarm devices upon actuation of the signal formulating mechanisms at any one of said stations, setting of the switch mechanism at one station to another position effecting adjustment of the circuits to cause response of all the local alarms only upon actuation of the signal formulating mechanism at the station, and setting of the switch mechanism at any station to another position effecting adjustment of the circuits to cause response of only the general alarm mechanism upon actuation of the signal formulating mechanism at the said station.
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20. In a signaling system, the combination of a plurality of stations each having signal formulating mechanism and a local alarm device, general alarm mechanism, current supply mechanism, circuits connecting said various mechanisms and devices, and selective switch mechanism at each station, the switch mechanisms at the stations being normally set to adjust the circuits to cause response of all the alarm devices upon actuation of the signal formulating mechanisms at any one of said stations, setting of the switch mechanism at one station to another position effecting adjustment of the circuits to cause response of all the local alarm devices only upon actuation of the signal formulating mechanism at the station, and setting of the switch mechanism at any station effecting adjustment of the circuits to cause response of only the general alarm
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mechanism upon actuation of the signal formulating mechanism at the said station.

21. In a signaling system, the combination of a plurality of stations each having signal formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits for connecting said various mechanisms in various relations, switch mechanism at each station for controlling the connection arrangement of said circuits, the switch mechanism and the signal formulating mechanisms at the stations being normally in position to close a circuit through all said various alarm mechanisms and signal formulating mechanism and current supply mechanism whereupon actuation of the signal formulating mechanism at any station will effect opening and closure of said circuit to cause response of all the alarm mechanisms, and a holding circuit for the general alarm mechanism, setting of the switch mechanism to another position at any one sub-station causing closure of said holding circuit to prevent operation of the general alarm mechanisms whereby the local alarm mechanisms only will respond upon actuation of the signal formulating mechanism at the said station.

22. In a signaling system, the combination of a plurality of stations each having signal formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits for connecting said various mechanisms in various relations, switch mechanism at each station for controlling the connection arrangement of said circuits, the switch mechanism and the signal formulating mechanism at the stations being normally in position to close a circuit through all said various alarm mechanisms and signal formulating mechanism and current supply mechanism whereupon actuation of the signal formulating mechanism at any station will effect opening and closure of said circuit to cause response of all the alarm mechanisms, a holding circuit for the general alarm mechanism, setting of the switch mechanism to another position at any one station causing closure of said holding circuit to prevent operation of the general alarm mechanisms whereby the local alarm mechanisms only will respond upon actuation of the signal formulating mechanism at the said station, a holding circuit for the local alarm device, setting of the switch mechanism at any one station to another position causing closure of the holding circuit through the general alarm mechanism and causing closure of the local alarm device holding circuit through all the local alarm devices except at the said one station whereby the local alarm device at only the said one station will respond and the local alarm devices at

all the other stations and the general alarm mechanism will remain silent upon actuation of the signal formulating mechanism at the said one station.

23. In a signaling system, the combination of a plurality of stations each having signal formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits for connecting said various mechanisms in various relations, switch mechanism at each station for controlling the connection arrangement of said circuits, the switch mechanism and the signal formulating mechanism at the stations being normally in position to close a circuit through all said various alarm mechanisms and signal formulating mechanism and current supply mechanism whereupon actuation of the signal formulating mechanism at any station will effect opening and closure of said circuit to cause response of all the alarm mechanisms, a holding circuit for the general alarm mechanism, setting of the switch mechanism to another position at any one station causing closure of said holding circuit to prevent operation of the general alarm mechanisms whereby the local alarm mechanisms only will respond upon actuation of the signal formulating mechanism at the said station, a holding circuit for the local alarm device, setting of the switch mechanism at any one station to another position causing closure of the holding circuit through the general alarm mechanism and causing closure of the local alarm device holding circuit through all the local alarm devices except at the said one station whereby the local alarm device at only the said one station will respond and the local alarm devices at all the other stations and the general alarm mechanism will remain silent upon actuation of the signal formulating mechanism at the said one station and setting of the switch mechanism at any one station to another position effecting adjustment of the circuits to cause closure of a holding circuit through all the local alarm mechanisms whereby upon actuation of the signal formulating mechanism at the one substation only the general alarm mechanism will respond.

24. In a signaling system the combination of a general alarm circuit, general alarm mechanism therein a local alarm circuit, a plurality of stations, a set of contacts at each station for opening and closing said general alarm circuit, a set of contacts at each station for opening and closing said local alarm circuit, and a signal formulating mechanism at each station for controlling both contact sets, each of said circuits including suitable current supply mechanism.

25. In a signaling system, the combina-

tion of a plurality of stations, a main circuit running serially through the stations and including main signal receiving devices, a set of contact members at each station normally closing said main circuit, a local circuit running serially through the stations and including a local signal device at each station, a second set of contact members at each station normally closing said local circuit, said signal receiving devices responding upon openings of their respective circuits, signal formulating mechanism at each station for both sets of contact members thereat to open and close said circuits, a non-interference electromagnet at each station signally included in the main circuit, and an armature structure at each station for the electro-magnet thereat, and having interlocking association with the signal formulating mechanism at said station for preventing interference between signals when the signal formulating mechanisms at a number of stations are operating at the same time, each of said circuits including suitable current supply mechanism.

26. In a signaling-system, the combination of a plurality of stations each having a signal-formulating mechanism and local-alarm mechanism, general-alarm mechanism, current-supply mechanism, circuits for connecting said various mechanisms, and switch-mechanism at each station for adjusting the circuit conditions of the system, setting of the switch-mechanism at one station causing adjustment of the circuits to cause response of all the alarm devices upon actuation of the signal formulating mechanism at said one station, setting of the switch-mechanism at one of said stations to another position effecting adjustment of the circuits to cause response of only the local alarm device of the said station upon actuation of the signal-formulating mechanism at the said station, and setting of the switch-mechanism to another position at one of said stations effecting adjustment of the circuits to cause response of only the general alarm devices upon actuation of the signal-formulating mechanism at the said station, substantially as described.

27. In a signaling-system, the combination of a plurality of stations each having signal-formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits for connecting said various mechanism in various relations, switch-mechanism at each station for controlling the arrangement of said circuits, the switch-mechanism and the signal formulating mechanism at the stations being normally in position to close a circuit through all said various alarm mechanisms and signal-formulating mechanism and current supply mechanism whereupon actuation of the signal-formulating mechanism

at any station will effect opening and closure of said circuit to cause response of all the alarm mechanisms, a holding-circuit for the local alarm device, setting of the switch-mechanism at any one station to another position causing closure of the holding-circuit through the general alarm mechanism and causing closure of the local alarm device holding-circuit through all the local alarm devices except at the said one station whereby the local alarm device at only the said one station will respond and the local alarm devices at all the other stations and the general alarm mechanism will remain silent upon actuation of the signal formulating mechanism at the said one station and setting of the switch-mechanism at any one station to another position effecting adjustment of the circuits to cause closure of a holding-circuit through all the local alarm mechanisms, whereby upon actuation of the signal formulating mechanism at the one substation only the general alarm mechanism will respond, substantially as described.

28. In a signaling-system, the combination of a general alarm circuit including general alarm mechanism, a local alarm circuit including local alarm mechanism, a plurality of stations, circuit-controllers at each station in the general and local alarm circuits, respectively, signal formulating mechanism at each station for operating both circuit-controllers, an alarm-controller at each station having means to variably control the responsive action of the alarm-mechanisms, means to lock said alarm-controller in the different positions it may be set, and means to operate said locking-means to disengage the alarm-controller, and means to return the alarm-controller to normal position when disengaged and hold it in normal position, substantially as described.

29. In a signaling-system, the combination of a plurality of signal-boxes connected by two electric-circuits with a central-station, each signal-box having signaling-mechanism including two circuit-controllers, one for each circuit, to send a box-number signal over each circuit, an alarm associated with each box arranged in one of said circuits, an alarm at the central-station arranged in the other circuit, and an alarm-controller at each box having means to variably control the responsive action of said alarms, means to lock said alarm-controller in the different positions it may be set, and means controlled by the door of the box to operate said locking-means to disengage the alarm-controller, and means to return the alarm-controller to normal position when disengaged and to hold it in normal position, substantially as described.

30. In a signaling-system, the combination

tion of a plurality of stations each having signal formulating mechanism and local alarm mechanism, general alarm mechanism, current supply mechanism, circuits
 5 for connecting said various mechanisms, switch-mechanism at each station normally set to adjust the circuits to cause response of all the alarm devices upon actuation of the associated signal formulating mechanism, the switch-mechanism at any station
 10 being adapted to be set to adjust the circuits to variably control the responsive action of said alarm devices, means to lock said switch-mechanism in the different positions it may be set, means controlled by the door
 15 of the box to operate said locking-means to disengage the switch-mechanism, and means to return said switch-mechanism to normal position when disengaged and hold it in
 20 normal position, substantially as described.

31. In a signaling-system, the combination of a general alarm circuit and a local alarm circuit, a plurality of stations, circuit-controllers at each station in the general
 25 alarm and local alarm circuits, respectively, a signal formulating mechanism at each station for operating both circuit-controllers, and non-interference mechanism at each station for preventing interference between
 30 signals when the signal formulating mechanisms at a number of stations are operating at the same time, substantially as described.

32. In a signaling-system, the combination of a general alarm circuit and a local alarm circuit, a plurality of stations, circuit-controllers at each station in the general
 35 alarm and local alarm circuits, respectively, a signal formulating mechanism at each station for operating both circuit-controllers, a non-interference mechanism at each station
 40 under the control of the general alarm circuit for preventing interference between signals when the signal formulating mechanisms at a number of stations are operating
 45 at the said time, substantially as described.

33. In a signal system, the combination of a general alarm circuit and a local alarm circuit, a plurality of stations, circuit-controllers at each station in the general alarm
 50 and local alarm circuits, respectively, a signal formulating mechanism at each station for operating both circuit-controllers, a non-interference mechanism at each station, the general alarm circuit-controllers being sub-
 55 ject to the non-interference control of said mechanism, substantially as described.

34. In a signaling-system, the combina-

tion of a general alarm circuit and a local alarm circuit, a plurality of stations, circuit-controllers at each station in the general
 60 alarm and local alarm circuits respectively, a signal formulating mechanism at each station for operating both circuit-controllers, a non-interference mechanism at each station
 65 under the control of the general alarm circuit to prevent interference between signals when the signal formulating mechanism at a number of stations are operating at the same time, both the general alarm circuit-controllers and the local alarm circuit-controllers
 70 being subject to the non-interference control of said mechanism, substantially as described.

35. In a fire alarm system, the combination of a plurality of non-interference fire
 75 alarm signal boxes connected by two electric circuits with a central-station, the signaling-mechanism of each of said boxes including two circuit-controllers, one in each circuit, means for operating the same to send a box-
 80 number signal over each circuit, an alarm at the central-station arranged in one of said circuits and subject to control of the non-interference mechanism of each signal-box, an alarm associated with each box arranged
 85 in the other of said circuits and also subject to the control of said non-interference mechanism, and means at each local-station for variably controlling the responsive action of the said alarms, substantially as described. 90

36. In a signaling-system, the combination of a general alarm circuit including general alarm mechanism and a local alarm circuit including local alarm mechanism, a plural-
 95 ity of stations and circuit-controllers at each station in the general and local alarm circuits respectively, signal formulating mechanism at each station for operating both circuit-controllers, an alarm-controller at each station having means to variably control the
 100 responsive action of the alarm mechanism, a non-interference mechanism at each station for preventing interference between signals when the signal formulating mechanisms at a number of stations are operating at the
 105 same time, substantially as described.

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

NATHAN H. SUREN.

Witnesses:

CHARLES H. MOULTON,
 EDWARD J. COLEMAN.