F. W. COLE.

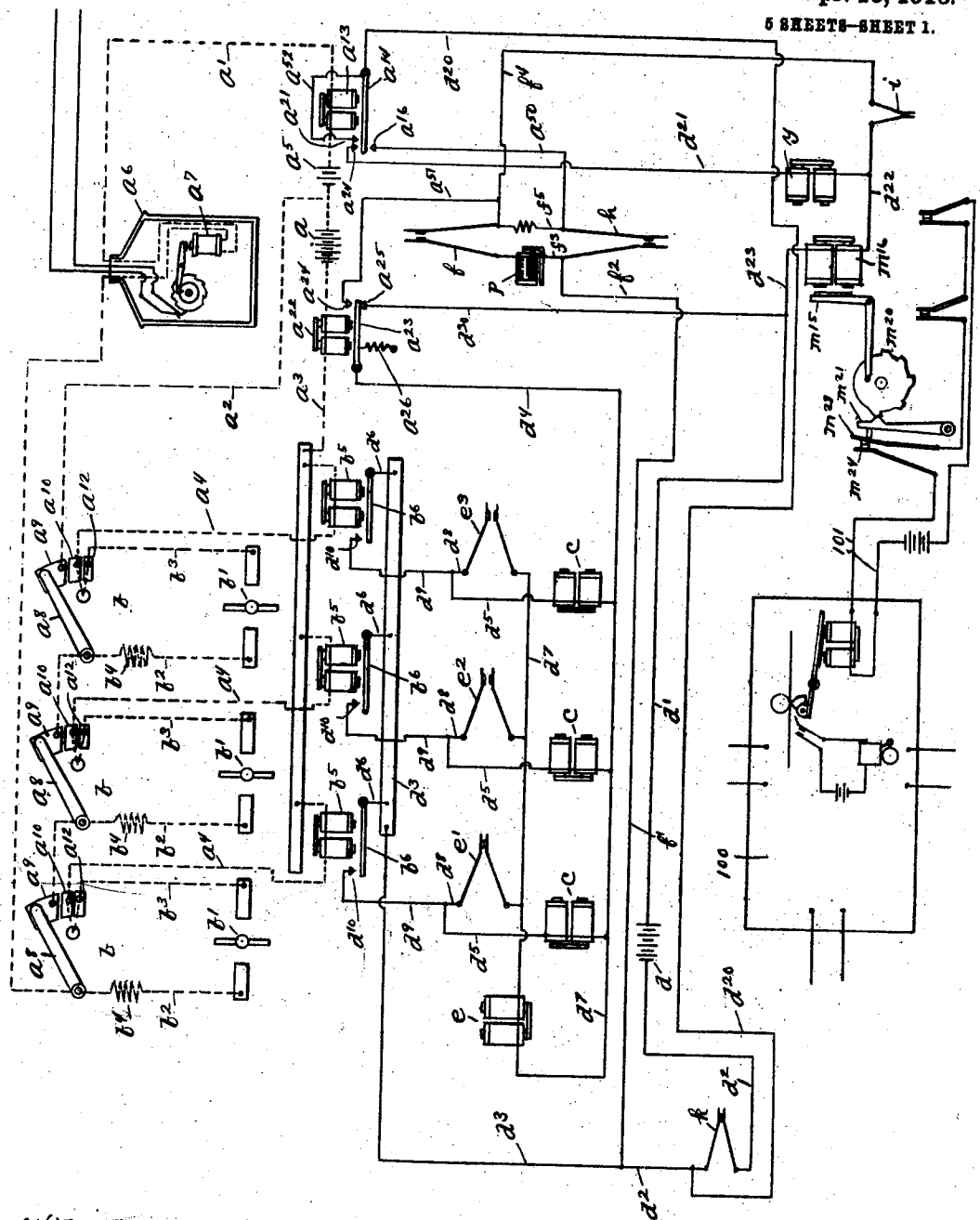
SUPERVISORY SIGNAL SYSTEM.

APPLICATION FILED APR. 15, 1910.

1,058,724.

Patented Apr. 15, 1913.

5 SHEETS—SHEET 1.



Witnesses:
H. B. Davis.
W. A. Boyle.

Fig. 1.

Inventor:
Frederick W. Cole
by Noyes & Harriman
Attys.

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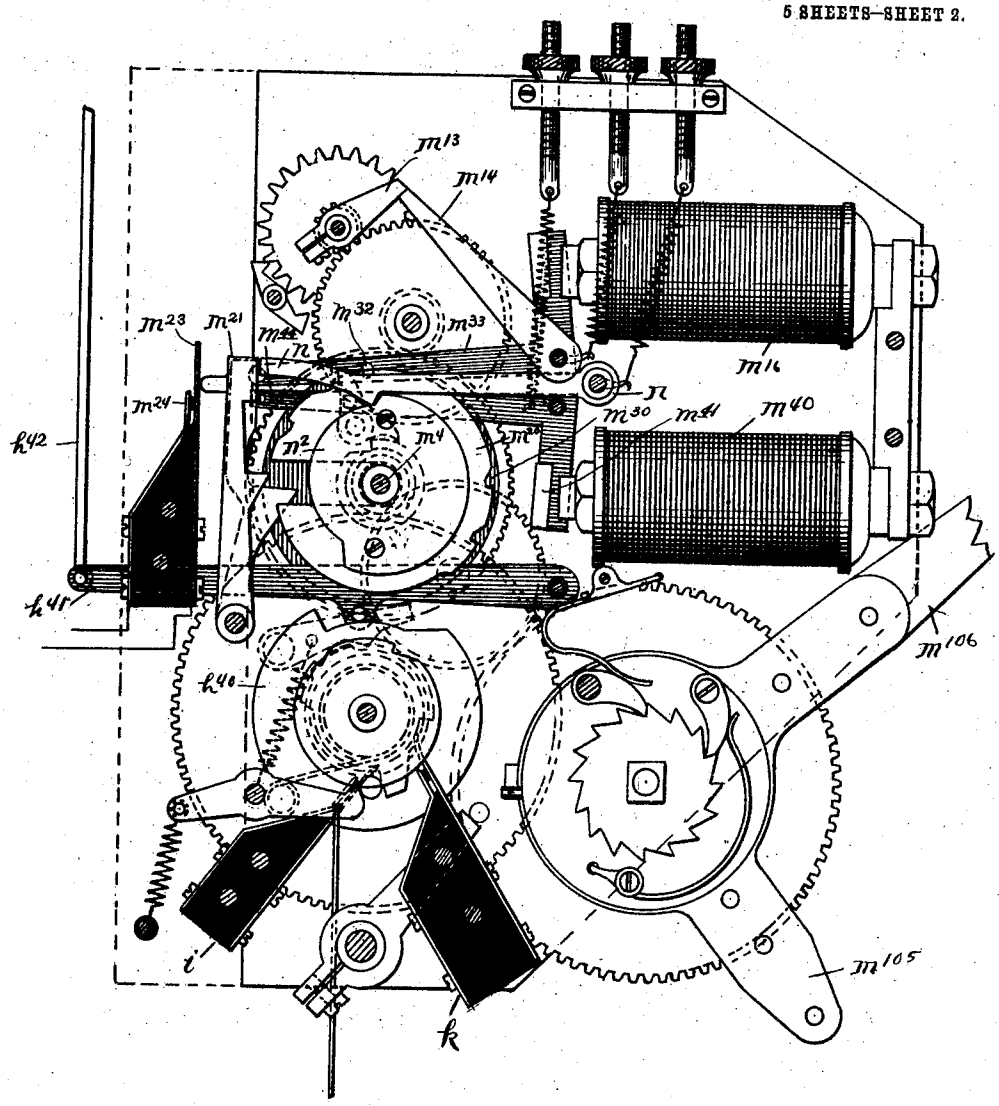

Fig. 2.

Witnesses:
H. B. Davis.
W. K. Boyle.

Inventor:
Frederick W. Cole
by Hayes & Harriman
Attys.

F. W. COLE.

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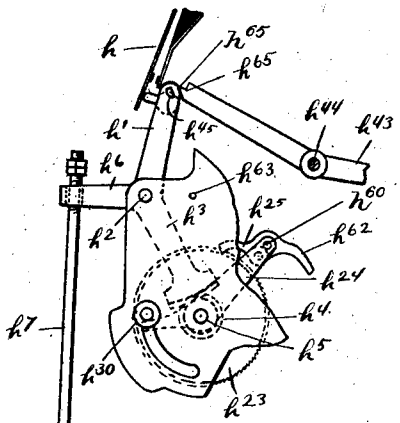


Fig. 3.

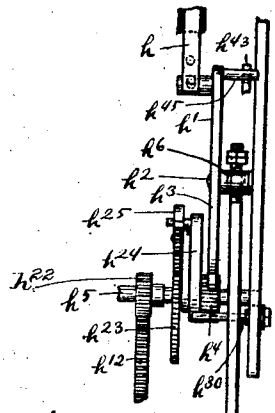
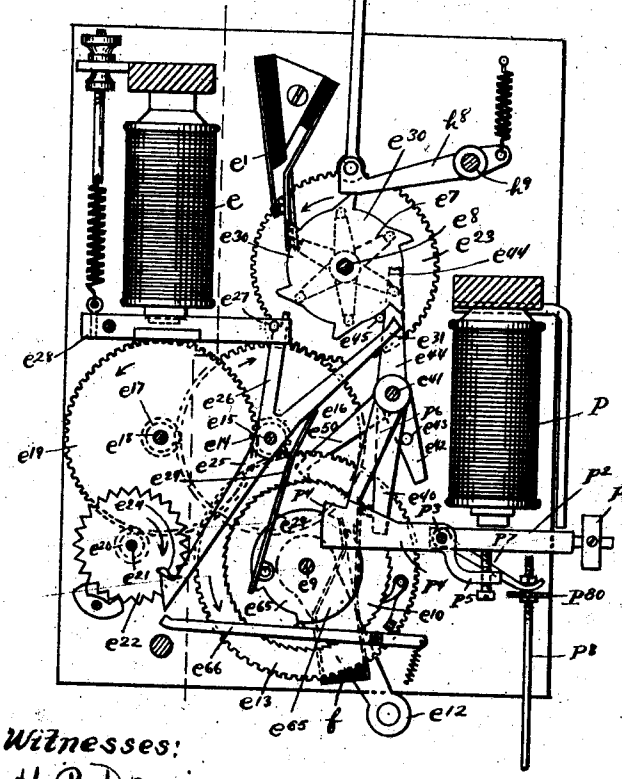
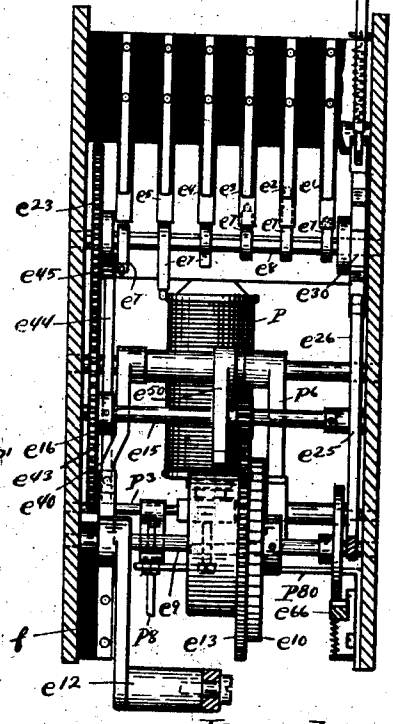


Fig. 4.





Witnesses:
H. B. Davis
W. A. Boyle

Inventor:
Frederick W. Cole
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Attys

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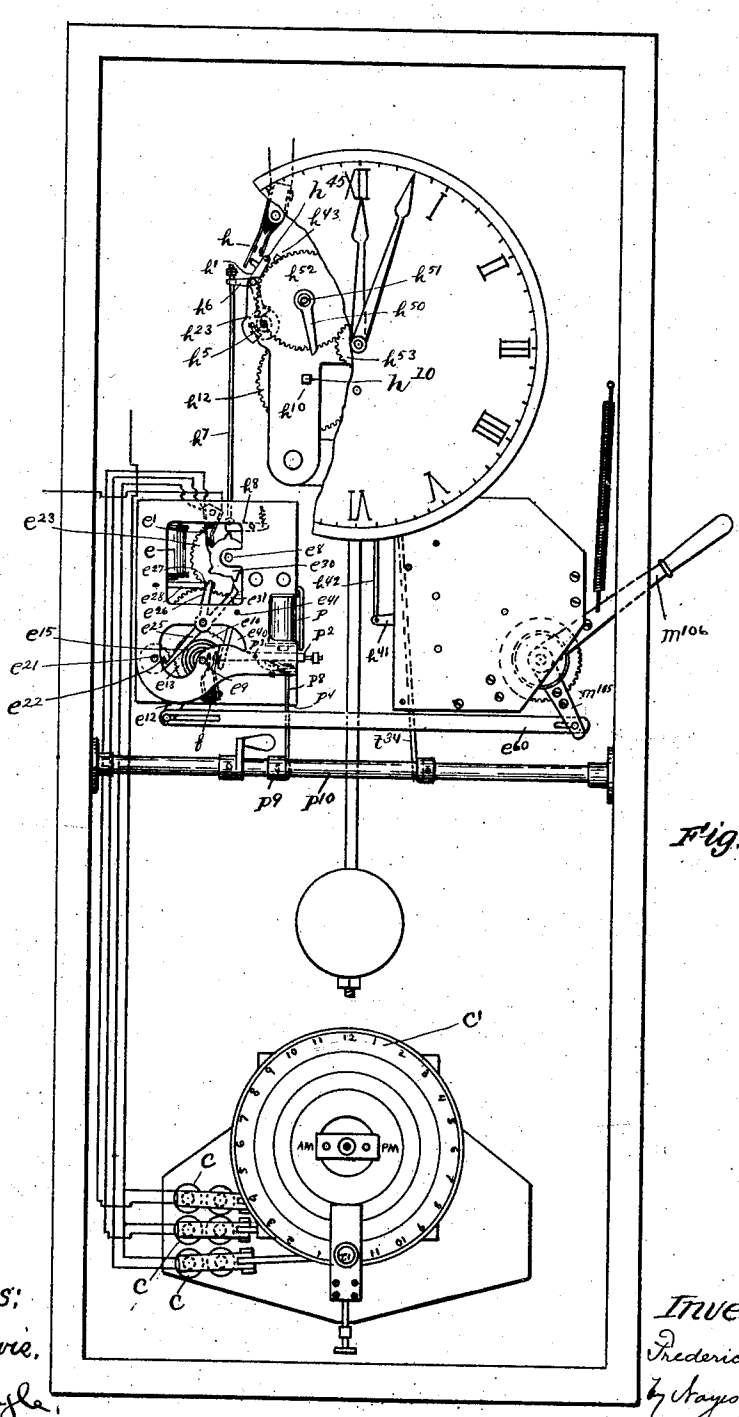

Fig. 5.

Witnesses:
H. B. Davis.
D. A. Boyle.

Inventor:
Frederick W. Cole
by Hayes & Harrison
Attys.

F. W. COLE.

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5 SHEETS—SHEET 5.

Fig. 6.

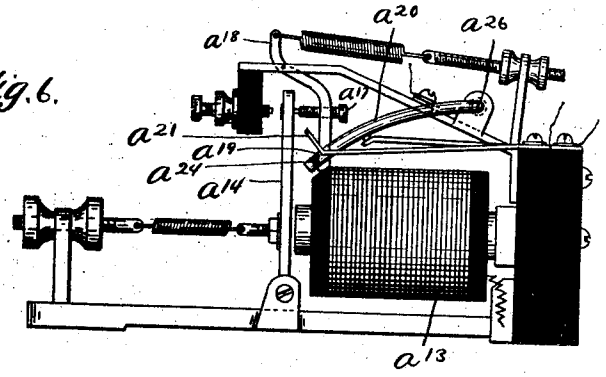


Fig. 7.

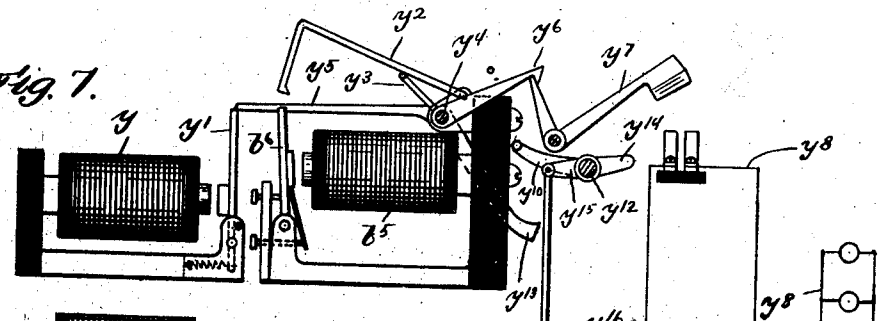
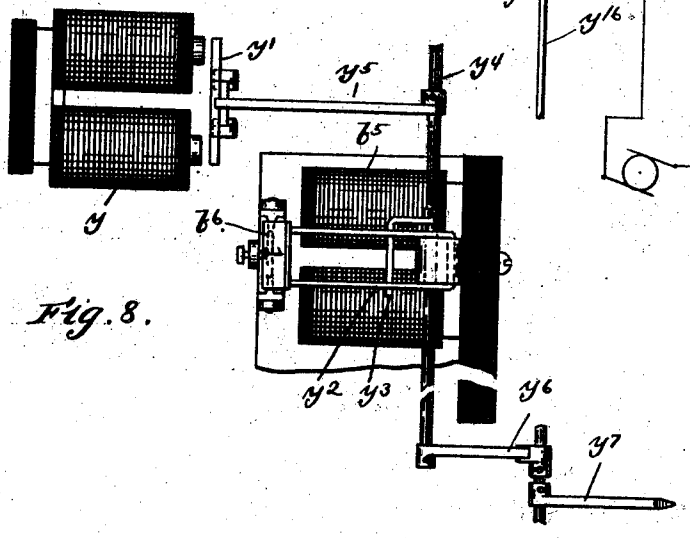


Fig. 8.



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H. A. Boyle.

Inventor:
Frederick W. Cole
by Noyes & Harriman
attys.

UNITED STATES PATENT OFFICE.

FREDERICK W. COLE, OF NEWTON, MASSACHUSETTS, ASSIGNOR TO THE GAMEWELL FIRE ALARM TELEGRAPH COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

SUPERVISORY SIGNAL SYSTEM.

1,058,724. Specification of Letters Patent. Patented Apr. 15, 1913.

Application filed April 15, 1910. Serial No. 555,601.

To all whom it may concern:

Be it known that I, FREDERICK W. COLE, of Newton, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Supervisory Signal Systems, of which the following is a specification.

This invention relates to an electric supervisory signal-system.

It comprehends essentially the combination of an auxiliary fire-alarm and a watchman's supervisory signal-system.

An auxiliary fire-alarm, as ordinarily constructed, comprises essentially an electric-circuit, auxiliary to the fire-alarm circuit, and arranged throughout a building or other property to be protected, and is connected to the starting-magnet of a fire-alarm signal box in said fire-alarm circuit, and has signaling-devices arranged throughout the building, adapted to be operated in case of a fire to cause said starting-magnet to release or otherwise operate said fire-alarm box to send its signal to the fire-department.

A watchman's supervisory signal-system, as ordinarily constructed, comprises signaling-devices arranged throughout a building or other property, adapted to be operated by a watchman going his round, to control the operation of signal-receiving devices located at a supervisory-station, where supervisors are in attendance, whose duties are to note the reception of signals indicating the proper and also improper operation of the signaling-apparatus, and to immediately make an investigation in all cases of evidence of trouble, or failure of the watchman to properly perform his duty.

The essential object of this invention is to combine an auxiliary fire-alarm with a watchman's supervisory signal-system, whereby the same supervision may be given to the auxiliary fire-alarm apparatus and circuits as is given to the watchman's signaling-apparatus and circuits; and, in addition thereto, to provide other novel and valuable features whereby the utility, efficiency, and value of both are increased, taken separately or collectively.

The invention comprises signaling-devices arranged at signal-stations throughout a building to control an auxiliary-circuit, and adapted to be operated at frequent intervals by a watchman going his round, to cause the transmission of an "on-duty" signal, and a signal-receiving device located at a supervisory-station, the operation of which is controlled by said signaling-devices and also by the fire signaling-devices.

The invention also comprises other signal-receiving devices, such as a signal-recorder, located at the supervised building, as, for instance, in the office thereof, adapted to be controlled by the watch signaling-devices and also by the fire signaling-devices.

A simple arrangement for sending the signals to the supervisory-station comprehends the employment of a supervisory-circuit connecting the supervised building with the supervisory-station, and a code-signal transmitter at the supervised building, arranged to send signals over said circuit and adapted to be controlled by the aforesaid signaling-devices. The arrangement, however, is such that the operation of the watch signaling-devices will not affect the starting-magnet of the auxiliarized fire-alarm box.

This invention also comprises automatic means for starting the supervisory signal-transmitter after a prolonged period of time, unless re-set, which is prevented from starting said transmitter within prescribed periods of time by the operation of the re-setting means, controlled by the watch signaling-devices, whereby, in case said signaling-devices are not operated within such periods of time, in a prescribed order, or otherwise, or in case the signaling-devices or the auxiliary-circuit or system containing them is out of order, so as to render their operation ineffective, a signal, herein termed an "off-duty" signal, and which is different from the aforesaid signal, will be sent promptly by the supervisory signal-transmitter to the supervisory-station, to be recorded and audibly announced.

The invention also comprehends the employment of means for controlling the operation of the supervisory code-signal transmitter to cause it to send a signal to the supervisory-station promptly, in case the auxiliary-circuit or apparatus is out of order, or is not in its proper operative condition, thereby affording a substantial element of safety by indicating that the apparatus is continuously in working condition. The signal thus sent, which is caused by improper or abnormal conditions, is herein

termed a "trouble" signal, and will be different from the other signals, and will preferably be both recorded and audibly announced.

As the auxiliary-circuit is controlled by the fire signaling-devices, and also by the watch signaling-devices, and as the latter signaling-devices are operated frequently, and signal-receiving apparatus at the supervisory-station is caused to respond in some manner to both signals, and, furthermore, as the failure to operate the watch signaling-devices also causes signal-receiving apparatus at the supervisory-station to respond, a valuable surveillance over the auxiliary-circuit and apparatus is obtained, which is an important feature, as it insures said circuit being kept in working condition for the sending of the fire-signals, which are the most important signals of all. Suitable local annunciators may also be employed for indicating the locality of any station operated for fire, and bells to give local alarm operated throughout the premises to call attention, and lamps lighted throughout the building.

As it is important to distinguish the signals one from another at the receiving-station and to call attention to the important signals, the supervisory code-signal transmitter is constructed and arranged not only to send different signals, but also a differentiating-impulse in conjunction with some of them, which will cause the operation of alarm-mechanism at the supervisory-station, which does not respond to the other signals, and which will either audibly or visually call the attention of the supervisors to the fact that an important signal is being received, which requires immediate attention, and the signal sent will depend upon the particular means which caused its operation. A number of supervised buildings will be connected with the one central or supervisory-station, each building being equipped with an auxiliary fire-alarm system having an auxiliarized fire-alarm box and also a supervisory signal-transmitter, and the supervisory- or transmitting-circuit which extends from the supervised building to the supervisory-station will include the supervisory signal-transmitters of two or more supervised buildings, and therefore the supervisory signal-transmitters are preferably provided with signaling-devices, whereby code-signals will be transmitted by each for the identification of the supervisory-transmitter from which the signal is sent, and they will also be provided with non-interfering devices controlled by the transmitting circuit, whereby confusion or loss of signals is avoided, they being of such a nature that no matter for which one of its several signals the signaling-mechanism has been set to transmit, the non-interference devices will keep it so set until the selected signal has been correctly sent over the transmitting-circuit.

Figure 1 is a diagram of a circuit which may be employed in installing the system embodying my invention, the several devices which are connected therewith being also shown in diagram, Fig. 2 is a front view of a multiple code-signal transmitter, such as may be employed, Figs. 3 and 4 are respectively front and side views of the "on-duty" and the "off-duty" signal-controlling mechanisms which may be employed, Fig. 5 is a front view of a watch-clock such as may be employed, the "on-duty" and "off-duty" signaling-mechanisms being arranged in the case thereof, Fig. 6 is a side view of a relay which may be employed to control the circuit to send a fire-signal and also a test-signal, Figs. 7 and 8 are details of the annunciating means which may be employed for locally annunciating the fire-signals.

The auxiliary-circuit here shown, see Fig. 1, for the purpose of illustrating this invention is a modification of a well-known type, and comprises essentially an open circuit having a heavy battery and one or more open branches at one side of said battery and a closed loop at the other side of said battery.

a represents the heavy battery; a', a^2, the circuit-wires of the closed loop at one side of said battery; and a^3 a circuit-wire leading from the other side of said battery which has one or more open branches a^4. A small battery a^5 may and preferably will be arranged in the closed loop for testing purposes. The closed loop is extended throughout the building or other property to several fire-signal stations b, and also to an auxiliarized fire-alarm box a^6, the starting-magnet a^7 of which is contained in said loop. The auxiliarized fire-alarm box has its signaling-devices connected in a fire-alarm circuit by which the fire-alarm signals are sent to the fire department.

At the several auxiliary fire-signal stations b, a^8 represent pivoted switch-arms normally resting on plates a^9, all arranged in series in the closed loop. The several open branches a^4 of the auxiliary-circuit also extend to the several auxiliary fire-signal stations b, and are connected to plates a^{10}, arranged close to the plates a^9, so that the switch-arms a^8 may be readily moved from the plates a^9 to make connection with the plates a^{10}. The switch-arms a^8 and plates a^9, a^{10} constitute the fire-signaling devices, and said signaling-devices are manually operated, and, when operated, the closed loop will be opened, and that side of said loop containing the starting-magnet a^7 of the auxiliary fire-alarm box will be connected to the open branch leading to the plate a^{10} associated with the switch-arm which is

operated. The heavy battery a will be then included in the circuit thus formed, and the starting-magnet a^7 caused to release or otherwise operate the auxiliarized fire-alarm box. In case the usual small battery a^5 is employed in the closed loop, it will preferably be arranged with its poles disposed the same as the poles of the heavy battery a, so that, when the two batteries are connected in series, their combined energies will be utilized.

Throughout the building watchman's signal-stations hereinafter referred to as watch-signal stations or watch-stations are arranged. They may be combined with the fire signal-stations b, but preferably will be made as separate stations. As here shown, they each have a signaling-device, such as a circuit-closer b', adapted to connect together a pair of circuit-wires b^2, b^3, one, as b^2, leading from the closed loop of the auxiliary-circuit, preferably from one side of a fire signaling-device and through a resistance-coil b^4, and the other, as b^3, leading from a branch a^4 of the auxiliary-circuit, preferably from the plate a^{12}, which is electrically connected with the plate a^{10} at the other side of said fire signaling-device.

The circuit-closer b' may comprise a key, which will be carried by a watchman, having projections designed to engage and connect together two pairs of spring-clips connected respectively with the circuit-wires b^2, b^3. Whenever any one of the watch signaling-devices is operated, one of the open branches a^4 is connected with the closed loop, forming a closed circuit as follows: battery a, circuit-wires a^3, a^4, b^3, signaling-devices b', circuit-wire b^2, to the closed loop, where the current divides, the larger part going through the path of low resistance by circuit-wire a^2 to battery. Thus, a section of the closed loop and some one of the branches of the auxiliary-circuit is utilized when operating any of the watch-signaling devices. If one of the sections of the closed loop should be broken at the moment the signaling-device b' is operated, the other section will be utilized to form a closed circuit. The resistance b^4, which is included in the circuit formed by the operation of the watch signaling-device b', as, for instance, in branch-wire b^2, is sufficient to allow but a small amount of current to flow through the circuit, so that the starting-magnet a^7 of the auxiliarized fire-alarm box will not be operated to start said box, even though the section a^2 of the loop is broken and the section a' of the closed loop is the only one included in the closed circuit formed by the operation of the watch-signaling devices.

The watch signaling-devices are designed to control the operation of signal-receiving apparatus at a supervisory-station 100, where the supervisors are in attendance, and means are herein provided for sending to said supervisory-station two different signals which are controlled by the watch-signaling devices, namely, an "on-duty" signal, indicating that the watchman is attending to his duty, and an "off-duty" signal, indicating that the watchman is not attending to his duty, or that, for some cause, the watch signaling-devices or circuits or devices responsive to the operation thereof have failed to operate. These signals coming into the supervisory-station place the watchman and the signaling-devices and the circuits controlled thereby, including the auxiliary fire-alarm circuit, under the direct supervision of the supervisors at said station.

For sending the "on-duty" signal the means shown in my application for Letters Patent, Serial No. 555,603, filed April 15, 1910, may be employed, and such means possesses many advantages, among them being the provision of means for requiring the watchman to visit the signal-stations in a prescribed order, and also means for locally recording all the signals, and means for sending a signal to the supervisory-station only when all of the signal-stations have been visited. In lieu of this particular means for sending the "on-duty" signal, so far as my present invention is concerned any other suitable means may be employed.

For sending an "off-duty" signal, the means shown in my application for Letters Patent, Serial No. 555,604, filed April 15, 1910, may be employed, as such means possess many advantages, among them being the provision of automatic means for sending a signal after a prolonged period of time, unless re-set, and re-setting means adapted to be operated by the signaling-devices at the signal-stations when said signaling-devices are operated to send the "on-duty" signals. In lieu of this particular means for sending the "off-duty" signal, so far as my present invention is concerned any other suitable means may be employed.

Both the "on-duty" and the "off-duty" signaling-means are designed to operate or set in motion suitable code-signaling-mechanism for sending signals over a supervisory circuit 101, to a supervisory-station 100, and for sending these two signals, as well as other signals as will be hereinafter described, code-signal transmitting means, such, for instance, as shown in my application for Letters Patent, Serial No. 555,605, filed April 15, 1910, may be employed, but my invention is not limited to the employment of these means, as it is obvious that, so far as this invention is concerned, any other suitable code-signal transmitting means may be employed. The particular form of code-signal transmitting-means shown in my said application con-

sists of a multiple code-signal transmitter, and sends its signals over the supervisory-circuit 101, to the supervisory-station 100.

Referring to Fig. 2, the multiple signal-transmitter of my said application is shown for purposes of illustration, but a detailed description of the same is deemed unnecessary. The signal-wheel m^{20} of said transmitter is adapted to co-act with a signal-key m^{21}, and to be revolved to send a code-signal representing an identification number of a supervised building with or without a differentiating signal-impulse. The signal-impulses composing the identification number are of short duration, and the differentiating signal-impulse is of long duration. The identification number, once sent, designates the "on-duty" signal; twice sent, with a differentiating signal-impulse between them, designates an "off-duty" signal; and, as additional signals which may be sent by the transmitter and which will be hereinafter described, the identification number three times sent, with differentiating signal-impulses between them, designates a "trouble" signal; and four times sent, with differentiating signal-impulses between them, designates a fire-signal. The prolonged signal-impulse is caused to be sent with all the signals except the "on-duty" signal, and is prevented on such signal by the coöperation of a pivoted lever n with the signal-key m^{21}, said lever being moved by a cam-disk n^2, revolving in unison with the signal-wheel. This signal-transmitter is adapted to be electrically started and controlled, and, for such purpose, a starting-magnet m^{16} is employed for releasing or otherwise operating it, and also for controlling its operation to cause the different signals to be transmitted. Said starting-magnet m^{16} is connected in the circuit of battery d, and said circuit has several branches containing circuit-controlling devices, arranged to separately control the operation of said circuit and thereby cause the starting-magnet to release the signal-transmitter to transmit the different signals. This local circuit is controlled by relays in the branches of the auxiliary-circuit, but said relays may be omitted if desired. As several code-signal transmitters are designed to be included in a single supervisory-circuit which is connected with a supervisory-station, each may be provided with non-interference devices adapted to be controlled by the supervisory or transmitting circuit, whereby confusion or loss of signals is avoided; as, for instance, a non-interference magnet m^{40} may be employed, see Fig. 2, the armature m^{41} of which is attached to a lever m^{44} adapted to coöperate with the signaling-devices in the manner shown and described in my said application, Serial No. 555,605. For the transmission of an "on-duty" signal a local circuit-controlling device f is provided in one of the branches of the local-circuit, and the circuit controlled by it is as follows: battery d, circuit-wires d', d^{23}, starting-magnet m^{16}, circuit-wires d^{22}, f^4, local circuit-controlling device f, circuit-wires f^3, f^2, f', d^2, to battery. Herein said local circuit-controlling device f is adapted to be operated when, but not until, the signaling-devices of all the watch signaling-stations have been operated, preferably in a prescribed order. For the accomplishment of this result the "on-duty" signal-mechanism of my application Ser. No. 555,603, is herein employed, which is shown in Figs. 3 and 4, for purposes of illustration only. A detailed description is herein deemed unnecessary.

Referring to Figs. 3 and 4, e represents the controlling-magnet for the route-determining mechanism, and e', e^2, e^3, the route-switches corresponding in number to the number of watch-signal stations. Said switches are arranged in separate branches of a local circuit controlled respectively by the several watch signaling-devices, and the controlling-magnet is arranged in a branch common to all said branches, whereby it may be arranged in series with any one of said switches. As here shown, see Fig. 1, the several switches are included in branch-circuits d^8, d^9, leading from a branch-circuit d^7, which is common to all said branch-circuits d^8, and contains the controlling-magnet e. Said branch-circuits d^8, d^9, respectively extend to the contacts d^{10}, with which the armatures b^6 of relays b^5 are adapted to coöperate. Said armatures b^6 are connected by circuit-wires d^6 with the branch-wire d^3 of the local-circuit, and the relays b^5 are included in the open branch-wires a^4 of the auxiliary-circuit, so that said armatures are respectively responsive to the operation of the several watch signaling-devices b'. The local-circuit containing the route-switches is as follows: battery d, circuit-wires d', d^{30}, armature a^{23}, of a testing-relay (to be described), circuit-wires d^4, d^7, d^8, d^9, contact d^{10}, armature b^6, circuit-wires d^6, d^3, d^2, to battery. But one of the switches is closed at a time, and the controlling-magnet can only respond to the operation of the particular watch signaling-device which controls the branch-circuit containing the closed switch, and it is designed that the switches shall be successively closed by means controlled by the controlling-magnet e, to place said controlling-magnet successively under the control of the several watch-signal-stations to be operated by the signaling-devices thereat and to thereby require the watchman to visit the several signal-stations in a prescribed order; that is to say, as a closed switch is opened, the next succeeding switch will be closed, and so on throughout the entire group, and the con-

trolling-magnet e is therefore successively arranged in series with the switches. For the purpose of successively operating the several switches *seriatim*, as above described, a series of fingers e^7, see Figs. 3 and 4 one for each switch, extend radially in different directions from a shaft e^8, and said shaft is adapted to be revolved intermittently to cause the fingers to successively engage the switches. Said shaft is normally at rest with one of its fingers in engagement with one of the switches, to thereby hold said switch closed, and, as the shaft is moved, said finger disengages its switch, and the next finger engages its switch, and so on during the entire revolution of the shaft. A normally-wound train is employed for revolving the shaft intermittingly, which is adapted to be released by the controlling-magnet e each time said magnet is energized. Said magnet, however, can only be energized as stated, by the operation of a signaling-device which controls the branch-circuit containing a closed switch in series with which said controlling magnet is arranged.

When all of the route-switches e', etc., have been operated, as a consequence of the watchman visiting all of the watch signal-stations, the intermittently-movable route-switch mechanism will have completed a cycle of its operation, and, at such time, or during one of its steps, the local circuit-controlling device f will be momentarily operated by it. To accomplish this result, an arm e^{40}, loosely mounted on a pivot-shaft e^{41}, is arranged to engage said local circuit-controlling device f, and an arm e^{42}, which is also mounted for convenience on said pivot-shaft e^{41}, has a laterally-extended pin e^{43}, which engages said arm e^{40}, and an arm e^{44} is connected with said arm e^{42}, and extends into the path of movement of a pin e^{45} on the gear-wheel e^{23}, or other movable part of the train, so as to engage said arm e^{44} while the shaft e^8 is moved during one of its intermittent movements. When the pin e^{45} in passing engages and moves this arm e^{44} the local circuit-controlling device f will be momentarily closed to cause energization of the starting-magnet m^{16} of the supervisory signal-transmitter, to merely release said transmitter to permit it to operate and send its "on-duty" signal. When the starting-magnet m^{16} is thus energized, the locking-lever controlled by it is moved to release the signal-transmitting train; that is to say, the arm m^{14} of the locking-lever disengages the detent m^{13}, but before said detent m^{13} has made a complete revolution the arm m^{33} of the locking-lever will be held in unlocked position by the notched disk m^{30}, and, as the starting-magnet is immediately deënergized, said locking-lever will be permitted to resume its normal position, as soon as the disk m^{30} has made a complete revolution, at which time a pin m^{32} on the arm m^{33} falls into a notch in said disk. As the signal-wheel m^{20} is secured to the shaft m^4, bearing the notched disk m^{30}, it also makes a complete revolution during this time, and a signal, consisting of one round of the identification number, is transmitted.

Each time a watch-signaling-device is operated, the auxiliary-circuit, or at least a part thereof, is used and therefore tested, and if said circuit is in proper working condition, and the watch signal-stations properly visited, the route-switch mechanism will be intermittently operated and finally the "on-duty" signal will be sent to the supervisory-station, indicating that the watchman has been and is properly performing his duties, and also indicating that the auxiliary-circuit is in good working condition for emergency, and also indicating that the instruments in the building are operatively connected with the circuits leading to the supervisory-station and have not been tampered with or disabled from any cause.

As a local means for recording the movements of the watchman and the time he visits the several watch signal-stations, an electric signal-recorder, such as watch-clock, may be employed. Said signal-recorder, may be located in the building to be supervised. It may be of any usual or suitable construction, so far as my present invention is concerned. In Fig. 5 an ordinary watch-clock is shown as the signal-recorder for purposes of illustration only, and in the case of said clock the "on-duty" and "off-duty" signaling-mechanisms and other devices are preferably located, in order that as much as possible of the apparatus may be assembled in compact form. The watch-clock has several operating-magnets c corresponding to the number of watch-signal stations. Said operating-magnets c are included in circuit-wires d^5 leading from the circuit-wire d^4 to the circuit-wires d^9, so that they are arranged respectively in multiple with the route-switches e', etc., and are adapted to respond to the movements of the armatures of the relays b^5, regardless of whether the route-switches e', etc., are open or closed.

As the watchman visits the several watch signal-stations and operates the signaling-devices thereat, the operating-magnets c will be operated and the watch-signals recorded on the dial of the watch-clock, thereby indicating that he has visited his stations, and also the stations he has visited, and the time of each visit, even though the route-switches have not been operated or have failed to respond, for any cause, or the "on-duty" signal has not been sent. In case the watchman should not follow the prescribed order, such error, or the route he did follow, will be recorded on the dial of the watch-clock, and therefore serve as an additional check on the

watchman. This watch-clock also serves as a local recorder for the auxiliary fire-alarm signals, for, whenever one of the fire-signaling-devices is operated to control the auxiliary-circuit and cause the starting-magnet a^7 to release or otherwise operate the auxiliarized fire-alarm box, a relay b^5, corresponding to the fire-signal station which has been operated, will attract its armature, and the corresponding operating-magnet c of the watch-clock will make a record on the dial of the watch-clock indicating the station operated for the fire, and the time of its operation, as well as providing a permanent supplemental record at the building for the fire-signal.

Referring to the "off-duty" signal which is sent to the supervisory-station. This signal is of more importance than the "on-duty" signal, for the reason that, when trouble exists, it should be attended to immediately for the protection of the watchman, for the protection and preservation of property in danger, for the capture of criminals at work, or before they can escape, for the maintenance of the high efficiency of the auxiliary-circuit and the fire-alarm devices connected therewith, as well as for maintaining proper supervision of the watchman. In Figs. 3, 4, and 5, the means employed in my said application Ser. No. 555,604, are shown for sending the "off-duty" signal, but a detailed description of same is deemed unnecessary.

h represents a local-circuit-controlling device, which is shown as normally open, and, when closed, operates to close branches of a local-circuit to operate the starting-magnet m^{16} of the supervisory signal-transmitter and cause said signal-transmitter to transmit the "off-duty" signal. Said local-circuit is as follows, see Fig. 1: battery d, circuit-wires d', d^{23}, starting-magnet m^{16}, circuit-wires d^{22}, f^4, f^5, circuit-controlling device h, circuit-wires f^2, f' d^2, to battery.

Automatic means is provided for operating the local circuit-controlling device h, to close the local-circuit, if allowed to do so, at the end of or after a prolonged period of time, and said automatic means is arranged to be repeatedly re-set or set back to starting point on each operation of a watch-signal-device b', and, as here shown, on the operation of the route-switch mechanism, although any suitable mechanism responsive to the proper operation of signaling-devices at the watch-signal stations may be employed, in lieu thereof. As the watch signaling-devices are operated at frequent intervals, to properly operate the route-switches e', etc., and finally send the "on-duty" signal, said automatic means will be repeatedly re-set and hence will not operate said circuit-controlling device h; but if more than the allotted time expires during which a watch signaling-device should have been operated, the sufficient time will elapse for said automatic means to operate to cause the circuit-controlling device h to close the circuit of the starting-magnet m^{16}, and cause the supervisory signal-transmitter to send the "off-duty" signal to the supervisory-station. The local circuit-controlling device h may comprise a pair of contact-pens, see Fig. 3 which are normally separated, one of which is movable into engagement with the other to close the circuit by its own spring action, when permitted to act.

An arm h', pivoted at h^2, is provided for normally holding said local circuit-controlling device h open, by engaging the spring-acting contact-pen. Said arm is moved in one direction, or advanced by the pressure of the spring-acting contact-pen upon it, but such movement is controlled or retarded by a continuously-operating timing-mechanism, such as a clock-train, and said arm is moved in the opposite direction or set back to starting point or thereabout by means controlled by the controlling-magnet e for the route-switch mechanism and "on-duty" signaling-device.

The timing-mechanism for timing or retarding the forward motion of the arm h', as here shown consists of a winding-shaft h^{10}, see Figs. 3, 4 and 5, bearing a main-spring, a spur-gear h^{12} driven thereby, which engages and drives continuously a pinion h^{22} secured to a shaft h^5 and a ratchet-toothed wheel h^{23} is secured to said shaft h^5. A pinion h^4 is mounted loosely on the shaft h^5, which is engaged by a toothed sector formed on the end of a lever h^3, which is rigidly connected with the arm h'. Said loose pinion h^4 is connected to an arm h^{24} having a pin h^{60}, which engages a pawl h^{25}, pivotally supported on another arm h^{61}, mounted loosely on said shaft h^5. The pin h^{60} enters or extends through a slot in the pawl, which is arranged at the side of its pivot, so that the pawl is movable on its pivot into and out of engagement with the ratchet-wheel by a movement of the arm h^{24}, to thereby connect the arm h' with and disconnect it from the continuously-moving ratchet-wheel. While the pawl is in engagement with the continuously but slowly moving ratchet-wheel, the arm h^{24} and pinion h^4 connected with it are moved slowly in a direction to permit forward movement of the arm h', and, if said arm h' is not re-set for a prolonged period of time, it will move forward far enough to permit the spring-acting contact-pen to engage the other pen and thereby close the circuit. To insure a quick closing of the members of said circuit-controlling device h, as contrasted to a slow closing of said members, incident to the slow movement of the train, to thereby prevent the battery from running down while a good

contact is being made, means are provided for disengaging the pawl from the ratchet-wheel at or about the end of the allotted period of time, whereby the arm h' is thereafter unrestrained. To accomplish this result the pawl is provided with an extension or tail h^{62}, which at the proper time engages a fixed pin h^{63} on the frame and by said pin is turned on its pivot to disengage the ratchet-wheel, and said extension is made long enough to continue in engagement with said pin h^{63} while the pawl is thereafter moved forward farther, and also while it remains in such forward position to allow quick closing of the contact springs h.

When the circuit-controlling device h closes the circuit of the starting-magnet m^{16}, said magnet will release or cause the supervisory signal-transmitter to operate to send the "off-duty" signal. When transmitting this signal, the signal-transmitter will continue to operate until the circuit of the starting-magnet m^{16} is opened. As here shown, this result is accomplished by means controlled by the signal-transmitter and non-interference magnet, as, for instance, it may be accomplished mechanically by a cam-wheel h^{40} driven by the transmitting mechanism, which operates when the identification number has been twice correctly sent, to raise a pivoted lever h^{41}, which is connected by a rod h^{42} with one end of a lever h^{43}, pivoted at h^{44}. The other or outer end of said lever h^{43} is beveled at one side and adapted, when depressed, to engage a pin h^{45} on the arm h' to move said arm backward a short distance, far enough to open the circuit-controlling device h. The arm h' is then partially restored to normal position, or partially re-set. The lever h^{43} has a shoulder h^{65} at its outer end, which passes by and slips under the pin h^{45}, when moved as above described, and by engagement with said pin both said lever and the arm h' are locked relatively to each other. The lever is at such time prevented from returning to normal position and the arm h' is held with the circuit-controlling device h open. The lever h^{43} has a loose sliding connection with its actuating-rod h^{42}, so that, when moved by said rod to open the circuit-controlling device h, it may remain in such abnormal position until subsequently released, yet the rod h^{42} is permitted to return to its normal position independently thereof. As the arm h' is thus moved backward a short distance, the arm h^3 is correspondingly moved and the pinion revolved and the arm h^{24} moved backward, carrying with it the pawl and pawl-carrying arm, but the pawl is still held disengaged from the ratchet-wheel, and not until after the arm h^{24} has been restored to normal, and is beginning its forward movement, will said pawl again engage the ratchet-wheel. This automatic starting-means for the signal-transmitter is as above described thus temporarily disabled, or thrown out of action.

For the purpose of setting back the arm h' to starting point by means controlled by the switch-controlling magnet e at any time during its forward movement, to prevent the circuit-controlling device h from closing the circuit, and also after it has permitted the circuit-controlling device to close the circuit and has subsequently opened said circuit-controlling device, an arm h^6 is rigidly connected with said arm h', and is loosely connected by a rod h^7 with a spring-actuated arm h^8, pivoted at h^9, and arranged to normally rest upon and be held in elevated position by any one of the teeth of the intermittently revoluble toothed wheel e^{30} connected with the route-switch mechanism. When said toothed wheel e^{30} is revolved one step the tooth on which said arm h^8 rests passes from beneath the arm, permitting the arm to be moved by its actuating-spring into the interdental space adjacent said tooth, and such movement of the arm will cause the rod h^7 to draw down the arm h^6 and move the arm h' toward the left and thereby re-set it. Before the toothed wheel e^{30} is arrested, the next tooth thereon will engage and lift the arm h^8 and rod h^7, but during such upward movement said rod will slide freely in the hole in the arm h^6 through which it passes. When the arm h' is thus re-set the sector-lever is re-set by it, also the loose pinion h^4 and arm connected with it, and the pawl is caused to pass over but free from the teeth of the ratchet-wheel during such re-setting movement, but said pawl is moved immediately into engagement with the ratchet-wheel by the beginning of the forward movement of the arm h^{24}. The extent of backward movement of the arm h^{24} and parts connected with it by and during the re-setting operation, and, consequently, the time required for it to move forward to close the circuit-controlling device h, is greater than the length of the periods of time during which the watch-signal stations must be successively visited by the watchman, and such movement and prolonged period of time may be adjusted by a stop h^{30}, arranged on the frame against which the arm h^3 strikes when moved backward. When the watchman goes off duty, say in the morning, the "off-duty" signal is soon sent automatically by reason of the watch signaling-devices not having been operated during a prolonged period of time, and the automatic starting-means will not be re-set until he goes on duty at night. In case another watchman goes on duty when the night watchman leaves in the morning, as would be the case on holidays and Sundays, then the "off-duty" signal will not be sent, and the apparatus remains in operative con-

dition continuously whenever the watch is continued.

It is quite important to know whether or not the watchman returns to duty on time, and means are herein provided for automatically re-setting the starting-means at a predetermined time, as, for instance, when the watchman is due to return to duty, so that, in case he should not return to duty on time, an "off-duty" signal will be sent. For the purpose of accomplishing this result an arm h^{50} is adjustably secured to a shaft of the timing-mechanism, as, for instance, to the shaft h^{51}; and a toothed-wheel h^{52} is secured to the said shaft, back of said arm, which is arranged to make a complete revolution every twenty-four hours, and is preferably indexed to indicate the hours. Said arm h^{50} may be set to occupy different positions on its shaft, which positions may be determined by the indexed wheel. Said wheel h^{52} is driven by a toothed-wheel h^{53} secured to one of the shafts of the clock-train and the arm h^{50} is moved by it. This arm is made long enough to engage the pin h^{45} when the latter is in locking engagement with the restoring-lever h^{43}, but will pass by said pin without engaging it when said pin is in its re-set position. In case the arm h^{50} engages the pin while said pin is in locking engagement with the restoring-lever h^{43}, it acts to move said pin out of engagement with the shoulder on the restoring-lever, thereby releasing said restoring-lever, allowing the arm h^{50} to resume its normal position, and, as soon as it passes by said pin, the arm h' is free and will be immediately moved by the pressure of the spring-acting contact-pen thereupon to permit the circuit-controlling device h to again close and cause the supervisory signal-transmitter to send an "off-duty" signal. If the watchman has returned to duty on time and has visited his first station, then the arm h' will have been re-set by the means controlled by the switch-controlling magnet e, and hence the pin h^{45} will be removed from the path of movement of the arm. An "off-duty" signaling-mechanism is thus provided which gives a most efficient and valuable service under many different conditions. It is adapted to be brought into service when required, both manually and automatically, and remains in service as long as required, including Sundays and holidays, and the watchman and the property and also the auxiliary and local circuits and signaling instruments are under the same protection and supervision during Sundays and holidays as during the nights when the watchman is on duty. When not required, the "off-duty" signal is automatically sent to indicate that the "off-duty" signaling-mechanism is properly in circuit and temporarily disabled or thrown out of action, but is in readiness to immediately resume operation at the proper time, either by manually operating the resetting device, or by automatically rendering it operative.

As the supervisory-transmitter, and also the route-switch mechanism, contain normally-wound trains, which must be wound from time to time, it becomes one of the duties of the watchman to wind them; and it is herein designed that the watchman shall wind them on each round of his beat, to insure their always being maintained in a wound condition, and, for the accomplishment of this result, the winding-device for both trains is connected together and provided with a hand-lever projecting from the case which is adapted to be operated by the watchman to wind both trains at the same time.

The winding-lever e^{12}, of the route-switch mechanism, and the winding-lever m^{105} of the signal-transmitter, are connected together by a bar e^{60}, and a hand-lever m^{106} is connected with the shaft of one of the winding-levers for operating both winding-devices. In case a watchman fails to wind the trains at the designated times, means are provided for sending an "off-duty" signal to the supervisory-station, and, for the accomplishment of this result, as shown in Fig. 3, a cam e^{65} is secured to the winding-shaft or other member of the train, having a notch, and a spring-pressed lever e^{66} is pivoted to the frame, which has a projection which engages said cam and is adapted to enter the notch thereof when the cam is moved to bring its notch into position to receive said projection, as it will be when the train is run down more than the amount necessary to cause it to be operated from all the watch signal-stations. Said lever is arranged so that, when moved by its projection entering the notch in the cam, its end-portion will be moved into the path of movement of the locking-lever e^{25}, and thereby prevent said lever from moving far enough to release the train, and, as a result, the arm h' of the "off-duty" circuit-controlling device h cannot be set back to starting-point, and hence will soon cause said circuit-controlling device h to close and thereby cause the supervisory signal-transmitter to send an "off-duty" signal in the manner heretofore described.

As it is important that the supervisory-station be immediately notified of any trouble in the auxiliary-circuit, automatic means are provided for testing it, and said means is adapted to control the operation of the supervisory-signal-transmitter, whereby a signal is sent to the supervisory-station. This signal is herein referred to as the "trouble" signal, and is distinguished from the other signals, as, for instance, it may

consist of the identification number three times sent, preferably in connection with distinguishing impulses, whereby it is not only recorded, but also causes a visible or audible alarm-mechanism to respond.

For the purpose of automatically and continuously testing the closed loop a' of the auxiliary-circuit, a small battery a^5 is included therein, and also a relay a^{13}. The armature a^{14} of said relay is normally held by the weak battery in a semi-attracted position, see Fig. 6, against an adjustable pin a^{17}, on a pivoted-lever a^{18}, having connected with it a spring which is strong enough to resist further attraction of the armature when only the current of the weak battery is passing through the relay-magnet. When the armature of said relay is moved into its fully retracted position, as from a break in the closed loop or a weakening of the battery, it will engage a back contact-point a^{16}. The contact-point a^{16} is connected by a branch-wire a^{50} with a branch-wire f^5 of the local-circuit of the starting-magnet m^{16}, and the armature a^{14} is connected with the branch-wire d^{20} of said local-circuit, so that, when the armature closes on said back contact-point a^{16}, a local-circuit of the starting-magnet m^{16} is closed to release the supervisory code-signal transmitter to send a "trouble" signal to the supervisory-station. This local-circuit is as follows: battery d, circuit-wires d', d^{23}, starting-magnet m^{16}, circuit-wires d^{22}, f^4, f^5, a^{50}, contact-point a^{16}, armature a^{14}, circuit-wires d^{20}, d^2, to battery.

The signaling-determining device provided for controlling the transmitter to cause the "trouble" signal to be sent, consists of a switch-opening device represented as a cam-disk, adapted to be moved by the train to open a switch at the end of three rounds of the identification number, and which is shown as a pair of contact-pens i, which are arranged in the branch-wire f^4 of the local-circuit of the starting-magnet m^{16} of the transmitter. As soon as this switch is opened by the aforesaid switch-opening device, the local-circuit, which is closed by the retraction of the armature a^{14}, is opened, and the starting-magnet m^{16} then permitted to resume its normal condition to stop the transmitter, as previously described. The armature a^{14} and contact-point a^{16} thus constitute a local circuit-controlling device for controlling the circuit of the starting-magnet m^{16}, to indicate the condition of the auxiliary-circuit, and particularly the closed loop thereof.

For the purpose of automatically sending a "trouble" signal to the supervisory-station in case of a cross connecting any one of the branch-wires a^4 of the open auxiliary-wire a^3 with the closed loop a', a relay a^{23}, called a cross-relay, is included in said circuit-wire a^3, the armature a^{23} of which is normally retracted and engages a contact-point a^{25} connected with the branch-wire d^{30} of the local-circuit of the starting-magnet m^{16}, and said armature, when moved into attracted position, will engage a contact-point a^{24} connected with a branch-wire a^{51}, leading to the branch-wire f^4 of the local-circuit. In case a cross occurs, as above mentioned, the armature a^{23} is attracted, as is also the armature b^6 of one of the relays b^5, thereby closing the local-circuit of the starting-magnet m^{16}, which includes the switch i, so that the same "trouble" signal as heretofore described will be sent to the supervisory-station. The circuit is as follows: battery d, circuit-wires d', d^{23}, starting-magnet m^{16}, circuit-wire d^{22}, circuit-wires f^4, including the switch i, circuit-wire a^{51}, contact-point a^{24}, armature a^{23}, circuit-wires d^4, d^5, d^9, contact-point d^{10}, armature b^6, circuit-wires d^6, d^3, d^2, to battery. It will be noted that, in addition to the "trouble" signal being sent to the supervisory-station, a local record will also be made on the local signal-recorder, indicating the particular branch-wire which is accidentally connected or crossed to the closed loop of the auxiliary-circuit.

The armature a^{23} and contact-point a^{24} of the cross-relay constitute a local circuit-controlling device for the circuit of the starting-magnet m^{16}, which is operated to indicate the condition of the auxiliary-circuit and particularly the open circuit-wire thereof. The retractile-spring a^{26}, which is connected to the armature a^{23}, is quite strong, and acts to hold said armature retracted when the watch signaling-devices are operated, and a resistance b^4 is included, so that said armature will not respond to the operations of said signaling-devices. Therefore, it will be seen that these two local circuit-controlling devices, which are employed to indicate the condition of the auxiliary-circuit, are arranged to cause code-signals to be sent to the supervisory-station, whereby abnormal conditions of the auxiliary-circuit will be immediately indicated at said station, and the particular auxiliary-system from which the signal is sent will be identified, and, so far as my invention is concerned, they may be so employed regardless of other features of this invention. When employed in connection with the means for sending other supervisory-signals, the supervisory signal-transmitter will preferably be of the multiple type, but otherwise a simple form of code-signal transmitter may be employed. In the system, as here shown, the circuits are constructed as separate, normally open circuits, but this construction is not a material part of my invention as it is obvious that all the circuits might emanate from a single source of energy, and yet be separate as regards their

operation, and such an arrangement of circuits is the equivalent of the separate circuits here shown.

For the purpose of testing any of the open circuits, as here shown, testing-magnets may be employed like unto the construction shown in my aforesaid application Ser. No. 555,603. One such testing-magnet is represented at p, Fig. 3, for illustration, it being included in the branch-circuit-wire f^3, in series with the local circuit-controlling device f, so that when said local circuit-controlling device is operated to close the local-circuit of the starting-magnet m^{16}, said testing-magnet p will be included, and, if the battery-current d is of the requisite strength, it will be properly energized to hold its armature in attracted position, and, if the current is not of the proper strength, the magnet will be but slightly or moderately energized, and not enough to hold its armature in attracted position. The local-circuit containing the magnet p is as follows: battery d, circuit-wire d', d^{23}, starting-magnet m^{16}, circuit-wire d^{22}, switch i, circuit-wire f^4, local circuit-controlling device f, test-magnet p, circuit-wires f^3, f^2, f', d^2, to battery. p^2 represents the armature of this testing-magnet p. It is loosely mounted on a shaft p^3, and has an extension on which is adjustably secured a retractile weight p'. Secured to the shaft p^3 is a supporting-lever comprising a portion p^5, extended beneath the armature p^2, through which passes an adjusting-screw on which said armature rests, so that the normal position of said armature is controlled by said supporting-lever. This supporting-lever also comprises an arm p^4, which engages or rests against the end of an arm p^6, connected with the arm e^{40}, which is adapted to operate the local circuit-controlling device f. The arm p^4 of the supporting-lever has a notch at its end in front of the point of engagement with the arm p^6, and, when the arm p^6 is moved, as it will be when the arm e^{40} is moved to close the circuit-controlling device f, then its end will pass over the notched portion of the arm p^4. At this moment, if the battery-current is of the requisite strength, the testing-magnet p will be energized sufficiently to attract and hold its armature p^2 in its attracted position when released by the aforesaid movement of the arm p^6; but, if not of the required strength, then the armature will be moved into its retracted position, raising the arm p^4, so that its notched end-portion will engage the arm p^6, while the latter is in its abnormal position, and the shoulder of the notch will thereby lock said arm p^6 from returning to normal position, and the parts will remain locked and the circuit contacts f closed until the armatures and supporting-lever have been manually restored.

An arm p^7 is secured to the pivot-shaft p^3, to which the supporting-lever is also fastened, and said arm extends in the path of movement of a flat restoring-spring fastened to the frame. The end of said spring is connected by a link p^8 with an arm p^9 on a rock-shaft p^{10}, which may be manually turned to positively raise the link and thereby allow the spring to restore the armature. The rock-shaft p^{10} is provided with a restoring-spring which is strong enough to overcome the flat restoring-spring for the armature. As the arm p^6 is connected with the arm e^{40}, it will be observed that the local circuit-controlling device f will become permanently closed when the arm p^6 is locked by the supporting-lever, instead of momentarily closed, as heretofore described, and such permanent closure operates the starting-magnet m^{16} to release the supervisory signal-transmitter, and continues to thus hold said starting-magnet while said transmitter operates until the signal-determining device of said transmitter operates to open the switch i, and the signal sent will therefore be a "trouble" signal. The circuit of the starting-magnet m^{16} in such case is the circuit which is operated by the local circuit-controlling device f, before-described. Thus, notwithstanding this local circuit is normally open, it will be frequently tested, and, if it is found that the battery d is not of the required strength, a signal will be sent to the supervisory-station, notifying said station of the fact, in order that a supervisor may be sent to the building at once to correct the trouble. Similar means may be provided for testing the open-circuit battery a of the auxiliary-circuit as for instance, another magnet and armature are arranged just back of the ones shown and another pair of contacts in circuit with said magnet, arranged to momentarily close a branch from the open auxiliary circuit through such magnet and a proper resistance simultaneously with the closure of the circuit-controller f, and if the current from the auxiliary battery is weak then the armature of its magnet will fall at such time and cause the supporting-lever to lock the contacts f closed and give the trouble call as before stated. Means are also provided for sending a "trouble" call in case the main-spring of the route-determining mechanism should break, which consists of an arm e^{50} connected to the arm e^{40}. This arm e^{50} lies in the path of the main-spring, and, if said spring breaks, it will immediately expand and engage and move said arm e^{50}, causing the arm e^{40} to close and hold closed the contacts to thereby send the "trouble" signal as previously described.

It is desirable that the manual fire-signals due to the operation of any of the fire-signaling devices in the auxiliary-circuit, and

which are adapted to operated the auxiliarized fire-alarm box, shall also be sent to the supervisory-station, to thereby notify the supervisors at said station of the manual operation of the auxiliary-circuit at the supervised building, and, consequently, the auxiliarized fire-alarm box connected therewith for fire. For the purpose of carrying out this feature of my invention the testing or tell-tale-relay a^{13}, which is included in the closed loop of the auxiliary-circuit, in series with the starting-magnet a^7 of the auxiliarized fire-alarm box, may be employed. As before stated, the armature a^{14} of this relay normally occupies a semi-attracted position, bearing against an adjustable pin a^{17}, borne by a pivoted-lever a^{18}. This lever a^{18} has a shoulder a^{19}, which is normally engaged by a pin a^{24} extended laterally from a spring-operated lever a^{20}, pivoted at a^{26}, and locks said lever a^{20} in set position. The pin a^{24} also extends beneath a contact-pen a^{21}, and, when the lever a^{20} is released by the lever a^{18}, upon the armature being moved into its fully attracted position by a heavy current passing through its magnet, said pin a^{24} will engage said pen a^{21}, and close the circuit. The pin a^{24} will remain in engagement with the contact-pen a^{21} until manually re-set. Whenever any of the manually-operative fire-signaling devices are operated and the starting-magnet of the auxiliarized box thereby caused to release said box, the armature a^{14} of the relay a^{13} will also be moved into its fully attracted position, resulting from the heavy current which will then pass through its magnet.

The circuit-controlling device a^{24} and a^{21} is connected in branch-circuit-wires d^{21}, a^{52}, d^{20}, of the circuit of the battery d, and, when closed, the circuit of the starting-magnet m^{16} is closed to cause said magnet to release the supervisory signal-transmitter. Said circuit is as follows: battery d, circuit-wires d', d^{23}, starting-magnet m^{16}, circuit-wires d^{22}, d^{21}, circuit-controlling devices a^{24}, a^{21}, circuit-wires a^{52}, d^{20}, switch k, circuit-wire d^2 to battery. When the circuit-controlling device a^{24}, a^{21}, is closed, the armature of the starting-magnet m^{16} will be held in its attracted position until the circuit, including said circuit-controlling device, is opened, and, to accomplish this result, another signal-determining device operated by the supervisory signal-transmitter is employed for opening this local-circuit. Such signal-determining device comprises a switch-opening device operated by the transmitter and adapted to operate a switch k when the signal-transmitter has operated to transmit the fire-signal, which signal may be the identification number five times repeated, in conjunction with differentiating signal-impulses between each repetition. The apparatus and circuits used for the manual fire-signals will also be as well supervised, and receive the same benefits therefrom and in a similar way, as is the case with the circuits and devices heretofore described.

To annunciate the fire-signals locally so as to visually indicate from which signal-station they are sent, and to cause bells to be sounded and lamps to be lighted throughout the building, in case of fire means are provided which are here shown as arranged in connection with the relays b^5, and the parts are so constructed and arranged as to be operated by the armature-levers of said relays b^5 only in case of fire, said armature-levers being free to respond to other signals without affecting the operation of the annunciating-means.

Referring to Figs. 1, 7 and 8, y represents the annunciator controlling-magnet, which is included in the branch circuit-wire d^{21}, so as to be energized only when the relay a^{13} is operated in response to the operation of a fire signaling-device. y^2 represents separately-pivoted annunciator-drops arranged above the armature-levers of the relays b^5. An arm y^3 is arranged beneath each annunciator-drop, and said arms are designed to engage and hold the annunciator-drops in elevated position. Said arms are fixed to a rock-shaft y^4, so that, when said shaft is rocked, all of said arms will be moved from beneath the annunciator-drops to permit said drops to fall a short distance and engage the upper ends of the armature-levers of their respective relays b^5. An arm y^5 is fixed to said rock-shaft and engages the upper end of the armature-lever y', of the controlling-magnet y, and, when said lever is moved by the attracting-armature, said arm y^5 will be disengaged and permitted to fall. As the fire signaling-devices operate said relays b^5, it will be seen that in case any of said signaling-devices are operated, the annunciator-controlling magnet y will be operated, and the relay corresponding to the fire signaling-device which is operated will attract its armature, and the annunciator-drop which is in engagement with the armature-lever of said relay will be released and permitted to fall. A latch y^6 is also fixed to the rock-shaft y^4, which normally engages a spring-acting member y^7 of a switch which is adapted to control an alarm-circuit y^8, which, as here shown, may contain electric-lamps and bells. This switch is normally held open but is unlocked and free to operate to close upon operation of the rock-shaft. It will thus be seen that the lamps will be lighted and the bells sounded whenever a fire-signal is sent, and the location of the fire signaling-device which is operated will be locally indicated. As a means for restoring the annunciator-drops y^2 and switch y^7, an arm y^{10} is secured to a rock-shaft y^{12}, which, when said shaft

is rocked, engages an arm y^{13} secured to the rock-shaft y^4 and acts to restore said shaft y^4. Another arm, y^{14}, is secured to said shaft y^{12}, which, when said shaft is rocked, will engage and lift the switch-arm y^7. For the purpose of rocking said shaft y^{12} an arm y^{15} is secured to it, which is connected by a rod y^{16} with an arm on the rock-shaft p^{10}, so that said parts will be restored when said shaft p^{10} is rocked to restore other parts of the apparatus.

I claim:—

1. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit over which signals are sent from various stations connected therewith to a supervisory-station, a code-signal transmitter arranged to send signals over said supervisory-circuit, another circuit, auxiliary to both said circuits, one or more signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box, and means, responsive to the operations of said signaling-devices, for causing the operation of said transmitter, whereby a fire-alarm signal is sent over the fire-alarm circuit, and a code-signal, indicating the locality of the signaling-device which is operated, is sent over the supervisory-circuit, substantially as described.

2. In a supervisory signal-system, the combination of an auxiliary fire-alarm box connected in a fire-alarm circuit and having a starting-device, a supervisory signaling-circuit over which signals are sent from various stations connected therewith to a supervisory-station, a code-signal transmitter arranged to send signals over said supervisory-circuit, having a starting-device, controlling-means for the starting-device of said transmitter, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and also to operate the controlling means for the starting-device of said transmitter, whereby a fire-alarm signal is sent over the fire-alarm circuit, and a code-signal, indicating the locality of the signaling-device which is operated, is sent over the supervisory-circuit, substantially as described.

3. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit over which signals are sent from various stations connected therewith to a supervisory-station, a code-signal transmitter arranged to send signals over said supervisory-circuit, and having a starting-magnet, another circuit, auxiliary to both said circuits, a relay in said auxiliary-circuit adapted to control the circuit of the starting-magnet of said transmitter, signaling-devices arranged to control said auxiliary-circuit, to operate the starting-magnet of the auxiliarized fire-alarm box and also said relay, whereby a fire-alarm signal is sent over the fire-alarm circuit, and a code-signal, indicating the locality of the signaling-device which is operated, is sent over the supervisory-circuit, substantially as described.

4. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit over which signals from various stations are sent to a supervisory-station, a code-signal transmitter connected in said supervisory-circuit, and having a starting device, controlling-means adapted to be set to operate the starting-device of said transmitter and to remain set until restored, and means for manually restoring it, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and also the controlling-means for the starting-device of said transmitter, substantially as described.

5. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit over which signals are sent from various stations to a supervisory-station, a code-signal transmitter arranged to send signals over said supervising-circuit, and having a starting-magnet, another circuit, auxiliary to both said circuits, a relay in said auxiliary-circuit, a local circuit-controlling device adapted to be set by said relay to control the circuit of the starting-magnet of said transmitter and to remain set until restored, means for manually restoring said local circuit controlling device, and signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relay, substantially as described.

6. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, a code-signal transmitter arranged to send signals over said supervisory-circuit, a circuit, auxiliary to both said circuits, having means for starting the auxiliarized fire-alarm box, and having means for starting said code signal transmitter, signaling-devices arranged to control

said auxiliary-circuit to operate the starting-magnet for the auxiliarized fire-alarm box, and other signaling devices arranged to control said auxiliary-circuit to operate the starting-means for the transmitter, substantially as described.

7. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, a circuit, auxiliary to both said circuits, having means arranged to start the auxiliarized fire-alarm box and also means arranged to control the starting of said signal-transmitting means, signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for the auxiliarized fire-alarm box and also the means to control the starting of the signal-transmitter, and other signaling-devices arranged to control said auxiliary-circuit to operate the means to control the starting of the signal-transmitter exclusively of the auxiliarized fire-alarm box, substantially as described.

8. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, having a starting-device, another circuit, auxiliary to both said circuits, means connected with said auxiliary-circuit for controlling the starting-device of the auxiliarized fire-alarm box, and other means connected with said auxiliary-circuit for controlling the starting-device of said signal-transmitting means, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

9. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-device, another circuit, auxiliary to both said circuits, means connected with said auxiliary-circuit for controlling the starting-device of the auxiliarized fire-alarm box, and also for controlling the starting-device of said signal-transmitting means, and other means connected with said auxiliary-circuit for controlling the starting-device of said signal-transmitting means, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

10. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, a code-signal transmitter arranged to send signals over said supervisory-circuit, and having a starting-device, controlling means for the starting-device of said signal-transmitter, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said auxiliary-circuit to operate the controlling-means for the starting-device of said signal-transmitter, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

11. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-device, controlling-means for the starting-device of said signal-transmitting means, another circuit, auxiliary to both said circuits, means connected with said auxiliary-circuit for controlling both the starting-device of the auxiliarized fire-alarm box and the controlling-means for the starting-device of said supervisory signal-transmitting means, and other means connected with said auxiliary-circuit for controlling said circuit to operate the controlling-means for the starting-device of said signal-transmitting means, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

12. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means having a starting-magnet and arranged to send signals over said supervisory-circuit, a local circuit-controlling device for the circuit of the starting-magnet of said signal-transmitting means, another circuit, auxiliary to both the supervisory and fire-alarm circuits, signaling-devices arranged to control said circuit to operate the starting-magnet of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said circuit to control the operation of said local circuit-controlling device, exclusively of the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

13. In a supervisory signal-system, the

combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory-signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of said signal-transmitting means, another circuit, auxiliary to both said supervisory and fire-alarm circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and one of said local circuit-controlling devices, and other signaling-devices arranged to control said circuit to control the operation of the other local circuit-controlling device, exclusively, substantially as described.

14. In a supervisory signaling-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-device, two separate controlling-means for the starting-device of said signal-transmitting means, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and also one of the controlling-means for the starting-device of said signal-transmitting means, and other signaling-devices arranged to control said auxiliary-circuit to operate the other controlling means for the starting-device of the said signal-transmitting means, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

15. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory-signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, having starting-means, a circuit, auxiliary to both said circuits, with which the starting-magnet of the auxiliarized fire-alarm box and the starting-means for the transmitting means are connected, and signaling-devices in said auxiliary-circuit arranged to include said starting-means and the operating battery in circuit with a shunt of low resistance around the starting-magnet of the auxiliarized fire-alarm box, to prevent operation of said box and permit operation of said code-signal transmitting means, and other signaling-devices in said auxiliary-circuit arranged to include said starting-means, the operating-battery and the starting-magnet of the auxiliarized fire-alarm box, in series, to permit operation of said signal-transmitting means and also the auxiliarized fire-alarm box, substantially as described.

16. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected to the supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having starting-means, a circuit, auxiliary to both said circuits, with which the starting-magnet of said auxiliarized fire-alarm box and said starting-means are connected, signaling-devices in said auxiliary-circuit, adapted, when operated, to connect, in series, the starting-magnet of the auxiliarized fire-alarm box and the starting-means for the signal-transmitting means and the battery, and other signaling-devices in said auxiliary-circuit, adapted, when operated, to form a divided circuit with the starting-magnet for the auxiliarized fire-alarm box in one division, and said starting-means for the starting-magnet of the signal-transmitting means, common to both divisions, substantially as described.

17. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having starting-means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, said starting-means being included in said open circuit and said starting-magnet being included in the closed loop, signaling-devices arranged to control said auxiliary-circuit to operate said starting-means, exclusively of the starting-magnet, and other signaling-devices arranged to control the auxiliary-circuit to operate said starting-magnet, substantially as described.

18. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having starting-means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-means for the supervisory signal-transmitting means being included in said open circuit, and the starting-magnet for

the auxiliarized fire-alarm box being included in said closed loop, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and the starting-means for the supervisory signal-transmitting means, and other signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for the supervisory signal-transmitting means, exclusively of the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

19. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having starting-means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-means for the supervisory signal-transmitting means being included in said open circuit, and the starting-magnet for the auxiliarized fire-alarm box being included in said closed loop, signaling-devices adapted to close said open circuit and cause the starting-means for said signal-transmitting means to respond, and other signaling-devices adapted to open said closed loop and to connect one side thereof with the open circuit and cause the starting-magnet of the auxiliarized fire-alarm box to respond, substantially as described.

20. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected to a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having starting-means, a circuit, auxiliary to both said circuits, comprising an open circuit and a closed loop at one side of its battery, the starting-magnet of the auxiliarized fire-alarm box being included in said closed loop and the starting-means for said signal-transmitting means being included in said open circuit, signaling-devices arranged in series in said closed loop, and adapted, when operated, to open said loop and to connect the open circuit to that side of said loop including the starting-magnet of the auxiliarized fire-alarm box, and other signaling-devices arranged in multiple in said open circuit and adapted, when operated, to close said open circuit and include therein the starting-means for said signal-transmitting means, substantially as described.

21. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having starting means, another circuit, auxiliary to both said circuits, signaling-devices arranged in series in said auxiliary-circuit to control said circuit to operate the starting-magnet of the auxiliarized fire-alarm box and the starting-means for the signal-transmitting means, and other signaling-devices arranged in said auxiliary-circuit, respectively, in multiple with the aforesaid signaling-devices, to control said circuit to operate the starting-means for the signal-transmitting means, exclusively of the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

22. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit and having starting-means, a circuit, auxiliary to both said circuits, comprising an open circuit and a closed loop at one side of its battery, the starting-magnet for the auxiliarized fire-alarm box being included in said closed loop and the starting-means for the signal-transmitting means being included in the open circuit, signaling-devices arranged in series in said closed loop for operating the starting-magnet of the auxiliarized fire-alarm box and other signaling-devices arranged in multiple in the open circuit for operating the starting-means for the signal-transmitting means, exclusively of the auxiliary fire-alarm box, substantially as described.

23. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having starting-means, a circuit, auxiliary to both said circuits, comprising an open circuit and a closed loop at one side of its battery, the starting-magnet for the auxiliarized fire-alarm box being included in said closed loop and the starting-means being included in the open circuit, signaling-devices arranged in series in said closed loop for operating the starting-magnet of the auxiliarized fire-alarm box, and other signaling-devices arranged in multiple in the open circuit, and also respectively in mul-

tiple with the aforesaid signaling-devices for operating the starting-means for the signal-transmitting means, exclusively of the auxiliary fire-alarm box, substantially as described.

24. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, two separate starting-means for said supervisory signal-transmitting means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, one of said starting-means being included in the open auxiliary-circuit and the other starting-means and also the starting-magnet of the auxiliarized fire-alarm box being included in said closed loop, signaling-devices in said auxiliary-circuit, arranged to control said circuit to operate one of the starting-means for said signal-transmitting means, exclusively of the other starting-means and of the starting-magnet of the auxiliarized fire-alarm box, and other signaling-devices in said auxiliary-circuit arranged to control said circuit to operate the other starting-means for said signal-transmitting means and the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

25. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, controlling-means for said signal-transmitting means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the controlling-means for said signal-transmitting means and also the starting-magnet of the auxiliarized fire-alarm box being included in said closed loop, and signaling-devices arranged to open said closed loop and to connect the open circuit with one side thereof, to thereby operate the controlling-means for said signal-transmitting means and also the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

26. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, a circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit, and means to control the starting of the auxiliarized fire-alarm box, responsive to the operation of said signaling-devices, and other signaling-devices arranged to control said auxiliary-circuit, and relays responsive to the operations thereof adapted to control the starting of said signal-transmitting means, substantially as described.

27. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, a circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit, means to control the starting of the auxiliarized fire-alarm box, and relays to control the starting of said signal-transmitting means, both responsive to the operations of said signaling-devices, and other signaling-devices arranged to control said auxiliary-circuit, to the operations of which said relays only are responsive, substantially as described.

28. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-magnet, a circuit, auxiliary to both said circuits, in which the starting-magnet of said auxiliarized fire-alarm box is connected, relays in said auxiliary-circuit, and means controlled by their armatures for controlling the circuit of the starting-magnet of the signal-transmitting means, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relays, and other signaling-devices arranged to control said auxiliary-circuit to operate said relays exclusively of said starting-magnet, substantially as described.

29. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means contained in said supervisory-circuit, having a starting-magnet, a circuit, auxiliary to both said circuits in which the starting-magnet of the said auxiliarized fire-alarm box is connected, relays in said auxiliary-circuit, a local-circuit controlled by the armatures of said relays, means controlled by said local-circuit for controlling the starting-magnet of the supervisory signal-transmitting means, signaling-devices arranged to control said auxiliary-circuit, to operate the start-

ing-magnet of the auxiliarized fire-alarm box and also said relays, and other signaling-devices arranged to control said auxiliary-circuit, to operate said relays, exclusively of the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

30. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal-transmitting means arranged to send signals over said supervisory circuit, and having a starting-magnet, a circuit, auxiliary to both said circuits, in which the starting-magnet of the auxiliarized fire-alarm box is connected, relays in said auxiliary-circuit, a local circuit controlled by the armatures of said relays, a local circuit-controlling device adapted to be operated by means contained in said local-circuit, a local-circuit controlled by said local circuit-controlling device containing the starting-magnet of the signal-transmitting means, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relays, and other signaling-devices arranged to control said auxiliary-circuit to operate said relays, exclusively of the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

31. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, another circuit auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, a starting-magnet for the auxiliarized-box contained in said closed loop, a starting-magnet for the transmitting means, a local-circuit containing said starting-magnet, a local circuit-controlling device in said local-circuit, relays included in the open auxiliary-circuit adapted to control said local-circuit, signaling-devices in the auxiliary-circuit adapted to control said circuit to operate said relays, and other signaling-devices in said auxiliary-circuit adapted to control said circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relays, substantially as described.

32. In a supervisory signal-system, the combination of an auxiliary fire-alarm box connected in a fire-alarm circuit, and a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, a circuit, auxiliary to both said circuits, having starting-means for the auxiliarized fire-alarm box, and starting-means for the signal-transmitting means, and having relays controlling other starting-means for the signal-transmitting means, signaling-devices arranged to control said auxiliary-circuit to operate both starting-means and the relays, and other signaling-devices arranged to control said auxiliary-circuit to operate the relays, exclusively of both starting-means, substantially as described.

33. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start the signal-transmitting means after a prolonged period of time, unless re-set, means for resetting said automatic starting-means, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary circuit to operate the starting-device of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

34. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-device, controlling-means for the starting-device of said signal-transmitting means, automatic means adapted to operate said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit auxiliary to the aforesaid circuits, signaling-devices arranged to control said auxiliary-circuit, to operate the starting-device of said auxiliarized fire-alarm box, and other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means, substantially as described.

35. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-magnet, a local-circuit for the starting-magnet of said transmitting-means, a local circuit-controlling device for said local-circuit, automatic means adapted to operate said local-circuit-control-

ling device after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit auxiliary to the aforesaid circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means, substantially as described.

36. In a supervisory signal-system, the combination of an auxiliary fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal-transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start said transmitter after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, another circuit auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-magnet or the auxiliarized fire-alarm box being connected in said closed loop, which is responsive to the operations of signaling-devices in said auxiliary-circuit, and means included in said open circuit, responsive to the operations of other signaling-devices in said circuit, to operate said re-setting means, substantially as described.

37. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting-means arranged to send signals over said supervisory-circuit, automatic means operating to start said transmitting-means after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, another circuit auxiliary to both said circuits, including the starting-magnet of the auxiliarized fire-alarm box, relays in said auxiliary-circuit, and means controlled by the armatures of said relays for operating said re-setting means, signaling-devices arranged in said auxiliary-circuit to control the operation of the starting-magnet of the auxiliarized fire-alarm box and also said relays, and other signaling-devices in said auxiliary-circuit arranged to control said relays, exclusively of said starting-magnet, substantially as described.

38. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start said transmitting-means after a prolonged period of time, unless re-set, means for re-setting said automatic starting-means, manual starting-means for said signal-transmitting means, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and said manual starting-means, and other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means, exclusively, substantially as described.

39. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-device, two separate controlling-means for the starting-device of said signal-transmitting means, automatic means adapted to operate one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and one of said controlling-means, and other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means exclusively, substantially as described.

40. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of said signal-transmitting means, automatic means adapted to operate one of said local circuit-controlling devices after a prolonged period of time, unless re-set, re-setting means for said automatic-operating means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and one of said local circuit-controlling devices, and other signaling-devices arranged to control said circuit to operate said re-setting means, substantially as described.

41. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervi-

sory-circuit, and having a starting-device, two separate controlling-means for said starting-device, automatic means for operating one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-magnet for the auxiliarized fire-alarm box and the other controlling-means being included in said closed loop, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet and the controlling-means included in the closed loop, and other signaling-devices arranged to control said circuit to operate said re-setting means, substantially as described.

42. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start the transmitting-means after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, other starting-means for the transmitting-means, another circuit, auxiliary to both said circuits, signaling-devices for controlling said circuit to operate the starting-device of said auxiliarized fire-alarm box, and other signaling-devices for controlling said circuit to operate said re-setting means and said other starting-means, exclusively of the auxiliarized fire-alarm box, substantially as described.

43. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-device, two separate controlling-means for the starting-device of said signal-transmitting means, automatic means adapted to operate one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said circuit to operate the starting-device of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said circuit to operate the re-setting means and the other controlling means, exclusively of the auxiliarized fire-alarm box, substantially as described.

44. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, and having a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of the signal-transmitting means, automatic means adapted to operate one of said local circuit-controlling devices after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said circuit to operate the starting-magnet of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said circuit to operate said re-setting means and the other local circuit-controlling device, exclusively of the auxiliarized fire-alarm box, substantially as described.

45. In a supervisory signal-system, the combination of an auxiliary fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start said transmitting-means after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, other starting-means for said signal-transmitting means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-magnet for the auxiliarized fire-alarm box being included in said closed loop and responsive to the operations of signaling-devices in said auxiliary-circuit, and means included in said open circuit, responsive to the operations of other signaling-devices in said circuit, to operate said re-setting means and also to operate said last-named starting means, substantially as described.

46. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start said transmitting-means after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, other starting-means for said transmitting-means, another circuit, auxiliary to both said circuits, including the starting-magnet of the auxiliarized fire-alarm box, relays in said auxiliary circuit, means controlled by the armatures of said relays for operating said re-setting means and said

last-named starting-means, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relays, and other signaling-devices arranged to control said auxiliary-circuit to operate said relays, exclusively of said starting-magnet, substantially as described.

47. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start said transmitting-means after a prolonged period of time, unless re-set, means for re-setting said automatic starting-means, two other starting-means for said signal-transmitting means, another circuit, auxiliary to both said circuits, signaling-devices for controlling said circuit to operate the starting-device of said auxiliarized fire-alarm box and one of said last-named starting-means, and other signaling-devices for controlling said circuit to operate said re-setting means and the other last-named starting-means, substantially as described.

48. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, having a starting-device, three separate controlling-means for the starting-device of said signal-transmitting means, automatic-means adapted to operate one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, manually operative signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and another controlling-means, and other manually operative signaling-devices arranged to control said auxiliary-circuit to operate the re-setting means and the remaining controlling-means, substantially as described.

49. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting-means arranged to send signals over said supervisory-circuit, and having a starting-magnet, three local circuit-controlling devices for the circuit of the starting-magnet of the signal-transmitting means, automatic means adapted to operate one of said local circuit-controlling devices after a prolonged period of time, unless reset, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said circuit to operate the starting-magnet of the auxiliarized fire-alarm box and another local circuit-controlling device, and other signaling-devices arranged to control said circuit to operate said re-setting means and the remaining local circuit-controlling device, substantially as described.

50. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start said transmitting-means after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, two other starting-means for said signal-transmitting means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-magnet and one of said starting-means being included in said closed loop and responsive to the operations of signaling-devices arranged to control said auxiliary-circuit, and means included in said open circuit responsive to the operations of other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means and also the other starting-means, substantially as described.

51. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start said signal-transmitting means after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, two other starting-means for said signal-transmitting means, another circuit, auxiliary to both said circuits, including the starting-magnet of the auxiliarized fire-alarm box and one of said starting-means, relays in said auxiliary-circuit, means controlled by the armatures of said relays for operating said re-setting means and the other starting-means, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and one of said starting-means and said relays, and other signaling-devices arranged to control said auxiliary-circuit to operate said relays only, substantially as described.

52. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and a supervisory signaling-circuit connected with a supervisory-station, a multiple code-signal transmitter arranged to send signals over said supervisory-circuit, another circuit, auxiliary to both said circuits, having starting-means for the auxiliarized fire-alarm box and also starting-means for the multiple signal-transmitter, signaling-devices arranged to control said auxiliary-circuit to operate both starting-means, and other signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for said multiple signal-transmitter only, substantially as described.

53. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and a supervisory signaling-circuit connected with a supervisory-station, a multiple code-signal transmitter arranged to send signals over said supervisory-circuit, having a starting-device, another circuit, auxiliary to both said circuits, means connected with said auxiliary-circuit for controlling the starting-device of the auxiliarized fire-alarm box and also for controlling the starting-device of said multiple signal-transmitter, and other means connected with said auxiliary-circuit for controlling the starting-device of said multiple signal-transmitter, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

54. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, a multiple code-signal transmitter arranged to send signals over said supervisory-circuit, having a starting-device, controlling-means for the starting-device of said multiple signal-transmitter, another circuit, auxiliary to both said circuits, means connected with said auxiliary-circuit for controlling both the starting device of said auxiliarized fire-alarm box and the starting-device of said multiple signal-transmitter, and other means connected with said auxiliary-circuit for controlling said circuit to operate the controlling-means for the starting-device of said multiple signal-transmitter, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

55. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, a multiple code-signal transmitter arranged to send signals over said circuit, another circuit, auxiliary to both said circuits, having starting-means for the auxiliarized fire-alarm box, and two separate starting-means for the multiple signal-transmitter, signaling-devices arranged to control said auxiliary-circuit to operate the starting-means of the auxiliarized fire-alarm box and one of the starting-means of the multiple signal-transmitter, and other signaling-devices arranged to control said auxiliary-circuit to operate the other starting-means of the multiple signal-transmitter, substantially as described.

56. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-device connected with a supervisory-station, a multiple code-signal transmitter arranged to send signals over said supervisory-circuit, and having a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of said multiple signal-transmitter, another circuit, auxiliary to both said circuits, signaling-devices for controlling said circuit to operate the starting-magnet of the auxiliarized fire-alarm box and one of said local circuit-controlling devices, and other signaling-devices arranged to operate said circuit to control the operation of the other local circuit-controlling devices, exclusively, substantially as described.

57. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, a multiple code-signal transmitter arranged to send signals over said supervisory-circuit, having a starting-device, two separate controlling-means for the starting-device of said multiple signal-transmitter, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and also to operate one of the controlling-means for the starting-device of said multiple signal-transmitter, and other signaling-devices arranged to control said auxiliary-circuit to operate the other controlling-means for the starting-device of said multiple signal-transmitter, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

58. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, a multiple code signal transmitter arranged to send signals over said supervisory-circuit, automatic means operating to start said multiple signal-transmitter after a prolonged period of time, unless re-set, means for re-setting said automatic start-

ing-means, manually controlled starting-means for said multiple signal-transmitter, another circuit, auxiliary to both said circuits, manually operative signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and said manually controlled starting-means, and other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means exclusively of the auxiliarized fire-alarm box, substantially as described.

59. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, having a starting-device, two separate controlling-means for the starting-device of said multiple signal-transmitter, automatic means adapted to operate one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuit, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box and the other controlling-means, and other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means, exclusively of the auxiliarized fire-alarm box, substantially as described.

60. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, and having a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of said multiple signal-transmitter, automatic means adapted to operate one of said local circuit-controlling devices after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and one of said local circuit-controlling devices, and other signaling-devices arranged to control said circuit to operate said re-setting means, substantially as described.

61. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-system connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, and having a starting-device, two separate controlling-means for said starting-device, automatic means for operating one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-magnet for the auxiliarized fire-alarm box and the other controlling-means being included in said closed loop, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet and the controlling-means included in the closed loop, and other signaling-devices arranged to control said circuit to operate said re-setting means, substantially as described.

62. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-system connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, automatic means operating to start said multiple signal-transmitter after a prolonged period of time, unless re-set, means for re-setting said automatic starting-means, manually controlled starting-means for said multiple signal-transmitter, another circuit, auxiliary to both said circuits, having signaling-devices for controlling said circuit to operate the starting-device of said auxiliarized fire-alarm box, and other signaling-devices for controlling said circuit to operate the re-setting means and said manually controlled-means, exclusively of the auxiliary fire-alarm box, substantially as described.

63. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-system connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, and having a starting-device, two separate controlling-means for the starting-device of said multiple signal-transmitter, automatic means adapted to operate one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, having signaling-devices arranged to control said circuit to operate the starting-device of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said circuit to operate the re-setting means and the other controlling-means, exclusively of the auxiliarized fire-alarm box, substantially as described.

64. In a supervisory signal-system, the combination of an auxiliarized fire-alarm

box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, and having a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of the multiple signal-transmitter, automatic means adapted to operate one of said local circuit-controlling devices after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said circuit to operate the starting-magnet of the auxiliarized fire-alarm box, and other signaling-devices arranged to control said circuit to operate the said re-setting means and the other local circuit-controlling devices, exclusively of the auxiliarized fire-alarm box, substantially as described.

65. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signal-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, automatic means operating to start said multiple signal-transmitter after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, other starting-means for said multiple signal-transmitter, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-magnet for the auxiliarized fire-alarm box being included in said closed loop and responsive to the operations of the signaling-devices in said auxiliary-circuit, and means included in said open circuit responsive to the operations of other signaling-devices in said circuit to operate said re-setting means and also to operate said last-named starting-means, substantially as described.

66. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-system connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, automatic means operating to start said multiple signal-transmitter after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, other starting-means for said multiple signal-transmitter, another circuit, auxiliary to both said circuits, including the starting-magnet for the auxiliarized fire-alarm box, relays in said auxiliary-circuit, means controlled by the armatures of said relays for operating said re-setting means and said last-named starting-means, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relays, and other signaling-devices arranged to control said auxiliary-circuit to operate said relays exclusively of said starting-magnet, substantially as described.

67. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, automatic means operating to start said multiple signal-transmitter after a prolonged period of time, unless re-set, means for re-setting said automatic starting-means, two manually controlled starting-means for said multiple signal-transmitter, another circuit, auxiliary to both said circuits, signaling-devices for controlling said circuit to operate the starting-device of said auxiliarized fire-alarm box and one of said manually controlled starting-means, and other signaling-devices for controlling said circuit to operate said re-setting means and the other manually controlled starting-means, substantially as described.

68. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, having a starting-device, three separate controlling-means for the starting-device of said multiple signal-transmitter, automatic means adapted to operate one of said controlling-means after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said circuit to operate the starting-device of the auxiliarized fire-alarm box and another controlling-means, and other signaling-devices arranged to control said auxiliary-circuit to operate the re-setting means and the remaining controlling-means, substantially as described.

69. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, and having a starting-magnet, three local circuit-controlling devices for the circuit of the starting-magnet of said multiple signal-transmitter, automatic means adapted to operate one of said local

circuit-controlling devices after a prolonged period of time, unless re-set, re-setting means for said automatic operating-means, another circuit, auxiliary to the aforesaid circuits, signaling-devices arranged to control said circuit to operate the starting-magnet of the auxiliarized fire-alarm box and another local circuit-controlling device, and other signaling-devices arranged to control said circuit to operate said re-setting means and the remaining local circuit-controlling devices, substantially as described.

70. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, automatic means operating to start said multiple signal-transmitter after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, two other starting-means for said multiple signal-transmitter, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, the starting-magnet and one of said starting-means being included in said closed loop and responsive to the operations of signaling-devices arranged to control said auxiliary-circuit, and means included in said open circuit responsive to the operations of other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means and also the other starting-means, substantially as described.

71. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-station, a multiple signal-transmitter arranged to send signals over said supervisory-circuit, automatic means operating to start said multiple signal-transmitter after a prolonged period of time, unless re-set, re-setting means for said automatic starting-means, two other starting-means for said multiple signal-transmitter, another circuit, auxiliary to both said circuits, including the starting-magnet of the auxiliarized fire-alarm box and one of said starting-means, relays in said auxiliary-circuit, means controlled by the armatures of said relays for operating said re-setting means and the other starting-means, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and one of said starting-means and said relays, and other signaling-devices arranged to control said auxiliary-circuit to operate said relays only, substantially as described.

72. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit over which signals are sent from various stations connected therewith to a supervisory-station, a code-signal transmitter arranged to send signals over said supervisory-circuit, a local signal-recorder, another circuit, auxiliary to both said circuits, having signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and having means responsive to the operations of said signaling-devices for causing the operation of said transmitter, and having means also responsive to the operations of said signaling-devices for operating said recorder, substantially as described.

73. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, a code-signal transmitter arranged to send signals over said supervisory-circuit, a circuit, auxiliary to both said circuits, having means for starting the auxiliarized fire-alarm box, and having means for starting said transmitter, signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for the auxiliarized fire-alarm box, other signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for the transmitter, and a local signal-recorder responsive to the operations of said last-named signaling-devices, substantially as described.

74. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, a circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit, and means to control the starting of the auxiliarized fire-alarm box, responsive to the operation of said signaling-devices, and other signaling-devices arranged to control said auxiliary-circuit, relays responsive to the operations thereof adapted to control the starting of said signal-transmitting means, and a local signal-recorder having operating-magnets corresponding to said relays and responsive to the operations thereof, substantially as described.

75. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, another circuit, auxiliary to the aforesaid circuit, signaling-devices arranged to control said auxiliary-circuit, and means to control

the starting of the auxiliarized fire-alarm box responsive to the operations of said signaling-devices, and other signaling-devices arranged to control said auxiliary-circuit, and a local signal-recorder arranged to be operated by said last-named signaling-devices, substantially as described.

76. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, another circuit, auxiliary to the aforesaid circuit, signaling-devices arranged to control said auxiliary-circuit, and means to control the starting of the auxiliarized fire-alarm box responsive to the operations of said signaling-devices, and other signaling-devices arranged to control said auxiliary-circuit, and a local signal-recorder arranged to be operated by all said signaling-devices, substantially as described.

77. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, another circuit, auxiliary to the aforesaid circuit, having signaling-devices, and having means to control the starting of the auxiliarized fire-alarm box, responsive to the operations of said signaling-devices, and having other signaling-devices and relays responsive to the operations thereof, a local signal-recorder having operating-means corresponding to the relays and responsive to the operations thereof, substantially as described.

78. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start the signal-transmitting means after a prolonged period of time, unless re-set, means for re-setting said automatic starting-means, another circuit, auxiliary to both said circuits, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box, other signaling-devices arranged to control said auxiliary-circuit to operate said re-setting means, exclusively of the starting-device of the auxiliarized fire-alarm box, and a local signal-recorder arranged to be operated by said signaling-devices which operate the re-setting means, substantially as described.

79. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting-means arranged to send signals over said supervisory-circuit, automatic means operating to start the transmitting means after a prolonged period of time, unless re-set, means for re-setting said automatic starting-means, manually controlled starting-means for the transmitting-means, another circuit, auxiliary to both said circuits, signaling-devices for controlling said circuit to operate the starting-device of said auxiliarized fire-alarm box, other signaling-devices for controlling said circuit to operate said re-setting means and said manually controlled starting-means, exclusively of the auxiliarized fire-alarm box, and a local signal-recorder also arranged to be operated by said signaling-devices, substantially as described.

80. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, automatic means operating to start the transmitting-means after a prolonged period of time, unless re-set, means for re-setting said automatic starting-means, manually controlled starting-means for the transmitting-means, another circuit, auxiliary to both said circuits, signaling-devices for controlling said circuit to operate the starting-device of said auxiliarized fire-alarm box, other signaling-devices for controlling said circuit to operate said re-setting means and said manually controlled starting-means, exclusively of the auxiliarized fire-alarm box, and a local signal-recorder arranged to be operated by both signaling-devices, substantially as described.

81. In a supervisory signal-system, the combination of an auxiliary fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, code-signal, transmitting means arranged to send signals over said supervisory-circuit, a circuit auxiliary to both said circuits, having starting-means for the auxiliarized fire-alarm box, and starting-means for the signal-transmitting means, and having relays controlling other starting-means for the signal-transmitting means, annunciators controlled by said relays and the first-named starting-means for the signal-transmitting means, signaling-devices arranged to control said auxiliary-circuit to operate both starting-means and the relays and annunciators, and other signaling-devices arranged to control said auxiliary-circuit to operate the relays, exclusively of both starting-means and annunciators, substantially as described.

82. In a supervisory signal-system, the combination of an auxiliary fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a

supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, a circuit auxiliary to both said circuits, having starting-means for the auxiliarized fire-alarm box, and starting-means for the signal-transmitting means, and having relays controlling other starting-means for the signal-transmitting means, local switches controlled by said relays and the first-named starting-means for the signal-transmitting means, and a local alarm-circuit controlled by all said switches, signaling-devices arranged to control said auxiliary-circuit to operate both starting-means and the relays and the local switches, and other signaling-devices arranged to control said auxiliary-circuit to operate the relays, exclusively of both starting-means and local switches, substantially as described.

83. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit over which signals are sent from various stations connected therewith to a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, another circuit, auxiliary to both said circuits, one or more signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box, means, responsive to the operations of said signaling-devices, for causing the operation of said signal transmitting-means, and means responsive to a weakening of the current or a break in said auxiliary-circuit for also causing the operation of said signal-transmitting means, substantially as described.

84. In a supervisory signal-system, the combination of an au auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit over which signals are sent from various stations connected therewith to a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, having a starting-magnet, another circuit, auxiliary to both said circuits, a relay in said auxiliary-circuit, adapted to control the circuit of the starting-magnet of said signal-transmitting means, which is responsive to a weakening of the current or a break in said auxiliary-circuit, and signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relay, substantially as described.

85. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit over which signals are sent from various stations to a supervisory-station, signal-transmitting means arranged to send signals over said supervisory-circuit, having a starting-magnet, another circuit, auxiliary to both said circuits, a relay in said auxiliary-circuit, two local circuit-controlling devices adapted to be operated by said relay to control the circuit of the starting-magnet of said signal-transmitting means, one upon the attraction and the other upon the retraction of the armature of said relay, and signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and also said relay, substantially as described.

86. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, having a starting-device, another circuit, auxiliary to both said circuits, means connected with said auxiliary-circuit for controlling the starting-device of the auxiliarized fire-alarm box, and other means connected with said auxiliary-circuit for controlling the starting-device of said signal-transmitting means, exclusively of the starting-device of the auxiliarized fire-alarm box, and a testing-relay in said auxiliary-circuit, and means operated by it for controlling the starting-device of said signal-transmitting means, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

87. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged to send signals over said supervisory-circuit, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, a starting-magnet for the auxiliarized fire-alarm box and a relay contained in said closed loop, two local circuit-controlling devices for the circuit of the starting-means of the signal-transmitting means, one controlled by the armature of said relay when attracted, and the other when retracted, and signaling-devices arranged to open said closed loop and to connect the open circuit with one side thereof, to thereby cause the relay to attract its armature and also to operate the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

88. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-magnet, a supervisory signaling-circuit connected with a supervisory-

station, code-signal transmitting means arranged to send signals over said supervisory-circuit, controlling-means for said signal-transmitting means, another circuit, auxiliary to both said circuits, comprising an open circuit having a closed loop at one side of its battery, controlling-means for said signal-transmitting means and also the starting-magnet of the auxiliarized fire-alarm box included in said closed loop, and signaling-devices arranged to open said closed loop and to connect the open circuit with one side thereof, to operate the controlling means for said signal-transmitting means, and also the starting-means of the auxiliarized fire-alarm box, substantially as described.

89. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected in a fire-alarm circuit, and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting-means arranged to send signals over said supervisory-circuit, having a starting-device, another circuit, auxiliary to both said circuits, a testing-device for the battery of said circuit, means controlled by said testing-device for controlling the starting-device of said signal-transmitting means, means connected with said auxiliary-circuit controlling the starting-device of said signal-transmitting means, and other means connected with said auxiliary-circuit for controlling the starting-device of said signal-transmitting means, exclusively of the starting-device of the auxiliarized fire-alarm box and for operating the testing-device of the battery of said auxiliary-circuit, substantially as described.

90. In a supervisory signal-system, the combination of a plurality of auxiliarized fire-alarm boxes having starting-magnets, a separate auxiliary-circuit connected with the starting-magnet of each box, a plurality of code-signal transmitters corresponding to said auxiliary-circuits, having starting-means, a supervisory-circuit connected with a supervisory-station, with which said code-signal transmitters are connected, and signaling-devices arranged to control each auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box which is connected in said circuit and also to operate the starting-means of the corresponding code-signal transmitter, substantially as described.

91. In a supervisory signal-system, the combination of a plurality of auxiliarized fire-alarm boxes having starting-devices, a separate auxiliary-circuit connected with the starting-device of each box, a plurality of supervisory signal-transmitters corresponding to the auxiliary-circuits, having starting-devices, a supervisory-circuit connected with a supervisory-station, with which the supervisory signal-transmitters are connected, and means connected with each auxiliary-circuit for controlling the starting-device of the corresponding supervisory signal-transmitter, exclusively of the starting-device for said auxiliarized fire-alarm box, substantially as described.

92. In a supervisory signal-system, the combination of a plurality of auxiliarized fire-alarm boxes having starting-devices, a separate auxiliary-circuit connected with the starting-device of each box, a plurality of supervisory signal-transmitters corresponding to the auxiliary-circuits, having starting-devices, a supervisory-circuit connected with a supervisory-station, having connected therewith said supervisory signal-transmitters, means connected with each auxiliary-circuit for controlling the starting-device of the auxiliarized fire-alarm box connected with said circuit and also for controlling the starting-device of the corresponding supervisory signal-transmitter, and other means connected with each auxiliary-circuit for controlling the starting-device of the corresponding supervisory signal-transmitter, exclusively of the starting-device of said auxiliarized fire-alarm box, substantially as described.

93. In a supervisory signaling-system, the combination of a signal-receiving device at a signal-receiving station and several multiple signal-sending devices at signal-sending stations, all arranged in series in a transmitting-circuit, means associated with each signal-sending device whereby it may be set to send either of two or more signals, means also associated with each signal-sending device and under the control of the transmitting-circuit for controlling the operation of its respective signal-sending device to prevent said device when set to send a signal from starting the signal while the transmitting-circuit is being used to transmit another signal, and for temporarily preventing further operation of the transmitting-circuit by the signal-sending device to finish a signal partially sent by it in case of any interruption or operation of the transmitting-circuit whereby such signal could not be correctly completed, and to keep said signal-sending device set, when once set, until the signal has been completely and uninterruptedly sent over the transmitting circuit, substantially as described.

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

FREDERICK W. COLE.

Witnesses:

B. J. NOYES,

H. B. DAVIS.