F. W. COLE.

COMBINED AUXILIARY AND AUTOMATIC FIRE ALARM SYSTEM.

APPLICATION FILED APR. 15, 1910.

1,058,725.

Patented Apr. 15, 1913.

2 SHEETS—SHEET 1.

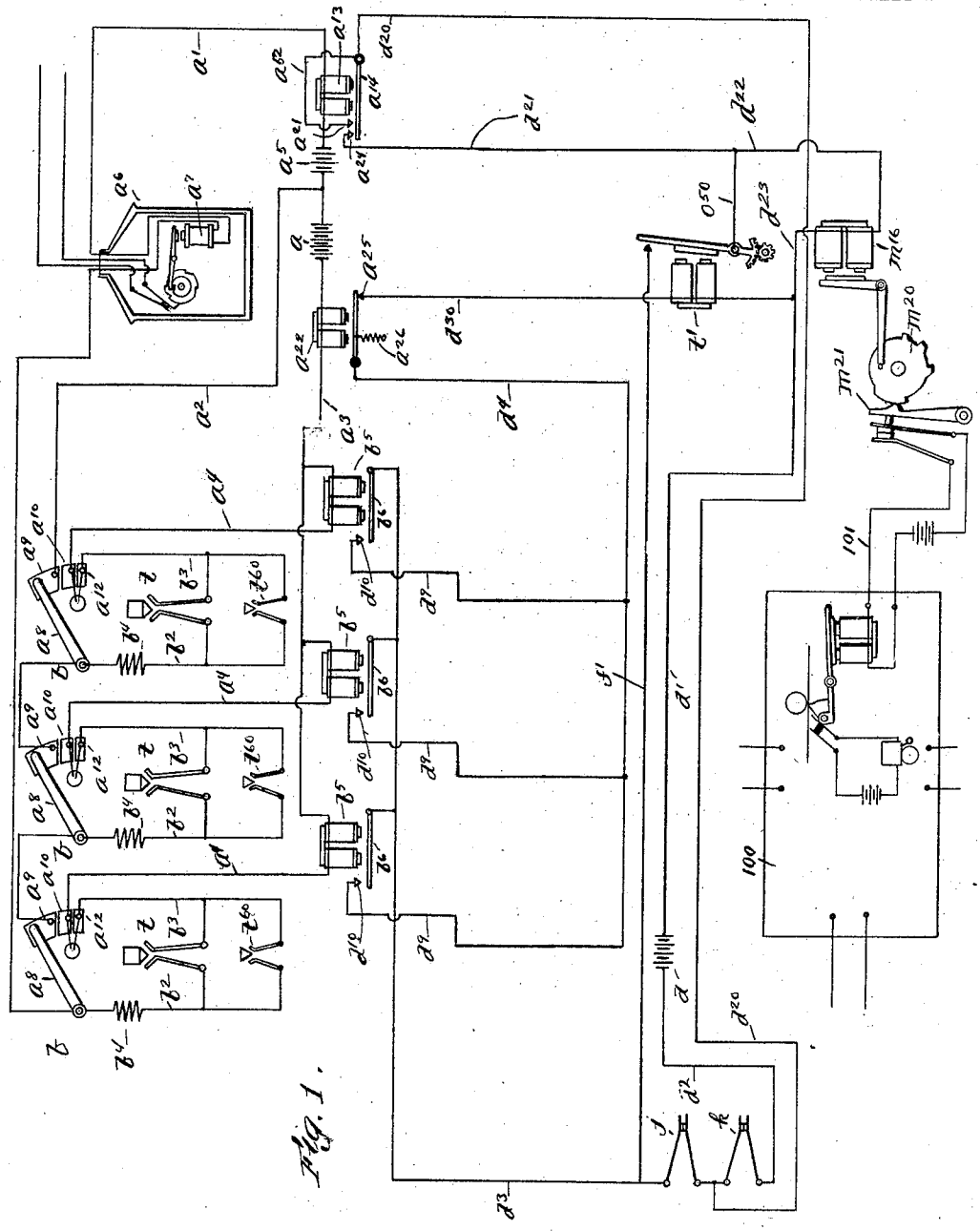

Fig. 1.

Witnesses:
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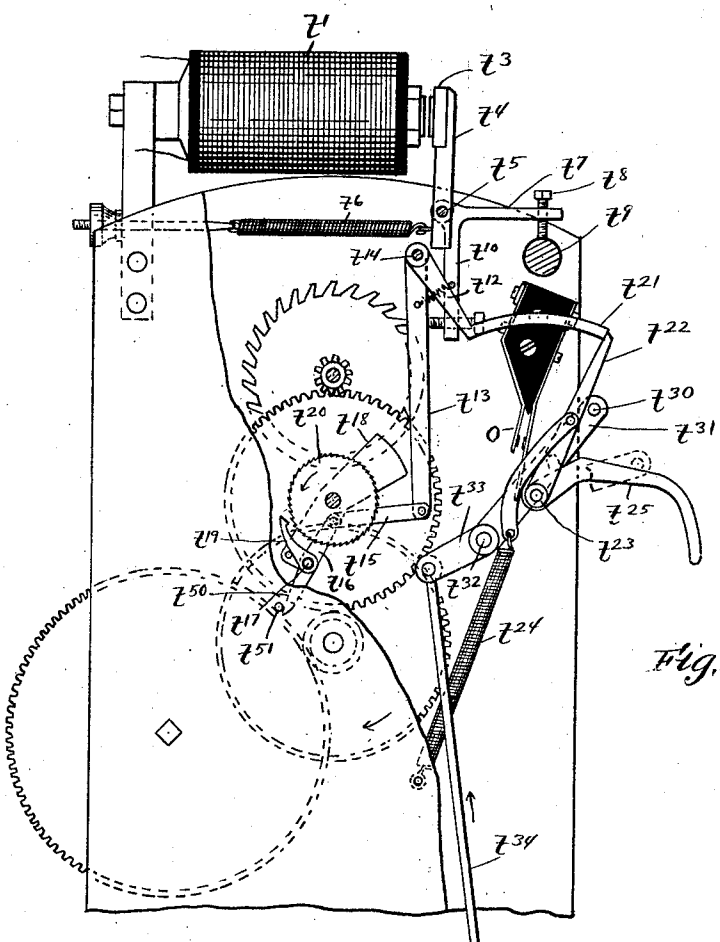

Fig. 2.

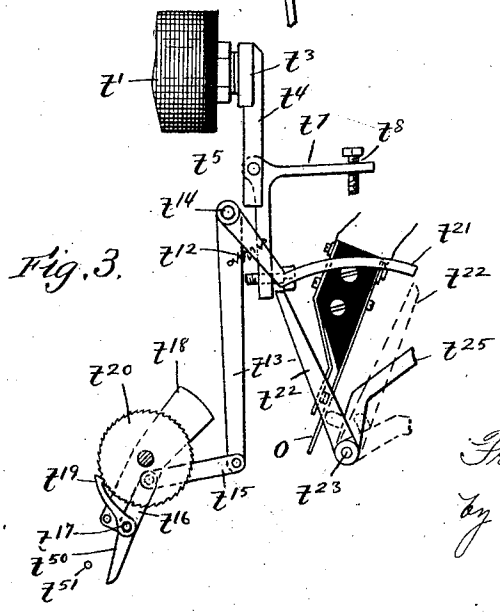

Fig. 3.

Witnesses:
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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.

COMBINED AUXILIARY AND AUTOMATIC FIRE-ALARM SYSTEM.

1,058,725. Specification of Letters Patent. Patented Apr. 15, 1913.

Application filed April 15, 1910. Serial No. 555,602.

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 Combined Auxiliary and Automatic Fire-Alarm 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 an automatic fire-alarm 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 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.

An automatic fire-alarm usually comprises thermostats arranged throughout the building, or other property to be protected, adapted to operate a circuit-closer for an electric-circuit and cause a signal to be sent.

The essential object of this invention is to provide an auxiliary fire-alarm system, having an auxiliarized fire-alarm box and signaling-devices for controlling its operation, with automatic signaling-devices adapted to be operated by thermostats, sprinklers, and other devices, and to provide code-signal transmitting means adapted to be operated by said automatic signaling devices, exclusively of the auxiliarized fire-alarm box, whereby automatic fire-signals and other automatically-operated signals are sent to a supervisory-station, where inspectors are in attendance. Also to provide other means for operating said code-signal transmitting means by the signaling-devices which are employed for operating the auxiliarized fire-alarm box, whereby the fire-signals are likewise sent to the supervisory-station.

The invention also has for its object to provide the mechanism which is responsive to the operations of the automatic signaling-devices, with time-controlled means, whereby it will not respond to a quick operation of said automatic signaling-devices, such, for instance, as might be produced by a sudden jar or blow, or any accident.

Figure 1 is a diagram of a circuit of a combined auxiliary and automatic fire-alarm system embodying this invention, Fig. 2 is a front view of a signal-controlling mechanism adapted to respond to the operations of the automatic signaling-devices for controlling the operation of a code-signal transmitter, Fig. 3 is a detail of a portion of the signal-controlling mechanism shown in Fig. 2, in position to close the circuit of the starting-magnet of the code-signal transmitter.

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, and 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 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 automatic fire-signal stations are arranged, and also, if desired, other automatic signal-stations. As here shown, they each have an automatic signaling-device, such as circuit-closer t and t^{60}, adapted to be operated by a thermostat, sprinkler, or other device, and each circuit-closer is arranged 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. When any one of the automatic 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^5, automatic signaling-device t, 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 automatic signaling-devices. If one of the sections of the closed loop should be broken at the moment the signaling-device t 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 an automatic signaling-device, 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 should be broken, and the section a' of the closed loop the only one included in the closed circuit formed by the operation of the automatic signaling-device.

The signaling-devices are designed to control the operation of signal-receiving apparatus, such as a recorder and a bell, 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, one controlled by the fire signaling-devices, and the other controlled by the automatic signaling-devices. For sending these two signals code-signal transmitting means such as shown in my application for Letters Patent, Ser. No. 555,605, filed April 15, 1910, may be employed, but my invention is not limited to the employment of said 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 consists of a multiple code-signal transmitter, and sends its signals over the supervisory-circuit 101, to the supervisory-station 100.

Referring to Fig. 1, m^{20} represents the signal-wheel of the code-signal transmitting means which 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, preferably with differentiating signal-impulses. The identification number four times sent, with differentiating signal-impulses between them, designates an automatic fire-signal; and five times sent, with differentiating signal-impulses between them, designates an auxiliary fire-signal. 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 the starting-magnet to release the signal-transmitter to transmit the different signals. One of these local circuits is controlled by relays b^5 in the branches of the auxiliary circuit, which are responsive to the operation of the automatic signaling-devices, and also to the operation of the fire-signal devices. The armatures b^6 of said relays are connected with a circuit-wire d^3 which is connected by circuit-wire d^2 with the battery d, and the contacts d^{10} which are engaged by said armatures when attracted, are connected by circuit-wires d^9 with a circuit-wire d^4, which is connected to the armature a^{26} of a relay a^{22}, which is arranged in the open branch of the auxiliary-circuit, said armature being normally retracted and engaging a contact a^{25} connected with a circuit-wire d^{30} which is connected by a circuit-wire d' with the battery d. The circuit-controlling device controlled by said local-circuit is designed to control the starting-magnet m^{16} to oper-

ate the transmitter to send the automatic fire-signal, and said circuit-controlling device will now be described. t' represents an electro-magnet which, for simplicity of construction is connected in the circuit-wire d^{30} and is energized whenever the circuit is closed by any one of the relays b^5. The circuit at such time is represented as follows:—battery d, circuit-wire d', electro-magnet t', circuit-wire d^{30}, armature a^{26}, circuit-wires d^4, d^9, contact d^{10}, armature b^6, circuit-wires d^3, d^2 to battery. As the operation of the fire-signaling devices is momentary and the operation of the automatic signaling-devices permanent, the circuit controlling device which is operated by the electro-magnet t' is of a slow responding character, so that the difference in time or continuation of the closure is utilized to cause its operation, and in turn to control the circuit of the starting-magnet m^{16} of the signal-transmitter to send the automatic signal. Said delayed or slow-responding circuit-controlling device comprises a pair of normally open contacts o adapted to be closed only upon a prolonged closure of the circuit of the electro-magnet t', and when operated, will close a branch-circuit of the starting-magnet m^{16} as follows: battery d, circuit-wires d', d^{23}, starting magnet m^{16}, circuit-wires d^{22}, and o^{50} leading to the delayed or slow responding circuit-controlling device, circuit-wires f' and d^2, to battery.

Referring to Figs. 2 and 3, a clock-train or other timed controlling-device is employed for controlling the operation of the slow-responding circuit-controlling device, hence said circuit-controlling device is referred to as time-controlled. The armature t^3 of the magnet t' is borne by a lever t^4 secured to a pivot-shaft t^5, and is normally held in retracted position by a retractile-spring t^6. A bell-crank lever is also secured to said pivot-shaft t^5, one arm, as t^7 of which bears an adjustable stop-screw t^8, adapted to engage a fixed stop t^9 on the frame, and the other arm, as t^{10}, of which is connected by a spring t^{12}, with an arm t^{13}, pivoted at t^{14}. Said arm and lever are normally held separated by an adjustable screw. The armature, when attracted, pulls upon the spring t^{12} and thereby moves the arm t^{13}. Thus the armature is flexibly connected with the arm t^{13}. The arm t^{13} is loosely connected by a link t^{15}, with an arm t^{16}, to which is rigidly secured a pawl t^{19}, and said arm and pawl are pivotally connected at t^{17} to a weighted pawl-carrying plate t^{18}, loosely mounted on a shaft of a timing-mechanism of any suitable construction. This pawl t^{19} is movable into and out of engagement with a ratchet-wheel t^{20}, secured to a shaft of the timing-mechanism and revolved continuously by it. In order to insure a proper disengagement of the pawl and ratchet-wheel, an arm t^{50} is rigidly connected with the pawl and arm t^{16}, and said arm t^{50} engages a fixed pin t^{51} on the frame when the armature is retracted which serves as an abutment, so that as the arm t^{16} is moved upon attraction of the armature, it swings about the fixed pin and moves the pawl into engagement with the ratchet wheel and also moves the weighted pawl-carrying plate. When the armature of the magnet t' is attracted, the first movement of the arm t^{13} moves the pawl t^{19} into engagement with the ratchet-wheel, and then said pawl and the arm t^{13} will be permitted to move with it, but only as fast as said ratchet-wheel is operated by the timed-mechanism. If the armature remains in its attracted position, the arm t^{13} will continue to move until a detent-lever t^{21}, rigidly connected with said arm t^{13}, disengages a lever t^{22}, pivoted at t^{23}. Said lever t^{22}, when released, is moved by a spring t^{24} connected with it. A contact operating-lever t^{25} is rigidly connected with said lever t^{22} and when permitted to operate upon release of the lever t^{22} will engage the contact pens o and close the circuit. Thus it will be seen that the circuit-controlling device o is closed only upon a prolonged closure of the circuit, and therefore is time-controlled and is not affected by the quick operation of the fire signaling-devices, and is not affected by a quick or short closure of the thermostat contacts which would be caused from a sudden jar from a blow or from moving heavy articles about on the floor above a thermostat, and is not affected by a water hammer upon the devices used in connection with a sprinkler system. To restore the operating-lever t^{25} to normal, a restoring-arm t^{31} is provided which is pivoted at t^{32} and has a pin t^{30} adapted to engage said lever and said restoring-arm has an extension t^{33} to which a rod t^{34} is connected, and upward movement of said rod, by a manual operation, operates to move the arm t^{31} and restore said operating lever and also open the time-controlled circuit-controlling device o. When the time-controlled circuit-controlling device o is closed, the armature of the starting-magnet m^{16} will be moved into its attracted position and held until the circuit including said electro-magnet t' is opened, and this is accomplished by means operated by the code signal-transmitter which opens a switch j, when the automatic fire or other automatic signal has been sent. A relay a^{22} is herein provided for disabling the local circuit of the automatic signaling-devices when the fire-signaling devices are operated, and also upon the occurrence of a cross between the open branches and closed loop of the auxiliary-circuit, thus preventing the sending of an automatic-signal. Said relay is responsive only to the heavy current employed for operating the starting-magnet of the auxil-

iarized fire-alarm box, and hence will not respond to the operation of the automatic signaling-devices.

It is desirable that the manual operation of any of the fire-signaling devices in the auxiliary-circuit, and which are adapted to operate the auxiliarized fire-alarm box, shall also cause a signal to 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 a relay a^{13} may be employed, 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. The armature a^{14} of this relay normally occupies a semi-attracted position. Whenever any of the manually-operative fire-signaling devices are operated and the starting-magnet of the auxiliarized fire-alarm box thereby caused to release said box, the armature a^{14} of the relay a^{13} will be moved into its attracted position and the circuit-controlling device a^{24}, a^{21}, closed. Said circuit-controlling device a^{24} 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^{10} 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 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, as shown in my application #555,605 before referred to.

If desired, a local signal-recorder of any suitable construction may be provided at the building containing the signaling-devices, and, as here shown, the operating-magnets c of such a recorder are represented in diagram, Fig. 1, which are included in branch-wires d^{9}, so as to be controlled by the armatures b^{6} of the relays b^{5} and adapted to respond when said armatures close on the contacts d^{10}. The signals sent, upon the operations of all of the signaling-devices, will thus be recorded locally.

I claim:

1. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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, an auxiliary-circuit 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, and automatic signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for said transmitter, substantially as described.

2. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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, an auxiliary circuit 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 automatic 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.

3. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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, having a starting device, controlling means for the starting-device of said signal-transmitter, an auxiliary circuit, signaling-devices arranged to control said auxiliary-circuit to operate the starting-device of the auxiliarized fire-alarm box, and automatic 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.

4. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit and having a starting-device, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting-means ar-

ranged to send signals over said supervisory-circuit, having a starting-device, controlling-means for the starting-device of said signal-transmitting means, an auxiliary-circuit, 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 automatic 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.

5. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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 a starting-magnet, a local circuit-controlling device for the circuit of the starting-magnet of said signal-transmitting means, an auxiliary-circuit, signaling-devices arranged to control said auxiliary circuit to operate the starting-magnet of the auxiliarized fire-alarm box, and automatic signaling-devices arranged to control said auxiliary-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.

6. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit 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 a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of said signal-transmitting means, an auxiliary-circuit, 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 automatic signaling-devices arranged to control said circuit to control the operation of the other local circuit-controlling device, exclusively, substantially as described.

7. In a supervisory signaling-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, two separate controlling-means for the starting-device of said signal-transmitting means, an auxiliary-circuit, 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 automatic signal-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.

8. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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 a starting-magnet, a time-controlled local circuit-controlling device for the circuit of the starting-magnet of said signal-transmitting means, an auxiliary-circuit, signaling-devices arranged to control said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box, and automatic signaling-devices arranged to control said circuit to control the operation of said time-controlled local circuit-controlling device, exclusively of the starting-magnet of the auxiliarized fire-alarm box, substantially as described.

9. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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 a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of said signal-transmitting-means, one of which is time-controlled, an auxiliary-circuit, 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 automatic signaling-devices arranged to control said circuit to control the operation of the time-controlled local circuit-controlling device, exclusively, substantially as described.

10. In a supervisory signaling-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, two separate controlling means for the starting-device of said signal-transmitting means, one of which is time-controlled, an auxiliary-circuit, signaling-device arranged to con-

trol 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 automatic signaling-devices arranged to control said auxiliary-circuit to operate the time-controlled 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.

11. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit 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, an auxiliary-circuit, with which the starting-magnet of the auxiliarized fire-alarm box and the starting-means for the transmitting-means are connected, and automatic 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 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.

12. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit, 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, automatic 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.

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

14. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-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, automatic 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.

15. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, having starting-means, an auxiliary-circuit, 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 automatic 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.

16. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit, 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 automatic 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.

17. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit, comprising an open circuit and a closed loop at one side of its battery, the starting-magnet for the auxiliarized box being included in said closed loop and the starting-means for the signaling-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 automatic signaling-devices arranged in multiple in the open circuit, and also respectively in multiple 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.

18. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit, 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, automatic 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.

19. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, code-signal transmitting means arranged in said signals over said supervisory-circuit, an auxiliary-circuit, 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 automatic 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.

20. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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, an auxiliary-circuit, signaling-devices arranged to control said auxiliary-circuit, means to control the starting of said signal-transmitting means, both responsive to the operations of said signaling-devices, and automatic signaling-devices arranged to control said auxiliary-circuit, to the operations of which said relays only are responsive, substantially as described.

21. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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 a starting-magnet, an auxiliary-circuit, 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 automatic signaling-devices arranged to control said auxiliary-circuit to operate said relays exclusively of said starting-magnet, substantially as described.

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

box connected with a fire-alarm circuit, 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, an auxiliary-circuit 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 starting magnet of the auxiliarized fire-alarm box and also said relays, and automatic 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.

23. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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 a starting-magnet, an auxiliary-circuit, 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 automatic 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.

24. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit 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, automatic 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.

25. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit 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, time-controlled 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 starting-magnet of the auxiliarized fire-alarm box and also said relays, and automatic 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.

26. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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 a starting-magnet, an auxiliary-circuit 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 time-controlled local circuit-controlling device adapted to be operated by means contained in said local-circuit, a local-circuit controlled by said time-controlled 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 automatic 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.

27. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit 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 time-controlled local circuit-controlling device in said local-circuit, relays included in the open auxiliary-circuit adapted to control said local-circuit, automatic 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.

28. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, a supervisory signaling-circuit connected with a supervisory-station, a multiple code-signal transmitter arranged to send signals over said supervisory-circuit, an auxiliary-circuit 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 automatic signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for said multiple signal-transmitter only, substantially as described.

29. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit, 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, exclusively of the starting-device of the auxiliarized fire-alarm box, substantially as described.

30. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, an auxiliary-circuit, 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 multiple signal-transmitter, and automatic 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.

31. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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, an auxiliary-circuit 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 automatic signaling-devices arranged to control said auxiliary-circuit to operate the other starting-means of the multiple signal-transmitter, substantially as described.

32. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with a fire-alarm circuit, 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, having a starting-magnet, two local circuit-controlling devices for the circuit of the starting-magnet of said multiple signal-transmitter, an auxiliary-circuit, signaling-devices for controlling said auxiliary-circuit to operate the starting-magnet of the auxiliarized fire-alarm box and one of said local circuit-controlling devices, and automatic signaling-devices arranged to operate said circuit to control the operation of the other local circuit-controlling device, exclusively, substantially as described.

33. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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, an auxiliary-circuit, 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 automatic 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.

34. In a supervisory signal-system, the combination of an auxiliarized fire-alarm box connected with 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, an auxiliary-circuit, 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-magnet for the auxiliarized fire-alarm box, and automatic signaling-devices arranged to control said auxiliary-circuit to operate the starting-means for said transmitter, and a local signal-recorder arranged to respond to the operation of all the signaling-devices, substantially as described.

35. The combination of a code-signal transmitter and a starting-magnet therefor, of electrically-operated controlling-means for said starting-magnet, having a retarding-device whereby said means is caused to operate the starting-magnet and start the transmitter upon a prolonged operation of the controlling-circuit and not upon a short operation of said circuit, and signaling-devices to operate the controlling-circuit for a prolonged period of time, substantially as described.

36. In a combined auxiliary fire-alarm and automatic signal-system, the combination of an electric-circuit, means responsive to a prolonged operation of said circuit, signaling-devices to operate said circuit for a prolonged period of time, an auxiliarized fire-alarm box having a starting-magnet responsive to a short operation of the circuit, and signaling-devices to operate said circuit for a short period of time, substantially as described.

37. In a combined auxiliary fire-alarm and automatic signal system, the combination of an electric-circuit, means responsive to a prolonged operation of said circuit to send a signal to a supervisory-station, signaling-devices to operate said circuit for a prolonged period of time, an auxiliarized fire-alarm box having a starting-magnet responsive to a short operation of the circuit, and signaling-devices to operate said circuit for a short period of time, substantially as described.

38. In a combined auxiliary fire-alarm and automatic signal-system, the combination of an electric-circuit, means responsive to a prolonged operation and also other means responsive to a short operation of the circuit to send a signal to a supervisory-station, signaling-devices to operate said circuit for a prolonged period of time, an auxiliarized fire-alarm box having a starting-magnet responsive to a short operation of the circuit, and signaling-devices to operate said circuit for a short period of time, substantially as described.

39. In a combined auxiliary fire-alarm and automatic signal-system, the combination of an electric-circuit having automatic signaling-devices, and means responsive to the operations thereof, an auxiliarized fire-alarm box having a starting-magnet, and signaling-devices in said circuit to the operations of which said starting-magnet is responsive, substantially as described.

40. In a combined auxiliary fire-alarm and automatic signal-system, the combination of an electric-circuit having automatic signaling-devices and a resistance, and means responsive to the operations thereof through the resistance, an auxiliarized fire-alarm box having a starting-magnet and signaling-devices in said circuit arranged to operate it without including the resistance to cause said starting-magnet to respond, substantially as described.

41. In a combined auxiliary fire-alarm and automatic signal-system, the combination of an electric-circuit having automatic signaling-devices and a resistance, and means responsive to the operation thereof through the resistance, an auxiliarized fire-alarm box having a starting-magnet therefor, and signaling-devices in said circuit arranged to operate it without including said resistance to cause said starting-magnet to respond, and means controlled by said circuit when operated without including the resistance to disconnect the automatic signaling-devices, 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.