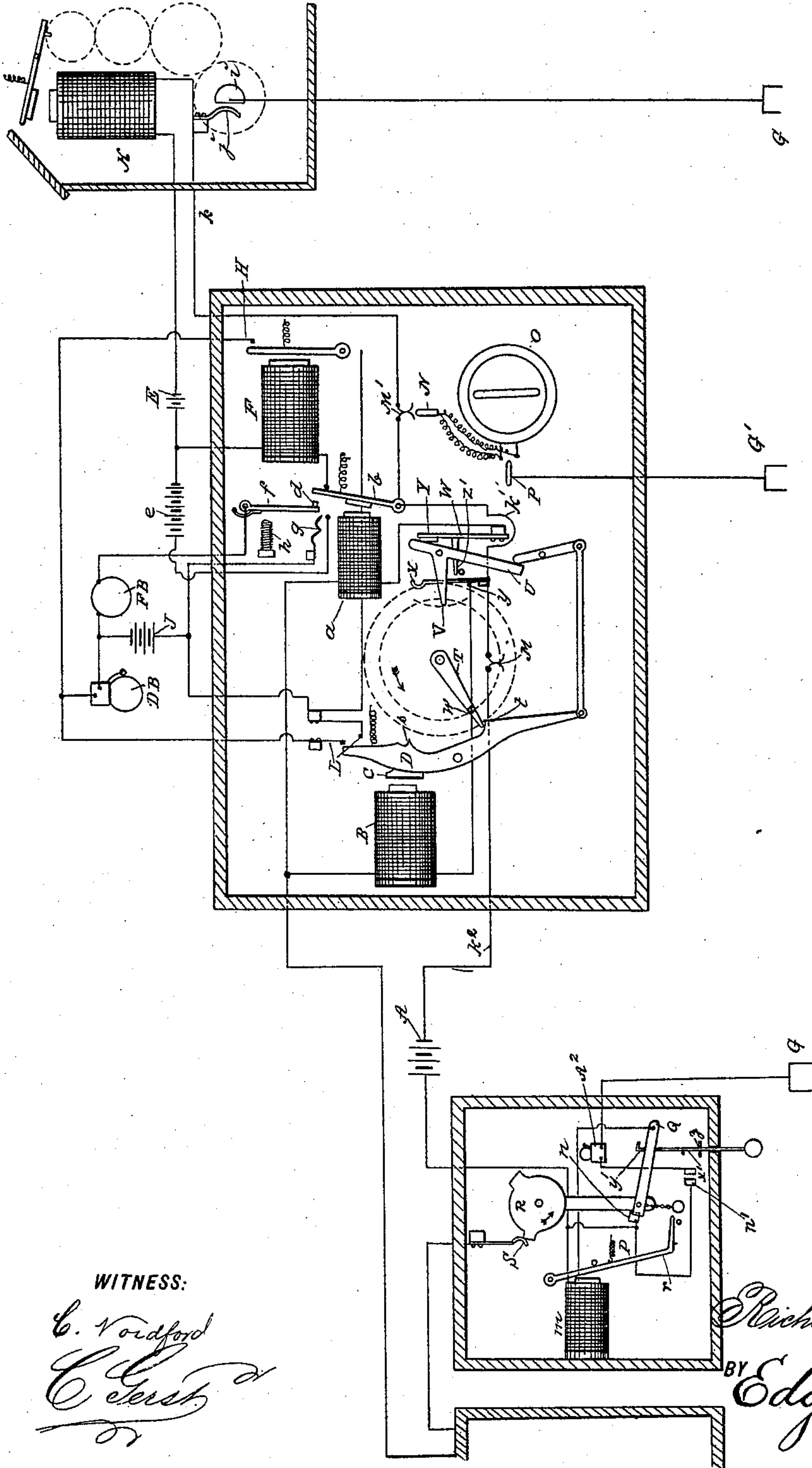


(No Model.)

R. E. ALEXANDER.
AUXILIARY FIRE ALARM SYSTEM.

No. 585,072.

Patented June 22, 1897.



WITNESS:

C. Vordford
C. Christ

INVENTOR

Richard E. Alexander

BY *Edgar Tatelco*

ATTORNEYS.

UNITED STATES PATENT OFFICE.

RICHARD E. ALEXANDER, OF YONKERS, NEW YORK.

AUXILIARY FIRE-ALARM SYSTEM.

SPECIFICATION forming part of Letters Patent No. 585,072, dated June 22, 1897.

Application filed October 31, 1896. Serial No. 567,515. (No model.)

To all whom it may concern:

Be it known that I, RICHARD E. ALEXANDER, a citizen of the United States, and a resident of Yonkers, in the county of Westchester and State of New York, have invented certain new and useful Improvements in Auxiliary Fire-Alarm Systems, of which the following is a specification, reference being had to the accompanying drawing, forming a part thereof, in which similar letters of reference indicate corresponding parts.

The invention is fully disclosed in the following specification, of which the accompanying drawing forms a part, said drawing being a diagrammatic view of my improved electric alarm system and showing at the left thereof a plan of an auxiliary alarm-box and operating mechanism therein and centrally of the sheet a similar view of the main operating and testing apparatus and at the right a similar view of a part of a street alarm-box to be operated as hereinafter described.

In the practice of my invention I provide two normally-closed circuits which operate the system. One of these circuits connects with all the auxiliary boxes in series and by means of the closed-circuit battery A, which energizes the electromagnet B, actuates the armature C, which is attached to the pivoted arm D, and the other circuit, by means of a closed-circuit battery E, energizes the electromagnet F, so as to hold its armature out of connection with the contact H, which closes the circuit through the open-circuit battery J and the disarrangement-bell D B, the current flowing over the circuit through the magnet K in the street-box, but not of sufficient strength to move the mechanism operated by the magnet K.

It will be readily seen that a break in this circuit will operate the disarrangement-bell D B; also, that a break in the other circuit through the auxiliary boxes will release the armature C and close the open circuit at L and ring the same bell.

Referring to the main operating apparatus and testing mechanism, which is shown centrally of the drawing, M and M' represent spring-jacks into which a jack-plug N or other device may be inserted for testing either of the two circuits by means of the galvanometer O and the ground-switch P. In giving an

alarm the lever Q in the auxiliary box at the left of the drawing is pulled down as far as it will go, which winds and trips a spring or clock-movement (not shown) operating the break-wheel R. As soon as this wheel begins to revolve the circuit is broken at S, the armature C is released, and the lever D swings back and releases the hand or lever T, which is operated by clockwork and moves synchronously with the break-wheel R, and at the same time and by means of the levers connected with the lever D the arm U is dropped, so that its end V is thrown out of the path of the pin W on the hand or lever T. When the hand or lever T has reached and pressed back the spring x , thus breaking contact with the circuit at y through the magnet B and closing it at z' through the magnet a , the break-wheel R closes the circuit which energizes the electromagnet a , which attracts the armature b and closes the other circuit at d through the large open-circuit battery e , and the closed-circuit battery E thus energizes the magnet K and starts the train of the street-box or puts the mechanism thereof in operation.

The armature b at the same time pushes the lever f against the spring g , which engages the lever f and holds it until thrown back by pressing on the button h , thus closing the circuit through the open-circuit battery J and the fire or alarm bell F B.

The street-box train operates the contact-wheel i , closing a circuit from the ground at j , through k , k' , and k^2 , the battery A, and the lever Q, which is held down for an instant by the operator, after being pulled, through a bell, buzzer, drop, or other device A^2 , to the ground, thus giving a return-signal that the street-box is in operation.

If two of the boxes are operated quickly and nearly simultaneously, the circuit will be open when the second is operated and the end of the lever r will remain in the path of the lever Q, so as to prevent it from coming far enough to trip the train and start the break-wheel R. Therefore the first box will give the alarm without interference from the second, which does not operate. When the first box is operated, the lever Q as it descends leaves the contact n , throwing the magnet m in the circuit, which immediately at-

tracts the armature p and pulls the lever at r out of the path of the lever Q . If the circuit is open or from any cause there is no current to attract the armature p , the lever r will stop the lever Q before it starts the mechanism of the box, and the operator will know at once without waiting for the return-signal that no alarm has been given by him, because he has not heard the clockwork operate.

10 It will be understood that if the first box operated has had time to make a complete revolution before the second is operated the circuit will be closed through the magnet m , thus attracting the lever P and drawing said
15 lever out of the path of the lever Q and the second box will operate; but as the alarm has already been given through the first box no interference will result.

20 The magnet m is not in circuit when the lever is in its normal position or when pulled down awaiting the return-signal, being short-circuited through the lever Q at n and n' .

25 The rod x' extends through the bottom of the auxiliary boxes and projects over the lever Q at y' , and formed on said rod at y is a stop which permits the lever Q to be drawn down just sufficiently to clear the contact n , but not enough to operate the mechanism that starts the break-wheel R .

30 If the rod x' is pulled down as far as it will go, the contact at n will be broken and the magnet m will be thrown into the circuit, and if the circuit on the line and through the box is in order the armature p will be attracted
35 and the lever r will move back. If said lever does not move, the circuit is not complete, and the box can in this way be tested without being opened or breaking the glass.

40 If the circuit through the auxiliary boxes is broken, the lever D will fall back and operate the disarrangement-bell by closing the circuit at L , and it will also release the hand T , but as there will be no current on the circuit when it reaches the spring x and makes
45 contact at z' through the magnet a this magnet will not be energized and no alarm will be given, but the hand will be stopped at s until the circuit is closed, when it will be released and assume its normal position at t .

50 An alarm can only be given by opening the auxiliary-box circuit and closing it exactly as the hand T reaches the spring x , and if, after the circuit has been opened and the hand T has commenced to move, the circuit
55 is again closed before the hand T reaches the point V the armature C will be attracted and the lever D thrown over and the arm U moved forward, so that its end V will engage the pin W on the hand T , and the arm or
60 lever U will thus be raised by the pin W pressing back the spring w at V and drawing the contact-point z' back, so that the spring x will not reach it when moved by the hand or lever T , and therefore, as the circuit is open, no
65 alarm can be given, and if the circuit is not closed until after the hand T has passed the spring x of course no alarm is given, as the

magnet a is not in circuit. It will be understood that the hand or lever T may be made to travel quite rapidly and the extent of contact between said lever and the spring x may be made short, and it will thus be almost impossible to give an alarm either accidentally or maliciously by manipulating the wires.

70 It will be understood that the wires of the main signal system, which connect with the fire-alarm headquarters, communicate with and operate the apparatus located in the street-box, and it will also be understood that the system herein described is auxiliary
75 thereto and connected therewith.

This system may be employed in a factory or other building provided with a large number of rooms, offices, &c., in which case the operating apparatus or testing mechanism
80 may be located at any desired point in the building, or in the main office, or in the basement, and the auxiliary alarm-boxes will be located in the various rooms or compartments of the building, and also, if desired, in other
85 buildings connected therewith or adjoining the same or in the locality, or it may be employed in connection with any desired number of private buildings, in which event the operating apparatus or testing mechanism
90 may be located in the basement of one of said buildings where it will be easy of access to inspectors or others who are charged with the care thereof, and in this event one of the auxiliary alarm-boxes will be located in each of
95 the buildings or dwellings with which it is desired to make connection; and in the usual arrangement of my improved auxiliary electric alarm system the operating apparatus and testing mechanism, wherever it may be
100 located, will constitute the central station of the auxiliary system.

My invention is not limited to the exact form, construction, and arrangement of the various parts thereof as herein shown and described, and I therefore reserve the right to make all such alterations therein and modifications thereof as fairly come within the scope of the invention.

Having fully described my invention, I
115 claim as new and desire to secure by Letters Patent—

1. In an electric alarm system, the combination of a main-circuit signal-box comprising a let-off magnet, a testing mechanism,
120 and auxiliary boxes, a normally-closed circuit containing the testing mechanism, and auxiliary boxes in series, and a second closed circuit controlled by the first, including the testing mechanism and the let-off magnet,
125 substantially as shown and described.

2. In an electric alarm system, the combination of a main-circuit signal-box comprising a let-off magnet, a testing mechanism,
130 and auxiliary boxes, a normally-closed circuit containing the testing mechanism, and auxiliary boxes in series, and a second closed circuit controlled by the first, including the testing mechanism and the let-off magnet,

and means to prevent false alarms by opening and closing the auxiliary circuit accidentally, or in any other way except by the operation of the auxiliary boxes, also to prevent any auxiliary box interfering with any other, when both are operated at once, substantially as shown and described.

3. In a system for the transmission of electric signals, the combination with a signal-transmission box which is in connection with a main alarm-circuit connecting said box with a central signal-receiving station, of an auxiliary electric alarm system, extending through a series of substation-boxes and connecting said substations with said alarm-box of the main circuit; said auxiliary system consisting of operating and testing mechanism, an electromagnetic releasing device controlling the signal-sending mechanism of the said alarm-box, the actuating-magnet of said releasing device being included in the circuit of the auxiliary system, two normally-closed circuits, one of which connects with all the substation-boxes in the auxiliary system in series, and with a battery, and with the operating and testing mechanism, and the other of which connects the operating and testing mechanism with said electromagnetic releasing device within the said alarm-box of the main circuit; said parts being constructed, combined and arranged, substantially as shown and described.

4. In a system for the transmission of electric signals, the combination with a main alarm-circuit which connects a signal-transmission box with a central signal-receiving station, of an auxiliary electric signal system, comprising an operating apparatus and testing mechanism which is in connection with the operating mechanism of said signal-box of the main circuit, and a series of substation-boxes which are also in connection with said operating apparatus and testing mechanism, said operating apparatus and testing mechanism being in connection with said alarm-box of the main circuit by means of a normally-closed circuit which is also in connection with a battery capable of operating the operating apparatus and testing mechanism of the auxiliary system but not powerful enough to operate the mechanism of the said alarm-box, the operation of the mechanism of the alarm-box of the main circuit being accomplished by throwing into the circuit, to the alarm-box, a battery strong enough to operate the mechanism of said alarm-box, said battery being normally not in circuit; said operating apparatus and testing mechanism of the auxiliary system being connected with a circuit through a disarrangement-bell and a local battery, so arranged that a break in either of the circuits which connect the substation-boxes with the operating apparatus and testing mechanism of the auxiliary system and the latter with the alarm-box of the main circuit, will operate said dis-

arrangement-bell, substantially as shown and described.

5. In a system for the transmission of electric signals, the combination with a main alarm-circuit which connects a signal-transmission box with a central signal-receiving station, of an auxiliary electric signal system, comprising an operating apparatus and testing mechanism which is in connection with the operating mechanism of said signal-box of the main circuit, and a series of substation-boxes which are also in connection with said operating apparatus and testing mechanism, said operating apparatus and testing mechanism being in connection with said alarm-box of the main circuit by means of a normally-closed circuit which is also in connection with a battery capable of operating the operating apparatus and testing mechanism of the auxiliary system but not powerful enough to operate the mechanism of the alarm-box, and said substation-boxes being in connection in series with the operating apparatus and testing mechanism, and by means of the mechanism in the substation-boxes, with the operating apparatus and testing mechanism of the auxiliary system and through it with the operative mechanism of the alarm-box of the main circuit, said operation of the mechanism of the alarm-box of the main circuit being accomplished by throwing into the auxiliary circuit to the alarm-box, a battery strong enough to operate the mechanism of said alarm-box, said battery being normally not in circuit, said operating apparatus and testing mechanism thereof being connected with a circuit through a disarrangement-bell and a local battery, so arranged that a break in either of the circuits which connects the substation-boxes with the operating apparatus and testing mechanism of the auxiliary system and the latter with the alarm-box of the main circuit, will operate said disarrangement-bell and an alarm-bell, in a separate circuit connected with said operating apparatus and testing mechanism, said alarm-bell being operated only when an alarm is given from the substation-boxes, substantially as shown and described.

6. In a system for the transmission of electric signals, the combination with the alarm-box of a main alarm-circuit which is in connection with a central signal-receiving station, of an auxiliary electric alarm system, comprising a plurality of substation-boxes, which are all in connection by means of a single closed circuit with an operating apparatus and testing mechanism, said operating apparatus and testing mechanism being also in connection with the alarm-box of the main circuit by means of a single closed circuit, and said substation-boxes being each provided with a clockwork or spring mechanism which forms part of the operative apparatus therein, and said operating apparatus and testing mechanism of the auxiliary system,

being also provided with a clockwork or spring mechanism which forms part of the operative apparatus thereof, the clockwork or spring mechanism within the substation-boxes being adapted to be wound and released in the operation of the apparatus in transmitting a signal, and the clockwork or spring mechanism which forms part of the operating apparatus and testing mechanism being normally wound and said clockworks or spring mechanisms being both adapted to move synchronously, substantially as shown and described.

7. In a system for the transmission of electric signals, the combination with the alarm-box, of a main alarm-circuit which is in connection with a central signal-receiving station, of an auxiliary electric alarm system, comprising a plurality of substation-boxes which are all in connection in series by means of a single closed circuit with an operating apparatus and testing mechanism, said operating apparatus and testing mechanism being also in connection with the alarm-box of the main circuit, by means of a single closed circuit, and said substation-boxes being each provided with a clockwork or spring mechanism which forms part of the operative apparatus therein, and said operating apparatus and testing mechanism of the auxiliary system being also provided with a clockwork or spring mechanism which forms part of the operative apparatus thereof, the clockwork or spring mechanism within the substation-boxes being adapted to be wound and released in the operation of the apparatus in transmitting a signal, and the clockwork or spring mechanism which forms part of the operative apparatus of the auxiliary system being normally wound, and said clockwork or spring mechanism being adapted to move synchronously with the clockwork or spring mechanism of the substation-boxes, and means for breaking the circuit and closing said circuit, in order to give the signal, and means connected with the clockwork or spring mechanism of the operating apparatus and testing mechanism of the auxiliary system for preventing an alarm from being given except by the breaking and closing of the circuit within the substation-boxes, substantially as shown and described.

8. In a system for the transmission of electric signals, the combination with an alarm-box, of a main alarm-circuit which is in connection with a central signal-receiving station, of an auxiliary electric alarm system, comprising a plurality of substation-boxes which are all in connection in series by means of a single closed circuit with an operating apparatus and testing mechanism, said operating apparatus and testing mechanism being also in connection with the alarm-box of the main circuit by means of a single closed circuit, and said substation-boxes being each provided with a clockwork or spring mechanism which forms part of the operative ap-

paratus thereof, the clockwork or spring mechanism within the substation-boxes being adapted to be wound and released in the operation of the apparatus in transmitting a signal, and the clockwork or spring mechanism which forms part of the operative apparatus and testing mechanism being normally wound, and said clockwork or spring mechanism being adapted to move synchronously with the clockwork or spring mechanism of the substation-boxes, and means for breaking the circuit and closing said circuit in order to give the signal, and means connected with the clockwork or spring mechanism in the operating apparatus and testing mechanism of the auxiliary system for preventing an alarm from being given, except by the breaking and closing of the circuit within the substation-boxes, said means consisting of a hand or lever which is revolved by the clock mechanism, an electromagnet adapted to control the movement of said arm, and contact breaking and closing devices operated by said hand or lever, and by said electromagnet, substantially as shown and described.

9. In a system for transmitting electric signals, the combination with a signal-box in connection with a main alarm-circuit which connects with a central signal-receiving station, of an auxiliary alarm system comprising a plurality of substation-boxes which are in connection with an operating apparatus and testing mechanism by means of a closed single circuit, said substation-boxes being also in connection with said alarm-box, by means of a closed single circuit, the mechanism within said alarm-box being adapted to close a connection with a ground-circuit, through the circuits of the auxiliary system, and a bell, buzzer, or other device which forms a part of the apparatus within the substation-boxes and the ground, whereby a return-signal may be given, showing that the mechanism within the alarm-box is in operation, substantially as shown and described.

10. In a system for the transmission of electric signals, the combination with an alarm-box, which is in connection with the circuit of a main signal system which connects with a central signal-receiving station, of an auxiliary system comprising a plurality of substation-boxes, each of which is in connection in series with the operating apparatus and testing mechanism of the auxiliary system by means of a single closed circuit, and said operating apparatus and testing mechanism being in connection with the alarm-box, by a single closed circuit, and means connected with the operating apparatus of the substation-boxes for preventing an interference if two or more of said substation-boxes should be operated at the same time, substantially as shown and described.

11. In a system for the transmission of electric signals, the combination with an alarm-box which is in connection with the circuit of a main signal system which connects with

a central signal-receiving station, of an auxiliary system comprising a plurality of substation-boxes, each of which is in connection in series with the operating apparatus and
5 testing mechanism of an auxiliary system, by means of a single closed circuit, and said operating apparatus and testing mechanism being in connection with the said alarm-box by a single closed circuit, and means connected
10 with the substation-boxes or the operative apparatus therein, for testing the circuit through the substation-boxes, without breaking the

glasses thereof, or opening said boxes, or giving an alarm, substantially as shown and described.

In testimony that I claim the foregoing as my invention I have signed my name, in presence of the subscribing witnesses, this 16th day of October, 1895.

RICHARD E. ALEXANDER.

Witnesses:

C. M. GERST,

M. A. KNOWLES.