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J. O. FOWLER, Jr.

Fire, Burglar and District Alarm Telegraph.

No. 207,509. Patented Aug. 27, 1878.

Fig. 1.

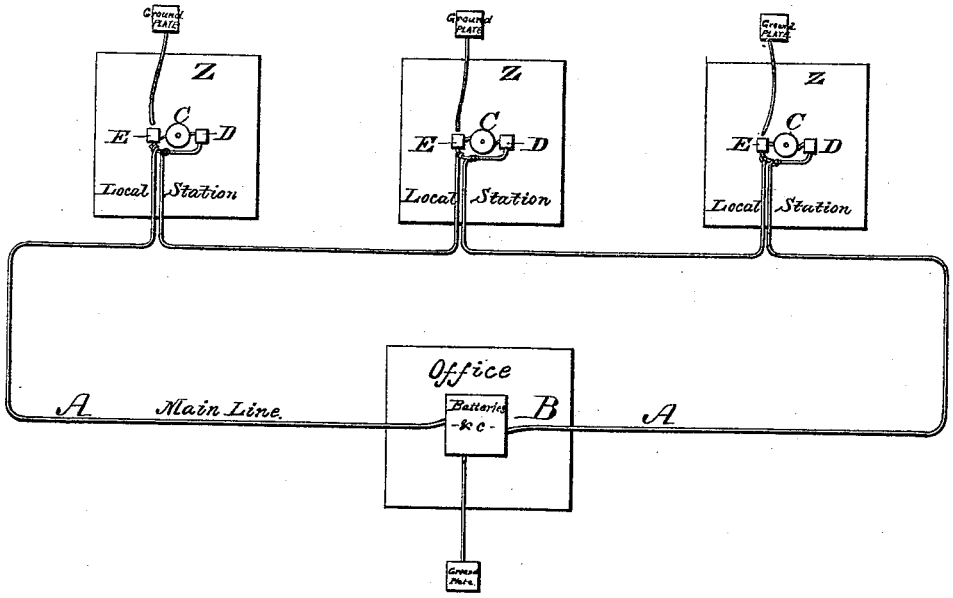

Fig. 2.

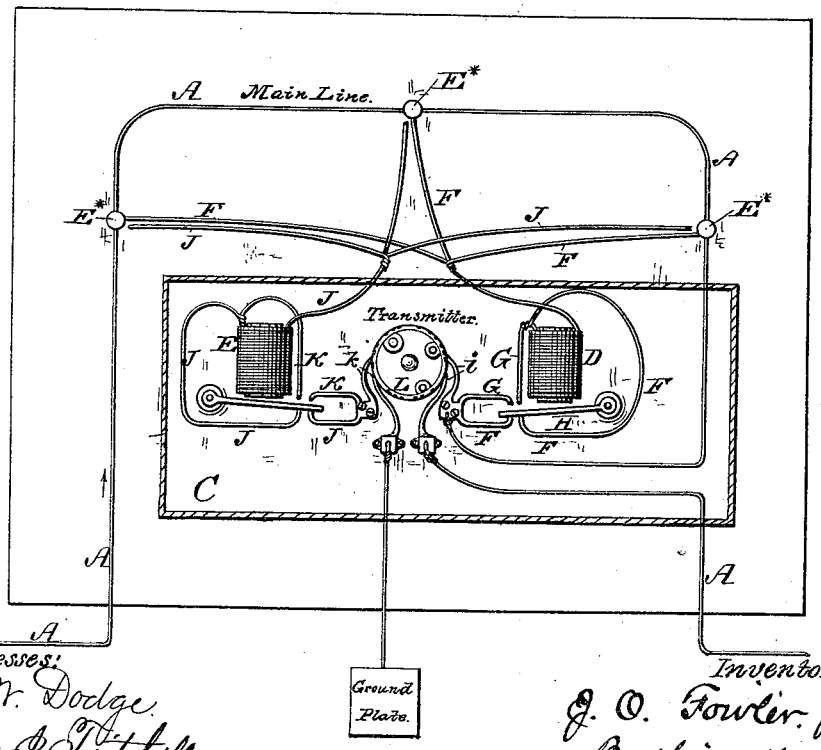

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Fig. 5.

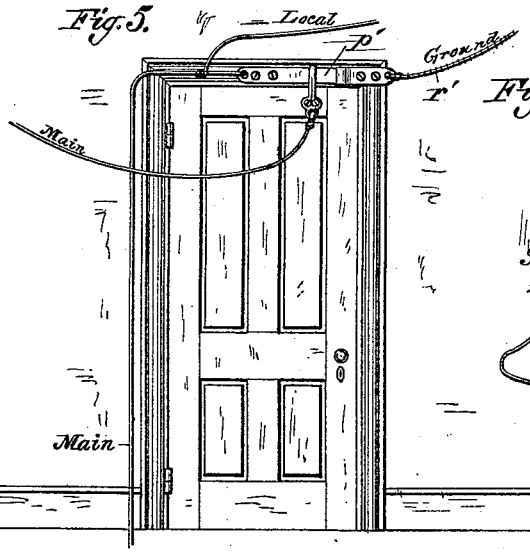


Fig. 6.

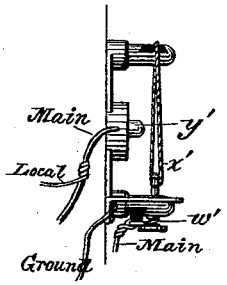


Fig. 7.

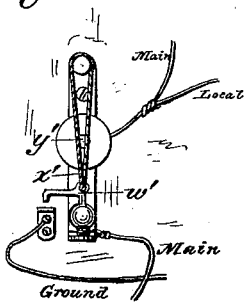


Fig. 4.

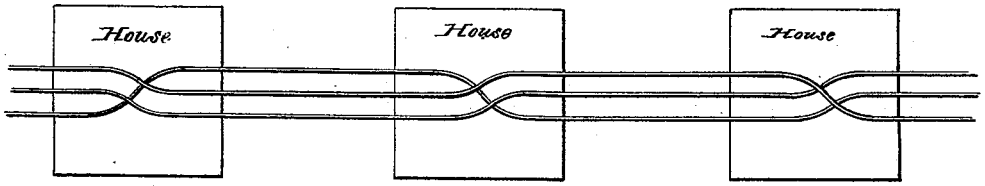
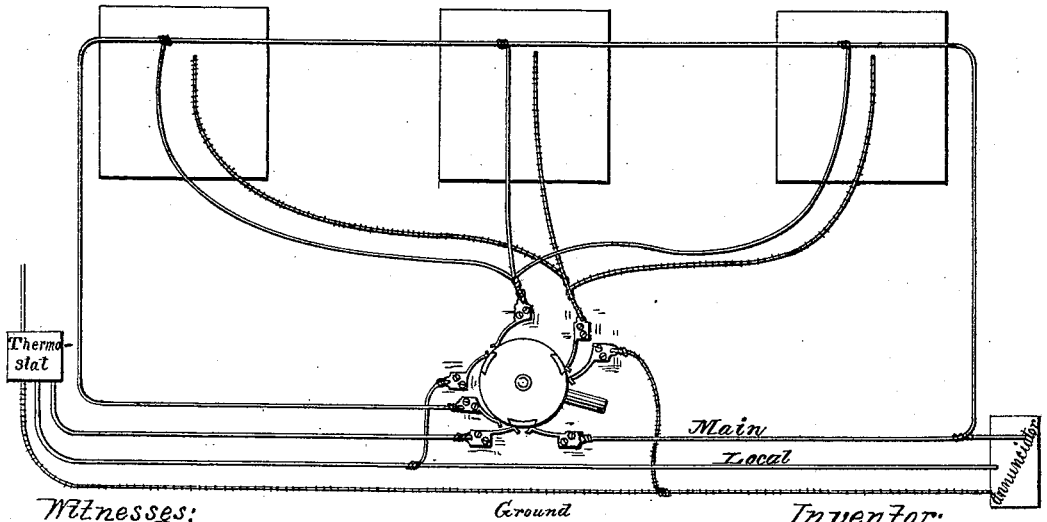


Fig. 3.



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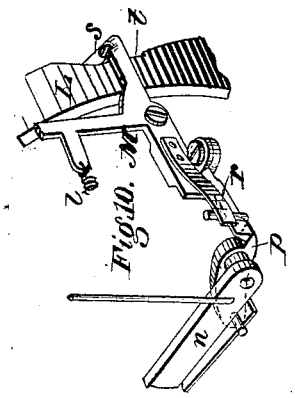

Fig. 10.

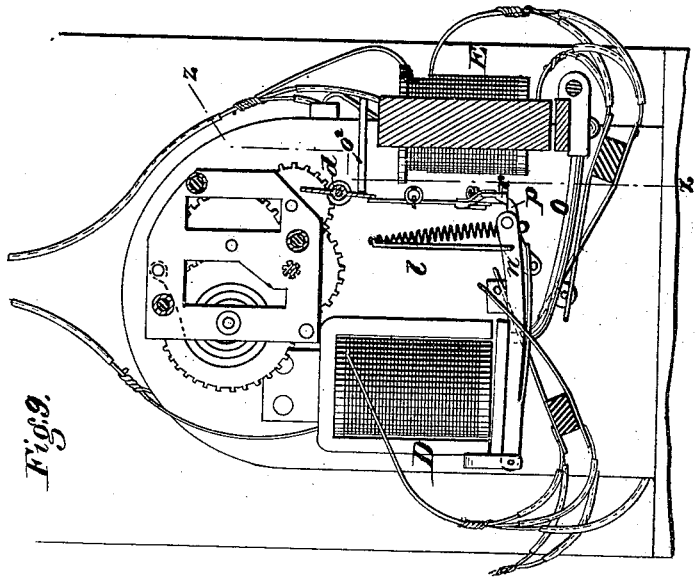

Fig. 9.

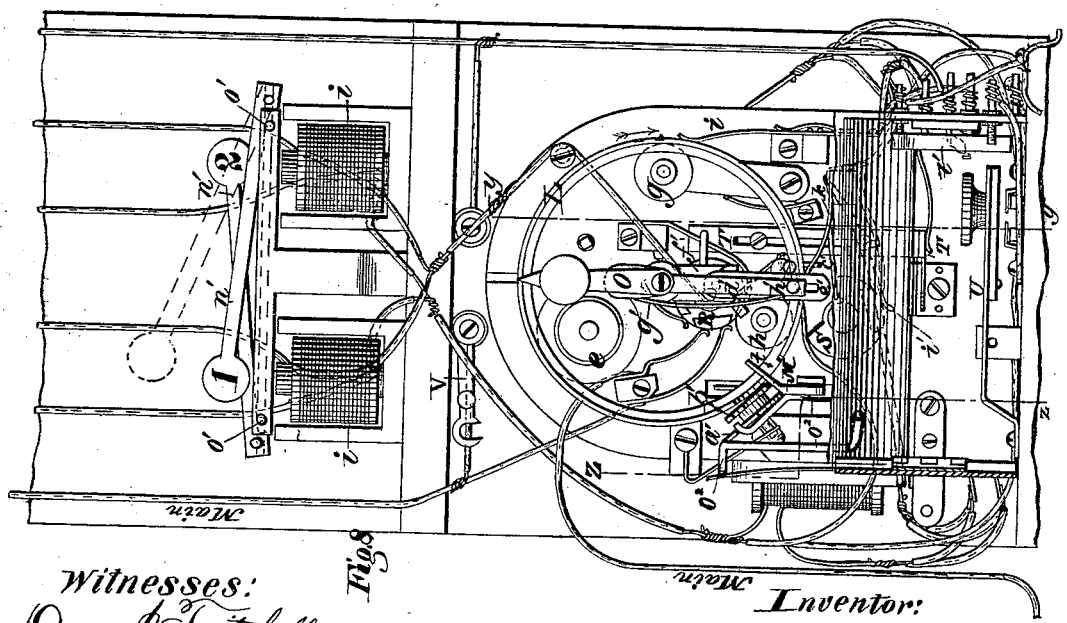

Fig. 8.

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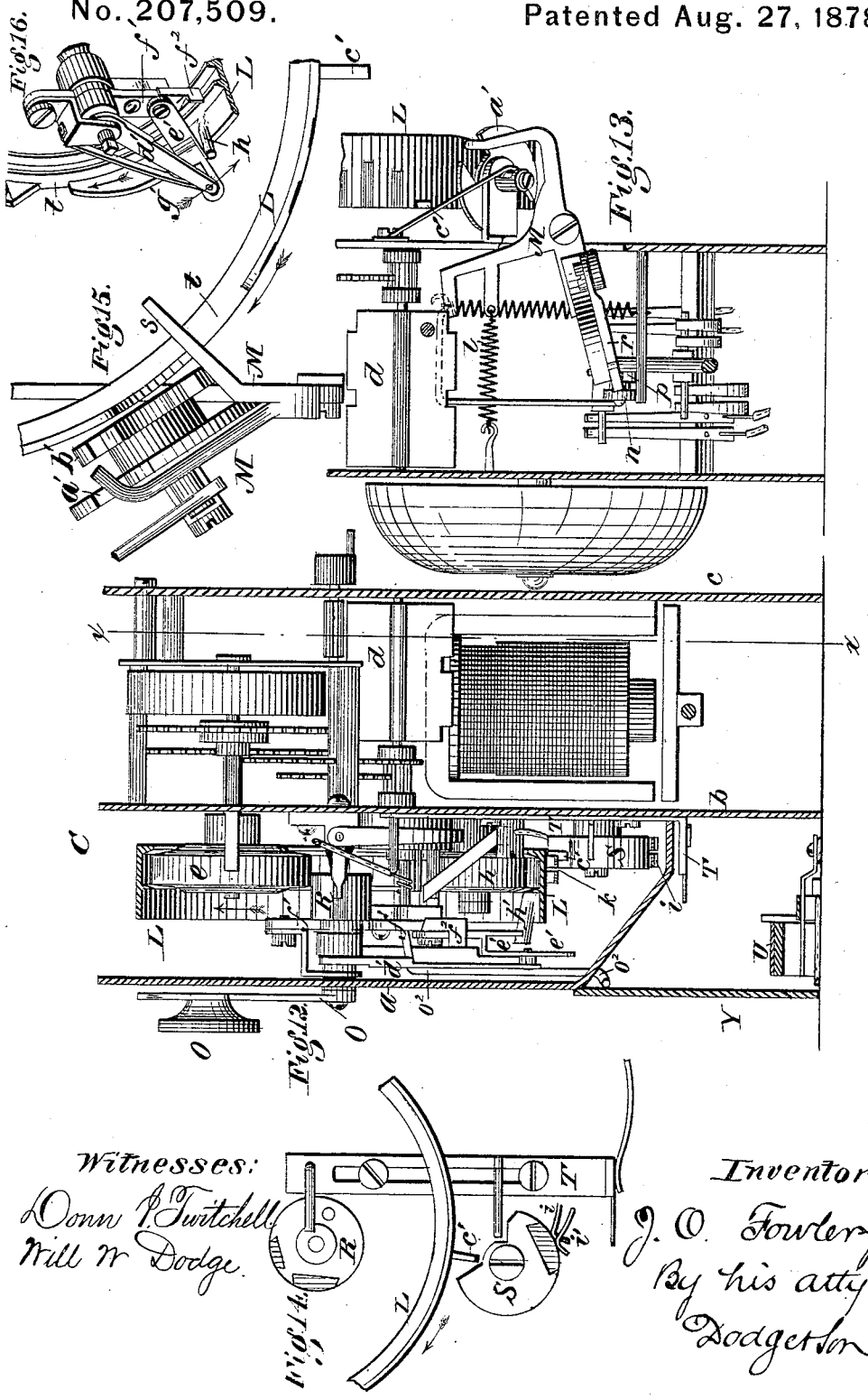

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Fire, Burglar and District Alarm Telegraph.

No. 207,509. Patented Aug. 27, 1878.

Fig. 11.

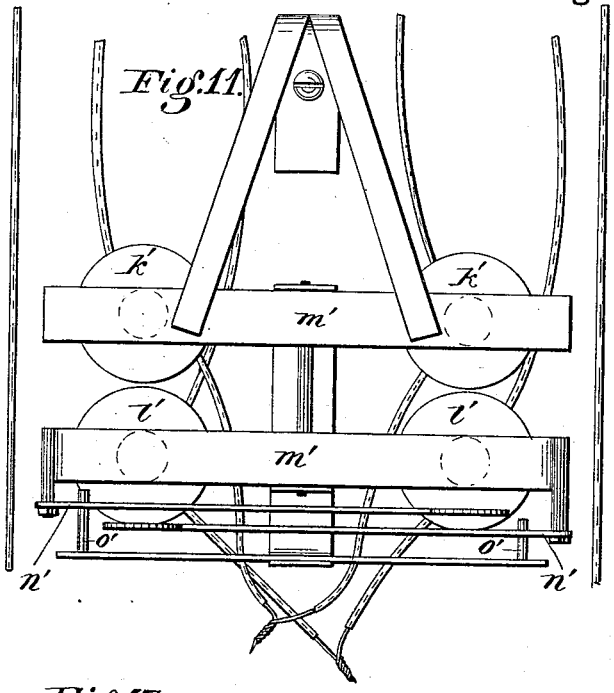
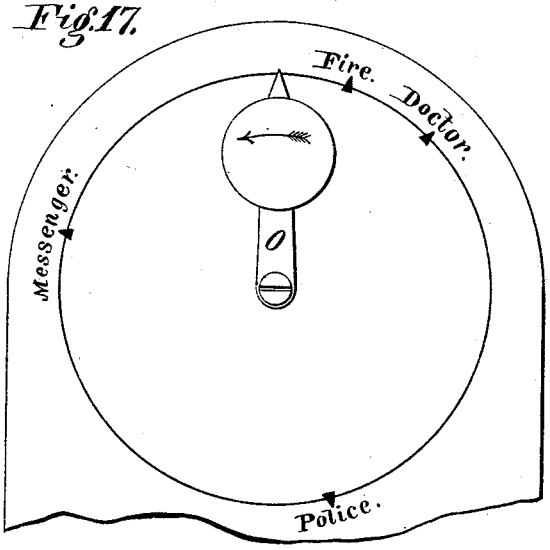


Fig. 17.



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UNITED STATES PATENT OFFICE.

JONATHAN O. FOWLER, JR., OF NEW YORK, N. Y.

IMPROVEMENT IN FIRE, BURGLAR, AND DISTRICT ALARM TELEGRAPHS.

Specification forming part of Letters Patent No. **207,509**, dated August 27, 1878; application filed February 16, 1878.

To all whom it may concern:

Be it known that I, JONATHAN O. FOWLER, Jr., of New York, in the county of New York and State of New York, have invented certain Improvements in Fire, Burglar, and District Alarm Telegraphs, of which the following is a specification:

The object of my invention is to give protection against fire and burglars, and at the same time supply at the smallest expense a convenient and reliable district-alarm telegraph, for which purposes I provide a telegraph system embracing an automatic fire-alarm telegraph, an automatic burglar-alarm telegraph, and a district-alarm telegraph to be actuated or controlled manually.

The invention relates more particularly to the method of combining the three telegraphic systems, or either two of them, in one main system; in certain improvements in the fire, burglar, and district systems, applicable when said systems are used separately as well as when they are used jointly; in the construction of a signaling or transmitting instrument adapted to be operated by the automatic heat and burglar detecters, and also to be operated manually as a district-alarm box for transmitting different signals, as may be required; in automatic fire and burglar detecters, more particularly adapted for use with my systems; in the peculiar arrangement of local circuits and ground-connections in relation to the main-line and local instruments; in an annunciator for use at the buildings or local stations, to there indicate the source of any alarms which may be given; in the particular combination and arrangement of a manual-key and suitable automatic switches with the local transmitting or signaling instrument, to permit general telegraphing between the local station and the central office; and in minor details, which will be hereinafter explained.

In constructing my apparatus I establish, at a suitable point in a town or city, a telegraph-office or central station, where I place a battery and suitable indicating, printing, or alarm instruments of any ordinary construction, to indicate the point from which the alarms are given. From this office I extend a metallic wire to form a complete metallic circuit, passing through the district to be protected and returning to the office; or, instead of returning the wire to the office, I provide means of making a ground-connection therewith at each of the buildings or local stations to be protected, so that when such connection is made at either station a combined metallic and earth circuit is established between such station and the central office; or I may, and in fact I prefer to, use both the complete metallic circuit and the ground-connections, so that the latter may be brought into action in the event of the former being broken, or when for any other reason it may be desired to use the earth-circuit.

At each building or local station to be guarded I locate a transmitting or signaling instrument, the action of which causes a definite alarm to be rendered at the central station or office, this instrument being also arranged to sound a local alarm, and indicate on its face the precise room or locality in the building from which the alarm is given. Connected with the signaling or transmitting instrument at each local station there are a number of heat and burglar detecters, the former located in the various apartments and the latter connected with the various doors and windows, so arranged that upon the breaking out of a fire or the opening of a door or window the detecter guarding that point will set the transmitter in motion, and cause it to send in the alarm to the central station, and at the same time give its own local alarm and indication of the room or opening from which the alarm emanates.

The signals are transmitted in the local instrument by means of spring conducting-fingers resting on a revolving metallic ring which is driven by a clock-train, and provided in its periphery with suitably-spaced non-conducting portions which break the circuit, in the same manner as the ordinary circuit-breakers in common use, so as to cause the striking of a specific number or signal at the central station by the instruments there located.

The local or signaling instrument contains a driving spring and gear, a detent, and two electro-magnets, either of which will release the detent and start the instrument. The two magnets connect, one with a branch local circuit, which is connected with the main wire,

and the other with an open branch local circuit connecting with a ground-plate, and both local circuits connecting with the automatic detecters, in order that the instrument may be started by the detecters through either one of said local branch circuits.

Each of the above-mentioned local branch circuits is accompanied by another local branch, and as soon as the instrument starts the current is directed from the former through the latter. In order that the series of earth-circuits at the various stations may not interfere with the main line, the local earth-circuits are nominally open and the detecters arranged to close the same when they are actuated in giving automatic signals. No difficulty arises from having the local wire circuit permanently connected with the main circuit, for the reason that as it offers an increased resistance the current continues on the main wire until it is severed.

The signaling or transmitting instrument is so constructed that it may also be actuated by a hand-crank to transmit different signals for different purposes, in a manner similar to that of the ordinary district-alarm boxes in common use. Suitable switches are provided for making and breaking the earth-connections automatically and by hand, as required; and for the purpose of permitting general telegraphic communication between the local and central stations the local transmitting-instrument is provided with a common telegraphing-key covered by a door, which latter is connected with switching devices in such manner that when opened its key is introduced into the main circuit, and the magnets of the transmitter made to serve as sounders for messages returned from the central office, where a key and sounder will also be located in the same circuit.

Referring to the accompanying drawings, Figure 1 is a diagram representing the general arrangement of my telegraph with the relative positions of the various instruments, &c.; Fig. 2, a diagram representing a local station, with the arrangement of the local circuits, detecters, transmitting or signaling instrument, and ground-connection; Fig. 3, a view illustrating the arrangement within a building or local station of the fire and burglar detecters and instruments and the switch by which the burglar-alarm is thrown out of action during the day; Fig. 4, a view showing the arrangement of extra wires in connection with the main wire, to mislead burglars and others attempting to change the connections and defeat the action of the apparatus; Figs. 5, 6, and 7, views showing the construction of the burglar and fire detecters; Fig. 8, a face view of the automatic transmitting and hand signaling instrument used at the local station, with the dial-plate removed, showing the annunciator and the telegraph-key; Fig. 9, a vertical section through said instrument on the line *x x* of Fig. 12; Fig. 10, a view of one of the details; Fig. 11, a plan view of the annunciator; Fig. 12, a vertical section through the transmitter or signal-instrument on the line *y y*, Fig. 8; Fig. 13, a section on the line *z z*, Figs. 8 and 9, looking inward, and showing the arms of the armatures and the manner in which they control and change the local circuits and unlock the transmitting or signaling ring; Fig. 14, a view illustrating the switches of the transmitting-instrument; Fig. 15, a view showing the devices by which the signal-ring is locked and the number of its revolutions determined; Fig. 16, a perspective view of the hand-crank and connections for transmitting signals through the local instrument; Fig. 17, a face view of the local transmitter or signal-instrument.

Referring, now, to Fig. 1, A represents the main circuit-wire connecting the central office B with the various buildings or local stations Z which are to receive protection. As shown in the drawing, the central office or station is provided with a battery connected with the main wire A, and also with a ground-plate, which may be brought into connection at will, or which may remain in connection to complete the circuit when the main wire is broken, or when, for other reasons, it is desired to complete the circuit by way of the earth instead of the wire between the central station and any particular local station, or when two circuits, one by the wire and the other by the earth, are to be established. Each local station or building contains a disconnected ground-plate, the transmitting or signaling instrument C, the latter having, as before stated, a spring and clock-train and two magnets, D and E, by either of which latter the instrument may be set in motion to transmit the alarm and number of the station to the central station, B. One of the magnets is actuated by a local metallic circuit permanently connected with the main circuit, and the other by the branch local circuit through the ground-plate, both connected with the detecters. The magnets of the local instruments C are normally out of the circuits, the one because it is on the disconnected earth branch and the other because it offers a greater resistance than the main line, so that the currents continue by way of the latter as long as it remains complete, but are brought into action, one at a time, by the detecters or the hand-crank connected with them, respectively, as hereinafter explained, so that upon the action of a thermostat or the hand-crank at either one of the local stations the instrument C at such station will send the signal through one or both local branch circuits and the main circuit to the central office.

Referring, now, to Fig. 2, the arrangement at each local station of the detecters, transmitting instrument, and local branch circuits will be readily understood. The main line or circuit A is passed through the building or station, and provided at the various points to be guarded with automatic detecters E, which may

be either thermostatic fire-detecters or burglar-detecters applied to the doors and windows. The transmitting or signaling instrument C, located in the local station, has its magnet D connected by the before-mentioned closed local branch circuit F with the main wire A, as shown. The instrument is also provided with an open local or branch circuit, G, connecting with the magnet D and the main wire, and with an armature, H, for said magnet D, arranged in such manner that when attracted it opens the branch circuit F and closes the branch circuit G, through which latter the current continues as long as the instrument continues in action. From each of the detecters in the local station an open local circuit, J, extends to the ground-magnet E of the transmitting-instrument. A second local open branch circuit, K, is also connected with the ground-magnet in the manner shown, and the armature of said magnet arranged to close the same and open the circuit J, after which the current continues down through the transmitter and the ground-plate. The detecters E* are each constructed in such manner that, when set in action by heat or a burglar, they break the main circuit A and complete the circuit J to the earth-magnet E, so that both magnets D and E are connected with the main circuit A, the former with the wire circuit and the latter with the circuit passing through the earth. The operation of the instrument C at this time will transmit its signal over either or both circuits to the office or central station, though there will, of course, be a tendency to take the ground course alone unless a resistance-coil is introduced to equalize the resistance of the two circuits.

The transmission of the signals by the instrument is effected by means of the rotating metallic ring L, having non-conducting spaces in its edge, and spring-fingers introduced into the circuits and arranged to bear on the ring, as shown, the ring serving as a conductor between the fingers, while the non-conducting spaces serve to break the circuit in the same manner as the ordinary circuit-breaking wheels. Although, as stated, the detecters complete both the earth and the wire circuits through the magnets of the instrument C, the automatic and hand fire-signals are ordinarily sent through the earth and the manual or district signals sent through the wire-circuit, the ground-connection not being ordinarily made until the automatic detecters are actuated by a fire or burglar, although a switch may be provided for so doing, if desired.

Referring, now, to Figs. 8, 9, and 10, &c., the signaling or transmitting instrument will be described in detail.

As shown in Fig. 12, the instrument consists primarily of a front or dial plate, *a*, and two frame-plates, *b* and *c*, with the transmitting devices located between *a* and *b* and the clock-train and magnets between *b* and *c*. The clock-train is of ordinary construction, driven by a spring or weight, governed in speed by a fan, *d*, and provided with a shaft extending through the plate *b*, and carrying a rubber or other friction-wheel, *e*, the purpose of which latter is to rotate the circuit breaking or signaling ring L. This ring L, which has its surface provided with properly-arranged non-conducting portions, as before described, has flanges or guides around its interior, and is hung upon the wheel *e*, and held by two internal wheels or rollers, *g* and *h*, mounted on the frame, as shown in Figs. 8 and 12, so that as the wheel *e* is rotated by the gearing it turns the ring forward in the direction indicated by the arrow. In order to hold the ring with the required pressure against the driving-wheel *e*, and to permit its ready removal and replacement by one bearing a different number or signal, its supporting-wheel *g* is mounted on a pivoted swinging arm acted upon by a spring, which presses the wheel against the ring, as shown in Fig. 8. This arrangement, while holding the ring down snugly on its carrying-wheels, admits of the wheel *g* being swung inward with the fingers, so as to release the ring at will and permit its removal.

The springs for transmitting the signals through the main and the earth circuits and magnets are represented by *i* and *k*, Figs. 8 and 12, said springs being connected with the respective circuits, as before explained, and as represented in Figs. 1 and 2, in which the ring and springs are clearly shown.

The operation of the ring-driving gear, the spring of which is kept under tension, is controlled by a latch or detent, M, Figs. 9 and 13, which is held in contact with the governing-fan *d* or other part of the gearing by a spiral spring, *l*, as shown. To release this catch or detent M, and permit the action of the instrument, is the main purpose of the magnets D E, before referred to.

As shown in Fig. 13, the catch or detent M has a lower arm, and the armature of the magnet D an arm or extension, *n*, extending thereunder, as shown in Figs. 9, 10, and 13, while the armature of magnet E has an arm, *o*, extending under the arm *n*, as shown, to raise the same. When either armature is attracted, the arm *n* is caused to raise the catch M and release the gearing, whereupon the signal-ring L is set in motion and the signal transmitted to the central station.

In the operation of the instrument the arm *n* remains suspended by the magnet while it becomes necessary to permit the catch or detent M to fall back, in order to stop the mechanism at the proper instant. It therefore becomes necessary that the catch or detent shall be able, after being raised, to fall past the arm *n*, and that the latter, when it finally falls, shall be able to pass the catch and engage thereunder again. These results are secured mainly by the arrangement represented in Figs. 9, 10, and 13, the arm *n* having a pivoted nose or end, *p*, free to turn upward under pressure, but held down normally by a spring acting under its rear end, while the catch has a laterally-swinging arm,

r, urged toward the arm *n* by a spring, but limited in its inward movement by a stop or shoulder.

As an additional means to the end mentioned, the catch or detent M has in front an arm, *s*, which extends through the front of the frame and bears against the front edge of the signal-ring L, which is provided with a beveled or V-shaped recess, *t*, in its edge, as clearly shown in Figs. 8, 13, and 15.

The action of the parts is as follows: When the arm *n* is raised by means of either magnet it raises the catch M, releasing the mechanism and starting the signal-ring L, the rotation of which latter causes the catch to ride out of the recess *t* and up onto the raised edge of the ring L, whereby the inner end of the catch M is raised clear of the arm *n* and the pivoted nose *p* of the latter permitted to turn upward, so that when the catch is released its inner end can fall past the end of arm *n*. When the arm *n* is released its pivoted nose *p* falls past the pivoted yielding end *r* of the catch M, which engages over it in the manner represented in Fig. 10, so that when the arm is again raised it actuates the catch, as before. The catch M being raised to start, the ring L is held up by the same until the ring has completed one revolution and brought the notch in its edge under the front arm *s* of the catch, whereupon the catch, unless sustained by other devices, will fall and stop the mechanism.

In transmitting automatic fire or burglar signals it is desired to have the ring make two revolutions in order to repeat the signals. This is provided for by mounting at one side of the ring, under the front arm of the catch or detent M, two disks, *a'* and *b'*, secured together and mounted on a common pivot, Figs. 8, 13, and 15. The disk *a'* is intended to hold the detent or catch M up, in order to permit the continued action of the mechanism, and is provided in its edge with two notches, into one or the other of which the catch must fall, as shown in Figs. 13 and 15, before the mechanism can be stopped. The disk *b'* has in its edge four notches, to receive an actuating-pin, *c'*, secured to the signal-ring, as shown in Figs. 13 and 15.

When the rotation of the ring L commences the pin *c'*, acting in the notched edge of the disk *b'*, turns the disk *a'* a fourth of a revolution in such position as to prevent the catch or detent M from falling, as it would otherwise do, at the end of the first revolution of the ring. During the second revolution of the ring the pin *c'* gives the disks another quarter-turn and brings one of the notches of *a'* under the catch M, so that it may fall and stop the mechanism when the ring completes the second revolution. Thus it will be seen that by the combined action of the pin *c'* and the two disks the ring is permitted to make two revolutions whenever it is released through the instrumentality of the magnets and automatic detecters. By changing the number of notches in the disks *a' b'* the ring L may be caused to rotate any number of times desired.

In order that the instrument may be actuated by hand as a district-alarm box, I provide a hand-crank attachment, O, by means of which the signal-ring may be turned backward any desired distance, and then permitted to run forward again, so as to render the signals first backward and then forward, in order that they may be distinguished from the automatic signals, which are transmitted in the forward order only. The ring L has the signals repeated on its face any suitable number of times—ordinarily, however, three times—so that at each revolution the signal is transmitted thrice to the central station. Supposing the signal to be 123, the release of the ring by the detecters, and its consequent double rotation, will cause the signal 123 to be sounded at the central station six times in rapid succession. Supposing, however, the ring to be turned by the crank, the signal will be given backward and then forward a greater or less number of times according to the distance the ring is turned back by the crank.

The dial-plate *a*, over which the crank revolves, is provided with suitable graduations or marks to indicate the meaning of the signals transmitted when the crank is turned back to the respective points, as shown in Fig. 17.

The release of the mechanism when the hand-signals are to be sent is caused by the signal-ring raising the catch or detent M up out of the inclined notch *t* in its edge, and thereby causing the release of the gearing.

The manner in which the hand-crank is arranged to turn the ring back without interfering with its forward rotation when the automatic signals are given will be understood on referring to Figs. 8, 12, and 16.

The crank is connected rigidly to a depending arm, *d'*, mounted loosely on a supporting-axis, and the arm *d'* has at its lower end a pin working in the lower slotted end of an arm, *e'*, which latter is pivoted to the lower end of an arm, f^1, mounted loosely on the shaft or axis which sustains the crank and arm *d'*. The arm f^1 is prevented by a stop from swinging to the left, while the arm *e'* is prevented by a shoulder, f^2, from swinging to the right of arm f^1. A spring, *g'*, tends to hold the three arms *d'*, *e'*, and f^1 in line with each other. A pin, *h'*, on the front edge of the signal-ring rests against the right side of the arm *e'*. When the ring is turned forward to give the automatic signals, the arm *e'* yields and permits the pin *h'* to pass, as shown in Fig. 16, without disturbing the crank; but when the hand-crank is turned it causes the arm *d'* to carry the arm *e'* against the pin *h'* on the signal-ring and turn the latter backward, as indicated by the arrow, Fig. 16. When the crank is released and the ring turns forward again, the pin *h'* carries the arms and crank back to their normal positions.

The manual fire-signal is the one given by turning the crank back to the greatest distance, and there is introduced into the instrument a rotary switch, R, so arranged that when the crank is turned back to give the fire-signal it causes the arm f^1 to act against a pin on the switch and move the same in such manner as to connect the ground-line and cause the current to pass from the main line through the arms of the crank, and thence through the switch and signaling devices back to the main line, which continues until the crank and ring have turned back to the starting-point, when the current is directed automatically through the two local circuits, which causes the magnet to again release the ring, which then makes its two forward revolutions in the same manner as when released by the detecters.

Thus it will be seen that the hand fire-signals consist, first, of the reverse signals caused by the backward motion of the ring, then the forward signals given by the ring coming back to its place, and, finally, the signals given by two forward revolutions of the ring; or, in other words, of one backward and three forward rotations of the ring.

When the instrument is at rest the transmitting-springs of the ground-magnet branch rest upon insulated portions of the ring L, in order to cut off the ground-connection and prevent the interruption of the main line extending to the stations beyond.

It is necessary, in order to start the instrument, to have a temporary connection through another source, for which reason I introduce a rotating switch, S, into the lower part of the instrument, and arrange conducting-springs i' to connect therewith, as shown in Figs. 8, 12, and 14. Normally the switch stands in the position shown in Figs. 8 and 14, and the local circuit is made through the springs i'. When, however, the signal-ring starts forward, the pin thereon turns the switch S and opens its ground-connection, and the current is established through the transmitting-springs and ring, the switch leaving the ground-connection open when the instrument stops, so that the main line will not be interrupted. Were the ground-connection left closed, the main wire would, of course, fail to operate with the stations beyond.

For the purpose of resetting the two switches R and S by hand when desired, a sliding bar, T, is mounted in the frame, and provided with a thumb-piece and arms to act upon the switches, as shown in Figs. 8 and 14.

In order that notice may be given at the local station when an alarm is given by the detecters, a bell or gong is mounted on the back of the transmitting-instrument and arranged to be actuated by the gearing. This bell-alarm may be of any ordinary form. In order that the local instrument C may indicate the particular room from which the alarm is given, an annunciator of any suitable construction is mounted thereon, although it is preferred to use the one represented in the drawings, Figs. 8 and 11. This instrument has for each room two magnets, k' and l', one to be actuated by the ground local or branch circuit and the other by the wire local or branch circuit. An armature, m', pivoted at its middle, has under one end the two magnets k' and l' of one room, and under the other end the two magnets of another room, as shown in Fig. 11. To the respective ends of the armature there are pivoted two levers, n', extending inward and bearing on fixed fulcrums o^1. The inner end of each lever carries a number or word indicating one room. Upon a current passing from either room through its ground or main annunciator-magnet, the corresponding end of the armature is depressed, and the lever n', attached thereto, caused to tip, as in dotted lines in Fig. 8, elevating and exposing its number opposite suitable openings as long as the magnet is charged.

The armatures and magnets, arranged as above, may be duplicated in one instrument, to indicate any desired number of rooms.

The telegraphic or manual key, for general telegraphing with the main station, is mounted in a separate compartment in the foot of the transmitting-instrument C, as shown at U, Figs. 8 and 12, and is protected by a door, Y, which will be kept locked. The door is connected with a swinging spring arm or detent, o^2, which locks the gearing of the transmitting mechanism when the door is open, in order that the magnets D E may be used as sounders for the return signals from the central station without releasing the gearing and ring.

The door is also connected with and arranged to operate switching devices by which the key and the magnets are switched into and out of the circuit.

When the door is opened the current passes, by way of conducting-springs, under the key U, and also passes through the magnets D E at the local station, and through another sounder and key at the central station, the ground and wire circuits both communicating with the key, so that it will actuate whichever magnet may be in use.

The switching device consists merely of a spring-arm, t', properly connected with the various circuits, as shown in Fig. 8.

When the door Y is open the arm springs outward, breaking the main circuit and making connection with the conducting-wires, so that a closed metal circuit and an earth circuit are established between the local and central stations, each circuit including the local magnet and key and the sounder and key at the central station, so that upon operating the key at either end, and thereby breaking the circuit, the sounder at the other end will be actuated. Of course, the magnet at the transmitting end will also be operated; but to this there is no objection.

When the door is closed its detent-arm is released from the gearing and the main cir-

cuit closed, the spring moved so that the magnets are switched out of the main circuit and back into the local branches, and the key switched out entirely.

The construction of the heat and burglar detecters by which they are adapted to break the main circuit and close the local ground-circuits is clearly shown in Figs. 5, 6, and 7, the former representing a burglar and the two latter a heat detecter. In the burglar-detecter the main and the branch local wires are connected with a spring, p', which, when released, connects with the ground-wire r'. The other end of the main wire is attached to the door, and when the latter is closed the main wire is carried against the spring and forces the same back, whereby it breaks the connection with the local ground-wire and completes the main wire, the local-wire branch remaining always closed.

When the door is opened the main circuit is broken and connection made from the main wire through the ground local branches, and also maintained through the other local branch.

In Figs. 6 and 7 the main and branch local connect with a metal base, whence the main passes out through a sliding bolt, w', held up to maintain the contact by a cord, x', passing over a hot-air match, y', the ignition of which causes the severance of the cord and the release of the bolt w', which is forced down by a spiral spring, so as to break the main circuit. On one side the bolt has an arm which makes connection with the ground-wire when the bolt falls, so that the local branches are introduced into the circuit.

Fig. 4 illustrates the manner in which the extra wires are carried with the main circuit, and their relative positions changed at the points where they enter and leave the local stations, for the purpose of misleading burglars and defeating any attempts they may make to sever and reconnect the wires to prevent the action of the instruments.

Fig. 3 illustrates the manner of using a switch in the local station to switch the burglar-detecters out of the circuit during the day-time.

It will, of course, be understood that, although the detecters shown are preferred, others may be used, provided only they serve the same end.

As represented in Fig. 8, a switch, V, may be introduced into the local instrument to cut off connection with the fire and burglar detecters, while permitting the operation of the instrument by the crank, and also the action of the telegraph-key when its door is opened.

The instrument may be provided with an automatic switch to reconnect and complete the main line after it has been broken and the signal transmitted by the instrument.

Although it is preferred to use in my system the two magnets and both the local ground and the metallic circuits connecting with the central station, the earth-magnet and its connections may be used alone, in order to simplify the apparatus, and the other closed branch local used merely to connect and complete the main line after the ground and mains are both severed at a local station.

In order to adapt the instrument C to be started to give the alarm-signal, a protruding handle may be provided to act against the armatures. This will cause the same signal as the detecters and adapt the box for street use.

Having thus described my invention, what I claim is—

1. In combination with a set of batteries supplied with an earth-plate and office-telegraph receiving-instruments connected constantly with a main telegraph-line, A, on a closed circuit, an automatic heat or burglar detecter, E*, a closed branch or local circuit, F, and an open branch or local earth-circuit, J, each local circuit having an annunciator-magnet to indicate a number, and each provided with a magnet controlling one alarm and transmitting mechanism, L, to sound an alarm at the house or branch station, and to turn in at the central office the determinate signal, either over the metallic line or through the earth-wire, or both, whenever the main line has been severed by the heat or burglar detecters, substantially as and for the purpose set forth.

2. In combination with a battery having an earth-connection, and connected constantly with a main telegraph-line on a closed circuit, A, a signaling-instrument, C, one or more automatic heat or burglar detecters, E*, an earth-wire with an equivalent number of open branch or local earth-circuits, J, and a secondary additional branch open circuit, K, to effect the automatic closing of one of the open earth-wire circuits J, and the subsequent automatic breaking of the circuit, and closing of the secondary additional branch open earth-wire circuit K, through which a signal is automatically sent whenever the main line is severed by any of the heat or burglar detecters, substantially as and for the purpose set forth.

3. In combination with a main telegraph-line, A, on a closed electric circuit, a signaling-instrument, C, one or more automatic heat or burglar detecters, E*, an equivalent number of closed branch or local circuits, F, and one open local or branch circuit, G, communicating therewith, to effect the automatic breaking of the closed branch circuits F and completing of the open local circuits G, through which a signal is automatically sent immediately after the main line has been broken by any of the heat or burglar detecters E*, substantially as and for the purpose set forth.

4. The combination, with an electric-telegraph circuit, of a closed branch circuit, F, controlled by automatic heat or burglar detecters E*, and an open earth-circuit, J, controlled by automatic heat or burglar detecters, and a circuit-breaker, L, to give determinate signals,

controlled either automatically by the heat or burglar detecters or manually by a district-alarm crank.

5. The combination, in a single signaling apparatus, of a single automatic circuit-breaker, driven by a train of wheels, released by heat or burglar detecters, with manual devices arranged to move said circuit-breaker directly and positively to give special signals, the automatic and the manual devices being each capable of action without regard to the other, so that the apparatus may be operated by either at any time, as and for the purposes described and shown.

6. In a telegraph-signal box, an electric signaling mechanism to give a determinate signal, driven by a train of wheels and released by heat or burglar detecters, in combination with manual operating devices independently operated, by which the signal-box may be caused to give two or more special or call signals without disarranging the automatic signaling apparatus.

7. The combination, in a signal-box, C, of an automatic signaling mechanism, L, a manual telegraph-key, U, a door, Y, covering the key, and a detent, o^2, and circuit-switching devices arranged and connected with the door, substantially as shown, whereby the opening of the door is caused to apply the detent to the automatic mechanism and switch said mechanism out of and the key into the circuits.

8. In an alarm-telegraph system, an annunciator consisting of two magnets, l', and armature m', and two pivoted arms, n', actuated by the armature, as shown and described.

9. In an alarm-telegraph, the combination, with the main or circuit wire, of one or more extra or dummy wires carried into and out of the buildings therewith for the purpose of misleading burglars and incendiaries.

10. In an automatic signaling instrument, the combination of a clock-train, a rubber or equivalent friction-wheel, e, driven thereby, signal-circuit-breaking ring L, magnet and mechanism connected therewith, substantially as shown, so that whenever the magnet is charged with electricity the clock-train is released and the signal-ring is caused to revolve, substantially as and for the purpose set forth.

11. In an electric signaling-instrument, the combination, with a circuit-breaker, L, capable of making continuously two or more revolutions, a clock-train to actuate the same, means for releasing the same, and the automatic stop device M, arranged to limit the circuit-breaker ordinarily to one revolution, and to stop it in the position from which it started.

12. In an automatic signaling-instrument, C, the combination, with a revolving circuit-breaker, L, clock-train, and means for automatically releasing the same, of the rotating device a' b', by which the signal-ring is allowed to revolve a definite number of times, substantially as and for the purpose set forth.

13. In combination with the circuit-breaker L and its detent provided with the pivoted dog r, the armature n, provided with the pivoted dog or nose p, as and for the purpose described.

14. In combination with the local earth-circuits J K, the automatic transmitter L, and its detent, the earth-line magnet E, having its armature arranged to break the circuit J, complete circuit K, and release the detent, as described.

15. In a signaling-instrument adapted to be manually or automatically operated at will, the combination, with a district-alarm crank, O, and mechanism f^1 f^2 e' d' o^2 connected thereto, of a clock-train and an automatic circuit, so arranged that the district-alarm crank mechanism is not disturbed when the automatic signaling apparatus is operated or the automatic signaling mechanism disarranged by the use of the district-alarm crank mechanism, substantially as described and shown.

16. A signal-box, C, upon a closed metallic circuit, and also upon an earth-circuit, closed by the action of a heat or burglar detecter, provided with an automatic signaling device, L, and with a switch, S, to break the earth-circuit, so arranged that the action of the automatic signaling device opens said switch, and thereby breaks the earth-circuit, leaving the metallic circuit complete.

17. In a signaling-instrument adapted to be either manually or automatically operated at will, the combination, with a revolving circuit-breaker, L, and means for automatically operating the same, of a district-alarm crank, O, and a switch, R, arranged with the different lines, as described, for the purpose of diverting the circuit of the main line by turning the switch by means of the district-alarm crank, as described, and by this means automatically releasing the clock-train, so as to sound a peculiar signal, as described, to indicate a fire in a building not connected with the fire-detecter lines.

18. In a signaling-instrument, the combination of a circuit-breaker, L, a magnet for causing the automatic action of the same, a crank, O, for operating the circuit-breaker by hand, and a ground-switch, R, arranged, as described, so that it is not moved by the automatic action of the circuit-breaker, but may be moved by the manual action of the same to render the automatic and the manual signals different from each other.

19. In a signaling-instrument to be automatically or manually operated, the combination, with a switch mechanism, S, which is moved by the automatic signaling apparatus, and a switching mechanism, R, operated by means of a manual arm or crank, as described, of a sliding spring-bar, T, by pressing which either or both of the displaced switches are returned to their normal positions.

20. In an automatic signaling-instrument located on a closed metallic and also on an open earth-circuit, both controlled by heat or

burglar detecters, a circuit-breaker, L, controlled by magnets on both circuits, in combination with two springs, *i*, of the closed circuit and two insulated springs, *k*, of the open circuit, all arranged to rest against the circuit-breaker, as and for the purpose described.

21. A thermostat or heat-detecter, E*, to be used where three electric circuits meet, two closed and one open, constructed, substantially as shown, to automatically close the open circuit and break one of the closed circuits by the action of the heated air, leaving the other closed circuit undisturbed.

22. A burglar-detecter constructed, as shown and described, to be used where three electric circuits, two closed and one open, meet, arranged to close the open circuit and break one of the closed circuits by the movement of the door or window, leaving the other closed circuit undisturbed.

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Witnesses:
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