(No Model.) 2 Sheets—Sheet 1.

C. F. A. STURTS.

ELECTRIC BURGLAR ALARM.

No. 492,478. Patented Feb. 28, 1893.

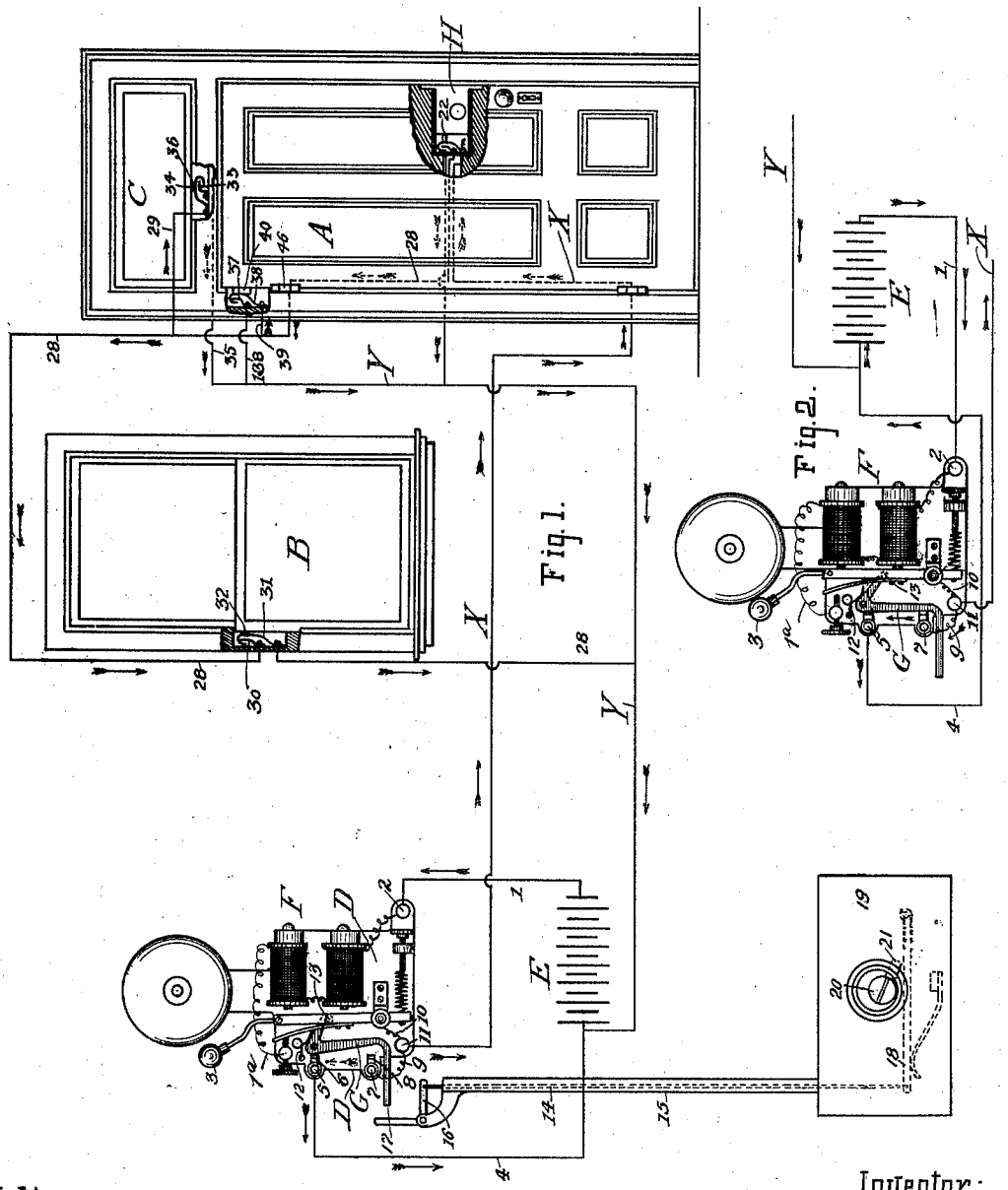

Fig. 1.

Fig. 2.

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(No Model.) 2 Sheets—Sheet 2.

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ELECTRIC BURGLAR ALARM.

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Fig. 3.

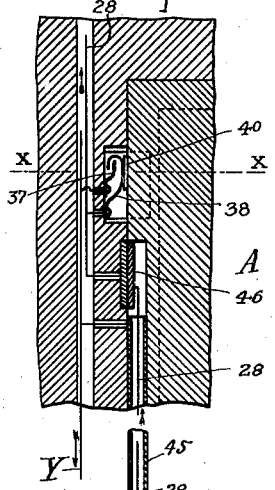
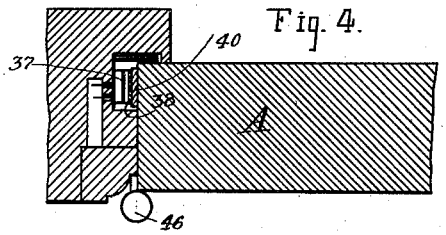


Fig. 4.



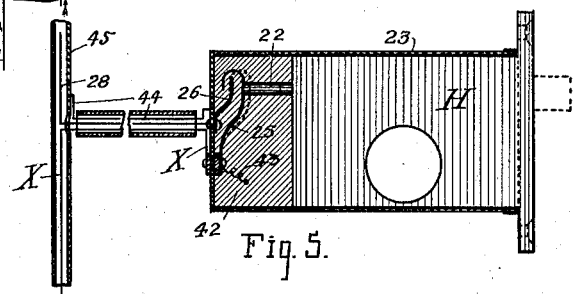
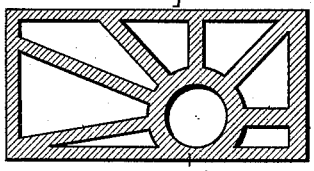


Fig. 5.

Fig. 7.



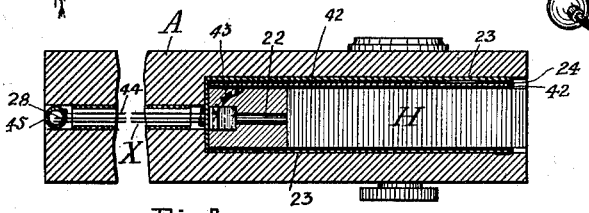


Fig. 6.

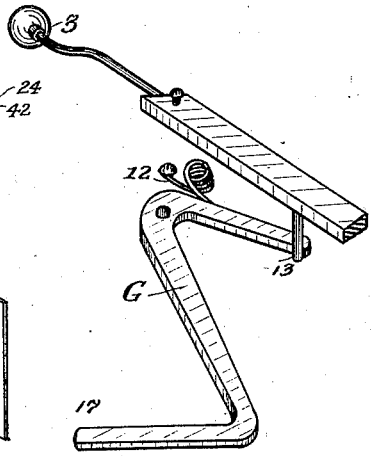


Fig. 9.

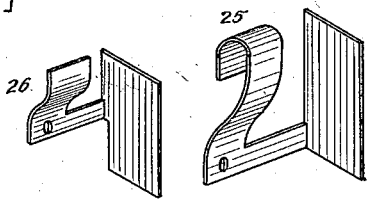


Fig. 8.

Witnesses:
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A. Hang

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UNITED STATES PATENT OFFICE.

CHARLES F. A. STURTS, OF SAN FRANCISCO, CALIFORNIA.

ELECTRIC BURGLAR-ALARM.

SPECIFICATION forming part of Letters Patent No. 492,478, dated February 28, 1893.

Application filed September 30, 1891. Serial No. 407,257. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. A. STURTS, a citizen of the United States, residing at San Francisco, in the county of San Francisco and State of California, have invented certain new and useful Improvements in Electric Burglar-Alarms; and I do hereby declare that the following is a full, clear, and exact description thereof.

This invention relates to electric burglar alarms, adapted to the protection of buildings, such as stores and ware-houses, and particularly in the absence of their proprietors.

The object of my invention is to provide an exterior alarm mechanism located at some point on the outside of the building, and adapted to notify police or passers-by that an attempt is being made to gain ingress into the building. The alarm is located in an independent bell circuit, which when once closed will cause it to sound continuously until the circuit is positively broken by direct mechanical means. This bell circuit is closed by means of another circuit extending to doors, windows, transoms, and other points of possible admittance, and also to the main lock of the entrance door which is the controlling point. This circuit is normally open at each door, window, and transom, and is also open at the door lock, excepting when the latter is locked. In the latter case, the circuit is normally closed at the lock, but remains open at each door, window and transom. An attempt to open any one of these, will close the circuit there, throw in the bell circuit, and sound the alarm continuously; and no cutting of wires, or displacement of parts in the outside circuit can thereafter affect the alarm. From this it will be seen that while the entrance door is unlocked during business hours, doors, windows, transoms, &c., may be operated as usual, without possibility of completing the circuit and sounding the alarm.

The above is a general description of the alarm, but for a full comprehension thereof, reference must be made to the following detailed explanation and to the accompanying drawings.

In the drawings—Figure 1, is a diagram to indicate the location of a door, window, and transom, the bell striking mechanism in open circuit, the battery and electrical connections to such door, window and transom. Fig. 2, is a detail elevation of the bell striking mechanism in closed circuit, as when in operation. Fig. 3, is a vertical section, showing the upper left hand corner of the door in Fig. 1. Fig. 4, is a section on line x—x of Fig. 3. Fig. 5, is a longitudinal section to illustrate electrical connections to the door lock. Fig. 6, is a horizontal section of the same. Fig. 7, is a sectional view of one of the insulating plates for the door lock. Fig. 8, represents in perspective, the spring contacts for closing the circuit when the door is locked. Fig. 9, is a detail perspective of the bell striker and the hook or trigger which forms the closer for the bell circuit.

The diagram, Fig. 1, does not correctly represent the relative proportions or location of the parts of my apparatus as they would be used in practice. The door A, window B, and transom C, are merely supposed to form parts of a building to be protected, and their relative positions are not and need not be, accurately shown. The door, window and transom are taken to illustrate three common methods of obtaining unauthorized ingress to a building; but any number of doors, windows and transoms may be connected in the manner to be hereinafter described, all protected by my alarm apparatus.

The alarm mechanism illustrated in different positions in Figs. 1 and 2, is supposed to be inclosed in a box or case, situated at some inaccessible point upon the exterior of the building, where its operation will give notice to the police or passers-by that an attempt at entrance is being made. D, will therefore represent the back plate of such a box, to which the bell mechanism is secured. The battery E, is concealed at any point, as in a cellar or basement, or if preferred, it may be carried by and inclosed within the box which contains the bell mechanism.

One of the battery wires 1, runs to the binding post 2, in the box D, the latter being electrically connected to the electro magnet F, the armature of which carries the bell striker 3, and thence the wire 1, runs to the binding post 1^a, which has the usual screw for contact with the armature. The other battery wire 4, extends to a binding post 5, which has a

contact point 6. Another binding post 7, having a contact point 8, is electrically connected to the armature by the wires 9 and 10, and post 11. The connections thus far described indicate an open bell circuit.

G, represents a trigger pivoted at its upper end and having a spring 12, which tends to throw it into contact with the points 6 and 8. It is however normally kept out of contact and the bell circuit kept open, by a pin 13 on the armature, over which its hooked end is caught, and by which it is held until the armature is attracted. It will then be released, and will make contact at both 6 and 8, closing the bell circuit and permitting the bell striker to vibrate continuously in the usual manner of an electric bell. The course of the closed circuit is, battery, wire 1, magnet, and through the connecting wire to the binding post 1^a, thence through the armature to the wires 9 and 10, trigger G, wire 4, to the battery. The bell will ring continuously until the circuit is broken at contact point 8. This is accomplished by a rod, wire or cord 14, inclosed within a tube 15, and connected to a bell crank 16. When this cord is pulled, the bell crank will push the trigger G, forward by striking its projecting end 17, breaking the circuit at 8, and causing the trigger to reengage with the armature. The parts are shown, in Fig. 2, in closed circuit, with the bell ringing.

To avoid tampering with the cord or wire which controls the trigger G, I prefer to connect such cord or wire to a pivoted lever 18, carried in a case 19, resembling a lock case, and accessible only by a key or other instrument inserted from the outside, and capable of turning the center pin 20. Such pin has a projection 21, which strikes the lever 18, and thus pulls the cord or wire 14.

The purpose of inclosing the cord or rod 14, in the tube 15, is of course to prevent access to it by unauthorized persons; concealed and protected as it is, and the bell crank 16 having no positive connection to trigger G, a person attempting to stop the alarm might pull down the whole tube, bell crank, and case 20, without effect, for unless he could pull the wire 14 independently he could not open the circuit. The key which controls the lever 18, would of course only be intrusted to police, or watchmen, or other responsible parties.

I have thus far described the construction and arrangement of an alarm mechanism in an independent bell circuit, and means for making and breaking said circuit. I have however so far assumed that the magnet would be energized at proper times for operating the alarm; and I now describe how an attempt to gain entrance to the building, will cause this to be done.

The alarm apparatus is controlled by the lock H, upon the entrance door A of the building. Such lock is in electrical connection with the battery, and also with normally open contacts upon each window, or transom, or other points of possible ingress. There is thus formed, a normally open circuit, which, when the door is unlocked is broken at the door, at each window, and at each transom. When the door is locked, the circuit is closed at the lock, but remains open at the other contacts. Now if a window for example, should be raised, the circuit will also be closed at such window, which will complete it to the battery and magnet, and the alarm will sound continuously as before explained. I now describe the details of this mechanism, referring to Figs. 1, 3, 4, 5, 6, 7, and 8.

The main door-lock H, may be of any desired construction and its mechanism, with the exception of its sliding bolt 22, is not shown in the drawings. It is inclosed within a metallic case 23, (Fig. 6,) and is insulated therefrom so that the lock itself is never in circuit. In one end of the case 23 (Fig. 5), are two normally separated metal springs 25, 26, kept apart by the pressure of the lock bolt 22, but permitted, as shown in dotted lines, to make a contact when the pressure of the bolt is removed by locking the door. These springs are separately illustrated in Fig. 8. A wire X, extends from the binding post 11, which as before stated, is in electrical connection with the armature, is connected to the door hinge, (a convenient way of avoiding complication at that point,) and then continues and is connected to the spring contact 25 at the lock. Another wire 28, running from the contact 26, is connected to the battery wire Y. Now if this circuit, which includes the battery and magnet, and which is normally open is completely closed, by any one of the circuit closers 30, 31, 33, 34 or 37, 38, the alarm will ring continuously; and so my purpose is to have the circuit closed at the lock and open at other points, such for illustration as the door, window and transom shown. Taking the window B, and referring to Fig. 1, it will be seen that the wire 28 passes first to the upper door hinge 46, and is then connected to one of two contact springs 30, 31, situated at a point in the window casing, and kept out of contact, when the window is closed by a stud 32 on the sash. From the contact 31 the wire 28 runs to the battery wire Y. Now the circuit, although closed at the lock by contacts 25, 26, is normally open at the window and will remain open until electrical connection is made through contacts 30 and 31. If the window is raised so as to push the stud 32 past the spring 30, the circuit will be closed at that point also, the battery thrown in, the magnet energized and the alarm sounded. If the burglar should be sufficiently ingenious to cut the wire 28, with a view to breaking the circuit and stopping the alarm, no effect would be produced, because the independent bell circuit remains established. Similarly the transom C is provided with contacts 33, 34, one connected by a wire 35 to the battery wire Y, and the other by a wire 29, to the wire 28. These contacts are held apart

by a stud 36, when the transom is closed. Should it be opened however, the spring 34 is released and a contact made. The course of the current is now, magnet, wire X, contacts 25, 26, at the lock, wire 28, wire 29, contacts 34, 33, wire 35, wire Y, battery, and the alarm will be sounded as before. The window and transom are now provided with safeguards. The door A, must however, be supplied with a similar device, which in the diagram, is shown in its left hand upper corner. There are special features of construction here which I have separately illustrated, but at present I refer only to Fig. 1, as affording a clear illustration of the course of the circuit without reference to details. In the casing of the door are contact springs 37, 38, one connected to the battery wire Y, by a wire 138, the other to the wire 28, by a wire 39. A projection 40 on the door keeps them apart until the door is opened, when they are released and close the circuit, the course of which is now, magnet, wire X, lock, wire 28, wire 39, contacts 38, 37, wire 138, wire Y, battery, the alarm sounding continuously.

I now describe means provided for sounding the alarm in case any attempt is made to tamper with the lock itself; and I refer especially to Figs. 1, 5, and 6. As before mentioned, the lock is inclosed in a metal case and insulated therefrom, as shown by heavy black lines in Fig. 6. Toward the outside of the door, but within the metal casing, is a thin metal plate 42, insulated from the case 23 by a thin perforated sheet 24 of some insulating material, (shown separately in Fig. 7.) The contact point 25, (and consequently the wire X and magnet,) is connected to the plate 42 by a wire 43; while the case 23, is connected to battery wire Y by a wire 44. The insulating strip will ordinarily keep the plate 42 and case 23, out of contact; but if a punch or other instrument be inserted so as to strike the case 23, the latter will be forced inwardly and will make contact with the plate 42 through one or more of the perforations in the strip 24. This will close the circuit and sound the alarm in the manner before described. I have explained these four methods of protecting different vulnerable points, in order to clearly illustrate the fact that by a very simple arrangement of circuits, any number of such points may be placed in circuit. The arrangement of the wires and other mechanism at all of such points is substantially the same, the only changes being those required by the different locations of and constructions at those points. Figs. 3 and 4 therefore, which are sectional views at the left hand upper corner of the door, will be understood to show substantially the details of the mechanism employed at windows and transoms also. I prefer to protect my wires by tubes, as 45. One of such tubes may also be utilized as indicated in Figs. 3 and 5 (which may be read together), to connect the wire 44 to the wire Y. Fig. 3 also shows passages formed in the door and its casing to receive the wires, and indicates the connection of the wire 28 to the upper door hinge 46, the hinge thereby becoming a part of the conductor.

The operation of my burglar alarm has been so fully set forth in connection with the description, that no special explanation will now be required. Attention is however called to one point which shows a particular advantage of my device aside from its use as a protection. It will also operate to give a warning against leaving the building unprotected. If on locking the main door at night, a window should have been left open, the circuit will have been closed at that window; and the operation of locking the door will close the circuit completely, and sound the alarm, thus notifying the person leaving, that some exposed point has been left unfastened. The principal advantage of my alarm system, however, lies of course in the fact, that after the bell circuit has been established the alarm will sound continuously; and no effort of any unauthorized person who has caused it to sound, will avail to stop it even though such effort should destroy the whole external circuit.

What I claim is—

1. A burglar alarm consisting of an alarm in a bell circuit, and an external circuit including a door lock and one or more places of admission such as a window, the circuit being normally open at such window, and closed at such lock when the door is locked, whereby the closing of the circuit at the window will throw in the bell circuit and sound a continuous alarm, substantially as set forth.

2. An electrical burglar alarm consisting of an alarm in a normally open bell circuit, an external circuit which includes the lock of a door, at which point it is closed by the locking of the door, such circuit also including one or more windows or like means of ingress, and circuit closers at such window, normally out of contact but adapted to make contact when the window is opened, all constructed and arranged so that, when the door is locked, the opening of the window will complete the external circuit, throw in the independent bell circuit, and cause a continuous alarm, substantially as set forth.

3. In an electrical burglar alarm the combination of a magnet and battery, an armature carrying a bell striker, an electrical circuit including said parts, a pivoted trigger normally in engagement with the armature, and an external open circuit including one or more windows or similar means of entrance, all constructed and arranged so that the closing of the external circuit will cause the release of said trigger, the closing of the bell circuit, and the sounding of a continuous alarm, substantially as set forth.

4. The combination of the bell operated by an electro magnet in a bell circuit, the trigger G normally in engagement with the armature of the magnet, the contact points 6

and 8, the bell crank 16, rod 14, tube 15, case 19, and lever 18 in said case adapted to be operated from the outside by a key, substantially as and for the purposes set forth.

5. In a burglar alarm, and in combination, a bell circuit including a magnet a battery and a bell, a door lock inclosed in a metal case, a plate 42 insulated from said case by a perforated strip, and electrical connections from said magnet and battery respectively to said plate 42 and said metal case, substantially as and for the purposes set forth.

In testimony whereof I have affixed my signature, in presence of two witnesses, this 17th day of September, 1891.

CHARLES F. A. STURTS.

Witnesses:
H. J. LANG,
L. W. SEELY.