May 3, 1932. G. F. BULEN 1,857,040

FIRE ALARM MECHANISM

Filed July 16, 1929

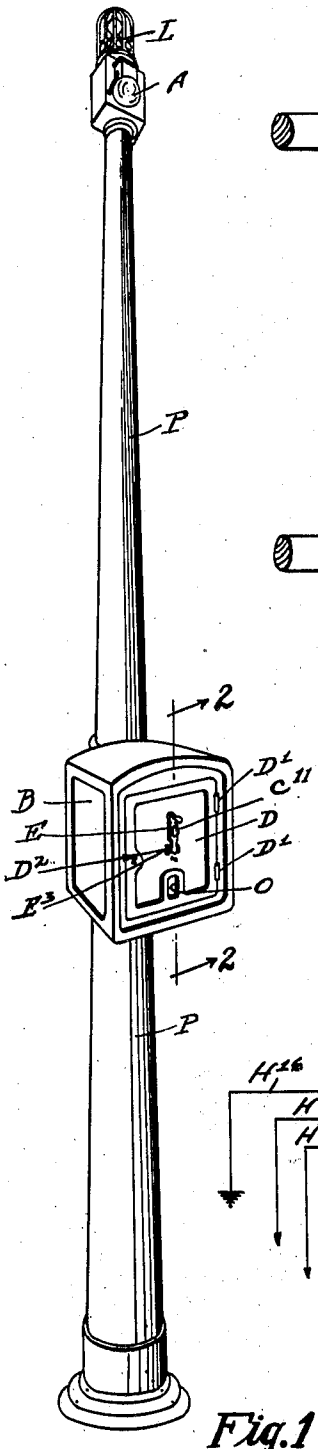


Fig.1

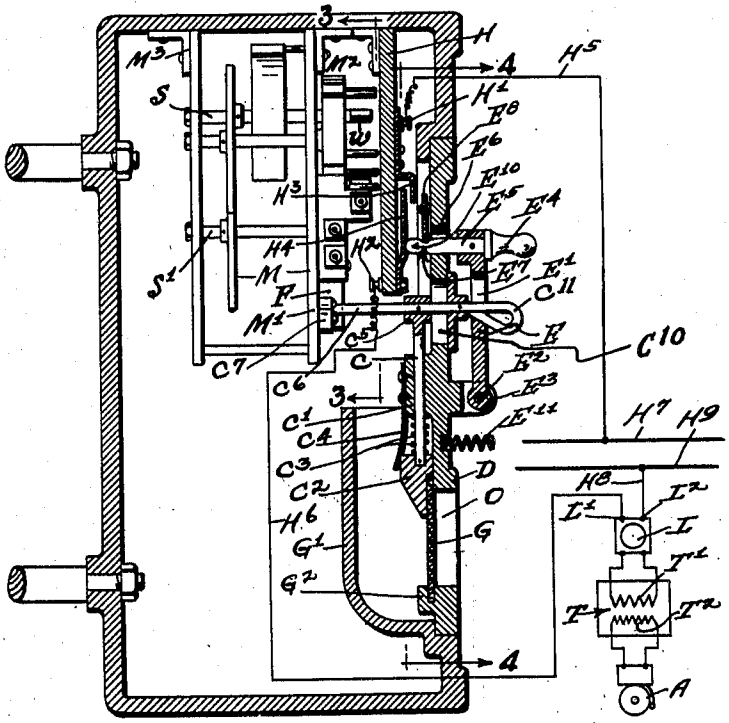


Fig.2

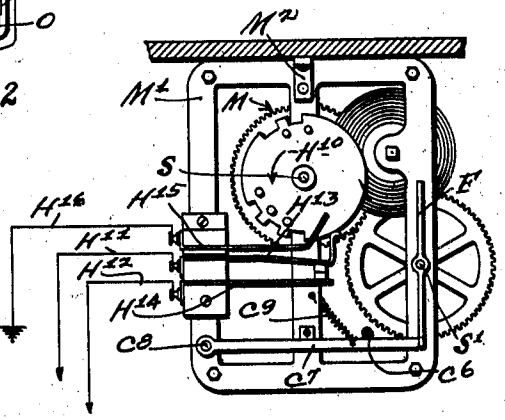


Fig.3

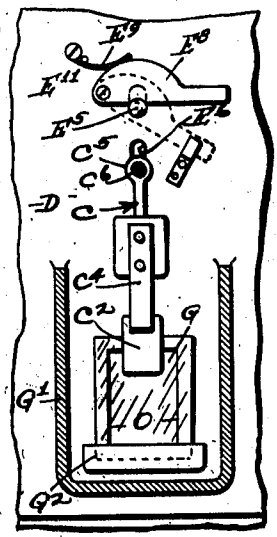


Fig.4

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# UNITED STATES PATENT OFFICE

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## FIRE ALARM MECHANISM

Application filed July 16, 1929. Serial No. 378,671.

This invention relates to fire alarm mechanisms and the primary object is to provide an improved local station or street-box fire alarm signaling system for connection and operation with the usual central station apparatus, my said improved local station alarm signaling system embodying primarily, a combination of manual and automatic means for actuating the alarm mechanism thereof and that of the central station in connection therewith and sounding the alarm incorporated in cooperative relation with the local station.

This application is a continuation in part of applicant's prior application Serial No. 227,186 filed October 19, 1927.

Another object of the invention is to provide a street box or local station having enclosed therein against unauthorized access a mechanism for sounding a local alarm and a mechanism for sounding a central station alarm, together with means exterior to the box for actuating the local alarm and mechanism supported by a glass panel for rendering the central station alarm mechanism normally inoperative, the means for actuating the local station mechanism being employed to break the glass and release the central station mechanism.

Another object is to provide cooperating means externally and internally of the box whereby the operation of the external means is necessary in order to insure the operation of the internal means, and the restoration of the external means will automatically reset the internal means for a succeeding operation.

Another object is to provide a connection between the glass panel and the actuating means for preventing the operation of the actuating means until and unless the glass has been previously broken.

A further object is to provide a manually operable member externally of the fire alarm box and carried on the door thereof and arranged to be swung downwardly for simultaneously releasing the actuating means and for breaking the glass panel by forcibly striking the glass with means provided on the operating member.

The words local station wherever herein used, refer to both the street alarm signal box and to the pole to which it is attached, and of which said box by reason of the independent alarm means incorporated with the pole, forms but a part.

Other objects will appear as the description progresses.

I have shown a preferred embodiment of my invention in the accompanying drawings, subject to modification within the scope of the appended claims, without departing from the spirit of my invention. In said drawings:

Fig. 1 is a perspective view of my improved mechanism mounted for use on a suitable pole.

Fig. 2 is an enlarged sectional view of a local fire alarm station box embodying my improvements, and cut away on a transverse line 2—2 of Fig. 1 to show the interior of the box;

Fig. 3 is a sectional elevation of the local station box on line 3—3 of Fig. 2.

Fig. 4 is a section of the same on line 4—4 of Fig. 2.

Briefly described, the improved mechanism includes a local station box B mounted on a pole P and comprising the usual door D. The top of the pole P may be provided with a suitable alarm bell A and caged lamp L adapted for connection with an electric service line, as hereinafter described.

The box B is provided internally with a suitable spring actuated code wheel mechanism M, of clock-like character and including a suitable number of gear reduction units for imparting rotary motion from the main shaft S to a control shaft S′. The mechanism M is provided with an extension shaft W adapted to receive a key, by means of which the mechanism may be wound when necessary from the forward side of the supporting frame M1. The frame M1 is suitably mounted on the rear of the box B by means of brackets M2 and M3, or otherwise.

The control shaft S′ has a forward extension which is provided with a winged wheel F fixed thereto and adapted for engagement with a portion of the actuating means, as hereinafter described, for rendering the

mechanism M inoperative under normal conditions, and operative at will.

Door D is hinged at D', D', to box B and may be provided with a suitable key operated lock D2 at its other side for preventing unauthorized access to the internal mechanism. Said door has a central opening O in the lower portion thereof, behind which is suitably held a glass panel G, and said door also has a pocket G1 formed integrally with or attached to the door at the rear of the glass G, for the purpose of protecting the opening O and for catching and holding the broken particles of glass when the panel G is broken, as hereinafter explained.

The actuating means comprises a vertically reciprocable plunger C held in a lug C1 and provided with a head C2 on its lower end which rests normally upon the upper end of the glass G. A spring C3 is carried on the plunger C between the head C2 and lug C1, and tends to urged the plunger downwardly when the glass G is removed from its position. The head C2 is engaged by a flat spring C4 which is attached to the inner side of lug C1 in such a manner that the lower end of said spring will engage the upper end of the head C2 when the plunger has dropped into operative position for sounding a central station alarm.

The upper end of plunger C has a boss C5 thereon in which is held a horizontal rod C6. Said rod is extended inwardly so that its end rests in the plane of the winged wheel F and over a bar C7 which is pivoted at C8 on frame M1 and is urged upwardly by a spring C9. The free end of bar C7 engages and normally prevents the rotation of winged wheel F. An enlarged eye C11 is provided on the outer end of the rod C6 which extends thru an elongated aperture E1 in an operating member E, the underlying extremity of the eye forming element being disposed in a gradual diminution of thickness to a tapered affect whereby the lever E is forced upwardly in engagement with the tapered aperture E1 in the lever E when said lever is pulled outwardly by means of the handle E4. Member E is pivotally mounted on the exterior of the door D at E2 between lugs E3, E3, substantially below the rod C6, and above the opening O.

Operating member E has a handle E4 at its upper end with a stem E5 which extends thru an opening E6 in the door and has an annular groove E7 engaged by a detent E8 which is pivoted at E11 to the door D and is urged into engagement with stem E5 by means of a spring E9. A panel H mounted on box B carries a pair of terminals H1 and H2 which are connected respectively, with contacts H3 and H4. It will be observed that the contact H4 is yieldable relative to the contact H3 and is engaged by the inner end E10 of stem E5. Thus, when the operating member E is positioned as shown in Fig. 2, the contacts H3 and H4 will be held apart, for the purpose of maintaining an open circuit of the local alarm A, as described in detail hereinafter.

The detent E8 serves to hold the member E in normal position by the tension of spring E9 but permits the ready operation thereof when an alarm is sounded. The detent will move downwardly over the opening E6 after member E is pulled outwardly and prevent the resetting of said member except by authorized persons.

Below the fulcrum of the operating member E, I may provide a spring cushioning element E11 adapted to engage the outer side of the member E when the same is swung downwardly, so as to prevent the accidental breaking of the glass G, but permitting the intentional breaking thereof, against the tension of said spring.

The rod C6 operates thru an elongated slot C10 in door D of sufficient length to permit the upward and downward thrust of the plunger C, for effecting and stopping the operation of the mechanism.

Now, referring particularly to Fig. 3, I will describe the electrical connections between the several portions of the local station mechanism and the operative connection of the latter with a central station electrical system.

Wires H5 and H6 connect terminals H3 and H4, respectively, with line wire H7 and one of the terminals L1 of lamp L, while the other lamp terminal L2 is connected by means of a wire H8 with line wire H9. Thus the lamp L is in series with the line, and the lamp is connected with the primary winding T1 of a transformer T, while the alarm bell A is connected with the secondary winding T2 of the transformer, as shown.

When the operating member E is swung outwardly from the door the lamp and bell circuit will be closed by the disengagement of the stem E5 from contact H4 and by the engagement of contacts H3 and H4. Said elements will continue to be energized until the lever E is reset on the eye C11. The restoration of member E after a central office and a local alarm is given automatically opens the circuit and discontinues the local alarm when member C is restored by authorized persons.

A suitable shaft, as at S, of the mechanism M, is provided with a commutator or code wheel H10 of suitable form and is adapted to cooperate in unison with the central station equipment with which it is operatably connected by means of wires H11 and H12 leading respectively from contacts H13 and H14, and another contact H15 may be grounded as at H16.

When an alarm is to be sounded, the operating member E is pulled outwardly from the

door D, thus closing the circuit of the lamp L and bell A, and sounding the local alarm positioned at the top of the pole and releasing the actuating plunger C for operating the central station signal. When the glass G has been broken, said plunger, together with bar C7, is permitted to drop downwardly for the purpose of releasing the winged wheel F, so that the mechanism M may operate.

The glass G may be broken by forcibly projecting the handle E4 of the member E against the glass, so that the tension of the spring C3 may be effective for dropping the plunger C and bar C7 out of interference with wheel F. Thereupon the mechanism M operates freely and institutes the rotation of the code wheel H, for transmitting the signal to the central office.

It may be noted that the glass element G adapted for use in my mechanism may be held in seats as at G2 at the bottom of the pocket G1 for firmly holding the same in position behind the opening O. Other forms of glass may be used with as good results, depending upon convenience or necessity.

Thus, in the operation of my device, the local or street alarm is sounded when the operating member E is swung outwardly, glass G being broken, and simultaneously therewith the circuit of the central office signal is operated, the local alarm continuing to sound until member E is reset.

The above operation is effected as follows: When the operating member E is pulled outwardly preparatory to breaking the glass G, the stem E5 is moved to the left, as seen in Fig. 2, thereby allowing the contact H4 to engage contact H3 for closing the circuit of the local alarm. This operation will also disengage the member D from the eye C11 so that plunger C and bar C7 will be allowed to move downwardly when the glass G is broken by the forcible projection of the handle E4 of lever E against the glass by reason of the tension of its spring C3, so as to release the code wheel operating mechanism. Thus the circuit of the local alarm independently or together with the circuit of the central station signal remains closed until authorized persons have gained access to the box B and have reset the plunger C, whereupon the mechanism will resume the relative positions shown in Fig. 2.

Preferably the spring C3 locks the plunger C downwardly after lever E is removed from eye C11 so that the lever cannot be restored until access is had to the interior of the box. Of course the local alarm is sounded for as long a time as the lever remains off of the eye.

To discontinue the alarm and reset the mechanism, door D is opened and plunger C is brought to a position corresponding to that shown in Fig. 2, the mechanical elements C1, C2, C3, C4 and E thereby automatically opening the circuit for subsequent alarms.

What I claim is:

1. A signal device comprising a local station box, a door thereon closed against unauthorized access, a signal mechanism in said box arranged for connection with a central station, a local alarm adjacent said box, means including an exposed operating member mounted on said door adapted to complete the circuit of the local signal when it is swung outwardly from normal position, means including a collapsible element normally preventing the operation of the central station signal, said operating member being effective for breaking said collapsible element when it is swung downwardly for effecting the operation of the central station signal.

2. A signal device as characterized in claim 1, including means for normally supporting said operating member in position for maintaining an open circuit of the local signal.

3. A signal device as characterized in claim 1, including means operative when the operating member is pulled outwardly to prevent the unauthorized opening of the local alarm signal.

4. A fire alarm device comprising a local station box having a code wheel signal mechanism therein arranged for connection with a central station system, said device including a local alarm mechanism, actuating means in said box normally set to prevent the operation of said code wheel signal mechanism, an operating member movably mounted in said box and movable to release said actuating means to cause operation of said code wheel signal mechanism, means associated with said operating member to initiate operation of said local alarm mechanism when the operating member is moved to one position and means to normally prevent stoppage of said local alarm when the operating member is moved to said one position, said operating member being further movable to initiate operation of said code wheel mechanism.

5. A signal device including independent means for actuating a local alarm and a remote alarm, a box therefor, a collapsible element held in a side of said box, means engaging said collapsible element for holding one of said actuating means inoperative, and means externally of the box associated with the other alarm mechanism and adapted to release its respective actuating means and when swung outwardly from the box, operable for breaking said collapsible element to release its associated actuating means.

6. A fire alarm device comprising a box having a door locked against unauthorized opening, a code wheel signal mechanism in said box for sounding a central station alarm, normally inoperative means in said box for

sounding a local alarm, actuating means internally of said door adapted to be set for preventing the operation of said central station alarm, a collapsible element supporting said central station actuating means, and a member external of said door for releasing said local alarm actuating means and collapsing said collapsible element to release the central station actuating means.

7. A device of the class described having in combination with a mechanism provided with a plunger bearing against a sheet of frangible material so that the mechanism operates upon fracture of said sheet, a hammer pivoted externally of the device and adapted when forced against the frangible sheet to fracture said sheet by impact at a point offset from said plunger.

8. A device of the class described having in combination with a mechanism provided with a plunger bearing against a sheet of frangible material so that the mechanism operates upon fracture of said sheet, a hammer pivoted externally of the device above said sheet and adapted when forced against the frangible sheet to fracture said sheet, and spring means acting against the pivoted hammer to resist the swing of the hammer against said sheet.

9. A device of the class described comprising in combination with a casing provided with a glass plate and a mechanism having a plunger bearing endwise against said plate so that the mechanism operates upon fracture of the plate, a hammer pivoted on the outer face of said casing above said plate and having a knob adapted to meet the glass plate at a point offset from the plunger end and to fracture the glass when the hammer is forced against the plate, and a spring acting against the hammer to resist the swing of the hammer against the glass and normally to hold the hammer knob spaced from the glass.

10. A device of the character described comprising in combination a casing having a window, a frangible closure for the window, a mechanism bearing against said closure and operating automatically when the closure is broken, a hammer pivoted to swing against the exterior face of said closure, said casing having a recess at one side of the window in the arcuate path of a portion of the hammer, and a spring in said recess normally to hold the hammer out of contact with said closure.

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