2 Sheets—Sheet 1

P. H. VANDER WEYDE.

Automatic Fire-Alarm.

No. 213,536. Patented Mar. 25, 1879.

Fig. 1

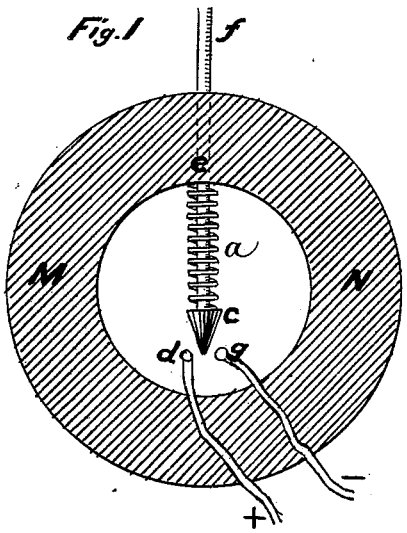


Fig. 2

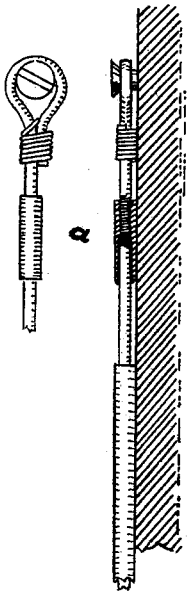


Fig. 3

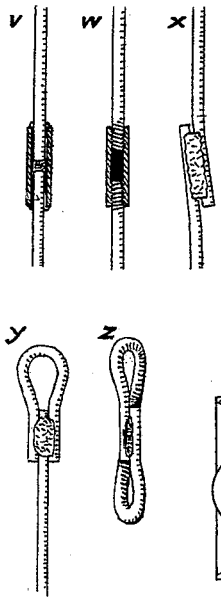
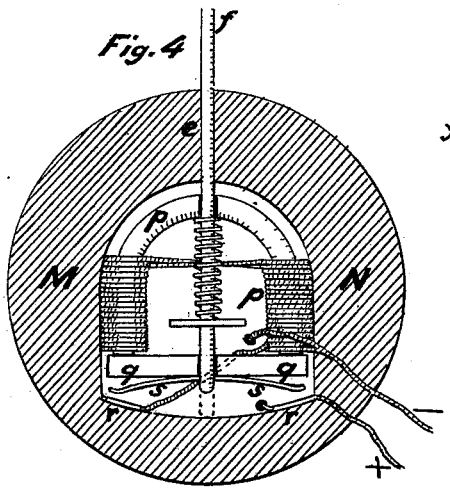


Fig. 4



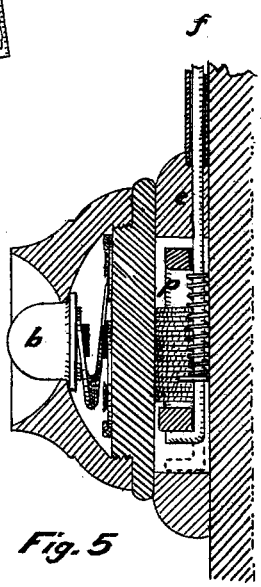


Fig. 5

Witnesses-

J. W. Lasserre

Clarence N. Snyder

Inventor:

P. H. VanderWeyde

2 Sheets—Sheet 2.

P. H. VANDER WEYDE.

Automatic Fire-Alarm.

No. 213,536. Patented Mar. 25, 1879.

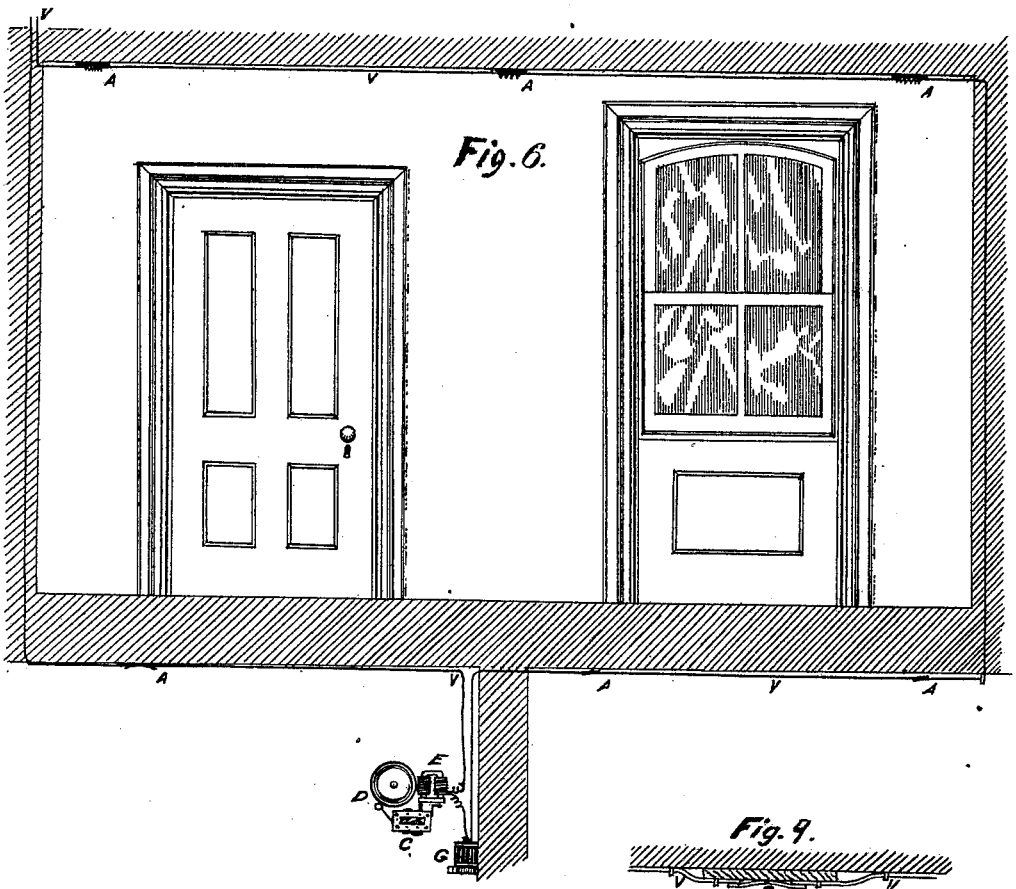


Fig. 6.

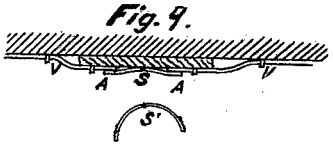


Fig. 9.

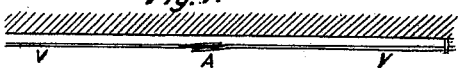


Fig. 7.

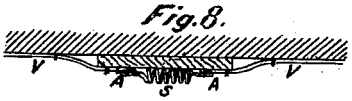


Fig. 8.

Witnesses:

J. H. Lasserre

Clarence W. Seaman

Inventor.

P. H. Vander Weyde

UNITED STATES PATENT OFFICE

PETER H. VAN DER WEYDE, OF BROOKLYN, NEW YORK.

IMPROVEMENT IN AUTOMATIC FIRE-ALARMS.

Specification forming part of Letters Patent No. **213,536**, dated March 25, 1879; application filed May 11, 1877.

To all whom it may concern:

Be it known that I, PETER H. VAN DER WEYDE, of the city of Brooklyn, county and State of New York, have invented a new and useful Automatic Fire-Alarm, to be used in connection with the district telegraph and hotel-annunciators, which invention is fully set forth in the following specification and accompanying drawings.

The nature of my invention consists in an attachment to the signal-boxes of the district telegraph, and to the bell-pull of hotels, so that they are worked in an automatic way the instant the temperature anywhere in the house or room is raised to a certain degree. A spring or weight is attached to an arrangement which, when liberated, will cause the contact of the conducting-wires, and is kept in tension by means of a wire in which there are joints soldered by an easily-fusible alloy. As soon as, by a heat of, say, 140° or 150° Fahrenheit, the alloy melts, the wire is disrupted and the weight descends or the spring relaxes, and by its pressure establishes contact between the conducting-wires as well as if the signal-box or bell-pull were worked by hand.

It is evident that with such an arrangement the temperature can never rise above 140°, or thereabout, without calling an attendant to the room, whether it is occupied or not.

In the adjoining drawings, Sheet I, Figures 1 and 4 represent the back, and Fig. 5 a cross-section, of the button or bell-pull as used in all large hotels where an electric-call system is established.

M N, Figs. 1 and 4, Sheet I, is a wooden ring, which I simply attach to the back of the arrangement as now used, and the opening in which gives place to the details of my invention. This consists in two brass or copper wires, *d* and *g*, Fig. 1, Sheet I, respectively connected with the same conductors as are worked by the thumb-button *b*, Fig. 5, Sheet I, while C, Fig. 1, Sheet I, is a wedge-shaped piece of copper, which is attached to a wire, *f*, and pushed down by a spiral spring, *a*, surrounding this wire, which is kept in place by passing through the hole *e* in the ring M N. At the top of the wire *f* is a soldered joint, placed near the ceiling, where, by the ascending tendency of the hot air, the heat of an incipient fire will the sooner reach it. This part of the apparatus is represented in Fig. 2, Sheet I, where the wires are joined, in any of the ways later described, by means of an easily-fusible alloy made of lead, tin, bismuth, and cadmium, of which I can vary the proportions according to the temperature at which I desire it to melt. I find the most available proportion to be four parts bismuth, two parts lead, one part tin, and one part cadmium, which melts at a heat of 140° to 150°, which temperature is soon enough reached after the least incipient fire has commenced, while an alloy that melts at a lower degree, say 110° and 120, may often give rise to false alarms, especially in factories where steam heat is used, and where the heat may accumulate in some spots during the night when the building is closed, and the steam heat perhaps neglected to be turned off. However, I can make the alloy melt at a higher or lower temperature, if required, by altering the proportion, adding sodium, amalgam, or the newly-discovered metal gollium, which melts at 90°, while the very small quantities of the metals required would not make any objectionable feature in regard to cost. As shown in Sheet I of drawings, it is best in this case to have the hotel-bell arranged with a vibrating armature, so as to be kept ringing while the contact lasts; but in case there is no such vibrating armature connected with the bell, and that it is not desired to make it, a small vibrating armature may be placed in the button-ring, as represented in Fig. 4, seen in longitudinal section, while Fig. 5 represents a cross-section.

p is an electro-magnet, with its coils; and *q*, the armature, which is kept up by the wire *f*, described in Fig. 1. Under this armature is a brass spring, *s s*, attached, which, when allowed to descend, closes the circuit by touching the metallic piece *r r*. If, now, the alloy which keeps the wire *f* up melts, and allows the descent to take place, the small electro-magnet will then be charged and raise the armature, when the contact is broken and the vibrating armature will cause a continuously-interrupted current, which will keep the hotel-bell ringing until the matter is attended to.

The second drawing represents the arrange-

ment, in an ordinary house, warehouse, factory, &c., of wires placed along the ceiling of various rooms and floors, Fig. 6, of which the ends are mutually connected by the alloy A A A. If by an incipient fire the heat ascends, it melts the alloy, the electric current is interrupted, and the alarm C D E sounded.

Figs. 7, 8, and 9 represent various ways to secure the separation of the wires when the alloy melts. In Fig. 7 it separates by its own weight; in Fig. 8, by the elasticity of the intermediate piece S S; in Fig. 9, by the contraction of the spiral spring S. In this case the closed current of a contact-battery is to be used; but in case no closed current is desired, it is easy to reverse the connections, and cause the current to be closed by the melting of the alloy; but in this case a separate wire must be used for every connection.

For working signal-boxes of a district telegraph for this same purpose—namely, to make them serve for giving automatic fire-alarms—I use two methods. One is to make an attachment to the existing boxes in a similar way that an attachment is made to the button or call-bell in hotels, as described, and the other is to have an additional box constructed and attached to the same telegraph-wire.

The attachment to the existing district-telegraph boxes consists in a wheel turned by a weight or spring, and kept at rest by a pawl, which is retained in place by a perpendicular wire attached to the ceiling, and there soldered together with the fusible alloy described, so that when this alloy melts by the heat of an incipient fire the pawl will release the wheel, and this, turning by the weight or spring, will transmit automatically the signal, which in ordinary circumstances is only transmitted by working it by hand.

It is evident that the wire referred to may run through different rooms of the whole house or factory, like an ordinary bell-wire, and possess several soldered joints, which are best applied at such places as are likely to be first reached by hot air when a fire begins. Any of the joints melting, no matter where, the wire being always on a street, it will release the pawl and give the alarm. It is, however, just as practical to attach to a district-telegraph wire, police-telegraph, or fire-department-telegraph wire (which proceeds from a main office) at different premises a separate additional telegraph-box of simple construction, because it is arranged for fire-alarm. The box is operated by a spring, which, when set free, moves an indented wheel, made as usual for such purposes, and gives the fire-alarm signal repeatedly for as long a time as the spring is able to drive the wheel.

The joints referred to above are represented in V, Figs. 2 and 3, Sheet I. I either make the soldered joints by putting some alloy between the ends of the wire, as seen in *x*, *y*, and *z*, Fig. 3, or I cut a screw-thread in the inside of a short piece of brass tubing, of which the interior is slightly smaller than the wire; and I cut a screw-thread on the end of the wire also, and screw them together. The other end of the brass tube is filled with the easily-fusible alloy, and when this is liquefied by heat the end of the wire to be united is stuck in, and fastened by its solidification in cooling. (See *a*, Fig. 2, Sheet I.) The mass of this alloy is so small and its fusing-point so low that the heat of a match is sufficient.

In order to make the connection it is only necessary simply to stick a wire in the end of the tube filled with the fused alloy, and to wait until it solidifies, when it makes an exceedingly strong joint. To make this alloy adhere, the metal to be soldered should be moistened with a solution of chloride of zinc, which I simply prepare by dissolving scrap-zinc in hydrochloric acid.

In order to make joints in wires for bell-pulls without the customary bending, (seen in *y*,) which cannot well pass through holes, I cut a right and left handed screw-thread in a short piece of brass wire, and also on the ends of the wires to be united, as represented in V and W, Fig. 3, Sheet I, which makes a small neat joint.

I claim—

1. The attachment to the electric bell-call, as presently in use in hotels and by district telegraphs, of an arrangement which, by the rise of temperature during an incipient fire, melts an easily-fusible alloy, and causes the bell-call to be worked automatically as a fire-alarm.

2. In combination with an automatic fire-alarm transmitter, a circuit closer or breaker consisting of conducting-wires running through different apartments of a building, and connected together in sections with an easily-fusible alloy, which, when melting by the heat of an incipient fire, disconnects a section, and so either interrupts or establishes the electrical connection which starts the fire alarm.

3. A district-alarm-telegraph box which, in place of being worked by hand, so as to give the customary fire-alarm signals, is started by the melting of an easily-fusible alloy, and so gives the alarm automatically.

P. H. VAN DER WEYDE.

Witnesses:

K. NEWELL,

J. W. LASSERRE.