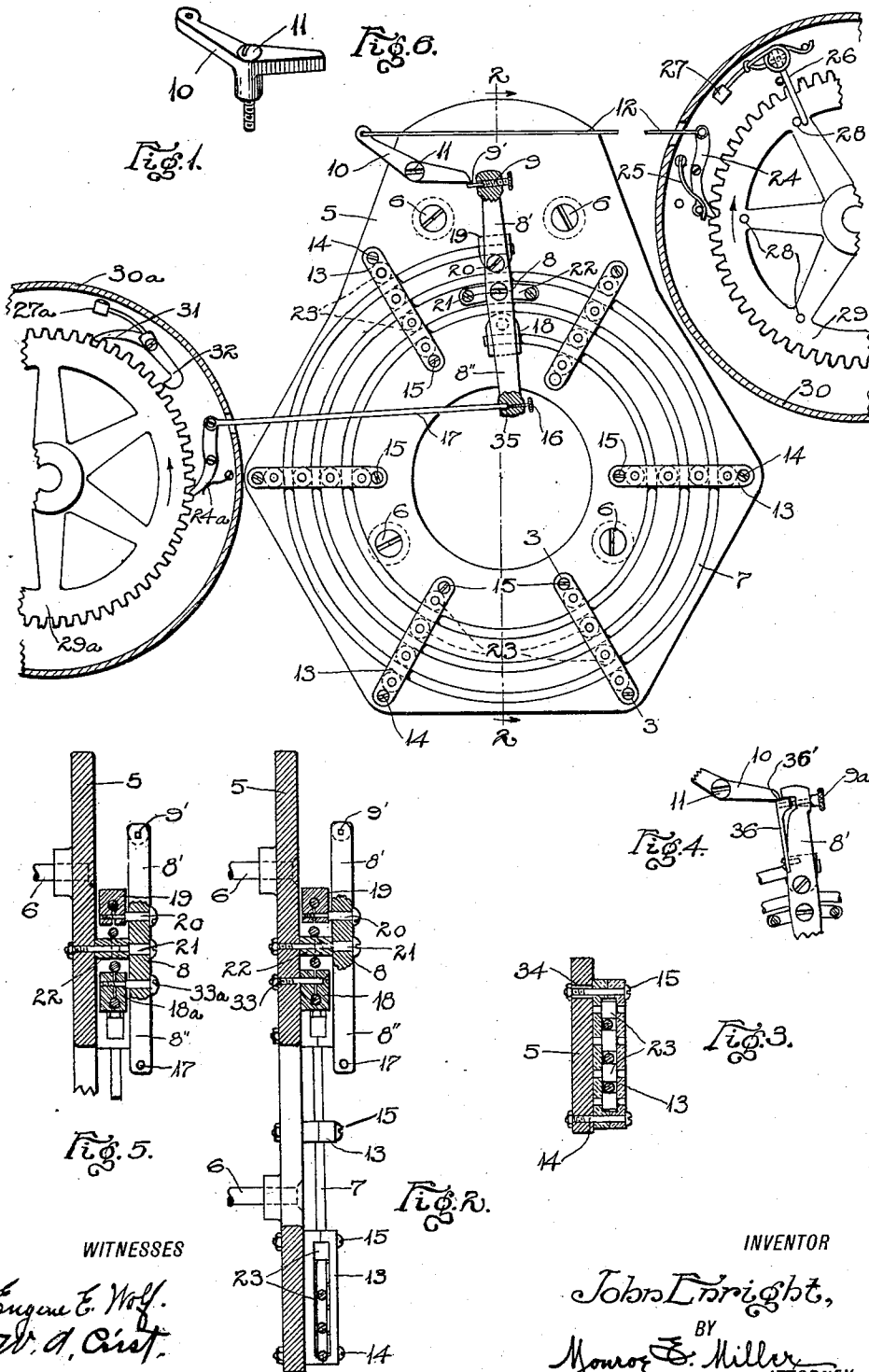


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FIRE ALARM.

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1,015,878.

Patented Jan. 30, 1912.



WITNESSES

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## FIRE-ALARM.

1,015,878.

Specification of Letters Patent.

Patented Jan. 30, 1912.

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*To all whom it may concern:*

Be it known that I, JOHN ENRIGHT, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Fire-Alarms, of which the following is a specification.

This invention relates to fire alarms and especially to automatic fire alarms.

The object of my invention is to produce an automatic heat detector and fire alarm, by means of which destructive fires in hotels, school houses, and other buildings including the holds of vessels, may be detected before attaining dangerous headway, in order to quickly extinguish same. I accomplish this result by utilizing the expansion of a wire or rod, due to the rise in temperature, to release certain mechanism which detains an alarm.

The invention embodies a novel arrangement and construction of parts as hereinafter described and as shown in the accompanying drawings, in which—

Figure 1 is a plan view of the detector and two alarm connections, parts broken away. Fig. 2 is a section on the line 2—2 of Fig. 1. Fig. 3 is a section on the line 3—3 of Fig. 1. Fig. 4 is a plan view in detail of a modification. Fig. 5 is a view similar to Fig. 2 of a modification, part broken away. Fig. 6 is a perspective of a detail.

Similar reference characters indicate similar parts in the several figures shown in the accompanying drawings.

Reference being had to the drawings, 5 indicates a bed plate composed of porcelain or other suitable material having a low coefficient of superficial expansion, which plate may be held in set position against a wall, ceiling, or other suitable location by bolts 6.

Mounted on the said plate 5 is a spiral wire or coil 7 of suitable thickness and material, having a large coefficient of linear expansion. The said spiral wire 7 passes snugly between a plurality of radial arranged rollers or guides 23 pivoted in housings 13, which have a comparative large coefficient of expansion. The screws 14 which secure the outer ends of the housings to plate 5 are rigid, while the screws 15 which connect the inner ends of the housings to plate 5 are loose in the slots 34 in the said plate. Housings 13 and rollers 23 preserve the shape and position of the spiral wire 7. The inner end of the spiral wire or coil 7

is made fast to the plate 5 by screw 33 and clamp block 18, while the outer or free end of the said coil is secured to the upper arm 8' of a lever or rocker 8 near the fulcrumed point, by means of screw 20 and clamp block 19. The lever 8 is pivoted to the plate 5 by a screw 21 and is spaced therefrom by block 22. The lever or rocker 8 is in an approximate radial position with respect to the spiral or coil 7. The upper arm 8' of the lever 8 carries an adjusting screw 9 at its outer end, having a projecting squared end 9'. The lower arm 8'' has a recess 35 and an adjusting screw 16 passing into same from the opposite side of the said arm 8'. In the modified form shown in Fig. 4, a spring 36 is secured to the end of the arm 8' having an outward tension, which provides a shoulder 36'. A set screw 9<sup>a</sup> holds the said spring to any desired adjustment. In the two forms shown the projection 9' and the shoulder 36' both have the same function as will be seen in the hereinafter description. Either form may be used as desired. A trip 10 is pivoted adjacent the end of arm 8' at 11 and when the coil is in normal position the inner end or arm thereof rests on the projecting end 9' of the screw 9 or on the shoulder 36' as the case may be.

The afore described mechanism comprises the essential part of the alarm, which detects a dangerous rise in temperature and releases a detained alarm mechanism at a predetermined degree of temperature.

The alarm mechanism may be of any suitable character, wherein mechanism may be operated by the movement of the free end of the coil 7 and lever 8 to ring a bell or gong, to blow a whistle, to set off explosives, or to otherwise indicate danger.

For purpose of illustration, two gong ringing mechanisms have been shown in the drawings, one having connection to lever 10 and the other to the lower end of arm 8''. The former being adapted to be placed at a distance from the detector, while the latter is adapted to be placed adjacent the detector. The first mentioned gong mechanism comprises a gong 30, a gear wheel 29 made to revolve in the direction of the arrow by any convenient means (not shown), lugs or fingers 28 on the wheel 29 for striking a pallet 26 to vibrate the hammer 27 to ring the gong, a pawl or detent 24 engaging the gear wheel 29 (when parts are in "set position") to detain its movement, a spring

25 tending to release detent 24 from the gear wheel 29, and a cord or wire 12 connected to the pawl 24 and trip 10, and by its tension holding pawl 24 in engagement with wheel 29. It is readily seen that when  
 5 detent or pawl 24 is released that the wheel 29 is free to turn and ring the gong. As this mechanism is old an extensive description thereof is not thought necessary. The  
 10 latter gong ringing mechanism comprises a gong 30<sup>a</sup>, a gear wheel 29<sup>a</sup> made to revolve in the direction of the arrow by any well known means (not shown), pallets 31 and 32 adapted to be oscillated by the movement of  
 15 wheel 29<sup>a</sup> to vibrate hammer 27<sup>a</sup> and thus ring the gong, a detent 24<sup>a</sup> engaging wheel 29<sup>a</sup> and preventing movement thereof (when in "set position"), and a push rod 17 connected to the pawl 24<sup>a</sup> and resting against  
 20 screw 16 in recess 35 of arm 8". Thus when rod 17 is pushed by arm 8", the wheel 29<sup>a</sup> is free to turn and ring the gong. In a similar manner the detecting apparatus may be used to set off other alarm mechanisms,  
 25 including the closing or opening of an electric circuit.

In use, the parts are set as shown in Fig. 1, when the temperature is normal. Now, as the temperature rises, the wire 7 expands  
 30 faster than the plate 5 and necessarily the free end thereof is forced outward thereby, thus swinging lever 8 with it. At a predetermined temperature, generally from about 180 to 300 degrees, by means of the adjusting  
 35 screw 9, the trip 10 slips off of projection 9', and the slacking of wire or cord 12 allows the spring 25 to force pawl out of engagement with the wheel 29 to ring the gong 30. At the same time the movement  
 40 of the push rod 17 releases detent 24<sup>a</sup> and allows wheel 29<sup>a</sup> to ring the gong 30<sup>a</sup>. Housings 13 in expanding inwardly due to the slot 34 tend to cramp the wire 7, and assist in swinging lever 8 by forcing the free end  
 45 of the wire outward. If desired, by increasing the number of cords or wires 12 a similar number of alarms at various locations may be set off. The lower arm 8" of the lever 8 and attached parts can be dispensed with.  
 50 Any movement of the free end of the coil 7 is enlarged at the end of the arm 8' as will be understood. The spiral arrangement of wire 7 provides a compact means for obtaining the expansion of a comparative long  
 55 piece of wire or the like. The cord or wire 12 being under tension, when the parts are in "set position", assures the setting off of the alarm in case of its breakage or disarrangement as well as in case of fire, should  
 60 other accidents occur.

Various other alterations and modifications of the device can be made within the scope of the appended claims, and no limitations are inferred by the specific structure  
 65 shown and described. For example, as

shown in Fig. 5, in which the inner end of the wire 7 is not made rigid with the plate by clamp block 18 and screw 33, but is secured to the lower arm 8" of the lever 8 by clamp block 18<sup>a</sup> and screw 33<sup>a</sup>. In this  
 70 construction, as the wire expands, the central portion of the wire remains neutral while both ends extend to move or swing the lever 8 for the purpose described, but the extension of either of the ends of the  
 75 wire is only one-half that of the extension of the free end of the wire shown in Fig. 1.

Having described my invention, what I claim as new is:—

1. In a fire alarm mechanism, the combination of a bed plate having a low coefficient of expansion, a coil of wire of larger  
 80 coefficient of expansion mounted on the said plate and having one end free, a plurality of inwardly expanding guides for the said wire, a trip held in normal position by the free end of the said wire, an alarm  
 85 mechanism, a detent therefor, and means communicating between the said trip and the detent, whereby the said trip is released on a predetermined rise in temperature and the said detent disengaged from the alarm  
 90 mechanism.

2. In a fire alarm mechanism, the combination of a bed plate having a low coefficient  
 95 of expansion, a coil of wire of larger coefficient of expansion mounted on the said plate and having one end free, a plurality of inwardly expanding guides for the said wire, a swingable arm connected to the free  
 100 end of the said wire, a trip adapted to rest against the said arm, an alarm mechanism, a detent therefor, and a tension cord attached to the said trip and detent, whereby the slackening of the tension of the said cord, when the said arm is swung and the trip  
 105 released due to the expansion of the said wire on a predetermined rise in temperature, allows the detent to be disengaged from the alarm mechanism.

3. In a fire alarm mechanism, the combination of a bed plate having a low coefficient  
 110 of expansion, a coil of wire of larger coefficient of expansion mounted on the said plate and having one end free, a plurality of inwardly expanding guides for the said wire, a trip held in normal position by the free end of the said wire, an alarm mechanism, a detent therefor, and a tension cord connecting the said trip and detent, whereby the tension of the said cord is slackened and the detent disengaged from the alarm  
 115 mechanism when the trip is released due to a predetermined rise in temperature.

4. In a fire alarm mechanism, the combination of a bed plate having a low coefficient  
 125 of expansion, a spiral coil of wire of larger coefficient of expansion mounted on the said plate and having its inner end secured to the said plate and its outer end free, a plurality  
 130

of inwardly expanding guides for the said wire, an arm pivoted to the plate in an approximately radial position with respect to the said coil, the said free end of the wire being connected to the said arm near its fulcrumed point, a trip adapted to rest against the outer end of said arm, an alarm mechanism, a detent therefor, and a tension cord attached to the said trip and detent, whereby the slackening of the tension of the said cord, when the said arm is swung and the trip released due to the expansion of the said wire on a predetermined rise in temperature, allows the detent to be disengaged from the alarm mechanism.

5. In a fire alarm mechanism, the combination of a bed plate, having a low coefficient of expansion, a coil of wire of larger coefficient of expansion mounted on the said plate having one end free, a plurality of guides for the said coil of wire, and means communicating between the free end of the said wire and an alarm mechanism, whereby the expansion of the said wire is utilized to set the alarm mechanism into action.

6. In a fire alarm mechanism, the combination of a bed plate having a low coefficient of expansion, a coil of wire of larger coefficient of expansion mounted on the said plate having one end free, a plurality of guides for the said coil of wire, a trip held in normal position by the free end of the said wire, an alarm mechanism, a detent therefor, and means communicating between the said trip and detent, whereby the said trip is released on a predetermined rise in temperature and the said detent disengaged from the alarm mechanism.

7. In a fire alarm mechanism, the combination of a bed plate having a low coefficient of expansion, a coil of wire of larger coefficient of expansion mounted on the said plate having one end free, a plurality of guides for the said coil of wire, a trip held in normal position by the free end of the said wire, an alarm mechanism, a detent therefor, and a tension cord connecting the said trip and detent, whereby the tension of the

said cord is slackened and the detent disengaged from the alarm mechanism when the trip is released due to a predetermined rise in temperature.

8. In a fire alarm mechanism, the combination of a bed plate having a low coefficient of expansion, a coil of wire of larger coefficient of expansion mounted on the said plate having one end free, a plurality of guides for said wire, a swingable arm connected to the free end of the said wire, a trip adapted to rest against the said arm, an alarm mechanism, a detent therefor, and a tension cord attached to the said trip and connected with the detent, whereby the slackening of the tension of the said cord, when the said arm is swung and the trip released due to the expansion of the said wire on a predetermined rise in temperature, allows the detent to be disengaged from the alarm mechanism.

9. In a fire alarm mechanism, the combination of a bed plate having a low coefficient of expansion, a coil of wire mounted on the said plate having one end free, a plurality of inwardly expanding guides for said wire, an alarm mechanism, and means communicating between the free end of the said wire and the alarm mechanism, whereby the expansion of the said guides is utilized to set the alarm mechanism into action.

10. In a fire alarm mechanism, the combination of a bed plate having a low coefficient of expansion, a coil of wire having a larger coefficient of expansion mounted thereon having one end free, a plurality of inwardly expanding guides for said wire, an alarm mechanism and means communicating between the free end of the said wire and the alarm mechanism, whereby the joint expansion of the said wire and guides is utilized to set the alarm mechanism into action.

In testimony whereof I do affix my signature in presence of two witnesses.

JOHN ENRIGHT.

Witnesses:

EUGENE E. WOLF,  
MONROE E. MILLER.