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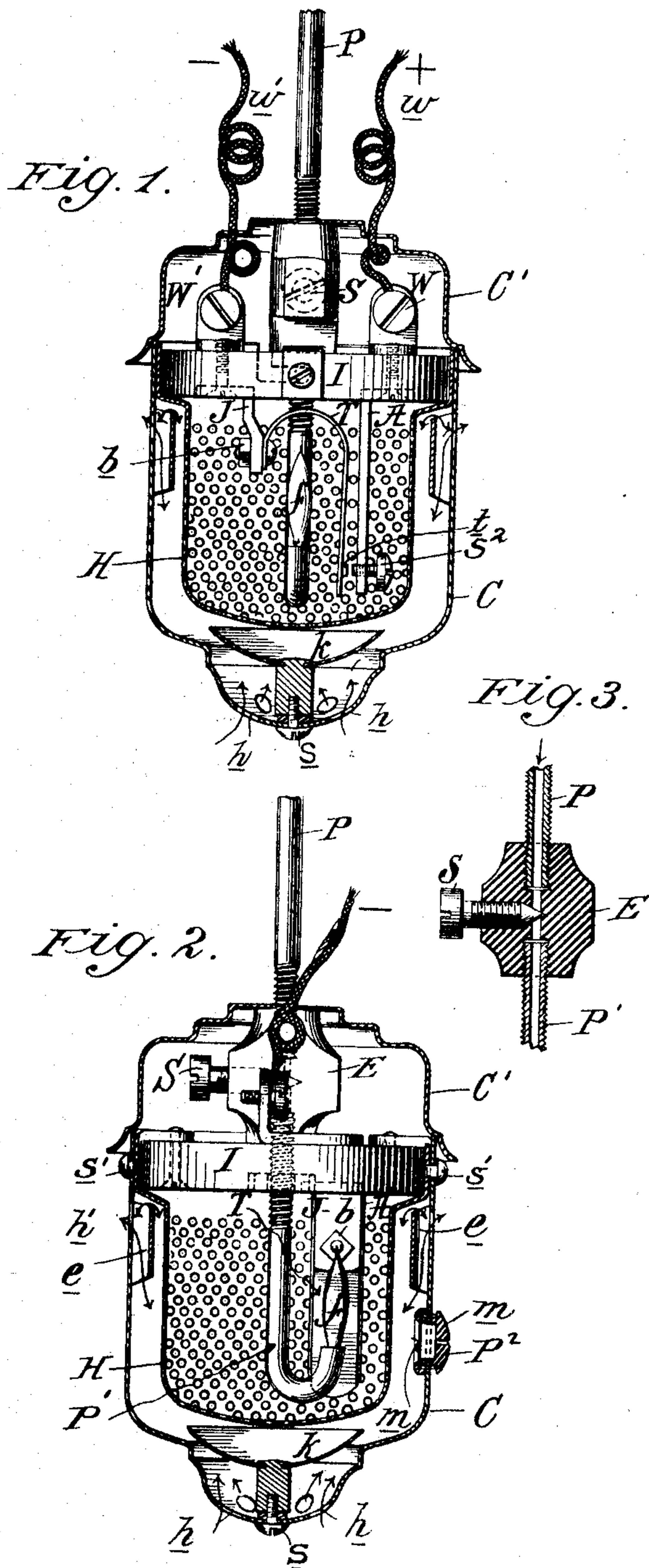
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H. C. BAER.

MEANS FOR GIVING ALARMS THROUGH THE AGENCY OF SMOKE OR OTHER GASES.

(Application filed Nov. 5, 1898.)

(No Model.)



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UNITED STATES PATENT OFFICE.

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MEANS FOR GIVING ALARMS THROUGH AGENCY OF SMOKE OR OTHER GASES.

SPECIFICATION forming part of Letters Patent No. 632,546, dated September 5, 1899.

Application filed November 5, 1898. Serial No. 695,637. (No model.)

To all whom it may concern:

Be it known that I, HENRY C. BAER, a citizen of the United States, residing at New York, in the county of New York and State of New York, have made a new and useful Invention in Means for Giving Alarms Through the Agency of Smoke or other Gases, of which the following is a specification.

My invention has for its object the giving of an audible signal or alarm through the agency of smoke or such non-flame-supporting gases as are ordinarily generated by fire; and to this end it consists in novel means for effecting such result, the especial points of novelty thereof being particularly pointed out in the claims at the end of this specification.

Referring to the drawings, Figure 1 is a vertical sectional view of a thermostatic fire-alarm embodying the principle of my invention, and Fig. 2 is a similar sectional view thereof, taken in a plane at right angles from that in which Fig. 1 is taken, Fig. 3 being a detail sectional view taken through the regulating means for controlling the flow of gas to the burner.

My invention is based upon the well-known principle that a flame of gas or other combustible material is only supported or continues to burn by being supplied with a given or definite amount of oxygen, and when such supply is diminished to a certain degree it is extinguished. I utilize this principle by causing the flame to act upon a thermostatic bar included in an electrical circuit with an electrical alarm of any well-known form, the circuit being normally open so long as the flame continues, the arrangement being such that when it (the flame) is extinguished the circuit will be closed through two electrical contacts, one of which is stationary and the other of which is carried by the thermostatic bar, thereby causing an alarm to be continuously sounded at some distant point.

Referring to the drawings in detail for a full and clear understanding of my invention, such as will enable others skilled in the art to which it most nearly relates to construct and use the same, I represents a cylindrical-shaped block of insulating material—such, for instance, as slate—adapted to withstand great heat, provided at its center with an

opening adapted to receive the upper end of a screw-threaded pipe P' , the lower end of which is turned upward, so as to receive a gas-nipple for a gas-flame f , the upper end of said pipe P' being secured by screw-threads to a metallic junction E , which in turn is secured to a gas-pipe P , connected with a supply of flame-supporting gas located at any desired point.

S represents a regulating-screw for controlling the supply of gas to the burner.

$W W'$ represent binding-posts located on the upper surface of the insulating-block I , and A and J represent metallic arms extending downwardly from the under surface of said block and secured by screws to metallic lugs or ears integral with the binding-posts $W W'$.

T represents a curved thermostatic bar having one end secured by a screw b to the rigid metallic arm J and carrying at its lower or free end a platinum or equivalent electrical contact-point t , the curved portion of said thermostatic bar being located directly above the flame f , as clearly illustrated in Fig. 1.

S^2 represents a screw-threaded or adjustable contact located in the lower end of the metallic arm A and in the direct path of the movable contact-point t .

$w w'$ represent insulated electrical conductors running from the binding-posts $W W'$ to a source of electrical energy and an electrically-actuated device of any preferred form, but not here shown.

H represents a casing which is provided with a large number of perforations or openings adapted to supply a definite amount of oxygen to the flame f , said casing being enlarged at its upper end and secured to the insulating-block I by bayonet-slots and screws $s' s'$. It is important that the perforations in this casing shall be of such number and dimension as to supply only a sufficient amount of oxygen from the external air to support the flame f under normal conditions of atmospheric temperature and the normal supply of flame-supporting gases usually found in rooms or buildings. I have obtained good results with such a casing having perforations corresponding in size and number to those found in well-known forms of wire-gauze having about twenty meshes per lineal inch.

C represents a cylindrical-shaped outer protecting-casing which is adapted to fit snugly over the inner perforated casing H and is secured to the insulating-block I by bayonet-slots and the same screws $s' s'$ which support or sustain the inner casing H. This outer casing is provided at its bottom with a number of air vents or openings $h h$, adapted to admit air to the interior thereof, as shown by the arrows, and at its upper end with a corresponding number of vents or openings $h' h'$, adapted to carry away such of the products of combustion as may be emitted therethrough.

$e e$ are protecting-shields which are secured to the inner wall of the casing C at points opposite the vents or openings $h' h'$, so as to prevent sudden gusts of air from the outside of the casing from extinguishing the flame f .

k is a regulating-cup secured inside of the casing C by a screw s , extending upward from the bottom thereof, the arrangement being such that said cup may be raised and lowered so as to regulate the inflow of air through the vents or openings $h h$.

P^2 represents a peep-hole consisting of a perforated casing and a mica or other transparent medium m , said peep-hole being located directly opposite the flame f , so that a person may ascertain by visual observation as to whether or not the flame is burning.

C' represents a metallic cap provided with an opening on its end for the pipe P and additional side openings for the outgoing conductors $w' w'$, the arrangement being such that when the parts are put together they will appear as clearly illustrated in Figs. 1 and 2 of the drawings.

The operation of the device is as follows:
One or more of said devices is placed in each room or chamber which it is desired to protect and connected in any well-known manner with an electrical alarm mechanism located at some distant point, said device being preferably secured to the ceiling by the pipe P. The regulating-screw S is adjusted so as to admit the proper supply of gas for combustion under normal atmospheric conditions, dependent upon the capacity of the perforations in the casing H to admit the necessary supply of oxygen for supporting the flame f of the desired heat-giving capacity. The casings C and H are now removed and the gas ignited, so as to produce the flame f . The casings are then restored to their permanent positions and the adjustable cup k regulated by the screw s for a proper supply of air at the base of the device. The conditions of proper adjustment may be ascertained by the user by visual examination through the peep-hole P^2 . As soon as sufficient heat is generated beneath the thermostatic bar T the platinum contact-point t is caused to assume the position shown in Fig. 1 of the drawings, such that the circuit is interrupted between it and the stationary adjustable contact S^2 . Should an abnormal condition take place in the sur-

rounding atmosphere—such, for instance, as is attributable to the presence of smoke—it (the smoke) will be drawn into the casing C and ultimately pass through the perforations in the inner casing H until such a quantity thereof is present as will extinguish the flame f . Consequently the thermostatic bar T cools, and in a few seconds the movable contact t establishes the circuit by coming into contact with the stationary contact S^2 and causes the alarm at the distant point to be sounded continuously.

Although I have shown in the preferred form of device for carrying out the generic principle of my invention a gas-burner with a flame f for generating the heat which controls the movements of the thermostatic bar T, I do not limit myself to this special means of generating such heat, as I wish it understood that my claims include, broadly, heat-generating means wherein carbonaceous substances are subjected to combustion—such, for instance, as lamps, candles, and the like. I also wish it understood that my claims include, generically, all types of thermostatic devices which may be affected generically in the same manner as is the thermostatic bar T.

It will be apparent that my invention is generic in its nature and has other uses than that of giving indication of the presence of fire—as, for instance, in determining the presence of such poisonous gases as ordinarily extinguish a flame which is supported by carbonaceous materials and oxygen or equivalent flame-supporting gases. To illustrate, my invention might be employed to indicate the presence of carbonic-acid gas or any equivalent non-flame-supporting gas which may be present in the atmosphere in such quantities as to extinguish a flame in the manner indicated.

It is also obvious that the generic principle of my invention may be utilized for other purposes than the sounding of an alarm—as, for instance, it might be utilized for causing sprinklers to be actuated in such manner as to extinguish a fire, the thermostatic bar T being utilized for controlling the escape of water from the sprinklers.

My invention may also be used for the detection of illuminating-gas in rooms and other places, its operation being such that when said gas in sufficient quantity appears around the instrument it will instantly cause the flame therein to be extinguished and allow the thermostatic bar to act in the manner already described. It is also apparent that said thermostat might be utilized for controlling the operation of a mechanically-actuated alarm and still come within the scope of my claims hereinafter made.

I am aware that prior to my invention electrical alarm mechanism had been controlled by the action of fire-damp in connection with miners' lamps by causing the fire-damp to generate increased heat within the lamp, which increased heat caused an electrical cir-

cuit to actuate alarm mechanism located at some distant point. I am also aware that it is old to cause-thermostatic devices to be so actuated by a gas-flame that on the discontinuance of such flame either by reason of a variation of the pressure of the gas itself or by the blowing out of the flame an electrical alarm will be actuated, and I make no claim hereinafter of such scope as to include any such structures, the generic novelty of my invention, as hereinbefore indicated, lying in the extinguishment of a source of heat or flame through the agency of smoke or such non-flame-supporting gases as are generated by fire and in such manner as to cause an audible alarm to be given to indicate that fact.

Having thus described my invention, what I claim, and desire to secure by Letters Patent of the United States, is—

1. Means for indicating the presence of smoke or a non-combustion-supporting gas, consisting of a source of heat as a flame, a thermostat acted upon by said flame and included in an electrical circuit, together with a protecting-casing wholly surrounding the flame and provided with perforations or openings having a capacity to supply a definite amount of air to the flame, substantially as described.

2. Means for indicating the presence of smoke or a non-combustion-supporting gas, consisting of a source of heat as a flame, in combination with a thermostat adapted to actuate or control an alarm and a perforated protecting-casing wholly surrounding the flame and adapted to furnish only sufficient air to support the flame, substantially as described.

3. Means for indicating the presence of smoke or a non-combustion-supporting gas, consisting of a source of heat as a flame, a perforated protecting-casing wholly surrounding the flame and adapted to furnish a sufficient supply of oxygen therefor; a thermostat controlled in its movements by the flame and an alarm actuated or controlled by said thermostat, together with regulating means for varying the flow of gas to the flame, substantially as described.

4. Means for indicating the presence of smoke or a non-combustion-supporting gas, consisting of a source of heat as a flame, a perforated protecting-casing therefor adapted to furnish a sufficient supply of oxygen for the flame; a thermostat controlled in its movements by the flame, an alarm actuated or

controlled by said thermostat; an exterior protecting-casing provided with vents or openings for supplying air to the inner casing and flame, and means for regulating the supply of gas to the flame, substantially as described.

5. Means for indicating the presence of smoke or a non-combustion-supporting gas, consisting of a source of heat as a flame; a perforated protecting-casing therefor adapted to furnish a sufficient supply of oxygen for the flame; a thermostat controlled in its movements by the flame; an alarm actuated or controlled by said thermostat; an exterior protecting-casing provided with vents or openings for supplying air to the inner casing; a peep-hole located in the outer casing for enabling one to observe the flame, and means for regulating the flow of gas to said flame, substantially as described.

6. Means for indicating the presence of smoke or a non-combustion-supporting gas, consisting of a source of heat as a flame; a perforated protecting-casing therefor adapted to furnish a sufficient supply of oxygen for the flame; a thermostat controlled in its movements by the flame; an alarm actuated or controlled by said thermostat; an exterior protecting-casing provided with vents or openings for supplying air to the inner casing; a peep-hole located in the outer casing for enabling one to observe the flame; means for regulating the flow of gas to said flame and additional means for regulating the flow of air into the outer casing substantially as described.

7. Means for indicating the presence of smoke or a non-combustion-supporting gas, consisting of a source of heat as a flame; a perforated protecting-casing therefor adapted to furnish a sufficient supply of oxygen for the flame; a thermostat operatively connected with an electrical circuit and an alarm, said thermostat being controlled in its movements by the flame; an exterior protecting-casing provided with vents or openings for admitting and emitting air and smoke to the interior casing and flame, substantially as described.

In testimony whereof I have hereunto subscribed my name this 14th day of October, 1898.

HENRY C. BAER.

Witnesses:

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