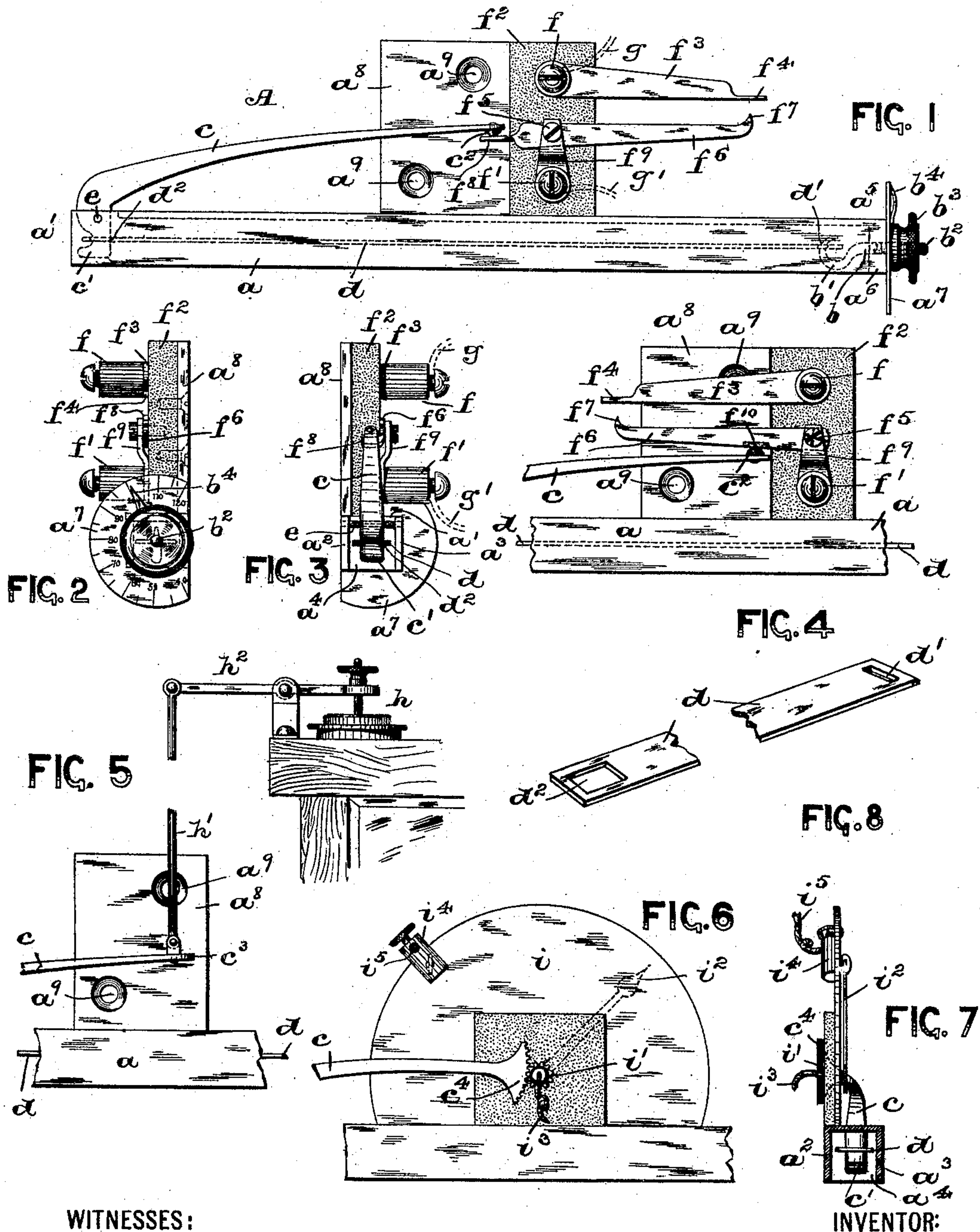


(No Model.)

E. B. PETERSEN.
HEAT OR COLD INDICATOR.

No. 605,129.

Patented June 7, 1898.



WITNESSES:

Wm. H. Campfield, Jr.
Maury Z. Trusdell

EMIL B. PETERSEN,

BY

Fred C. Fraentzel,
ATTORNEY

UNITED STATES PATENT OFFICE.

EMIL B. PETERSEN, OF KEARNY, NEW JERSEY.

HEAT OR COLD INDICATOR.

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To all whom it may concern:

Be it known that I, EMIL B. PETERSEN, a citizen of the United States, residing at Kearny, in the county of Hudson and State of New Jersey, have invented certain new and useful Improvements in Heat or Cold Indicators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters of reference marked thereon, which form a part of this specification.

This invention has reference generally to a heat or cold indicator and regulator, and more especially to improvements in devices of that character provided with an indicating mechanism for announcing an excessive degree of heat or great cold either by sounding an electric alarm operated by means of a circuit-closing device or by some mechanical means controlled by the indicating apparatus.

The primary object of this invention, therefore, is to provide a simply constructed and operative device of this nature which is to be used as a temperature-indicator, and in consequence of a rise in temperature, as in the case of a fire, by sounding an electric alarm-signal warning the occupants of the building of the presence of a fire or an excessive degree of heat. The device is also designed for use in greenhouses, incubators, &c., or in factories, where an even temperature is required and excessive heat or cold may mean certain destruction, the device serving as an automatic indicator to give notice when the temperature is above or below that required.

A further object of this invention is to provide, in connection with the device, a suitable adjusting means and indicating-dial for rendering the device adjustable and set it to a certain number of degrees, at which contact is to be made for the purposes intended.

A further object of the invention is to provide a device of this class which shall be simple in construction, but shall have strength and lightness and shall be adapted to be readily attached to any part of a room.

The invention therefore consists in the improved heat or cold indicator and regulator herein set forth and also in such novel ar-

rangements and combinations of parts, all of which will be hereinafter fully described, and finally embodied in the clauses of the claim. 55

The invention is clearly illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of my novel form of circuit-closing device when used as an automatic heat-indicator, and Figs. 2 and 3 60 are end views of the device. Fig. 4 is a detail view of certain parts of the device when used as a cold-indicator, and Fig. 5 is a detail view of certain parts of the device when employed for controlling the heat-regulating device of an incubator. Fig. 6 is a face view of a modified construction of heat-indicator embodying the principles of my invention, and Fig. 7 is an edge view of the same. Fig. 8 is a perspective view of the respective ends of a 65 connecting-plate employed in connection with the device. 70

Similar letters of reference are employed in all of the views to indicate corresponding parts. 75

In said drawings, A indicates the complete contact or circuit-closing device, comprising a suitable metallic base *a*, which is open at one end, as at *a'*, and has the two downwardly-extending sides *a²* and *a³*, which form a longitudinal channel or chamber *a⁴* in said base, as clearly illustrated in Fig. 3. The other end *a⁵* of said chamber or channel is closed, as at *a⁶*, (see Fig. 1,) and has secured thereto a dial *a⁷*, provided with suitable graduations 80 for indicating degrees of heat and cold. Arranged to slide in a suitable hole or perforation in said closed end of the base *a* is a bar or rod *b*, provided in said channel *a⁴* with a hook end *b'*, and its other end *b²* being provided with a screw-thread, substantially as 85 illustrated in Fig. 1. On said screw-threaded end of said bar or rod *b* is an adjusting-nut *b³*, which is provided with a suitable index hand or pointer *b⁴*, as will be clearly seen from 90 an inspection of Figs. 1 and 2. Pivotally arranged in the open end *a'* of said base *a* and on a suitable pin *e* is a hook-shaped end *c'* of an arm *c*, provided at its free end with a button *c²* or other suitable device, made of rubber or any other desirable non-conducting material. Within said channel or chamber *a⁴* of the base *a* is a thin strip *d* of any suitable metal, preferably zinc, which is provided at 100

one end with an opening d' for fitting said end over the hook b' of the bar or rod b , and having at its other end a suitable opening d^2 for placing this end of the strip d in operative
 5 holding contact with the hook-shaped end c' of the pivot-arm c . Said bar a is also provided with a suitable post or holding-piece a^8 , having screw-holes a^9 for securely attaching the apparatus in any desirable position to the
 10 wall or ceiling of a room. On said post or holding-piece a^8 are a pair of contact-posts f and f' , which are suitably insulated from said piece a^8 by a piece of non-conducting material f^2 , which is secured on said piece by the said
 15 contact-posts f and f' . Connected with said posts are the ends g and g' of the electric-circuit wires, as clearly indicated in dotted outline in Figs. 1 and 3. Held in a fixed position on the post f is a contact-arm f^3 , provided
 20 with a flattened end f^4 , and fulcrumed on a pivot or screw f^5 on an upwardly-extending post or bracket f^6 , operatively connected with the contact-post f' , is a second contact-arm f^6 , having a contact-point, as f^7 , at the one end
 25 and a flat surface, as f^8 , at the other end. In constant and normal holding contact with said flattened end f^8 of the contact-arm f^6 is the herein-described insulating-button c^2 of said arm c , the weight of said arm c being such
 30 that its normal tendency is to keep the connecting plate or strip d taut and under its proper tension at all times and at the same time remain in operative holding engagement with said end f^8 of the arm f^6 . Thus it will
 35 be evident that as the temperature rises said strip d will expand, which permits the heavy arm c to swing in a downward direction on its pivotal support and at the same time exert a greater pressure on the portion f^8 of the
 40 arm f^6 , which naturally causes said arm to rise until its point f^7 makes contact with the part f^4 of the arm f^3 . At once a completed electric circuit is established through said
 45 arms f^3 and f^6 , the posts f and f' , and the wires g and g' , and an alarm-bell in said circuit gives the danger-signal. As soon as the temperature again falls below the danger-point the strip d is again contracted, which draws the
 50 arm c in an upward direction, and the electrical contact between the arms f^3 and f^6 will at once become broken.

It will be evident that by turning a screw or nut b^3 in either direction the tension on the strip d can be increased or decreased,
 55 which varies the position of the arm c and brings the contact-point f^7 of the arm f^6 , under normal conditions of the temperature, either closer to or farther away from the part f^4 of the contact-arm f^3 , as will be clearly understood. It will be seen that contact can be
 60 established at any desired degree of temperature—as, for instance, if the index-hand b^4 indicates to the graduation “90” on the dial a^7 it means that the device has been adjusted to
 65 make an electrical contact between the arms f^3 and f^6 when the temperature in the room has risen to 90°.

When it is desired to use the apparatus as a cold-indicator, the button c^2 on the arm c is reversed and the two arms f^3 and f^6 arranged
 70 in opposite direction from that shown in Fig. 1, as will be evident from an inspection of Fig. 4. Thus it will be seen that when the strip d contracts the arm c is drawn in an
 upward direction, whereby said button c^2
 75 pushes against the part f^{10} on the arm f^6 and causes the latter to make electrical contact with the arm f^3 in the manner as hereinabove described.

When the apparatus is to be used in connection with the valve mechanism h of an incubator, I dispense with the use of the arms
 80 f^3 and f^6 and connect the end c^3 of the arm c with a rod h' to operate a lever h^2 , which in turn opens the valve mechanism h , as the
 85 strip d expands when the heat in the incubator is too great. Of course it will be understood that when used in connection with an incubator said strip d must extend directly
 into the inner compartment of the incubator to be subjected to the action of the heat
 90 therein.

In Figs. 6 and 7 I have illustrated the device when used as a temperature-indicator. In this construction the end of the arm c is
 95 provided with a toothed segment c^4 , which is in operative mesh with a pinion i' and index-hand i^2 of a graduated plate i . Thus it will be evident that as the strip d expands or contracts and the lever-arm c is lowered or raised,
 100 in the manner hereinabove stated, said pinion and its index-hand are moved to indicate the degrees of temperature in the room. Said pinion i' may be insulated from the body of the dial-plate i and the index-hand connected
 105 with a circuit-wire i^3 . On the edge of said plate i may be arranged an adjustable contact-post i^4 , having the other end i^5 of the circuit-wire connected therewith. As soon as the temperature rises to a degree, according
 110 to the adjustment of said post i^4 on said plate i , and the pointer or index-hand caused to come in contact with said post a complete electrical circuit will be established and the device can be used as an indicator of too great
 115 a degree or of too low a temperature.

The operation of the several parts of the device are very simple and effective for the many purposes for which it is intended.

I am aware that many changes may be
 120 made in the several arrangements and combinations of parts, as well as in the details of construction, without departing from the scope of my present invention. Hence I do not limit myself to the exact arrangements and
 125 combinations of parts herein shown, and illustrated in the accompanying drawings.

Having thus described my invention, what I claim is—

1. In a heat or cold indicator, the combination, with an indicating mechanism, of a base-
 130 plate, a longitudinal channel or chamber therein, a metallic strip in said channel or chamber, secured at one end to said base, and a

pivoted lever on said base, with which the other end of said strip is connected, and said lever being adapted to actuate said indicating mechanism.

5 2. In a heat or cold indicator, the combination, with an indicating mechanism, of a channeled base-plate *a*, a tension device at one end of said base, a pivoted lever at the opposite end of said base, and a strip supported
10 at its ends by said tension device and said lever, said lever being adapted to actuate said indicating mechanism, substantially as and for the purposes set forth.

15 3. In a heat or cold indicator, the combination, with an indicating mechanism, of a channeled base-plate *a*, a tension device at one end of said base, consisting, essentially, of a hook-shaped rod *b* and an adjusting screw or nut thereon, a pivoted lever *c* at the opposite
20 end of said base, having a hook-shaped end *c'*, and a strip supported at its ends by said hook-shaped rod *b* and the hook end of said lever *c*, said lever being adapted to actuate said indicating mechanism, substantially as
25 and for the purposes set forth.

4. In a heat or cold indicator, in combination, with a base, having a longitudinal channel or chamber therein, a metallic strip in said channel or chamber, secured at one end to
30 said base, a pivoted lever on said base, with which the other end of said strip is connected, and an electrical-contact device, adapted to be actuated by said lever, substantially as and for the purposes set forth.

35 5. In a heat or cold indicator, in combination, with a base, having a longitudinal channel or chamber therein, a metallic strip in said channel or chamber, secured at one end to said base, a pivoted lever on said base, with which
40 the other end of said strip is connected, and an electrical-contact device, consisting, essentially, of a fixed contact-arm *f*³ and a pivoted contact-arm *f*⁶ adapted to be engaged by the end of said lever, to cause said arms to make
45 electrical contact, substantially as and for the purposes set forth.

50 6. In a heat or cold indicator, in combination, with a base, an index-dial, a metallic strip, secured at one end to said base, a pivoted lever on said base, a tension device on

said base, a strip supported at its ends by said tension device and said lever, and an electrical-contact device, adapted to be actuated by said lever, substantially as and for the purposes set forth.

55 7. In a heat or cold indicator, in combination, with a channeled base, an index-dial, and a tension device at one end of said base, a pivoted lever at the other end of said base, a strip supported at its ends by said tension
60 device and said lever, and an electrical-contact device, consisting, essentially, of a fixed contact-arm *f*³ and a pivoted contact-arm *f*⁶ adapted to be engaged by the end of said lever, to cause said arms to make electrical con-
65 tact, substantially as and for the purposes set forth.

8. In a heat or cold indicator, in combination, with a channeled base, an index-dial and a tension device at one end of said base, consisting of a hook-shaped rod *b* and an adjusting screw or nut thereon, a pivoted lever
70 *c* at the opposite end of said base, having a hook end *c'*, a strip supported at its ends by said hook-shaped rod *b* and the hook end of said lever *c*, and an electrical-contact device, adapted to be actuated by said lever substantially
75 as and for the purposes set forth.

9. In a heat or cold indicator, in combination, with a channeled base, an index-dial
80 and a tension device at one end of said base, consisting of a hook-shaped rod *b* and an adjusting screw or nut thereon, a pivoted lever *c* at the opposite end of said base, having a hook end *c'*, a strip supported at its ends by
85 said hook-shaped rod *b* and the hook end of said lever *c*, and an electrical-contact device consisting, essentially, of a fixed contact-arm *f*³ and a pivoted contact-arm *f*⁶ adapted to be engaged by the end of said lever, to cause said
90 arms to make electrical contact, substantially as and for the purposes set forth.

In testimony that I claim the invention set forth above I have hereunto set my hand this 6th day of August, 1897.

EMIL B. PETERSEN.

Witnesses:

FREDK. C. FRAENTZEL,
WM. H. CAMFIELD, Jr.