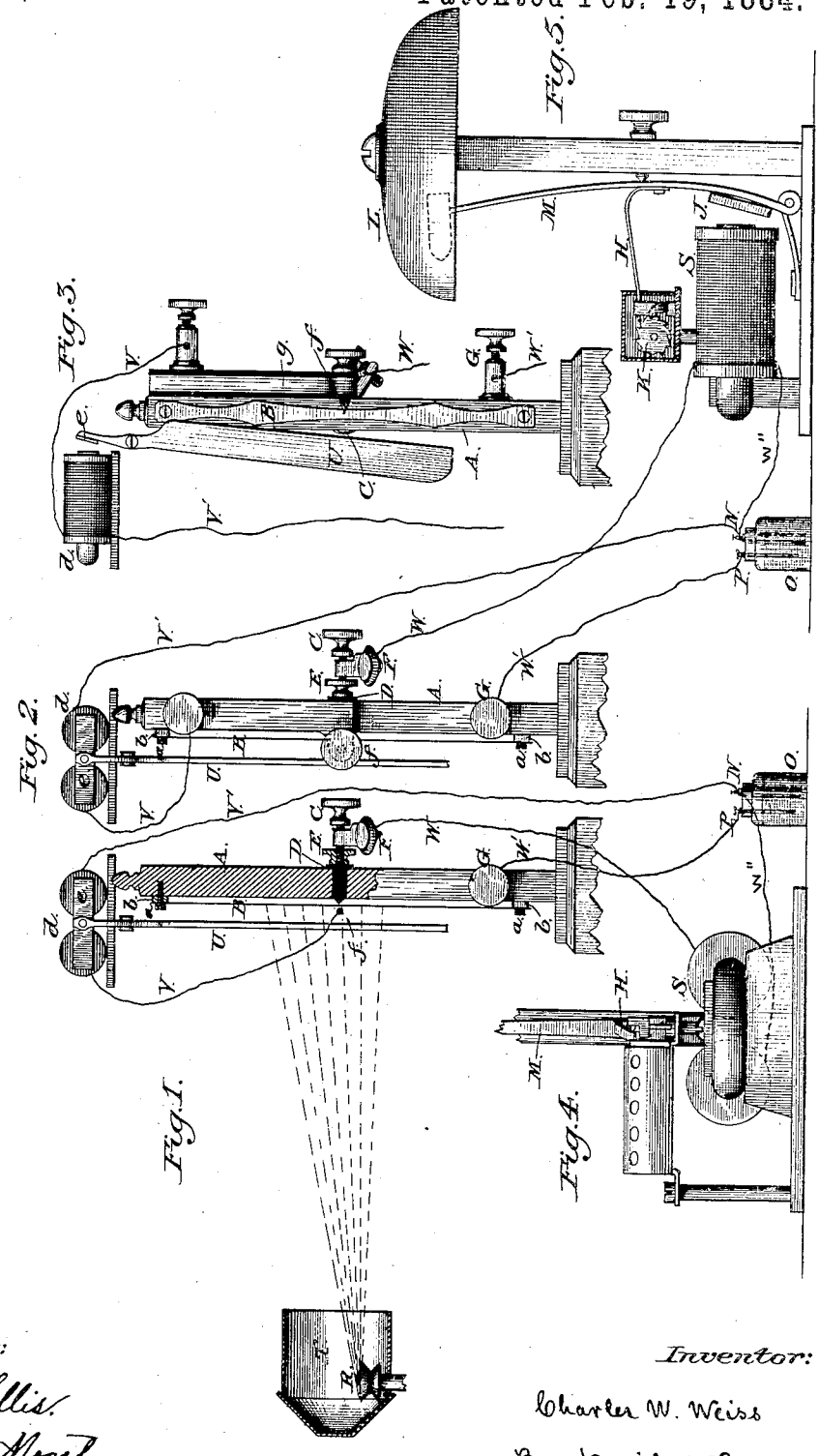
(No Model.)

C. W. WEISS.

THERMOSTATIC ELECTRIC REGISTERING APPARATUS.

No. 293,828. Patented Feb. 19, 1884.



Witnesses:
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UNITED STATES PATENT OFFICE.

CHARLES W. WEISS, OF BROOKLYN, ASSIGNOR OF ONE-HALF TO CHARLES KRUSE, OF NEW YORK, N. Y.

THERMOSTATIC ELECTRIC REGISTERING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 293,828, dated February 19, 1884.

Application filed October 10, 1882. (No model.)

To all whom it may concern:

Be it known that I, CHARLES W. WEISS, of Brooklyn, in the county of Kings and State of New York, have invented a new and useful Thermostatic Electric Registering Apparatus; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, and to the letters of reference marked thereon, making a part of this specification.

My invention relates to a novel apparatus for producing a registration of the number of persons or objects passing a given point or through a prescribed passage-way by their interception in passing of heat-rays made to fall upon a sensitive strip, which will operate by its expansion and contraction to open and close an electric circuit adapted to actuate an indicating device.

It has for its object a simple, effective, and less costly method of counting and registering the number of persons entering or passing through a passage-way; and it consists of a thin plate highly sensitive to heat, which, being placed upon one side of the passage, is so exposed to the constant heat from a lamp or stove placed upon the opposite side of the passage-way as to be kept thereby expanded, its expansion serving to break its contact with the pole of an electric circuit which would otherwise be closed thereby, said circuit being made, when closed, to ring a bell and to operate, by means of a pawl and ratchet, the gearing of an indicator. The device is so adjusted as that the interception of the heat-rays but for an instant will suffice to allow the plate to contract sufficiently to close the circuit, as is hereinafter fully described.

In the accompanying drawings, Figure 1 is a side elevation, partly in section, of the calorific and contact-producing devices arranged on either side of the passage-way; Fig. 2, a side elevation of the contact-plate and pillar detached; Fig. 3, a front view of the contact-plate and pillar, and of the automatic regulating-shutter; Fig. 4, a partial front view; and Fig. 5 a side elevation, partly in section, of the electric sounding and registering device.

A represents a metallic post or pillar, upon the front face of which a thin extended sensitive strip or contact-plate, B, preferably of silver, is secured parallel therewith and at a slight distance therefrom by means of screws *a a* at either end thereof, the desired interval between the strip and post being procured either by means of bosses upon the posts or by means of interposed collars *b b*, as illustrated in Figs. 1 and 2. A connecting-screw, C, is led through the center of the post A, at a right angle to the strip B, and is insulated from the post by means of a sleeve, D, of hard rubber or other insulating material inserted in the post and secured thereto. The point of the screw C is made to project slightly beyond the inner face of the post A, under the strip B, so that in approaching the post the strip shall strike the point. When adjusted, the screw is fixed by means of a lock-nut, E, thereon. A binding-clamp, F, is fitted upon the outer end of the connecting-screw C, to facilitate the attachment of a wire, W, thereto. A binding-post, G, is fitted to the post A, at any suitable point, for the attachment thereto of a second wire, W'. The wire W from the clamp F is led to the electro-magnet S of an indicating device. This device consists of a pawl, H, Fig. 5, reciprocated by the movement of the armature J of the magnet, and which engages a ratchet-wheel, K, which, in its intermittent rotation, actuates a train of indicating-wheels serving to record the number of the movements of the armature J, produced by a contact of the strip B with the connecting-point of the screw C each time an interception occurs of the heat-rays which fall upon the strip. A bell, L, may be combined with the indicator by connecting the arm M, carrying its hammer, with the armature J, so that each movement of said armature shall produce a stroke of the bell. The electro-circuit exciting the electro-magnet S of the indicating device is completed by means of a wire leading from the magnet to the negative pole N of a battery, O, the wire W' from the binding-post G being connected with its positive pole P.

The radiant heat required to excite the strip B may be obtained from the flame of a

gas-burner, R, placed in a reflecting or radiating-chamber, T, upon the side of the passage-way opposite to the strip, so that the heat-rays from said burner shall be directed across the passage-way upon the strip. An overheating of the strip is automatically prevented and its sensitiveness maintained by means of a shutter, U, pivoted at its upper end to swing over the face of the strip between it and the burner, and thus serve to shut off the heat-rays. The shutter is so pivoted as to drop away automatically by its own weight from before the strip, and its movement toward the strip is obtained by means of an electro-magnet, *d*, actuating an armature, *e*, upon the upper arm of the shutter above its pivot, the magnet being excited to attract the armature by the closing of an electric circuit closed by contact of the strip B, when overheated, with the end of the connecting-screw *f*, projecting in front of the strip from an insulated plate, *g*, secured to the side of the post A, and which is connected by a wire, V, with the coil of the magnet *d*, the opposite end of the coil being connected with the battery O by a second wire, V'. The shutter may be arranged near to the burner to intercept the rays at that point instead of at the strip B, as illustrated.

In the operation of my improved thermo-electro-indicator the burner R being lit, the heat radiating therefrom and condensed and reflected by the sides of the radiating-chamber J is thrown upon the face of the silver strip B, which, being confined at both ends, will, upon becoming expanded by the heat, bend centrally outward clear of contact with the end of the screw C. Before the strip becomes so highly heated as to be in danger of becoming insensitive to an interception of the heat-rays it will bend so far as to touch the point of the outer screw, *f*. This contact will serve to close a circuit from the positive pole P of the battery O through the wire W', the binding post G, the silver strip B, and wire V to the magnet *d*, and thence through the wire V' to the negative pole N. The current exciting the magnet will cause it to move the shutter so that it will swing in between the burner and the strip and to intercept the heat-rays. So soon as the rays are intercepted the strip B will spring away from contact with the screw *f* and the shutter, left uninfluenced by the magnet, will automatically by its own gravity swing away from the strip. An adjustment of the strip B is thus automatically maintained, so that it shall be so far sensitive to any interception of the rays from the burner R as that the passage of a person or an object between the strip and lamp will suffice to cause the strip to spring back into contact with the connecting-screw C, and thereby close an electric circuit from the positive pole P of the battery O through the wire W, binding-post G, pillar A, and strip B to the wire W', and through it to the coil of the electro-magnet S, the wire W'', and the negative pole N. The current thus closed will, by exciting the magnet S, actuate the armature J, and thus operate the indicator K and sound the bell L.

It is evident by fixing the strip B at one end only the expansion and contraction of its free end may be utilized to open and close a circuit; and it is moreover manifest that, without departing from my invention, various modifications may be made in the device for closing by means of the movement of the sensitive strip B, an electric circuit adapted to actuate an indicator, and also in the device for automatically controlling the admission of the rays of heat to the strip; and I do not deem it necessary to describe herein these obvious mechanical devices.

I am aware that the expansion of a sensitive plate when exposed to heat has been made to increase by its pressure the resistance to the electric current in a carbon block included in an electric circuit, the consequent variations in resistance as denoted by the deflections of a delicate galvanometer included in the circuit being utilized to measure the intensity of the heat-rays falling upon said sensitive plate. This method of measuring the intensity of the heat does not, however, involve the subject-matter of my present invention, in which a total interception of the heat-rays is made to produce a break or positive interruption of an electric circuit, resulting in the movement of the armature of an electro-magnet included in said circuit, so as to produce thereby a positive signal and actuate a registering device.

I claim as my invention—

1. The method as herein described of opening and closing an electric circuit to produce a movement of the armature of an electro-magnet included in said circuit by the contraction of a sensitive strip or plate under the influence of an obstruction or interruption of constant heat-rays made to fall upon said plate, substantially in manner as set forth.

2. The combination, with a sensitive strip which will expand when submitted to heat and contract when the heat-rays are intercepted, of an electric circuit arranged to be opened or closed by the expansion and contraction of said strip, an electro-magnet included in said circuit, and a registering device actuated by and indicating the movements of the armature of said electro-magnet, all substantially in the manner and for the purpose herein set forth.

3. The combination, with a burner or device, R, producing radiant heat, a sensitive strip, C, expanded by the projection thereon of the radiant heat and contracted by its interception, and an electric circuit, W W', arranged to be opened by the expansion of said strip and to be closed by its contraction, and which includes therein an electro-magnet, S, actuating an indicating device, H K, of an auxiliary electric circuit, V V', arranged to be closed by the expansion of said strip C and to be opened by its contraction, and electro-magnet *d*, included in said circuit, and a slide or

shutter, U, arranged to pass between the strip and the burner to intercept the heat-rays when said auxiliary circuit is closed, and to drop away automatically from between the strip and burner when the circuit is opened, all substantially in the manner and for the purpose herein set forth.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHAS. W. WEISS.

Witnesses:
DANIEL R. GARDEN,
JOHN A. ELLIS.