(No Model.) 2 Sheets—Sheet 1.

H. J. HAIGHT.

CIRCUIT CLOSER AND REGULATOR FOR ELECTRO MAGNETIC THERMOSCOPES.

No. 376,880. Patented Jan. 24, 1888.

Fig. 1.

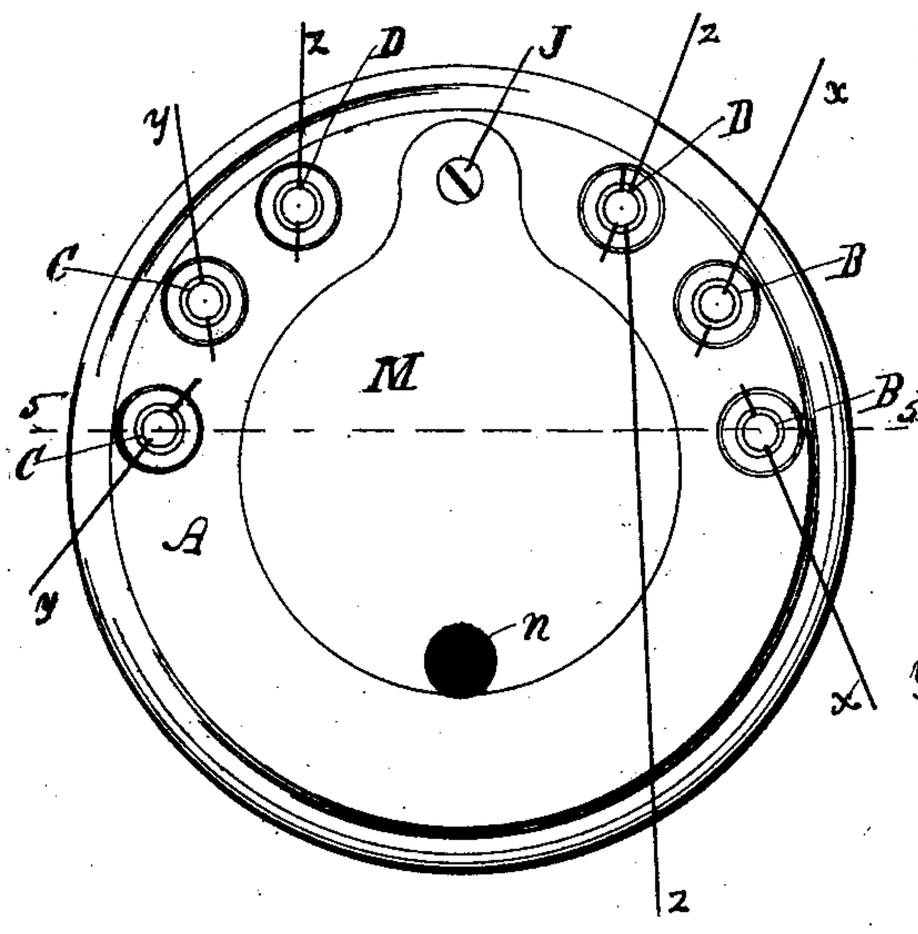


Fig. 2.

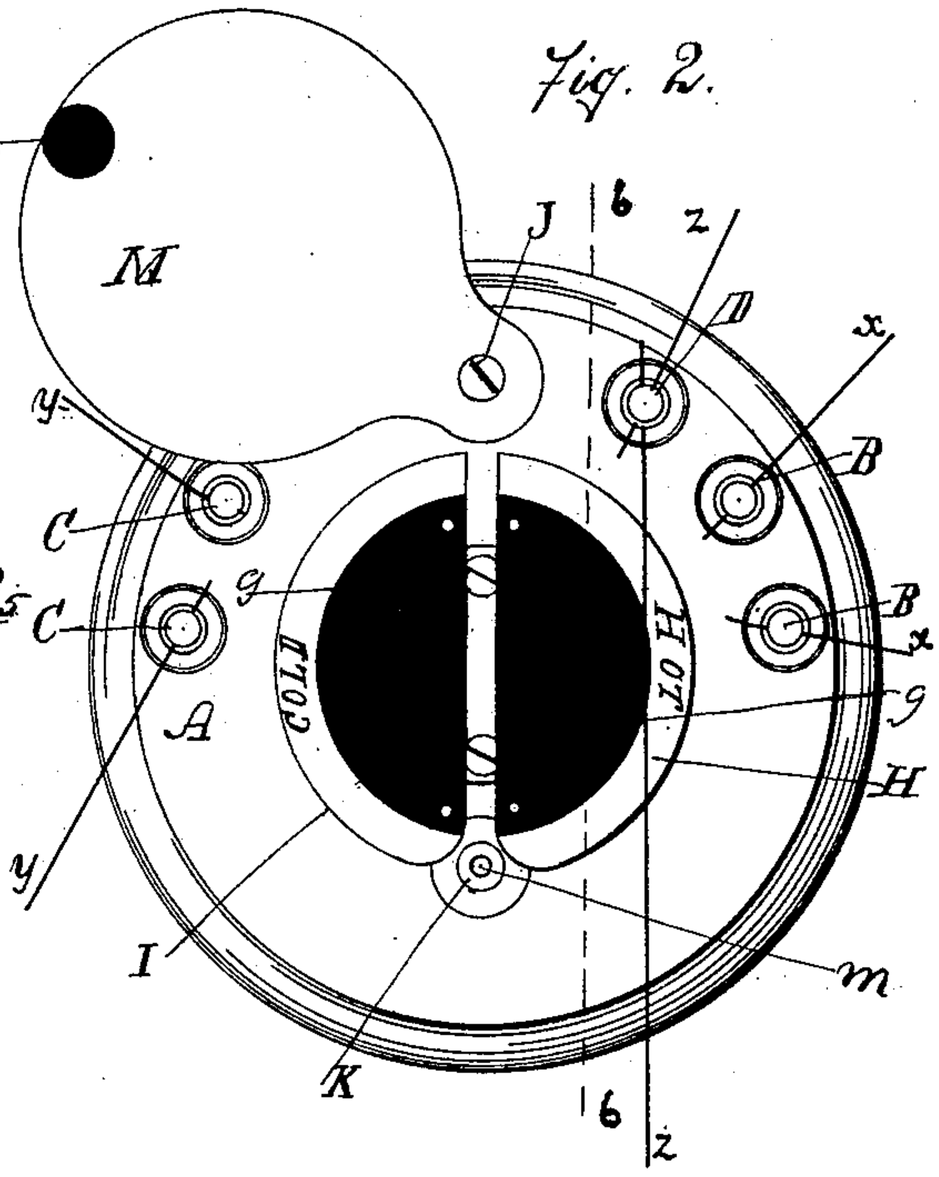


Fig. 3.

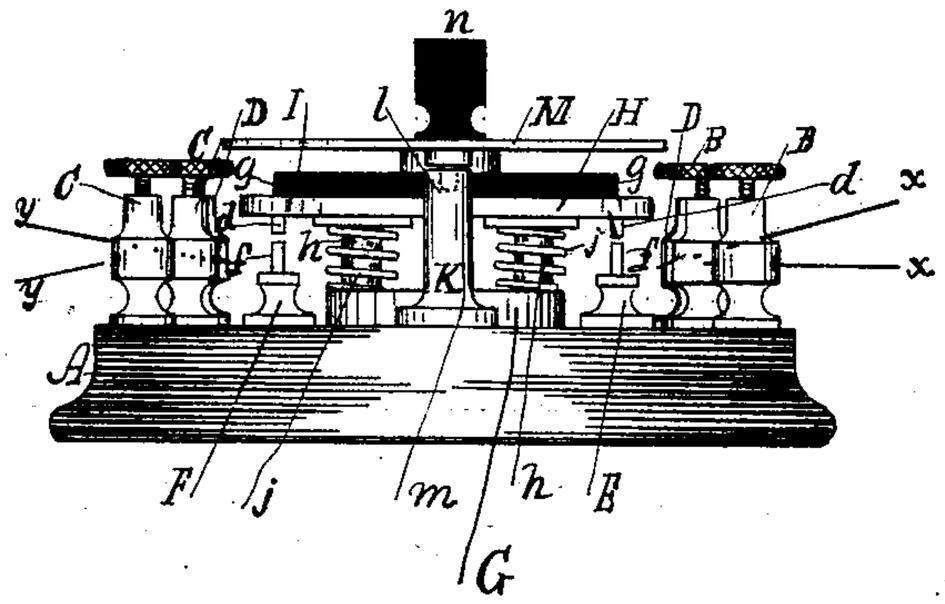
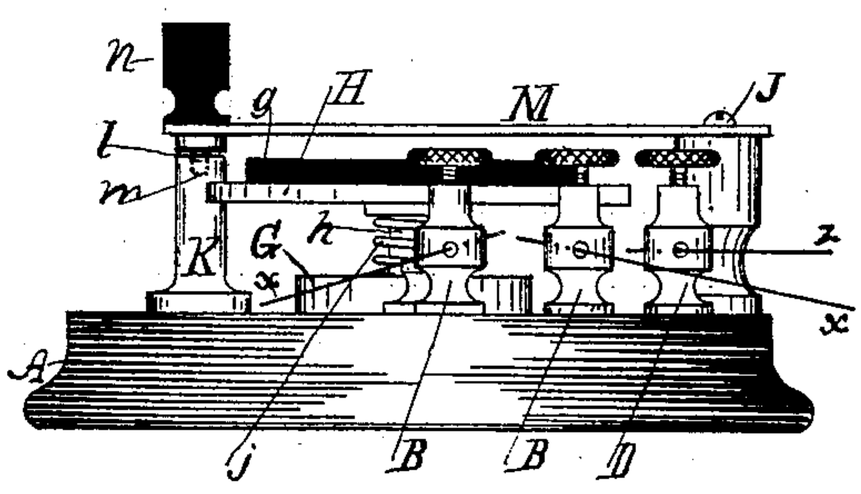


Fig. 4.



Witnesses
F. H. Lane.
A. L. Browne.

Inventor:
Henry J. Haight,
By his Attorney:
J. S. Brown,

(No Model.) 2 Sheets—Sheet 2.

H. J. HAIGHT.

CIRCUIT CLOSER AND REGULATOR FOR ELECTRO MAGNETIC THERMOSCOPES.

No. 376,880. Patented Jan. 24, 1888.

Fig. 5.

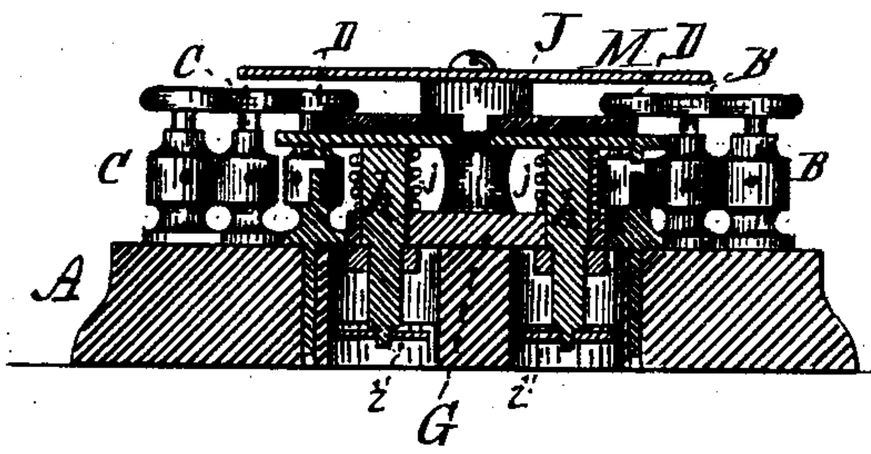


Fig. 6.

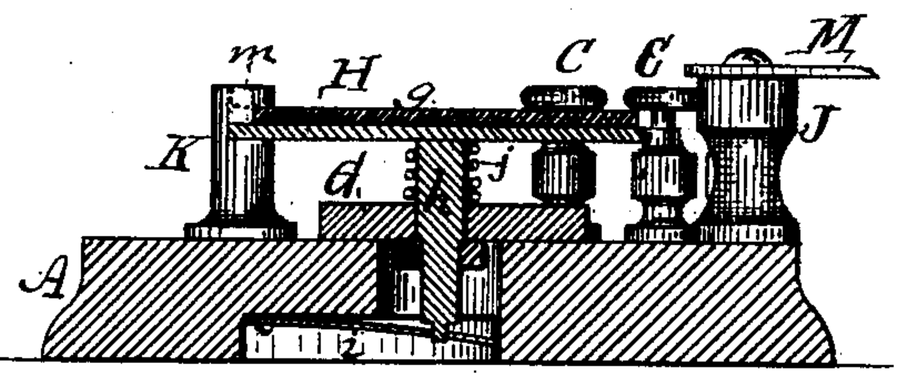
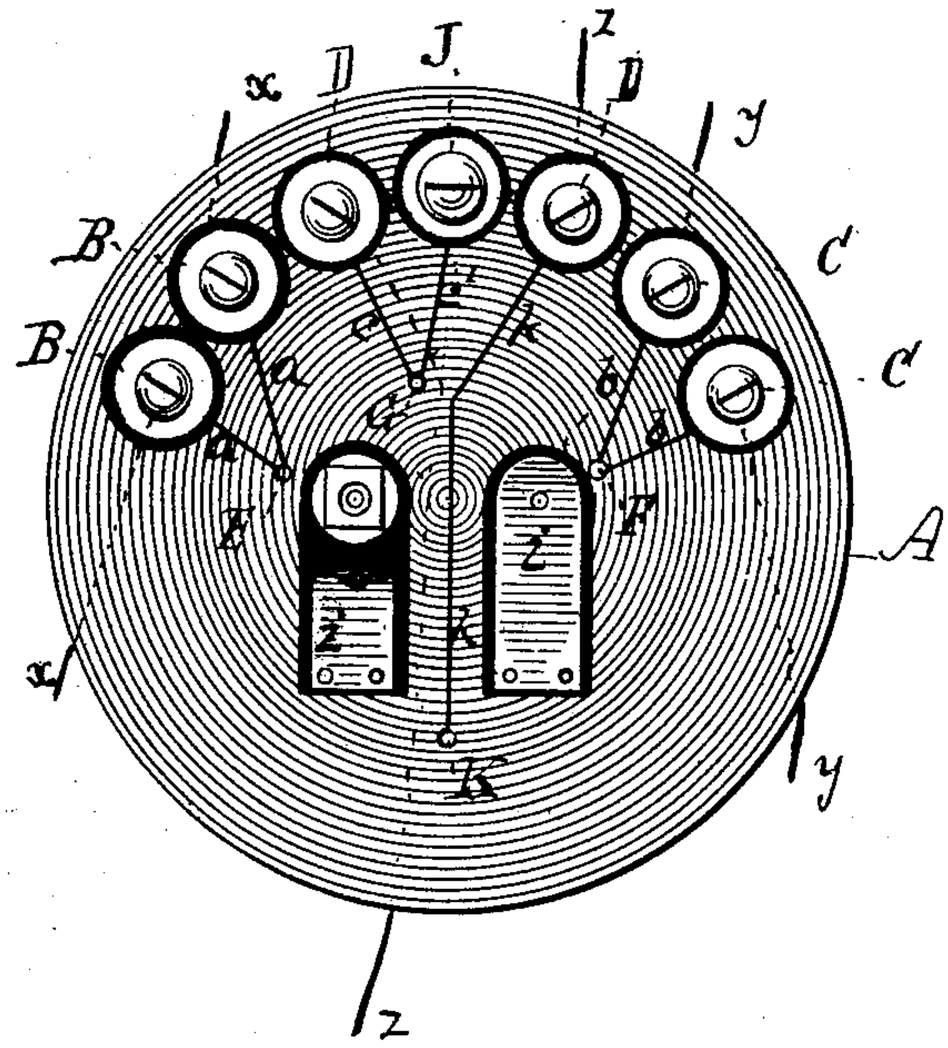


Fig. 7.



Witnesses.

H. H. Howe

Daniel Breed

Inventor,

Henry J. Haight,

By J. S. Brown,

his Attorney.

UNITED STATES PATENT OFFICE.

HENRY J. HAIGHT, OF NEW YORK, N. Y.

CIRCUIT-CLOSER AND REGULATOR FOR ELECTRO-MAGNETIC THERMOSCOPES.

SPECIFICATION forming part of Letters Patent No. 376,880, dated January 24, 1888.

Application filed March 8, 1886. Serial No. 194,439. (No model.)

To all whom it may concern:

Be it known that I, HENRY J. HAIGHT, of the city, county, and State of New York, have invented an Improved Temperature Circuit-Closer and Regulator for Electro-Magnetic Thermoscopes; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings, making part of this specification.

In the use of electro-magnetic thermoscopes for transmitting temperature indications from one station to another, or to other stations, it becomes necessary sometimes to break and close the high-temperature circuit or low-temperature circuit a definite number of times for the special purpose of bringing the temperature indications into unison at the different stations when disarranged, as well as for any other purpose, or sometimes to cut one wire out of the circuit, as set forth, for example, in my application for Letters Patent No. 183,543. I have devised an electric circuit closer and breaker for these purposes, sure and definite in action and easily manipulated.

In the accompanying drawings, Figure 1 is a top view of the instrument; Fig. 2, a top view thereof, with the guard-plate swung to one side, showing the constructon of the operative parts of the instrument ordinarily beneath the same; Fig. 3, a front view of the instrument arranged as in Fig. 1; Fig. 4, a side view of the same; Fig. 5, a vertical section thereof in a plane indicated by the line 5 5, Fig. 1; Fig. 6, a vertical section in a plane indicated by the line 6 6, Fig. 2; Fig. 7, a view of the under side of the instrument.

Like letters designate corresponding parts in all of the figures.

Upon a suitable non-conducting base, A—as of wood or equivalent material—are secured the requisite binding-posts for attaching the circuit-wires. Thus the binding-posts B B are shown for attaching the parts *x x* of the increasing-temperature wire, and the binding-posts C C for attaching the parts *y y* of the decreasing-temperature wire, and the binding-posts D D for attaching the parts *z z* of the battery or return-circuit wire. The two binding-posts B B are respectively connected, by short wires or conductors *a a*, Fig. 7, with a metallic stud or anvil, E, mounted on the non-conducting base; and similarly the binding-posts C C are respectively connected, by short wires or conductors *b b*, with another metallic stud or anvil, F, also mounted on the non-conducting base. One binding-post, D, the one directly connected with the battery, is connected by a short wire or conductor, *c*, with a metallic block or disk, G, secured upon the base A, preferably near the middle thereof, as shown.

Now by forming a metallic connection between this disk G and either the anvil E or F, as the case may be, the increasing-temperature or decreasing-temperature circuit is closed, moving the corresponding index of the receiving-thermoscope one degree on the temperature-scale. For these two purposes, two keys, knobs, or buttons, H and I, are mounted upon and metallically connected with the disk G, each having a downwardly-projecting pin, *d*, to strike upon an upwardly-projecting pin, *f*, on one or the other anvil below. These several pins are made of platinum or other non-oxidizing metal, such metal being therefore useful, but not absolutely necessary, to the operation of the invention, since metallic or other conducting connection between the knobs and anvils is all that is required to close either circuit. The two knobs H I may be side by side and close to each other, but separated so that either can be vibrated up and down without disturbing the other. The upper surfaces of the knobs or disks are covered with hard rubber or gutta-percha *g* to insulate them from the hand of the operator.

In order to give the knobs an up-and-down reciprocating movement, they preferably have square or other angular or equivalently-formed stems *h h*, extending down into apertures in the disk G, so as to be held and guided thereby and prevented from turning out of proper position. The lower ends of the stems are secured to spring-plates *i i* attached to the under side of the base A, and these plates serve, or may serve, to hold the knobs up out of contact with their respective anvils and keep the circuits broken. Spiral springs *j j*, around the stems *h h*, above the disk G, may be used to hold up the knobs, either as auxiliary to or instead of the plates *i i*. By depressing either knob the circuit connected therewith is closed, and on removing the hand from the knob the

circuit is immediately opened. Thus by depressing either knob a given number of times the index of the receiving-instrument in connection with that circuit is advanced a corresponding number of degrees of temperature.

Two additional studs, J K, are mounted on the base A, respectively, near opposite edges thereof. One stud, J, is connected by a short wire or conductor, *c'*, and the wire *c* with the battery binding-post D. The other stud, K, is connected by a short wire or conductor, *k*, with the other or ground wire binding-post, D, of the return-circuit. By connecting metallically the studs J K by a suitable switch the return-wire is made continuous, so as to make a closed circuit through the entire line, and by disconnecting the said switch the return part of the circuit is broken, thereby allowing the increasing-temperature and decreasing-temperature wires to form short circuits with one part of the return-wire by the above-described keys or hammers. I form this connection by means of a metallic plate, M, which is pivoted to the binding-post J, while a pin or projection, *l*, on the under side of the plate, near the edge opposite to the pivot of the plate, is arranged to fit into a socket or depression, *m*, in the upper end of the stud K, to close the entire return-circuit. The plate may be made to spring down upon the stud K, and thus make a reliable metallic connection. When the plate is swung over the stud K, as shown in Figs. 1, 3, and 4, the return-circuit is closed; but when the plate is swung to one side or back, as shown in Fig. 2, the return-circuit is broken. This circuit closing and breaking plate is also employed as a shield to cover the knobs or buttons H I and prevent their being accidentally depressed and thus improperly closing their circuits. For this purpose the plate is made broad enough to completely cover and protect the knobs. When the plate is swung back, as shown in Fig. 2, to allow the knobs H and I to be reached, the return-circuit is broken, as required. The plate M has an insulating knob or handle, *n*, to keep the battery-current away from the hand of the manipulator.

I claim as my invention—

1. The combination of the increasing-temperature, decreasing-temperature, and return-circuit wires of an electro-magnetic thermoscope, anvils connecting, respectively, with the said increasing and decreasing temperature wires, two separate keys or hammers, both in metallic connection with and both acting to close and break the respective increasing and decreasing temperature circuits, and a switch for breaking and closing the return-circuit, substantially as and for the purpose herein set forth.

2. In combination with the increasing-temperature and decreasing-temperature keys or knobs, a shield-plate adapted to cover and shield the keys or knobs and at the same time to close the entire return-circuit and to open the said return-circuit when the said keys or knobs are uncovered by said plate.

3. The combination of the increasing-temperature, decreasing-temperature, and return-circuits, anvils connected, respectively, with the increasing-temperature and decreasing-temperature circuits, a metallic disk or plate connected with the return-circuit, spring-keys connected with the return-circuit disk or plate and adapted to respectively strike upon said anvils to close the circuits connected therewith, and a shield-plate adapted to separately close the return-circuit and to shield the said keys or knobs, substantially as and for the purpose herein specified.

HENRY J. HAIGHT.

Witnesses:
C. S. NEWELL,
D. H. HAIGHT.