2 Sheets—Sheet 1.

R. F. BARTEL.

Thermostat for Electric Fire-Alarms.

No. 200,017. Patented Feb. 5, 1878.

Fig. 1.

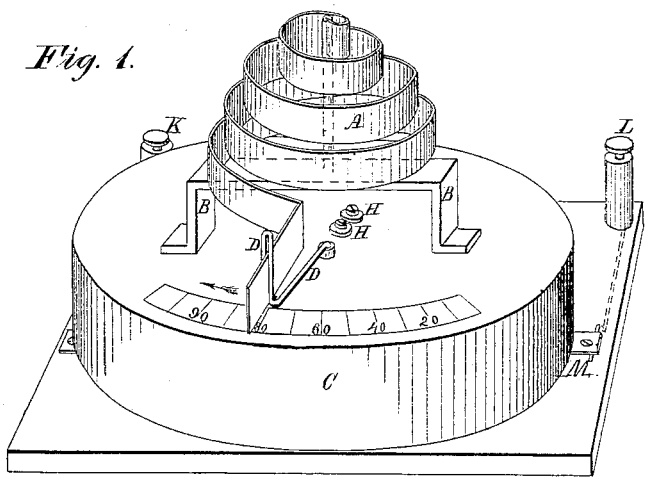


Fig. 2.

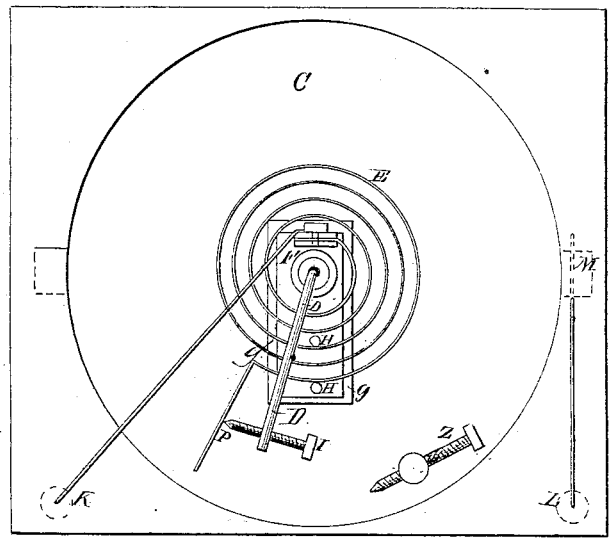
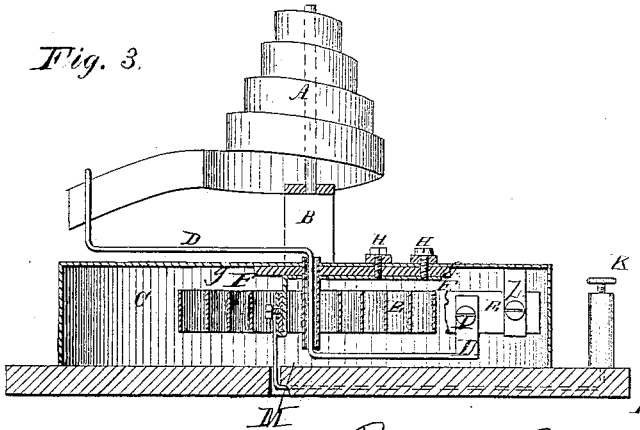


Fig. 3.



Witnesses;

William H. Haldane

D. W. Harkness

Inventor

Rudolph Frederic Bartel

N. PETERS, PHOTO-LITHOGRAPHER, WASHINGTON, D. C.

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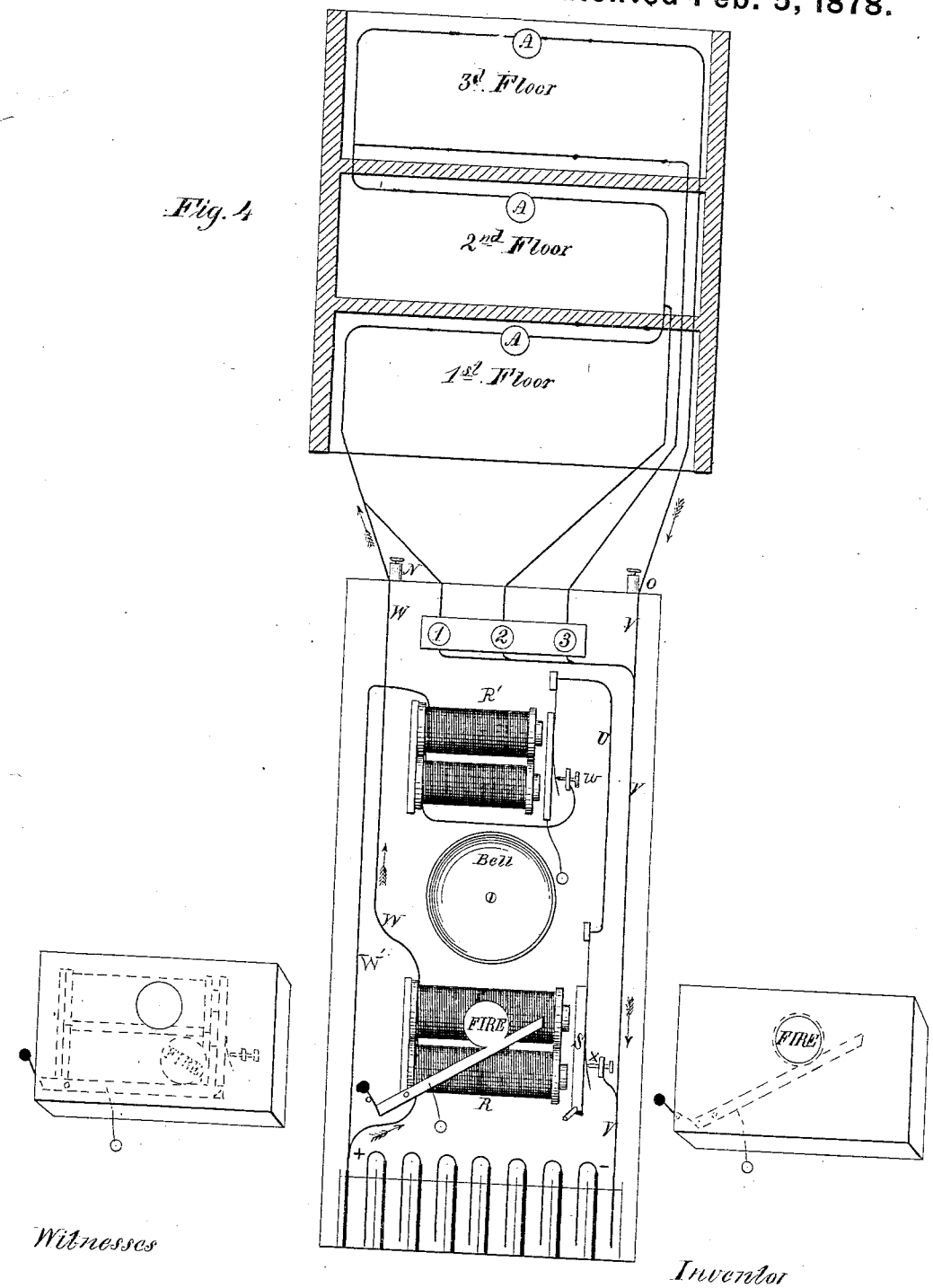
Fig. 1



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UNITED STATES PATENT OFFICE.

RUDOLPH F. BARTEL, OF NEW YORK, N. Y.

IMPROVEMENT IN THERMOSTATS FOR ELECTRIC FIRE-ALARMS.

Specification forming part of Letters Patent No. **200,017**, dated February 5, 1878; application filed April 23, 1877.

To all whom it may concern:

Be it known that I, RUDOLPH FREDERIC BARTEL, of New York, State and county of New York, have invented an electric apparatus which telegraphs a rising fire before it has taken any larger extension, the apparatus being self-acting, self-regulating, and self-controlling; and I do hereby declare that the following, taken in connection with the drawings which accompany and form part of this specification, is a description of my invention.

This invention relates to an improved electric fire-indicator, its object being to provide an apparatus which may be placed in one or more rooms of a building, and connected by an electric circuit with an indicator, the whole being so arranged that any undue increase of temperature in the room in which it is broken will break the electric circuit and operate to demagnetize an electro-magnet, so as to set in motion an alarm, and thus indicate any danger arising from fire.

My invention consists in the combination of two convolute springs or coils, each constructed of two metals of different degrees of expansibility, one of said springs being connected with a double-armed spindle or pivot placed between the springs, one of the arms being connected to and moving with the free end of one of the springs, and the other arranged to come into contact with the free end of the other spring, the whole being located in an electric circuit containing an indicating-instrument, the springs being so constructed and arranged relatively that one will uncoil with more rapidity than the other, so as to break the electric circuit under the influence of any extraordinary increase of temperature, but still maintain the connection under all ordinary variations, as more fully hereinafter set forth.

In the drawings, Figure 1 represents a perspective view of my improved instrument. Fig. 2 represents a plan view of the same; Fig. 3, a view partly in elevation and partly in section of the instrument; Fig. 4, a view representing the instrument as applied to the different rooms of a building, and in connection with the indicating apparatus.

The letter A represents a convolute spring, composed of two metals of different degrees of expansibility, preferably of German silver and steel, secured at one end upon a support or standard mounted on the bridge B, secured to the casing C. Within the said casing C is located another convolute spring, E, secured at one end to a hanger, F, which is insulated from the casing C by the intervention of the insulating material *g*, being held in place by means of the screws H H.

The letter D represents a lever journaled at the center of the casing, one arm of which extends inside the casing, and is provided with a set-screw, I, which bears against the free end of the spring E when said arm is in its normal position, the outer arm of said lever being connected with the convolute spring A, so as to move with it. From the hanger F extends a wire to the binding-screw K, and from the casing C extends a similar wire to the binding-screw M.

The letter Z represents a set-screw standard secured to the casing C, which limits the movement of the arm D, for the purpose to be hereinafter explained.

In Fig. 4 several of the instruments indicated by A are represented as secured to the ceilings of a series of rooms, and electrically connected with the electro-magnet R of the indicating or signal instrument, and the battery by means of suitable wires proceeding from the binding-screws K L of each instrument, forming a closed circuit, which maintains the magnetism until the circuit is broken.

The letter R′ represents an additional electro-magnet electrically connected with one pole of the battery by means of a wire, W′, and by means of a circuit-breaker, *w*, to the armature of said magnet R′, said circuit-breaker being connected by a wire, U, to the armature S of the electro-magnet S′, which is located opposite a circuit-breaker, X, connected to the opposite pole of the battery. The armature of the magnet R′ is provided with a hammer, which strikes an alarm-bell when said armature is vibrated. The wire W from the signal-instrument and battery extends from one instrument to the other throughout the circuit, a return-wire from each proceeding to the buttons 1 2 3, which are connected with the return-wire V, proceeding to the battery by means of a branch wire, in such manner that when one of the buttons is depressed after

the main circuit is broken it will re-establish the circuit, for the purpose to be hereinafter explained.

The operation of my invention is as follows: Upon any sudden and extraordinary increase of temperature in the neighborhood of the instrument the convolute coil A, by reason of its peculiar shape and exposed position, will be rapidly uncoiled, carrying the arm D with it, and breaking its contact with the spring E. This interrupts the electric current through the coil of the electro-magnet R, demagnetizing said magnet and releasing the armature S, which, coming in contact with the circuit-breaker X, establishes the current through the magnet R′, causing the armature to vibrate and ring the alarm.

In the event of the spring A being acted upon and expanded by the ordinary changes of temperature, the expansion will take place so slowly that the spring E, which expands also under changes of temperature, will be affected, and will follow the arm D, and thus maintain the closed circuit and prevent a false alarm from being sounded. The set-screw Z limits the motion of the spring E, so that should the said spring E, from any cause, be expanded so as to follow the spring A during any dangerous increase of temperature, it will be stopped when the temperature reaches 120° Fahrenheit, and insure the alarm being sounded. When the circuit has been broken at any instrument the particular instrument at which it is so broken can be readily ascertained by depressing the buttons 1 2 3 in succession until the alarm is stopped, which will indicate the instrument and the location of the fire.

Having described my invention, what I claim, and desire to secure by Letters Patent, is—

The combination, in a fire-alarm instrument, of two convolute springs, each constructed of two metals of different degrees of expansibility, and a double-armed spindle or pivot placed between the springs, one of the arms being connected to and moving with the free end of one of the springs, and the other arranged to come into contact with the free end of the other spring, the whole being arranged in electric circuit with a signal-instrument and with the battery, one coil being adapted to expand with greater rapidity than the other under extraordinary changes of temperature to break the circuit, and the two to travel together under ordinary changes to prevent false alarms, substantially as specified.

Dated New York, April 21, 1877.

RUDOLPH FREDERIC BARTEL.

Witnesses:

WILLIAM H. HALDAM,

D. W. HARKNESS.