(No Model.) 2 Sheets—Sheet 1.

L. S. NORTON & F. E. HOFFMAN.

TELETHERMOMETER.

No. 493,558. Patented Mar. 14, 1893.

Fig. 1.

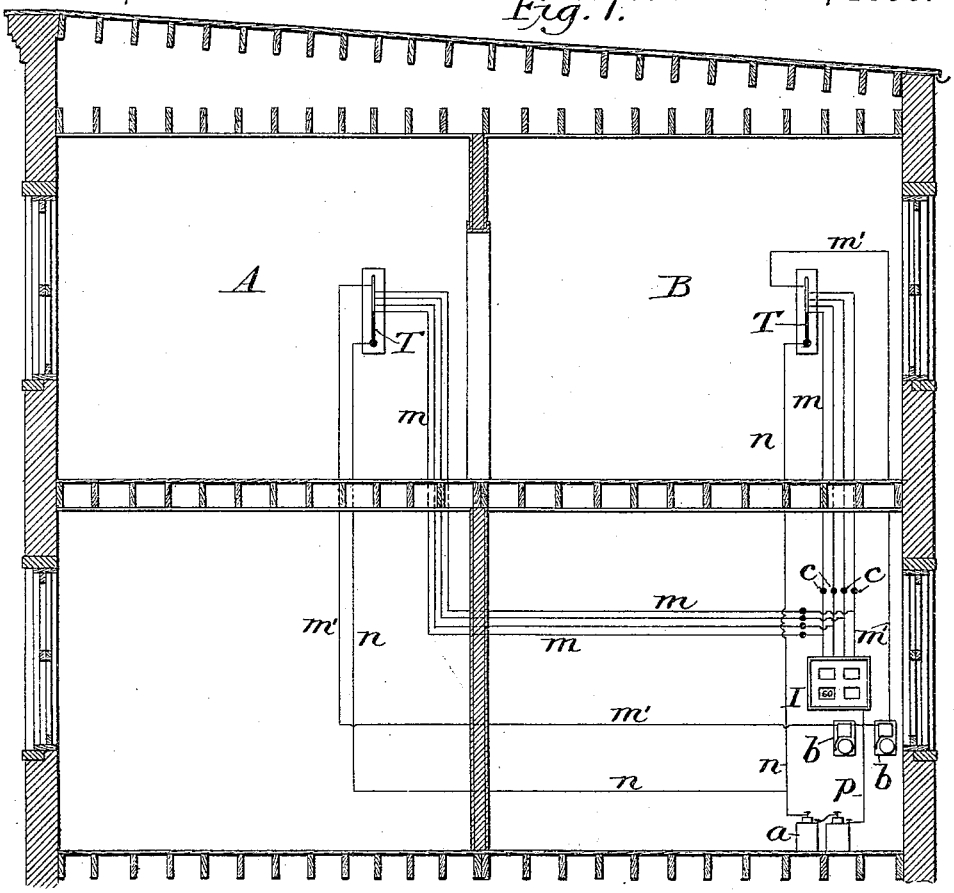
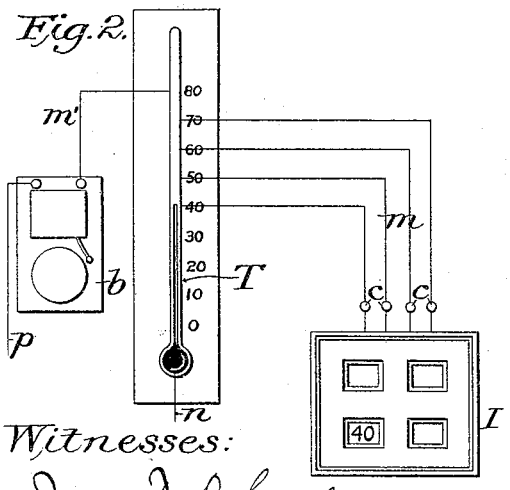
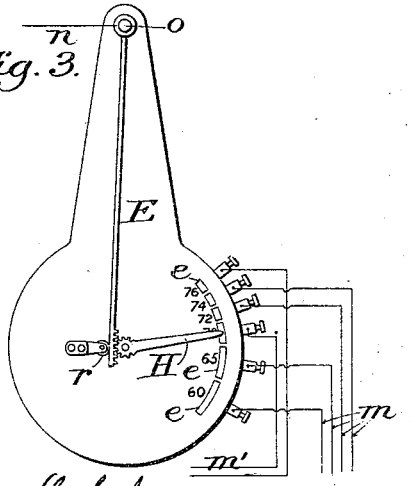


Fig. 2.



Witnesses:
James F. Duhamel
Horace A. Dodge.

Fig. 3.



L. S. Norton &
F. E. Hoffman
Inventors
by Dodger & Sons
Attys.

(No Model.) 2 Sheets—Sheet 2.

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Fig. 5.

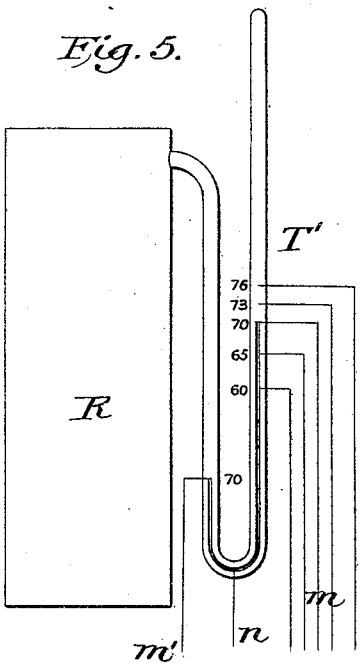
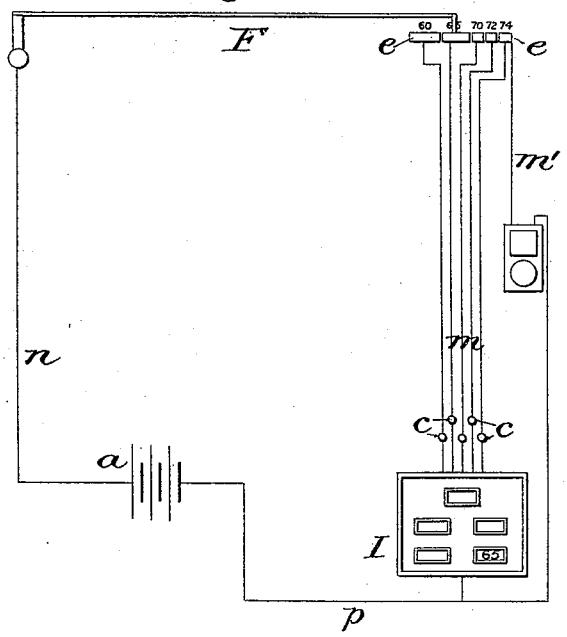


Fig. 4.



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UNITED STATES PATENT OFFICE.

LEROY S. NORTON AND FRANK E. HOFFMAN, OF ALPENA, MICHIGAN; SAID HOFFMAN ASSIGNOR TO SAID NORTON.

TELETHERMOMETER.

SPECIFICATION forming part of Letters Patent No. 493,558, dated March 14, 1893.

Application filed October 31, 1892. Serial No. 450,466. (No model.)

To all whom it may concern:

Be it known that we, LEROY S. NORTON and FRANK E. HOFFMAN, citizens of the United States, residing at Alpena, in the county of Alpena and State of Michigan, have invented certain new and useful Improvements in Telethermometers, of which the following is a specification.

Our invention relates to apparatus for ascertaining at will the temperature, within specified limits, in a series of rooms or places, and indicating the same to the janitor or person in charge at any desired central point; and the invention consists in a novel combination and arrangement of devices or parts for that purpose, as hereinafter more fully set forth.

Figure 1 is transverse vertical section of a building showing the invention arranged for operation therein. Fig. 2 is an enlarged face view of a portion of the apparatus, to more clearly illustrate its construction and mode of operation; and Figs. 3, 4 and 5 are face views of modified forms of certain parts of the apparatus.

The object of this invention is to provide a cheap and simple means by which the janitor or person in charge of a building can at any time ascertain the temperature in any and all of the rooms of the building, without leaving his room or position. To accomplish this result, we place in each of the rooms, or in as many of them as may be desired a thermometer T, as shown in Fig. 1. These thermometers, as shown more clearly in Fig. 2 have the ends of a series of electric conducting wires *m* fused tightly into the side of the tube which contains the mercury, the ends of the wires passing through the wall of the tube, so that as the mercury therein rises by expansion it will come in contact successively with the several wires, whatever their number may be. As the temperature of rooms occupied by scholars or other persons is usually kept at from 60° to 70° Fahrenheit, it is sufficient for ordinary purposes to so arrange these wires as to indicate the temperature within those extremes; but it is obvious that they may be arranged to indicate a much greater range of temperature, and in Fig. 2 we have shown them arranged to cover a range of temperature extending from 40° to 70°, with an alarm wire *m'* arranged to make contact at 80°.

In Fig. 2 we have shown the wires arranged to make contact with the mercury at intervals of 10°, but it is obvious that by using more wires they may be arranged to make contact at each degree, or at intervals of two, three, four or any number of degrees desired. Having provided the requisite number of these thermometers thus provided with contact wires, we place one in each of the occupied rooms, as shown in the rooms A and B Fig. 1, and extend the wires *m* to an indicator I, located at the desired point, usually in the basement, or wherever the janitor or person in charge can have ready access to the same, this indicator being connected by a wire *p* to the positive pole of an ordinary open circuit battery *a*, as shown in Fig. 1.—there being also a return wire *n* connected with the bulb or lower portion of the thermometer tube in the same manner as the wires *m*, and which is connected to the opposite or negative pole of the battery as also shown in Fig. 1.

In the line of each wire *m* there is inserted a spring key or push button *c*, as shown in Figs. 1 and 2, these being so arranged as to normally remain open, and to complete the line or circuit only when pressed. With the parts thus arranged, it will readily be seen, that by simply passing the thumb or fingers over these keys successively, or by pressing on them all at once, the circuit will be completed through such of the wires *m* as have been brought into contact with the mercury in the thermometer tube, thereby operating in the indicator the correspondingly numbered cards or plates, and thus indicating the highest point to which the temperature has risen within the room where the thermometer is located.

In order to ascertain the temperature in each room separately, each set of wires *m* for the different rooms will be provided with a set of keys, as shown in Fig. 1.

In order to call attention in case the temperature should become excessive, and the person in charge should be negligent or absent from his post, we extend what we term the maximum or alarm wire *m'* to the battery separately, and place in the line of said

wire an electric bell *b*, as shown in Figs. 1 and 2, so that whenever the mercury in the tube makes contact with this wire the bell will be rung automatically. In Fig. 2. we have shown this arranged to make contact at 80°, but it is obvious that it may be arranged at any point desired above the normal temperature at which it is desired to keep the room. Another advantage of this is that it will serve as a fire alarm, and for such purpose it may be arranged to ring a larger bell located outside of the building, or be connected with the fire alarm of the city, or with the fire engine stations, or both, at will. A minimum wire and bell may be also added if desired.

There are many forms of temperature indicating devices which may be used in lieu of the thermometers T, and be made to operate the same. In Fig. 2, E indicates a metallic bar or rod of a kind that has a high degree of expansibility. having one end permanently fastened in place by a stud *o* or any suitable means, and having at its opposite and free end a series of teeth arranged to engage with a pinion *t* mounted on a shaft to which is secured a hand or pointer H, the outer end of which has frictional contact with a series of insulated metallic plates *e*, each of these plates being provided with a binding screw for connecting the wires *m*, as shown. The expansion and contraction of the bar E will cause the hand or pointer H to move and thus successively make contact with the plates *e*, so that by pressing the keys or buttons *c* in the lines *m*, the circuit will be completed and the temperature shown at the indicator I, the same as when the mercurial thermometers are used, as above described. In order to hold the rack of the expansion bar E in gear with the pinion *t*, and permit it to move freely, a friction roller *r* is arranged to bear against its rear side, as shown in Fig. 3. In Fig. 4, we have shown a similar series of insulated metallic plates *e* arranged in a right line, with an expansion bar E provided with a contact point arranged to rest and slide to and fro on the plates *e*, as the bar expands and contracts, the wires *m* being connected one to each separate plate, the same as in Fig. 2, the arrangement of the keys, indicator and alarm bell being the same as previously described.

In Fig. 5 R indicates an air tight vessel of any suitable kind to be filled with air, gas or volatile fluid expansible by heat. To this is connected a bent tube T′ partially filled with mercury, and having the wires *m* inserted in the same manner as in the thermometer tubes. The expansion of the contents of this vessel R will force the mercury up the graduated arm of the tube and bring it in contact with the wires *m* successively, as shown, and thus produce the same result.

All these forms of the device, with many others are the equivalents of the thermometer T, and obviously may be substituted therefor in our apparatus without changing its principle or mode of operation.

For the more ready illustration of our invention, we have shown each wire as being run separately from the thermometer to the indicator, but as is well known by all electricians, the wires if properly insulated may, for each room be bunched or twisted into a cable; and they will preferably be concealed to prevent being broken or injured by children or others.

While we have shown an ordinary battery as the source of electricity, it is obvious that the same result will be obtained with a suitable current produced by other means. It is also obvious that the indicator instead of being located within the building, may be located at any other point, wherever desired, and be made to operate the same; and that if desired, one or more additional indicators may be located elsewhere, and thus by simply connecting these additional indicators with the circuit, the temperature may be simultaneously indicated at as many different points as may be desired; any one familiar with electrical matters being able to make the necessary connections for this purpose, and which it is therefore unnecessary to show.

The apparatus is exceedingly simple and cheap, and can be applied by any person familiar with electrical devices; and as the line is open at all times except when the keys are pressed, the exhaustion of the battery is very slight indeed, thus rendering the apparatus durable and requiring but little attention.

Having thus described our invention, what we claim is—

1. An apparatus for indicating the temperature of one or more apartments, comprising the following elements in combination: a thermometer in the apartment or apartments, provided with contact points corresponding with the degrees of temperature to be indicated; an indicator provided with a series of signals corresponding with the several contact points of the thermometer; electric conductors connecting the contact points of the thermometer with the signals of the indicator, each of said conductors being provided with a contact key or button arranged to normally keep the line or circuit open; a battery or source of electrical energy; and a return wire connecting the thermometer and the battery, substantially as shown and described.

2. In combination with two or more compartments, thermometers, one in each compartment, each thermometer provided with a series of contact points corresponding to different degrees of temperature; an indicator provided with signals corresponding to the respective contact points of said thermometers; conductors connecting the respective contact points of the thermometers with the corresponding signals of the indicator, each of said conductors being provided with a key or switch to complete its connection or circuit; a battery or source of electrical energy; a return conductor connecting the thermostats with the battery; and a separate conductor

leading from the thermometers to the battery and arranged to automatically ring an alarm bell whenever the temperature in any one or more of the apartments reaches a predetermined point above the normal temperature, substantially as shown and described.

3. In combination, a series of compartments each provided with a thermometer having a series of contact points corresponding with different degrees of temperature; an indicator provided with a series of signals corresponding with the respective contact points of the thermometers; electrical conductors connecting the respective contact points of the thermometers with the corresponding signals of the indicator; a source of electrical energy, and a series of circuit closing keys or devices, arranged to complete the circuit between the contact points of the thermometers and the indicator signals at will.

In witness whereof we hereunto set our hands in the presence of two witnesses.

LEROY S. NORTON.
FRANK E. HOFFMAN.

Witnesses:
JOSEPH W. FITZGERALD,
ALEX. MCDONALD.