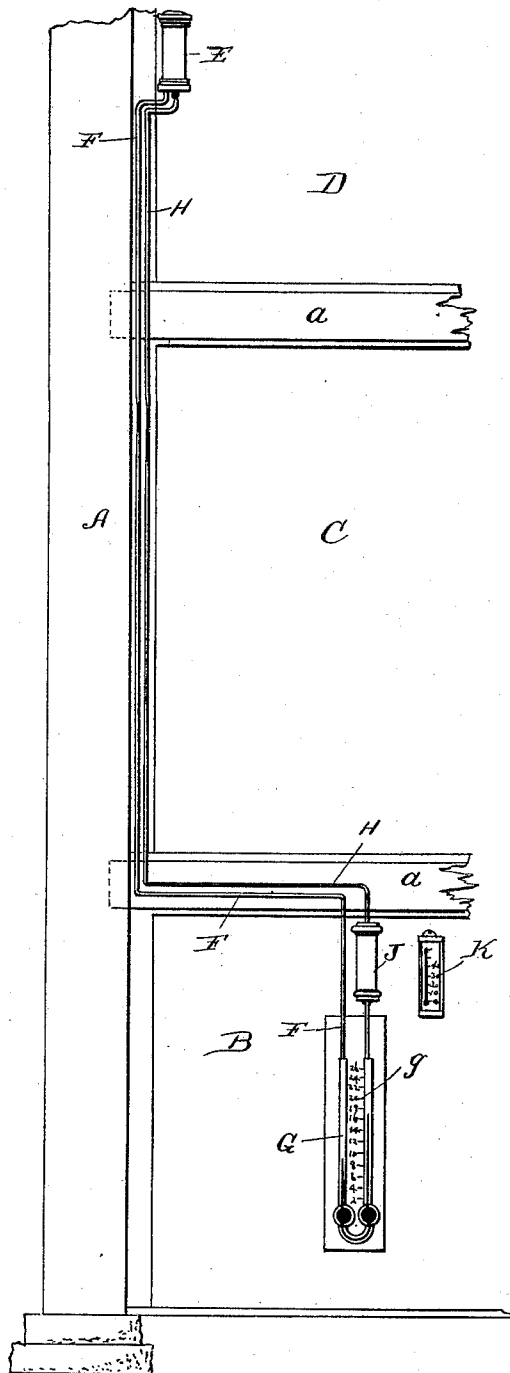


(No Model.)

G. H. HESS, Jr.
TELETHERMOMETER.

No. 466,934.

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UNITED STATES PATENT OFFICE.

GEORGE H. HESS, JR., OF CHICAGO, ILLINOIS.

TELETHERMOMETER.

SPECIFICATION forming part of Letters Patent No. 466,934, dated January 12, 1892.

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To all whom it may concern:

Be it known that I, GEORGE H. HESS, Jr., a citizen of the United States, residing in Chicago, in the county of Cook and State of Illinois, have invented a new and useful Improvement in Heat-Indicators, of which the following is a specification.

My object in this invention is to provide a means for indicating the temperature of the various rooms of a building, which shall enable the engineer or janitor who may have the heating apparatus of the building in charge to know the temperature of the several rooms.

To this end the apparatus which I employ consists of generators in the various rooms, indicators located in the janitor's or engineer's room or at the point of observation, and closed pipes containing columns of air adapted to be moved by the generators in the several rooms and to actuate the indicators.

The construction of generators which I have found to work exceedingly well consists, simply, of a plain tube closed at its ends and connected with the air-pipe. For the indicator I prefer to employ a column of mercury or other fluid confined in a glass tube in connection with a scale denoting the various degrees of temperature, said tube being joined to the lower end of the air-pipe, so that the mercury may be moved by the column of air whenever the latter is expanded by the heat communicated to the generator in the room where the latter is located. To guard against the actuating of the indicating-fluid through the expansion of the air confined in the air-tubes, caused by heat communicated to said tubes at points between the thermostats in the rooms and the point of observation, I prefer to provide a duplicate column of air bearing upon the other side of the indicating-fluid in the indicator, and this duplicate air column is confined in a tube running parallel with and adjacent to the first-mentioned air-tube. The duplicate air-tube may be provided with a generator at the janitor's room or point of observation, so that said column is affected by the temperature of the latter point. In this manner the expansions caused by the heat communicated to the two columns of air which it is not desired to register or make

note of are counterbalanced each by the other, it being supposed that both of the tubes will be subjected to the same influences by reason of their being laid close together and parallel. The duplicate air-tube is not provided with a generator, unless at the janitor's room, as already stated; but the column of air in it should be about the same in height as that confined in the primary tube. Where the duplicate air column and generator are thus employed, that one of the generators which may at the time be subjected to the greater heat will produce a movement of the fluid in the indicator, and the engineer or janitor, noting the direction of such movement and its extent by means of the scale placed upon the indicator and adding or deducting the same to or from the temperature of his room, is enabled to know the condition of the air in the room above.

These and other features of my invention are fully described below and shown in the accompanying drawings, in which I have shown a sectional elevation of a portion of a building with my heat-indicating apparatus positioned therein.

In said drawings, A may represent one of the walls, and a the floors, of any ordinary building. The lower room B may be the room where the heating apparatus is kept or where the janitor or engineer is ordinarily stationed.

C and D are the upper rooms, the heat whereof is to be regulated from the room B.

It is desirable that my apparatus be employed in the case of each room to be heated from the furnace or boiler, so that the engineer or janitor may be at all times fully informed as to the temperature in the various rooms. I have illustrated the apparatus, however, only in the case of the single upper room D to avoid unnecessary complexity in the drawings. In principle, however, the apparatus will be the same whether it be employed in one room or many, each room having its own generator, column or columns of air, and indicator.

At E is the generator, located in the room D. It consists, by preference, of a simple tube sealed at its ends and connected to the upper end of the air-tube F. This tube extends down to the room B, and is connected to one side of an indicator-tube G, containing a body

of mercury or other indicating-fluid. It will be seen from the construction of the parts thus far described that any heat which may come to or effect the generator E will cause an expansion of the air in said generator and a consequent downward movement of the column of air in the tube F. This movement of the air column actuates the fluid in the indicator G and forces a portion of it into the farther branch of said indicator. The extent of this movement may be noted by means of the scale *g*, with which the indicator is provided. The engineer is by this means notified at once of all changes in the temperature of the room D, and he can then take measures either to increase the amount of heat sent to said room or he can shut off some portion of it, as occasion requires. Inasmuch, however, as the tube F may be subject to different or varying temperatures at points between the rooms D and B, which would to some extent bring about movement of the air in the tube and a consequent change of the indicating-fluid which would not truly reflect the condition of room D, I provide a companion tube H of substantially the same length or height as tube F and connect it with the other branch of the indicator G, as indicated. This tube H is sealed at its upper end and contains a column of air the equal substantially of that in tube F, and by laying the tube H in close proximity to tube F throughout the latter's course it is subjected to the same influences at all points between rooms D and B as is tube F, and the column of air therein is affected to the same extent as in tube F, so that the movements of the air in tube F, due to heat communicated at intermediate points, will be neutralized or counterbalanced by those in tube H and no effect be produced thereby upon the indicating-fluid.

To produce a more perfect balance of the two air columns and to equalize their bulk, and also to enable the engineer or janitor to ascertain the difference in temperature between the rooms B and D, I insert in the duplicate pipe and within the room B a generator J of the same capacity as the generator E and adapted to actuate the indicating-fluid ac-

cording to the temperature existing at room B. That one of the generators E and J which is subject to the greater heat will now move the indicating-fluid in proportion to the difference in the temperature at the generators. The direction and extent of this movement are noted by the person in charge, and by means of the scale upon the indicator and the thermometer K, showing the temperature of room B, he is enabled to know the exact temperature prevailing at room D.

While I have shown my invention as used for indicating the heat in the rooms of a building, it will be understood that it is equally usable for indicating the temperature of liquids and gases, and also for showing the temperature of cooling rooms, tanks, &c.

I claim—

1. In a device to indicate the difference in temperature between rooms, the combination of the sealed generator confining a body of gas in the room where the heat is to be regulated, the fluid indicator in the room from which the heat is to be regulated, two parallel tubes joined to opposite sides of the fluid indicator, one of said tubes connected to the generator, the other one sealed at the end farthest from the fluid indicator, and a second generator joined to the last-named tube at its junction with the fluid indicator, as set forth.

2. The apparatus for indicating the temperature in different rooms of a building, consisting of a sealed generator confining a body of gas in the room from which the heat is to be regulated, two parallel tubes joined to opposite sides of the fluid indicator, one of said tubes being connected to the sealed generator, the other tube being sealed at the end farthest from the fluid indicator, a second generator connected to this last-named tube at its junction with the fluid indicator, and a thermometer indicating the absolute temperature of the second generator, substantially as described.

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Witnesses:

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