

S. W. CRAMER & W. B. HODGE.
 HYGROMETER FOR REGULATING HUMIDIFYING AND HEATING SYSTEMS.
 APPLICATION FILED DEC. 14, 1909.

968,133.

Patented Aug. 23, 1910.

1 SHEET—SHEET 1.

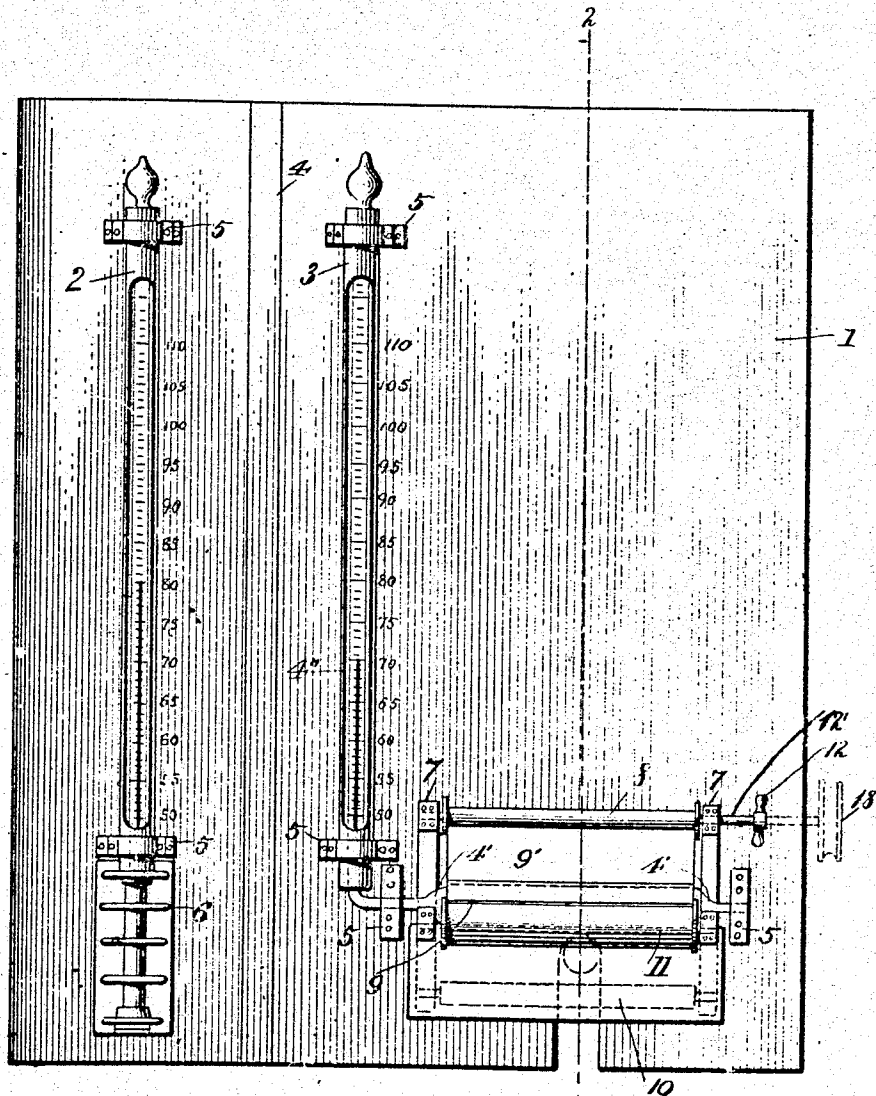


Fig. 1

Witnesses

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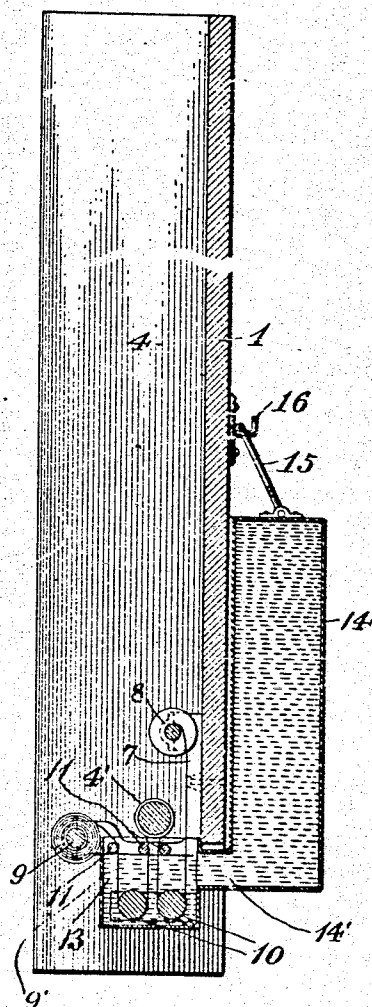


Fig. 2.

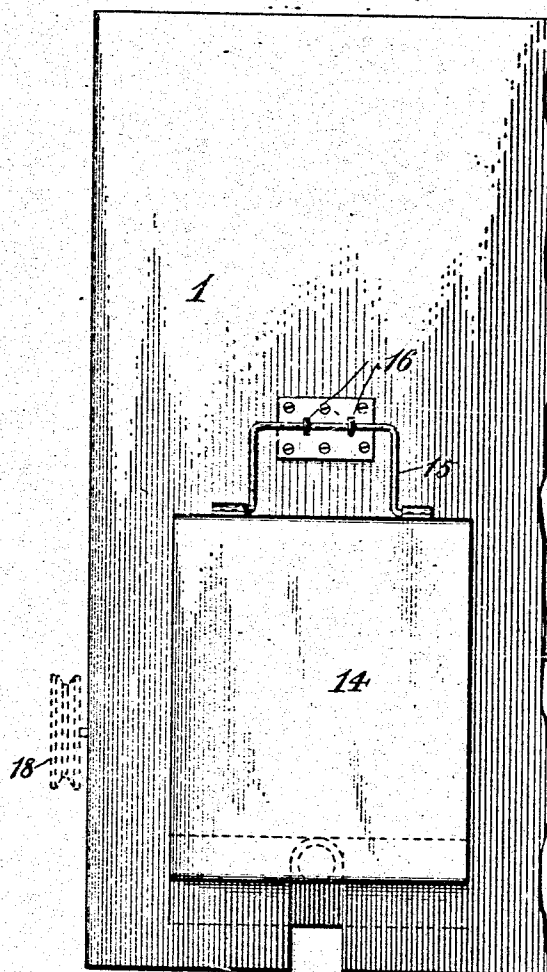


Fig. 3.

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UNITED STATES PATENT OFFICE.

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HYGROMETER FOR REGULATING HUMIDIFYING AND HEATING SYSTEMS.

968,133.

Specification of Letters Patent.

Patented Aug. 23, 1910.

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To all whom it may concern:

Be it known that we, STUART W. CRAMER and WILLIAM B. HODGE, citizens of the United States, residing at Charlotte, in the county of Mecklenburg and State of North Carolina, have invented certain new and useful Improvements in Hygrometers for Regulating Humidifying and Heating Systems; and we do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

This invention relates to hygrometers for regulating humidifying and heating systems and consists in certain improvements by means of which the member indicating the temperature of evaporation is maintained under more uniform conditions and more in accordance with the true temperature of evaporation than in the older types.

Hygrometers with wet bulb members covered with absorbent material are well known in the art. They are subject to more or less inaccuracy owing to the fact that the fibers of the material covering the wet bulb become coated with dust and dirt, and the pores of the material filled up so that it is no longer hygroscopic. It is then necessary to replace the covering with a new one. The frequency of such replacements depends upon the amount of dirt and dust in the air of the room in which the instrument is placed, and in locations where any appreciable dust and dirt are present, it frequently becomes necessary to change the covering as often as once a day, otherwise the instrument indicates in an erratic and grossly inaccurate manner.

The invention will be fully disclosed in the following specification and claims.

In the accompanying drawings, which form part of this specification: Figure 1 represents a front elevation of our improved instrument. Fig. 2 a vertical transverse section on line 2--2 Fig. 1, the stem of the wet bulb member being omitted, and Fig. 3 a rear elevation.

Reference being had to the drawings and the designating characters thereon, 1 indicates a suitable backboard on which is mounted a dry bulb thermometer 2, and a wet bulb thermometer 3. These thermometers can be of any convenient type, the means

for cooling the wet bulb being particularly applicable to large and bulky types.

4 is a partition separating thermometers 2 and 3, so that the cooled air surrounding wet bulb thermometer 3 will not affect the indications of the dry bulb thermometer 2.

The thermometers are secured to the back by means of clips 5, and for protecting purposes, a shield 6 surrounds the bulb of thermometer 2. The bulb of thermometer 2 is exposed to the temperature of the air in the room where it may be placed, and consequently indicates dry bulb temperature. The bulb 4' of thermometer 3 in the construction shown is turned at a right angle to the stem 4". Attached to the backboard 1 is a frame 7 which carries cylinders or rollers 8 and 9 as well as idler cylinders or rollers 10 and 11. On cylinder 9 is wound a strip of cloth or textile fabric 9' suitable for a wet bulb covering. This cloth moisture conveyer extends down under one of the rollers 10; thence up past one idler 11 around and over the bulb 4' of the thermometer 3, then down the other side past the other idler 11 and around roller 10; thence up to the cylinder 8 on which the cloth is wound. By rewinding cylinder 8 with hand wheel 12 on the shaft 12' this cloth or other absorbent material can be unwound from cylinder 9 passed over wet bulb 4', and then rolled on cylinder 8.

13 indicates an extension to an air tight tank 14. This latter tank is closed at the top, and is filled with water, which flows into tank 14 until it covers the opening 14' connecting the two tanks. Tanks 13 and 14 are supported on the back 1 by means of bail 15 and hook 16.

It will be seen that the absorbent covering for wet bulb 3 is immersed in the liquid contained in tanks 13 and 14, which by capillary attraction will be drawn up into this covering of the thermometer bulb 4' consequently maintaining it in a moistened condition. To afford a convenient and easy means for changing the working surface of this covering, we have devised the arrangement shown so that whenever a change in the working surface of the covering is required, it is only necessary to turn the hand wheel 12 and revolve the cylinder 8; this presents new surface of conveyer or covering to the wet bulb member, and one whose pores are not filled

with the dust of the air and the solid particles from the water, and so by turning the hand wheel 12 and changing the position of the moisture conveyer as frequently as occasion requires, the errors in indications previously encountered can be eliminated. It is also evident that a small pulley 18, (shown in dotted line) could be attached to an extension of the shaft of the cylinder 8, and connected to some slowly moving part of the mill machinery by a suitable belt, so that whenever this machinery is operated, the pulley 18 will revolve slowly, and continuously keep a new and fresh surface of the conveyer against the wet bulb member. It is also obvious that if this instrument stands in a quiet atmosphere where it is not subject to drafts of air, the indications will follow the hygrometric law whereas, on the other hand, if it be placed in a sufficiently strong draft of air, the rate of evaporation will be somewhat increased, and the indications will then follow the psychrometric law.

We do not make claim to any particular style of hygrometers, or any particular kind of bulb, or material of which the thermometers are made, or any particular shape of bulb, neither does this invention apply to indicating instruments alone. It is especially applicable to combined wet and dry bulb mechanisms where differences in temperature are not indicated in degrees, but where such differences actuate valves on

other devices whereby moisture producing devices are either set in operation or stopped, depending upon the humidity of the air surrounding the instrument, as described in patents to Stuart W. Cramer, #811,383, January 30th, 1906, re-issued December 3rd, 1907, #12,727, #813,083, February 20th, 1906, and #856,944, June 11th, 1907.

Having thus fully described our invention, what we claim is—

1. In a hygrometer, a wet bulb member, a covering for the same, means for supplying moisture to the covering, and means for drawing the covering across said member progressively.

2. In a hygrometer, a wet bulb member, and means for maintaining the same at the temperature of evaporation, comprising a conveyer for supplying moisture to the bulb, means for drawing said conveyer across said bulb, and a receptacle for liquid in which the conveyer is immersed progressively.

3. In a hygrometer, a wet bulb member, a covering for the same, means for supplying water to said covering, and means for simultaneously unwinding and rewinding the covering while in contact with the bulb.

In testimony whereof we affix our signatures, in presence of two witnesses.

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WILLIAM B. HODGE.

Witnesses:
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