F. B. COMINS.

PSYCHROMETER.

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1,234,529.

Patented July 24, 1917.

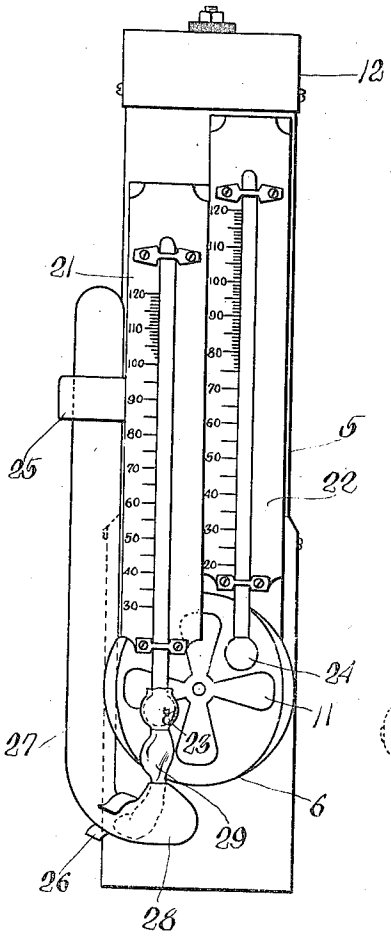


Fig. 1.

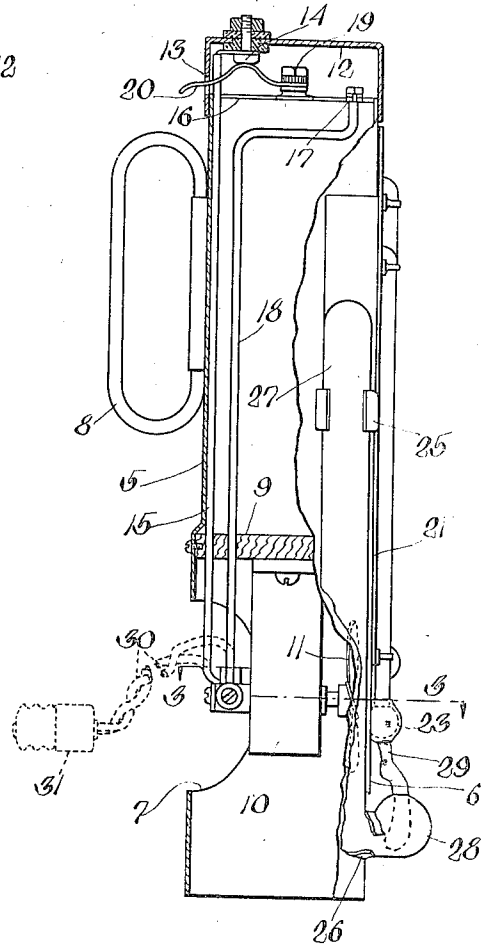
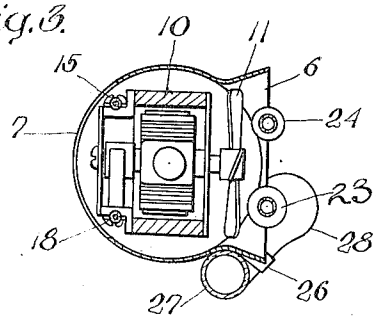


Fig. 2.

Fig. 3.



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UNITED STATES PATENT OFFICE.

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PSYCHROMETER.

1,234,529. Specification of Letters Patent. Patented July 24, 1917.

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To all whom it may concern:

Be it known that I, FRANK B. COMINS, a citizen of the United States, residing at Newton, in the county of Middlesex and State of Massachusetts, have invented new and useful Improvements in Psychrometers, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention has reference to improvements in psychrometers for determining the relative humidity of the air or the temperature of evaporation.

One object of the invention is to provide a device of this nature conveniently portable and containing all the essentials of accurately determining the relative humidity or the temperature of evaporation of air in active circulation and without undue physical effort.

Another object of the invention is to so construct a psychrometric apparatus that it is adapted for universal use in large or small rooms or compartments and may effect the ventilation of the thermometer bulbs essential to accuracy by self contained means.

Other objects of the invention will appear from the following description.

The invention consists in the means for mounting and carrying the thermometers and the means for effecting ventilation thereof.

The invention also consists in such other novel features of construction and combination of parts as shall hereinafter be more fully described and pointed out in the claims.

Figure 1, represents a front view of the improved psychrometric apparatus.

Fig. 2, represents a side elevation of the same parts thereof being broken away and other parts being shown in section.

Fig. 3, represents a sectional view taken on line 3—3 Fig. 1.

Similar characters of reference designate corresponding parts throughout.

In the measurement of atmospheric moisture it has been customary to employ psychrometric apparatus provided with thermometers respectively of the dry bulb and wet bulb variety and to observe the difference between the temperatures indicated by said thermometers. The wet bulb thermometer has usually been supplied with a wick or fabric covering the bulb of said thermometer and provision has been made to supply moisture to such wick or fabric in that the bulb of such wet bulb thermometer might be influenced by the atmospheric temperature coöperating with such moisture. As a matter of fact the presence of said wick or fabric around or partially around the thermometer bulb to some extent excludes air from said bulb and this is particularly the case after a period of use in which impurities in the water supplied to said wick or fabric have been taken up by the fabric and have been retained thereby after evaporation of the water.

In order to obtain a fairly accurate measurement of atmospheric moisture it is at least desirable that the air should pass through the saturated wick or fabric of the wet bulb thermometer, that is, this wet bulb should in some manner be brought into contact with the air or ventilated. One of the objects of this invention is to effect this ventilation of the bulb or bulbs of a psychrometer and to accomplish such ventilation in a self contained apparatus conveniently portable for use in various rooms or compartments.

In carrying this invention into practice in its preferred form I construct the casing 5 of suitable size and cross sectional shape having near its lower end the passages 6 and 7 and provided with the handle 8. Within this casing 5 is the partition 9 which sustains the frame 10 of any suitable electric motor, preferably of low voltage, having the fan 11 adapted to be rotated by the operation of said motor to draw air through one of said passages 6 or 7. At the upper end of the casing 5 is the closure 12 having the slotted wall 13 and constituting or carrying an electro terminal 14 which is connected by anv suitable electric conductor 15 with said electric motor of frame 10. Within the casing 5 and preferably sustained by the partition 9 is the electric battery 16 having one terminal 17 connected by the electric conductor 18 with the motor of frame 10 and its other terminal 19 furnished with the electric circuit closer 20 adapted to effect electric contact with terminal 14.

Mounted on the center portion of case 5 in positions in which their indications may be conveniently observed and compared are the thermometers 21 and 22 having the bulbs 23 and 24 of their tubes located before the passage 6 or in position to be ventilated by air passing through said passage. Casing 5

has also the clips or holding members 25 and 26 for the water column 27 which has the curved lower end or bowl 28 having an opening to receive the wick 29 which latter is arranged on the bulb 23 of thermometer 21 in the usual manner to supply moisture around said bulb 23.

In order to provide for the operation of the electric motor of this device from a source of electric energy other than the battery shown while still permitting the apparatus to be moved about I may supply said motor 11 with electric conductors in the cable 30 having the plug or connector device 31.

When it is understood that in some instances observations as to humidity of the atmosphere are required, by law, to be taken several times per day in all rooms and compartments of certain factories the importance of having a self contained conveniently portable device of this nature will be evident and also, of great importance is the fact that when the fan 11 is operated currents of air are drawn over the bulbs 23 and 24 and the ventilation of the wick 29 by such currents of air may readily be standardized so that the measurement of atmospheric moisture by means of this apparatus may be quite accurate. In addition this device may be placed or held by the inspector in comparatively small compartments or chutes which supply air or effect supplies of air to more important compartments or rooms.

The operation of the device is very simple. The inspector carrying the apparatus may pass from point to point in a room or from room to room and at each point at which he wishes to observe the humidity of the air he may come to a stop, operate the circuit closer 20 to complete the electric circuit between the terminals 19 and 14 to supply current to the fan motor. Thereupon fan 11 is rotated to draw air into circulation with the wick or fabric 29 and also of course into contact with the bulbs 23, 24. This circulation of the air need be for a very short time, usually less than thirty seconds and a single operation of the device with an observation and comparison of the indications on the thermometer scales only is necessary. Nor is any particular skill required as is the case when psychrometric devices are used in which circulation of air to ventilate the wet bulb is effected through uncertain manual operations of the apparatus.

Having thus described my invention I claim as new and desire to secure by Letters Patent:

1. A portable psychrometer comprising a casing having a handle and having an opening in its wall, a motor fan located in said casing to draw air through said opening, a pair of thermometers mounted on said casing and having their bulbs positioned to receive at the same time currents of air passing through said opening, a water supply means carried by said casing and a wick for conveying water capillarily from said water supply to one of said thermometer bulbs.

2. A psychrometer of the nature described comprising a portable casing member having a transverse passage, an electric motor having a fan adjacent said passage, an electric battery contained in said casing and in electrical connection with said motor, a thermometer mounted on said casing and having a moisture receiving element located in front of said fan, and means carried by said casing to supply moisture to said element.

3. A psychrometer of the nature described comprising a portable casing having a transverse passage, a pair of thermometers mounted on the casing side by side and having their bulbs in line with said passage, a water container mounted on said casing, an element for conveying water capillarily from said container to one of said bulbs, a partition in said casing, an electric motor fan having a frame carried by said partition, an electric battery contained in said casing and a pair of electrical conductors connecting said battery with said motor, one of said conductors including a circuit closing and opening device.

FRANK B. COMINS.