

E. W. COMFORT.
HYGROMETRIC INDICATOR.
APPLICATION FILED JAN. 4, 1911.

1,003,341.

Patented Sept. 12, 1911.

Fig. 1.

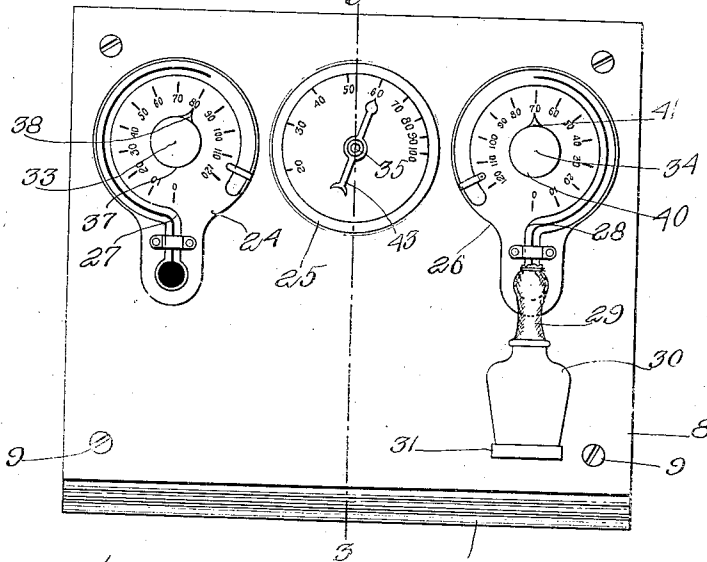


Fig. 2.

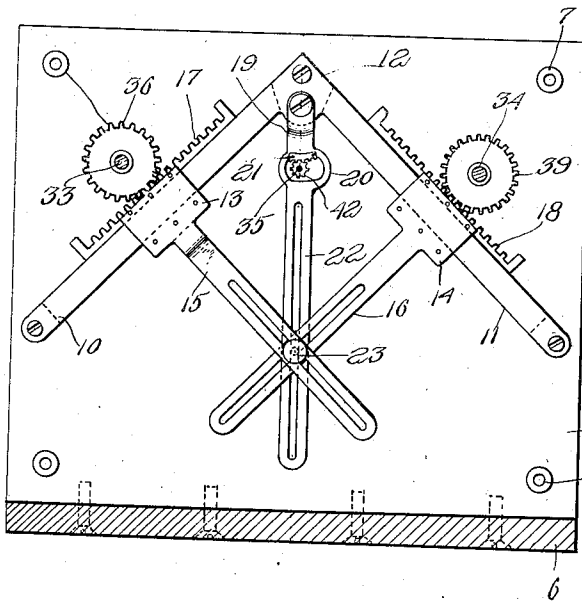
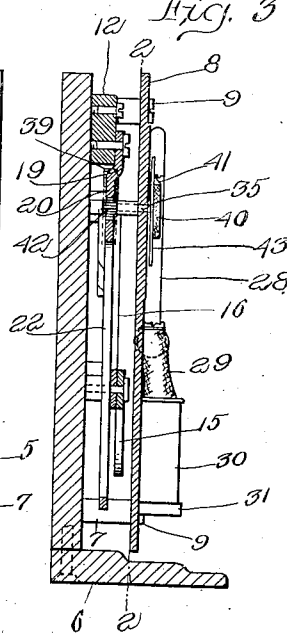


Fig. 3.



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UNITED STATES PATENT OFFICE.

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HYGROMETRIC INDICATOR.

1,003,341.

Specification of Letters Patent. Patented Sept. 12, 1911.

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To all whom it may concern.

Be it known that I, EDWARD W. COMFORT, of Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Hygrometric Indicators, of which the following is a specification, reference being had to the accompanying drawings, forming part thereof.

This invention has reference to improvements in devices for indicating the humidity of the atmosphere ascertained by or through the wet and dry bulb elements of a hygrometer.

One object of the invention is to so construct an indicator that independent mechanical elements, actuated relatively to the dry and wet bulb temperatures of the air, may jointly affect the operation of the indicating device to indicate, on a scale or chart, the relative humidity of the atmosphere.

The object of the invention is also to construct an indicator having a pair of manually operable members adapted to be moved respectively with reference to the dry and wet bulb temperatures of the atmosphere, as indicated by hygrometric measurement, that the result of the conjoint movement of said members may be indicated on a suitable scale or chart.

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

The invention consists in a pair of members movably mounted and means for moving the same independently, an indicator and an indicator operating means actuated relatively by each of said members whereby the conjoint action of said members effects the movement of the indicator to the point of constant ratio between the wet bulb temperature and the dry bulb temperature.

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 elevation of the new hygrometric indicator. Fig. 2, represents a sectional view of the same taken on line 2 Fig. 3. Fig. 3, represents a sectional view taken on line 3—3 Fig. 1.

Similar numerals of reference designate corresponding parts throughout.

As shown in the drawings, in its preferred form, 5 indicates a back member preferably furnished with the base 6 and having the posts 7, 7 to which the front 8 is secured by

the screws 9, 9. Mounted on said back member 5 are the guide bars 10 and 11 which are suitably spaced from said back member and, preferably, are integral with the juncture plate 12 from which said bars extend approximately at right angles. On said guide bars 10 and 11 are respectively mounted the slides 13 and 14 having respectively the slotted arms 15 and 16 and the racks 17 and 18. Pivottally mounted on the plate 12 is the lever 19 having the open frame 20, provided with the segmental rack 21, and the slotted arm 22, furnished with the pivot 23, slidably engaged with the slot of said arm 22 and with the slots of the arms 15 and 16 which overlap or cross the arm 22.

The front or face plate 8 is provided with the dials 24, 25 and 26 preferably furnished with graduated thermometric scales of which the scales of dials 24 and 26 are preferably numbered to read in opposite directions. Dial 24 is preferably provided with the dry bulb thermometer 27 and dial 26 with the wet bulb thermometer 28 to the bulb of which moisture is supplied by the hygrometric wick 29 extending into the water container 30 mounted on the extension 31 carried by said plate 8.

Journalled in bearings of the back member 5 and the front plate 8 are the shafts 33, 34 and 35 which are axially disposed respectively in the dials 24, 25 and 26. Shaft 33 has the gear 36 meshing with rack 17 and, at its outer end, has the thumb knob 37 from which extends the pointer 38. Shaft 34 has the gear 39 meshing with the rack 18 and, at its outer end, the thumb knob 40 with its pointer 41. Shaft 35 has the pinion 42 which is engaged by the segmental rack 21 of lever 19 and is furnished, at its outer end, with the hand or needle 43 which may move as an indicator over the face of dial 25 and with relation to the scale on said dial. The diameters of the gears 36 and 39 are preferably the same while the diameter of the pinion 42 is relative to the diameter of said gears 36 and 39 and to the length of arm 22 from the pivot of its lever 39 to its point of intersection with the arms 15 and 16.

The method of ascertaining the humidity of the atmosphere with this machine is based primarily on the constant ratio which exists between the wet bulb temperature and the dry bulb temperature of the atmosphere

whereby the ascertaining of said temperatures independently and demonstrating said readings mechanically effects a conjoint action on an indicator whereby the ratio of said readings is indicated. Taking, for instance, the readings of the dials 24 and 26, shown herein, it will be seen that the dry bulb temperature, read on the scale of the thermometer 27, is 80 degrees, while the wet bulb temperature indicated by the thermometer 28 is 70 degrees. The knob 37 has been rotated to bring its pointer to the 80 degree scale mark and the slide 13 has been moved proportionately by such rotation of shaft 33 and the action of gear 36 on rack 17, to correspondingly swing arm 22 through its connection with arm 15. Knob 40 has been rotated to bring its pointer to the 70 degree scale mark and in so doing has caused the rotation of gear 39 and the movement of rack 18 with the slide 14 and arm 16 and the pivot 23 has thus been moved along the slot of arm 15 and has effected additional movement of the arm 22, either in the same direction in which it was first moved through the movement of arm 15, or in the opposite direction, depending upon the positions of the pointers 38 and 41 previous to their operation. The conjoint action of the arms 15 and 16, transmitted to the arm 22 through the pivot 23 and by the rack 21 to the pinion 42 of shaft 35, will thus effect the rotation of said shaft, in ratio with such conjoint action, to swing the needle 43 over the dial 25 a relative degree and thus indicate, by the position of said needle, the humidity of the atmosphere.

While I have herein shown the preferred construction by which my invention is carried into practice it is not thereby my intention to limit myself to the construction shown or to any other specific construction.

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

1. A hygrometric indicator comprising a pair of movable members, means for moving

said members independently to positions indicative respectively of the dry bulb temperature and the wet bulb temperature of the atmosphere, an indicator movably mounted, and indicator moving mechanism operatively connecting said members and said indicator, whereby through the independent movement of said members the conjoint action thereof is registered by said indicator, substantially as described.

2. The combination with a pair of angularly disposed guides, a lever pivoted at the juncture of said guides and having a segmental rack and an indicator shaft rotatably mounted and having a pinion in engagement with said rack, of a pair of arms slidable on said guides and connected with said lever.

3. The combination with a pair of angularly disposed guides, a pivoted lever having a rack, and an indicator shaft rotatably mounted and having a pinion in engagement with said rack, of a pair of arms slidable mounted on said guides and overlapping said lever, and slidable means connecting said lever and both of said arms substantially as described.

4. The combination with a frame, dials carried by said frame and having graduated scales, shafts journaled at the axes of two of said dials and having gears, and an indicator shaft journaled at the axis of the third dial and having a pinion, of a pair of angularly disposed guides mounted in said frame, a pair of slotted arms slidable on said guides and having a rack in mesh with the gears of the first mentioned shafts, a lever pivotally mounted in said frame and having a rack, in engagement with the pinion of the indicator shaft, and a slotted arm, overlapping said slidable arms, and a pivot extending through the slots of all of said arms, substantially as described.

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