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R. B. SOMERS

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HYGROMETER

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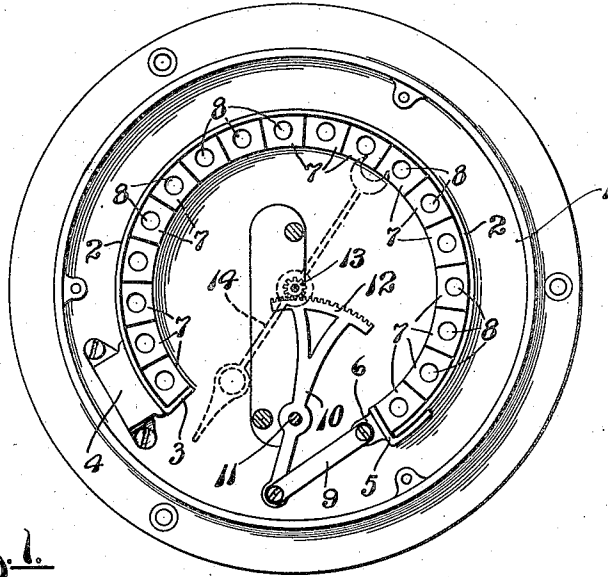


Fig. 1.

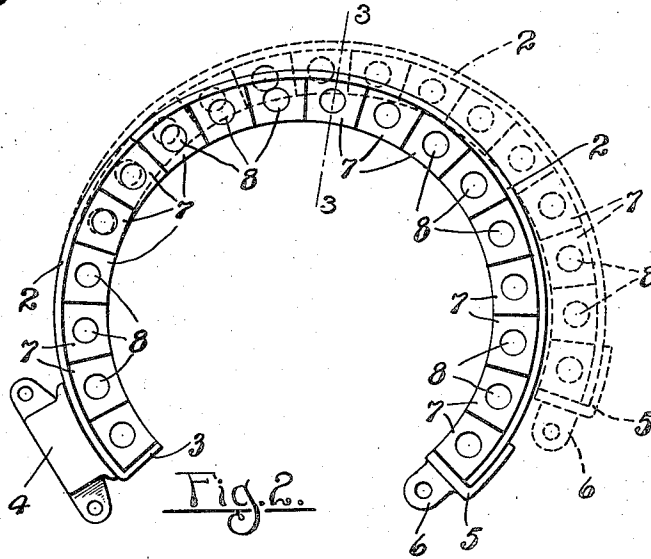


Fig. 2.

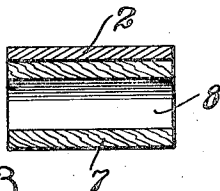


Fig. 3.

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HYGROMETER

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This invention relates to hygrometers. It is an object and purpose of the present invention to provide a device of this kind to indicate the relative humidity of the atmosphere and to construct the same in a simple and economical manner, making use of the well-known physical fact that bodies which absorb moisture expand and contract when the moisture is removed, while materials which are incapable of absorbing moisture are not effected by the presence of moisture in the vicinity thereof.

An understanding of the invention and the physical embodiment thereof which has proved simple, practical and economical to make may be had by reference to the following description taken in connection with the accompanying drawings, in which

Fig. 1 is an elevation showing the operative mechanism of the hygrometer, it being understood that the same is normally housed from view.

Fig. 2 is an elevation of the expanding and contracting element of the hygrometer, the same being shown in contracted position in full lines and in an expanded position in dotted lines, and

Fig. 3 is a fragmentary enlarged transverse section substantially on the line of 3—3 of Fig. 2.

Like reference characters refer to like parts in the different figures of the drawings.

In the construction of a hygrometer a housing member 1 of usual form is provided within which the expanding and contracting element which operates the indicating hand of the hygrometer is located. This element comprises a band 2 of metal of curved form which at one end is provided with an intumed flange 3. This end of the band 2 is permanently secured to an anchor 4 which in turn is permanently attached to the housing member 1 securely anchoring it in place. At the opposite end of the band a member 5 is permanently secured by welding, soldering or otherwise and has a flange turned inwardly similar to the flange 3. From said flange of the member 5 an ear 6 projects, the purpose of which will hereinafter appear.

At the inner concave side of the metal

band 2 a consecutive series of blocks 7 of wood or equivalent material are located and secured in any suitable manner. The end blocks of the series bear against the intumed flange 3 and the intumed flange of the member 5. The intermediate blocks 7 have close abutting contact with each other at their sides. Holes 8 are made through the blocks for the purpose of greatly enlarging their exposed surface area and decreasing the thickness of the block between all exposed surfaces. This feature is of considerable importance as it greatly adds to the sensitivity and efficiency of the apparatus. With the greater exposed surface the blocks will much more quickly absorb moisture from the atmosphere and the absorption of the block will be much more complete resulting in a quicker and more sensitive actuation and in a greater degree of expansion.

A link 9 is pivotally connected at one end to the ear 6 and at the opposite end to a lever 10 which is pivotally mounted on the housing member 1 at 11 at a point between its ends. The free end of the lever 10 is formed with a gear segment 12 meshing with a small pinion 13 fixed on a shaft on which an indicating hand 14 is also secured.

The blocks 7 of wood or other material, capable of absorbing moisture or vapor from the air, expand at their exposed sides on absorbing such moisture. But by reason of the fact that the outer sides of said blocks are in direct and immediate contact with the metal band 2 moisture is not absorbed by such outer sides and the blocks do not expand next to the band, but expand at their inner exposed sides only. The openings 8 permit a more rapid absorption of the moisture. The expansion of the blocks 7 at their inner exposed sides causes the same to elongate at such sides, whereupon the metal band 2 is distorted and the free end portion of the expanding element moves outwardly with a consequent movement of the link 9, whereupon the lever 10 is operated and the pointer 14 turned in proportion to the extent of the change in form or expansion of the expanding and controlling element of the device. When the moisture con-

tent of the atmosphere reduces the blocks 7 give up their moisture proportionately and contract at their inner exposed sides; and the device returns to or toward its original position, the band 2 being of an elastic nature the tendency of which is to return to normal position. It is, of course, understood that the band 2 could be of soft and pliable metal and a spring used to return the same to a contracted position on contraction of the blocks 7. Preferably, however, the spring action required is inherent in the metal band 2.

The construction described is very simple and economical to produce and has proved practical, efficient and accurate in service. It is economical to manufacture and is durable. The invention is defined in the appended claims and is to be considered comprehensive of all forms of structure coming within their scope.

I claim:

1. In a hygrometer, a band of flexible relatively non-expansible material, flange means at either end of the band and a plurality of blocks of absorptive expansible material laid end to end adjacent said band, the respective end blocks abutting the flange means of said band, said blocks having openings whereby their exposed surface is increased.

2. In a hygrometer having a housing, a curved metal band adapted to be anchored at one end to the hygrometer housing, a plurality of moisture absorbing blocks located at the inner concave side of the band, having exposed inner sides, tightly abutting ends and outer sides contacting against the band and means for holding the end blocks of the plurality of blocks against movement relative to the band.

3. A device of the class described comprising, a supporting member, a curved band of metal fastened at one end to the said supporting member, flanges extending inwardly from the ends of said band and a plurality of tapered blocks capable of absorbing moisture from the air placed against the inner side of the band with their tapered sides in tight abutting relationship, said blocks extending continuously from one flange to the other.

In testimony whereof I affix my signature.
ROY B. SOMERS.