

1,293,527.

E. J. OVINGTON.
VAPOR COUPLE.
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Patented Feb. 4, 1919.

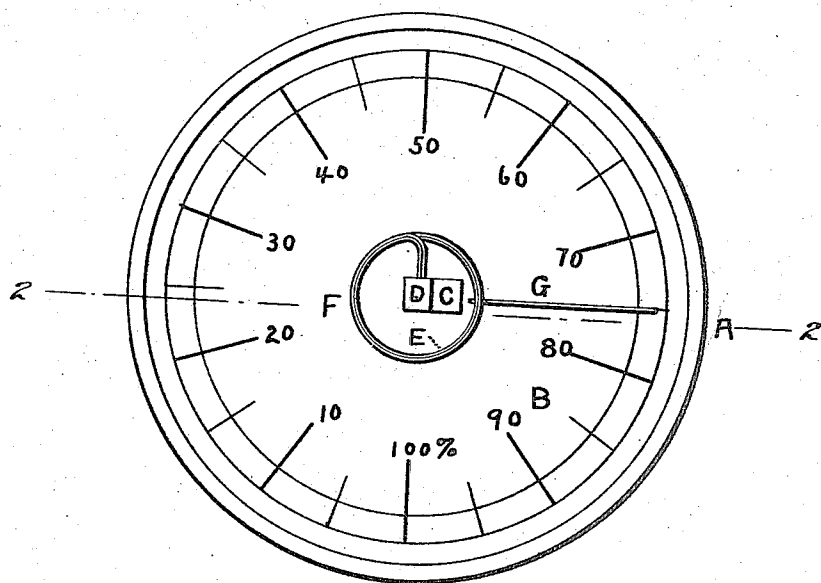
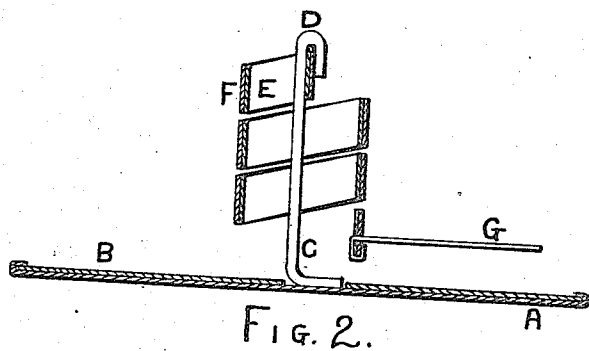


FIG 1.

WITNESSES.

Edward L. Ovington

Mrs. C. B. Garey

INVENTOR.

Edward J. Ovington

UNITED STATES PATENT OFFICE.

EDWARD J. OVINGTON, OF NEWTON CENTER, MASSACHUSETTS.

VAPOR COUPLE.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, EDWARD J. OVINGTON, a citizen of the United States, residing at Newton Center, in the county of Middlesex, State of Massachusetts, have invented new and useful Improvements in Vapor Couples, of which the following is a specification.

My invention relates to improvements in vapor couples for use more particularly as meters of water vapor, but which may be employed for other vapors or to act as vaporstats or hygrostats or for other uses for which their particular construction is utilizable.

A particular object of my invention is to provide a construction which will be rugged, easily and cheaply made, and assembled, reasonably accurate and extremely sensitive to slight changes in vapor tension.

A further object is to provide a vapor couple which will have only a slight error due to heat expansion and contraction.

Another object is to provide moisture absorbing units of a definite and easily regulated porosity and thickness which will make for uniformity of action.

Further objects, features and advantages will more clearly appear from the accompanying drawings in which Figure 1 is a plan view and Fig. 2 is a vertical cross section on the line 2-2 of Fig. 1 illustrating the invention in one of its preferred forms.

The preferred construction is as follows:

The moisture absorbing unit consists of a sheet of gelatin, albumin or the like. This is attached to the whole of one side of the moisture nonabsorbing unit which is a sheet of celluloid, the whole making a "film" similar to that used in photography. Heretofore metals have been used as moisture nonabsorbing units but they are apt to corrode under the influence of the moisture present and, when given a permanent set in the form required, are not so uniform as to their dimensions, as a celluloid unit set by heat.

A slight variation in the dimensions of the couple will cause a relatively great variation in its reading due to the multiplying leverage of the pointer reading on the dial. A moisture nonabsorbing unit of metal is otherwise objectionable. I find a nonmetallic unit far superior and I prefer to use celluloid as it is easily formed and shows only a slight error due to heat expansion and con-

traction. The couple is made preferably in the following manner: Photographic film, with a gelatin coating on only one side is treated in a "fixing" bath of hyposulfite and water to remove the chemicals from its coating. It is then thoroughly washed in fresh water to remove all chemicals and the surplus water is drained off. The film may then be given a bath in alcohol which removes the water, facilitates drying and helps to keep the coating porous. This porous condition tends to increase the sensitiveness of the coating to rapid changes in vapor tension. Referring to the photographic film, I prefer to use the coating which has contained the silver salts in preference to the nonsensitized backing placed on the film to make it noncurling as the former is more sensitive to moisture, but a plain gelatin, albumin or similar coating firmly attached for the whole of its working length to a strip of moisture nonabsorbing material such as celluloid can be used without departing from the spirit and scope of my invention. The film, after being treated as above, is cut into strips of the required length and the celluloid is given a permanent set in the form of a cylindrical spiral by winding it on an arbor and heating both to a temperature of about 180° F. I prefer a cylindrical spiral over a flat spiral as moisture will act more evenly on the former which conduces to a more nearly accurate indication of the meter of which the unit is a part.

In the drawing, "A" is the supporting base on which is a dial "B". Fastened to the base is a support "C" which consists of a metallic wire flattened and bent back on itself at its end "D" to hold one end of the spiral vapor couple which consists of the moisture absorbing unit "E" and the moisture nonabsorbing unit "F". To the other end of the spiral couple is fastened a pointer "G". When the couple is in the presence of moisture its coil is expanded, but as the moisture dries from the unit "E" this unit contracts thereby warping the coil and tightening the spirals, and as one end is held by wire "C" at "D", the other end, holding the pointer "G", is swept around the dial thereby indicating the loss of moisture. If the meter does not read correctly it can be set by twisting the flat wire support "C". The meter can be mounted in any suitable case.

It will thus be seen that my invention provides a moisture indicating meter composed of two substances united throughout their length and breadth and preferably set in a permanent spiral conformation, one of said substances being non-absorbent, while the other is moisture-absorbent, and the spiral is contracted or opened through the absorbing or drying action of the absorbent member, said moisture absorbent member being of a nature to expand in the presence of moisture and when drying out to produce a greater curling of the non-absorbent member and thus produce a contraction of the couple. The drying out of the absorbing member may also tend to further curve or curl or untwist the latter in addition to the curling of the non-absorbent substance. In either event the result is the same and the moisture indicating action of the couple is found to be very accurate in actual practice. I believe it to be a distinct novelty in this particular art to provide a couple of the kind described depending on the moisture-absorbing substance to contract or tighten the spiral in the absence of moisture, and when in the presence of moisture to untwist or expand the spiral, and I wish to claim the same broadly.

I do not desire to be understood as limiting myself to the particular provision, construction, formation and relative arrange-

ment and combination of parts, members and features shown and described; but reserve the right to vary the same, in adapting the invention and improvements to varying conditions of use, without departing from the spirit of the invention and the terms of the following claim.

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

A device of the kind described, comprising two nonmetallic strips, both of said strips being substantially of equal length and breadth and inherently adhesive to each other, said strips being formed as a unitary cylindrical spiral, the outer substance being of celluloid and the inner being vapor absorbent and sufficient in extent and power relatively with the celluloid to control the contraction and expansion of said spiral, a fixed support on a dial for one end of said spiral, and an indicator carried by the free end of the spiral, whereby the said spiral will contract in the absence of moisture, and will expand in the presence of moisture, thereby producing a movement of the indicator at the free end of the spiral around said dial.

EDWARD J. OVINGTON.

Witnesses:

J. M. WOOLWAY,
L. B. WOOD.