W. J. HARTUNG.

BAROMETER.

APPLICATION FILED AUG. 10, 1915.

1,191,508. Patented July 18, 1916.

Fig. 1

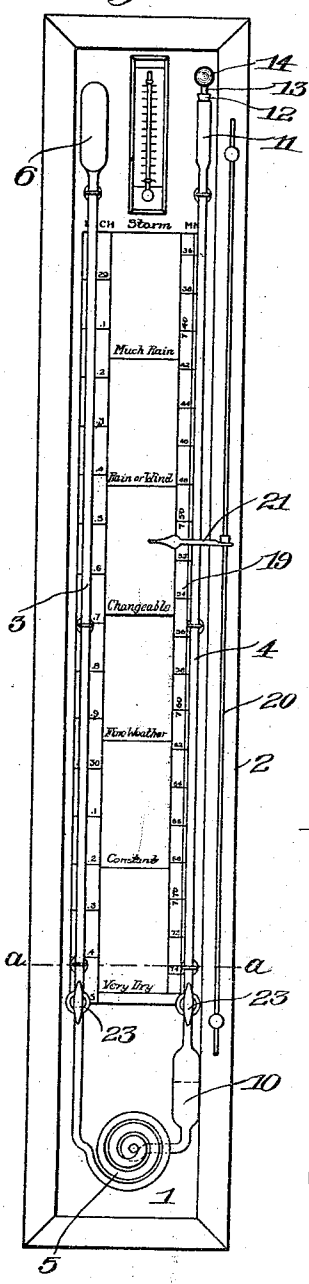


Fig. 2

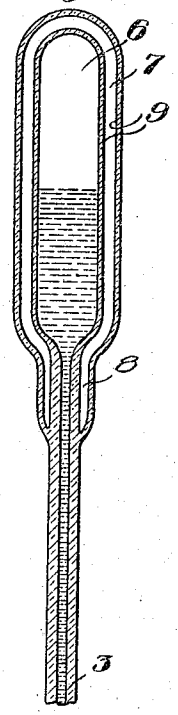


Fig. 3

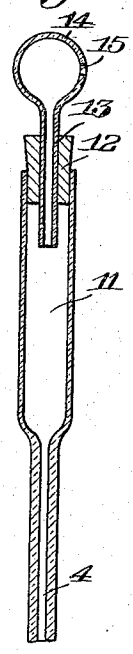


Fig. 4

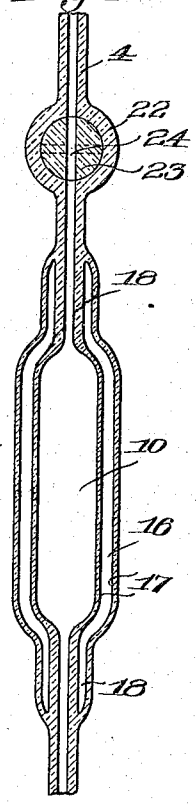


Fig. 5

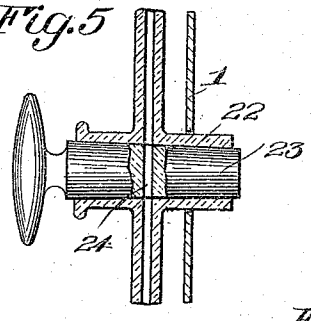
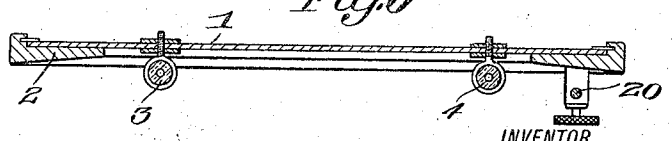


Fig. 6



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BAROMETER.

1,191,508. Specification of Letters Patent. Patented July 18, 1916.

Application filed August 10, 1915. Serial No. 44,824.

To all whom it may concern:

Be it known that I, WILLIAM J. HARTUNG, of Rochester, in the county of Monroe, State of New York, have invented a new and useful Barometer, which improvement is fully set forth in the following specification and shown in the accompanying drawings.

The present invention relates to barometers and an object thereof is to construct what is termed as an indirect reading barometer in such a manner that the two liquid ingredients usually employed as the expansion medium in such barometers may be held separated within the tube during shipment of the barometer.

Another object of the invention is to provide a barometer in which the expansive medium within the bulb or bulbs may be maintained unaffected by the conditions of the temperature, provision also being made for excluding light rays from the bulb in order to further increase the accuracy of the instrument.

To these and other ends the invention consists in certain parts and combinations of parts all of which will be hereinafter described, the novel features being pointed out in the appended claims.

In the drawings: Figure 1 is a face view of a barometer constructed in accordance with the present invention; Fig. 2 is an enlarged vertical section through the upper end of one of the legs of the barometer tube; Fig. 3 is an enlarged vertical section through the upper end of the other leg of the barometer tube; Fig. 4 is an enlarged vertical section through the balancing chamber; Fig. 5 is a detail sectional view through one of the valves; and Fig. 6 is a horizontal section on the line *a*—*a*, Fig. 1.

Referring more particularly to the drawings, 1 indicates a supporting plate surrounded by a frame 2 and supporting a barometer tube which, in this instance, has two legs 3 and 4 connected at their lower ends by a coil 5. The leg 3 has an air tight bulb 6 at its upper end surrounded by a vacuum chamber 7 which extends beyond the bulb at 8 to surround that portion of the leg 3 which connects with the bulb 6. The inner faces of the walls which form the vacuum chamber are coated with a silver plating or other light excluding substance at 9.

The leg 4 has a balancing chamber 10 near its lower end while at its upper end, an expansion chamber 11 is provided normally closed by a plug 12 through which extends the stem 13 of a bulb 14, the latter having an opening 15 in its side wall to permit the pressure of the atmosphere to be communicated to the interior of the chamber 11. The balancing bulb 10 is surrounded by a vacuum chamber 16, the walls of which are coated at 17 with a silver plating or other light excluding substance, and this chamber is extended at 18 on each side of the bulb to surround those portions of the tube connecting directly with the bulb so that the temperature of the tube will not be communicated to the bulb.

Within the tube, the expansion medium is arranged, this medium being composed in this instance, of two ingredients as mercury and colored alcohol, the mercury extending throughout the vertical leg 3, coil 5 and into the chamber 10, while the alcohol extends from the chamber 10 into the leg 4. The readings are taken from the usual matter or scale 19 arranged on plate 1 to one side of the leg 4. In order to determine in which direction the barometer is moving, a rod 20 is arranged parallel with the leg 4 and has a pointer or index 21 frictionally engaging therewith to extend over the leg 4 so as to be horizontally alined with the level of the alcohol.

The tube is provided with two valves preferably one in each leg, said valves in this instance, being formed by tubular casings 22 integral with the tube and turning plugs 23 rotatably mounted in the casings, and having transverse passages 24 for connecting the tube on opposite sides of the casings 22. These valves are provided for holding the mercury separate from the alcohol during shipment. At such a time, the mercury is caused to fill the bulb 6 and the tube above the valve in the leg 3 while the alcohol is caused to fill those portions of the tube between the valves.

A barometer constructed in accordance with this invention is capable of being shipped without mixing the two ingredients forming the expansion medium. The large bodies of the expansion medium in the bulbs 7 and 10 are protected against changes in temperature and the bulbs are connected to

the other portions of the tubes so that the walls of the bulbs are not heated by conduction.

What I claim as my invention and desire to secure by Letters Patent is:

1. A barometer comprising a tube having two connected legs one of which has an enlarged air tight chamber at its upper end and the other of which is formed with an enlarged chamber near its lower end and is open at its upper end to the atmosphere, an expansion medium within said tube composed of two separated ingredients, one operating in the first named leg and the enlarged chamber of the second named leg and the other operating in the second named leg, and valves arranged in said tube to confine the ingredients within the tube in separated conditions during shipment of the instrument.

2. A barometer comprising a tube having a bulb portion integral therewith, a wall surrounding said bulb portion to provide a vacuum chamber about the bulb portion, said wall extending beyond the bulb portion and connecting with the tube portion to provide an extension of the vacuum chamber about the tube portion in order that the tube portion will not conduct heat to the bulb portion.

WILLIAM J. HARTUNG.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."