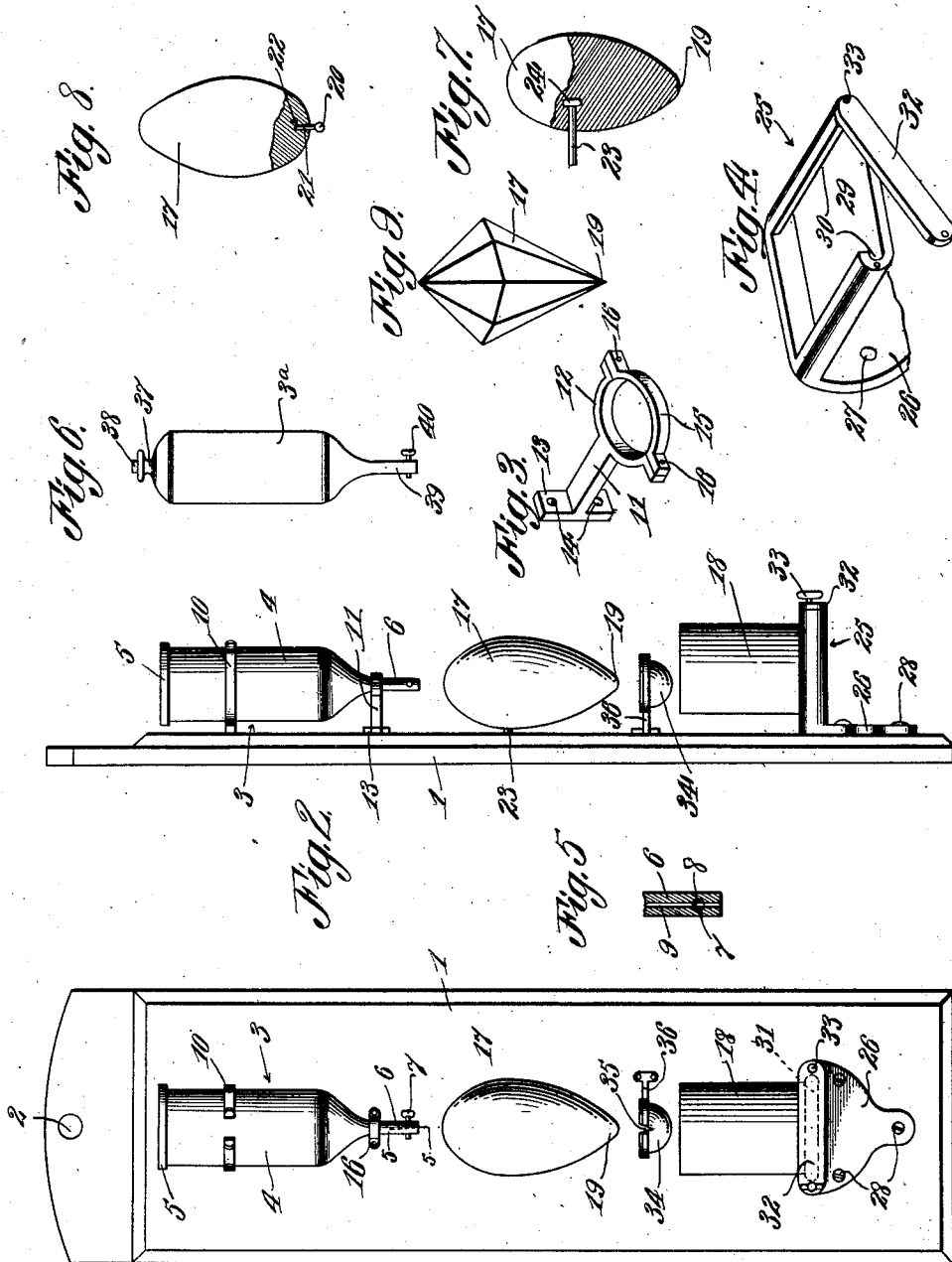


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 APPARATUS FOR TESTING AIR.
 APPLICATION FILED FEB. 4, 1910.

1,022,955.

Patented Apr. 9, 1912.



Witnesses
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Fig. 1.

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Specification of Letters Patent.

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Application filed February 4, 1910. Serial No. 542,120.

To all whom it may concern:

Be it known that I, WALTER STUART LEECH, a citizen of the United States, residing at Brooten, in the county of Stearns and State of Minnesota, have invented new and useful Improvements in Apparatus for Testing Air, of which the following is a specification.

My invention relates to improvements in air testing apparatus, and its primary object is the provision of a simple, durable and efficient device of this character by which the quantity of carbonic acid gas in the atmosphere may be determined.

A further object of the invention is the provision of an air tester of the above stated character which may be manufactured and sold at a comparatively low cost, and which shall be especially adapted for domestic use.

With the above and other objects in view, my invention consists in the construction, combination and arrangement of parts hereinafter fully described and claimed, and illustrated in the accompanying drawing, wherein:—

Figure 1 is a view in front elevation of an air tester constructed in accordance with my invention. Fig. 2 is a view in side elevation thereof. Fig. 3 is a detail perspective view of the bracket arm supporting the lower end of the reservoir. Fig. 4 is a detail perspective view of the bracket shelf supporting the receptacle. Fig. 5 is a sectional view taken on the plane indicated by the line 5—5 of Fig. 1. Fig. 6 is a detail view in side elevation of a modified form of reservoir. Fig. 7 is a sectional view illustrating the manner in which the liquid spreading member is secured in applied position. Fig. 8 is a similar view illustrating a modified form of liquid spreading member, and Fig. 9 is a view in side elevation illustrating a further modified form of liquid spreading member.

Referring to the drawing by reference numerals, 1 designates a bracket board which is preferably oblong in form and which is provided at its upper end with an

opening 2, the opening permitting the air tester to be secured to a wall or other support through the medium of a nail. A reservoir 3 which is secured to the front side of the bracket board 1 adjacent the upper end thereof, is designed to contain a quantity of colored liquid which loses its color when subjected to the action of carbonic acid gas. The reservoir is preferably colored to prevent the light from affecting the colored liquid therein. The body 4 of the reservoir 3 is preferably cylindrical and has its upper end fully open. A cap 5 is removably applied to the upper end of the body 4. The lower end of the body 4 is contracted and formed to provide a depending discharge nozzle 6. The flow of liquid from the reservoir 3 is under the control of a turning plug 7 mounted in the discharge nozzle 6 and provided with a way 8 adapted to be brought into and moved out of registration with the passage 9 of the discharge nozzle 6. The reservoir 3 is secured to the bracket board 1 by a pair of spring clamping arms 10 which are secured to the bracket board 1 and which embrace the body 4 of the reservoir, and by a bracket arm 11 provided at its outer end with a fork 12 adapted to receive the nozzle 6 of the reservoir. The inner end of the bracket arm 11 is provided with a base 13 perforated as at 14 to permit of the bracket arm's attachment to the bracket board 1. The nozzle 6 of the reservoir 3 is secured in the fork 12 by a plate 15 which is removably secured to the outer ends of the fork by bolts 16. The construction of the means securing the reservoir 3 to the bracket board 1 is such as to permit the reservoir 3 to be readily and quickly removed and replaced.

Situated at a point below the discharge end of the nozzle 6, to spread the liquid escaping from the reservoir 3 into a thin film, is a member 17 which may be of that form disclosed in Figs. 1 and 2, or of that form disclosed in Fig. 9. In view of the fact that it is spread out into a thin film by the member 17, the liquid in its passage from

the reservoir 3 to a receptacle 18 is thoroughly acted upon by the atmosphere. If the atmosphere contains any carbonic acid gas the color of the liquid will be changed, and the rapidity with which the liquid loses its color determines the quantity of carbonic acid gas in the atmosphere. The member 17 may have a curved outer surface as shown in Figs. 1 and 2 or an angular outer surface as shown in Fig. 9, the only requisite being that it should terminate in a pointed lower end 19 and that the outer surface or surfaces thereof should converge to said point. The liquid drops from the point 19 of the member 17 into the receptacle 18, and to retard the passage of the liquid from the member 17 to the receptacle 18 an element 20 of wire or any other material is secured to the lower end of the member. The element 20 is carried by a stem 21 secured in a socket 22 formed in the lower end of the member 17. The member 17 is constructed of malleable material and it is secured to the front side of the bracket board 1 by a bolt 23 which has a head 24 embedded in the member. The receptacle 18 is mounted upon a bracket shelf 25 secured to the front side of the bracket board 1. The bracket shelf comprises a vertical base plate 26 provided with openings 27 for the passage of fastening screws 28 and a horizontal supporting shelf 29. The shelf 29 is provided with grooves 30 adapted to receive a flange 31 formed upon the lower end of the receptacle 18, said flange being shown in dotted lines in Fig. 1 of the drawing. The grooves 30 open out through the front edge of the shelf 29, and the receptacle 18 is secured upon the shelf 29 through the medium of a plate 32 which is removably secured in applied position by bolts 33. Located below the member 17 and above the receptacle 18 is a retarding element in the form of a cup 34 which receives the liquid dropping from the member 17. The cup 34 is provided in its side with an overflow opening 35 through which the overflow of liquid in the cup 34 passes into the receptacle 18. The cup 34 is supported in applied position by a bracket 36.

In practice the receptacle 3 is supplied with a quantity of colored fluid which will lose its color on being subjected to the action of atmosphere containing carbonic acid gas. The plug 7 is then turned to register its way 8 with the passage 9 of the discharge nozzle 6 permitting the liquid to drop from the reservoir 3 on to the upper end of the member 17. The liquid flows down the member 17 in a thin film into the cup 34. During its passage down the member 17 the liquid is thoroughly acted upon by the at-

mosphere, and if the atmosphere contains carbonic acid gas the color of the liquid will disappear and the rapidity with which the liquid loses its color determines the quantity of carbonic acid gas in the atmosphere. The liquid passes from the member 17 to the cup 34 and from the cup 34 to the receptacle 18. If the member 17 is provided with the element 20 the cup 34 is dispensed with. If the liquid during its passage down the member 17 loses its color, the atmosphere contains a dangerous amount of carbonic acid gas, or carbon monoxid gas, or sulfureted hydrogen gas. If the liquid does not lose its color before it reaches the cup 34 or the element 20, the atmosphere contains a little but not a dangerous amount of carbonic acid gas, or carbon monoxid gas, or sulfureted hydrogen gas.

The reservoir 3^a disclosed in Fig. 6 of the drawing differs but little from the reservoir disclosed in Figs. 1 and 2 of the drawing, the difference consisting merely in the provision of the reservoir at its upper end with a neck 37 and closing the upper end of the reservoir by a stopper 38. As in the preferred embodiment of the reservoir, the modified form is provided with a discharge nozzle 39 and a turning plug 40.

The fluid may consist of the following elements and prepared in the following manner. Four parts sulfuric acid, five parts phthalic anhydrid, and ten parts carbolic acid are mixed and kept at a temperature of 248° F. for a period of eight or ten hours. The resulting product is exhausted with boiling water, and the residue is dissolved in dilute sodium hydroxid solution and precipitated with pure acetic acid. The product is then purified by boiling its alcoholic solution with animal charcoal and by precipitating the filtrate with water. The amorphous (phenolphthalein) powder which results is dissolved one part in fifteen hundred parts of ethel alcohol at a temperature of 70° and approximately 1/800 of a grain of potassium hydrate in an aqueous solution is added, producing a liquid possessing a pink color which disappears when subjected to the action of carbonic-acid gas.

From the foregoing description, taken in connection with the accompanying drawing, it should be apparent that I provide a device which is admirably adapted for the purpose for which it is intended, that the device is simple, durable and efficient of construction, and that the device may be manufactured and sold at a comparatively low cost.

Changes in the form, proportions and minor details of construction may be made

within the scope of the claim without departing from the spirit or sacrificing any of the advantages of the invention.

5 I claim is:—

10 An air testing apparatus comprising a bracket board, a reservoir, spring arms secured to the bracket board and engaging the reservoir, a bracket arm secured to the bracket board and engaging the reservoir,

a liquid spreading member secured to the bracket board below the reservoir, and a receptacle secured to the bracket board below the member.

In testimony whereof I affix my signature in presence of two witnesses.

WALTER STUART LEECH.

Witnesses:

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