

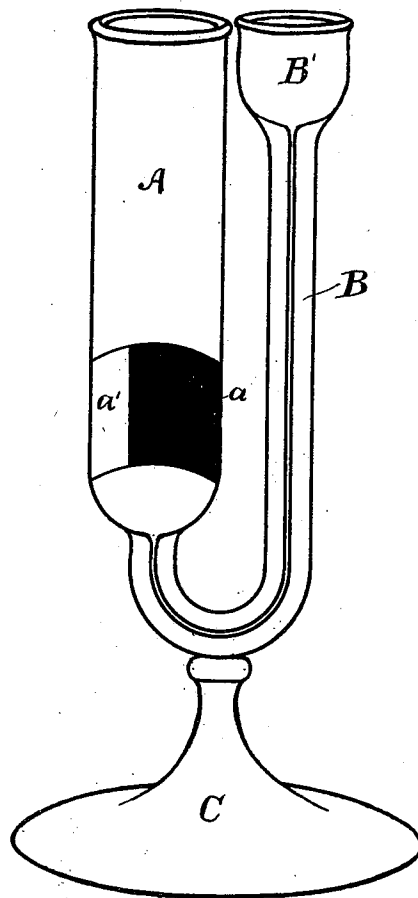
No. 665,468.

Patented Jan. 8, 1901.

R. C. ROBINSON.
CHEMICAL APPARATUS.

(Application filed May 2, 1900.)

(No Model.)



WITNESSES:

Albert E. Leach.
Hermann C. Lythgoe.

INVENTOR.

Ralph C. Robinson

UNITED STATES PATENT OFFICE.

RALPH C. ROBINSON, OF BOSTON, MASSACHUSETTS.

CHEMICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 665,468, dated January 8, 1901.

Application filed May 2, 1900. Serial No. 15,287. (No model.)

To all whom it may concern:

Be it known that I, RALPH C. ROBINSON, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain new and useful Improvements in Test-Glasses, of which the following is a specification.

My invention consists of an improved chemical test-glass especially adapted for use in cases where the presence of a substance is to be determined by a precipitate, cloudiness, or coloration at the plane of contact between two liquids of different specific gravity—as, for instance, in testing urine for albumen with nitric acid or in testing for nitrates with sulfuric acid and ferrous sulfate. In such cases as these it is customary to use an ordinary test-tube containing the liquid to be tested, the reagent being carefully poured down the side of the tube, so that the heavier liquid will sink to the bottom and form with the lighter supernatant liquid a comparatively plain line of demarcation, the presence of the substance sought for being indicated by a colored or cloudy zone at the junction of the two liquids. In such cases the delicacy of the test depends largely on the fact that the two liquids do not mix together, and great care ordinarily has to be taken to prevent this.

My object is to render such tests easy of manipulation and at the same time to increase the delicacy of the reading.

The accompanying drawing represents my improved test-glass.

A is the large tube of the test-glass, into which is poured directly the urine or other liquid to be tested.

B is a capillary side tube connected with the bottom of the part A and terminating at the top in the cup-shaped enlargement B', into which is poured the reagent.

C is the base or standard, which is preferably attached to the tube B by a stem shown.

The large tube A is provided near the bottom with the blackened surface *a* and preferably also with the whitened surface *a'*, so placed as to form a background for the colored or cloudy zone to be formed at the junction

of the two liquids by the substance to be tested for. If the substance is albumen, the distinct white zone that is produced is best seen against the black background *a*, and if the zone formed is colored, as in the case of urinary or biliary pigments, such a coloration is readily apparent against the white background *a'*.

The large tube A is filled with the urine or other substance to be tested (filtered, if turbid) and nitric acid or other reagent is poured into the enlargement B' at the top of the capillary tube B. By reason of the greater specific gravity of the acid the urine is gradually displaced through the capillary tube till the enlargement is empty. If albumen be present, a distinct white zone will be seen at the point of contact sharply defined against the dark background, the thickness and density varying with the amount of albumen.

By the peculiar construction and combination of the large tube and the capillary whereby the liquid to be tested and the reagent are introduced separately there is no tendency for the liquids, if of different specific gravity, to mix, and the line of demarcation is unusually clear.

For the best results it is preferable that the side tube B should be not merely a small tube, but, strictly speaking, a capillary to bring a comparatively slow but complete displacement of the liquid to be tested by the reagent liquid, thus forming a sharp line between them.

I am aware that forms of apparatus are in use wherein variously-constructed U-tubes are employed having one leg smaller than the other, and such I do not broadly claim.

What I claim is—

1. In a test-glass the combination of a large tube open at the top with a capillary side tube connecting therewith at or near the bottom, the capillary being provided with an enlargement at the top, arranged substantially as, and for the purposes described.

2. In a test-glass the combination of the large open tube, A, the connecting capillary side tube B provided with the enlargement

B' and the standard C, substantially as described.

5 3. In a test-glass the combination of the large tube A provided with the shaded or colored surface *a*, and the connecting capillary side tube B, provided with the enlargement B', substantially as described.

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

RALPH C. ROBINSON.

Witnesses:

ALBERT E. LEACH,
HERMANN C. LYTHGOE.