

No. 706,784.

Patented Aug. 12, 1902.

R. C. ROBINSON.  
CHEMICAL APPARATUS.

(Application filed Dec. 6, 1901.)

(No Model.)

Fig. 1.

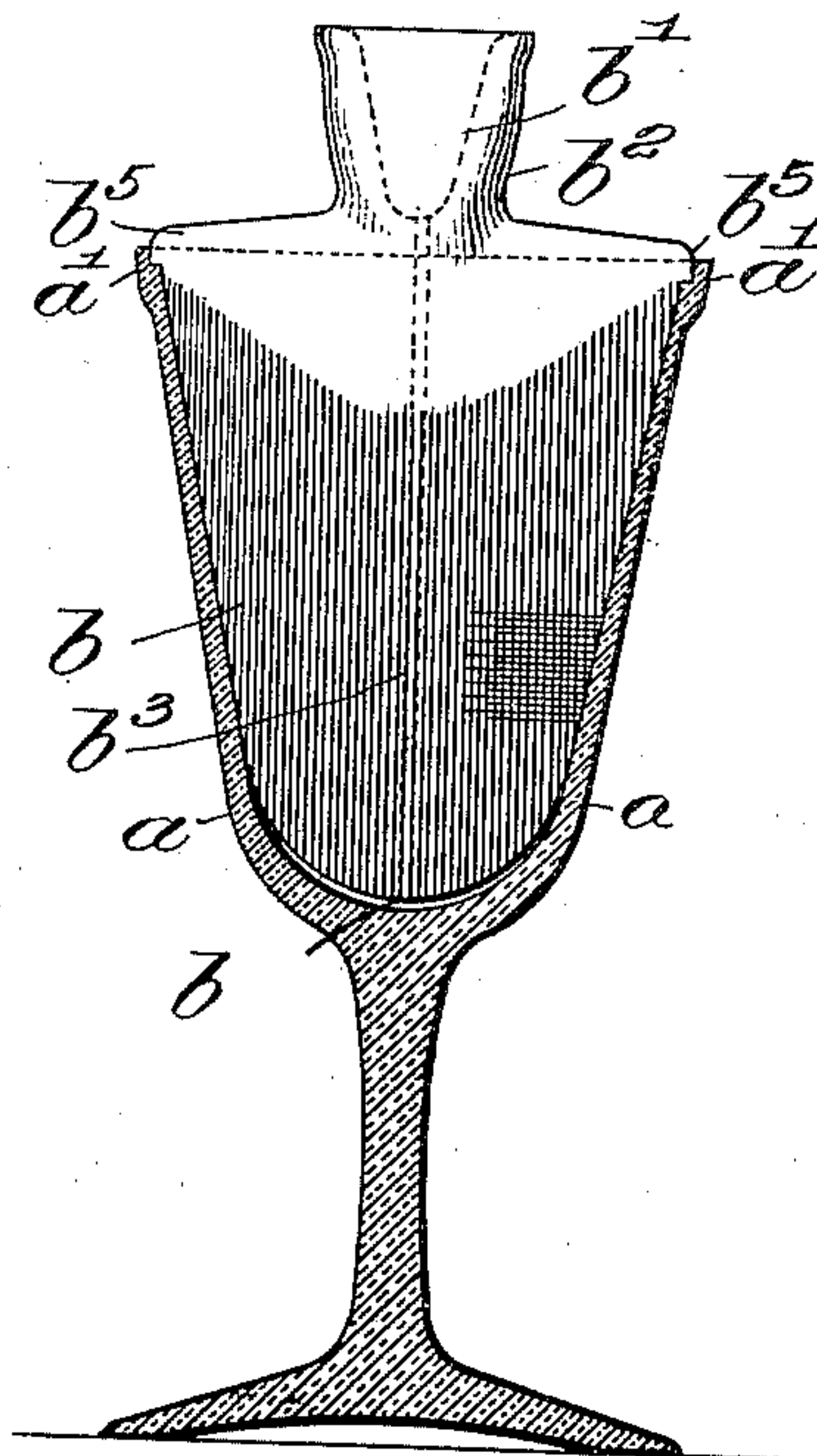


Fig. 2.

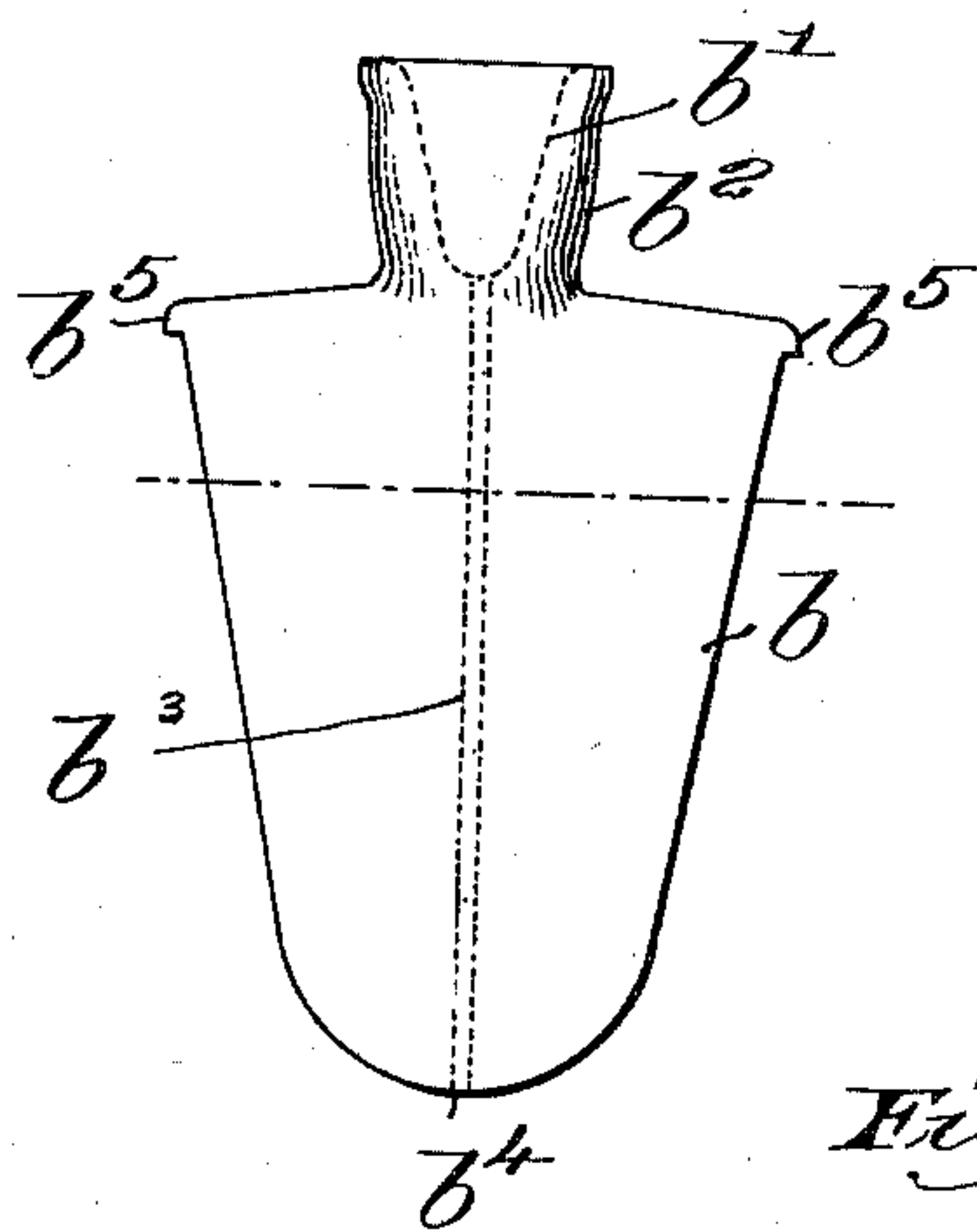


Fig. 3.

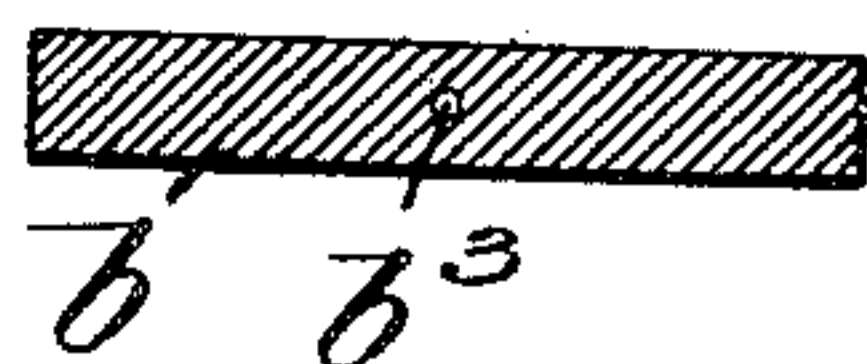
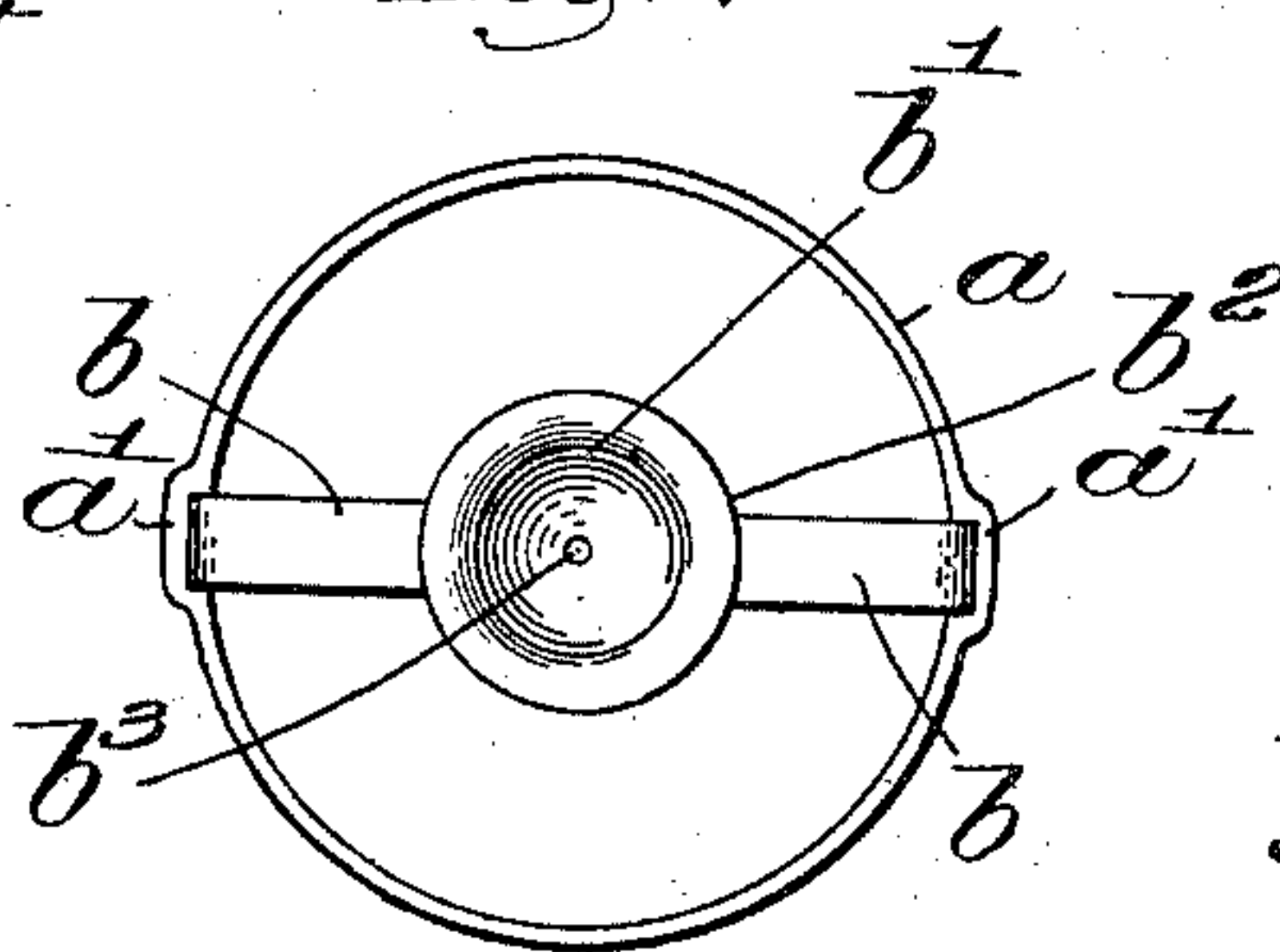


Fig. 4.



Witnesses:  
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# UNITED STATES PATENT OFFICE.

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## CHEMICAL APPARATUS.

SPECIFICATION forming part of Letters Patent No. 706,784, dated August 12, 1902.

Application filed December 6, 1901. Serial No. 84,886. (No model.)

*To all whom it may concern:*

Be it known that I, RALPH C. ROBINSON, a citizen of the United States, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Chemical Apparatus, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention in chemical apparatus relates more especially to apparatus for testing fluid wherein the presence of the substance to be detected is determined by a precipitate, cloudiness or difference in color at the plane of contact between liquid substances differing in specific gravity—as, for instance, in testing urine for albumen by the use of acids and in chemical experiments.

Figure 1 shows a liquid-holder in section, with an acid-supplying blade therein in side elevation. Fig. 2 shows the blade detached. Fig. 3 shows the blade in cross-section on the line  $x$ , Fig. 2; and Fig. 4 is a top or plan view of the vessel and the blade.

The fluid-holding vessel  $a$  is shown shaped as a wineglass provided at its top at diametrically opposite points with recesses or pockets  $a'$ . The acid-supplying blade  $b$  is shown as provided at its upper end with an inlet  $b'$ , preferably enlarged at its mouth and formed in a neck  $b^2$  at the upper end of the blade. The blade has a passage  $b^3$ , that communicates with an outlet  $b^4$ , shown as made at or near the lower end of the blade. The blade is shown as provided with lugs  $b^5$ , that enter the recesses or pockets  $a'$ , thereby not only sustaining the blade upright in the vessel, but also restraining any turning of the blade in the vessel.

For the best results the blade, composed, preferably, of vitreous material, will have one of its faces made darker than the opposite face—as, for instance, the face shown in Fig. 1 may be substantially black, while the opposite face, Fig. 2, may be substantially white. Preferably the edge of the blade will conform in shape substantially with the inner walls of the vessel  $a$ , to thereby prevent, or substantially so, the showing of light between the edge of the blade and the side of the vessel, as thereby the observations may be made

more accurately and refraction of light need not be taken into account.

The vessel being suitably filled with urine or other substance, the blade will be placed therein and the acid or other reagent will be poured into the inlet and traversing the passage  $b^3$  will emerge at the outlet  $b^4$ , shown as substantially near the bottom of the liquid in the vessel, and as the specific gravity of the acid or reagent is greater than the fluid being tested the urine or other fluid will be displaced and if albumen be present it will be indicated by a distinct substantially white zone at the plane of contact of the layers of differing specific gravity and said zone, due to the action of the acid or reagent on the fluid being tested, or any difference in color will be distinctly defined on one or the other face of the blade. The blade may be provided with suitable graduations to define substantially the proportional quantities of the different substances found in the liquid being tested.

A blade such as shown has great strength as compared with a test-tube made of glass, which heretofore has been used for this purpose.

My improved blade is really hard to break and will outlast scores of tubes each handled with average care.

I prefer to provide the blade with a lug or equivalent device to sustain the blade in a vessel, and preferably this vessel will be constructed to prevent axial or other movement of the blade in the vessel when observing the fluid; but it will be understood that my invention would not be departed from if the lugs were omitted and the blade was used in an ordinary wineglass or other usual vessel to contain the liquid.

Heretofore the background through which the fluid has been observed has been circular; but I have ascertained by experiment that the observation may be made more accurately by making the background substantially flat, and consequently I have made the face of the blade as a plane surface, so that to be located in the vessel the face will occupy a position substantially parallel with the diameter of the vessel.

While for the best results I prefer to shape the blade as shown, yet the shape may differ



from that shown and yet embody my invention in some of its forms and present an improved device for testing purposes.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A testing-blade having a substantially plane face, and a passage-way extending longitudinally of the blade substantially from its upper to its lower end.

2. A testing-blade having a neck at its upper end provided with an inlet, an outlet near the lower end of the blade, a passage-way extending longitudinally of the blade and connecting the inlet and outlet, and means for supporting the blade upon the edges of the vessel in which the blade is used.

3. A testing-blade having an inlet and an outlet, the body of the blade showing a dark color at one of its faces.

4. A testing-blade having an inlet and an outlet, and provided with scale-marks.

5. A testing-blade having a substantially plane face, means for supporting the blade upon the edges of the vessel in which it is used, said blade being provided with scale-marks.

6. A vessel having supporting notches or pockets, combined with a testing-blade having lugs to engage said notches or pockets and support the blade and prevent rotation or movement thereof within said vessel.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RALPH C. ROBINSON.

Witnesses:

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