A CONSTANT LEVEL APPARATUS.

By F. C. Robinson.

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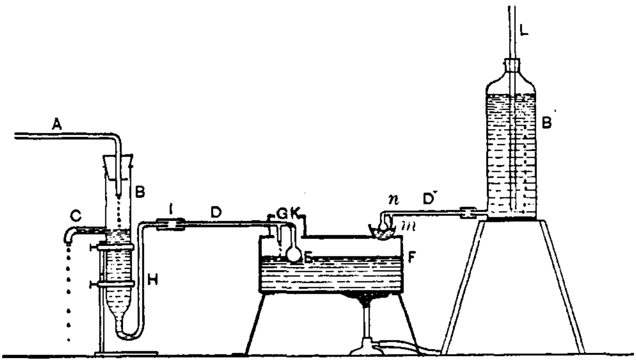
THE following apparatus, which I have used for some time, may interest other chemists; hence the following sketch and description:



B is a glass tube about 2.5 cm. diameter into which is passed the small tube A through a cork. A side tube C extends out about ten cm. and is of much larger bore than A. Upon the lower end of B is sealed a small glass tube H which is bent up until opposite C, and then turned at right angles. Connected with H by a rubber tube is a tube D of equal bore and about twenty-five cm. long. Upon the other end of D is a bulb E, five cm. in diameter, turned down at right angles as shown in the cut. At the point G is a short tube and just beyond it at K, the tube D is closed up by melting it together. F is a water-bath through one of the openings of which E passes and floats upon the water. As the water rises in the bath, E, of course, floats higher, and raises the tube D. The rubber connector holds D upright and allows it to move. If B is clamped so that C and D are upon a level and the tap opened so that water flows into B through A, it will run out of both C and D, but of course D will soon float up so high that no water will run through it, and all will discharge at C. Now heat the bath and as soon as evaporation has lowered D, sufficiently more water will run into the bath to take the place of that evaporated. A small stream of water flows constantly out at C and into the sink, but it need be very small indeed.

If the bulb E enters the bath through a place needed for evaporations, a small copper cylinder slightly larger than the opening and having a narrow strip cut out of it for D to move up and down in, may be placed over it as in the cut. Of course, the float may be placed in a side tube soldered to the bath with water-connection to it. If one cannot make it of glass it could easily be constructed of metal by any tinman.

I find also that the same idea works admirably for constant feeding of a small platinum dish in evaporating large quantities of water or other liquids for analysis of residues. In such cases the tube D′ is directly connected with a bottle holding several liters of water *in the manner illustrated in the cut at the right.* As D′ falls through evaporation of the water in *m*, air enters through L and water drops out at *n* till D′ rises so that *n* is higher than the bottom of L when it stops, and thus the level in *m* is constant. In this case the tube D′ is very small so that the bulb can be very small and still hold it up. In the one I use, the bulb is only 1.5 cm. in diameter and the tube *n* so close to it that it can be used in a crucible. It is very easy to clean the float from the slight residue clinging to it at the end.

I use the same apparatus for washing precipitates with a large amount of water, placing the bulb in the funnel on the surface of the wash-water.

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A SCALE OF HARDNESS FOR GLASS.[1]

BY W. NIEHLS.

THE term "hardness" as applied to glass, refers to its degree of fusibility in the flame of the blast-lamp. Thus a glass which softens readily in the flame is called a "soft" glass, while one which softens with difficulty is called a "hard" glass. Between the extremes of a very soft and a very hard glass there

[1] Read before the Cincinnati Section, April 16, 1894.