[CONTRIBUTION FROM THE CHEMICAL LABORATORY OF THE NORTH CAROLINA DEPARTMENT OF AGRICULTURE.]

NEW APPARATUS.

By CHARLES B. WILLIAMS.

Received November 30, 1901.

A DEVICE FOR MARKING VOLUMETRIC FLASKS.[1]

IT has been the custom in this laboratory for a number of years to graduate or calibrate all volumetric flasks before using, as experience has taught us that the different manufacturers have neither a uniform system nor a constant temperature of graduation. We use as a liter the volume occupied by a cubic decimeter (kilogram) of water at 4° C. *in vacuo*, and graduate all flasks to contain the indicated amounts at 22° C., as this is the mean annual temperature of our laboratory during working hours.

The calibrating apparatus used is that devised by Morse and Blalock.[2] The marker which we have used with such satisfaction for the past year consists primarily (Fig. 1) of a solid iron base H supporting a standard N of wrought iron. The collars A and S are fitted to spindle with splines. The set-screws a and c afford means of clamping the movable carriage S' and arm AB in various positions in a vertical plane; thus flasks any length up to 50 cm. can be marked. The marking-point F is made of steel and fitted into arm F', which has a collar G, loose on shouldered collar M, and can be easily adjusted to any position.

C is made of rubber or cork which can be replaced by removing the thumb nut e. The carriage M'' which supports flasks is made of wood and is screwed to a washer on the spindle of the hand-wheel S''. This carriage is constructed to accommodate any sized flask from 50 to 1000 cc. capacity.

The apparatus can be screwed to any secure foundation, as a table or window sill.

In marking, the arm AB is elevated to allow the flask to sit upright in the movable carriage M'', then the arm is lowered until C fits tightly in the neck of the flask when the arm is made fast by the set-screw a. By means of the hand-wheel S'', the flask carriage and stopper can be revolved horizontally. The arm F' may be adjusted so that the marker F will just be at the same height

[1] Read before the North Carolina Section of the American Chemical Society, on November 9, 1900.

[2] *Am. Chem. J.*, **16**, 479-488.

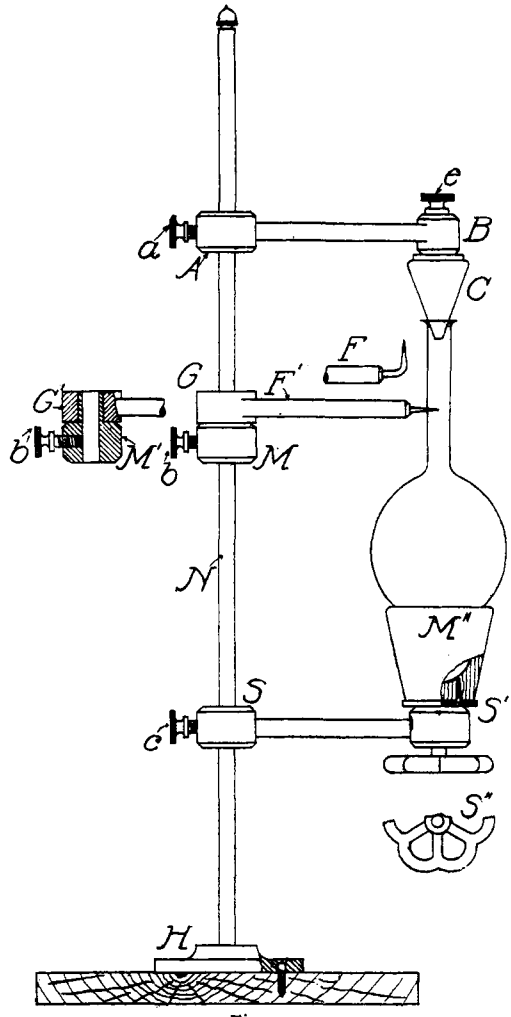

Fig. 1.

as the bottom of the meniscus of the measured liquid in the flask, when the arm F' can be pressed laterally with the hand and force the marker F into the beeswax, which has been melted and spread in a thin coating with a camel's hair brush over the neck of the flask where the marking is to take place. Then without relieving the pressure on the marker, the hand-wheel is revolved, which makes a mark around the neck of the flask through the beeswax

at the bottom of the meniscus. This mark is etched into the glass by means of hydrofluoric acid applied with a camel's hair brush and allowed to remain ten or fifteen minutes. With this device and procedure one is enabled to mark flasks very rapidly with but little practice.

A MODIFIED BULB TUBE FOR NITROGEN APPARATUS.[1]

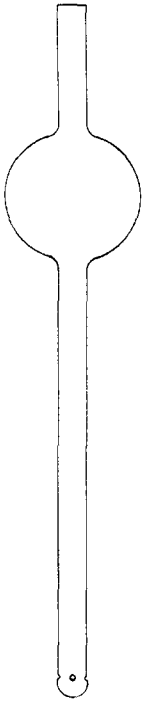

Fig. 2.

This bulb (Fig. 2) is of glass and consists of an upper stem 5 cm. long, a lower one 18 cm. long, and a bulb 5 by 5 cm. The bore of the stem is 7 mm. and thickness of walls about 1 mm. The free end of the lower stem is closed to a 2 mm. hole. Above this hole 6 or 7 mm., are arranged circularly around the tube four holes (diameter 2 mm.) equidistant apart. It is the experience in this laboratory that in using the plain open-end bulb tube with materials rich in nitrogen, such as sodium nitrate, cotton-seed meal, blood, etc., there is often loss of ammonia by non-absorption by the standard acid, as, at the beginning of the boiling, ammonia is copiously evolved and forced into the acid through one large orifice, hence coming in contact with only a small volume of the acid solution.

With this tube the ammonia is forced into the acid through five openings in as many different directions, thereby giving ample provision for complete absorption. It has now been in constant use for over fourteen months with perfect satisfaction, even in high-grade ammoniated materials. When distillation is complete, the tube is disconnected from the nitrogen apparatus and is used to stir the solution in titration.

[CONTRIBUTION FROM THE CHEMICAL LABORATORY, UNIVERSITY OF MICHIGAN.]

A ROTARY CEMENT KILN FOR USE IN THE LABORATORY.

BY E. D. CAMPBELL.

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IN the researches on the constitution of hydraulic cements which were begun in this laboratory about three years ago, the cements under examination were prepared in small crucible

[1] Read before the North Carolina Section of the American Chemical Society, on November 23, 1901.