

advantages are that large samples may be taken, comparatively few reagents are required and interfering substances are not introduced into the Marsh apparatus, so that it can be operated under standard and uniform conditions.

A MODIFIED WESTPHAL BALANCE FOR SOLIDS AND LIQUIDS.

BY F. M. WILLIAMS.

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THE advantages of the Westphal balance as a rapid and accurate means for the determination of the specific gravity of liquids are well recognized.

It occurred to the writer that this instrument might be so modified as to extend its use to the determination of the specific gravity of solids. Attempts have been made to use it with solids by means of heavy solutions, such as Thoulet's and Penfield's by diluting the liquid until the solid immersed will neither sink nor float, and then taking the gravity of the liquid in the ordinary way. But the maximum gravity obtainable by such solutions is about 4.5 and the operation is cumbersome and tedious.

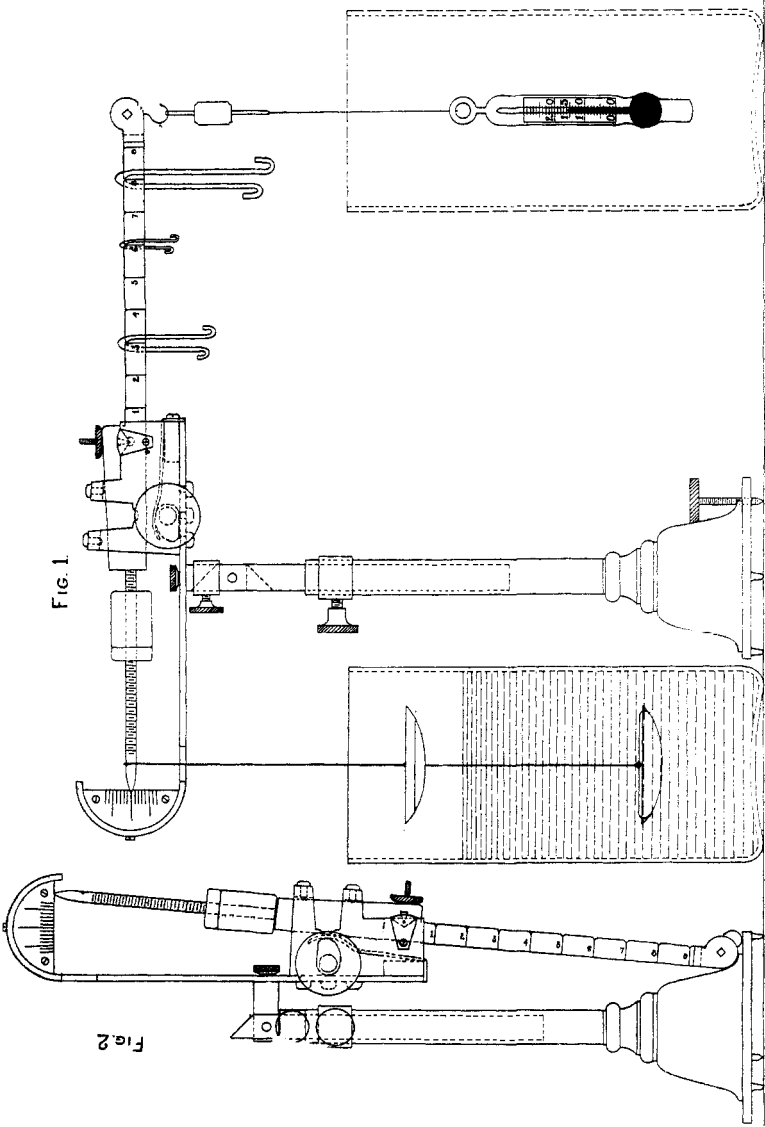
The modifications in the old form may be readily seen from the accompanying drawing. It will be noted that the pointer has been lengthened and upon this at a distance equal to the length to the other arm, a notch has been placed for the reception of a special support carrying two pans, one below the surface of the liquid, and the other above. By this means an object may be weighed in air and then in liquid by interchanging the pans, or by transferring to the lower pan.

For convenience in adjustment a two-piece counterpoising weight is made to move along the threaded portion of the pointer. By having the counterpoising weight in two pieces one part serves as a lock-nut preventing accidental changes of adjustment.

A further modification tending to prevent wear upon the knife edges is a cam device for raising the beam and locking the same securely in place.

The balance has been made much more compact and portable by inserting a hinge joint in the upright standard arm, allowing the instrument to be folded to a space $2\frac{3}{4} \times 2\frac{3}{4} \times 10$ inches.

Owing to the comparatively unsatisfactory methods for the



determination of the specific gravity of Portland cement, as for example, with the Le Chatelier apparatus, open to the objections of choking of the tube, inaccuracies of volumetric glassware, and the difficulty of maintaining a constant temperature during the operation, the modified form of the Westphal balance has commended itself most highly as an easy, rapid and accurate means for the determination of the specific gravity of cement and all other solids, whose composition is changed by immersion in water. With this instrument it is only necessary to weigh the substance in air, and then in some liquid such as kerosene, carbon tetrachloride, or carbon bisulphide, after which the specific gravity of the liquid used is determined in the ordinary way by means of the thermometer plummet.

For the specific gravity of minerals it has been found very rapid and accurate, permitting the substance to be in either the form of a fragment or powder.

It will be seen that the instrument combines in compact and portable form all the advantages of the original Westphal balance and the Jolly balance.

It may also be used as a portable analytical balance for loads up to 10 grams with a sensibility of 0.5 mg.

A PERCOLATOR FOR USE IN ASSAYING DRUGS.

BY FRANK R. ELDRED.

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THE percolator here described has been in use in this laboratory for two years, during which time it has proved to be a very useful piece of apparatus.

Moistening or macerating a drug in one vessel and then transferring to another for extraction is a tedious operation always involving danger of loss. The dry drug can be placed in this percolator and the entire operation of maceration and extraction can be conducted without transfer.

In using this percolator (Fig. 1), a plug of cotton is packed tightly below the constriction *A*, by means of a wire which may be sharpened on one end and provided with several barbs for removing the cotton. The dry drug is placed in the percolator, the solvent is then added, the stopper inserted, and the whole thoroughly shaken. During the maceration the stopper is held