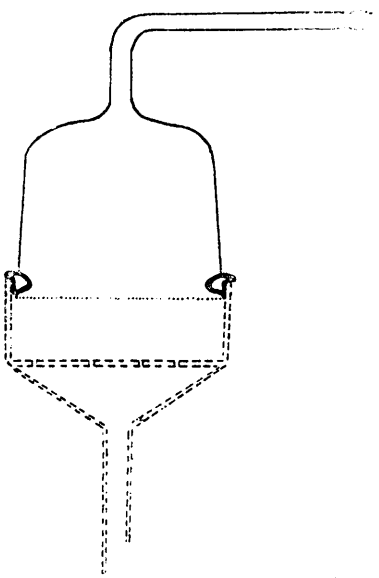
APPARATUS, ETC.

Some Forms of Glass Manometer. C. G. Jackson. (*J. Chem. Soc.*, 1911, **99**, 1066-1071.)—Three varieties of glass manometer, suitable for the measurement of pressures of vapours which attack mercury, or for measurements in which the experiment requires the manometer to be at a high temperature, are described and illustrated in the paper. The author has made use of one of these manometers in

studying the dissociation of cupric bromide, and the application of the manometer to such a purpose is explained, and the whole arrangement of apparatus is figured in the text.

G. C. J.

Addition to the Buchner Funnel. A. C. G. Egerton. (*Proc. Chem. Soc.*, 1911, **27**, 189-190.)—The apparatus consists simply of a small glass hood, which can be connected to a drying-tube. The glass hood is made of such a diameter that it fits inside a Buchner funnel, the joint being made air-tight with a rubber ring situated in a groove round the rim of the hood. It is well to employ a gentle pressure with the ring of a retort-stand to hold the hood in position, unless working with air under diminished pressure. A precipitate collected in the usual manner on the funnel can be dried by means of this simple additional apparatus in a very short time. Besides dispensing with the trouble of transferring the precipitate to a desiccator, the apparatus saves much time in the drying. The drying is most rapid when a steady, not too rapid, stream of air is drawn through the apparatus by means of the filter-pump after passing through a large drying-tower filled with calcium chloride; further, the hood, which is made of blown glass or, for very rapid drying, of metal, can be warmed with a flame. The precipitate can, if desired, be dried under diminished pressure by affixing a screw clip to the air inlet of the drying-tower. Another application of the apparatus is the drying of a precipitate in a non-reactive atmosphere; the gas can be circulated round and round, if necessary, by means of a blowing arrangement fitted to the filter-pump.

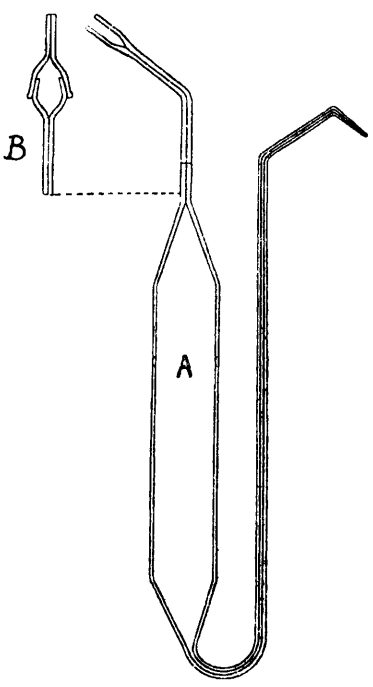


This small, inexpensive apparatus changes a Buchner funnel into an exceptionally efficient desiccator, which dries, not only precipitates collected on the funnel by the usual methods employed therewith, but also can be used conveniently for drying crucibles, etc., in a current of dry air.

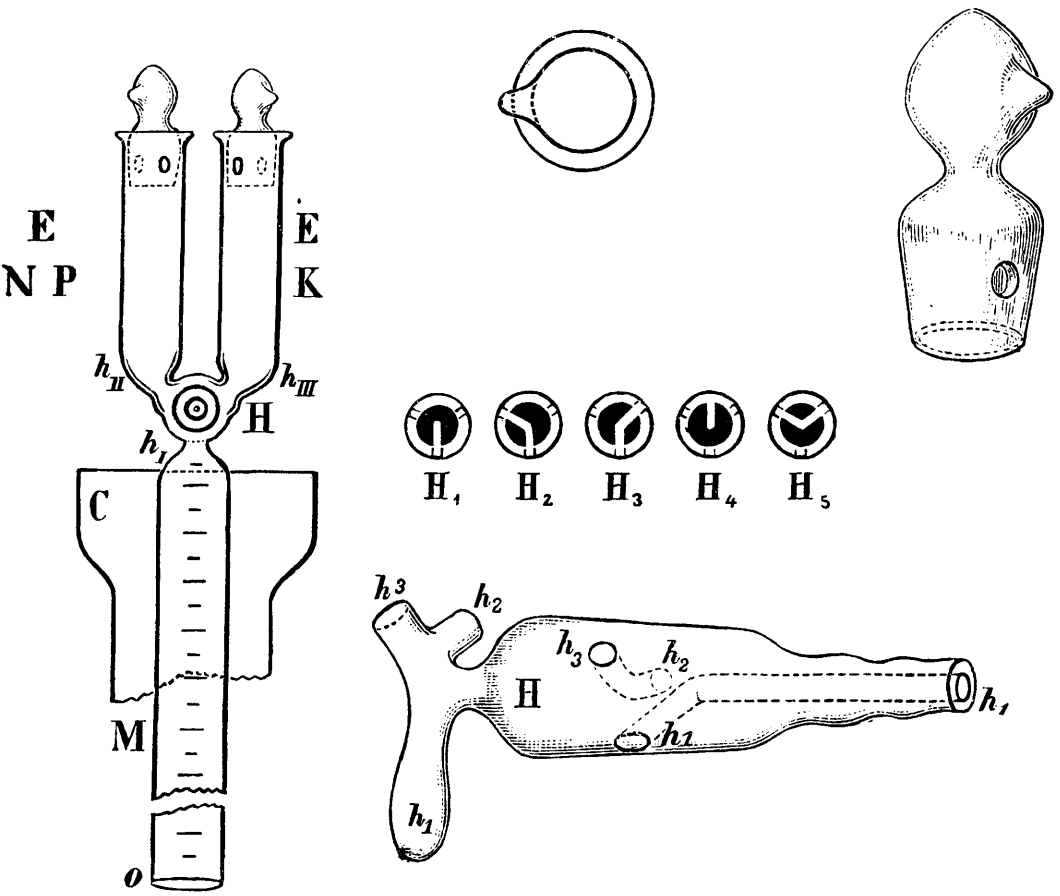
Melting-Point Determinations. G. A. Menge. (*U.S. Treasury Dept. Hygienic Lab. Bulletin*, 1911, 70, 1-101.)—A report of experiments carried out with the object of prescribing, in the ninth U.S. Pharmacopœia, the use of a simple method, so far rigidly defined, that it may be expected to yield approximately identical results in the hands of all operators. The apparatus finally recommended is a 10 by 3 cm. test-tube with walls about 1 mm. thick, and constructed of glass which will stand heating over an open flame. The test-tube is half filled with sulphuric acid, or for high temperature work, with a mixture of 70 parts by weight of sulphuric acid with 30 parts of potassium sulphate. The liquid is stirred continuously by a suitable (hand) stirrer. The substance to be examined is contained in a capillary tube not

less than 0·8 mm. nor more than 1·25 mm. in internal diameter, this tube to contain a solid column of the substance 3 mm. high. The substance is heated rapidly to within 25° C. of its melting-point, then at the rate of 3° a minute until it begins to melt, as judged by the observation that some one point in the column of sample has collapsed against the side of the capillary. The rate of heating is then reduced to 0·5° a minute. A melting *interval* is to be returned, the beginning being that temperature at which some point in the column collapses, the end the temperature when the last trace of sample becomes liquid. All results should be corrected for the emergent stem of the thermometer in accordance with a prescribed formula. It is suggested that, if possible, some department of the U.S. Government should issue official thermometers of uniform construction. In that case a table or curve should be incorporated in the Pharmacopœia, showing the corrections to be made for the emergent stem. The need for uniformity of method in the determination of melting-points is illustrated by reference not only to foreign pharmacopœias, but to recently published and widely conflicting values which have been given for substances which are readily obtainable in a state of extreme purity, as judged by the shortness of the melting interval and other criteria. G. C. J.

Determination of the Density of Liquids. H. Hartley and W. H. Barrett. (*J. Chem. Soc.*, 1911, **99**, 1072-1074.)—Two forms of pyknometer were used, each made from test-tube glass, weighing about 5 grms. and holding 20 to 25 c.c. The form B, used for determining densities at temperatures below that of the laboratory, has a bulb to allow the liquid to expand, and a cap which should be ground on outside. The diameter of the capillary is 0·3 mm. The authors make use of a counterpoise made from the same kind of glass as the pyknometer, and having nearly the same surface area. By making the external volume of the counterpoise nearly equal (within 0·5 c.c.) to the sum of the volumes of the pyknometer and of the liquid it holds when full, the calculation of a series of densities may be greatly simplified without introducing an error greater than 2 units in the sixth decimal place of the density, even if the temperature should rise 10° C. and the barometer falls 30 mm. between the weighings of the pyknometer full of water and of the liquid to be tested. By the use of this apparatus and a thermostat constant to ±0·01° C., the authors were able to determine the densities of dilute (under 2 per cent.) aqueous solutions of several salts with an error not exceeding four parts in a million. In order to obtain this degree of accuracy in the case of liquids with a larger co-efficient of expansion, more accurate temperature regulation would be required. G. C. J.



Apparatus for Flue Gas Analysis. A. Gawalowski. (*Zeitsch. anal. Chem.* 1911, **50**, 435-439.)—The apparatus consists of a 100 c.c. measuring-tube, surmounted by a three-way cock of special construction, and provided with two nitrometer cups each of which is stoppered, the hollow stoppers having each a hole which may be made to coincide with a hole in the ground seating. In the illustration one form of the three-way cock is shown on an enlarged scale; but it has been found better to



make the plug of these cocks hollow and to fuse in small tubes rather than to bore channels in a solid plug. In use, the measuring-tube, which is open at the bottom, is sunk in a cylinder C of brine, the cock being in the position H_1 in which the measuring-tube is connected to the channel h_1, which allows air to escape. The end of the plug h_1 is now connected to the flue and the measuring-tube raised. The cock is turned to the position H_2 or H_3, and the first charge of gas blown off through either of the cups by sinking the tube in the brine cylinder. The tube is refilled with gas, its volume adjusted to exactly 100 c.c., and strong potash is admitted from the cup NP. After measuring the reduction in volume due to absorption of carbon dioxide, alkaline pyrogallol is added from the same cup NP and the oxygen estimated.

Finally, an ammoniacal solution of cuprous chloride is admitted from the other cup K to absorb carbon monoxide. As made now, the open end of the measuring-tube is somewhat constricted to facilitate closing by the finger, if it be desired to shake the contents of the tube. The maker is C. Glatzl, Mährisch-Ostrau. G. C. J.

Apparatus for the Maintenance of Constant Pressures Above and Below the Atmospheric Pressure. Application to Fractional Distillation. J. Wade and R. W. Merriman. (*J. Chem. Soc.*, 1911, **99**, 984-997.)—For pressures below that of the atmosphere, air is exhausted continuously from the system by an ordinary water-pump. For pressures above that of the atmosphere, air (or other gas) is forced in continuously by an automatic compressor, actuated by falling mercury. The pressure is kept constant by a regulator consisting of an open syphon manometer, which allows air to escape from or enter the system as soon as the desired excess or diminution of pressure is exceeded.

Devices are described in connection with fractional distillation, more especially for changing the receiver without disturbing the pressure. G. C. J.