BURETTE ARRANGEMENT.

By E. M. Johnson.

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THE burette arrangement here shown has been found very satisfactory and convenient in a metallurgical laboratory where a number of standard solutions are in use every day. The glass tube *B* is connected direct to the three-way burette by a short rubber tube *A*. This connection should be made so as to bring the ends of the glass tubes very near to each other, practically doing away with any contact between the standard solution and the rubber. There is no pressure on the rubber connection, consequently no leakage, as is the case when the burettes are filled by force of gravity. The burette is held in place by an ordinary bird cage spring *C*, and can be easily detached and cleaned by disconnecting the connection *A* and unhooking the spring. It is easier to replace an empty standard solution bottle than is the case with other devices. This is done by simply disconnecting at *A* and running the glass tube *B* up high enough to put in a full bottle. The glass tube *B* should slide with ease through the rubber stopper. The surface of the glass plate next to the table may be painted white, or some suitable white material placed under it. It is very easy to keep the glass plate clean.

Denver, Colorado.
February 12, 1902.

A GENERATOR FOR HYDROGEN SULPHIDE.

By J. N. Swan.

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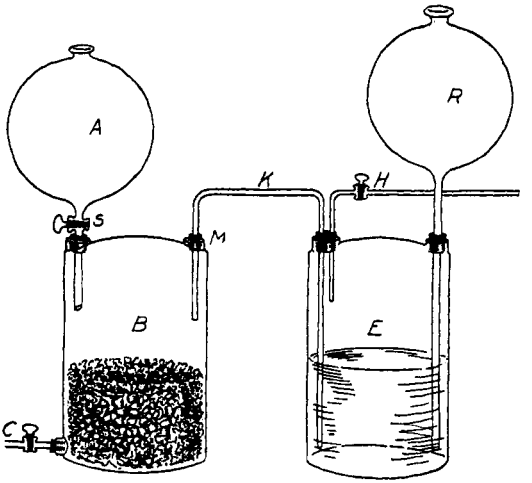
OF the making of apparatus for the generation of hydrogen sulphide there is no end. One would think that out of the more than 200 acetylene generators on the market a machine might be chosen which would at least approximate perfection as a generator for hydrogen sulphide. If one generates the gas on the large scale and uses a gasometer with pipes leading to the places where the gas is to be used there are machines which give satisfactory results. If, however, it is desired to use the gas in fairly small quantities as, *e. g.*, with an ordinary class in qualitative analysis, there is still something to be desired in the way of a machine that will give satisfactory results in every particular.

The machine herewith illustrated has been used for such work

in this laboratary with better results than had been obtained before, using a number of different forms of generators. The generator was made by assembling ordinary laboratory apparatus.

Referring to the figure, a two-necked Woulfe flask, *B*, contains the iron sulphide. Into one neck is fitted a separatory funnel, *A*, with a stop-cock, *S*. This funnel contains the dilute acid. *E* is a second two-necked Woulfe flask. Into one of the necks of this flask a tube, *R*, is fitted so that it reaches nearly to the bottom of the flask. The upper part of this tube contains a large bulb. The inner part of a Kipp apparatus is a good tube for the purpose. A tube, *K*, connects the two flasks and terminates under the water with which *E* is partly filled. An exit tube, *H*, with a stop-cock, forms the tube which delivers the gas ready for use.

To generate the gas, the stop-cock *S* is turned and a small quantity of the dilute acid is allowed to trickle down upon the sulphide in the Woulfe flask. As the gas is generated it passes through *K* into the flask *E*, in which passage it is washed by



bubbling up through the water in *E*. At the same time the pressure of the gas collecting in *E* will force the water up into *R*. By turning the stop-cock *H*, a supply of gas is received under the pressure of the head of water in *R*. If an excess of acid is permitted to flow out of the separatory funnel the gas generated by it will be stored in *E* ready for the next time it is to be used.

The spent acid can be removed at *C* at any time, and the flask

B thoroughly washed out by disconnecting at *M*, and allowing a stream of water to flow through the flask. This can be done without disturbing the acid in *A*. When fresh water is put into *E*, sufficient gas to saturate the water should be passed into it slowly if the machine is to stand for any length of time before being used. This will prevent the water from running back into *B* on standing.

It is probable that the chief advantage in this form of machine is that there are no narrow tubes to become clogged with salts crystallizing from the spent acid. In actual practice it has been found that there is a minimum amount of gas wasted and a maximum amount of time saved in caring for the machine as compared with other machines in common use.

MONMOUTH, ILLINOIS.

THE DETERMINATION OF COPPER BY ALUMINUM FOIL.

BY GEORGE E. PERKINS.

Received February 7, 1902.

THE following method is a modification of the process by A. H. Low. The copper is brought into solution as a sulphate by treatment similar to that in Low's modified cyanide process. The solution is evaporated until all nitric acid has been driven off and dense white fumes appear. Water is added until the dilution is about 50 cc. of water to 10 cc. of sulphuric acid. Sheet aluminum of about 25 gauge thickness is cut into pieces about 40 mm. square with one corner of each piece turned up for convenience in handling. Two or three of these pieces are added to the beaker containing the solution of copper. The solution is then boiled. In about five minutes, all of the copper is precipitated upon the aluminum sheets.

Instead of redissolving the deposited copper and titrating with cyanide solution, more satisfactory results are obtained by washing the deposited copper into a tared Gooch crucible, by giving a final wash with alcohol and by burning off the alcohol and drying. Weigh the result as metallic copper.

In forming the filter, care should be taken that only sufficient asbestos fiber is used to produce a good filter. In washing with alcohol and burning, the same care is needed as in the electrolytic method that too much alcohol is not used.

PROVIDENCE, R. I.,
February 3, 1902.

[1] Read before the January meeting of the Rhode Island Section of the American Chemical Society.