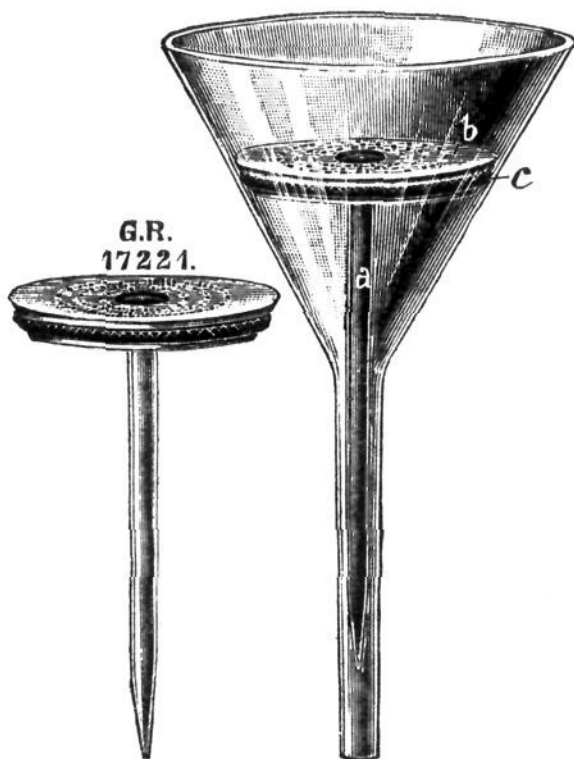


AN IMPROVED FILTER-DISK.¹

BY MAX KAEHLER.

AN obstacle to the extended use of the porcelain filter-disks, introduced by Otto N. Witt, (*Ber. d. chem. Ges.*, 1886, 918), has existed in the great difficulty of securing a uniformly tight joint between disk and funnel. On the one hand it was necessary to have funnels whose walls were not only perfectly smooth, but were inclined at an angle of exactly 60° . On the other hand any irregularity on the side of the disk seriously affected the tightness of the joint, and frequently, even when the oblique position was scarcely evident to the eye, caused the cracking of the funnel.

These difficulties have been overcome by the introduction of a



modified form shown in the accompanying sketch. The disks are made with a rather deep groove running around the side, in which is held a stout rubber ring (c), projecting a slight distance beyond the adjoining surface. The disk is further perforated in the center by a funnel shaped opening, into which is adjusted a glass rod (a) which extends down into the neck of the funnel. The rubber ring produces a perfect joint while the glass rod keeps the disk in a horizontal position. When

large disks and wide necked funnels are used a cork with channeled sides and fitting closely in the funnel's neck is slipped over the lower end of the glass rod.

¹ Read before the Cincinnati Section, December 15, 1893.

The new device assures rapidity and certainty in manipulation with complete absence of danger to the funnels employed.

These new disks are manufactured by Kaehler and Martini, of Berlin, Germany.

QUANTITATIVE WORK FOR BEGINNERS IN CHEMISTRY.¹

BY W. A. NOYES.

I N most of our chemical laboratories the work which is given to beginners is chiefly or altogether of a qualitative nature. In many schools and colleges the work begins with a study of the qualitative properties of a series of chemical elements and their compounds, chiefly of gases and metalloids. In other schools the students begin at once with the study of qualitative analysis. A large majority of our students never get beyond this first stage and it is safe to say that they acquire but a very slight knowledge of real chemical work. The work which is done in our scientific and technical laboratories and in chemical factories consists almost entirely of quantitative analyses or of the preparation of chemical substances carried out in an accurate quantitative manner. Indeed, we are accustomed to say that the science of chemistry began with the use of the balance and we all recognize the extreme importance of quantitative relations in most of our chemical work.

We must keep in view several objects in selecting the laboratory work for beginners. First they should become personally acquainted with the appearance and properties of a number of the chemical elements and their compounds. The acquisition of a large amount of knowledge of this kind is desirable but we may easily make the mistake of endeavoring to impart too much. A few topics exhaustively studied will prove of greater value than a superficial study of a great many. This is especially true of qualitative tests with solutions. A beginner can apply a great many such tests in a comparatively short time, but unless his powers of discrimination and of memory are very unusual he will retain only a confused recollection of his work. A second object is to secure a training in delicate and accurate manipulation and in the use of different forms of apparatus. A third

¹ Read before the World's Congress of Chemists, August 26, 1893.