

*A New Form of Receiver for Fractional Distillation in Vacuo.*¹—While there are several forms of receivers which give satisfaction, when small quantities of liquids are fractionated *in vacuo*, most of them are open to the serious objection that it is necessary to destroy the vacuum to change receivers or to remove all or part of the distillate; these difficulties are entirely obviated by the apparatus shown in the figure.

The receiver consists of three separatory funnels sealed together, each of the three bulbs being provided with a side stop-cock, the uppermost having an additional one, which is connected with the vacuum pump.

The condenser tube enters into the top bulb, connection being made by a ground glass joint, for which a rubber stopper may be substituted if desired.

The *modus operandi* is obvious and almost automatic; the stop-cocks *a*, *d*, *e*, and *f* are closed, *b*, *c*, and *g* opened, the last being connected with the vacuum pump; the first fraction is collected in bulb A, the stop-cock *b* closed, and the second fraction collected in bulb B; by closing stop-cock *c*, the third fraction may be collected in bulb C.

If it is desirable to separate the distillate into more than three fractions, or if the quantity of the distillate exceeds the capacity of the bulbs (which may be 1 liter each), the apparatus shows its special advantages.

Suppose the first fraction has been collected in bulb A and the second is being received in B; by opening stop-cock *d*, air is admitted into A, and the contents withdrawn through *a*; closing this and connecting *d* with a second pump, the vacuum is re-established in A. This point may be ascertained without the aid of a separate manometer by slightly opening *b* when, if the vacuum is less in A than in B, air will bubble through the liquid in the latter, while if the pressure in both bulbs is the same, or if it is less in A, the distillate will flow down to A, where it may be collected and drawn off as before, and the operation repeated *ad infinitum*.

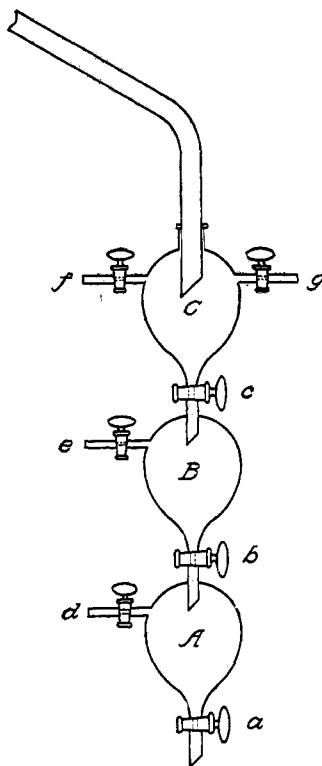
With a little experience a receiver of a total capacity of three liters may be so manipulated as to distil several liters of liquid without interruption. In actual practice 40 liters are

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regularly distilled in this way, and each fraction is made sharp and exact, as there is no disturbance of the vacuum.

With bulbs of smaller capacity, *e. g.*, 250 cc. each, it is unnecessary to employ more than one pump, since the vacuum will not appreciably diminish in the short time necessary to close *g*, disconnect the pump, attach it to *d*, and reestablish the vacuum in this bulb. A makeshift apparatus, embodying the principles of the one shown in the sketch, can be made in any well-equipped laboratory by connecting three separatory funnels by means of two-holed rubber stoppers, the other holes being occupied by bent glass tubes provided with stop-cocks or even rubber tubing and pinch-cocks.

For continued use the apparatus with the bulbs sealed together is to be recommended; the one described has been used almost daily by the writer and was made according to his designs by E. Greiner, No. 62 Centre Street, New York.



LUCIEN FOGETTI.

OBITUARY.

Hon. Nathaniel Peter Hill, of Denver, Colorado, scientific metallurgist, sometime professor of chemistry in Brown University, and later United States Senator from Colorado, was born in Montgomery, N. Y., February 18, 1832; he died in Denver, Colorado, May 22, 1900.

His father and mother were notable people in Orange County, N. Y. The father, a well-to-do and substantial farmer, had been lieutenant of cavalry in the war of 1812 and subsequently he held many offices of trust in his county where he was