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R. KÖNIG.

TITRATION APPARATUS.

APPLICATION FILED AUG. 25, 1905.

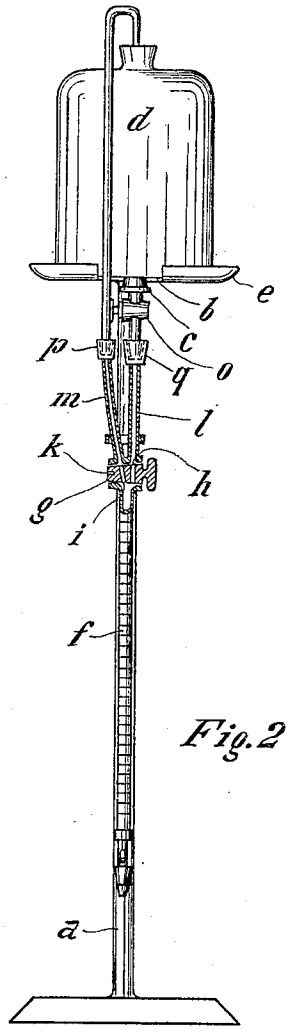


Fig. 2

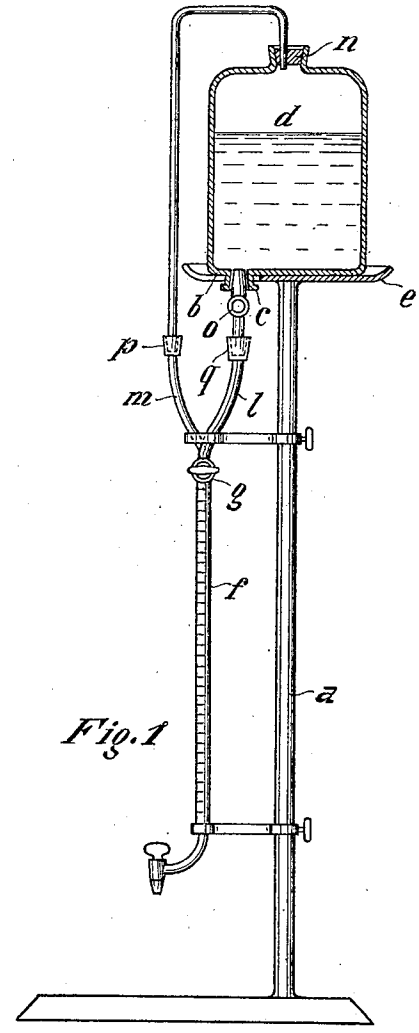


Fig. 1

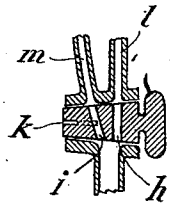


Fig. 3

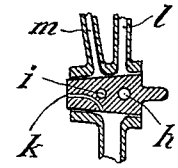


Fig. 4

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TITRATION APPARATUS.

No. 813,977. Specification of Letters Patent. Patented Feb. 27, 1906.

Application filed August 25, 1905. Serial No. 275,817.

To all whom it may concern:

Be it known that I, RUDOLF KÖNIG, engineer, a citizen of Germany, residing at Hohenzollernstrasse 8, Gelsenkirchen, Prussia, German Empire, have invented new and useful Improvements in and Relating to Titration Apparatus, of which the following is a specification.

For experimental work in volumetric analysis apparatus is frequently employed which consists of a vessel or bottle provided with an under tube, said vessel serving for the reception of the normal solution, and of a burette, the lower end of which possesses a lateral extension fitted with a cock for the supply of the solution to the burette and the upper end of which carries a two-way cock and a vessel arranged above the same for holding surplus solution. The graduation of the burette is in that case so arranged that the zero-point is situated at the upper cock. For the purpose of filling and adjusting the burette the cock of the lower extension is opened and the two-way cock is so set that the burette stands in connection with the upper vessel. By closing the lower cock and adjusting the two-way cock the adjustment of the zero-point is then effected. The manipulation of this device requires, however, very much care on account of the necessary adjustment of two cocks, as if the lower cock is not closed at the right time or if the two-way cock is set incorrectly during the filling of the burette the normal solution overflows. Moreover, the well-known device has in addition the disadvantage that the normal solution when the apparatus is not in use is in communication with the outer air and is therefore exposed to variations in its concentration. This circumstance is disadvantageous, as very humid or very dry air should as much as possible be prevented from having any influence on the titration liquid. A further disadvantage of this device is that in the case of the two-way cock being incorrectly set the titration liquid can overflow by flowing through the air-supply capillary passage. These defects are avoided in the case of the subject-matter of the present invention, the chief parts of which likewise consist of a supply vessel or bottle and a burette, on the one hand, by substituting a three-way for the two-way cock, whereby the lower cock is also dispensed with, and consequently a reduction of the manufacturing costs of the apparatus brought about, and, on the other hand, by leading the upper extension-tube of the burette into the upper part of the supply-bottle, which is closed air-tight.

In the drawings, Figure 1 represents the apparatus in part sectional side elevation; Fig. 2, the apparatus in front elevation, and Figs. 3 and 4 the cock in two different positions.

In the example of the subject-matter of the present invention illustrated in the drawings, *a* is the stand, the upper plate *e* of which for carrying the supply-bottle *d* is provided suitably with an opening *b* for the bottom tube *c* of said bottle.

f is the burette fitted in the ordinary manner with a cubic-centimeter graduation and a discharge-cock, said burette possessing a three-way cock *g* in the place of the zero-point. The said three-way cock has two passages *h* and *i*, Figs. 3 and 4, running in approximately parallel directions, as well as a third passage *k* for the admission of air during the titration. The two first-mentioned passages lead to the tubes *l* and *m*, respectively, the first of which leads to the tube *c* and serves for filling the burette, while the second tube *m* is led upward above the neck of the supply-bottle and is in connection with the air-space in the same, which space is closed air-tight by means of a rubber stopper *n* or a glass stopper, which has been ground in. The cock *o* and the ground joints *p* and *q* are intended to facilitate the refilling of the supply-bottle by rendering possible the taking down of the same from the stand *a*.

The advantages which result from utilizing the above-described apparatus, in addition to the advantageous simplification of the device caused by one of the cocks being dispensed with, are the absolute security against overflow of the titration solution and the perfect closure of the normal solution from the outer air when the device is not being used and when the burette is being refilled.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is—

1. In a titration apparatus the combination with a graduated burette of a closed supply vessel, of tubes at the top of the burette, one connecting it with the bottom of the supply vessel, and the other connecting it with the air-space of the same, and of a three-way cock at the top of the burette having pas-

sages to said connecting-tubes and having a third passage adapted to admit air into the burette substantially as described.

2. In a titration apparatus the combination with a graduated burette of a closed supply vessel, of tubes at the top of the burette, one connecting it with the bottom of the supply vessel, and the other connecting it with the air-space of the same, and of a three-way cock at the top of the burette having passages to said connecting-tubes and having a third passage adapted to admit air into the burette, of a stop-cock in the tube connecting the burette with the bottom of the supply vessel, and of ground joints in both connecting-tubes substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

RUDOLF KÖNIG.

Witnesses:
PETER LIEBER,
WILLIAM ESSENWEIN.