

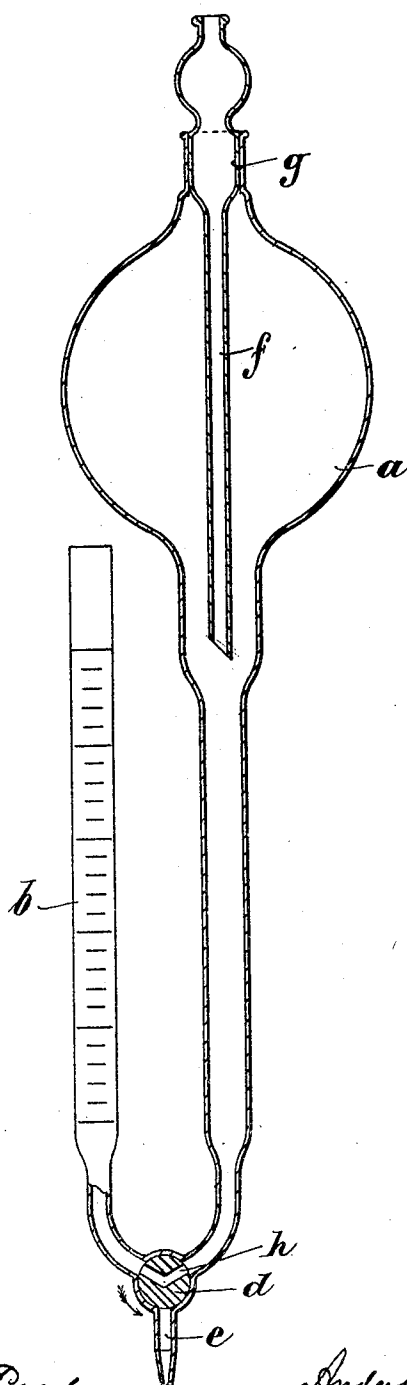
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A. M. SÖDERLUND.

BURETTE.

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Witnesses:

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BURETTE.

No. 804,894.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, ANDERS MARTIN SÖDERLUND, a subject of the King of Sweden, and a resident of Surbrunnsgatan 2, Göteborg, Sweden, have invented a new and useful Improvement in Burettes, of which the following is a specification, reference being had to the drawing accompanying and forming a part hereof.

This invention relates to apparatus to be used for volumetric analyses and known by the name of "burettes."

The chief object of the invention is to provide means by which the level of the fluid in the burette will automatically place itself at zero.

The invention consists, briefly, in providing a reservoir or fluid-holder connected by a tube with the burette and in the reservoir or fluid-holder placing an air-pipe of suitable length, open at the top to the air and at the bottom into the reservoir, the pipe having communication with the reservoir only at the bottom and the reservoir having communication with the air only through the pipe.

In the accompanying drawing I have illustrated a suitable mode of carrying out my invention. The figure shows a sectional view of a burette constructed in accordance with the present invention.

The burette consists, as usual, of a graduated measuring-tube *b*, that is here connected by a bent tube with a fluid-holder or reservoir *a*, which latter may be cut off from the former or from an outlet-pipe *e* by means of a two-way cock *d* or the like. By means of said cock *d* the burette may be put in connection with either the fluid-holder or said outlet-pipe. In the fluid-holder *a* is inserted an air-pipe *f*, preferably of glass. Said air-pipe may be provided with an enlarged part *g*, fitting air-tightly in the opening of the fluid-holder *a*, or the air-pipe *f* may, for instance, be surrounded by a plug of suitable material, such as rubber or the like, fitted air-tightly in the opening of the fluid-holder, or it may be inserted in any other suitable manner. The lower end of said air-pipe *f* is in level or approximately in level with the zero-line on the burette *b*. The pipe *f* is open at the top to the air, but has communication, either liquid or air, with the fluid-holder only at the bottom, and the fluid-holder has communication with the air only through the tube.

The working of the apparatus is as follows:

If the cock *d* is turned to the position shown in the drawing, the fluid, on account of the outer air-pressure, will flow from the fluid-holder *a* into the burette *b* until the fluid-level in the latter has reached the zero-line—i. e., has risen into level with the lower mouth of the air-pipe *f*—a state of equilibrium being then created and created when the fluid-level in the measuring-tube reaches the zero-line. In the same degree as the fluid flows out from the fluid-holder *a* air is pressed into the same through the air-pipe *f*. The cock *d* may then be turned in the direction of the arrow until the passage *h* of the cock communicates with the burette and the outlet-pipe *e*, so as to let out the fluid from the burette. When the desired quantity of fluid is drawn off, the cock is turned so much in the opposite direction to the arrow that the burette will be cut off from both the outlet-pipe *e* and the fluid-holder *a*. If the cock be returned to the position shown in the drawing, fluid will again flow from the fluid-holder into the burette until the state of equilibrium again takes place.

On account of the capillary action the air-pipe may practically end somewhat above the zero-line of the burette *b*. In order that air-bubbles of minimum size may leave the mouth of the air-pipe *f* and just as soon as they are large enough to rise, the air-pipe *f* is obliquely faced off, as shown in the drawing.

Having now described my invention and how it may be performed, what I claim, and desire to secure by United States Letters Patent, is—

1. The combination of a burette, graduated from zero-line downward, a reservoir or fluid-holder, a pipe connection between said reservoir and burette, a pipe, inserted air-tightly in said reservoir, open to the air at its upper end and communicating with said reservoir at its lower end only, the lower end of said pipe being obliquely faced off to form an orifice inclined to the horizontal, the higher end of said orifice being substantially on a level with the zero-line on the burette to which the fluid-level therein is desired to be automatically brought.

2. The combination of a burette, graduated from a zero-line downward, a reservoir or fluid-holder, a pipe connection between said reservoir and burette, a pipe, inserted air-tightly in said reservoir, open to the air at its upper end and communicating with said reservoir at

its lower end only, the lower end of said pipe being obliquely faced off to form an orifice inclined to the horizontal, the higher end of said orifice being substantially on a level with the
5 zero-line on the burette to which the fluid-level therein is desired to be automatically brought, an outlet-pipe from the pipe connection between said reservoir and burette and a
10 two-way cock adapted to connect the reservoir with the burette or either with the outlet-pipe.

3. The combination with a burette, graduated, a reservoir or fluid-holder and pipe connection between said reservoir and burette,

of a pipe open to the air within said reservoir 15 and communicating with said reservoir at its lower end only, a discharge-opening from the pipe connection between said reservoir and burette and a two-way cock adapted to connect the reservoir and burette with each other, 20 or either with the discharge-opening.

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

ANDERS MARTIN SÖDERLUND.

Witnesses:

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LARS YUGVE TEOFROU BOBERG.