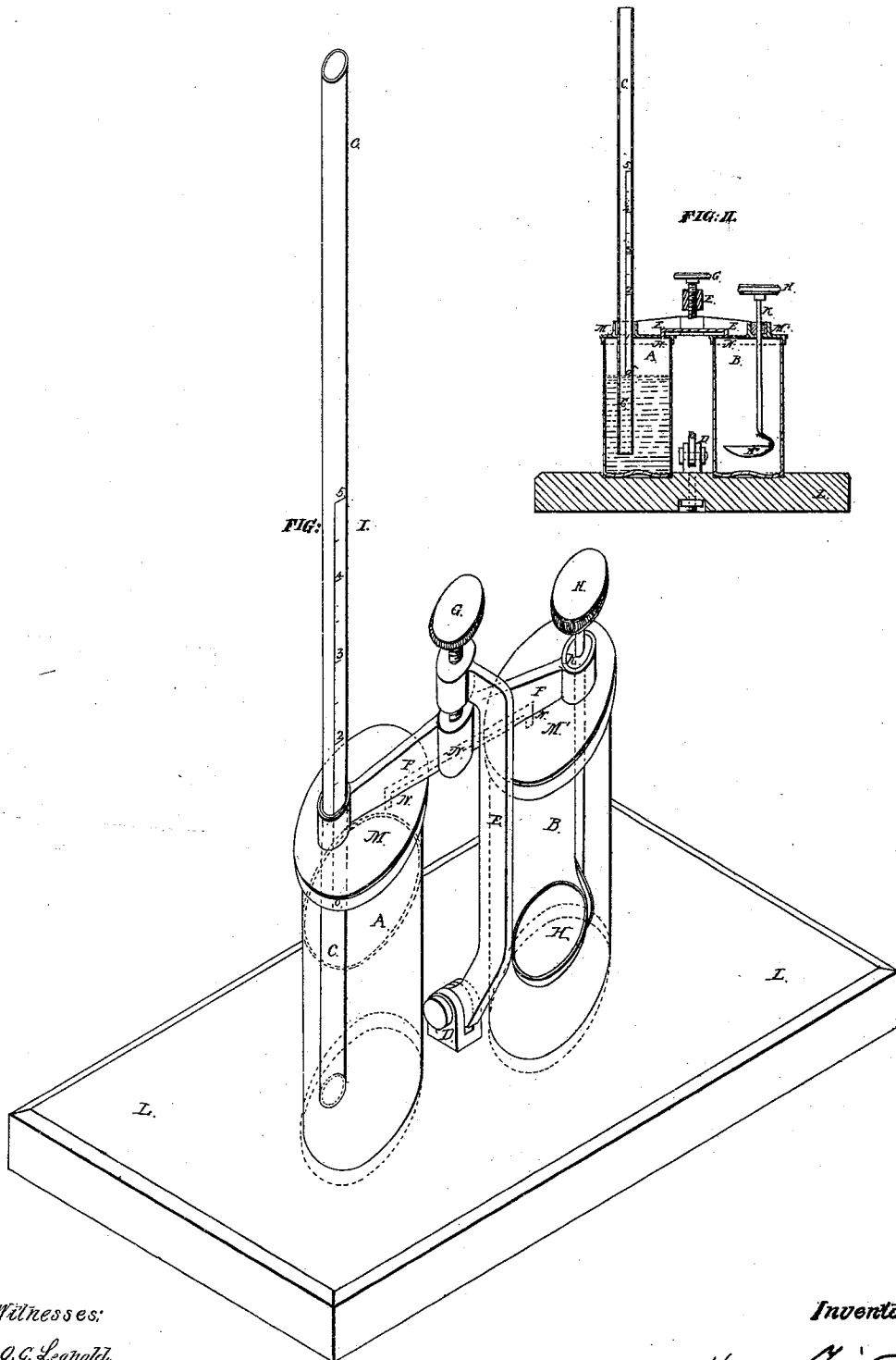


H. Twitchell.

Chemical Apparatus.

N^o 99,976.

Patented Feb. 15, 1870.



Witnesses:

A. G. Leopold.
Ed. Berghman

Inventor:

Henry Twitchell

United States Patent Office.

HENRY TWITCHELL, OF CINCINNATI, OHIO.

Letters Patent No. 99,976, dated February 15, 1870.

IMPROVEMENT IN APPARATUS FOR ASCERTAINING THE AMOUNT OF ACID IN LIQUIDS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, HENRY TWITCHELL, of the city of Cincinnati, in the county of Hamilton, and State of Ohio, have invented a new and improved Method of Ascertaining the Percentage of Acid in Liquids, and an apparatus therefor; and I do hereby declare that the following is a full and exact description thereof, reference being had to the accompanying drawings and to the letters of reference marked thereon, making a part of this specification, in which—

Figure I is an isometric perspective view, and

Figure II is a vertical section through the center line of the apparatus.

The apparatus consists of two glass jars A and B, placed side by side into a common base piece, L, and their open tops closed air-tight by metallic and closely-fitting covers M and M', which are cast to and form a part with the hollowed bar F. This bar F contains a channel, N, to establish a communication between the two glass vessels A and B.

Through the cover M' of the vessel B passes the stem of the spoon H', and is made air tight by means of the stuffing-box K. On the outside end of the spoon-stem is the milled button H for the purpose of moving the spoon up and down and rotating it.

Both covers M and M', through the agency of the connecting-bar F, are held firmly to their seats by means of the set-screw G, which is held by the vertical bar E that is linked at the bottom to the staple D, which is firmly fastened to the base L.

Through the cover M of vessel A, and held by it, passes the graduated tube of glass C, to within a short distance of the bottom of the glass jar A, and extending outside to the requisite height, showing the graduated scale divided into hundredths and thousandths. A measuring tube, which contains two hundred and fifty fluid grains, when filled to the mark near the top, is furnished with the instrument.

The mode of operation is as follows:

The vessel A is filled with water or any suitable fluid to the zero point of the scale on tube C. An amount of two hundred and fifty grains of the acetic

liquid to be tested is poured into the vessel B. The spoon H' is then drawn up, so that when the covers M and M' are in place it will not reach to the acetic liquid. It is then filled with bicarbonate of soda, or any other basic bicarbonate. Both vessels are then closed air-tight with their respective covers by bringing the set-screw G to bear and press tightly upon the connecting-bar F.

Thus prepared, the apparatus with its contents is ready for the operation that is to be made for the purpose of ascertaining the parts of acid contained in the acetic liquid of vessel B.

By pushing the spoon H' with its carbonic contents down into the acetic liquid and whirling it around so as to facilitate admixture, carbonic acid gas is developed, which rises to the top of vessel B, passes through channel N in connecting-bar F to the vessel A, presses on the liquid contained therein, forcing the same upward in the graduated glass tube C, and the division to which it reaches indicates the thousandths of acid contained in the acetic liquid tested.

I disclaim the measurement of the carbonic acid gas evolved in saturating the acetic liquid with a base, for the purpose of deducing therefrom the amount of acid contained; but having thus fully described the apparatus and its mode of action,

What I claim as my invention and desire to secure by Letters Patent, is—

1. The mode of determining the amount of acid in any liquid, by the height to which water or other suitable fluid is forced, (by means of the specified contrivances or their equivalents,) in a glass tube, graduated so as to indicate directly the amount of acid contained in the liquid tested.

2. The apparatus, in its combination and parts as above described, for the purpose of ascertaining the percentage of acid contained in wine, must, or other acetic liquids.

HENRY TWITCHELL.

Witnesses:

O. G. LEOPOLD,
ED. BERGHAUSEN.