2 Sheets—Sheet 1.

M. AUGENSTEIN.

Hydrometer.

No. 109,168. Patented Nov. 15, 1870.

Fig. 1.

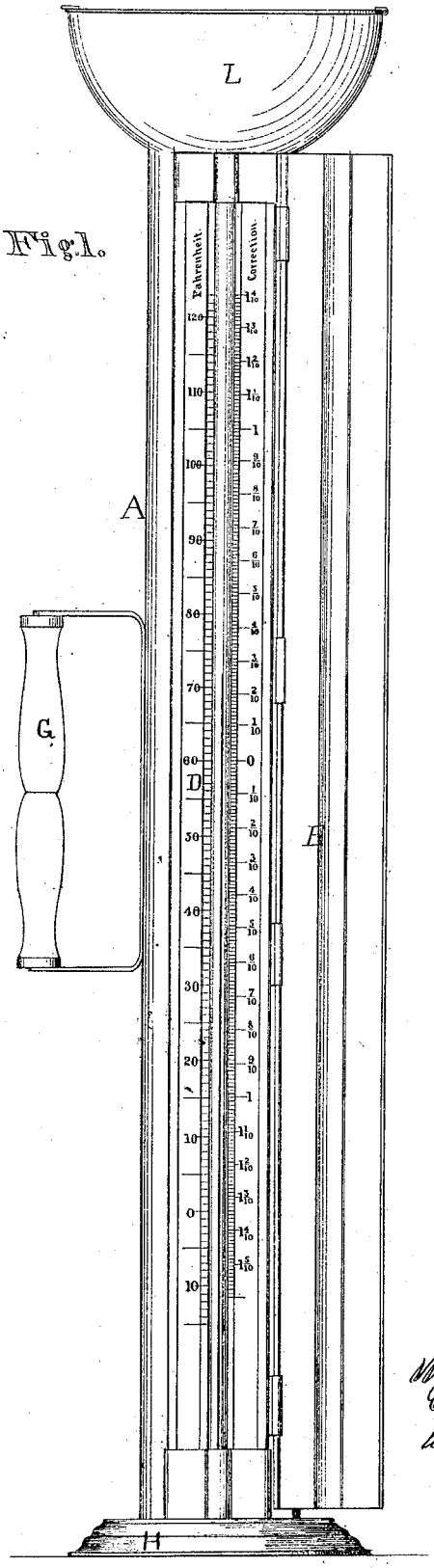


Fig. 2.

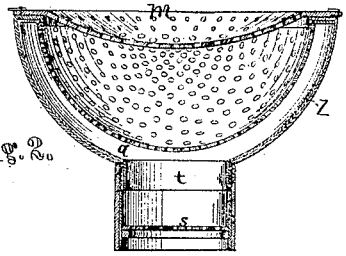
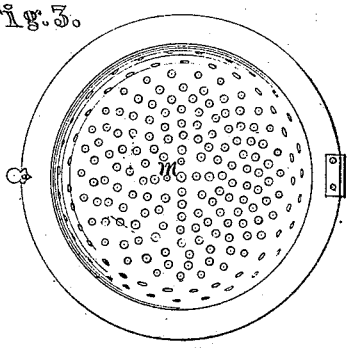


Fig. 3.



Witnesses.
Chas Kenyon
Villette Anderson.

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Attys

2 Sheets—Sheet 2.

M. AUGENSTEIN.

Hydrometer.

No. 109,168. Patented Nov. 15, 1870.

Fig. 4.

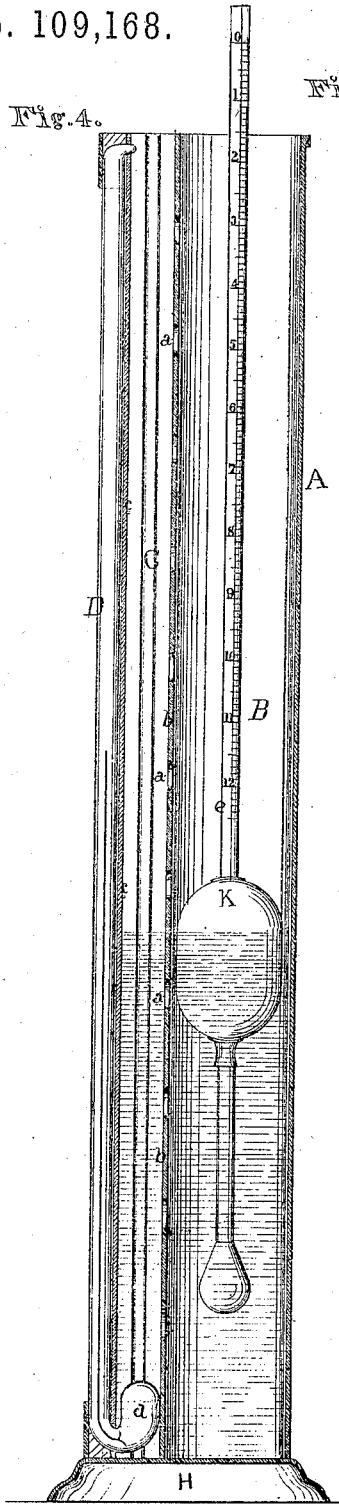


Fig. 5.

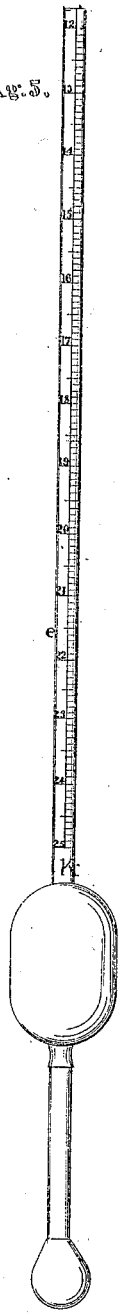
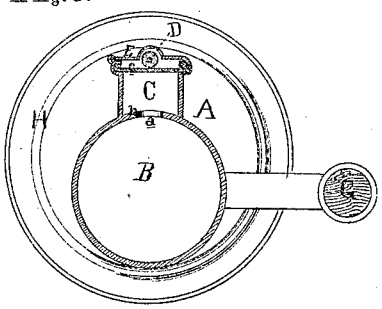


Fig. 6.



Witnesses:
Chas. Kenyon
Villette Anderson

Inventor:
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United States Patent Office.

MORITZ AUGENSTEIN, OF BROOKLYN, NEW YORK.

Letters Patent No. 109,168, dated November 15, 1870.

IMPROVEMENT IN TESTING INSTRUMENTS FOR BREWERS AND DISTILLERS.

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, MORITZ AUGENSTEIN, of Brooklyn, in the county of Kings and State of New York, have invented a new and valuable Improvement in Testing-Instruments for Brewers and Distillers; and I do hereby declare that the following is a full, clear, and exact description of the construction and operation of the same, reference being had to the annexed drawing making a part of this specification, and to the letters and figures of reference marked thereon.

Figure 1 of the drawing is a front view of my saccharometer, with the door opened.

Figures 2, 3, 5, and 6 are details; and

Figure 4 is a sectional view, showing the bulb of the thermometer in its chamber.

My invention has relation to means for determining the relative density of beer, and thereby ascertaining the percentage of absolute alcohol in the fermented wort; and

It consists in certain improvements upon the ordinary saccharometer, designed to render such instrument more efficient and accurate than it has heretofore been found to be in actual use.

These improvements consist—

In the use of more than one floating tube, whereby I am enabled to lessen its diameter, and to use within the space marking the same variation double the number of graduating lines;

In the construction of the test-cup, whereby it is provided with a separate compartment for the reception of the bulb of the thermometer, to which the beer has ready access through suitable perforations in the protecting partition, with a stout plate of brass separating the thermometer from the beer-chamber; and

In the construction of the straining-funnel with a series of graduated strainers, and duly tinned for the better protection thereof from the action of acids.

In such an instrument delicacy and accuracy of construction and graduation are matters of paramount importance, in order to enable us to obtain results upon which we can rely as the basis of calculation.

The letter A of the drawing designates the test-cup or sample-taker, usually made of copper.

B represents the cylindrical main compartment, into which the saccharometer or floating tube is introduced.

Extending vertically along one side of this compartment is a smaller compartment, C, into which the liquid from the chamber B passes freely through a series of perforations, *a*, in the partition *b*, which allows it to move back and forth from one chamber to the other.

The letter D represents a thermometer securely fixed on the outer face of the plate *c*, which is usually of brass, and forms the front wall of compartment C.

This plate is forked at its lower end, and the neck of the thermometer passes thereby into the compartment C, and is turned upward, terminating in the bulb *d*.

The outer face of the plate *c* is graduated in degrees of Fahrenheit, and is also provided with a correction-scale, graduated to hundredths of a degree of the saccharometer.

E represents a door, arranged to protect the thermometer; and

G, a non-conducting handle.

H is the base of the test-cup, which is usually weighted, and made non-conducting. It should have sufficient area to secure the case, which is necessarily of some height, in an upright position.

K K represent the saccharometers or floating indicators. They consist of weighted elliptical floats, from which extend upward the circular tubes *e*, closed at the top, and duly graduated to mark tenths per cent. of sugar from 0 to 25 per cent.

One instrument is graduated from 0 to $12\frac{1}{2}°$, and the other, which is more weighty, from 12 to 25°.

These instruments are graduated to 60° Fahrenheit, thereby facilitating the mathematical labor, of which their measurements form the basis, and which is necessary in order to determine the percentage of absolute alcohol.

By using two instruments in place of one, I am enabled to make the hollow stem, which extends upward from the float, and lies partly within and partly without the mash, of smaller diameter, and also to use within the space marking the same variation double the number of graduating lines, thereby enabling a more delicate test to be made, and a basis of calculation to be furnished which leads to a more accurate result.

The system of graduation employed is in accord with the decimal system of calculation.

L designates the straining-funnel, by means of which the head and foreign matter are prevented from passing into the test-cup.

This funnel consists of a hemispherical cup, Z, from the bottom of which extends downward a short cylindrical tube, *t*, designed to be introduced into the mouth of the cylindrical compartment B of the test-cup.

m is a coarse strainer, hinged to the upper edge of the cup Z, and resting on it in the manner of a concave perforated lid.

q is a hemispherical strainer of finer mesh, arranged within and parallel to the wall of the cup Z.

Below this, and across the tube *t*, is arranged a third strainer, *s*, of still finer perforations.

These different strainers, and the inner wall of the brass cup Z, and tube *t*, are protected from the action of acids by being formed of or coated with tin or other suitable material.

I claim—

1. The test-cup A, having cylindrical chamber B, bulb recess C, perforated partition *b*, graduated guard-plate *c*, and thermometer D, substantially as specified.

2. The straining-funnel herein described, having the upper and coarser strainer *m* hinged, the intermediate strainer *q* of similar shape to the funnel wall and parallel thereto, and the finest strainer *s* spanning the tube or spout, substantially as specified.

3. The complementary saccharometers K K herein described, graduated to tenths and according to the scale of 60° Fahrenheit, as specified.

4. The combination of the test-cup A, having cylinder chamber B, bulb recess C, guard-plate *c*, thermometer D, and correction scale, with the complementary saccharometers K K, substantially as shown and described.

5. The instruments K K, graduated so as to show per cents. and fractions of per cents., and adjusted to Fahrenheit's thermometer-scale, all substantially as specified.

In testimony that I claim the above, I have hereunto subscribed my name in the presence of two witnesses.

MORITZ AUGENSTEIN.

Witnesses:

EDWARD P. MASI,

JOSEPH LYONS.