(No Model.)

A. WALTHER.

RECORDING THERMOMETER.

No. 511,258. Patented Dec. 19, 1893.

Fig. 1.

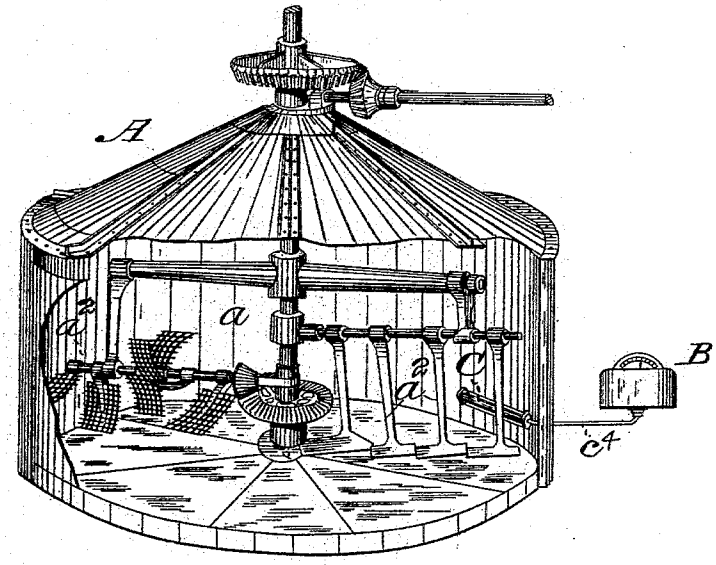


Fig. 3.

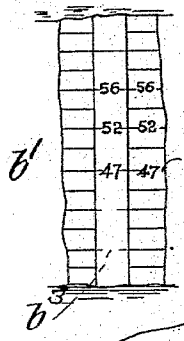
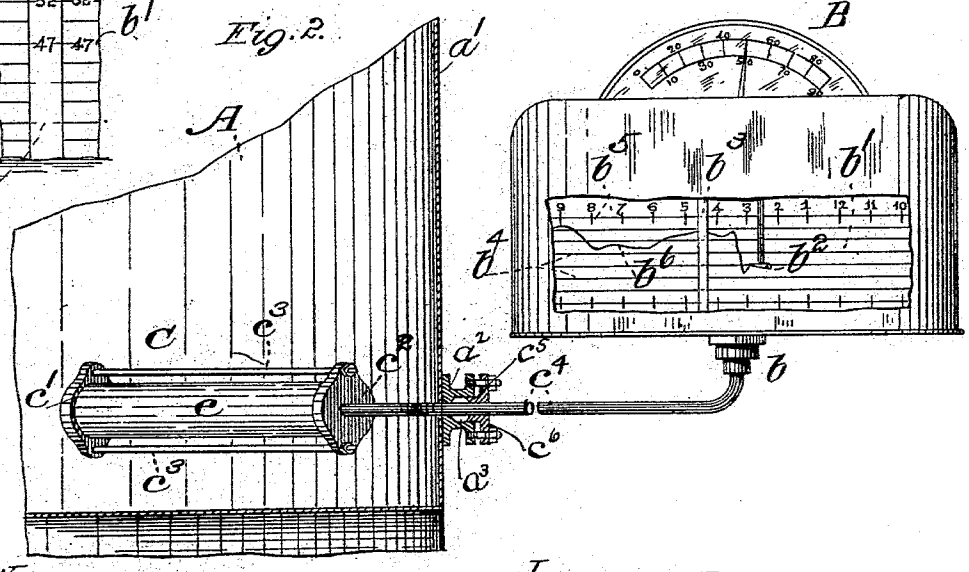


Fig. 2.



Witnesses
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UNITED STATES PATENT OFFICE.

ADOLF WALTHER, OF ST. LOUIS, MISSOURI.

RECORDING-THERMOMETER.

SPECIFICATION forming part of Letters Patent No. 511,258, dated December 19, 1893.

Application filed June 25, 1892. Serial No. 438,006. (No model.)

To all whom it may concern:

Be it known that I, ADOLF WALTHER, of St. Louis, Missouri, have made a new and useful Improvement in Recording-Thermometers, of which the following is a full, clear, and exact description.

The improvement under consideration has to do with the temperature within the mash-tub or vat during the mashing of the malt. The quality of a brew of beer depends, among other things, upon the temperatures at which the brewing occurs, so much so that a variation of even a very few degrees, and for a brief period only, changes the character of the brew, and accordingly it is essential not only that the brewing shall be initiated at the proper temperature but also that it shall be carried on at the proper, different, temperatures until the operation is completed. A common practice has been to employ thermometers of ordinary construction whereby the temperatures of the mash-tub can be noted from time to time during the brewing; but to enable the temperatures to be more accurately determined, and variations in temperature more readily noted, and further to enable a record to be kept of the temperatures throughout the brewing operation, are the objects of the present improvement which consists in a bulb or equivalent construction containing a fluid such as ether, sensitive to heat and which promptly expands and contracts as the temperature varies, and adaptable for use within a mash-tub, in combination with a pressure-recording gage substantially as is hereinafter set forth and claimed, aided by the annexed drawings, making part of this specification, in which—

Figure 1 is a view in perspective of a vat such as is used in brewing, a portion of the shell of the vat being broken away to exhibit the interior, and the gage and bulb being shown in position; Fig. 2 a view in sectional elevation, and upon an enlarged scale, exhibiting the gage and bulb, and including a portion of the vat containing the bulb; and Fig. 3 a detail.

The same letters of reference denote the same parts.

The tub or vat, A, is of any of the customary designs saving as it may be modified or supplemented by the improvement under consideration. The recording gage, B, is also substantially of the usual construction.

C represents the bulb. It may be arranged either within the interior, a, of the vat, substantially as shown, or it may be otherwise located so long as it is exposed to the temperature prevailing within the vat. Its shape also may vary. What is considered a desirable form is exhibited; namely, a thin copper tube, c, closed at its ends by the heads, c', c^2, and the heads preferably connected by means of the tie-rods c^3. A tube, c^4, serves to establish connection between the interior of the bulb and the gage, the head, c^2, being perforated to admit the tube which leads thence through the shell, a', of the vat, and connecting with the gage preferably at the point, b, at which the pressure is usually introduced into such a gage. In practice the tube c^4, is sufficiently pliable to enable that part of it which is within the vat, to be bent to enable the bulb to be arranged near the side of the vat, and out of the way of the stirrers, a^2, substantially as shown. Any suitable means not shown may serve to support the bulb in position.

To afford means of supporting the gage there is secured on the outside of the vat in any suitable way, as by soldering, or otherwise, a knob, or shoulder a^2, through which the tube c^4, passes, and into the hollowed portion a^3, of this the projection c^5, on the collar c^6, enters. This collar or clamping piece is fitted fast on the tube c^4, and is fastened to the knob a^2, by means of bolts and nuts as shown.

The operation of the improved mechanism is as follows: The brewing is carried on in the usual way within the vat; meanwhile the strip, b', within the gage, upon which the record is made, is moved past the recording pencil, b^2, in the ordinary manner; the temperature within the vat causes the ether within the bulb to gasify and expand or contract as the case may be; the pressures corresponding to such expansions and contractions are noted upon any convenient part, such for instance as the upright bar, b^3, in the gage; the strip b', is ruled horizontally in the usual manner to enable the pressures to be readily ascer-

tained, the marking upon the bar corresponding to the positions of the lines b^4; the usual time-marks b^5, also appear upon the strip. The line, b^6, traced upon the strip in this way thus indicates the pressures, and consequently the temperatures, prevailing within the vat from the beginning to the end of the brew, and the inspector, after the operation has ceased, obtains a record thereof. The recording strip, b', within the gage, may be prepared for work such as is under consideration by having the temperatures corresponding to the horizontal lines, b^4, upon the strip marked directly thereon, substantially as is indicated at b^7, Fig. 3, in which view the numbers 47, 52, &c., respectively are the temperatures (Fahrenheit, Reaumur, &c, as the case may be) corresponding to the lines, or said temperatures may be marked upon the bar b^3, or the temperature-markings may be upon both the strip and the bar, as in Fig. 3. The time-marks, b^5, divide the strip vertically into sections belonging respectively to the hours indicated, and thus the record shows also the periods when the various temperatures respectively obtained.

The present improvement, in its application, is not restricted to brewing apparatus exclusively, as it can, and for a similar or analogous purpose, be used in connection with distilling, sugar-making or other apparatus, having chambers in which it is desirable to keep an accurate record of the temperature prevailing therein.

It is not always essential to use in the bulb a fluid which gasifies before it exerts a pressure upon the recording gage.

I claim—

1. In a recording apparatus, the combination with a gage and a tube secured thereto, flexible at the outer end, of the bulb having heads at each end secured by the rods, the flexible portion of the tube entering one head, whereby the bulb can be placed in any desired position when in use inside a brewing vat, substantially as described.

2. In combination with a brewing vat, a recording gage and a bulb having within it a substance the volume of which is changeable by heat, said gage being supported upon the outside of the vat by a knob or shoulder secured thereto and the tube c^4, connecting the gage and the bulb and passing through the knob and said bulb adapted by its flexible connection with the recording gage to be located at any suitable point within the vat, all substantially as described.

Witness my hand this 21st day of June, 1892.

ADOLF WALTHER.

Witnesses:
HERM C. STIFEL,
C. D. MOODY.