B. ROOP.

Alcohol Still.

No. 3,575. Patented May 6, 1844.

Fig. 2

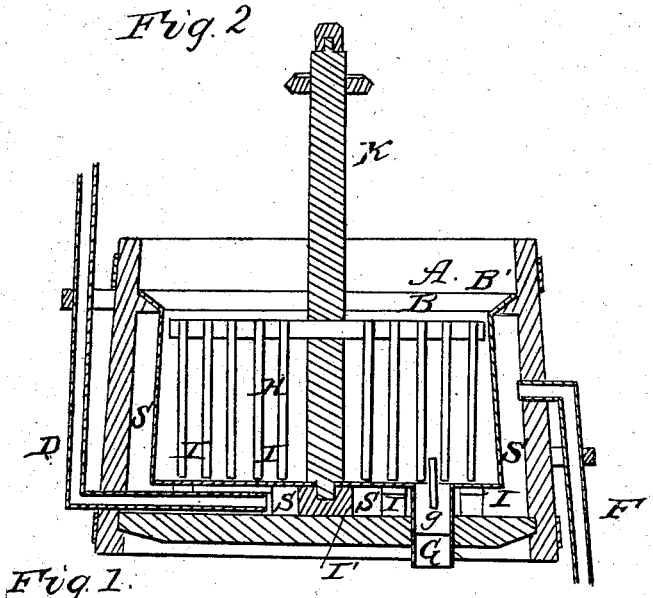
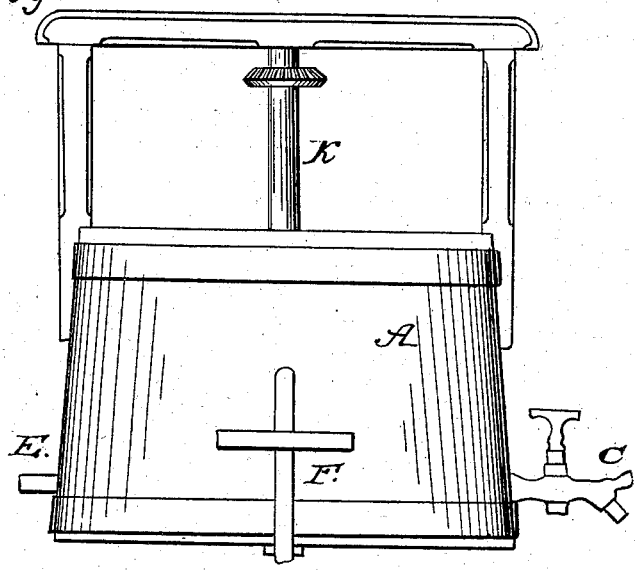


Fig. 1.



N. PETERS. Photo-Lithographer. Washington, D. C.

UNITED STATES PATENT OFFICE.

BENJAMIN ROOP, OF MOUNT PLEASANT, PENNSYLVANIA.

IMPROVEMENT IN MASH-TUBS.

Specification forming part of Letters Patent No. **3,575**, dated May 6, 1844.

To all whom it may concern:

Be it known that I, BENJAMIN ROOP, of Mount Pleasant, Westmoreland county, State of Pennsylvania, have invented a new and useful Apparatus for Distilling Grain, which is described as follows, reference being had to the annexed drawings of the same, making part of this specification.

Figure 1 is a side elevation of the exterior of the apparatus. Fig. 2 is a vertical cross-section of the interior.

Having for many years past been engaged in the business of distillation, particularly of grain, and having generally experienced much difficulty, especially during the warm weather or hot season of the year, in preparing properly for fermentation the grain and other substances destined for that purpose, so as to yield the greatest portion of spirits, I have invented and constructed an apparatus for the purpose of mashing and cooling off in a manner as I conceive far surpassing anything of the kind hitherto used for that purpose.

This apparatus consists of a tub or cistern, A, made in the usual manner, containing a copper vessel, B, of corresponding shape, but of lesser size, in which the mashing process is to be performed, five conductors, C, D, E, F, and G, and a revolving rake, H, to be propelled by steam or water or other power for the purpose of stirring the mash.

The tub or cistern A is to be constructed of pine or other suitable timber, the proportionate diameter of the top to be to that of the bottom as eight is to nine, and the height to be four-sevenths of its greater diameter, or thereabout, variable at pleasure, and the aggregate size to be gaged by the quantity of chop to be mashed at once, and four of the said five conductors to be from one to one and a half inch diameter, agreeably to the size of the mashing-tub, and the other, marked G, to be from two to three inches in diameter, as aforesaid.

The conductor lettered C is simply a stop-cock used for letting off the condensed steam and cold water from the space in the tub between its inner surface and the outer surface of the copper vessel therein. It is inserted into the tub near the bottom thereof.

The conductor D is used for conveying the cold water into the tub A, discharging the water under the copper vessel B, near the center thereof. This conductor descends vertically from the top to near the bottom of the tub, outside thereof, then turns horizontally, and passes into the tub through the space between its bottom and the bottom of the copper vessel.

The conductor E is used for conducting steam into the space between the sides of the tub and the copper vessel. It leads from a boiler or other place and enters the tub near the bottom thereof.

The conductor F is for the purpose of gradually drawing off the water conducted to the tub through the pipe D, for the purpose of expediting the cooling process on the mash at the proper time. It leads horizontally from the interior of the tub near the level of the top of the copper vessel B, and then turns vertically down outside thereof and discharges the water into any convenient place.

The conductor G is designed for discharging the mash from the copper vessel into the fermenting-tubs, and for this purpose it is inserted into the bottom of the copper vessel, and is made to pass through the bottom of the tub, opened and closed by a stopper or plug, *g*, from the inside of the vessel.

The copper vessel B aforesaid, in which the mash is to be made, is to be so constructed and arranged as to leave a space, S, of from two to three inches or more under and around it, and into which steam is to be conducted through the pipe E for the purpose of heating up the mash, as aforesaid, said copper vessel to rest on from eight to twelve bars, I, more or less, of such length as the diameter of the said tub will admit of, and to be one and one-half by two and one-half inches thick, placed parallel to each other and equidistant apart, the middle bar, I′, or rest, however, to be sufficiently large at the center to form a step for the lower end of the upright shaft K of the aforesaid revolving rake H to run in. The aforesaid space S around and under the copper vessel or container B and inside the tub A is to be made water and steam tight at the top of said copper vessel by means of a circular rim, B′, exactly filling said space at the top of the vessel, or by extending and flaring the upper edge of the copper vessel till its outer circumference touches the inner circumference of the tub, or in any way more convenient, under which is arranged an annular ring of wood beveled or made flaring to cor-

respond with the flaring edge of the copper vessel, which is nailed thereto. An aperture is made in the center of said copper vessel for the gudgeon of the upright shaft to turn in. The revolving rake H and its shaft K are made and arranged and turned in the usual manner.

Some of the advantages to be derived from the use of my improvements I conceive to be, first, a saving of at least five per cent. in the amount of steam required to heat up a given quantity of mash. This will be readily admitted on considering that the steam, when forced furiously into cold water, convulses in such manner that a considerable portion of it passes upward into the air; secondly, that a gain of at least ten per cent. more is realized from the increased quantity of spirit produced in consequence of the mash being heated more equally by the steam passing under and around it than it is possible to do in the ordinary way by throwing the steam therein. Where the steam is forced directly into the mash at a given point, the meal or chop first coming in contact therewith becomes scalded so instantaneously as to greatly prevent the production of the saccharine properties therein, together with the facility of bringing the mash to the required temperature at a proper time by means of throwing cold water into the aforesaid space S; and, lastly, that a further gain of from five to ten per cent. more is to be realized from the saving of fuel, machinery, and manual labor, a conclusion to be arrived at on considering that by the use of said improvement the process of mashing and cooling off is performed in much less time, and the quantity of beer made from a given amount of chop reduced in like proportion, especially in warm weather, all of which, as I conceive, making in the aggregate a profit of from twenty to twenty-five per cent. Besides, by the use of my improved machine, I find that I can do as much work in one day as I heretofore have been able to perform in two days.

I do not claim the mode of heating and cooling by a steam or water jacket; but

What I do claim is—

Said water or steam jacket, in combination with a mash-tub and mash-rake for the purpose of heating and cooling the mash, as herein set forth.

BENJAMIN ROOP.

Witnesses:

WM. P. ELLIOTT,

A. E. JOHNSON.