

(No Model.)

O. SELG.
MASHING APPARATUS.

No. 598,120.

Patented Feb. 1, 1898.

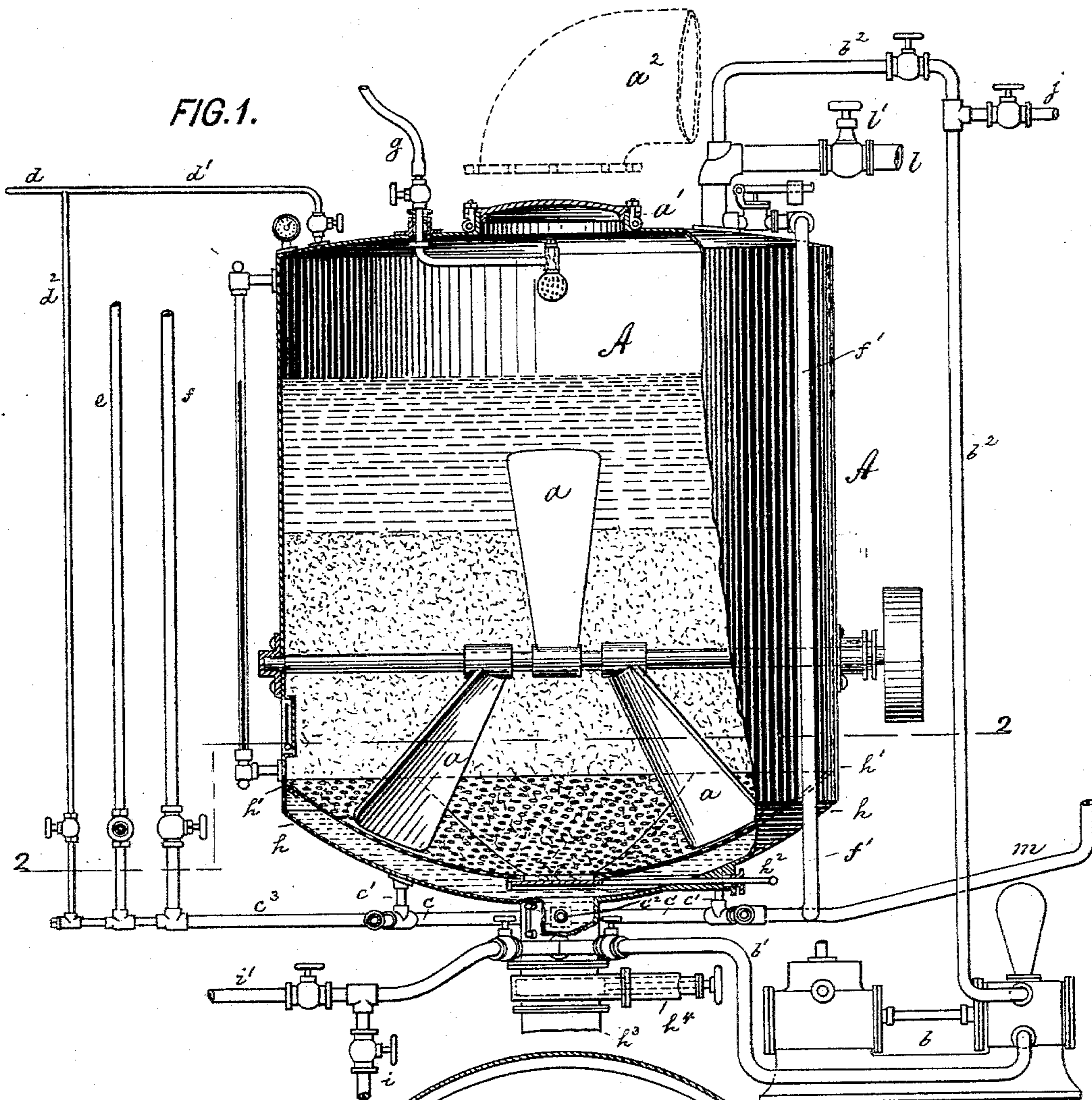
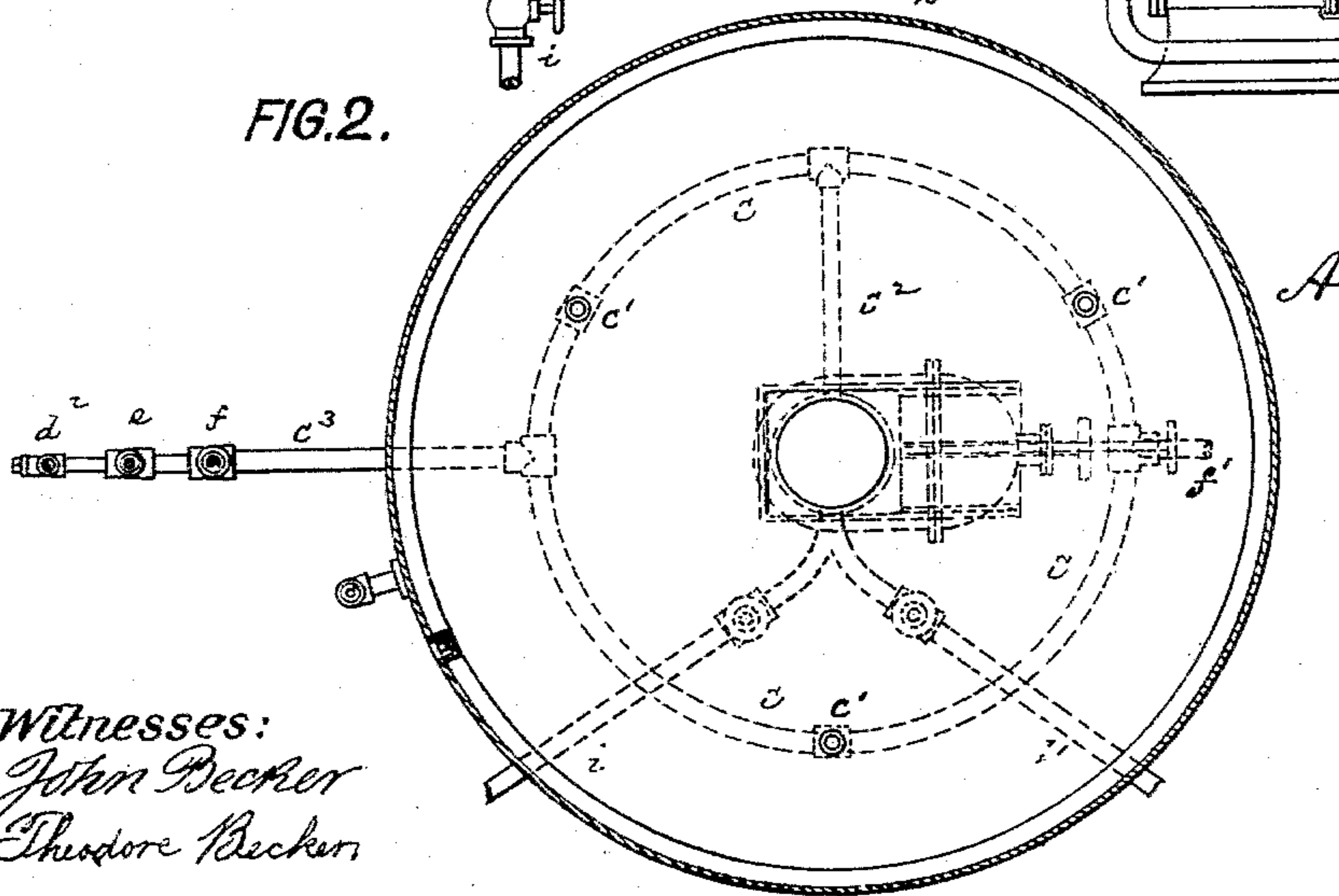


FIG. 2.



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MASHING APPARATUS.

SPECIFICATION forming part of Letters Patent No. 598,120, dated February 1, 1898.

Application filed March 25, 1895. Serial No. 543,023. (No model.)

To all whom it may concern:

Be it known that I, OTTO SELG, of Brooklyn, New York, have invented an Improved Mashing Apparatus, of which the following is a specification.

This invention relates to an improved mashing apparatus used in brewing beer and other malted beverages.

The invention consists in the combination of the mash-tub with the air-pipe, water-pipe, steam-pipe, and thin-mash pipe more fully pointed out in the claim.

In the accompanying drawings, Figure 1 is a vertical section of my improved mashing apparatus. Fig. 2 is a horizontal section on line 2 2, Fig. 1, with the false bottom omitted.

The letter A represents the mash-tub provided with the stirrers *a*, which are revolved as usual.

a' is the feed-opening or manhole, upon which is adapted to fit an elbow *a*², through which the hot air may be exhausted.

b is a pump for drawing the cloudy wort from the bottom of the mash-tub A through pipe *b'* and filling it in at the top of the tub through pipe *b*².

c is a circular pipe which is located beneath the tub A and connects with the tub by three (more or less) upright branches *c'* and one horizontal branch *c*². Through the pipe *c* cold air, water, or steam may be introduced into the tub. The cold air passes from an air-pump (not shown) through pipe *d* and thence to the top of the tub through branch *d'* and to the bottom of the tub through branch *d*², connection *c*³, and tube *c*. The water flows from a tank (not shown) to the bottom of the tub through pipe *e*, branch *e*³, and pipe *c*. The steam passes from a boiler (not shown) through pipe *f*, branch *e*³, and tube *c* to the bottom of the tub. It may also be admitted to the top of the tub by a pipe *f'*, which is fed from the pipe *c*.

g is a sparger for injecting hot or cold water into the apparatus.

The bottom *h* of the tub A, I make of bulged or concave form in contradistinction to the straight form heretofore generally used and the upper perforated false bottom *h'* is made of a corresponding bulged or concave form. This feature of construction I deem of great importance, because it concentrates the grain

and causes it to form a closely-packed body. Thus the grain will be prevented from drawing canals or splitting, and therefore the water cannot escape through it without completely washing out the extract. The false bottom *h'* has a central opening controlled by a sliding gate *h*², while the solid bottom *h* has a corresponding central opening controlled by gate-valve *h*⁴. Through this opening the spent grain is discharged by means of a pipe *h*³. This pipe also connects with a tube *i*, leading to the beer-kettle, and with a pipe *i'*, leading to the surface cooler.

The operation of the apparatus is as follows: I introduce into the tub A the necessary quantity of lukewarm water and the malted grain and subject the mixture to the action of the stirrers *a*. After a thorough mixture is effected the stirrers are arrested, and subsequently the thin mash is drawn off by pump *b* through pipes *b'* *b*² and branch *j*. The thin mash runs through the false bottom and through the central opening of the solid bottom into pipe *b'*, which enters at a point between the gate-valve and the central opening of the solid bottom. From this pipe the pump *b* delivers the thin mash through pipes *b*² *j* into a suitable receptacle. I now add a further quantity of water and the unmalted cereals—such as corn, rice, &c.—the stirrers *a* being of course again set into rotation. Steam is now introduced through pipe *c* to raise the temperature of the mash to the boiling-point. During this operation the vent *l* has been opened, and after the boiling has proceeded for a short time the vent is closed. The boiling may be carried on with more or less steam-pressure, according to the coarseness or fineness of the raw grain used. After the boiling has continued for the proper length of time the pressure is taken off by opening valve *l'*, the cover is taken off the manhole *a'*, and the elbow *a*² is fitted upon the flange of the latter. The vapor is drawn out through said elbow by a suction-blower (not shown) and simultaneously cold air is pumped into the top and bottom of the tub to reduce the temperature of the mash without the use of water. I now introduce the thin mash at the bottom of the tub through a pipe *m*, that leads from the thin-mash tub and connects with the pipe *c*. The apparatus is now set

at rest for about three-quarters of an hour and all the valves closed, so that the grain will settle. The pump *b* is then set into action to draw the cloudy wort from the bottom of the tub and fill it in at the top, as usual. After the wort runs clear the pump is arrested and the wort is run into the beer-kettle through pipe *i*. When the first wort has been run off, the sparger is turned on and the second wort is run off, the sparging being continued until all the extract has been washed out of the grain, after which the latter is discharged through the outlet *h*³.

The advantages connected with my invention are that the grain is compacted by the concave form of the bottom, so that the water is compelled to percolate through the body of the grain and to draw all the extract out of the latter. By simultaneously mashing and boiling the malted and raw cereals the quality of the wort is greatly improved and the yield increased because the starch is more thoroughly dissolved and converted into dextrine and maltose. Moreover, the process is greatly simplified, as a single apparatus will perform the work which it heretofore required

two separate apparatus to perform. Finally, by introducing the thin mash containing all the essential substances for the saccharification of the starch at the bottom of the tub in lieu of introducing it at the top, as was heretofore generally done, I obtain a more thorough intermixture of the thin mash with the mash and avoid at the same time the necessity of introducing hot water for the purpose of washing the false bottom.

What I claim is—

A mash-tub provided with a perforated false bottom, an annular pipe *c*, a cold-air pipe, a water-pipe, a steam-pipe and a thin-mash pipe entering the annular pipe, and branches that connect the annular pipe with the bottom of the tub, substantially as described.

Signed at New York, in the county of New York and State of New York, this 22d day of March, A. D. 1895.

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Witnesses:

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