

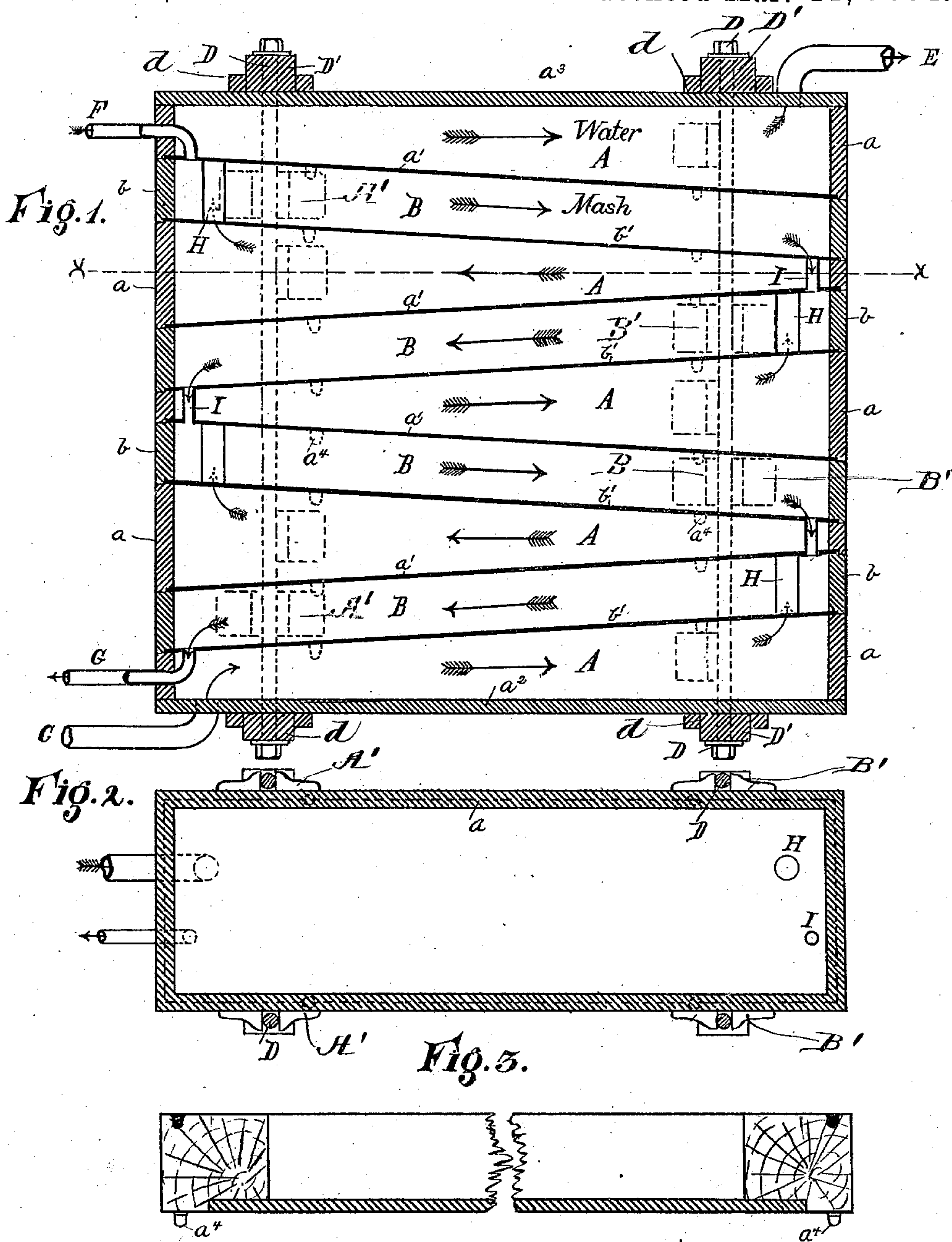
(No Model.)

T. HAYES.

APPARATUS FOR COOLING MASH, &c.

No. 295,005.

Patented Mar. 11, 1884.



Attest

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APPARATUS FOR COOLING MASH, &c.

SPECIFICATION forming part of Letters Patent No. 295,005, dated March 11, 1884.

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To all whom it may concern:

Be it known that I, TIMOTHY HAYES, of Anderson's Ferry, in the county of Hamilton and State of Ohio, have invented certain new and useful Improvements in Apparatus for Cooling Mash, &c., of which the following is a specification.

This invention has for its object to provide novel and efficient devices for cooling mash or wort as it passes from the mash-tub to the fermenting-tank, whereby access may be had to all the parts for the purpose of cleaning or repairing the same.

To such end my invention consists, essentially, in the construction and arrangement of parts hereinafter described and claimed, reference being had to the accompanying drawings, in which—

Figure 1 is a sectional elevation of my improved cooling apparatus. Fig. 2 is a plan thereof on line *x x* of Fig. 1; and Fig. 3 is a section of one of the chambers, showing the manner of sinking the bottom plates into the wooden frame.

Similar letters of reference indicate similar parts.

A A are a series of wedge-shaped water-chambers, consisting of frames *a a* and bottom *a' a'*, the shallow ends of which chambers are alternately disposed at the opposite ends of the cooler. All of the chambers A, excepting the lowermost one, are furnished with bottoms of copper or other suitable material; but this chamber has a wooden bottom, *a''*; likewise, the uppermost chamber A is covered with a wooden cap, *a'''*.

B B are a series of inclined mash-chambers of uniform depth from end to end, placed, as shown in Fig. 1, between the wedge-shaped chambers A, and consisting of wooden frames *b* and copper bottoms *b'*. The bottoms *a'* and *b'* are plain flat plates of copper, rabbeted into the edges of the frames *a* or *b*, as clearly shown in Fig. 3, so that when one chamber, as A, is pressed firmly down upon another chamber, as B, a mash-tight and water-tight joint is made. Dowel-pins *a''* upon the lower edges of each frame engage with corresponding holes in the next chamber, A or B, below, to properly locate the chambers in the cooler.

The several chambers A and B alternate one above the other, and, as shown in Fig. 1, are bound together with vertical tie-bolts D and binders D', which binders are prevented from slipping transversely upon the top *a''* or bottom *a''* by the cheek-pieces *d d*. Cheeks A' and B' upon the sides of the chambers A and B prevent the chambers from sliding endwise under pressure of the tie-bolts D, which, owing to the wedge form of chambers A, would happen but for the cheeks A' or B' taking against the tie-rods. The dowel-pins *a''* also assist in preventing end-thrust of the chambers when the cooler is made up and the several chambers bound tightly together by the tie-rods D and binders D'.

C is the inlet-pipe for the cooling-water, which passes upward, as shown by the arrows in chamber A, through pipes H, from chamber to chamber, and finally vents at the outlet-pipe E.

F is the inlet-pipe for the hot mash, which flows by gravity in the direction of the arrows in chambers B, through pipes I, from chamber to chamber, to the vent-pipe G, whence it passes to the customary fermenting-tubs. It will be observed from examination of Fig. 1 that the general course of the hot mash is downward, while the general course of the cooling-water is upward, the flow of the hot mash and cooling-water being in opposite directions through the several chambers A and B. The chambers B are made comparatively shallow, and both the upper and lower surfaces of the volumes of hot mash are exposed to the cooling influence of the water in the chambers A. The pipes H and I may be screwed from above into the plates *a' b'*, or may be attached to said plates by flanges and bolts, in the usual manner.

Although I have shown only five water-chambers and four mash-chambers in my improved cooling apparatus, it should be understood that any desired number of chambers may be used in order to completely cool the mash, there being always one more water-chamber than the number of mash-chambers—that is, the lowermost chamber and the uppermost chamber are always water-chambers.

Should it be deemed necessary to prevent

the generation of injurious acids by the impregnating of the wood of chambers B with the mash, the sides of these may be lined with copper or other suitable material to prevent contact of the mash with the wood.

I am aware that it is not new to arrange a series of reversely-inclined chambers in a case and alternately connected at their ends; also, that a box has been divided by parallel partitions to form chambers alternately connected by posts at the ends of the partitions, and a series of parallel pipes arranged in said chambers and alternately connected at their ends, so that beer will flow in one direction through the pipes and in the opposite direction through the chambers. Such features, therefore, I disclaim.

Having described my invention, what I claim is—

1. In an apparatus for cooling mash in transit from the mash-tub to the fermenting-tank, the combination of a series of inclined closed chambers, A, for the passage of the cooling agent, a series of inclined closed chambers, B, for the passage of the mash, said closed chambers alternating one above the other and reversely inclined, the pipes H, alternately connecting the ends of the closed chambers for the cooling agent, the pipes I, alternately connecting the ends of the closed chambers for the mash, the inlet-pipe F, for entrance of the mash to the upper mash-chamber, the outlet-pipe G, for the discharge of the mash from the lower mash-chamber, and the inlet and outlet pipes C and E, connected, respectively, with the upper and lower closed chambers for the cooling agent, substantially as described.

2. The combination of the series of inclined closed chambers A, for the passage of the cooling agent, the inclined closed chambers B, for the passage of the mash, alternately interposed between the other closed chambers, the bottom wall of one chamber constituting the top wall of the adjacent chamber, the pipes H, alternately connecting the ends of the closed chambers for the cooling agent, the pipes I, alternately connecting the closed chambers for

the mash, and the pipes F and E, C and G, connected, respectively, with the uppermost and lowermost closed chamber, substantially as described.

3. The combination of the reversely-inclined chambers A and B, alternately disposed one above the other, and connected alternately at their ends, respectively, by the pipes H and I, for the passage in opposite directions of the cooling agent and the mash, the check-pieces A' and B' on the side walls of the chambers, the vertical tie-bolts D and nuts D', clamping all the chambers together and engaging the check-pieces, and the respective inlet and outlet pipes C, F, G, and E, substantially as shown and described.

4. The combination of the reversely-inclined chambers A and B, alternately disposed one above the other, the bottom of one chamber constituting the top of the adjacent chamber, and said chambers alternately connected at their ends, respectively, by the pipes H and I, for the passage in opposite directions of the cooling agent and the mash, the check-pieces A' and B' on the side walls of the chambers, the check-pieces d on the top and bottom chambers, the connecting-bolts and nuts clamping the chambers together and engaging the respective check-pieces, and the inlet and outlet pipes C and F, E and G, substantially as described.

5. The combination of the inclined chambers A and B, alternately arranged one above the other, and connected as described, and having dowel-pins a' on the lower edge of each chamber, engaging the upper edge of the adjacent chamber, with the vertical tie-bolts D and nuts D', for clamping the chambers one upon the other, substantially as described.

In testimony whereof I have signed my name to the foregoing specification in the presence of two subscribing witnesses.

TIMOTHY HAYES.

Witnesses:

CHAS. ANDERSON,
JOSEPH W. SIMS.