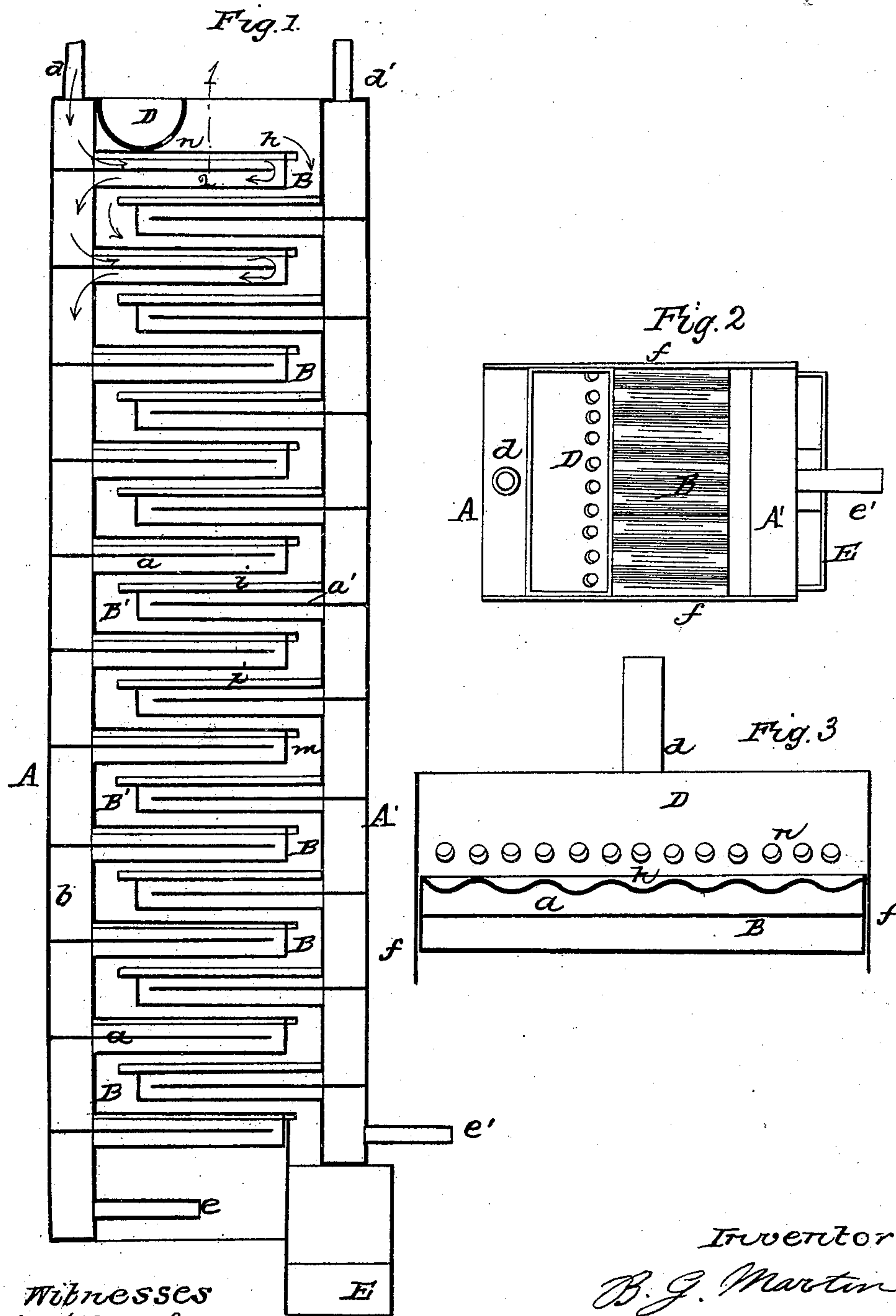


B. G. MARTIN.

Beer Cooler.

No. 53,082.

Patented March 6, 1866.



Witnesses
Wm. Albert Steel
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Inventor
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UNITED STATES PATENT OFFICE.

B. G. MARTIN, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO HIMSELF,
W. SANFORD, OF NEW YORK, N. Y., AND T. M. DAVIS, L. H. WALTON,
OF PHILADELPHIA, PENNSYLVANIA.

IMPROVED APPARATUS FOR COOLING LIQUIDS.

Specification forming part of Letters Patent No. 53,082, dated March 6, 1866; antedated March 2, 1866.

To all whom it may concern:

Be it known that I, BENJAMIN G. MARTIN, of Philadelphia, Pennsylvania, have invented certain Apparatus for Cooling Malt and other Liquors; and I do hereby declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, and to the letters of reference marked thereon.

My invention consists of certain apparatus, fully described hereinafter, for cooling malt liquor and other fluid by causing it to take a course through zigzag passages between plates chilled by the contact therewith of continuous streams of cold water, which also take a zigzag course.

I will now proceed to describe the manner in which my invention may be carried into effect, reference being had to the accompanying drawings, which form a part of this specification, and in which—

Figure 1 is a vertical section of my apparatus for cooling beer and other fluids; Fig. 2, a plan view, and Fig. 3 a vertical section on the line 1 2, Fig. 1, of the upper portion of the apparatus, drawn to an enlarged scale.

Similar letters refer to similar parts throughout the several views.

A is a vertical casing of thin metal, from one side of which project a number of boxes, B, closed at the outer end and communicating at the opposite end with the interior of the said vertical casing, there being in the inside of and midway between the top and bottom of each box a plate, *a*, extending from the exterior plate, *b*, of the casing to within a short distance from the outer end of the box, so that water passing into the pipe *d* at the top of the casing must take the zigzag course pointed out by the arrows before it reaches the outlet-pipe *e*.

A similar vertical casing, A', has projecting boxes B', with internal plates, *a'*, so that water admitted into the pipe *d* shall take a zigzag course, similar to that through the casing A, before it reaches the outlet-pipe *e'*, the projecting boxes B' of the casing A' being arranged midway between the boxes B of the casing A, as shown in the drawings.

Plates *f f*, Fig. 2, serve to cover the sides of

the casings and their boxes and to inclose the zigzag space *i* formed by and between the said boxes, and these plates *f* may be so hinged to the casings that ready access may be had to the said space *i*.

The upper plate, *h*, of each box is corrugated or grooved, so as to form the channels represented in Fig. 3, and the plate overhangs the end of the box so as to form a lip, *m*.

On the top of the uppermost box B of the casing A is a reservoir, D, in which are a number of holes, *n*, (best observed on reference to Fig. 3,) and at the lower end of the casing A' is a reservoir, E.

At one stage in the process of brewing malt liquors it is necessary to cool the wort as rapidly as possible in order to prevent acetification. This cooling of the wort has usually been accomplished by exposing it in broad shallow cisterns over which currents of air are made to play—an objectionable plan, owing to the extended space demanded by the cisterns and the delay incurred in conducting the process effectually.

In using my above-described cooling apparatus the hot wort is permitted to fall in a continuous stream into the reservoir D, while cold water is introduced through the pipes *d* and *d'* into the casings A and A', the water taking the zigzag course above described and escaping through the exit-pipes *e* and *e'*. The hot wort passes through the holes *n* of the reservoir D in streams, which fall onto the corrugated plate *h* of the uppermost box B, and, flowing along the channels formed by the corrugations, passes over the lip *m* onto the corrugated plate of the box below, and thus continues its circuitous course until it reaches the reservoir E.

It will be seen that the streams of hot wort, as they pass over the plates *i*, must not only be cooled by contact with that plate, but as the streams pass immediately below, although not in contact with the lower plates of the boxes, the latter must have a cooling effect on the wort.

The length of the course traversed by the wort may be regulated at pleasure by moving the vertical casings A and A' from or toward each other, and thereby causing the wort to

flow nearly from end to end of each plate *h* in succession, or to traverse a portion only of each plate, as the heat of the wort or refrigerating properties of the plates may suggest.

It will be evident that the apparatus occupies a small space compared with that demanded by the usual cooling-cisterns and that the cooling process is rapid and continuous. It will also be evident that the apparatus may be used for cooling any heated fluids.

Although I prefer to allow the wort to pass in the course indicated, it may be cooled by permitting it to pass through the pipes *d* and to flow through the zigzag passages formed by the vertical casings and their boxes, while the cold water is introduced into the cistern *D* and permitted to flow thence in the course previously described as being taken by the wort.

I claim as my invention and desire to secure by Letters Patent—

1. The two vertical casings *A* and *A'*, with their boxes and plates, the whole being constructed and arranged substantially as and for the purpose specified.

2. So constructing the said vertical casings, with their boxes and plates, that they may be adjustable to and from each other, as and for the purpose described.

3. The reservoir *D*, with its holes *n*, in combination with the said casings and boxes.

4. In combination with the said casings and boxes, the upper plates, *h*, of the latter corrugated or otherwise formed so that the liquid may flow along the same in separate channels.

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

BENJAMIN GREEN MARTIN.

Witnesses:

CHARLES E. FOSTER,
JOHN WHITE.