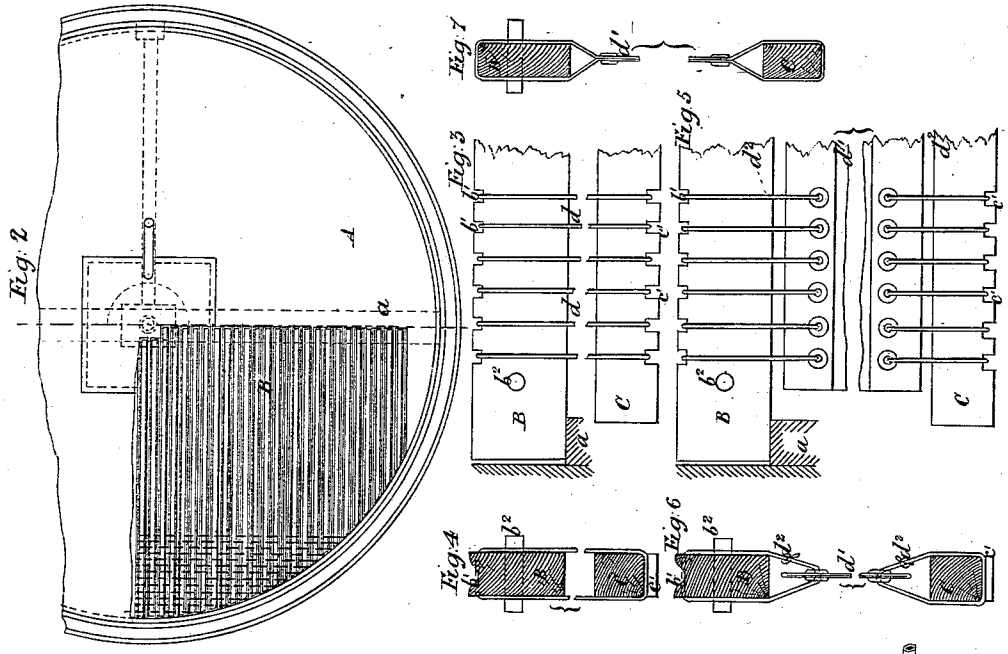
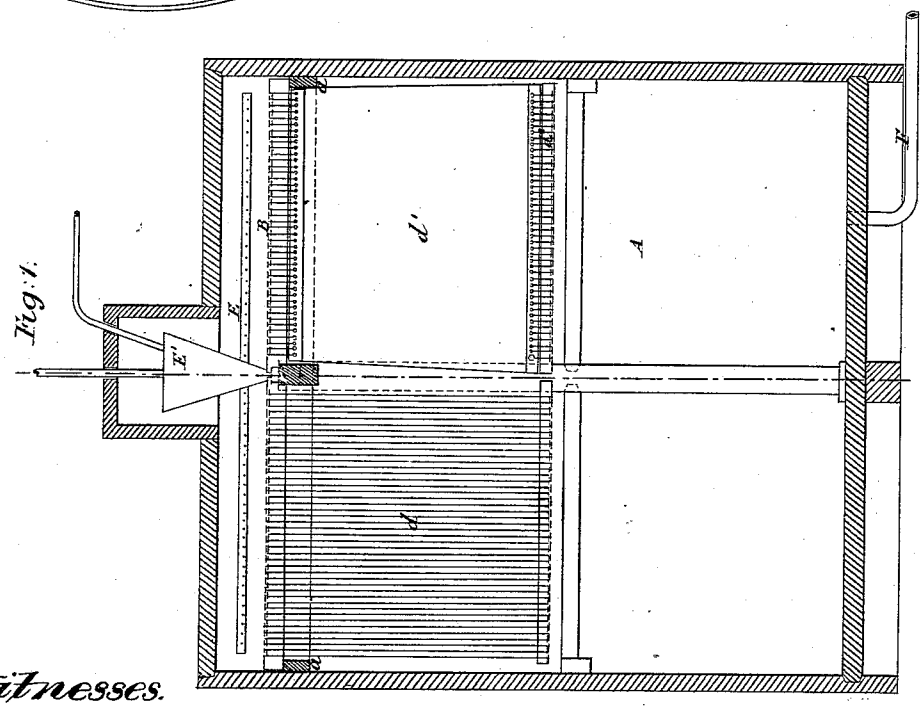
(No Model.)

E. LUCK.

APPARATUS FOR EXPOSING LIQUORS TO THE ACTION OF ATMOSPHERIC AIR.

No. 278,986. Patented June 5, 1883.





Witnesses.

J. A. Rutherford

Robert Everett.

Inventor,

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UNITED STATES PATENT OFFICE.

EDWARD LUCK, OF STAMFORD STREET, BLACKFRIARS, COUNTY OF SURREY, ENGLAND.

APPARATUS FOR EXPOSING LIQUORS TO THE ACTION OF ATMOSPHERIC AIR.

SPECIFICATION forming part of Letters Patent No. 278,986, dated June 5, 1883.

Application filed March 30, 1883. (No model.) Patented in England September 7, 1881, No. 3,883; in France February 2, 1882, No 147,177; in Germany February 7, 1882, No. 19,280; in Belgium February 13, 1882, No. 57,065; in Spain June 7, 1882, No. 2,693, and in India July 13, 1882, No. 746.

To all whom it may concern:

Be it known that I, EDWARD LUCK, a citizen of England, residing at Stamford Street, Blackfriars, in the county of Surrey, England, have invented a new and useful Improved Apparatus for Exposing Liquids to the Action of Atmospheric Air or other Gases or Vapors, more particularly applicable for the manufacture of vinegar, the maturing of spirits, the preparing of sugar-sirups, and the like, (for which I have obtained patents in Great Britain, dated September 7, 1881, No. 3,883; France, dated February 2, 1882, No. 147,177; Belgium, dated February 13, 1882, No. 57,065; Germany, dated February 7, 1882, No. 19,280; Spain, dated June 7, 1882, No. 2,693, and India, dated July 13, 1882, No. 746,) of which the following is a specification.

My invention relates to improved apparatus for exposing liquids to the action of atmospheric air or other gases or vapors, and more particularly for acetifying alcoholic liquids in the manufacture of vinegar and for the maturing of spirits.

In the acetifying or maturing vessel, as ordinarily constructed, the alcoholic liquid or spirits are made to trickle down basket-work in order to subject them to the air-currents or other gases circulating through the vessel. According to my present invention, I substitute for such basket-work bars, rods, or analogous supports, from which are suspended strings, tapes, or woven, twisted, or knitted fabrics, down the surface of which the liquid is made to run.

Figure 1 of the accompanying drawings shows a vertical section, and Fig. 2 a part sectional plan, of an acetifying-vessel arranged according to my invention. Figs. 3 and 4 show, respectively, an elevation and a cross-section to an enlarged scale of the upper and lower supporting-bars carrying the cords.

The acetifying or maturing vessel A has fixed to the upper part of the sides ribs *a*, on which rest the bars B, of wood or other suitable material, each bar having in its upper side a longitudinal groove or channel, *b*, and transverse grooves or channels *b'*. Below each bar B is a bar, C, having transverse grooves *c'*, and over and under the upper and lower bars, within the grooves *b' c'*, are wound strings, tapes, or cords *d*, the lower bars being thus suspended from the upper ones by means of such strings, as shown at the left-hand side of Fig. 1. The strings or tapes for each pair of bars are by preference wound round the upper and lower bars in one continuous length, but they may also be formed as a number of separate loops. The bars B are kept the requisite distance apart by means of distance-pieces b^2, attached thereto.

E is a "Barker's mill" or series of radial tubes with side openings supplied with the liquid through the central funnel, E', to which they are attached, so that as the liquid flows from the tubes these are made to rotate, thus distributing the liquid uniformly over all the sets of bars and strings; or any other known arrangement may be employed for distributing the liquid. F is the pipe leading the liquid collected in the bottom of the vessel A to a lift-pump.

Instead of having the strings or tapes separate and parallel to each other, they may be twisted together or plaited or intertwined; or, in place of the strings or tapes a sheet of calico or other woven or plaited or intertwined material may be employed, as shown on the right-hand side of Fig. 1, and in enlarged part front view and cross-section at Figs. 5 and 6, where *d'* is a sheet of suitable textile fabric, having its upper and lower edges folded over or otherwise strengthened, and pierced with eyelet-holes, through which are passed cords or tapes d^2 for securing the sheet to the upper and lower bars, B and C, as shown; or, in place of securing the sheet by cords its ends may be passed round the bars, as shown at Fig. 7, and fastened by eyelet-rivets or by stitching. In this case the bars B and C are shown without any grooves.

Although the above-described apparatus is more particularly applicable for acetifying alcoholic wash and the maturing of spirits, yet it is equally applicable to other purposes— such as for treating sugar-sirups, before boil-

ing, with sulphurous-acid gas, as commonly practiced in sugar-refineries; also for deodorizing and bleaching cocoanut and other oils by passing ozone in contact therewith.

I am aware that a distributer has been suspended by cords and adapted to receive, break, and scatter the drops of liquid being treated, but in that construction the cords do not serve as a medium down which the liquid passes. I am also aware that in acidification of liquid in vinegar manufacture chambers having perforated floors and a series of suspended cords with free lower ends down which the liquid is adapted to trickle have been employed; but these contrivances are not sought to be covered in this application.

Having thus described the nature of my invention and the best means I know of carrying the same into practical effect, I claim—

1. In apparatus for exposing liquids to the action of atmospheric air and other gases, the suspended strings, cords, or tapes or textile fabrics *d* within a casing or vessel through which air or gas is made to pass while the liquid is caused to trickle down the strings, cords, tapes, or fabrics, combined with the bars B, having upper longitudinal groove, *b'*, and transverse grooves *b*, and with the bar C, suspended by said cords or tapes, as specified.

2. In apparatus for exposing liquids to the action of atmospheric air and other gases, the combination of suspended strings, cords, tapes, or textile fabrics down which the liquid to be acted upon is made to travel, with supports B, grooved longitudinally and transversely to act as channels or guides for the liquid.

3. In combination with the bars or supports B and suspended bars C, and cords or tapes, as described, the radial tubes E, having openings upon one side, and the funnel F, connected therewith, whereby the feed of the liquid through the rotating tubes causes the same to be uniformly distributed over all the bars and cords, as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 14th day of March, A. D. 1883.

EDWARD LUCK.

Witnesses:
OLIVER IMRAY,
G. W. WESTLEY.