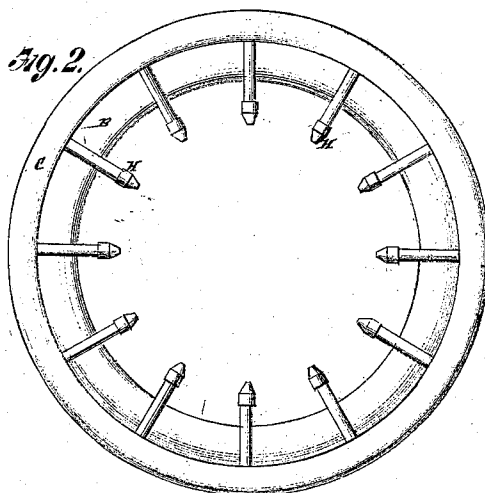
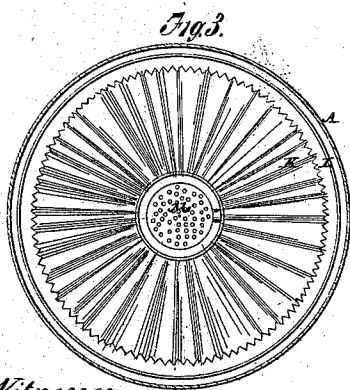
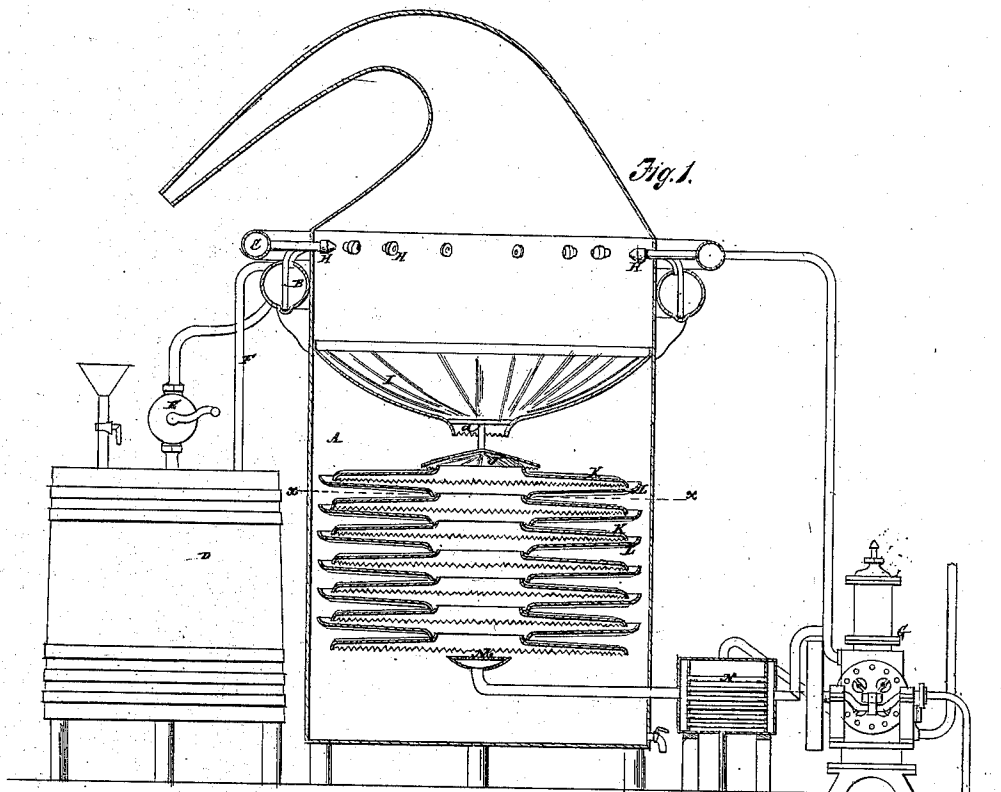


R. D. TURNER.
 MANUFACTURE OF VINEGAR AND ACIDIFYING LIQUIDS.
 No. 105,390. Patented July 12, 1870.



Witnesses
Thos. Harnes
R. Kabeau

Reuben D. Turner

United States Patent Office.

REUBEN D. TURNER, OF NEW YORK, N. Y.

Letters Patent No. 105,390, dated July 12, 1870.

IMPROVEMENT IN THE MANUFACTURE OF VINEGAR AND ACIDIFYING LIQUIDS.

The Schedule referred to in these Letters Patent and making part of the same.

To all whom it may concern:

Be it known that I, REUBEN D. TURNER, of the city, county, and State of New York, have invented a new and useful Improvement in Apparatus for Making Vinegar and Acidulating other Liquids, of which the following is a full, clear, and exact description, reference being had to the accompanying drawing forming part of this specification, and in which—

Figure 1 represents a mainly sectional elevation of an apparatus constructed in accordance with my improvement;

Figure 2, a plan of certain liquid and air-chambers, or belts, with spray-pipes connected, forming a portion of said apparatus; and

Figure 3 is a sectional plan through the tank portion of the apparatus, taken as indicated by the line $x x$ in fig. 1.

Similar letters of reference indicate corresponding parts.

This invention has for its basis the same principle of action which is described in Letters Patent No. 96,056, issued October 19, 1869, and in which the liquid to be treated is exposed in a mist or spray form to the oxidizing influence of atmospheric air, by means of spraying devices operating in combination with a receiver.

The present invention, however, has for its object a different purpose, and embraces various peculiarities of construction and combination of devices with such an apparatus as hereinafter described, for making vinegar or acidulating other liquids.

Referring to the accompanying drawing—

A represents the receiver, preferably of circular form, and mounted with a goose-neck, or other suitably-shaped top.

B and C are annular chambers, or hollow belts, arranged to surround the receiver near its top, and forming a portion of the spray apparatus, the chamber B holding the liquid from which the vinegar is to be made, and which may be forced up to it from a vessel, D, by a pump, E, and be kept at a uniform level therein by an overflow or return-pipe, F, and the chamber C serving to receive and distribute atmospheric air, forced or blown into it by an air-pump, G.

The spray-pipes or tubes H, which may be of the same construction as those described in my patent hereinbefore referred to, are suitably connected with these chambers B and C, and arranged so as to project radially within the receiver A.

Within said receiver, below the spray-tubes H, is a bowl-shaped conductor, I, for the liquor under treatment after it has been broken into a spray by the tubes H, and exposed to the oxidizing influence of the air entering by said tubes and otherwise contained within the receiver, and which of itself partly accomplishes the process designed by this improvement.

This conductor I is corrugated in a radial manner, as it were, from a bottom outlet, a , which is serrated at its edge, by which construction of the conductor, the liquid, as it falls atom by atom, is gathered in thin streams, in a straight and divided manner, down on to a radially corrugated and serrated scatterer, J, of convex or sloping shape, to equalize the distribution, and spread or deliver it in thin straight streams on to a series in succession of reverse conical disks, K L, having a central passage-way up through them for the introduction of heated air issuing from a distributor, M, to permeate and act upon the liquid under process of treatment.

These disks K L are also corrugated, and the upper ones, K, serrated at their edges, to direct the liquid in thin straight streams over their surfaces as it passes toward and over the peripheries of the upper disks on to the lower ones, and, from the latter, at the inner edges, on to the next succeeding upper disk, and so on in succession, reversing and extending the travel, and exposing the liquid in thin layers or streams in a protracted manner to the oxidizing influence of the air, the liquid finally being delivered at the bottom of the receiver, from which it may be drawn off perfectly acidulated.

The heated air, entering by the distributor M, materially assists the process, and, if desirable, the air entering by the spray-tubes may also be heated.

The same air-pump G that is used to supply the spray-tubes may also be used to supply the distributor M, and the air, as it passes to the latter, be caused to circulate through a tubular or other heater, N, of any suitable description, heated by steam or otherwise.

The apparatus, as thus constructed and operating, will effect a most perfect and rapid acidulation of the liquid or mixture under treatment, by reason of the finely divided and protracted exposure of it to air within the receiver.

What is here claimed, and desired to be secured by Letters Patent, is—

1. The combination of the conductor I, scatterer J, and reverse conical disks K L, constructed and arranged within the receiver A, for operation in connection with the spray-tubes H, substantially as specified.

2. The combination of the heater N, and air-distributor M, with the reverse conical disks K L, scatterer J, conductor I, and spray-tubes H, within the receiver A, essentially as shown and described.

REUBEN D. TURNER.

Witnesses:

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