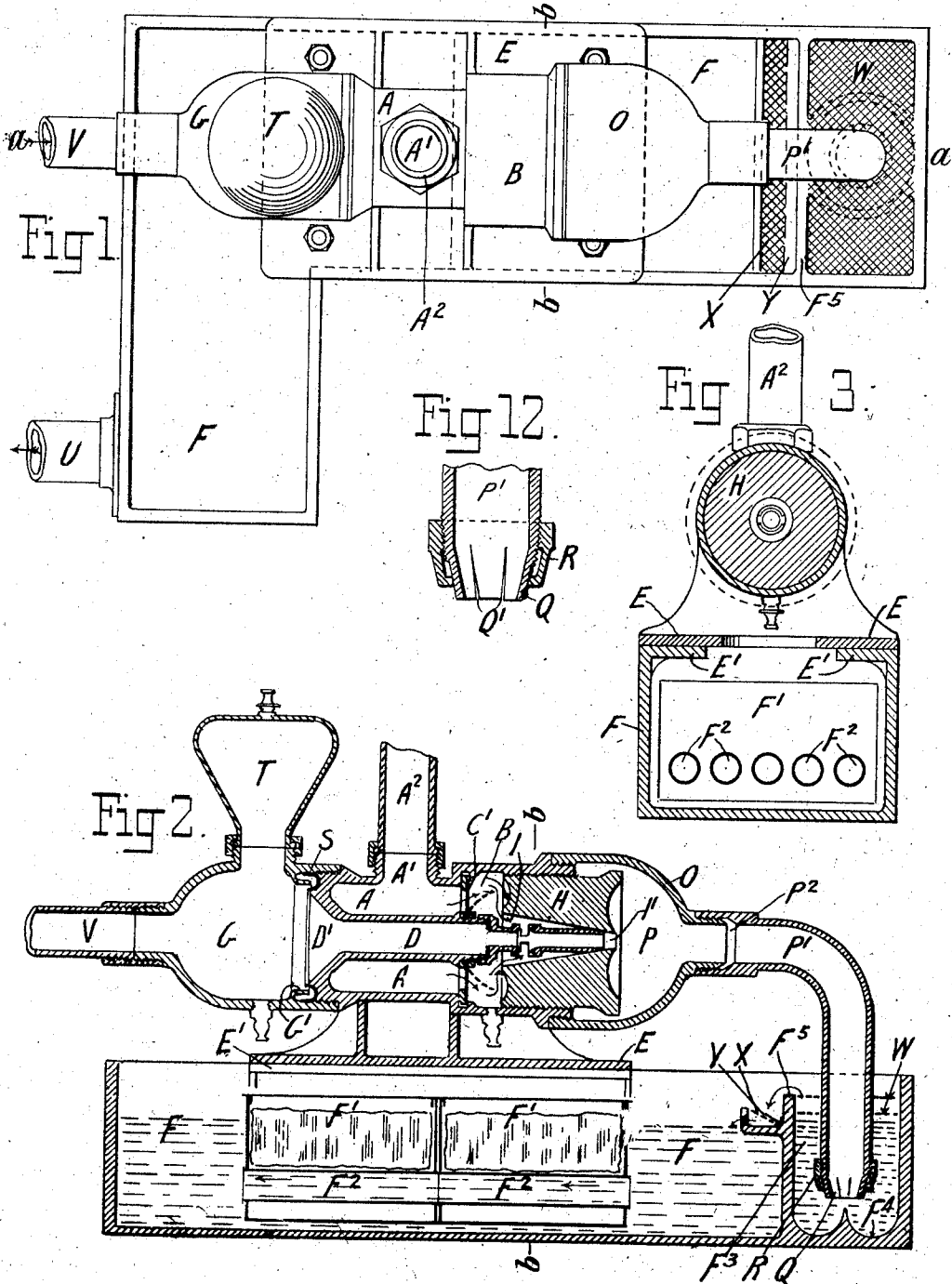


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ASPIRATOR.

APPLICATION FILED MAR. 27, 1908.

Patented Dec. 22, 1908.
2 SHEETS—SHEET 1.

907,392.



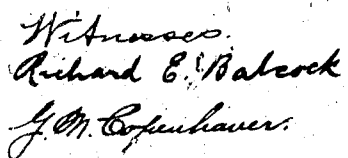
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2 SHEETS—SHEET 2.



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UNITED STATES PATENT OFFICE.

CHARLES WESLEY NANCE, OF SYDNEY, NEW SOUTH WALES, AUSTRALIA.

ASPIRATOR.

No. 907,392.

Specification of Letters Patent.

Patented Dec. 22, 1908.

Application filed March 27, 1908. Serial No. 423,588.

To all whom it may concern:

Be it known that I, CHARLES WESLEY NANCE, a citizen of the Commonwealth of Australia, residing at No. 348 Oxford street, Paddington, Sydney, in the State of New South Wales, in the Commonwealth of Australia, provision merchant, have invented certain new and useful Improvements in Aspirators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

The object of this invention is to provide an efficient means whereby the complete exhaustion of the air, vapor, and gases contained in hermetically sealed chambers or vessels, together with their contents—such as articles of food—may be accomplished with greater expedition and thoroughness than heretofore, so as to insure a wholly vacuous condition within such vessels.

The maximum point of vacuity to be reached by the use of this invention will at all times coincide with the barometrical reading which is locally the natural result of existing atmospheric pressures. Such coincidence can be scientifically regarded as the practical attainment of the maximum vacuum.

By experiment it has been ascertained that articles of food, such as eggs, meat, fish, and such like, placed in suitably sealed vessels and operated upon by this invention, are wholly freed from the gases which ordinarily produce deterioration and decay. As an exhausting appliance, this invention is also applicable to other useful purposes, such, for instance, as an aid to the satisfactory completion of laboratory tests essential to the success of scientific research and investigation, also as a mechanical adjunct to pneumatic carrier systems, and likewise in the production of perfectly constructed incandescent electric bulbs, in all of which the principle of exhaustion or extraction of air, vapor, and gases is involved.

Referring to the accompanying drawings which form part of this specification, and in which similar letters are used throughout the different views to indicate similar parts: Figure 1 is a plan of the appliance. Fig. 2 is a vertical sectional elevation on line *a-a* of Fig. 1. Fig. 3 is a transverse sectional elevation on line *b-b* of Fig. 1. Fig. 4 is a de-

tail, vertical longitudinal central section of the chamber G hereinafter described; Fig. 5 is a detail, longitudinal, vertical central section of the liquid tube, the sole plate, the valve and valve seating and sundry proximate parts; Fig. 6 is a detail, longitudinal section of the plug H hereinafter described; Fig. 7 is a detail front elevation of the valve and valve seat; Fig. 8 is a detail side elevation of the same; Fig. 9 is a detail, longitudinal, vertical section of the exit tube N and the nose piece J; Fig. 9^a represents a detailed view of the parts J, N and their connections similar to that in Fig. 9, but on a larger scale and with some of the minor elements detached; Fig. 10 is a detail, central, longitudinal section of the casing O, the plug H being shown in dotted lines; Fig. 11 is a detail end elevation of the friction ferrule K and Fig. 12 is a detail, longitudinal, central section of the tail piece of the outlet pipe (broken away) and the nut fitting thereon.

The stationary part of the appliance is the induction chamber A, seen enlarged in Fig. 5, associated with the mixing chamber B and the circular valve seating C with its flexible valve C¹ clamped on the liquid tube D, the seating being likewise secured beneath the fixed lugs C². The sole plate E is used to secure the chamber A to the flanges E¹ formed on the fluid container or liquid reservoir F, as in Figs. 1, 2, and 3.

The removable parts consist of the cushioning and compression chamber G, as in Fig. 4; the adjustable plug H with its conical passage or central bore I, as in Fig. 6. The circular valve seating C and flexible valve C¹, secured by the nut C³ to the liquid tube D, are likewise removable, as shown in Figs. 7 and 8. Also the nose piece J screwed to the liquid tube D behind the re-seating valve C¹, the friction ferrule K, the screwed washer L which retains the ferrule in place, the bridled collar M fitting on the nose piece J and inclosing both the ferrule K and the washer L. Bands M¹ connect the said collars and have the same internal screw to receive the washer L which is adjustable. The exit tube N is retained in the bridled collar M, and when fully seated as shown in Figs. 2 and 9 is kept in place by the adjustable plug H, the outward taper N¹ coinciding with the taper of the conical tube I. The plug is shown in dotted lines in Fig. 9. The other removable parts are the casing O which, in combination

with the concave outer face H^1 , forms the ebullition chamber P, whose outlet pipe P^1 is provided with a contracted tail piece Q (*vide* Figs. 2 and 12) which may be either expanded or contracted by adjusting the traveling nut R, thus either opening or closing the slits Q^1 . The cup leather S, the air chamber T, the induction pipe A^2 communicating with the inlet port A^1 , are all likewise removable.

10 It is arranged in this invention that the impellent liquid shall be primarily stored in the container F ready for circulation by suitable pumps to be connected to the suction and delivery pipes, U and V, to secure the re-use of the liquid. Oil is regarded as a preferable fluid to water because of its equable temperature, but any fluid used is caused to pass through the tubes F^2 of the removable ice-boxes F^1 , to obtain a suitable temperature.

20 In the chamber G the liquid is rendered more forceful, its flow regular, and the pressure constant, by the air cushion which forms in the vessel T, also, pressure is maintained on the cup leather S located under the inverted cell G^1 to prevent leakage. The concentration of the fluid into the tube D is accomplished through the funnel shaped mouth D^1 . The diameter of the said tube bears a certain essential relation to the diameter of the pipe V, in the ratio of 1 to 1.25, to obtain the required velocity in the nose piece J whose internal diameter is in the ratio of .5 to 1 of the tube D. The friction ferrule K, to be regulated and secured as described, has its discharging orifice K^1 (as in Figs. 9^a and 11) formed with serrations which give the maximum amount of friction and create V shaped channels in the issuing stream which thoroughly infold the air and gases drawn through the induction chamber A as the flexible valve C^1 is unseated.

It is essential to secure the rapid movement of the flexible valve and to establish equilibrium of pressure in chambers A and B, and for that purpose minute chases (shown dotted in Fig. 7) are cut on the working face of the valve seating C, extending from the ports C^4 to a little beyond the margin of the valve C^1 . The aggregate areas of the ports C^4 are equal to the area of the main inlet port A^1 , which also coincides with the area of the induction pipe A^2 .

Figs. 2, 5, and 9 show, in dotted lines, the flexible valve C^1 unseated, its curved formation being serviceable to direct a cylindrical flow of the air and gases into the mixing chamber B, whose concave end H^2 is formed by the inner face of the adjustable plug H screwed into the chamber. The plug's central conical tube J is adapted to receive and secure the protruding exit tube N with the associated parts as before mentioned, its open portion is an essential and peculiar enlargement of the chamber B, and controls the inflow of the air and gases, as shown by the

arrows in Fig. 2. Moreover, whenever back pressure occurs from any cause, and the fluid escapes into it from either of the tubes J and N, or from both of them, it becomes serviceable in so directing the flow that it will instantly impinge against valve C^1 , rapidly re-seating it, and thereby preventing the flooding of the induction chamber A.

The combined liquid, air, and gases escaping into the ebullition chamber P, are first allowed to expand in the taper tail part P^1 , the open orifice being of the same diameter as the exit tube N. In the outlet pipe P^1 is formed a circular re-action cavity P^2 to hinder the back flow of the liquid. The pipe is the same diameter as the delivery pipe V, and is directed into an air-releasing chamber F^3 , the contracted outlet Q discharging into the conical saucer F^4 . The aerated liquid, in its upward movement, encounters the floating double screens W by which the particles are separated, the fluid passing over the lip F^5 and falling on to the screen X, is clarified in the well Y, from whence it passes into the container F for re-use. Drain-cocks may be provided for chambers B, G, and P, for the escape of the impellent liquid, and a relief cock may also be provided for the air vessel T.

It is essential, in order to obtain thorough efficiency with the appliance, first, that the friction ferrule K should be rightly adjusted according to the force of the impellent liquid, secondly, that the conical plug H should be fully seated upon the conical end N^1 of the exit tube N, and, lastly, that the contracted tail piece Q should be adjusted by the traveling nut R to the required dimension, which is to be ascertained by experiment, the said opening varying according to the force with which the impellent liquid is driven.

Having now described my invention, what I claim as new and desire to secure by Letters Patent is:

1. In an aspirator an induction chamber having an inlet port, in combination with a liquid tube, a valve seating provided with ports in its working face, means for retaining said valve seating in place, a flexible valve adapted to fit on said valve seating, a mixing chamber arranged to receive the discharge of said liquid tube and fitted on one end of said induction chamber, a plug removably fitting into said mixing chamber, a casing detachably fitting on said mixing chamber and surrounding said plug, a cushioning and compression chamber detachably fitted on the end of said induction chamber opposite to said casing substantially as set forth.

2. An air induction chamber and mixing chamber and a valve controlling communication between them, in combination with a detachable compression chamber, an air chamber communicating therewith but

otherwise closed, packing for the joint of said detachable chamber arranged to be tightened by the pressure of the air in said air chamber, and a liquid pipe from said compression chamber which pipe communicates near its forward end with said mixing chamber in order that the mingled air and liquid may flow out together, the apparatus being adapted to allow the subsequent escape of the air from the liquid substantially as set forth.

3. The removable nose-piece of an aspirator, in combination with an exit pipe in line with said nose-piece and connecting devices between these parts consisting of a friction ferrule, a washer, a bridled collar and intervening band, the said collar and band being internally screw-threaded to fit said washer, and an adjustable plug having a conical tube or bore formed therein, adapted to receive said pipe exit.

4. In an aspirator, in combination with a mixing chamber, a removable plug fitting therein and having a conoidal bore tapering continuously from end to end and concavities in its ends independent of said tapering bore and a casing surrounding one of the ends of said plug substantially as set forth.

5. In an aspirator, a casing forming an ebullition chamber, a movable plug within said chamber and having a bore or passage through it, an outlet pipe from said chamber having a slitted tapering tail piece and a nut screwed on said tail piece for regulating

the contraction thereof substantially as set forth.

6. In an aspirator, an outlet pipe tapered, longitudinally slitted, and screw threaded at its discharging end, in combination with a nut turning on the screw-threaded part of the same to increase or diminish the contraction thereof substantially as set forth.

7. In an aspirator the combination with an outlet pipe of an air releasing chamber having a conical saucer and floating screens substantially as set forth.

8. In an aspirator, a liquid reservoir, a sole plate resting on the same, removable ice boxes in said chamber and a suction pipe communicating with the latter and supplying the operative parts of the aspirator, the said sole plate being provided with flanges fitting the edges of said liquid reservoir to hold the said sole plate in place.

9. In an aspirator, a liquid reservoir in combination with an air releasing chamber, floating screens, a well screen and a well, said well-screen and well being located within and connected to said liquid reservoir substantially as set forth.

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

CHARLES WESLEY NANCE.

Witnesses:

H. A. IENES,
HARRY A. SMEDLEY.