June 11, 1935. A. JANESICK 2,004,371

STEAM PRESSURE ATOMIZER

Filed June 13, 1932

Fig. 1.

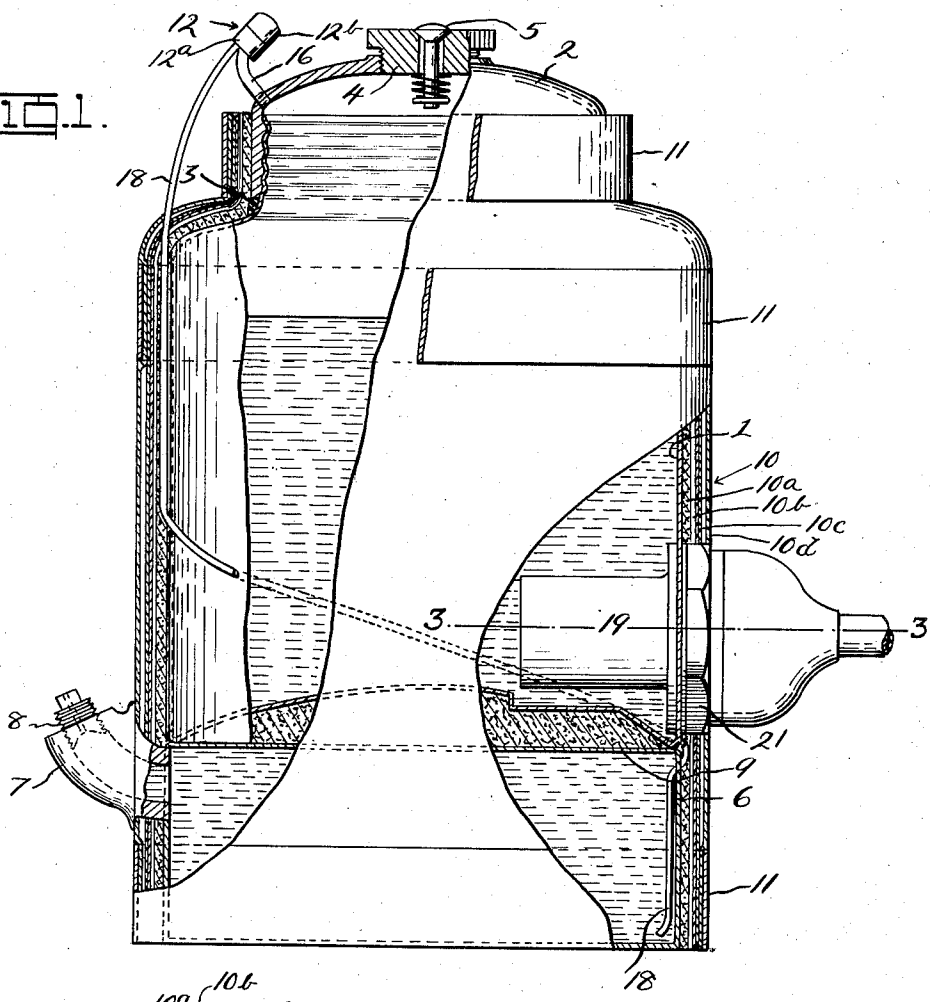


Fig. 3.

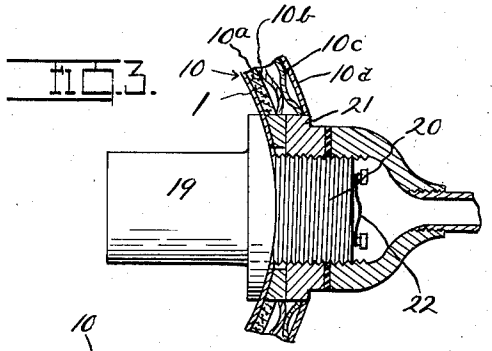


Fig. 2.

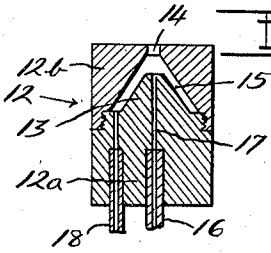
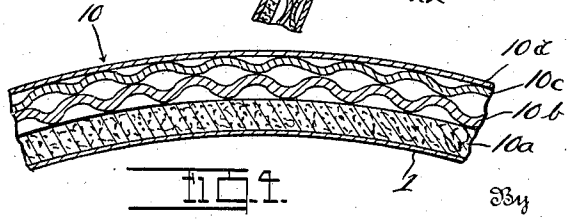


Fig. 4.



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STEAM PRESSURE ATOMIZER

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12 Claims. (Cl. 299—87)

This invention relates to atomizers and particularly to steam pressure atomizers.

An object of the invention is to position a receiver for a liquid to be atomized beneath a boiler for generating steam employed to atomize said liquid, whereby said liquid is subjected to a moderate heating effect by the boiler, facilitating atomization of the liquid, and whereby, the assembly formed by said boiler and receiver may, while in operation, be disposed upon a table or other piece of furniture without damage resulting from the high temperature of the boiler.

Another object is to deliver liquid from said receiver to an atomizing head through a discharge tube extending in a heat absorbing relation to the boiler, and to furthermore extend said tube between the boiler and a heat insulating jacket embracing the boiler.

Still another object is to interpose heat insulation between said boiler and receiver, to prevent undue heating of the contents of said receiver by the boiler, and to further utilize said insulation to hold the boiler and receiver in assembled relation.

A further object is to conserve the heat generated in the boiler and that applied to said receiver by embracing both the boiler and receiver by a heat insulating jacket, and to further utilize said jacket to maintain the assembled relation of the boiler and receiver.

A further object is to provide a steam pressure atomizer comprising a boiler having a delivery connection to an atomizing head, to which is further delivered the liquid to be atomized, the discharge from head being across the top of the boiler, so that heated air rising from the boiler will resist any separation of liquid particles from the discharging spray.

A further object is to employ an electrical heater for the boiler of a steam pressure atomizer, and to close the circuit of said heater through a member subject to the heat of said heater and adapted to fuse when the supply of water in the boiler becomes too depleted to submerge said heater, said fusible member being located, conveniently for replacement exteriorly of the boiler.

These and various other objects the invention attains by the construction hereinafter described and illustrated in the accompanying drawing, wherein:

Fig. 1 is an elevational view of the improved apparatus, partially in section.

Fig. 2 is an axial sectional view of the atomizing head.

Fig. 3 is a fragmentary sectional view taken upon the line 3—3 of Fig. 1, and particularly showing the mounting upon the boiler of the electrical heater.

Fig. 4 is a fragmentary horizontal section showing the component layers of the heat insulating jacket.

In these views, the reference character 1 designates a cylindrical boiler, formed preferably of aluminum, the top portion of said boiler being somewhat reduced in diameter and threaded for engagement by a metal cover 2, which closes a circular opening in said reduced portion. A packing ring 3 of rubber, leather, or the like is compressed by said cover against the boiler to form a steam tight joint. Centrally formed in said cover is a filling opening, which is normally tightly closed by a threaded plug 4 or the like, and a safety valve 5, adapted to open responsive to a predetermined boiler pressure, is arranged to control a small steam vent centrally formed in said plug.

Beneath the boiler and in a supporting relation thereto is a cylindrical receiver 6 for a liquid of a disinfectant or any other desired nature, which is to be discharged to the atmosphere by the atomizer, in the form of a fine spray. Said receiver is of substantially the same diameter as the boiler, and is equipped with an upturned filling neck 7, which projects radially some distance beyond the flush exterior walls of the boiler and receiver, and is normally closed by a screw plug 8 or the like. The bottom of the boiler is spherically upwardly dished, thereby increasing its resistance to steam pressure and forming a space above the receiver, substantially coextensive with the top face thereof, which may receive a heat insulating packing 9. This packing is preferably asbestos, which is applied in a wet or pulpy state, the boiler and receiver being pressed together to compress said packing. When the latter dries and hardens, it adheres strongly to both the boiler and receiver and thus acts as a securing means to maintain the described assembled relation of said parts.

Said assembly is further strongly maintained by a heat insulating jacket 10, which snugly embraces both the boiler and receiver, extending substantially the full height of the atomizer, conforming to the reduced upper portion of the boiler and marginally embracing the cover 2. Said jacket preferably comprises an inner layer 10a of flat sheet asbestos, which is preferably glued or otherwise firmly secured to the receiver, boiler, and cover 2. Surrounding said layer is a thickness of vertically corrugated sheet asbestos 10b,

and about this is applied a thickness 10c of vertically corrugated, heavy paper, and there may be finally applied if desired, a thickness of paper or other sheet material 10d, colored to imitate leather or to impart any other desired finish. To bind said jacket very securely in place upon the boiler 1, receiver 6, and cover 2, it is preferred to tightly engage the jacket by three metal bands 11, preferably aluminum, jointly clamping the jacket firmly upon each of the specified parts.

Mounted upon the cover 2 of the boiler above the margin thereof is an atomizing head 12 (see Fig. 2), which is preferably cylindrical and comprises an inlet member 12a and an outlet member 12b, said members being in screw-threaded engagement. The opposed end faces of the members 12a and 12b are formed respectively with a conical projection 13 and a conical recess receiving said projection and having a vapor outlet 14 at its apex. The projection 13 is spaced from the wall of said conical recess to form a suction chamber 15. To support the head 12 and deliver steam thereto from the boiler, a short length of curved metal tube 16 is at one end rigidly mounted upon the cover 2 and opens through the latter, its other end being axially inserted in the member 12a and communicating with a passage 17 aligned with and opening toward the outlet 14.

For delivering liquid to said atomizing head from the receiver 6, a flexible metallic tube 18 extends from said receiver to said head in heat absorbing relation to the boiler. The lower end portion of said tube extends into said receiver through a fluid sealed opening, having a terminal inlet adjacent to the receiver bottom, and in extending upward from the receiver, the tube passes between the boiler and heat insulating jacket. The heating effect of the boiler upon the liquid discharging through the tube may be increased to a desired extent by spiraling the tube around the boiler, as is clearly indicated in Fig. 1. The upper end of the tube 18 is inserted eccentrically in the member 12a of the atomizing head through which the liquid is delivered to the outer portion of the suction chamber 15.

An electric heater 19, of any suitable construction, is positioned in the lower portion of the boiler, and may be mounted in a vertical wall of the boiler, through which a threaded portion 20 of said heater projects outwardly for engagement by a clamping nut 21. It is preferred to mount on said portion, exteriorly of the boiler, a fusible member 22 which lies in the circuit of the heater and is subject to the heat generated by the heater, said member being adapted to melt when the heater temperature rises materially above the boiling point of water. Thus melting of said member will automatically break the heater circuit in case the supply of water in the boiler becomes so depleted as to leave the heater uncovered.

In operation of the invention, upon energization of the heater, the temperature of water in the boiler is soon raised to the boiling point, and steam is discharged from the atomizing head, drawing up a flow of liquid from the receiver 6 through the tube 18, and said liquid discharging with the steam in a finely vaporized form. The location of the atomizing head adjacent to a margin of the cover 2, and the arrangement of said head to discharge above and across said cover utilizes the rise of heated air from the boiler to resist any tendency toward dripping of liquid from the atomizing head or downward spattering of liquid particles from the spray.

The insulating jacket 10 conserves heat in the boiler and receiver and further permits the atomizer to be manually held, while in use, without resulting discomfort. Also said jacket serves to strongly hold the boiler and receiver in proper assembly and to secure the cover 2 in place.

Because of the location of the atomizing head adjacent to the margin of the cover 2, and the direction of discharge from said head toward the axis of the atomizer, any such tilting of the atomizer as is required to give a downward direction to the discharging spray will still maintain the point of steam discharge from the boiler uppermost and insure against water delivery from the boiler to the atomizing head.

The described composite heat insulating jacket has been found highly efficient both in resisting heat transmission and in supplying adequate strength to strongly hold the engaged parts in assembly.

The invention is presented as including all such modifications and changes as properly come within the scope of the following claims.

What I claim is:

1. A steam pressure atomizer comprising a boiler for generating steam, heating means for the boiler therewithin, a liquid receiver arranged beneath and in heat-absorbing proximity to said boiler, means for holding said boiler and receiver in assembled relation, a liquid discharge tube leading from the lower portion of said receiver, an atomizing head providing an outlet for said tube, and a steam delivery connection from said boiler to said atomizing head.

2. A steam pressure atomizer comprising a boiler for generating steam, a liquid receiver arranged beneath said boiler, means for holding said boiler and receiver in assembled relation, an atomizing head adjacent to the top of the boiler, a liquid discharge tube leading from the lower portion of said receiver to said atomizing head, and extending in a proximity to the boiler adapting the boiler to heat the discharging liquid, and a steam delivery connection to said atomizing head from the boiler.

3. In a steam pressure atomizer as set forth in claim 2, the bottom of said boiler being upwardly dished and thereby forming a space above said receiver, heat insulation in said space.

4. In a steam pressure atomizer as set forth in claim 2, the bottom of the boiler being upwardly dished and thereby forming a space above said receiver, heat insulation in said space holding the boiler and receiver in assembled relation.

5. A steam pressure atomizer as set forth in claim 2, said receiver having an upturned filling neck, laterally projecting beyond said boiler, and opening from the top portion of said receiver.

6. A steam pressure atomizer as set forth in claim 2, said means for holding the boiler and receiver in assembled relation comprising an insulating jacket, jointly embracing said boiler and receiver.

7. In a steam pressure atomizer as set forth in claim 2, an electrical heater projecting into the lower portion of the boiler through a substantially vertical wall of the boiler.

8. A steam pressure atomizer as set forth in claim 1, said liquid discharge tube being extended some distance around the boiler, in heat absorbing relation to the boiler.

9. A steam pressure atomizer comprising a boiler, for generating steam, a liquid receiver positioned beneath said boiler, a heat insulating jacket jointly embracing said boiler and receiver,

a liquid discharge tube having an inlet in the lower portion of said receiver and leading upwardly between said jacket and the boiler, an atomizing head engaged by the upper end of said tube, and a steam delivery connection from the boiler to said head.

10. In a steam pressure atomizer, a boiler and a liquid receiver arranged in juxtaposition and forming a single assembly, an atomizing head, a steam delivery connection from the boiler to said head, and a liquid discharge tube leading to said head from said receiver and extended some distance around the boiler, in heat absorbing relation to the boiler.

11. A steam pressure atomizer comprising a boiler having a vertical axis, a liquid receiver, means for holding said boiler and receiver in assembled relation, an atomizing head positioned above the boiler and discharging substantially toward the axis of the boiler, a steam delivery connection from the boiler to said head, and a liquid delivery connection to said head from said receiver.

12. An atomizer comprising a boiler, a liquid receiver, means for holding said boiler and receiver in assembled relation, an atomizing head carried by the boiler marginally of its top face and discharging across said face, a steam delivery connection from the boiler to said head, and a liquid delivery connection to said head from said receiver.

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