

Dec. 8, 1931.

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1,835,283

METHOD OF ATOMIZING FLUIDS FOR CLEANING PURPOSES

Filed July 23, 1928

2 Sheets-Sheet 1

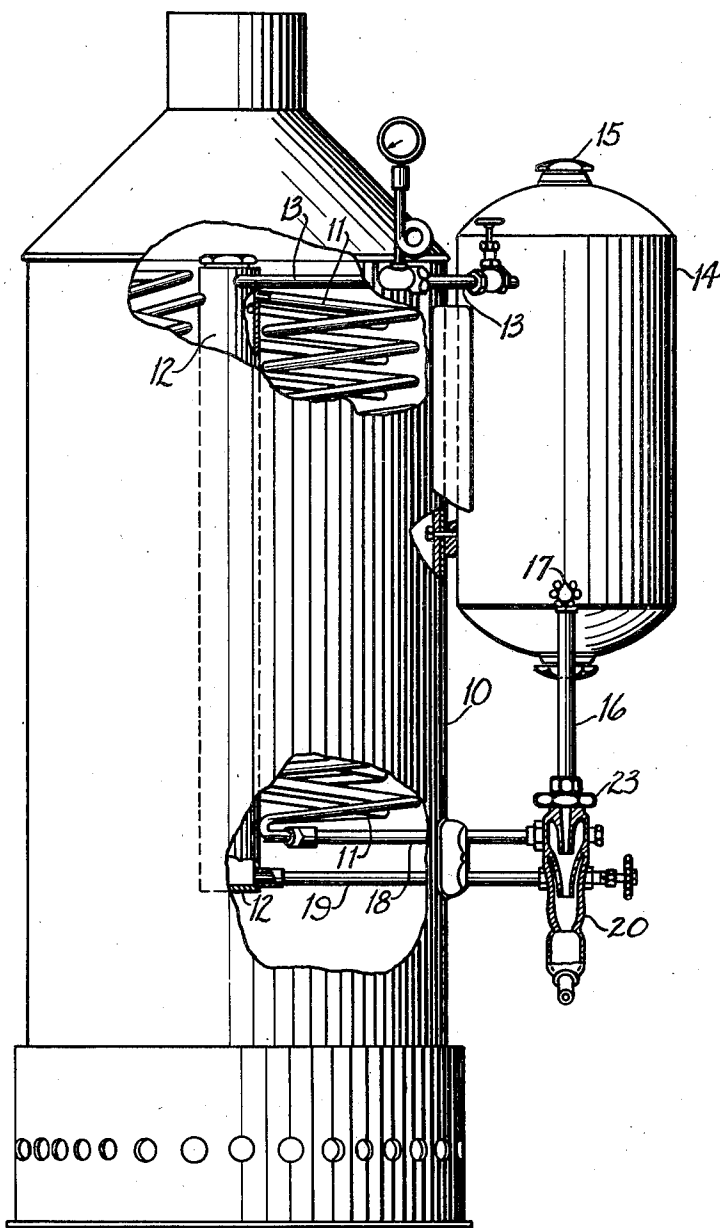


Fig. 1.

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2 Sheets-Sheet 2

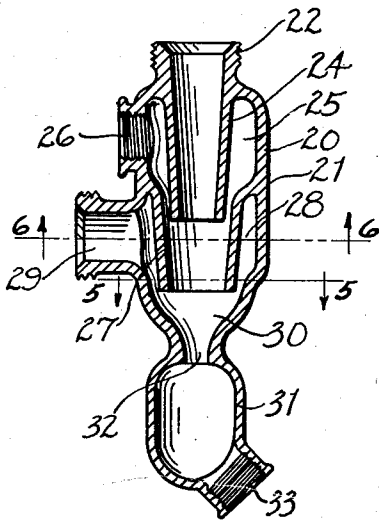


Fig. 3

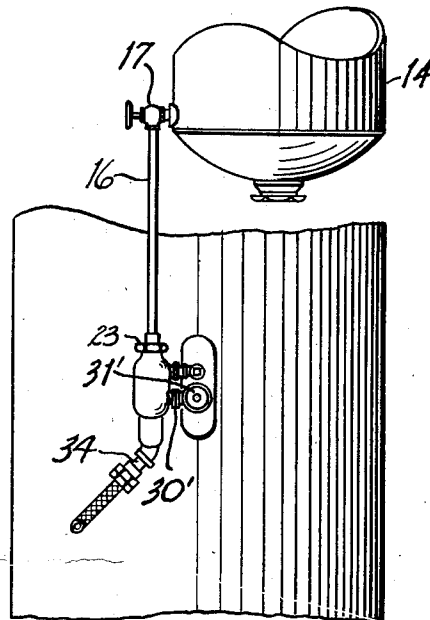


Fig. 2.

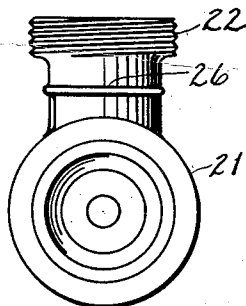


Fig. 4

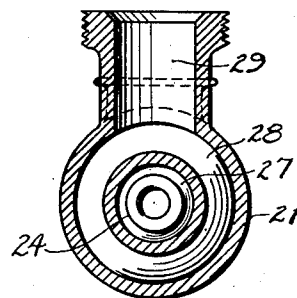


Fig. 6

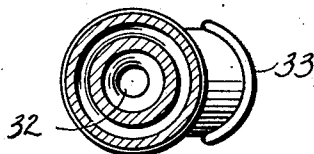


Fig. 5

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UNITED STATES PATENT OFFICE

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METHOD OF ATOMIZING FLUIDS FOR CLEANING PURPOSES

Application filed July 23, 1928. Serial No. 294,846.

This invention relates to new and useful improvements in method of atomizing.

One object of the invention is to provide an atomizing method whereby fluids of three constituents may be thoroughly mixed and atomized in a new and novel manner.

A further object of the invention is to provide a method wherein a detergent liquid is fed into the path of an atomizing fluid and the two mixed with a liquid for diluting the detergent liquid.

Another object of the invention is to provide a method whereby heated fluids may be mixed and atomized at a point in close proximity to the source of heating and supplying said fluids.

A construction designed to carry out the invention will be hereinafter described, together with other features of the invention.

The invention will be more readily understood from a reading of the following specification and by reference to the accompanying drawings, in which an example of the invention is shown, and wherein:

Fig. 1 is a view partly in elevation and partly in section showing an apparatus constructed in accordance with the invention,

Fig. 2 is a side elevation of some of the parts shown in Fig. 1,

Fig. 3 is a vertical sectional view of the suction atomizer,

Fig. 4 is a plan view of the same,

Fig. 5 is a horizontal cross-sectional view taken on the line 5—5 of Fig. 3, and

Fig. 6 is an enlarged horizontal cross-sectional view taken on the line 6—6 of Fig. 3.

In the drawings the numeral 10 designates an upright jacket having vertical steam coils 11 therein connected at their upper ends to a central column 12. A pipe connection 13 leads from the top of the column 12 and enters a tank 14 mounted on the side of the jacket. The tank 14 has a cap 15 which may be removed for introducing a suitable detergent material, such as soap, caustic alkali or any other ingredient. A structure of a similar type is clearly set forth in the co-pending application of Stuart A. Wier, filed February 14, 1927, Serial No. 168,161.

A hot fluid, such as hot water or saturated

steam, is conveyed by the pipe 13 to the tank 14 and a hot detergent liquid is formed therein. A discharge pipe 16, including a valve 17, is connected to the lower end of the tank 14 and one side thereof. The steam coils 11 are connected at their lower end with a steam discharge pipe 18 extending through the side of the jacket, and a hot water discharge pipe 19 leads from the lower end of the column 12 through the side of the jacket.

The pipes 16, 18 and 19 are connected with a suction atomizer 20, which is shown in my co-pending application filed May 5, 1928, Serial No. 275,355. This atomizer includes a hollow metal body 21 having an externally screw-threaded nipple 22 at its upper end which receives a union 23 for connecting the atomizer with the lower end of the pipe 16. A downwardly tapered nozzle or jet 24 depends axially from the nipple through a suction chamber 25 in the body. A short nipple 26 on the side of the chamber is internally screw-threaded for receiving the pipe 18, whereby steam is discharged into the chamber 25.

The chamber is merged at its bottom into a depending jet or nozzle 27 concentrically surrounding the jet 24. The jet 27 is somewhat larger at its upper end than the lower end of the jet 24, thus providing an annular passage therebetween. The lower end of the jet 27 is larger than the lower end of the jet 24 so as to readily discharge the combined fluids flowing from the jet 24 and the chamber 25.

The jet 27 is integral with the walls of the body 21 and is surrounded by a section chamber 28. A long nipple 29 having external screw threads enters the chamber 18 below the nipple 26 and is connected with the water discharge pipe 19 by a union 30'. A control valve 31' is connected in the pipe 19.

The chamber 28 is merged into a reducing neck 30 and this neck is connected with a bowl 31 through a reduced orifice 32. A nipple 33 extends from the bowl and is connected with a discharge conductor 34.

Where fluids of different characteristics, such as steam, hot water and a detergent

liquid are directed into a single stream, it is desirable to thoroughly commingle the fluids and also to atomize the same. It will be seen that the hot detergent liquid flowing
 5 down the pipe 16 will be discharged into the jet 24. The steam from the coils 11 flowing through the pipe 18 will discharge into the chamber 25 and downward into the jet 27. The suction thus created will draw the hot
 10 detergent solution from the jet 24 as the steam enters the jet 27.

As the steam and solution flow from the jet 27 the hot water supplied to the chamber 28 by the pipe 18 will be drawn down into
 15 the neck 30, whereby all of said fluids will be compressed owing to the converging of said neck. These fluids upon being compressed and discharging through the orifice 32 will be given an increased velocity. Upon
 20 entering the bowl 23 the fluids will expand so that atomization will take place, but there will again be a compressing when discharging through the nipple 33.

It will be seen that the amount of hot
 25 water supplied for diluting the detergent liquid may be controlled by the valve 31'. The atomizing of the fluids by reason of the suction of the steam will cause a steady flow and prevent fluctuating, particularly
 30 back through the steam coils and in the column 12. This system will produce a steady flow of a single fluid through the conductor 34. The pressure being equalized throughout the whole device, the hot solu-
 35 tion will readily flow down through the pipe 16.

Various changes in the size and shape of the different parts, as well as modifications and alterations, may be made within the
 40 scope of the appended claims.

What I claim, is:

1. The method of atomizing cleaning fluids which consists in feeding a detergent solution to an atomizer body, delivering a fluid
 45 under pressure to the atomizer body and inducing a flow of the detergent liquid through said body by said pressure fluid, delivering a hot liquid to the atomizer body for diluting the detergent liquid and inducing a flow
 50 thereof through said body by said pressure fluid, compressing said fluid and liquids in said atomizer body after admixture, and then delivering said fluid and liquids while hot to a common distributor discharging into the
 55 atmosphere.

2. The method of atomizing cleaning fluids which consists in feeding a detergent solution to an atomizer body, delivering a fluid
 60 under pressure to the atomizer body and inducing a flow of the detergent liquid through said body by said pressure fluid, delivering a hot liquid to the atomizer body for diluting the detergent liquid and inducing a flow
 65 thereof through said body by said pressure fluid, compressing said fluid and liquids in

said atomizer body after admixture, then expanding said fluid and liquids adjacent said point of compression, and then delivering said fluid and liquids in a single stream to a common distributing conductor discharging
 70 into the atmosphere.

3. The method of atomizing fluids for cleaning purposes which consists in feeding a hot detergent solution through a jet into the path of a gaseous fluid under pressure
 75 flowing circumferentially of the jet discharge, then feeding the solution and the pressure fluid through a second jet, then diluting the solution and pressure fluid contiguous to the second jet discharge with hot water, and then
 80 uniting the fluids in a single stream and conducting and expanding the same at the point of work.

4. The method of atomizing fluids for cleaning purposes which consists in feeding
 85 a hot detergent solution through a jet into the path of a gaseous fluid under pressure, then feeding the solution and the pressure fluid through a second jet, then diluting the solution and pressure contiguous to the second
 90 jet with hot water, then compressing the fluids into a single stream by retarding their flow, and then conducting the stream and expanding the same at the point of work.

In testimony whereof I affix my signature.
 95 CHARLES S. CRICKMER.

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