

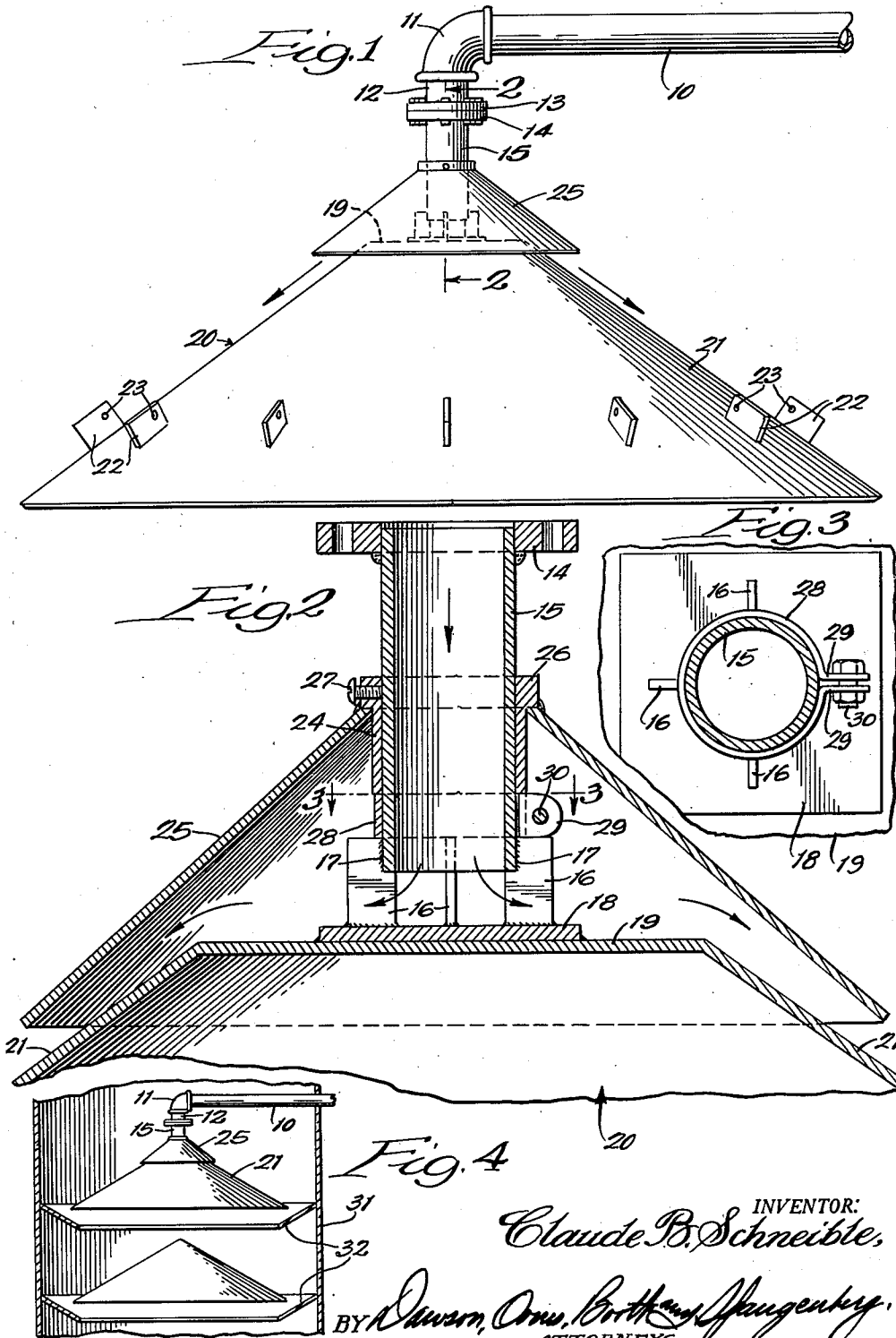
May 20, 1952

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2,597,192

LIQUID DISTRIBUTOR

Filed July 28, 1949



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UNITED STATES PATENT OFFICE

2,597,192

LIQUID DISTRIBUTOR

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Application July 28, 1949, Serial No. 107,237

3 Claims. (Cl. 261-121)

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This invention relates to a liquid distributor. The liquid distributor may be used at the top of a tower or column or at spaced points therein or at any other point where an even distribution of liquid is desired. The device is particularly useful in a dust or fume collecting apparatus as means for obtaining an even distribution of liquid over the entire surface of a horizontal plane, a cone, truncated cone, or other such surface.

An object of the invention is to provide a liquid distributor for providing an even distribution of liquid delivered into the distributor. A further object is to provide liquid distributing means for obtaining an even distribution of liquid over the entire surface of a horizontal plane, cone, truncated cone, or other such surface. Yet another object is to provide in a dust or fume collecting apparatus means for discharging an annular stream of liquid in a uniform manner for distribution within the apparatus. A still further object is to provide liquid distributing means, comprising a pair of members equipped with downwardly and outwardly inclined skirts arranged in nested but spaced apart relation, one of the members being adjustable with respect to the other to provide an adjustable jet and to provide also accessibility to the space between the members for cleaning, etc. Other specific objects and advantages will appear as the specification proceeds.

The invention is shown in illustrative embodiments, by the accompanying drawing, in which—

Figure 1 is a side view in elevation of distributor means embodying my invention; Fig. 2, a vertical sectional view on an enlarged scale, the section being taken as indicated at line 2—2 of Fig. 1; Fig. 3, a transverse sectional view, the section being taken as indicated at line 3—3 of Fig. 2; and Fig. 4, a vertical sectional view on a reduced scale, showing the liquid distributor applied for use in a dust or fume collecting column.

In the illustration given in Figs. 1 to 3 inclusive, 10 designates a liquid inlet pipe equipped with an elbow 11 and a nipple 12 supporting a flange 13. Bolted to the flange 13 is a flange 14 welded to the tube 15. The tube 15 at its lower end is shown welded to four standard plates 16, each having a cut-out corner portion 17 for receiving the tube. The lower portions of plates 16 are welded to a wear plate 18. The plate 18, in turn, welded to the upper flat wall 19 of the cone member 20. The cone member 20 has a downwardly and outwardly inclined side wall 21

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forming a skirt on which the liquid is to be discharged. To facilitate the raising and lowering of the member 21, the outer portion of the skirt may be equipped, if desired, with lug plates 22 provided with apertures 23 for receiving cable hooks, etc.

While I have shown the distributor member 20 suspended from the pipe 10, it will be understood that the member 20 may be supported from the side walls of a column or tower, or by any other suitable means. Further, if desired, the member 20 may be suspended from the top of a tower by cables or rods engaging the apertures in plates 22 and fixed at their upper ends to the top of the tower or column.

Slidably mounted upon the pipe 15 is a sleeve 24 to which is welded, or otherwise secured, a cone member or canopy 25. The upper portion of the sleeve may be equipped with a ring 26 threadedly receiving a set screw 27. While the set screw 27 or other suitable means may be employed for supporting the cone 25 at a desired elevation above the lower member 20, I prefer to employ a spacer ring 28 for this purpose, and the ring 25 may be equipped with parallel flanges 29 apertured to receive a clamping bolt 30, as shown best in Fig. 3. The spacer ring may be of varying height as desired to vary the height to which the sleeve 24 may be raised.

In the structure shown in Fig. 4, 31 designates a column or tower equipped with rings or baffles 32. The distributor, comprising the members 21 and 25, is supported over the uppermost baffle 32. The baffles may be of any desired construction and may be formed as shown in detail in my Patent No. 2,197,595. It will be understood that the distributor may be positioned at the top of a tower or column or at any desired elevation therein, or it may be employed in some entirely different apparatus where the uniform distribution of liquid in an annular stream is desired.

Operation

In the operation of the apparatus, the water or other liquid to be distributed is introduced through pipe 10 and pipe 15 into the interior of the space between the members 20 and 25. The liquid emerges from the bottom of the pipe 15 and flows outwardly between the flat plates 16 to substantially fill the chamber area. The water body is thus utilized, and the stream is discharged in an annular and uniform body through the annular orifice provided at the lower edge of the upper cone 25. With the structure shown, there is a minimum of turbulence and the water stream, after filling the chamber between the

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cones, is discharged in an annular body of uniform thickness over the distributor cone 20. If it is desired to discharge an annular stream of lesser thickness, the spacer 28 may be removed and a shorter spacer may be used or, if desired, the sleeve 24 may be dropped to a position where it rests upon the plates 16. By the use of the spacer rings of varying heights, the upper cone or canopy 25 may be adjusted to any desired height for controlling the amount of water distributed over the lower cone 20.

In the operation of the apparatus for certain purposes, dirty water or water containing foreign particles may be used, and this contaminates the distributor means. Further, foreign particles from the column or tower may find their way into the interior of the distributor apparatus. Access to the interior chamber between the cones 20 and 25 may be had readily by loosening the set screw 27 and raising the cone or canopy 25 to a position well above the lower cone 20. After cleaning or repairing, the upper cone may be adjusted to the desired height for the uniform distribution of liquid over the lower plate 20.

The wear plate 18 protects the wall 19 of the truncated cone 20, while at the same time providing a sturdy base for the spaced plates or standards 16.

The two cone members are found to be extremely efficient in distributing the liquid with a high degree of uniformity. The inclined spaced walls of the cones interfere to a minimum extent with the flow of water, preventing eddies or turbulence, and the water stream is discharged in a substantially annular body of uniform depth. Such even distribution is of the utmost importance in columns or towers where the water is to be applied over surfaces for contact with particle-laden fumes or gases, etc. The cone 20 has as its primary function the distribution of the liquid to form a curtain at its edge but also acts as a film-forming baffle to provide gas and liquid contact while the liquid is flowing over the extended surface of the cone 20.

While, in the foregoing specification, I have set out a single embodiment of the invention in considerable detail for the purpose of illustrating the invention, it will be understood that such details may be varied widely by those skilled in the art without departing from the spirit of my invention.

I claim:

1. In liquid distributing means, a truncated cone provided with a flat top wall, spaced standards carried by said wall and extending thereabove and providing therebetween outlet sectors of equal dimensions, an inlet pipe having its upper end fixed to the top portion of said standards for discharging liquid downwardly and out-

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wardly through the arc outlets provided by said standards, a sleeve slideably mounted upon said pipe, a cone member carried by said sleeve, and a removable spacer member enclosing said pipe and resting upon the top of said standards for supporting said cone member above said standards.

2. In liquid distributing means, a truncated cone, a wear plate carried by the top of said cone, a plurality of standards having their bottom portions welded to said wear plate and extending upwardly and outwardly from each other to provide therebetween equal arcuate discharge outlets, said standards being cut away along their top inner sides to provide seats for receiving an inlet pipe, an inlet pipe extending into the seats of said standards and secured thereto, a cone member provided with a ring slideably engaging said discharge pipe, and vertically movable thereon, and a supporting sleeve resting upon the top of said standards and engaging said ring to support said cone above said first-mentioned truncated cone.

3. In liquid distributing means, a truncated cone, a wear plate carried by the top of said cone, a plurality of standards having their bottom portions welded to said wear plate and extending upwardly and outwardly from each other to provide therebetween equal arcuate discharge outlets, said standards being cut away along their top inner sides to provide seats for receiving an inlet pipe, an inlet pipe extending into the seats of said standards and secured thereto, a cone member provided with a ring slideably engaging said discharge pipe and vertically movable thereon, a supporting sleeve resting upon the top of said standards and engaging said ring to support said cone above said first-mentioned truncated cone, and a set screw carried by said ring for temporarily supporting said cone member in elevated position on said discharge pipe for providing access to said standards.

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