Jan. 31, 1956 E. C. LASTER, SR., ET AL 2,733,103

FLUID DISPERSER

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Fig. 1

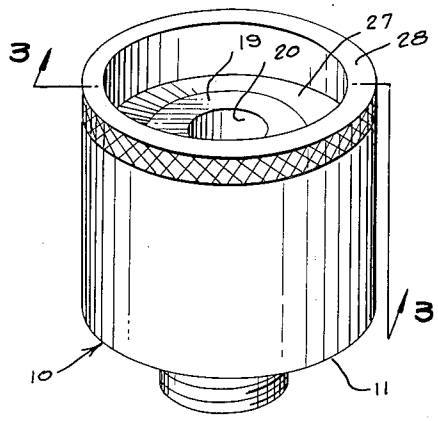
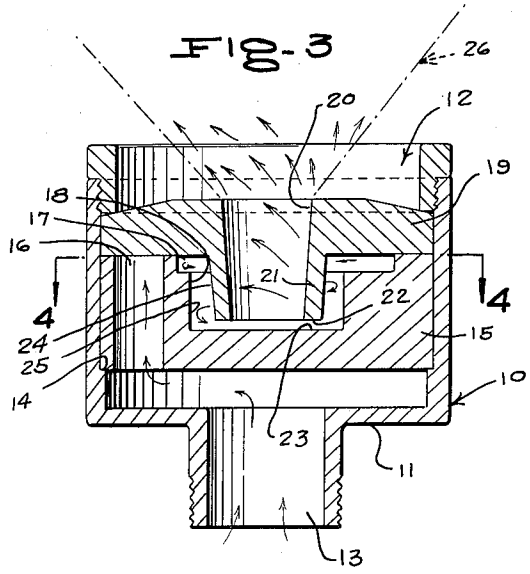


Fig. 3



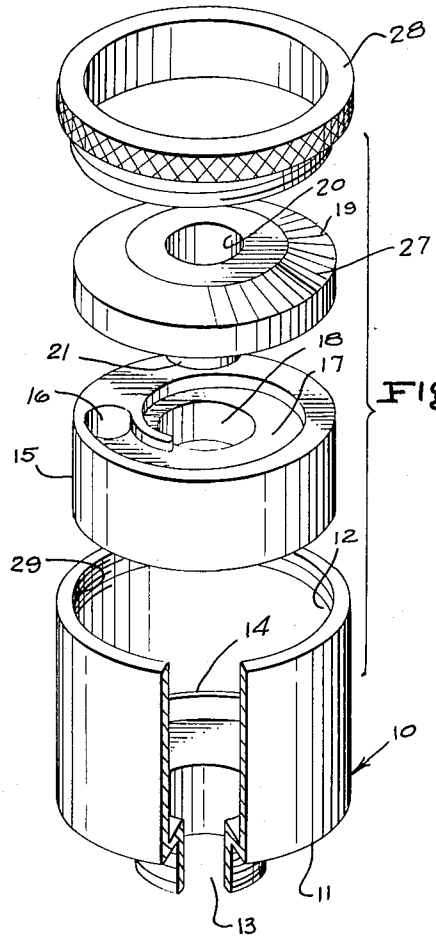
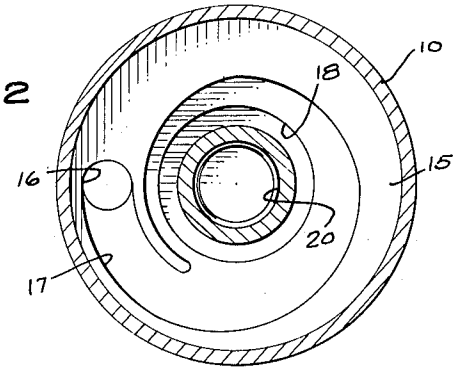


Fig. 2

Fig. 4



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FLUID DISPERSER

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3 Claims. (Cl. 299—120)

The present invention relates to a fluid disperser such as is used in a sprinkler head, an atomizer, a gas burner, or the like.

The primary object of the present invention is to provide a fluid disperser having means for efficiently and rapidly dispersing a liquid or a gas in another liquid or gas.

Another object of the present invention is to provide a disperser for fluid or a gas which can be used to disperse comminuted solid fuel particles in air or gases for combustion purposes.

A further object of the present invention is to provide a disperser for use in forming sprays and atomized mixtures of liquids or gases for many purposes, and one which is of sturdy construction having no moving parts and having no restricted orifices which can become blocked or clogged by foreign matter carried in the liquids or gases.

These and other objects and advantages of the present invention will be fully apparent from the following description when taken in connection with the annexed drawings, in which:

Figure 1 is a view in perspective of the fluid disperser of the present invention in assembled condition;

Figure 2 is an exploded view in perspective of the components of the present invention, showing one component partially broken away to show its internal construction;

Figure 3 is a side view in cross section on line 3—3 of Figure 1; and

Figure 4 is a vertical view partially in cross section on line 4—4 of Figure 3.

Referring in greater detail to the drawings in which like numerals indicate like parts throughout the several views, the present invention consists in a fluid disperser having a hollow body **10** provided with a closed one end **11** and an open end **12**. An inlet **13** extends through the end **11** of the body **10** and is threaded so that it may be connected to a pipe or conduit leading to a source of fluid under pressure.

The inner wall of the body **10** is provided with an annular shoulder **14** spaced from the bottom of the body **10** on which seats the one end of a cylindrical plug **15** disposed within the body **10**. The plug **15** is provided on one side of its center with a longitudinally extending passage **16** and is provided on its other end with a spirally arranged channel **17** beginning at the passage **16** and coiling inwardly and connecting the passage **16** with the opening of a well **18** which is formed centrally in the end of the plug **15**.

A second plug **19** is positioned within the body **10** in end to end confronting relation with respect to the plug **15** and overlies the channel **17** to form a spiral passage from the passage **16** to the well **18**. The plug **19** forms one wall of the channel **17** and closes the open end of the body **10**. A dispensing orifice **20** is provided in the plug **19** centrally thereof and has its

wall tapering or diverging outwardly at an angle to the longitudinal axis of the plug **19**.

The plug **19** is further provided on its confronting end with a tubular extension **21** which extends into the well **18** and has its free end **22** spaced from the bottom **23** of the well and also has its outer wall **24** spaced from the wall **25** of the well, the free end **22** of the extension being closer to the bottom **23** than the outer wall **24** is to the wall **25** of the well so that the passage formed by the end of the extension and the bottom of the well is resticted and thereby increases the velocity of the liquid or gas which moves from the spiral passage or channel **17** in a helical path downwardly in the well **18** and into the orifice **20**. The inner wall of the extension **21** is contiguous with the wall of the orifice **20** and the liquid or gas moves in a helical path on the wall of the orifice to the outlet and forms a conical spray shown in dotted lines and indicated by the reference numeral **26** in Figure 3.

The peripheral portion **27** of the end of the plug **19** is sloping and provides a seat for a gasket (not shown) which may be needed to make the joint between the plug **19** and the threaded locking nut **28** liquid or gas tight, the upper end of the body **10** being provided with cooperating threads indicated by the reference numeral **29** so that the nut **28** may be secured thereto.

In use, the liquid or gas admitted to the inlet **13** travels through the passage **16** to the spiral passage formed by the channel **17** thence with rotary movement around the well **18** and with rotary movement on the wall of the orifice **20**, emerging in a conically-shaped spray, the angle of which is determined by the angle of taper of the wall of the orifice and the pressure of the fluid or gas. The passage between the free end of the extension and the bottom of the well is restricted and is less than either the cross-sectional area of the inlet **13** or the cross-sectional area of the space between the wall of the well and the outer wall of the extension, thereby increasing the velocity and reducing the pressure of the liquid or gas as it emerges in the conical spray.

If a gas is being dispersed in another gas or in air, the gas or air within the conical spray is drawn outwardly to the spray and becomes intimately mixed with the air or other gas as it leaves the orifice. If a liquid is being dispersed, it becomes a spray having uniformly sized droplets. In use as a mixer of comminuted particles such as powdered coal in a heating or electric power industry, the powdered coal will be intimately mixed with the combustion air.

The disperser is therefore seen to be of value and to have many applications as a nozzle in cooling systems, in combustion systems, as a sprayer used in fire control systems, lawn sprinkler devices, insecticide applicator for gardens and orchards, and many other varied and unrelated applications.

What is claimed is:

1. A fluid disperser comprising a hollow body having one end open and an inlet in the other end adapted to be connected to a source of fluid under pressure, a plug positioned within said body intermediate said ends thereof having a well in its one end remote from said inlet, said plug having a spiral passage connecting said inlet with said well, and a second plug positioned within said body in end to end confronting relation with respect to said first named plug closing said open end of said body, said second plug having a dispensing orifice extending longitudinally therethrough, said second plug being provided on its confronting end with a tubular extension having its inner wall contiguous with the wall of said orifice, said extension projecting into said well and having its end edge spaced from the wall and bottom of

said well and forming with said well bottom a passage connecting said well with said orifice whereby fluid flowing into said well moves in a spiral path and moves outwardly on the wall of said extension and wall of said orifice in a helical path to form a conical spray.

2. A fluid disperser comprising a hollow body having one end open and an inlet in the other end adapted to be connected to a source of fluid under pressure, a plug positioned within said body intermediate said ends thereof having a well in its one end remote from said inlet, said plug having a spiral passage connecting said inlet with said well, and a second plug positioned within said body in end to end confronting relation with respect to said first named plug closing said open end of said body, said second plug having a dispensing orifice extending longitudinally therethrough with the wall of said orifice diverging outwardly, said second plug being provided on its confronting end with a tubular extension having its inner wall tapering and contiguous with the wall of said orifice, said extension projecting into said well and having its end edge positioned in spaced relation with respect to the wall and bottom of said well and forming with said well bottom a restricted passage connecting said well with said orifice whereby fluid flowing into said well from said inlet moves in a spiral path and moves outwardly on the wall of said extension and wall of said orifice in a helical path to form a conical spray.

3. A fluid disperser comprising a hollow body having one end open and an inlet in the other end adapted to be connected to a source of fluid under pressure, a plug positioned within said body intermediate said ends thereof

having a well in its one end remote from said inlet, said plug having a spiral channel in said one end connecting said inlet with said well and having a passage connecting said inlet with said channel, a second plug positioned within said body in end to end confronting relation with respect to said first named plug closing said channel and said open end of said body, said second plug having a dispensing orifice extending longitudinally therethrough with the wall of said orifice diverging outwardly, said second plug being provided on its confronting end with a tubular extension having its inner wall tapering and contiguous with the wall of said orifice, said extension projecting into said well and having its end edge positioned in spaced relation with respect to the wall and bottom of said well and with said well bottom forming a passage connecting said well with said orifice, the end edge of said extension being spaced closer to the bottom of said well than the outer wall of said extension is to the wall of said well whereby the liquid flowing into said well from said inlet moves in a spiral path and moves outwardly at increased velocity on the wall of said extension and wall of said orifice in a helical path to form a conical spray.

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