April 15, 1924. 1,490,316

D. A. DOUGHERTY

SPRAYING DEVICE

Filed Aug. 4, 1921

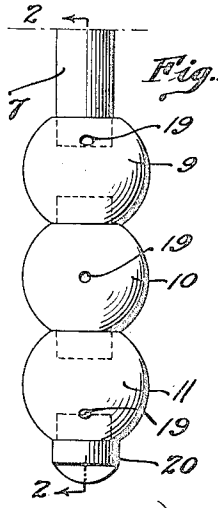


Fig. 1.

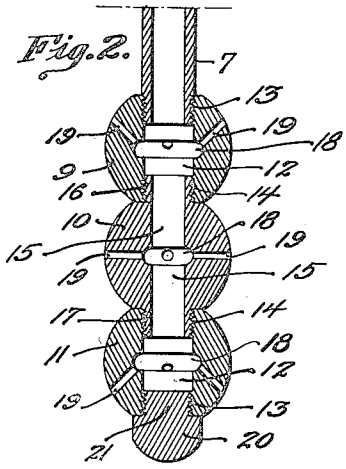


Fig. 2.

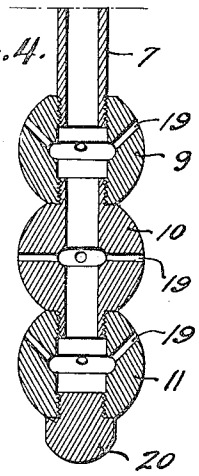


Fig. 4.

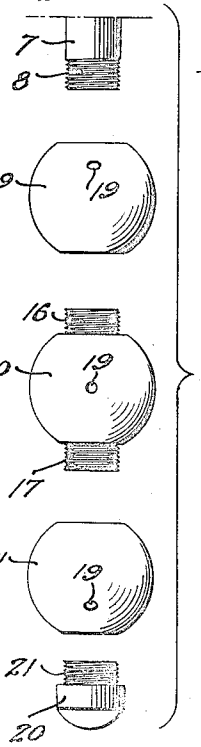


Fig. 3.

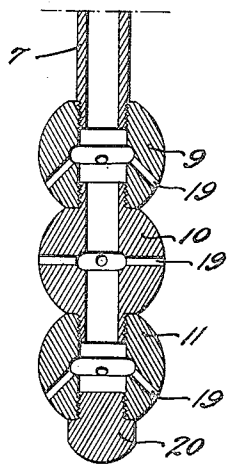


Fig. 5.

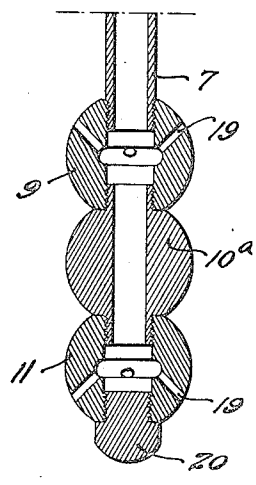


Fig. 6.

Witnesses
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Patented Apr. 15, 1924. 1,490,316

UNITED STATES PATENT OFFICE.

DANIEL A. DOUGHERTY, OF PHILADELPHIA, PENNSYLVANIA.

SPRAYING DEVICE.

Application filed August 4, 1921. Serial No. 489,691.

To all whom it may concern:

Be it known that I, DANIEL A. DOUGHERTY, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Spraying Devices, of which the following is a specification.

One object of my present invention is to provide an improved articulated spraying device of such character that the parts thereof can be readily reversed, interchanged or located in various positions. Due to this construction, my improved spraying device is of advantage for various purposes such for example as for mixing and distributing liquids, steam, gas and air.

Another object is to make my improved spraying device of a simple and durable construction and so that it can be manufactured at a low cost.

These objects, and other advantageous ends which will be described hereinafter, I attain in the following manner, reference being had to the accompanying drawings in which—

Figure 1 is a longitudinal elevation showing a spraying device made in accordance with my invention,

Figure 2 is a section taken on the line 2—2 of Figure 1,

Figure 3 is a view of said device with the parts detached,

Figures 4 and 5 are views of substantially similar character to Figure 2 showing different possible arrangements of the parts, and

Figure 6 is a longitudinal section showing an unperforated ring serving as a spacer between other perforated rings.

Referring to the drawings and particularly to Figures 1 to 5 inclusive, 7 represents a conduit pipe which is externally screw threaded at its end as shown at 8. I have illustrated three rings 9, 10 and 11; the ring 9 and the ring 11 being similarly constructed, each including a longitudinal passage 12, the opposite ends of which are internally screw threaded as shown at 13 and 14. The ring 10 has a longitudinal passage 15 and two externally screw threaded nipple extensions 16 and 17; it being noted that the longitudinal passage 15 extends entirely through the nipple extensions 16 and 17 as clearly shown in Figure 2.

Each of the rings 9, 10 and 11 have grooves 18 formed therein preferably midway between the opposite open ends of the rings and ducts or perforations 19 lead outwardly from the grooves 18; the ducts 19 of the ring 10 extending at right angles to the axis of the passage 15 while the ducts 19 of the rings 9 and 11 extend at a slant to the axes of their respective passages. A terminal plug cap 20 has an externally screw threaded stem 21, and the screw threads on all of said elements are substantially similar that is to say of equal diameter and equal pitch. For example, either of the nipple extensions 16 can screw into either of the screw threaded portions of the passages in the rings 9 and 11 and the screw threaded portions of the pipe and terminal plug cap are also capable of being screwed into the screw threaded portions of the passages in the rings 9 and 11.

Thus the rings can be secured together with the ring 9 secured to the pipe 7 and with the terminal plug cap 20 secured to and forming a closure for the outer end of the passage 12 in the ring 11 and it will be noted that if fluid of any character passes through the pipe 7 it will be ejected in spray or jet form through the various ducts in the rings and in the particular arrangement shown in Figures 1 and 2, the ring 11 will serve to eject jets or sprays upward at a slant; the ducts of the ring 11 serving to eject jets or sprays downwardly at a slant while the ducts 19 of the ring 10 will eject sprays or jets at right angles to the aligned axes of all of the rings.

By providing the annular grooves 18, mixing chambers are produced and owing to the construction the fluid entering the rings under pressure will be unable to escape as rapidly as it enters and a back pressure results giving the fluid an instant mix before escaping through the ducts. This is particularly valuable where fluid of various formulas are used, such for example as fire extinguishing fluid mixture; the device serving to create a foam which is readily adapted for extinguishing fire. In this connection it may be stated that a device such as above described may be inserted in a tank, such for example as an oil tank which has been set on fire and the arrangement is such that the fluid ejected will strike the inner surface of the tank at various points and run down the sides of the tank strik-

ing the surface of the oil and meeting at the center causing the flames to be driven to the center of the tank and extinguished.

In Figure 5, is shown an arrangement in which the ring 9 is reversed so that its ducts 19 will slant downwardly in the same manner as the ducts in the ring 11 so that an arrangement is provided in which both the rings 9 and 11 will eject sprays slanting downward while the ring 10 will eject sprays at right angles to the axis of the device.

In Figure 4, I have illustrated an arrangement differing from the arrangement shown in Figure 2 in that the ducts of both of the rings 9 and 10 slant upwardly. This arrangement can be either secured by reversing the ring 11 from the position shown in Figure 2 or removing the three rings bodily from the position shown in Figure 5 and after removing the plug reversing the position of the three rings as a unit so as to be joined in an opposite manner to the pipe 7, after which the plug cap 20 can be re-inserted in the outermost ring.

In Figure 6, I have shown an arrangement in which instead of employing the central ring with the ducts, I have illustrated a ring 10^a which has no perforations but which merely serves as spacing means for the rings 9 and 11. It will be noted that any number of rings can be coupled together so that the spray device can be extended as desired. If it is desired to use the device in the capacity of a nozzle as well as a spraying device, the terminal plug cap can be removed in any of the arrangements as illustrated and a portion of the fluid will pass directly through the device in the direction of its axis.

The device may also be used for spraying the interior surface of barrels or containers of any character or it may be used for coating purposes in places otherwise inaccessible.

While I have described my invention as taking a particular form, it will be understood that the various parts of my invention may be changed without departing from the spirit thereof, and hence I do not limit myself to the precise construction set forth, but consider that I am at liberty to make such changes and alterations as fairly come within the scope of the appended claims.

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

1. A spraying device connectable to a fluid conduit, said device comprising a plurality of joined members forming a pipe, several of said members having a plurality of peripheral ducts arranged at a slant to the axis of the pipe, and said members being reversible to produce either a converging or a diverging spray.

2. A spraying device connectable to the end of a fluid conduit, and comprising a plurality of joined rings forming a segmental pipe and each having a plurality of peripheral ducts, the ducts in the outer rings extending at a slant to the axis of said pipe and said outer rings being reversible to produce either a converging or a diverging spray or to direct the spray forwardly or rearwardly along the axis of said pipe.

3. A spraying device connectable to the end of a fluid conduit, and comprising a plurality of joined ball-like members forming a segmental pipe, the intermediate member having radial ducts, and the outer members having slanting ducts and being arranged to be reversibly mounted on said intermediate member to produce either a converging or a diverging spray.

4. A spraying device in the form of a segmental pipe connectable to the end of a fluid conduit, and comprising a plurality of joined ball-like members, the intermediate member having radial ducts and threaded necks, and the outer members having slanting ducts and being threaded internally, a closing member at the forward end of said pipe, said outer members being reversible to direct a spray either forwardly or rearwardly along the axis of said pipe or to produce either a converging or a diverging spray.

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

DANIEL A. DOUGHERTY.

Witnesses:
DANIEL F. DOUGHERTY,
CHAS E. POTTS.