

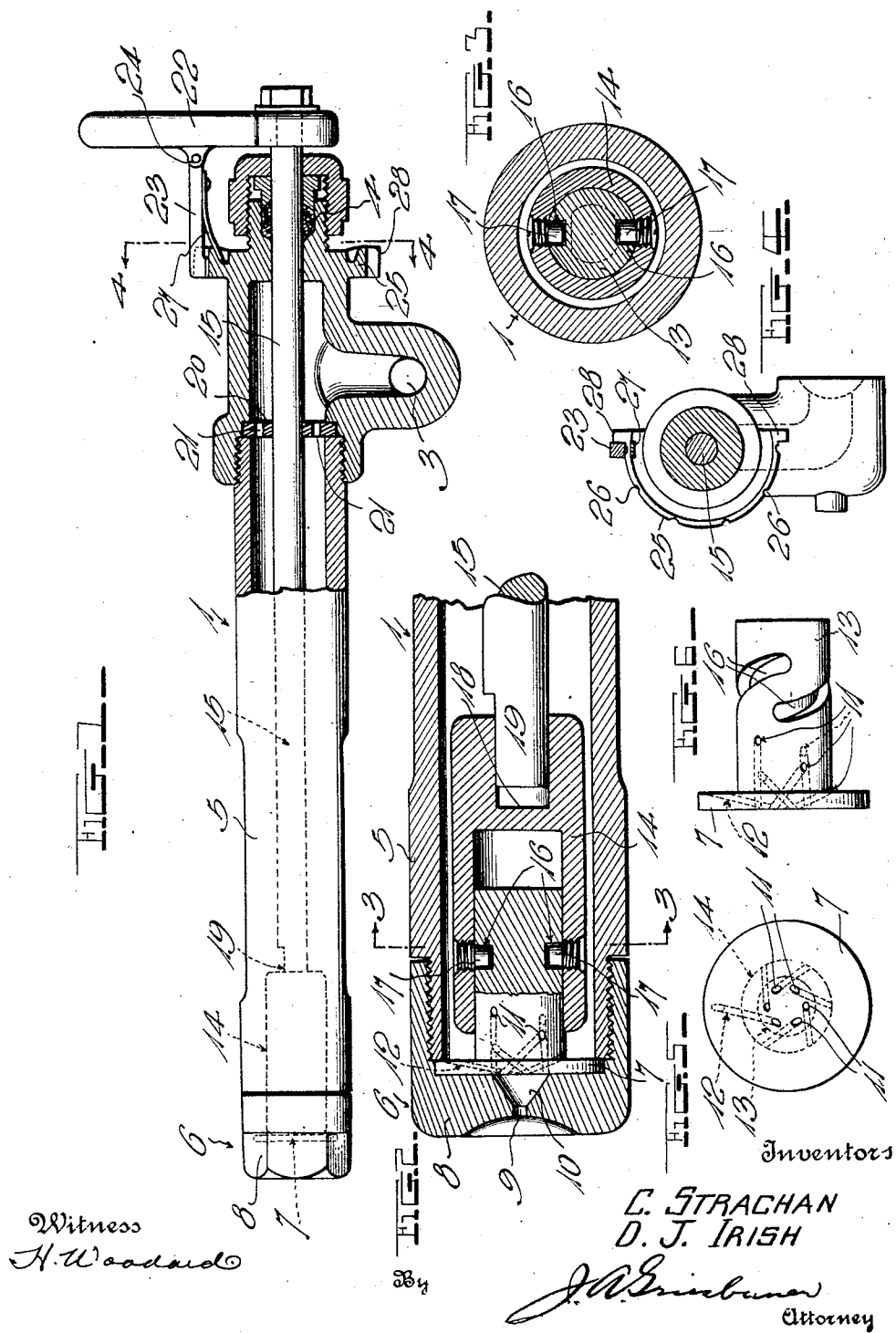
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C. STRACHAN ET AL

ATOMIZER

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UNITED STATES PATENT OFFICE.

CHRISTOPHER STRACHAN, OF SOUTH ORANGE, NEW JERSEY, AND DAVID J. IRISH, OF ST. GEORGE, NEW YORK, ASSIGNORS TO MORSE DRY DOCK & REPAIR CO., OF NEW YORK, N. Y., A CORPORATION OF NEW YORK.

ATOMIZER.

Application filed January 5, 1923. Serial No. 610,882.

To all whom it may concern:

Be it known that we, CHRISTOPHER STRACHAN and DAVID J. IRISH, citizens of the United States, residing at South Orange and St. George, Staten Island, in the counties of Essex and Richmond and States of New Jersey and New York, respectively, have invented certain new and useful Improvements in Atomizers, of which the following is a specification, reference being had therein to the accompanying drawing.

This invention relates to improvements in sprayers or atomizers and more particularly to mechanical oil burners used in boiler furnaces or the like in which fuel oil is supplied to the so-called burner under pressure to produce a hollow cone-shaped spray. Our invention relates more particularly to that class of such burners or atomizers which have a series of fixed capacities so that different predetermined quantities of oil may be sprayed into the combustion chamber without varying the oil pressure or temperature and without materially changing the shape of the oil spray.

The principal object of our invention is to provide a simple and efficient atomizer of this character which may be easily manipulated to obtain the desired capacity and which has improved means for controlling the passage of the oil or other fluid through a plurality of ports leading to a common discharge orifice.

In carrying out the above end, the spraying head of the atomizer is provided with a rearwardly extending neck in which the above mentioned ports are formed and we provide a sleeve surrounding said neck for the purpose of controlling the ports. Provision is made for sliding the sleeve toward and from the head when said sleeve is rotated and a stem extends rearwardly from said sleeve through a rear end of the body of the atomizer for the purpose of rotating said sleeve, further objects being to provide novel means for holding the stem against endwise movement, to provide an effective driving connection between the stem and sleeve of slidable nature to permit proper forward and rearward movement of said sleeve, and to equip the stem and the body of the atomizer with novel means for holding said stem in any position to which it has been adjusted.

With the foregoing in view, the inven-

tion resides in the novel subject matter hereinafter described and claimed, the description being supplemented by the accompanying drawings.

Figure 1 is a side elevation partly in longitudinal section.

Figure 2 is an enlarged longitudinal sectional view through the front end of the atomizer, showing certain parts in elevation.

Figure 3 is a transverse sectional view on line 3—3 of Fig. 2.

Figure 4 is a transverse sectional view as indicated by line 4—4 of Fig. 1.

Figures 5 and 6 are respectively an end elevation and a side elevation of the neck-carrying portion of the atomizing head.

In the drawings above briefly described, the numeral 1 designates a fluid conducting body which preferably consists of front and rear sections, the rear section being shown in the form of a casting having a fluid inlet 3 and provided with a stuffing box 4 at its rear extremity. The front section 5 is in the form of a tube whose front end is provided with an atomizing head 6. In the form of construction shown, this head preferably consists of a flat disk 7 contacting with the front end of the tube 5 and a cap 8 threaded upon the front end of said tube and contacting with the front side of said disk 7 to tightly clamp the latter in place. The cap 8 is formed with a central discharge orifice 9 enlarged at its rear portion to provide a conical fluid-whirling chamber 10 whose rear side is closed by the disk 7. The fluid to be atomized is supplied to the whirling chamber 10 by a plurality of ports 11 and an additional port 12, all of which are preferably disposed tangentially to whirl the fluid in said chamber. The ports 11 have their rear ends opening through the periphery of a cylindrical neck 13 which extends rearwardly from the disk 7 within the tube 5, said ports being spaced apart circumferentially and having their rear or inlet ends spaced successively increasing distances from the disk 7. The port 12 does not extend at its rear end through the neck 13, but merely opens through the rear side of the disk 7 and this port remains open at all times, whereas the other ports may be controlled in the manner described below. It is thus insured that even when all of the ports 11 are closed, sufficient oil shall pass through the port 12,

when the device is used as a burner, to insure that a pilot light or minimum steam generating flame shall exist at all times. The total cross-sectional area of the ports 11 and 12 is preferably less than the area of the outlet orifice 9, since this will help to produce a very fine spray with a wide angle.

For controlling the ports 11, we make use of a sleeve 14 which forms a valve, a stem 15 extends from this sleeve through the stuffing box 4 for rotating said sleeve and provision is made whereby the rotation of the sleeve will cause the latter to slide upon the neck 13. In the present showing, a helical cam connection is provided between the sleeve 14 and the neck 13, consisting of a pair of helical grooves 16 in the neck 13 and a pair of inwardly extending studs 17 carried by the sleeve 14, said studs being preferably threaded in place as shown in Figs. 2 and 3. We prefer to provide the rear end of the sleeve 14 with a flat-sided socket 18 receiving the similarly shaped front end 19 of the stem 15, the connection being such that while the stem rotates the sleeve, said sleeve may slide with respect to the stem.

As it would be inadvisable to permit the stem 15 to slide, on account of unnecessarily wearing the stuffing box packing and because of the liability of interfering with the means which holds said stem in adjusted position, we provide novel means for preventing such sliding of the stem, this means being here shown in the form of a collar 20 rigid upon the stem and rotatably held between the front and rear sections of the body 1. This collar is formed with perforations 21 which permit the passage of oil from the rear body section into the forward section.

The rear end of the stem 15 has been shown equipped with a suitable operating handle 22 provided with a forwardly extending holding arm 23 which is pivoted thereto as indicated at 24. The rear portion of the body section 2 is formed with an arcuate track 25 which is concentric with the stem 15, this track being provided in its outer curved side with a plurality of notches 26 to be engaged by the front end of the arm 23, for the purpose of holding the stem in adjusted position. To insure proper engagement of the arm 23 with the notches 26, we prefer to provide said arm with a spring 27 which contacts slidably with the inner curved side of the track 25. While this spring will hold the arm 23 properly engaged with any of the notches 26, it will yield and permit release of said arm when the handle 22 is turned in one direction or the other.

Stops 28 are preferably employed at the ends of the track 25 and when arm 23 strikes one of these stops, the atomizer is operating under full capacity, that is, the sleeve 14 is moved rearwardly to the maximum to un-

cover all of the ports 11. When the handle 22 is turned so that the arm 23 strikes the other stop however, all of the ports 11 are closed by the sleeve 14 but the port 12 remains open for the reason above set forth. By turning the handle 22 to the desired extent, it will be seen that any required number of ports may be opened so that the quantity of oil to be sprayed by the atomizer is readily under control, while maintaining a constant pressure of oil within the body 1.

As excellent results may be obtained from the details disclosed, these details are preferably followed, but within the scope of the invention as claimed, numerous changes may be made.

We claim:

1. An atomizer comprising a fluid conducting body having a head at its front end, said head having a discharge orifice and a rearwardly extending cylindrical neck, the latter having its periphery inwardly spaced from the wall of the body and having longitudinally spaced ports for establishing communication between the interior of the body and the discharge orifice, an internally cylindrical port-controlling sleeve slidably surrounding said neck, and means for sliding said sleeve to successively uncover said ports, said means including a handle on the exterior of said body.

2. An atomizer comprising a fluid conducting body having a head at its front end, said head having a discharge orifice and a rearwardly extending cylindrical neck, the latter having its periphery inwardly spaced from the wall of the body and having longitudinally spaced ports for establishing communication between the interior of the body and the discharge orifice, an internally cylindrical port-controlling sleeve slidably and rotatably surrounding said neck, means extending to the exterior of the body for rotating said sleeve, and connecting means between said neck and said sleeve for sliding the latter when it is rotated.

3. An atomizer comprising a fluid conducting body having a head at its front end, said head having a discharge orifice and a rearwardly extending cylindrical neck, the latter having longitudinally spaced ports for establishing communication between the interior of the body and the discharge orifice, an internally cylindrical port-controlling sleeve slidable and rotatable on said neck and having a helical cam connection therewith for sliding the sleeve when the same is rotated, and a stem extending from said sleeve to the exterior of the body for rotating said sleeve.

4. An atomizer comprising a fluid conducting body having a head at its front end, said head having a discharge orifice and a rearwardly extending cylindrical neck, the latter having longitudinally spaced ports

for establishing communication between the interior of the body and the discharge orifice, an internally cylindrical port-controlling sleeve slidable and rotatable on said neck and having an inwardly extending stud, said neck being formed with a helical cam groove receiving said stud, whereby rotation of the sleeve will effect sliding thereof, and a stem extending from said sleeve to the exterior of the body for rotating said sleeve.

5. An atomizer comprising a fluid conducting body having a head at its front end, said head having a discharge orifice and a rearwardly extending cylindrical neck, the latter having its periphery spaced inwardly from the wall of the body and having longitudinally spaced ports for establishing communication between the interior of the body and the discharge orifice, an internally cylindrical port-controlling sleeve slidably and rotatably surrounding said neck, a non-slidable rotatable stem extending from said sleeve to the exterior of the body and having a slidable connection with said sleeve for rotating the latter, and means whereby rotation of said sleeve will produce sliding thereof.

6. An atomizer comprising a fluid conducting body having a head at its front end, said head having a discharge orifice and a rearwardly extending cylindrical neck, the latter having longitudinally spaced ports for establishing communication between the interior of the body and the discharge orifice, an internally cylindrical port-controlling sleeve slidable and rotatable on said neck and having a flat-sided socket in its rear end, a non-slidable rotating stem for the sleeve extending through the rear end of the body and having a flat-sided front end received slidably in said socket, and means whereby rotation of said sleeve will produce sliding thereof.

7. An atomizer comprising a fluid conducting body having a head at its front end, said head having a discharge orifice and a rearwardly extending neck, the latter having longitudinally spaced ports for establishing communication between the interior

of the body and the discharge orifice, a port-controlling sleeve slidable on said neck, and means for sliding said sleeve to successively uncover said ports, said head having an additional port whose rear end opens through the rear side of said head at a point inaccessible to the front end of the sleeve, preventing the latter from closing said additional port.

8. An atomizer comprising a fluid conducting tube, a disk contacting with the front end of said tube and having a rearwardly extending neck, a cap threaded on the tube and bearing against the front side of said disk, said cap having a discharge orifice enlarged at its rear end to form a fluid whirling chamber, said neck and disk having tangential ports opening into said whirling chamber, the rear end of one port opening through the rear face of said disk, while the other ports open through the periphery of said neck, and a manually slidable port-controlling sleeve on said neck incapable of closing said one port.

9. An atomizer comprising a fluid conducting body formed of front and rear sections, threaded together, the rear section having a fluid inlet, adjustable atomizing means at the front end of the front section having an operating stem extending through the rear end of said rear section, and an apertured collar on said stem rotatably held between the two body sections for holding the stem against endwise sliding.

10. An atomizer comprising a fluid conducting body having a closed front end provided with a mixing chamber, an outlet orifice from said chamber and a port leading to said chamber from the interior of the body; and a valve in the body for either closing or opening said port; said closed end of the body being formed with an additional port inaccessible to said valve and leading from the interior of the body to said mixing chamber.

In testimony whereof we hereunto affix our signatures.

CHRISTOPHER STRACHAN.
DAVID J. IRISH.