

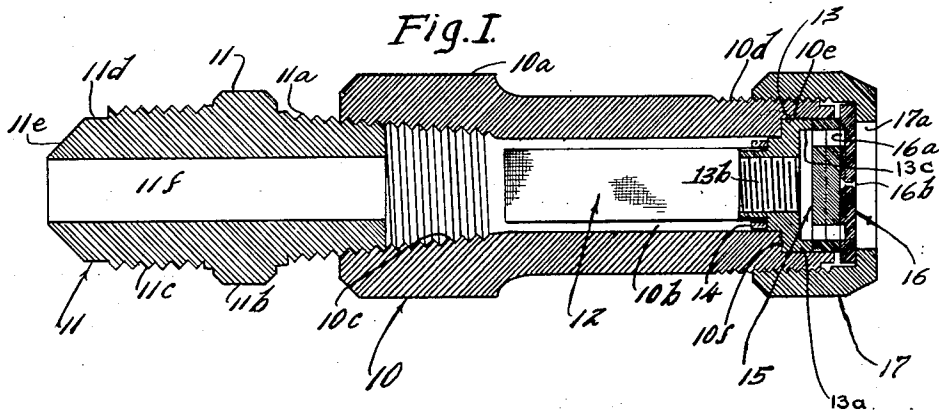
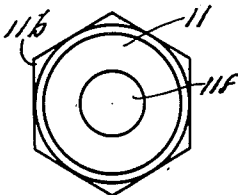
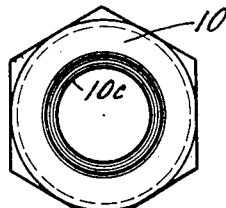
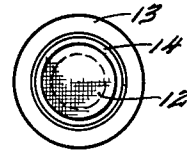
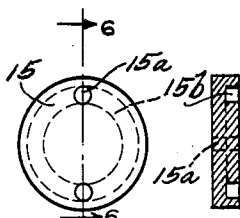
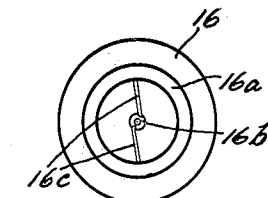
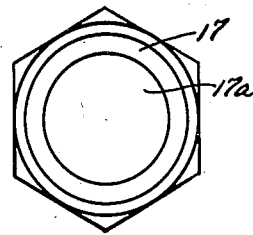
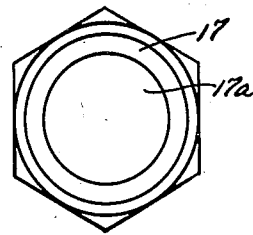
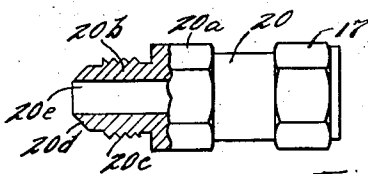
Aug. 14, 1934.

J. B. HAWLEY, JR

1,970,138

NOZZLE FOR OIL BURNERS

Filed Aug. 31, 1931



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UNITED STATES PATENT OFFICE

1,970,138

NOZZLE FOR OIL BURNERS

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Application August 31, 1931, Serial No. 560,367

4 Claims. (Cl. 299—120)

This invention relates to a nozzle, and while the nozzle may have various applications, it particularly is designed as a nozzle for use with an oil burner. With most of the oil burners now on the market, the oil is supplied under pressure and is discharged into the combustion chamber in the form of a fine spray delivered from a spraying or atomizing nozzle. Such nozzles commonly comprise a shell adapted to be coupled to the oil supply line, in which is disposed some form of screen or strainer, a distributing means, and a discharge member having a very small discharge aperture. It has been quite customary to have this discharge aperture in a cap threaded onto one end of said shell. It is desirable in such a nozzle, to have a construction which is easily assembled and disassembled and since one end, commonly called the rear end of the nozzle, is secured to the oil supply line, it is desirable to have the parts of the nozzle accessible and removable from the front end of the nozzle so that they can be taken out without disconnecting the nozzle. As the oil used in oil burners is not a highly refined oil and contains more or less grit, after the oil passes through the nozzle for some time, it wears and enlarges the small discharge aperture. It is desirable, therefore, to have this discharge aperture formed in a member made of very hard metal, and it is also desirable to have a discharge aperture made in a member which can be easily, quickly and cheaply replaced.

It is an object of this invention, therefore, to provide a nozzle for an oil burner or other use, of simple and compact form, the parts of which are easily accessible and removable.

It is another object of the invention to provide a nozzle for an oil burner or other use, comprising a shell having a chamber therein, a straining device or screen in said chamber, a distributing means disposed in said shell, a cap having an open end threaded on said shell and a discharge disk engaged by said cap, all of said parts being held in place by said cap and being removable from the front of said shell by the removal of said cap.

It is another object of the invention to provide a nozzle for an oil burner or other use, comprising a shell threaded at one end to receive a coupling and threaded at its other end to receive a cap, said shell having a bore at said latter end and a chamber therein of smaller diameter than said bore, thus forming an offset or shoulder, a screen disposed in said chamber and having a head secured thereto fitting in said offset, a distributing disk fitting in said bore and engaging said head, said disk having spaced holes therethrough communi-

cating with an annular groove at the outer side of said disk, a discharge disk engaging said distributing disk and having a shallow annular groove alining with the annular groove therein, and having a central small discharge orifice to which shallow grooves lead from said annular groove.

It is still another object of the invention to provide a nozzle having a shell, a cap threaded thereon, together with a distributing disk of molybdenum metal held in place by said cap, and having a small discharge aperture therethrough.

These and other objects and advantages of the invention will be fully set forth in the following description made in connection with the accompanying drawing, in which like reference characters refer to similar parts throughout the several views and in which:—

Fig. 1 is a central longitudinal section through the assembled nozzle;

Fig. 2 is an end view of the coupling member shown;

Fig. 3 is an end view of the nozzle as seen from the left end with the coupling member removed;

Fig. 4 is an end view of the screen member used;

Fig. 5 is an end view or face view of the distributing means used;

Fig. 6 is a section taken on line 6—6 of Fig. 5;

Fig. 7 is a face view of the discharge washer used as seen from the inner side thereof; and
Fig. 8 is an end view of the cap used as seen from the outer side thereof;

Fig. 9 is a view in side elevation partly in vertical section, showing a modification.

Referring to the drawing, a nozzle is shown comprising the shell 10. While this nozzle may be variously formed, in the embodiment of the invention illustrated it is shown as having a cylindrical central portion with a portion 10a of hexagonal form at the rear thereof, the rear end being slightly beveled. Said shell has a central chamber 10b therein shown as of cylindrical form and a flared tapped portion 10c extends rearwardly therefrom. A coupling member 11 is shown having a tapered threaded end 11a adapted to be screwed into the portion 10c of the shell 10. Said coupling has a central hexagonal portion 11b and a threaded cylindrical portion 11c to the rear thereof, said coupling having a plain cylindrical portion 11d to the rear of the portion 11c and having a beveled or tapered end 11e. Said plug has a bore 11f of cylindrical form extending therethrough. The shell 10 is exteriorly threaded at its front end as shown at 10d and has a cylindrical bore 10e at this end of larger

diameter than the chamber 10b so that a shoulder or offset 10f is formed therein. A strainer member or screen 12 is provided, having its rear end closed and having its front end fitted over the rear end of a head 13, said screen being held thereon by a ring 14 pressed over said screen about the exterior of said head 13 and screen 12 is thus very tightly secured to the head 13. Said head 13 has a portion substantially fitting in the chamber 10b and has an enlarged cylindrical portion 13a fitting in the bore 10e and against the seat 10f. Head 13 has a central opening 13b and at its front has a shallow recess therein surrounded by a comparatively shallow flange 13c. A distributing disk 15 is provided, of a diameter to fit snugly in bore 10e, and this disk engages the front of the head 13. Disk 15 has a pair of spaced holes 15a extending therethrough, and as shown, these holes preferably are formed at opposite sides of said disk. Disk 15 also has an annular groove 15b at its front side with which holes 15a communicate. A discharge disk 16 is provided, said disk having a shallow annular groove 16a at its inner side shown as of substantially the same diameter as the groove 15b and said disk has a small central discharge aperture 16b. While the shape of the aperture 16b may be varied, in the embodiment of the invention illustrated it is shown as slightly flaring at its outer side and having a somewhat larger flare or conical shape at its inner side. A pair of shallow grooves 16c extend from the groove 16a at the inner side of the disk 16 to the flaring portion of the aperture 16b, these grooves extending tangentially to the discharge aperture 16b as shown in Fig. 7. Disk 16 should be made of very hard material and while in practice it has been found that molybdenum metal or molybdenum steel is suitable for this member, a special alloy known as nitralloy, is used. A cap member 17 is provided, which is of hexagonal shape as shown in Fig. 8 and internally bored and threaded to screw onto the threaded portion 10d. Cap 17 has an opening 17a in its front surrounded by an inwardly extending flange, the inner side of which engages the outer side of the disk 16 and holds this disk together with disk 15 and the head 13 in place.

In operation, oil is supplied under pressure from the oil line to coupling 11 and is delivered into the chamber of shell 10. This oil is strained by passing through the screen member 12. This screen member has a large surface and thus a large capacity for efficiently straining the oil. The oil passes through the interior of the screen member through the opening 13b in member 13 and to the shallow recess in the front of member 13. From here the oil passes through the holes 15a to the groove 15b, thence to groove 16a through the shallow or small grooves 16c to the aperture 16b and is projected therefrom in finely divided condition.

If it is desired to inspect the nozzle or to remove or replace any of the parts, the cap member 17 can be removed and the disks 15 and 16 can then be at once removed as can also the strainer member 12 with its head 13. The head 13 is threaded at 13b so that an instrument can be threaded therein and head 13 and screen 12 then pulled outwardly. The parts are apt to be more or less tightly stuck into place after the burner has been operating for a considerable period. These parts can then be readily inspected, cleaned or replaced without disconnecting the nozzle from the supply line. The disk 16 being very hard, the aperture 16b does not wear

rapidly to a larger size. If it is ever necessary to replace the disk 16, it is an easy matter and a matter of small expense.

In Fig. 9 a modified form of shell is shown, indicated as 20. The central portion and front end of shell 20 are exactly the same as shell 10 already described. Shell 20 also has the hexagonal portion 20a similar to the portion 10a of shell 10. Instead, however, of having the shell interiorly threaded and a separate connecting nipple such as 11, the shell 20 is provided with the coupling projection 20b exteriorly threaded at 20c to receive the coupling. The bore 20e of the shell is continued through to the rear end and the rear end is beveled as shown at 20d. This projection 20d corresponds to the rear end of member 11 and is threaded to receive a standard coupling.

From the above description it will be seen that applicant has provided a very simple and efficient nozzle and one in which the parts are easily accessible and removable from the front end thereof. While the nozzle is thus convenient of access, it is at the same time capable of being very cheaply made. The parts are all of simple construction, as is shell 10 and are easily and inexpensively manufactured. As stated, the screen 12 has a large area and is very effective as a strainer without being quickly clogged up. The structure is very compact and all of the parts are securely held in place. The nozzle has been amply demonstrated in actual practice and found to be very successful and efficient.

It will, of course, be understood that various changes may be made in the form, details, arrangement and proportions of the parts, without departing from the scope of applicant's invention, which generally stated, consists in a device capable of carrying out the objects above set forth, in the parts and combinations of parts disclosed and defined in the appended claims.

What is claimed is:—

1. A nozzle having in combination, a shell exteriorly threaded at one end, a cap arranged on the threaded portion of said shell, said shell having a chamber therein providing a shoulder at the side of said chamber opposite said cap, a head for supporting a screen and fitting the chamber of said shell against said shoulder, said head including a central opening leading from said screen to said chamber, a distributing disk fitted in said shell and against said head, said distributing disk extending outwardly beyond the end of said shell adjacent said cap, a discharge disk without said shell and fitted against said distributing disk, said distribution disk providing communication between said head and said discharge disk, said discharge disk having an outlet aperture, and said cap threaded on said shell having an open front and including a portion engaging said discharge disk positively to clamp said head and disks between the shoulder of said shell and said cap under a pressure predetermined by the extent to which said cap is turned down on said shell.

2. A nozzle having in combination, a shell exteriorly threaded at one end, a cap arranged on the threaded portion of said shell, said shell having a chamber therein providing a shoulder at the side of said chamber opposite said cap, a head for supporting a screen and fitting the chamber of said shell against said shoulder, said head including a central opening leading from said screen and having a continuous flange portion opposite said screen providing a concavity for fluid adjacent said opening, a distributing disk fitted in said

shell and against said flange portion, said distributing disk extending outwardly beyond the end of said shell adjacent said cap, a discharge disk without said shell and fitted against said distributing disk and spaced from the end of said shell, said distributing disk providing communication between said concavity and said discharge disk, and said discharge disk having an outlet aperture, and said cap threaded on said shell having an open front and including a portion engaging said discharge disk to clamp said head and disks between the shoulder of said shell and said cap under a pressure predetermined by the extent to which said cap is turned down on said shell.

3. A nozzle having in combination, a shell exteriorly threaded at one end, a cap arranged on the threaded portion of said shell, said shell having a chamber therein providing a shoulder at the side of said chamber opposite said cap, a head for supporting a screen and fitting the chamber of said shell against said shoulder, said head including an opening leading from said screen to said chamber, a distributing disk fitted in said shell and against said head, said distributing disk extending outwardly beyond the end of said shell adjacent said cap, a discharge disk without said shell, fitted against said distributing disk and spaced from the end of said shell, said distributing disk providing communication between said head and said discharge disk, said discharge disk having an outlet aperture, said cap threaded on said shell having an open front and including a portion engaging said discharge disk to clamp said head and disks between the shoulder of said shell and said cap under a pressure predetermined by the extent to which said cap is turned down on said shell, and said discharge disk having the marginal portion thereof snugly fitted to the internal surface of said cap.

4. A nozzle for spraying oil having in combination, a shell exteriorly threaded at one end to receive a cap, said shell having a chamber therein with an enlarged bore adjacent its front end forming a shoulder, a cylindrical screen disposed in said chamber carried by a hollow member fitting against said shoulder, a distributing disk at the end of and engaging said member, a discharge disk engaging said last mentioned disk and spaced from the end of said shell, and a cap threaded on said shell having an open front end and constructed and arranged to engage said discharge disk and hold the same against said distributing disk and tight against said member carrying said screen.

JOHN B. HAWLEY, JR.

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