E. H. PEABODY.

ATOMIZER OR SPRAYING DEVICE.

APPLICATION FILED MAY 26, 1910.

1,007,795. Patented Nov. 7, 1911.

Fig. 2.

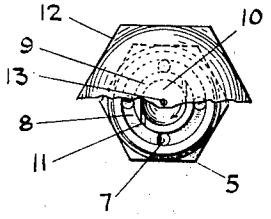


Fig. 3.

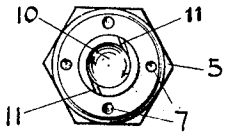


Fig. 1.

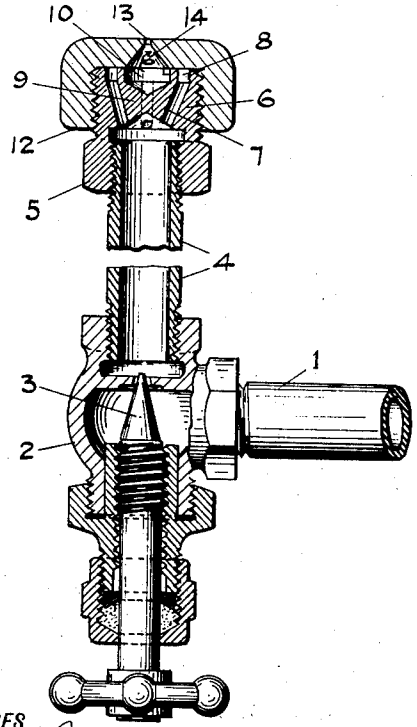
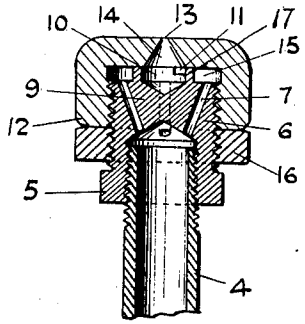


Fig. 4.



WITNESSES

Charles A. Jones.

Geo. E. Lawrence.

INVENTOR

Ernest H. Peabody

BY

Gifford & Bull

His ATTORNEYS.

UNITED STATES PATENT OFFICE.

ERNEST H. PEABODY, OF NEW YORK, N. Y., ASSIGNOR TO THE BABCOCK & WILCOX COMPANY, OF BAYONNE, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ATOMIZER OR SPRAYING DEVICE.

1,007,795. Specification of Letters Patent. **Patented Nov. 7, 1911.**

Application filed May 26, 1910. Serial No. 563,530.

To all whom it may concern:

Be it known that I, ERNEST H. PEABODY, a citizen of the United States, residing at New York city, borough of Manhattan, in the county of New York and State of New York, have invented certain new and useful Improvements in Atomizers or Spraying Devices, of which the following is a specification.

This invention relates particularly to improvements in atomizers used for spraying fuel oil, whereby the oil is atomized and injected into the combustion chamber of a furnace, in the form of spray, by means of mechanical action induced by pressure.

In my application Serial No. 497,283, filed May 20, 1909, I have shown and described a spraying device similar to that made the subject-matter of the present application. In my former application I have also shown a form of device in which the annular channel and the tangential passages are in the tip instead of in the nozzle, and it is my intention to claim the invention broadly in the former application and to restrict the claims of the present application to that form in which the annular channel and the tangential passages are in the nozzle.

The invention will be understood by reference to the accompanying drawings in which—

Figure 1 is a view of the complete atomizer shown partly in section; Fig. 2 is an end view, a portion of the tip being cut away to show the end of the nozzle to which it is attached; Fig. 3 is an end view of the nozzle with the tip removed; and Fig. 4 is a sectional view of a slight modification.

Similar reference numerals indicate similar parts in the several views.

Referring to Figs. 1, 2 and 3, the numeral 1 designates an oil supply pipe secured to the body 2 of a needle valve 3. Also secured to said valve is a pipe 4 into which the oil is delivered through the valve. The other end of pipe 4 is threaded to screw into a nozzle 5 properly threaded to receive the same. In the body 6 of the nozzle are formed passages 7 which communicate with a depressed annular channel 8 formed in the outer end of the body 6 about the central core 9. In the face of this core is formed a central chamber 10 and through the wall of this chamber are cut passages or ducts 11 connecting said chamber with the annular channel 8. The channels 11 are tangential to the wall of chamber 10, as shown in Fig. 2. The outer end of the nozzle is threaded to receive a tip 12 having a small discharge orifice 13 communicating with a conical chamber 14, the base of which chamber is of substantially the same diameter as that of chamber 10. In this form of my invention the liquid is delivered through the passages 7 to the annular channel 8 and from said channel it passes through passages or ducts 11 which deliver it tangentially to the chamber 10, at the same time imparting to the liquid a whirling motion. From thence the liquid issues through the discharge orifice 13 and is injected into the combustion chamber in the form of spray.

In Fig. 4 I have shown a slight modification. It will be noted in Fig. 1 that the outer wall of the body 6 of the nozzle extends to the outer end of the nozzle and that the annular channel 8 is formed in the face of the nozzle. The modification in Fig. 4 consists in stopping the outer wall of the body of the nozzle 6 short of the end of the nozzle so as to leave the wall 17 as a projection from the face of the nozzle. In that case an annular channel 15 will be formed when the tip 12 is screwed home so as to rest upon the wall 17. In this form a check-nut 16 may be used.

In atomizers of the type described, in which the liquid is atomized through centrifugal force imparted to the liquid before it is discharged, it is essential in order to obtain the maximum atomizing effect, to impart to the liquid the maximum possible whirling motion and maintain same with undiminished force until the liquid issues from the discharge orifice. This maximum whirling effect is imparted to the liquid by delivering it tangentially to the chamber immediately connecting with the discharge orifice, and it is essential that the liquid be discharged immediately thereafter to prevent diminution in the whirling effect through friction. Furthermore, the atomizer must be of simple and cheap construction, easily removable and capable of rapid alteration to meet the fluctuating requirements necessitated by use of liquids of different specific gravity and viscosity. This is obtained in the device described above by delivering the liquid to the annular chamber immediately surrounding the tip chamber connecting with

the discharge orifice, and communicating with said latter chamber by channels arranged to deliver the liquid tangentially as above described, both tip and nozzle being easily detachable and interchangeable with parts having channels of different size.

While I have described the channels 11 and 20—as tangential to the walls of the chambers 10 and 14, respectively, I desire to include any degree of eccentricity of said channels which will give to the liquid a whirling motion.

What I claim and desire to secure by Letters Patent of the United States is:—

1. In a spraying device, in combination, a nozzle having a central chamber, a tip secured to said nozzle and resting on the face thereof, an annular channel formed by said nozzle and tip substantially surrounding said central chamber, ducts leading from said annular channel to said central chamber tangential to the latter and forming the sole inlets to said chamber, and means for supplying liquid to said annular channel.

2. In a spraying device, in combination, a nozzle, a tip secured thereto, said nozzle having an annular channel and a central chamber in the end thereof, a wall between said channel and chamber, said wall having passages or ducts therein connecting said channel and chamber and tangential to the latter, whereby liquid issuing from the annular channel is given a whirling motion by which it is atomized.

3. In a spraying device in combination, a nozzle, a tip secured thereto, said nozzle having an annular channel and a central chamber in the end thereof, a wall between said channel and chamber, said wall having passages or ducts therein connecting said channel and chamber and tangential to the latter, whereby liquid issuing from the annular channel is given a whirling motion, and said tip formed with a central chamber adapted to register with the corresponding chamber of the nozzle.

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

ERNEST H. PEABODY.

Witnesses:
M. E. McNINCH,
CHARLES S. JONES.