

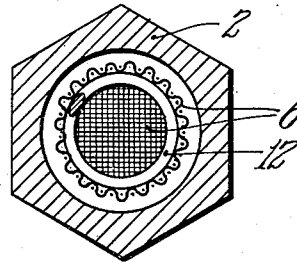
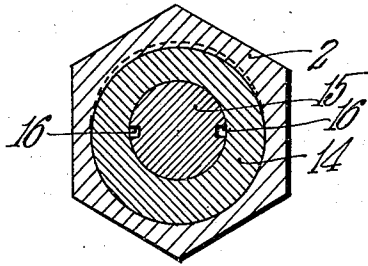
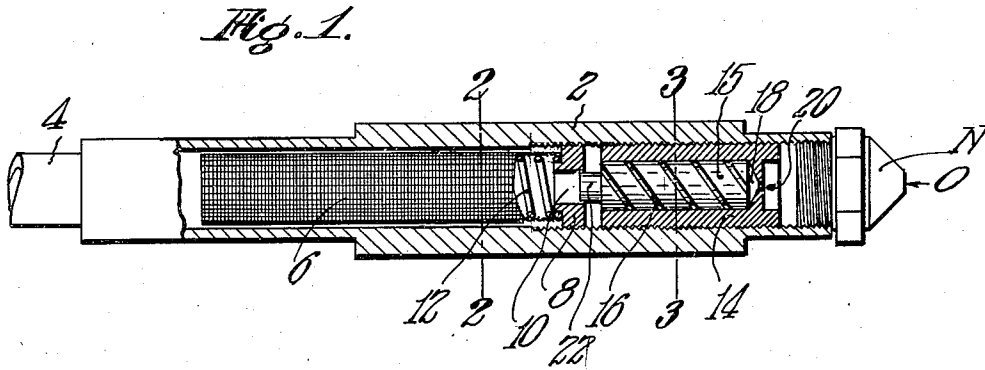
Jan. 19, 1937.

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2,068,593

FUEL DELIVERING DEVICE

Filed May 16, 1935



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2,068,593

FUEL DELIVERING DEVICE

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Application May 16, 1935, Serial No. 21,849

4 Claims. (Cl. 299—120)

This invention relates to improvements in fuel-burning apparatus and is directed more particularly to improvements in devices for delivering fuel.

The principal objects of the invention are the provision of a novel fuel-delivering apparatus which is characterized by its ability to deliver such fuel as oil in a more finely-divided state than is possible with prior art devices.

It is common practice in fuel-oil-burning apparatus to provide an oil-conducting conduit having on its discharge end a nozzle formed with a relatively small discharge orifice. The oil is fed to the conduit and nozzle under pressure and it is discharged by the orifice in a partially broken-up state and air is delivered to the combustion chamber along with the oil.

According to this invention, means is provided to break up the oil in its passage to the nozzle to the extent that there emerges from the nozzle an extremely finely-divided spray of oil. This is accomplished by a novel combination and arrangement of parts adapted to function at those pressures commonly used with apparatus to which the invention relates, it not being necessary to use elevated pressures likely to result in leaks, cutting of the nozzle and the like. Because of the condition of the oil discharged by the nozzle, according to this invention, a less amount of air is employed in order to bring about as complete combustion as was known heretofore.

Various other novel features and advantages of the invention will be hereinafter more fully referred to in connection with the accompanying description of the preferred form of the invention, reference being had to the accompanying drawing wherein:

Fig. 1 is a longitudinal sectional view through a fuel-delivery device having the novel features of the invention associated therewith;

Fig. 2 is a cross-sectional view on the line 2—2 of Fig. 1; and

Fig. 3 is a similar view on the line 3—3 of Fig. 1.

Referring now to the drawing more in detail the invention will be fully described.

A body 2 is provided which is provided with a longitudinal bore so as to be tubular in form. At its one end it is adapted for connection to a fuel supply conduit 4 while its other end portion is internally screw-threaded, as shown.

A nozzle N of usual form is associated with the delivery end of the body 2 and this has a discharge orifice at O which is preferably relatively small. The size of the orifice will depend upon

the amount of oil to be discharged or delivered by the nozzle N.

Fuel oil is delivered to the body by conduit 4 under pressure and this is accomplished in the usual way as by a pump or the like suitably connected to the conduit.

A strainer unit is disposed within the bore of the body 2 and this preferably consists of a tubular member 6 of wire gauze associated with a head member 8 threadedly engaging the screw-threads of the body, as shown. The strainer 6 is preferably supported against collapsing as by a spring-like member 12 disposed therein and the part 8 has an axial bore therethrough.

As fuel flows into the body 2 it passes between the strainer 6 and bore of the body, through the said strainer 6 and upwardly through the bore 10 of part 8. In this way the oil is strained which is a decided advantage in apparatus of this type as it insures a supply of oil for the nozzle which is substantially free from foreign matter.

A swirl unit is provided in the bore of the body between the strainer and nozzle, which consists of a shell or sleeve member 14 and a swirl member 15. This shell 14 is in screw-threaded relation with the threaded bore of the body and is provided with an axial bore in which is disposed the oil swirl member 15. A chamber 18 is provided at the bottom or inner end of the bore of the shell 14 and an outlet orifice 20 leads from the chamber axially towards the nozzle N.

One or more passageways which extend generally axially are provided between the sleeve 14 and swirl member 15. These may be formed by a groove or grooves 16 in the outer surface of member 15 and according to the preferred form of the invention the groove or grooves are arranged at an angle or helically as shown.

A projection 22 on the end of member 15 may be arranged to lie within the bore 10 of member 8 but is preferably out of contact therewith so that oil may flow from the opening 10.

With the body 2 connected to an oil-supply pipe such as 4 and as oil is delivered under pressure, the said oil passes through the wall of the filter 45 and upwardly so that it is strained and then upwardly and outwardly through opening 10 of part 8.

The oil from the strainer then enters and passes through the grooves 16 of swirl member 15 into chamber 18 and out orifice 20. From there the oil flows into and through the nozzle N and out the orifice O from which it is discharged.

The grooves in the member 15 are, as stated, preferably disposed at an angle or arranged heli-

cally. This is so that as the oil under pressure passes therethrough it is swirled, which action causes the oil to be broken up, atomized, or turbulent so that it leaves the orifice 20 in a finely divided state, appearing in what may be called a foamy condition. In this condition it is discharged by the nozzle N as a very fine mist which is desired for the most efficient combustion.

It is to be noted that by means of the swirl unit the oil is broken up prior to its passage through the nozzle. This is accomplished without the necessity of elevating pressures above those now employed and as a consequence of the finely divided condition of the oil discharged by the nozzle, a less amount of air may be used, than under present conditions, to bring about a more complete combustion.

While I have described the invention in great detail and with respect to a preferred form thereof, it is not desired to be limited thereto since many changes and modifications may be made therein without departing from the spirit and scope of the invention. What it is desired to claim and secure by Letters Patent of the United States is:

1. A fuel-oil delivery device comprising in combination, an elongated body member having a longitudinal bore with the forward end part thereof internally threaded, a nozzle on the forward end of said body member having a discharge orifice, a swirl sleeve member threadedly engaging the internally threaded part of the bore of the body member whereby it may be moved towards and away from said nozzle and form therebetween a chamber of variable size, the said swirl sleeve being provided with an axial bore therethrough which has a restricted outlet at its forward end leading into said chamber, and a swirl member disposed within the bore of said sleeve and provided with a longitudinally-extending groove from end to end thereof which has a part at least that is angularly disposed relative to the longitudinal axis of the member whereby oil may pass between said swirl and sleeve members and through said outlet into said chamber and then out the orifice of the nozzle.

2. A fuel oil delivery device comprising in combination, an elongated body having a longitudinal bore the forward end portion of which is internally threaded, a nozzle at the forward end of said body having a discharge orifice, a swirl shell threadedly engaging the threads of the body bore to facilitate longitudinal adjustment of the shell relative to the bore of the body whereby its forward end may be moved towards and away from said nozzle and co-operating with said nozzle and body to form a chamber of variable size between said forward end and nozzle, the said shell having a bore therein with an open end at the rear end thereof and an end wall at the forward end provided with an outlet leading into said chamber, and a swirl member in said

bore of the shell provided with a spirally arranged groove extending from end to end thereof and the forward end of the swirl member and wall of the shell being formed to provide a chamber in communication with said outlet and with which said spiral is in communication.

3. A fuel oil delivery device comprising in combination, an elongated body having a longitudinal bore the forward end portion of which is internally threaded, a nozzle at the forward end of said body having a discharge orifice, a swirl shell threadedly engaging the threads of the body bore to facilitate longitudinal adjustment of the shell relative to the bore of the body whereby its forward end may be moved towards and away from said nozzle and co-operating with said nozzle and body to form a chamber of variable size between said forward end and nozzle, the said shell having a bore therein with an open end at the rear end thereof and an end wall at the forward end provided with an outlet leading into said chamber, a swirl member in said bore of the shell provided with a spirally arranged groove extending from end to end thereof and the forward end of the swirl member and wall of the shell being formed to provide a chamber in communication with said outlet and with which said spiral is in communication, a member in threaded engagement with the threads of the body bore provided with an opening therethrough, and a strainer supported thereby at its rear side.

4. A fuel oil delivery device comprising in combination, an elongated body having a longitudinal bore the forward end portion of which is internally threaded, a nozzle at the forward end of said body having a discharge orifice, a swirl shell threadedly engaging the threads of the body bore to facilitate longitudinal adjustment of the shell relative to the bore of the body whereby its forward end may be moved towards and away from said nozzle and co-operating with said nozzle and body to form a chamber of variable size between said forward end and nozzle, the said shell having a bore therein with an open end at the rear end thereof and an end wall at the forward end provided with an outlet leading into said chamber, a swirl member in said bore of the shell provided with a spirally arranged groove extending from end to end thereof and the forward end of the swirl member and wall of the shell being formed to provide a chamber in communication with said outlet and with which said spiral is in communication, a projection on the rear end of the swirl member, a member in threaded engagement with the threads of the body bore provided with an opening therethrough loosely receiving the projection on the swirl member, and a strainer supported thereby at its rear side.

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