

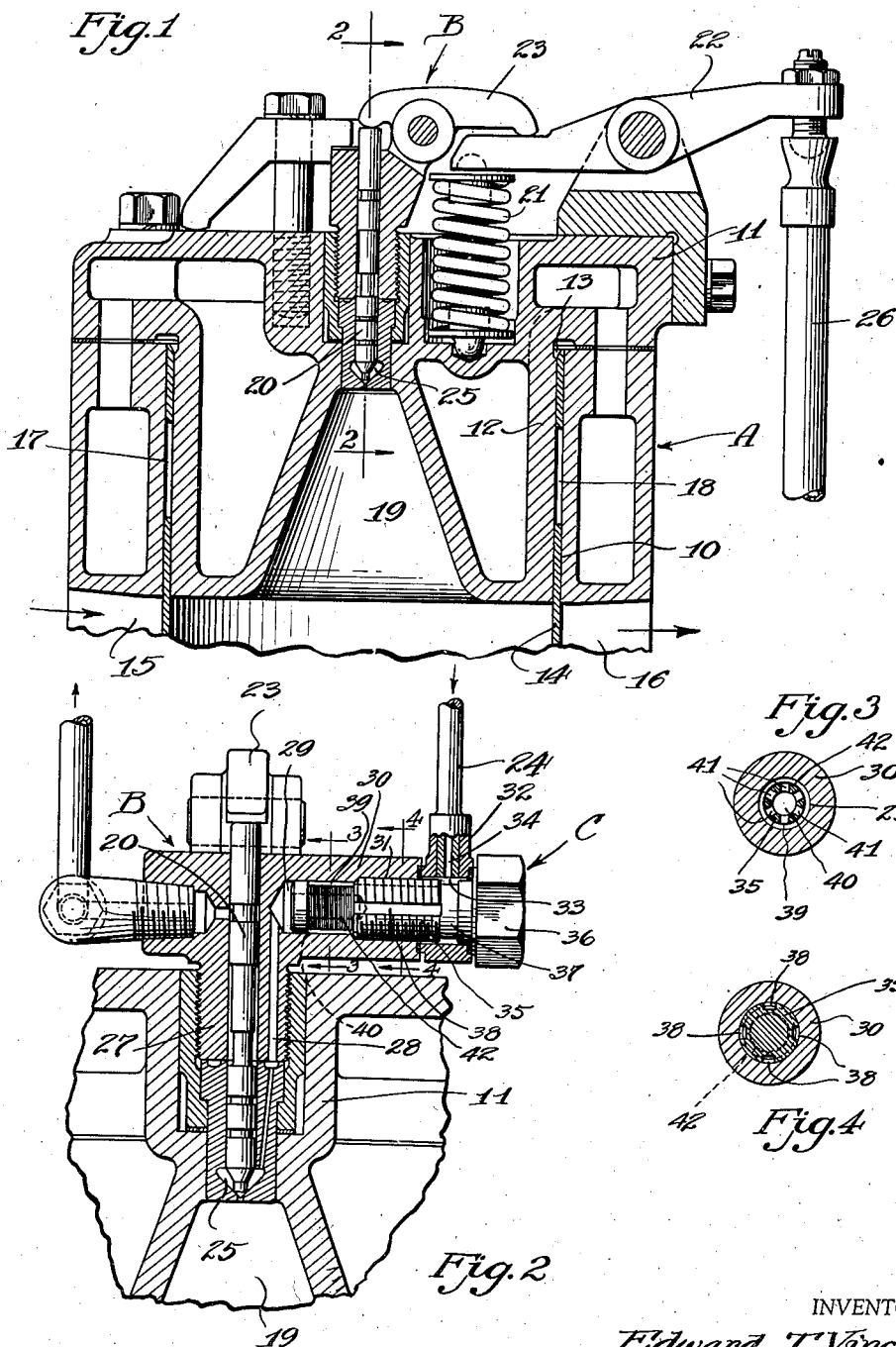
April 2, 1935.

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1,996,180

ENGINE

Filed Jan. 16, 1932



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1,996,180

ENGINE

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Application January 16, 1932, Serial No. 587,002

5 Claims. (Cl. 210—164)

My invention relates to engines and more particularly to engines of the fuel injection type, my improvements residing more particularly in the means for coupling the fuel supply line with the fuel atomizing device and for filtering the fuel thus introduced to the fuel atomizing device.

An object of my invention is to insure efficient engine performance in engines of the aforesaid type by providing a fuel filtering device which is so positioned and arranged that the same must be exposed on servicing the atomizer. When thus exposed the filtering device is never neglected as is the general tendency when removal and cleaning of the filtering device entails a separate and independent operation.

Further objects and advantages of my invention reside in the novel combination and arrangement of parts more particularly hereinafter described and claimed, reference being had to the accompanying drawing illustrating one embodiment of my invention, and in which:

Fig. 1 is a transverse sectional view of a portion of an engine cylinder and associated fuel atomizing means,

Fig. 2 is an enlarged sectional view taken substantially on the line 2—2 of Fig. 1,

Fig. 3 is a detail sectional view taken on the line 3—3 of Fig. 2, and

Fig. 4 is a detail sectional view taken on the line 4—4 of Fig. 2.

For purposes of illustration I have chosen to illustrate my device incorporated with a compression ignition engine of usual construction but it will be understood that the principle of my invention may be incorporated in other types of fuel injection engines and in engines wherever it is desirable to filter a liquid. The illustrations show a single sleeve valve engine, but obviously the particular type of engine forms no part of this invention and obviously I wish it understood that I do not limit my invention to the particular type shown and described.

"A" designates an engine structure having a cylinder 10 closed at one end by a cylinder head structure 11 carrying a fuel atomizing device B. In the illustrated embodiment of my invention, the cylinder head structure is provided with a re-entrant head portion 12 spaced from the cylinder wall in such a manner as to provide a sleeve pocket 13 for accommodating the upper or outer portion of a sleeve valve means 14. The engine cylinder is provided with intake and exhaust ports 15 and 16 respectively cooperating with the sleeve intake and exhaust ports 17 and 18 and

the sleeve valve means may be actuated in any suitable and well known manner.

The cylinder head is provided with a combustion chamber 19 and the fuel atomizing device B is preferably removably secured to the head in the usual manner. In the illustrated embodiment of my invention, the fuel atomizing device is provided with a plunger 20 yieldingly held on its seat by the spring 21 acting through levers 22 and 23. The fuel pressure from the supply line 24 directly communicates with the chamber 25 and exerts a pressure upwardly on the plunger 20. The push rod 26 may be actuated in any suitable manner and when so actuated it acts through the lever 22 to compress the spring 21 and release the plunger thereby permitting the fuel pressure to unseat the plunger and to be sprayed into the combustion chamber.

The atomizing device consists of a structure 27 having a passage 28 connecting the chamber 25 with an enlarged recess 29 in the laterally extending boss 30, said recess being internally threaded as at 31. The supply line 24 terminates in a fitting 32 having an opening 33, a passage 34 in said fitting communicating with the fuel supply line and opening into the opening 33.

A coupling C is provided for clamping the fitting 32 to the atomizing device, said coupling having an externally threaded shank 35 screwed into the internally threaded recess 29 and a head 36 for engaging said fitting 32 and clamping same to the atomizing structure 27. The shank of the coupling is provided with an annular groove 37 communicating with the passage 33 and a longitudinally extending groove 38 connecting groove 37 with an annular groove 39 spaced axially of said shank from the annular groove 37. The inner end of the shank is internally and axially bored as at 40, the said bore opening into the recess 29 thus communicating with the passage 28 in the atomizing device. The shank is radially bored or slotted as at 41 to connect the annular groove 39 with the internal bore 40. Thus the fuel may freely flow from the supply line 24 through passage 33 in the fitting 32 into annular groove 37 and thence into annular groove 39 by way of groove 38. From annular groove 39 the fuel may flow through the radial passages or holes 41 into the internal bore 40 and to the chamber 25 in the atomizing device adjacent the injection nozzle.

A filter 42 consisting of a very fine wire coil with slight projections (a known filtering mechanism) is preferably formed as a unitary structure with the coupling C and this wire coil is

preferably wrapped around the shank within the annular groove 39 thereby forcing the fuel to flow between the wire coils to said radial passages or holes 41. The end of the shank has a very slight clearance with respect to the recess 29 and preferably this clearance is not in excess of the clearance between the wires of said filter so as to induce the major portion of said fuel to flow through the filter.

It may be noted that the filter is withdrawn from the assembly with the coupling C which must be entirely removed in order to disconnect the fuel line, the disconnection of said fuel line being necessary when removing the atomizing device for service or for other reasons. Thus, whenever the fuel supply line is disconnected, the filter 42 is exposed to view and consequently may be readily and conveniently cleaned. The construction herein shown and described insures the frequent cleaning of the fuel filter, thereby resulting in more efficient and reliable engine performance.

It will be apparent to those skilled in the art to which my invention pertains that various modifications and changes may be made therein without departing from the spirit of my invention or from the scope of the appended claims.

What I claim as my invention is:

1. A coupling of the character specified including a fitting adapted for attachment with a device having a bore and a fuel conducting passage to be supplied with a fuel and communicating with said bore, said fitting assembled within said bore and removable axially therefrom and having an internal fuel passage arranged to communicate with the passage of said device, a separate intake coupling element cooperating with the fitting to provide a fuel passage externally of the fitting, said fitting having a second external annular passage spaced axially of the fitting from said first fuel passage and communicating therewith, said fitting provided with intermediate passages connecting said internal passage with said second external fuel passage, and a filter device carried externally of said fitting and interposed in the path of said fuel flow in flowing from said second external passage to said internal passage, said filter device being assembled within said second fuel passage.

2. A coupling of the character specified including a fitting adapted for attachment with a device having a bore and a fuel conducting passage to be supplied with a fuel and communicating with said bore, said fitting fitted within said bore and removable axially therefrom and having an internal fuel passage arranged to communicate with the passage of said device, a separate intake coupling element cooperating with the fitting to provide a fuel passage externally of the fitting, said fitting provided with an annular recess cooperating with said bore for providing a second fuel passage spaced axially of the fitting from said first passage and communicating therewith, said fitting having intermediate passages connecting said internal passage with said second external fuel passage, and a relative fine coiled spring filtering device encircling said fitting within said second fuel passage and interposed

in the path of said fuel flow in flowing from said second external passage to said internal passage.

3. A coupling of the character specified including a fitting adapted for attachment with a device having a bore and a fuel conducting passage to be supplied with a fuel and communicating with said bore, said fitting having an internal fuel passage arranged to communicate with the passage of said device, a separate intake coupling element cooperating with the fitting to provide a fuel passage externally of the fitting, said fitting provided with an annular recess cooperating with said bore for providing a second fuel passage spaced axially of the fitting from said first passage and communicating therewith, said fitting having intermediate passages connecting said internal passage with said second external fuel passage, and a relative fine coiled spring filtering device within said second fuel passage encircling said fitting and covering the mouth of said intermediate passages whereby to filter the fuel in passing from said second external passage to said internal passage.

4. A coupling of the character specified including a fitting adapted for attachment with a device having a bore and a fuel conducting passage adapted to be supplied with a fuel and communicating with said bore, said fitting fitted within said bore and removable axially therefrom and having an internal fuel passage arranged to communicate with the passage in said device and outwardly extending radial passages connecting said internal passage with the outer surface of the fitting, a relative fine coiled spring filtering device encircling said fitting and covering the mouth of said radial passages to filter the fuel prior to introduction to said device, and an intake coupling ring cooperatively associated with said fitting to provide an annular fuel chamber externally of the fitting and spaced from said filtering device axially of the fitting, said fitting having longitudinally extending passages connecting said annular fuel chamber with said filtering device.

5. A coupling of the character specified including a fitting adapted for attachment with a device having fuel conducting passage adapted to be supplied with a fuel and a bore communicating with said conducting passage, said fitting having an internal fuel passage arranged to communicate with the passage in said device and outwardly extending radial passages connecting said internal passage with the outer surface of the fitting, said fitting secured within the bore and removable axially therefrom, a relative fine coiled spring filtering device encircling said fitting within the bore and covering the mouth of said radial passages to filter the fuel prior to introduction to said device, and an intake coupling ring cooperatively associated with said fitting to provide an annular fuel chamber externally of the fitting and spaced from said filtering device axially of the fitting, said fitting having longitudinally extending external grooves connecting said annular fuel chamber with said filtering device.

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