

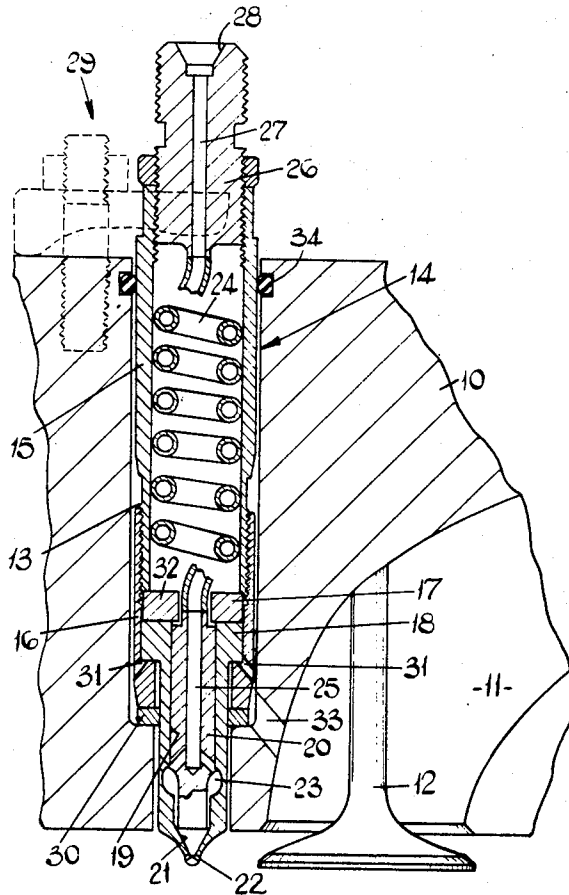
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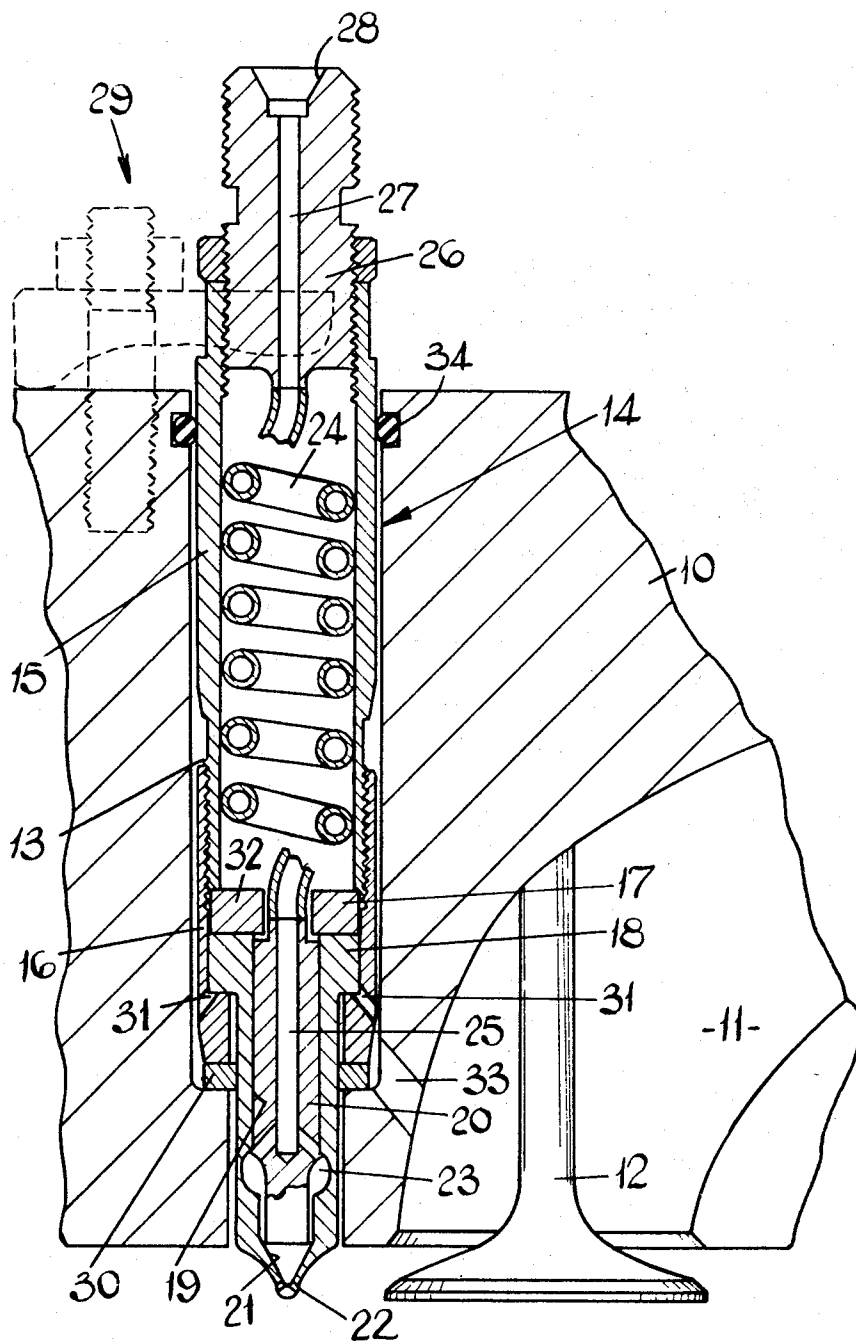
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[54] **LIQUID SUPPLY NOZZLES**
 4 Claims, 1 Drawing Fig.

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123/131, 239/602, 267/182
 [51] Int. Cl. **B05b 1/32**
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534, 584, 585, 602; 267/182; 123/131

ABSTRACT: A liquid supply nozzle including a valve member which is movable by the action of fluid under pressure within a chamber to permit such fluid to flow through an outlet orifice, the valve member being resiliently loaded by means of a spring and the spring being formed from tube and serving to convey the fluid under pressure to the aforesaid chamber.





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LIQUID SUPPLY NOZZLES

This invention relates to liquid supply nozzles of the kind comprising a nozzle head, an orifice formed in the head, a valve member slidable in the head for controlling the flow of liquid through the orifice from an inlet, resilient means acting to a position in which the flow of liquid through the orifice is prevented and a chamber to which liquid under pressure can be supplied, said liquid under pressure acting to move the valve member away from said position thereby to permit the flow of liquid through said orifice.

The object of the invention is to provide such a nozzle in a simple and convenient form.

According to the invention a nozzle of the kind specified is characterized in that the resilient means is formed from tube, the tube acting to convey liquid from the inlet to said chamber.

One example of a liquid supply nozzle in accordance with the invention will now be described with reference to the accompanying drawing which shows a nozzle suitable for injecting liquid fuel under pressure to the combustion space of an internal combustion engine of the compression-ignition type.

The drawing shows the wall 10 of a cylinder head of the engine and having an inlet passage 11 controlled by a poppet valve 12. Formed in the wall of the cylinder head 10 is a stepped bore 13 the narrower end of which is in communication with the combustion chamber.

Mounted within the stepped bore 13 is a liquid fuel injection nozzle generally indicated at 14. The nozzle comprises a tubular body portion 15 which at one end is provided with a peripheral screw thread. For engagement with this thread there is provided a complementarily internally threaded retaining member 16 and which when engaged, retains a stepped cylindrical nozzle head 18 relative to the body portion. Moreover, intermediate the nozzle head 18 and the body portion is an apertured stop plate 17.

Formed in the nozzle head is a bore 19 which at the end of the nozzle head which is exposed to the combustion chamber, tapers inwardly to define a seating 21. Furthermore, the bore is in communication with an orifice 22 through which liquid fuel can enter the combustion space of the engine. Slidable within the bore 19 is a valve member 20 which is shaped for cooperation with the seating 21. The bore 19 intermediate its ends is enlarged to define in conjunction with a narrowed portion of the valve member, a chamber 23.

The valve member 20 is urged towards a closed position in which it cooperates with the seating 21, by means of a coiled compression spring 24. This spring is accommodated within the body portion 15 and is formed as a tube. One end of the spring is secured to the valve member 20 and the tube communicates with a passage 25 which is formed in the valve member and which is extended so that it communicates with the chamber 23. The other end of the spring is secured to a plug 26 which is in screw thread engagement with the body portion and formed within the plug is a passage 27 which communicates with an inlet 28.

In operation, liquid fuel under pressure applied to the inlet 28 will flow to the chamber 23 and the pressure of fuel will urge the valve member 20 against the action of the spring. When the valve member is moved from the closed position fuel will flow from the chamber 23 through the orifice 22 to the combustion chamber of the engine and when the fuel pres-

sure falls the spring will urge the valve member to its closed position. The extent of movement of the valve member under the applied fuel pressure is determined by the stop plate 17 and the force exerted by the spring upon the valve member can be adjusted by rotating the plug 26.

In order to secure the nozzle in position within the bore any convenient form of clamping arrangement may be provided and such an arrangement is indicated in dotted outline at 29. Furthermore, in order to prevent escape of combustion gases there is located between the step defined in the bore 13 and the member 16, a washer 30.

In use, it is likely that fuel will seep into the interior of the body portion 15 due to leakage between the valve member and the bore 19. This fuel is allowed to leak away through passages 31 which communicate with the interior of the body portion by way of the clearance between the member 16, the nozzle head 18 and the stop plate 17. The stop plate is also provided with a groove indicated at 32 to ensure that the interior of the body portion is in communication with the aforesaid clearance.

Conveniently the clearance which is defined between the bore 13 and the nozzle communicates with the adjacent air inlet passage 11 of the engine by way of a passage 33 and a seal ring 34 is provided to provide a seal between the body portion and the wall of the bore 13 adjacent the wider end thereof.

By the construction above described there is provided a very slim injection nozzle since it is not necessary to provide a fuel conveying passage in the wall of the body portion 15.

I claim:

1. A liquid fuel supply nozzle for an internal combustion engine and comprising a nozzle head and a nozzle body to which the head is secured, an orifice formed in the head, a chamber formed in the head and communicating with said orifice, a valve member slidable in the head for controlling the flow of liquid from the chamber through the orifice, resilient means acting to urge the valve member to a position in which the flow of liquid through the orifice is prevented, an inlet for liquid under pressure, a coiled compression spring constituting said resilient means, said coiled compression spring being formed from tube, said tube-forming part of a flow path of liquid from said inlet to said chamber, said liquid under pressure in the chamber acting to move the valve member away from said position against the action of the spring, thereby to permit the flow of liquid through said orifice.

2. A nozzle as claimed in claim 1 including a passage in the valve member, one end of the tube forming the spring being secured to said valve member so that the interior of the tube communicating with said passage and the passage forms part of said flow path.

3. A nozzle as claimed in claim 2 in which said body is hollow, and including means for securing the nozzle head to one end of said body, a plug engaged within the other end of said body, said plug defining said inlet, and the other end of said tube being secured to said plug and passage means through which the interior of the body is in communication with the exterior of the body.

4. A nozzle as claimed in claim 3 in which said means for securing the nozzle head to the body part comprises a retaining member which is in screw-thread engagement with the body part and which defines a lip for engagement with a step on the nozzle head.

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