

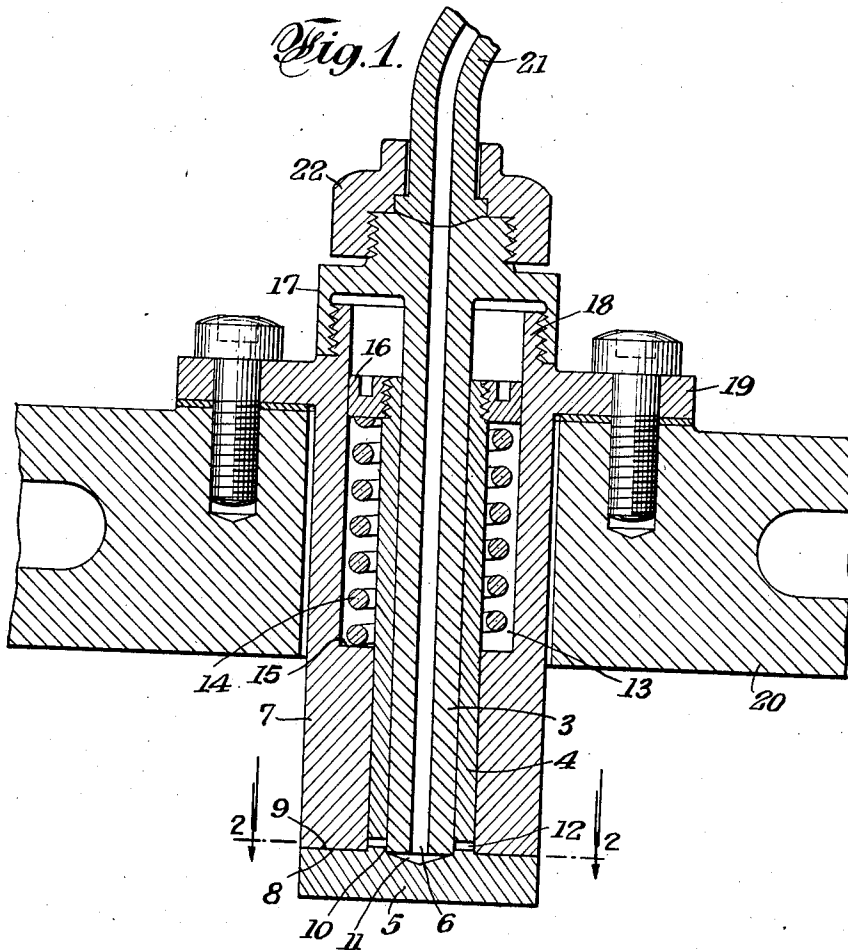
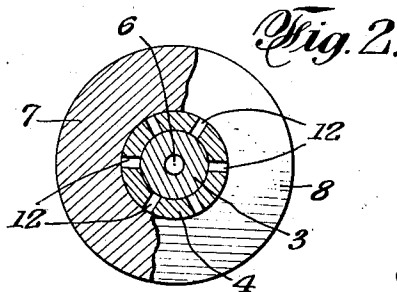
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FUEL INJECTOR

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FUEL INJECTOR

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5 Claims. (Cl. 299—107.6)

This invention relates to engines of the liquid fuel injection type.

Special objects of the invention are to provide a fuel injector which will be of simple, sturdy design, free of complicated or delicate parts and which will be self-clearing so as to overcome any fouling or carbon forming tendencies.

These and other desirable objects are attained by the novel features of construction, combinations and relations of parts hereinafter described, illustrated and broadly claimed.

In the accompanying drawing a practical and at present preferred embodiment of the invention is shown, but it will be understood that the actual physical structure may be modified and changed in various ways, all within the true intent and broad scope of the invention.

Figure 1 is a broken longitudinal sectional view of one form of the injector.

Figure 2 is a transverse sectional view as on substantially the plane of line 2—2 of Figure 1.

The injector consists of but three main parts, a stationary supply tube or nozzle 3, a surrounding piston sleeve 4 having a head or closed end 5 closing the open discharge end 6 of the nozzle tube and a casing sleeve 7 surrounding the movable piston sleeve.

The head of the piston sleeve is shown as extended as an annular flange 8 to overlap and engage the end 9 of the casing sleeve and as having in its inner face a cylindrical seat 10 for receiving the end of the nozzle tube. The bottom of this seat is shown as conical at 11 to provide clearance at the end of the tube.

Atomizing ports 12 are shown provided in the piston sleeve back of the flange 8 and back of the seat 10 so that the surrounding casing and the enclosed tube will operate as cutoffs for the opposite ends of ports 12 when the piston sleeve is retracted as shown.

The outer end of the casing 7 is shown as formed with a cavity 13 about the piston sleeve for the reception of a retracting spring 14 which is supported at the inner end on a seat or shoulder 15 and at its outer end acts against an abutment shoulder shown as a flange 16 screwed on the outer end of the piston sleeve.

The nozzle tube 3 is shown as supported by having an annular head portion 17 at its outer end screwed onto the hub portion 18 at the outer end of the casing sleeve. The latter is indicated as having a mounting flange 19 by which the structure may be secured in the engine head 20.

Liquid fuel under pressure is conducted to the

stationary supply tube through suitable high pressure tubing 21 shown as connected with the end of the supply tube by screw flange 22.

In the position shown, the atomizing ports 12 are closed and sealed at both ends, at the inner ends by the supply or nozzle tube 3 and at the outer ends by the surrounding casing sleeve 7. In this position the flange 8 of the piston sleeve seats against the end of the casing, being held firmly to this position by cylinder pressure, in addition to the force of the retracting spring 14. The conical seat 11 provides an ample piston area for the liquid under the pressure furnished by the fuel pump to force the piston sleeve inwardly sufficiently to uncover the opposite ends of the atomizing ports 12 which then spray or atomize the liquid into the cylinder through the space then provided between the end 9 of the casing 7 and the flange 8 of the piston head. The pump for creating the piston shifting and atomizing pressure is not illustrated as the structure of the same may vary widely and it may be made as a part of the injector or as a separate pump structure.

What I claim is:

1. A fuel injector comprising a stationary liquid fuel supply tube having an open discharge end, a piston sleeve slidable over said stationary tube and having a closed end covering the discharge end of said stationary tube and thereby subjected to pressure of liquid in said tube, a stationary casing about said piston sleeve, a flange at the closed end of said piston sleeve for abutment with the end of said casing, said piston sleeve having a port or ports back of said flange and closed at opposite ends by said supply tube and surrounding casing when said piston sleeve is retracted against the end of the casing and means for holding said piston sleeve retracted against pressure of liquid in said supply tube.

2. A fuel injector comprising a stationary liquid fuel supply tube having an open discharge end, a piston sleeve slidable over said stationary tube and having a closed end covering the discharge end of said stationary tube and thereby subjected to pressure of liquid in said tube, a stationary casing about said piston sleeve, a flange at the closed end of said piston sleeve for abutment with the end of said casing, said piston sleeve having a port or ports back of said flange and closed at opposite ends by said supply tube and surrounding casing when said piston sleeve is retracted against the end of the casing and means for holding said piston sleeve retracted against pressure of liquid in said supply tube, in-

cluding a spring housed within the casing about the piston sleeve, the casing having a supporting shoulder for one end of said spring and the sleeve having an abutment shoulder for the opposite end of said spring.

3. A fuel injector comprising a stationary liquid fuel supply tube having an open discharge end, a piston sleeve slidable over said stationary tube and having a closed end covering the discharge end of said stationary tube and thereby subjected to pressure of liquid in said tube, a stationary casing about said piston sleeve, a flange at the closed end of said piston sleeve for abutment with the end of said casing, said piston sleeve having a port or ports back of said flange and closed at opposite ends by said supply tube and surrounding casing when said piston sleeve is retracted against the end of the casing and means for holding said piston sleeve retracted against pressure of liquid in said supply tube, the closed end of said piston sleeve having a seat receiving the end of the supply tube.

4. A fuel injector comprising a stationary liquid fuel supply tube having an open discharge end, a piston sleeve slidable over said stationary tube and having a closed end covering the discharge end of said stationary tube and thereby subjected to pressure of liquid in said tube, a stationary casing about said piston sleeve, a flange at the closed end of said piston sleeve for

abutment with the end of said casing, said piston sleeve having a port or ports back of said flange and closed at opposite ends by said supply tube and surrounding casing when said piston sleeve is retracted against the end of the casing, means for holding said piston sleeve retracted against pressure of liquid in said supply tube and cooperating parts at the outer end of the supply tube and casing by which said supply tube is supported in spaced relation within said casing.

5. A fuel injector, comprising a casing sleeve having an open inner end, a nozzle sleeve secured in spaced relation within said casing sleeve and having an open inner end adjacent the open inner end of the casing sleeve, a piston sleeve operating in the space between said casing and nozzle sleeves and having a closed end over the open inner end of the nozzle sleeve and an annular projecting flange overlying the end of the casing sleeve, said piston sleeve having a port or ports back of said flange in position to be closed at opposite ends by said casing sleeve and nozzle sleeve when said piston sleeve is retracted, a retracting spring about the outer portion of said piston sleeve, an abutment shoulder for said spring on the outer end of said piston sleeve and a supporting shoulder in the outer end portion of said casing sleeve for the inner end of said retracting spring.

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