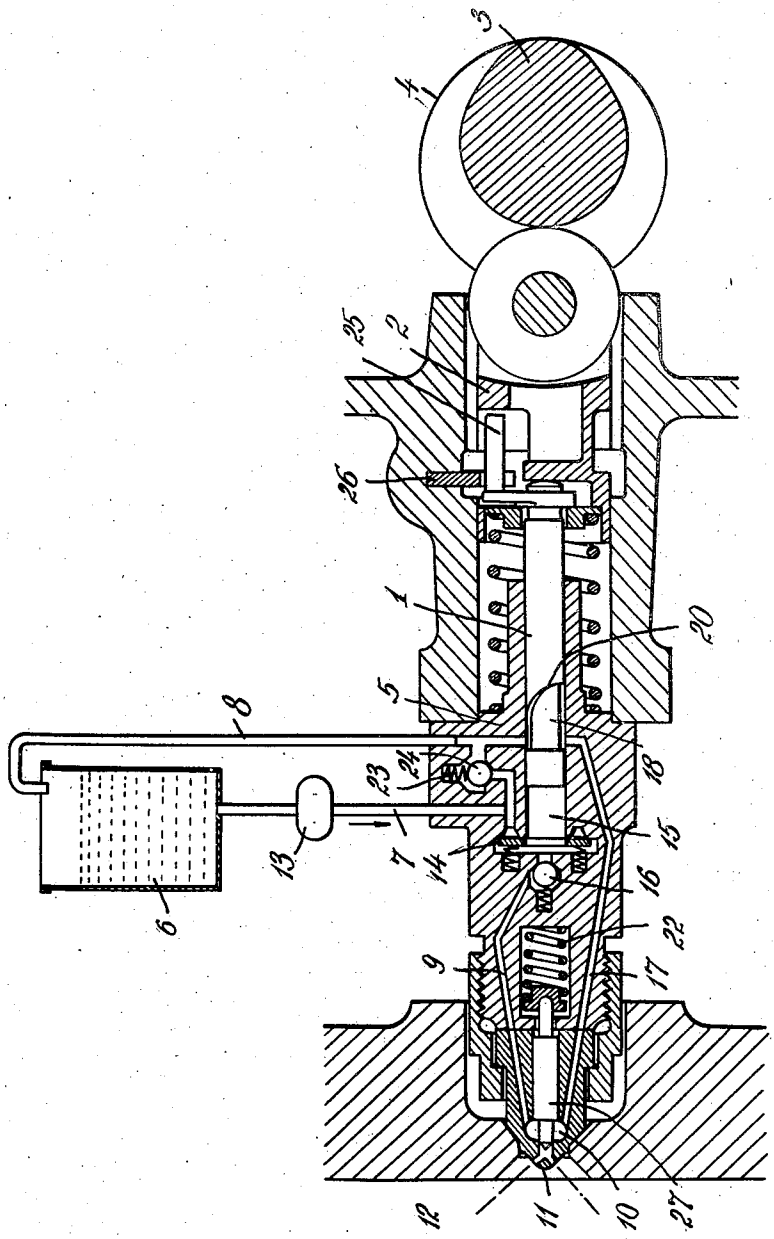
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FUEL INJECTION DEVICE

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FUEL INJECTION DEVICE

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3 Claims. (Cl. 299—107.2)

The invention relates to a fuel injection device, whose injection pump delivers fuel in excess of what is required. The invention consists in that the fuel delivered by the pump in excess passes from the delivery space of the pump through the nozzle space to a member controlling the return flow.

Preferably the injection pump plunger is provided with a peripheral recess which is defined in part by an oblique edge, which controls the return flow of the fuel delivered in excess through the nozzle space. It is recommended to construct the return flow member in such a way that the excess of fuel passes through the nozzle space before the injection period.

The single figure of the drawing shows one embodiment of the invention.

The pump plunger 1 is driven through a roller guide 2 by the cam 3 of the camshaft 4. The cylinder 5 of the fuel pump is connected to the fuel tank 6 through a delivery pipe 7 and a return pipe 8. Part of the fuel delivered by the pump reaches the nozzle chamber 10 through the passage 9 and is then injected through the nozzle 11 into the combustion space 12.

During the sucton stroke of the plunger 1, the fuel is forced by the feed pump 13 through the pipe 7 past the valve 14 into the delivery chamber 15 of the pump. During the delivery stroke of the plunger 1 fuel flows through the delivery valve 16 and the passage 9 into the nozzle chamber 10.

As long as the return passage 17 is in connection with the pipe 8 through the space formed by the recess 18 in the plunger 1, the fuel delivered in excess flows again into the tank 6. If the control edge 20 of the piston 1 breaks off the connection between the passage 17 and the pipe 8, the fuel delivered to the injection space 7 is subjected to pressure. In that way the fuel needle 21 is raised against the force of the spring 22. The fuel can then be injected through the nozzle 11 into the combustion space 12. After termination of the delivering and/or injecting, a new suction stroke begins.

The adjustment of the quantity of fuel to be injected is effected by the plunger 1 by varying the position of the control edge 20. The plunger 1 is fitted with an eccentric pin 25 which fits into a recess in the regulating rod 26 so that moving this rod 26 causes the plunger to turn through a corresponding angle.

The fuel delivered through the nozzle space before injection does not only cool the injection nozzle and nozzle needle, but also sweeps away any air bubbles that may be present. In this way troubles occurring to the injection in consequence of coking of the fuel or from the presence of air are prevented.

In order to prevent pressure waves forming in the delivery pipe after the beginning of an injection stroke, and to lead away the fuel supplied in excess by the delivery pump 13, a by-pass having an overflow valve 24 loaded with the spring 23 is provided. The superfluous fuel then passes from the pipe 7, through the by-pass and valve 24, into the return pipe 8.

I claim:

1. An oil injection device comprising an injection nozzle, a loaded valve normally closing the passage therethrough, a nozzle chamber with which the passage in the nozzle communicates when said valve is open, said valve being opened by oil pressure in said chamber greater than the loading pressure thereon, an oil delivery chamber, a delivery conduit for conducting oil to the delivery chamber, a passage for oil from the delivery chamber to the nozzle chamber, means for preventing return flow of oil through said passage, a pump cylinder, a pump plunger reciprocable in said cylinder, said plunger having a forward end portion filling said cylinder, the delivery end of said cylinder communicating with said delivery chamber, the pump plunger having a peripheral recess rearwardly of said forward outer end portion providing a space between the plunger and the cylinder, an oil passage from the nozzle chamber, through the cylinder, to said space, and an oil passage from said space, the plunger having a control edge defining a portion of said space and shaped to cut off flow of oil from said space to the oil passage leading therefrom at a predetermined position of the plunger during the advance thereof, to control the point during the advance of the plunger at which further forward movement thereof begins applying pressure on the oil in the nozzle chamber to cause injection.

2. An oil injection device as set forth in claim 1 having means to vary the position at which the control edge cuts off the flow of oil from said space during the forward movement of the plunger.

3. An oil injection device as set forth in claim 1 having a by-pass for the passage of oil from said oil delivery conduit to the oil passage leading from the said space, and a loaded non-return valve in said by-pass.

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