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# TRANSLATION

LIQUID FUEL INJECTOR

By

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## FOREIGN TECHNOLOGY DIVISION

AIR FORCE SYSTEMS COMMAND

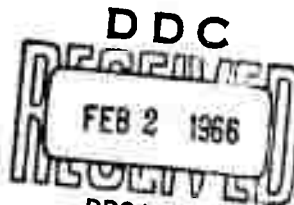
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# UNEDITED ROUGH DRAFT TRANSLATION

LIQUID FUEL INJECTOR

BY: I. Ye. Ul'yanov and N. S. Lamekin

English pages: 4

SOURCE: Patent No. 123375 (Appl. No. 576744/25,  
January 12, 1956), (Russian), 2 pages.

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## LIQUID FUEL INJECTOR

I. Ye. Ul'yanov and N. S. Lamekin

The object of this invention is an injector intended for atomizing liquid fuel which is designed in three constructive versions with an in-built generator of ultrasonic vibrations.

The known injectors for atomizing liquid fuel designed with the in-building in them of ultrasonic piezoquartz or magnetostriction vibrators assure a fine atomization of the fuel only with the creation of the proper constant pressure of feed of the fuel into the injector.

The distinguishing peculiarity of the proposed injector is the use in it of an air generator designed in the form of a volumetric resonator provided with a slit.

The use in the injector of an air ultrasonic generator of the design indicated enables one to accomplish fine atomization of the liquid fuel independently of the amount of pressure of its feed into the injector.

The Fig. 1 there is shown a design variant of the injector with the ultrasonic generator located internally with relation to the liquid fuel.

In the body 1 of the injector there is located the sleeve 2 which forms with it an annular cavity 3 into which there passes the liquid fuel and a generator which creates the ultrasonic vibrations it being designed in the form of a tube with the cavity resonator 4 and the wedge-shaped slit 5. The head 6 of the generator is pressed to the sleeve 2 by the clamping nut 7 through the medium of the intervening sleeve 8.

The compressed air passes into the resonator 4 along the tube 9, and the liquid fuel passes into the inner cavity 10 of the sleeve 2 through the window 11. The atomized fuel is thrown out through the opening 12.

In Fig. 2 there is shown the constructive variant of the injector which is internal with relation to the fuel jet.

According to this variant the cavity 13 serves as a resonator this hollow being created in the sleeve 14 between the nozzle 15 and the tube 16 along which there passes the liquid fuel. The compressed air is passed through the annular cavity 17 and the window 18 into the hollow of the sleeve 19. The atomized fuel is ejected through the nozzle 15.

In Fig. 3 there is shown the injector with the generator as being internal with relation to the fuel stream without the mixing of the air with the flow of fuel.

In this injector the fuel passes along the channel 20 through the soundpenetrable insert 21 into the nozzle 22. The air is passed along the tube 23 into the air generator 24 and is carried away through the lateral channel 25.

### Object of the Invention

An injector of liquid fuel with the use of a generator of ultrasonic vibrations acting on a stream of fuel inside or close to the nozzle which has the distinguishing feature that for the purpose of assuring a fine atomization of the fuel independently of the pressure of its feed into the injector, as a generator of ultrasonic vibrations there is used a pneumatic generator designed in the form of a volumetric resonator provided with a slit.

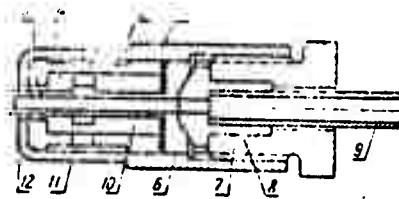


Fig. 1

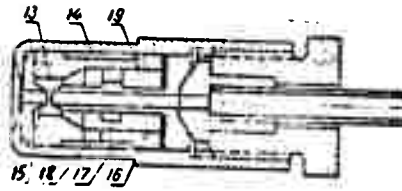


Fig. 2

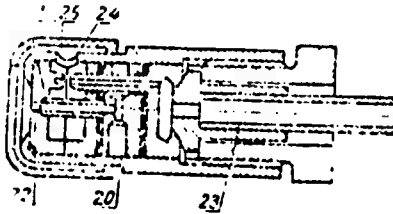


Fig. 3