H. M. REICHENBACH.

NEBULIZER AND VAPORIZER FOR INTERNAL COMBUSTION ENGINES.

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1,254,356.

Patented Jan. 22, 1918.

Fig. 1.

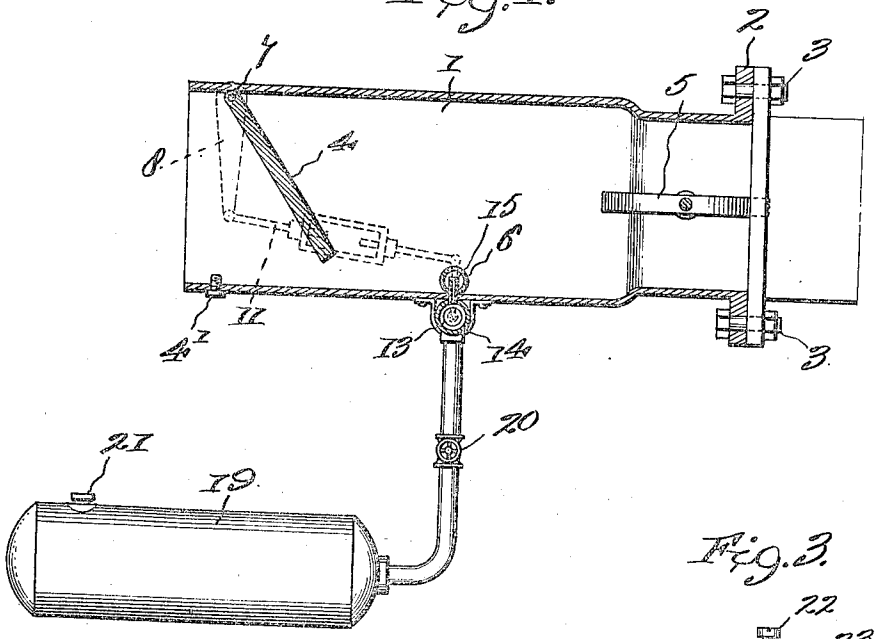


Fig. 3.

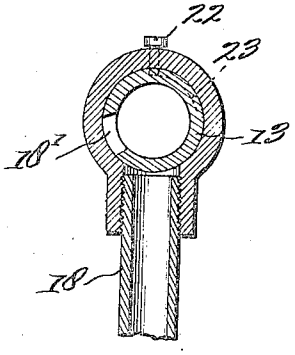
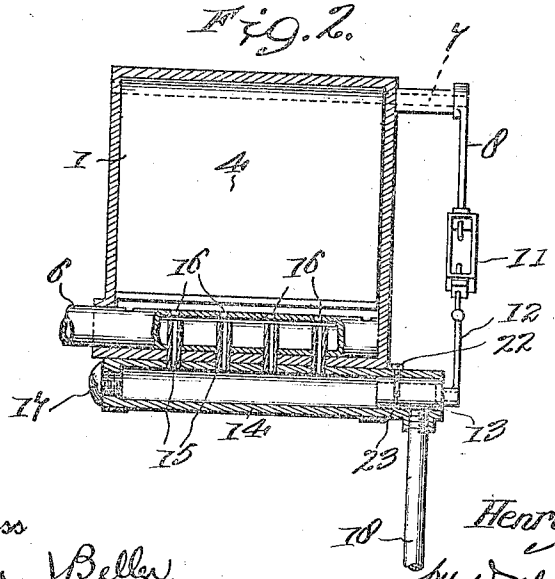


Fig. 2.



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NEBULIZER AND VAPORIZER FOR INTERNAL-COMBUSTION ENGINES.

1,254,356. Specification of Letters Patent. Patented Jan. 22, 1918.

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To all whom it may concern:

Be it known that I, HENRY M. REICHENBACH, a citizen of the United States, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Nebulizers and Vaporizers for Internal-Combustion Engines (Case "E"); and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to a form of device in which atomization is effected by means of a suitable elastic fluid such as air, under pressure, and in which fuel is fed into the air primarily brought by engine suction, into and through the conduit. The atomizing fluid may constitute an additional or supplemental air supplying means. The atomizing means may consist of jet or spray creating devices arranged directly in connection with the fuel supplying means, and preferably of injector devices acting directly upon the fuel supplied.

The atomizing means above mentioned, may be controlled in various ways, *i. e.* by hand, directly from the engine, in response to suction, or by means which will control the force and effect of said atomizer as to the secondary air supply, and the fuel supply, in accordance with the force of the draft or the quantity of air primarily passing into the intake conduit. I may arrange the means which controls the secondary supply of air in direct connection with some pressure responsive device in or connected to the conduit.

I may, for instance, connect a plate deflected by the main air supply directly entering the conduit, with a governing valve of the atomizing air supply, whereby the extent to which the one is opened determines the extent to which the other is opened.

The atomizing fluid supplied to the jet or spray devices may be an oxidizing, inert or combustible gas, and the primary air supply, as well as the fuel supply, must be gaged accordingly, the essential characteristic of the present invention residing in a construction and process wherein feed of fuel and nebulization are effected in direct response to engine suction, in the fuel feed devices, by a current drawn or forced from any source, of a nebulizing or atomizing elastic fluid.

In the accompanying drawings:

Figure 1 is a view partly in section of an intake conduit provided with a fuel supply blast guiding means and an auxiliary nebulizing air supply.

Fig. 2 is a section across such a conduit; and

Fig. 3 is an enlarged view of the air pipe and control valve.

In the drawings, 1 represents an engine intake conduit rectangular in cross section. This has a flange 2 by which, by suitable means such as bolts 3, the conduit may be secured to the engine walls. Within said conduit 1, I show an air deflector plate 4, a throttle valve 5, and a fuel supplying device 6.

The deflector plate 4 is mounted to rotate with the shaft 7 passing through the sides of the conduit. On the said shaft on the exterior of the conduit at one side, I provide an extension 8. The deflector, shaft and extension are rigidly secured together, and may well be in one piece. The weight of the deflector tends to keep it vertical or in conduit closing position against stop 4'. A spring or counterweight may be employed to assist in this tendency if wanted. This tendency is overcome by the pressure of the blast passing through the conduit, in response to engine suction.

Secured to the extension 8 is a link 11 extending to an arm 12, on the outer end of air admission valve 13. This link is made in two parts connected by the turnbuckle 10. This valve 13 fits an end of tube 14, from which tube 14 extend short tubes or injecting extensions 15. These extensions 15, as here shown, extend through the bottom of conduit 1 and into fuel pipe 6, arranged across the bottom of the conduit 1 and on the inside of said conduit. The said tube 6 is provided, as shown, with openings 16 opposite extensions 15. Fuel fed from a constant level device, discharges into and is drawn into the conduit, and blown across the blast entering past the deflector, whereby it is constantly and evenly distributed into and carried on said blast. The remote end of the pipe 14 may be closed by screw plug 17.

The valve 13 is shown in Fig. 3. The opening 18', when the valve is in open po-

sition, permits passage of air from pipe 18 to pipe 14. When the deflector 4 is in closed position, and in consequence the valve 13 shut, no air can pass. The pipe 18 connects the valve with a source of air supply, here indicated as tank 19, and may be closed by valve 20. A plug 21 permits the introduction of more air into the tank as needed. A pin and slot 22 and 23 hold said valve in place in pipe 14.

The operation of my device is apparent and may be briefly stated thus: The tank being charged with air and the fuel tank, not shown, with fuel, and the valves being suitably arranged, the engine is started. This draws air through the conduit and deflects plate 4, which, in turn, opens the air valve and permits the air from the tank to inject fuel into and carry it across the blast, the throttle being not quite closed at that moment. The mixture is carried to the engine and there exploded.

Modifications of various parts may be employed, the present being intended to typify a device in which feed of elastic fluid, under pressure, may be used in nebulizing and vaporizing fuel and feeding it into an air conduit, being under responsive control to engine suction.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent, is:

1. In an atomizer for internal combustion engines, in combination, an intake conduit, a deflector plate movable in response to intake air pressure, a source of fuel supply, means for supplying air under pressure to the fuel, an air control device, and a connecting means between the deflector plate and the pressure air control device whereby the quantity of air under pressure entering with fuel is varied in proportion to the quantity of air entering the conduit.

2. In an atomizing device for internal combustion engines, in combination, an intake conduit, a deflector plate pivoted therein, fuel feed devices in advance of said plate, a tank for fluid under pressure, a pipe leading from said tank to the fuel feed devices, a valve for controlling flow through said pipe, and a connection between said valve and said deflector plate whereby the position of the plate under the influence of the engine-induced blast, determines the extent to which the valve is opened.

3. In an atomizing device for internal combustion engines, in combination, an intake conduit, fuel feeding devices open for discharge into said conduit, a yielding deflector plate adapted to deflect an engine-induced blast into proper relation to said fuel feed devices, a source of fluid under pressure, a pipe leading from said source to said fuel feed devices, a valve in said pipe, an arm on said valve, and a link connecting said deflector plate and said arm, whereby the position of the deflector plate as determined by the blast determines the extent to which the valve is opened.

4. In an atomizing device for internal combustion engines, in combination, an intake conduit, fuel feeding devices open for discharge of liquid fuel into said conduit, a pivoted deflector plate adapted to deflect an engine-induced blast past said fuel openings, means for supplying air under pressure through said feeding devices whereby additional air, and fuel are supplied to said blast, a link connecting said deflector plate and air supplying means said deflector and additional air supply being in controlled relation to the pull of the engine, so that in response to engine pull, the supply of air under pressure, and consequently of fuel from both sources, increases.

5. In an atomizing device for internal combustion engines, in combination, an intake conduit, a pivoted deflector plate therein, fuel supply means adapted to open into said conduit in effective relation to said plate, air pressure injecting means in injecting relation to said fuel supply means, a connection between said plate and air injecting means and means operated thereby for controlling injection in response to engine suction as the plate is deflected.

6. In an atomizing device for internal combustion engines, in combination, an intake conduit, a deflector plate therein, fuel supply means adapted to open into said conduit in effective relation to said plate, air pressure injecting means in injecting relation to said fuel supply means, means for controlling supply of air under pressure, and a connection between said controlling means and said deflector plate whereby the extent to which the one is opened determines the extent to which the other is opened.

In testimony whereof, I affix my signature.

HENRY M. REICHENBACH.

Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."