M. BUCHERER.

FUEL ATOMIZER.

APPLICATION FILED JULY 21, 1915.

1,322,093.

Patented Nov. 18, 1919.

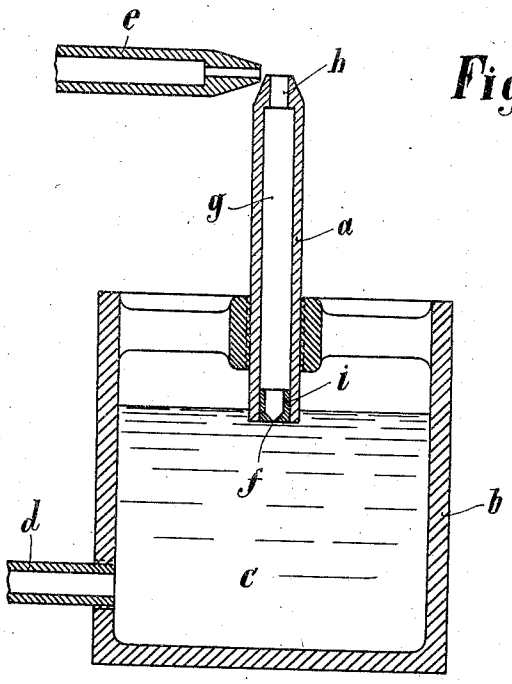


Fig. 1

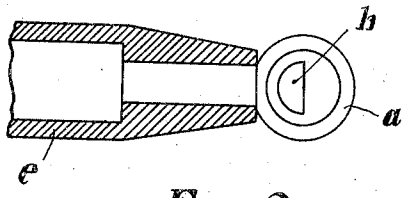


Fig. 2

Fig. 3

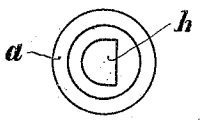
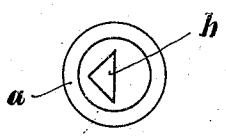


Fig. 4



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UNITED STATES PATENT OFFICE.

MAX BUCHERER, OF BERLIN-REINICKENDORF, GERMANY, ASSIGNOR OF ONE-HALF TO THE FIRM OF ROBUR-MOTOREN-GESELLSCHAFT M. B. H., OF BERLIN, GERMANY.

FUEL-ATOMIZER.

1,322,093. Specification of Letters Patent. Patented Nov. 18, 1919.

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To all whom it may concern:

Be it known that I, MAX BUCHERER, a subject of the German Emperor, and residing at 67 General Woynastrasse, Berlin-Reinickendorf, West, Germany, consulting engineer, have invented certain new and useful Improvements in Fuel-Atomizers, of which the following is a statement.

The present invention relates to devices acting similar to an inhaler for feeding and atomizing the liquid fuel of explosion and internal combustion engines. The essential feature of these devices consists in that a jet of liquid, air, gas or steam blows at right angles across the orifice of a small tube or a nozzle which forms with the fuel tank a system of communicating tubes, for example by dipping into the fuel. In order to secure a true inhaler effect the liquid in the tank and in the nozzle must be under the same pressure so that the jet blowing across the orifice of the nozzle alone will suck the liquid up to the plane of the orifice and thence carry the liquid with it in a finely diffused form, or atomize it.

The fuel nozzle may with such atomizing devices the same as with the ordinary jet carbureters be of a small suction area only, as otherwise it would, according to circumstances either supply the fuel too amply, or where the quantity is predetermined for each atomization, too suddenly. The atomizing will besides be the finer the less fuel a given volume of the sucking jet has to absorb.

The present invention, now, consists in that the minimum section corresponding to the fuel supply is disposed at a given distance from the orifice of the nozzle, and that the nozzle is made, at its orifice, of a considerably larger section. By such means the atomizing jet will, although the necessary narrow suction section is secured, be offered in the plane of the nozzle orifice a comparatively large liquid surface, so that the liquid is better distributed in the atomizing medium than with a narrow nozzle orifice.

Furthermore, the particular advantage is obtained that the nozzle, which dips with the narrow suction section permanently into the fuel will not be subject, even in case high temperatures occur in the neighborhood of the device, to being choked by incrustations. In consequence thereof such device is particularly adapted for atomizing heavy liquid fuels, which are inclined to form such incrustations to such degree that the known atomizing devices with naked narrow nozzle sections cannot be used therefor owing to the constant danger of their getting choked.

In the accompanying drawing the present invention has been exemplified in Figure 1 in an inhalerlike acting atomizing device with fuel nozzle dipping into the fuel.

Figs. 2–4 show, on a larger scale, various orifice sections of the fuel nozzle.

According to Fig. 1 the fuel nozzle *a* dips into the liquid fuel *c* in the open fuel tank *b*. The fuel is supplied to this tank *b* through the pipe *d*. At right angles to the nozzle *a* the nozzle *e* is disposed, in such a manner, that the axis of nozzle *e* crosses the axis of the nozzle *a*, and is preferably in the plane of the surface of the orifice of nozzle *a*.

From the nozzle *e* a jet of air, gas or steam is made to emerge at a high velocity by the action of a pressure produced by suitable means; this jet will exert on the liquid in nozzle *a* an inhalerlike suction, by which the liquid is first raised to the level of the orifice of the nozzle, where it is thereupon atomized by the action of the jet blowing across the orifice of nozzle *a*. The fuel liquid follows from the tank *b* into the nozzle *a* through the small opening *f* at the lower end of the nozzle. The limited quantity of liquid passing the fine opening *f*, will find only very little resistance within the part *g* and will readily pass through the bore *h* having a larger diameter than the opening *f*.

The fine opening *f* is preferably made by drilling a comparatively large hole into a plug to be subsequently fitted into the nozzle, but letting the drill penetrate only so far that its point produces in the end of the plug a hole *f* of the desired size only. This method avoids a long duct of the small section, in which very large losses in energy would be caused by the high friction of the liquid.

In order to facilitate the detaching of the fuel from the nozzle *a* it is advisable to make the orifice of this nozzle of such a section that the atomizing jet, on leaving the orifice area meets as long an edge as possible at right angles to the atomizing jet. Sections which will meet this requirement are, for example, a semicircular surface, the

curve of which is turned toward the nozzle *e* (see Fig. 2), a rectangle, to which, on the side of nozzle *e* a semicircular surface is added (see Fig. 3), or a triangle, which points with its apex toward the nozzle *e* (see Fig. 4).

I claim:

A fuel tank, a fuel nozzle dipping into the fuel in said tank, and an atomizing nozzle arranged at right angles to the upper end of said fuel nozzle, the latter nozzle having a plug at its lower end and being provided with a fine opening, and also having an outlet opening at the upper end, said outlet opening having a rear wall and side walls which are united together at the front side of said opening and which progressively recede from each other rearwardly from the atomizing nozzle to said rear wall.

In testimony whereof I affix my signature.

MAX BUCHERER.

Witnesses:

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HENRY HASPER.