

C. BOEHM.
 SPRAYING DEVICE.
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1,052,211.

Patented Feb. 4, 1913.

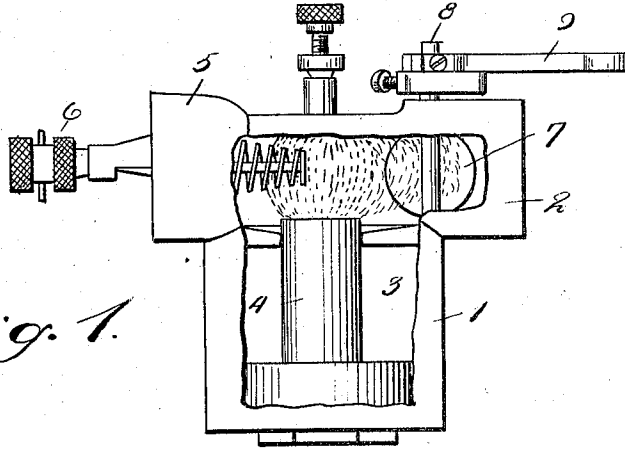


Fig. 1.

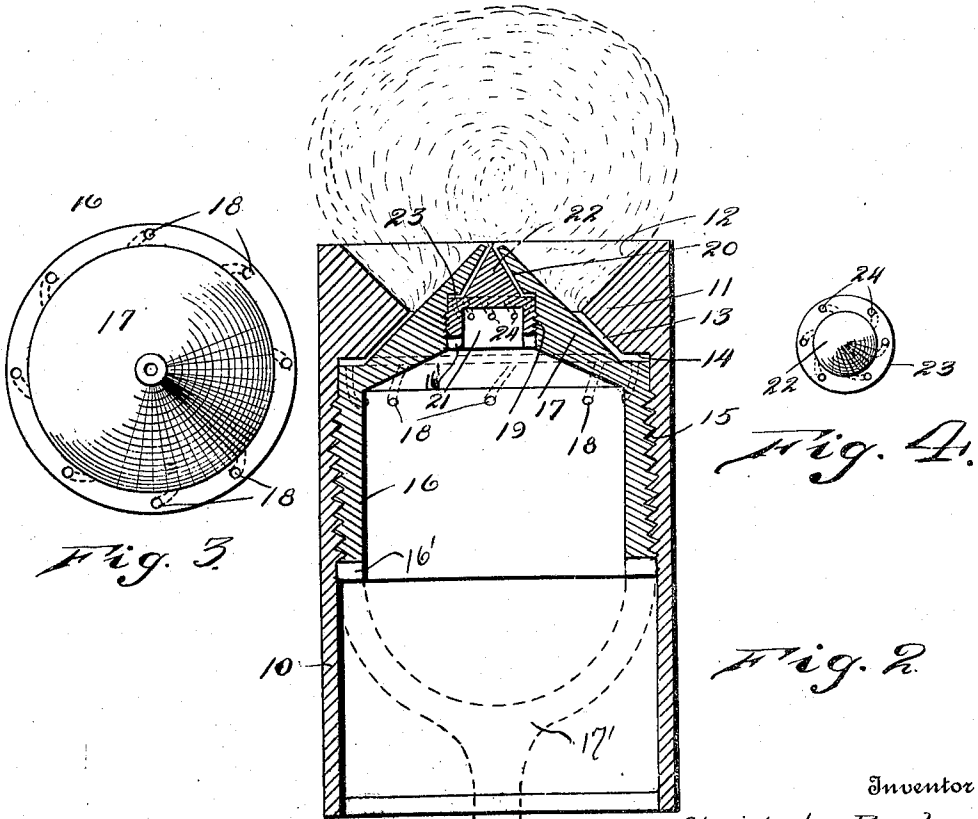


Fig. 3.

Fig. 4.

Fig. 2.

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SPRAYING DEVICE.

1,052,211.

Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, CHRISTOPHER BOEHM, a subject of the Emperor of Germany, residing at Atlantic City, in the county of Atlantic and State of New Jersey, have invented certain new and useful Improvements in Spraying Devices, of which the following is a specification.

The present invention relates to a device for spraying liquids, and has particular reference to that class of such devices which are employed to spray liquid fuel into the air chamber of a carbureter.

An important object of the invention is to provide means of the above mentioned character, which will spray the liquid fuel in a fine smokelike spray or vapor in two streams running in opposite directions, in the presence of air, whereby the fuel is intimately mixed with the air forming a carbureted gas of high efficiency.

A further object of my invention is to provide means of the above mentioned character, having adjustable parts so that the fineness of the spray of the liquid fuel may be regulated.

A further object of this invention is to provide a device of the above mentioned character, which is simple in construction, easy to operate, and cheap to manufacture.

A further object of this invention is to provide a device of the above mentioned character, which will provide a substantially spherical spray of the liquid fuel, thus exposing the maximum area of such spray to the direct contact with the air in the air chamber.

Other objects and advantages of the invention will be apparent during the course of the following description.

In the accompanying drawings forming a part of this specification and in which like numerals are employed to designate like parts throughout the same, Figure 1 is a side view of a carbureter, portions thereof being broken away to show my improved spraying device arranged therein, Fig. 2 is a central longitudinal sectional view through the spraying device, Fig. 3 is a plan view of the outer or larger nozzle, and, Fig. 4 is a plan view of the smaller or inner nozzle.

In the drawings wherein for the purpose of illustration I have shown a preferred embodiment of my invention, the numeral 1 designates a vertical casing of the carbureter to the upper end of which is attached a horizontal casing 2. The casings 1 and 2 form an air chamber 3. Within this air chamber is disposed my spraying device, designated as a whole, by the numeral 4. Air is supplied into the upper end of the air chamber 3 to mix with the sprayed or atomized liquid fuel through an inlet pipe 5, the passage of such air being controlled by a suitable valve construction 6. The atomized fuel after being mixed with the air passes out through a discharge pipe 6 to be fed to the cylinders of the explosive engine. The supply of this carbureted fuel is controlled by a valve 7, attached to a stem 8, which is turned by a lever 9, as shown.

My spraying or atomizing device 4 comprises an outer main casing or shell 10, which is preferably cylindrical and extends axially within the air chamber 3 and is held in place therein by any suitable means. The lower end of the casing or shell 10 is formed open, as shown, and is to be suitably connected with a pipe or conduit supplying the liquid fuel, under suitable pressure. The upper end of the main casing or shell 10 is partially closed by an inwardly extending annular flange 11, which is substantially V-shaped in vertical cross-section, providing upper and lower substantially frusto-conical openings 12 and 13. The flange 11 has a lower horizontal shoulder 14 at the lower end of the wall of the frusto-conical opening 13, as shown.

The main casing or shell 10 is internally screw-threaded near the flange 11, as shown at 15, for engagement with the internally screw-threaded portion of the tubular body portion 16 of an outer or large nozzle. At its upper end the tubular body portion 16 carries a conical tip or cap 17. The tubular body portion 16 is provided near and spaced from the tip 17 with fuel outlet ports 18. These fuel outlet ports are formed of the desired diameter as may be found best by experience, and are curved, or inclined to the right to give the atomized liquid fuel

passing therethrough a rotary movement in that direction. These ports have their outlet ends disposed below and adjacent the horizontal shoulder 14.

5 The conical tip or cap 17 is provided centrally thereof with an opening comprising a cylindrical screw-threaded portion 19 and a smooth tapered or conical portion 20. Disposed within this central opening is an inner or smaller nozzle, comprising a tubular
10 body portion 21, provided at its upper end with a conical cap or tip 22. The tubular body portion 21 is externally screw-threaded for engagement with the wall of the screw-
15 threaded portion 19 and the cap 22 fits within the tapered opening 20, as shown. Disposed at the lower end of the wall of the tapered opening 20 is a horizontal shoulder 23, as shown. The tubular body portion 21
20 is provided near and spaced from the cap 22 with a suitable number of fuel discharge ports 24 of smaller diameter than the ports 18. These ports 24 are curved or inclined to the left in a reverse direction to that of
25 the ports 18, to give the atomized liquid fuel passing therethrough a rotary movement to the left. It is thus seen that the liquid fuel will be sprayed or atomized to form a substantially spherical spray, formed of streams
30 having rotary movements in reverse directions. These ports 24 have their outlet ends disposed below and adjacent the horizontal shoulder 23.

35 The operation of the device is as follows:—The liquid fuel under suitable pressure, with or without air, is fed into the main casing 10 and passes into the tubular body portion 16 of the outer or large nozzle. A part of this liquid fuel passes through the
40 ports 18 and is discharged into the space between the wall of the opening 13 and the tip 17 in a stream rotating to the right. It is obvious that the extent of the space between the wall of the opening 13 and the tip 17 may be varied by rotating the tubular
45 body portion 16. The liquid fuel in this rotary stream is thus atomized and discharges from the upper contracted end of the opening 13 and is conducted upwardly
50 and outwardly by the diverging wall of the opening 12, to form a substantially spherical spray of finely atomized fuel. A portion of the liquid fuel passes through the ports 24 of the body portion 21, in a stream rotating
55 to the left or in a reverse direction to the rotation of the first named stream. This rotary stream discharges first into the opening 20 and finally passes from the outer end of the same to the central portion of the
60 said substantially spherical spray. It is obvious that the extent of the opening between the wall of the opening 20 and the tip 22 may be varied by turning the tubular body portion 21. When the liquid fuel is thus

65 sprayed or atomized and passes into the upper end of the air chamber 3 it is mixed with the air supplied through the pipe 5. By spraying the atomized liquid fuel in two oppositely rotating streams, in the presence
70 of air, the atomized fuel is intimately mixed with such air and a carbureted gas of high efficiency is obtained.

The tubular body portion 16 of the outer nozzle has its lower open end provided at diametrically opposite points with slots 16' 75 for removably receiving an operating tool or key 17', which is preferably Y-shaped, as shown. The tubular body portion 21 is also provided with such slots 16' to receive a key smaller but similar to the key 17'. The
80 parts of my device are few and simple, may be readily separated and assembled, and are not liable to derangements.

It is to be understood that the form of my invention herewith shown and described 85 is to be taken as a preferred example of the same, and that certain changes in the shape, size, and arrangement of parts may be resorted to without departing from the spirit of the invention or the scope of the sub-
90 joined claims.

Having thus described my invention, I claim:—

1. A spraying device of the character described, comprising a main casing having its 95 upper end partially closed by an inwardly extending flange having a tapered opening, an outer nozzle adjustably mounted in the main casing, said outer nozzle comprising a tubular body portion perforated near its
100 upper end and carrying a tapered cap extending within the tapered opening, said cap being provided with a central opening, and a smaller nozzle adjustably mounted in said central opening, said smaller nozzle
105 comprising a tubular body portion provided with perforations and carrying a tip.

2. A spraying device of the character described, comprising a main tubular casing having one end thereof open for receiving 110 the carbureted air and its opposite end partially closed to provide a contracted opening, an outer nozzle removably mounted within the main tubular casing, comprising a tubular body portion having one end there-
115 of open and in free communication with the opening of the main tubular casing and its opposite end partially closed by a cap extending within the contracted opening, said nozzle being provided near the cap with
120 spiral ports extending in one direction and said cap being provided with a substantially central opening having a contracted portion, and a smaller inner nozzle mounted within the substantially central opening, compris-
125 ing a tubular body portion having one end open and in free communication with the interior of the tubular body portion of the

first named nozzle, the tubular body portion
of the second named nozzle being provided
with spiral ports extending in opposite di-
rection to the first named spiral ports and
5 discharging into the contracted portion of
said substantially central opening, said sec-
ond named nozzles being readily removable.

In testimony whereof I affix my signature
in presence of two witnesses.

CHRISTOPHER BOEHM.

Witnesses:

EDNA M. WRIGHT,
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