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MEANS FOR ATOMIZING FUEL.

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1,085,075. Patented Jan. 20, 1914.

Fig. 1

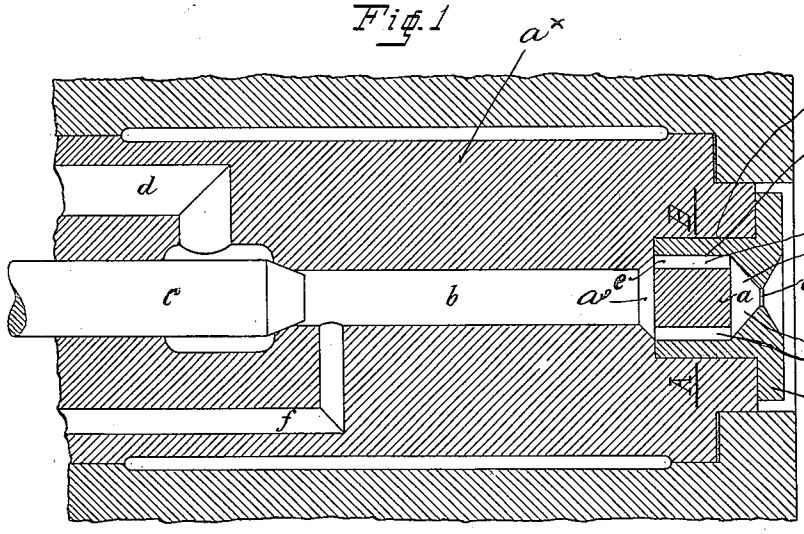
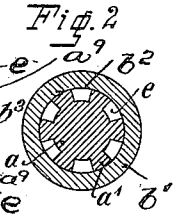


Fig. 2



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UNITED STATES PATENT OFFICE.

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MEANS FOR ATOMIZING FUEL.

1,085,075. Specification of Letters Patent. Patented Jan. 20, 1914.

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To all whom it may concern:

Be it known that I, ARNOLD WILLMER, citizen of the German Empire, residing at Hanover-Kleefeld, Germany, have invented certain new and useful Improvements in Means for Atomizing Fuel, of which the following is a specification.

This invention relates to means for atomizing fuel for use on internal combustion engines in which the fuel is blown through an atomizing device by compressed air or other high pressure atomizing fluid.

It is sought by means of the present invention to obtain a device in which the fuel and atomizing fluid pass through the atomizer at a considerable speed and prevent any settling of dirt or the like on the walls of the atomizer. To this end I provide an atomizer located at the end of the mixing channel for the air and fuel and having a central body portion equal to the cross sectional area of this channel and a plurality of peripheral spaced apart ribs projecting from the body portion to form passages through which the fuel and atomizing fluid pass co-directionally with the axis of the mixing channel. In this way I avoid the separating action produced by tortuous passages and channels while at the same time I insure effective atomizing. A convenient construction is to provide a casing formed with a longitudinal mixing chamber and an enlargement or seat, and locate an atomizer in said seat in alinement with the mixing chamber. The central part of the atomizer is solid and its periphery is provided with guiding walls which project from the central part by the amount of the enlarging of the channel. These peripheral guiding walls guide the fuel and atomizing fluid co-directionally with the axis of the channel and the plurality of passages open into a collecting chamber on the side of said atomizer remote from the mixing channel and this collecting chamber has a central outlet.

The invention will be more readily understood from the following description of one convenient form illustrated by way of example in the accompanying drawings.

In these drawings:—Figure 1 is a sectional elevation of the device and Fig. 2 is a cross section on the line A—B, of Fig. 1.

a^x indicates a casing formed with a longitudinal bore, which forms a mixing chamber b, which has a flaring enlargement a^3. Adjacent the flared enlargement the casing is provided with a seat a^2. The mixing chamber is supplied with liquid fuel through a duct f, and with air through a duct d, a valve c fitting in the end of the bore being provided to regulate the admission of air. Fitted in the seat a^2, is an atomizer comprising a nozzle b', which is formed with a bore b^2, the front wall of which is tapered, and communicates with an outlet opening b^3. Snugly fitting in the bore b^2, is a plug a, having a central body portion from which extends a plurality of spaced apart ribs a'. When plug a, is inserted in the bore b^2 of the nozzle, the spaces between the ribs a' form a plurality of passages e, and the beveled end wall of the bore a^2 and the outer end of the plug a form a collecting chamber a^9. The cross sectional area of the central body portion of the plug a is the same as the cross sectional area of the mixing chamber b. The passages e, of the atomizer, are disposed symmetrically with regard to the mixing chamber b, and the outlet opening b^3 in the nozzle b'. The opening in the nozzle is always open whereby this type of atomizer is known as the open nozzle type. The outlet opening b^3 opens into the interior of the combustion space of the engine. By means of this arrangement the atomizing and spraying of the fluid in the combustion space of the engine is effected in the shortest possible time. By arranging the atomizer at the end of the mixing chamber as described and also by making the body portion of the plug a the same cross sectional area and shape as the mixing chamber b, effective atomizing is assured while maintaining the co-direction of flow through the mixing chamber and the passages e.

With this device it is impossible for any particles to pass from the mixing chamber b, to the opening b^3 in the open nozzle b', without encountering some baffle surface whereby effective atomizing is obtained in spite of the co-directional flow of the fuel and atomizing fluid in the mixing chamber and atomizer.

I claim:

1. In a device for atomizing fuel, the combination of a casing having a bore forming a mixing chamber, means for supplying an atomizing agent and liquid fuel to the mixing chamber, a nozzle in the end of said cas-

ing and having a bore larger than and forming a continuation of said mixing chamber, a plug disposed in said enlarged bore and having a central solid portion in axial alinement with and of the same cross sectional area as the mixing chamber, and having radial projections forming with the nozzle, passages leading from the mixing chamber, a collecting chamber formed in the forward part of the nozzle and in communication with said passages, the nozzle having a contracted outlet leading from the collecting chamber.

2. In a device for atomizing fuel, the combination of a casing and a mixing chamber, and an enlarged seat in alinement with the mixing chamber, means for supplying fuel and air to the mixing chamber, an atomizer in said seat and having a central body portion with surrounding spaced passages communicating with said mixing chamber and extending co-directionally therewith, the central body portion being of the same cross sectional area as that of the mixing chamber, the atomizer having a front outlet opening and a communicating collecting chamber in rear of said opening, said latter chamber communicating with all the passages.

3. In a device for atomizing fuel, the combination of a casing having a mixing chamber provided with an enlarged flaring portion, one end of the mixing chamber having a main body portion, the inner surface of which forms an end wall, the main portion thereof being of the same cross sectional area as the cross sectional area of the main part of the mixing chamber, there being a series of parallel passages located between the main body portion and the casing and communicating with the enlarged portion of the mixing chamber, said passages communicating with a collecting chamber formed within the casing, said collecting chamber having an exit opening, and means for introducing air and fuel to the mixing chamber.

4. In a device for atomizing fuel, the combination of a casing formed at one end with a depressed seat, an atomizer fitted in the seat, said atomizer comprising a central body portion, and radially disposed spaced apart ribs, the spaces between the ribs forming passages, the atomizer having a tapered collecting chamber between its outer end and the central body portion, the passages communicating with said collecting chamber, the atomizer being formed with an outlet opening with which the collecting chamber communicates, the casing having a longitudinal mixing chamber in alinement with the depressed seat and formed with a flaring portion adjacent the inner end of the atomizer, the inner ends of the passages communicating with the flaring portion of the mixing chamber, and means for introducing fluid and fuel to the mixing chamber.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

ARNOLD WILLMER.

Witnesses:
MARIE BEHME,
MRS. RÖSELER.