F. T. ARMSTRONG.

REGENERATOR OR FUEL VAPORIZER FOR INTERNAL COMBUSTION ENGINES.

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1,413,564. Patented Apr. 25, 1922.

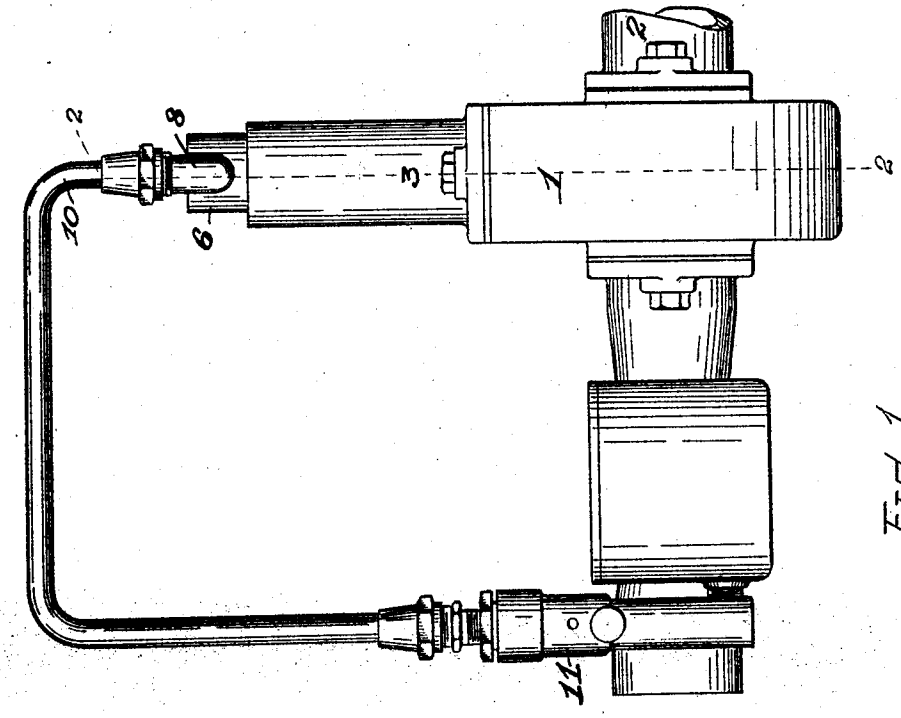


Fig. 1.

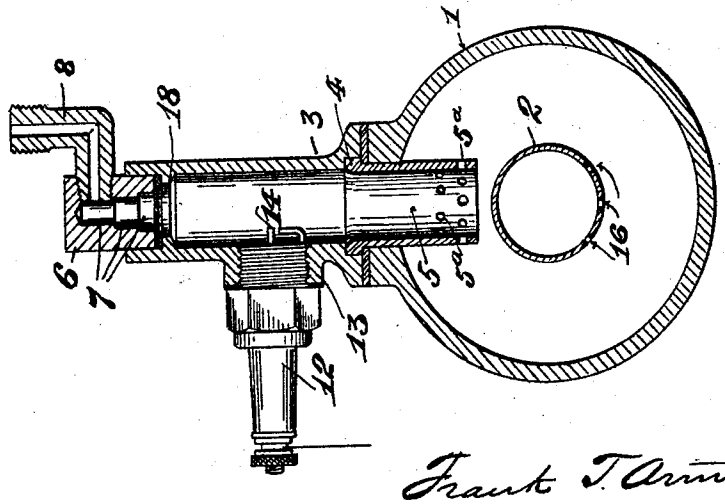


Fig. 2.

Inventor

Frank T. Armstrong

By S. E. Thomas

Attorney

UNITED STATES PATENT OFFICE.

FRANK T. ARMSTRONG, OF DETROIT, MICHIGAN, ASSIGNOR OF ONE-THIRD TO GORDON B. SAYRE AND ONE-THIRD TO ROBERT D. NESBITT, BOTH OF DETROIT, MICHIGAN.

REGENERATOR OR FUEL VAPORIZER FOR INTERNAL-COMBUSTION ENGINES.

1,413,564. Specification of Letters Patent. Patented Apr. 25, 1922.

Application filed May 18, 1921. Serial No. 470,579.

To all whom it may concern:

Be it known that I, FRANK T. ARMSTRONG, citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Regenerators or Fuel Vaporizers for Internal-Combustion Engines, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

This invention relates to a regenerator or fuel vaporizer for internal combustion engines.

The direct object of the invention is to prevent condensation of the vapor from the carburetor and thereby insure uniform mixture while a further object is to accomplish this result without preheating the incoming gas and air mixture to such a point that the efficiency of the engine is lowered.

With the foregoing and other objects in view which will appear as the description proceeds the invention further resides in the arrangement and combination of parts and in the details of construction hereinafter described and claimed, it being understood that changes may be made in the precise embodiment of the invention herein disclosed without departing from the spirit of the same.

In the drawings:

Figure 1 is a view in elevation of a regenerator that embodies features of the invention shown in connection with a source of fuel supply and an engine manifold; and

Figure 2 is a view in section through the generator with parts shown in elevation, taken on or about line 2—2 of Figure 1.

As herein shown in preferred form, a substantially cylindrical outer casing 1 encircles a portion of the intake manifold 2 of the gas engine. An ignition chamber 3 is secured over a side opening of the casing 1 and as a matter of good mechanical design acts also as means for clamping the expanded end portion 4 of a choke tube 5 in the casing so that the tube, the inner part of which is provided with perforations 5^a is substantially radial to and directed against the enclosed part 2 of the engine manifold.

An expansion head 6 is screw threaded or otherwise suitably secured in the upper end portion of the ignition chamber 3 and has a stepped bore indicated at 7 with diameters that increase inwardly. A fuel supply pipe 8, opens into the bore of the expansion head 6.

This fuel connection is arranged to be supplied through a conduit 10 from any source of supply which will deliver vaporized gasoline or a very fine stream of liquid gasoline to the expansion head and in this instance, is shown connected to a device 11 that is arranged with suitable jetting devices therein, not forming per se a part of this invention.

A spark plug 12 of the usual type is inserted in a suitable lateral nipple 13 of the ignition chamber 3 and is connected with the ignition system of the engine in such way as to provide a spark continuously across the terminals 14 of the plug when the engine is in operation. That portion of the manifold 2 surrounded by the casing, is provided with a plurality of openings 16 remote from the tube 5;—the tube 5 acts as a torch nozzle and directs a jet of flame against the manifold tube. Back fire is prevented by insertion of a wire gauze screen 18 or the like in the chamber and as a matter of good mechanical construction, this is clamped in place by the expansion head 6.

In operation the fuel which is indrawn into the device from the vaporizing supply by the piston action of the engine in the usual manner, is ignited by the terminals of the spark plug and a torch flame thereby directed against the manifold while the exhaust gases of combustion pass through the restricted openings in the manifold wall opposite the torch flame.

It will be readily be seen that the manifold 2 will be heated to a very high temperature. This is desirable as it is one of the features of this invention and prevents the mixture in the manifold 2 from being greatly heated. This is accomplished by the fact that when liquid gasoline is coming in contact with the inner walls of the tube or manifold 2 it is very rapidly vaporized which forms a blanket of expanding gas all over the inner surface of the tube and prevents the bulk of the mixture from coming in contact with its wall.

It will also be seen that although the wall of manifold or tube 2 becomes red hot, the

mixture passing through it can not be ignited as only gasoline gas is in contact with its inner wall and no air is mixed with this gas to support combustion.

Having thus described my invention what I claim is:—

1. A regenerator for an internal combustion engine comprising a casing adapted to envelope the intake manifold of an engine and provided with a torch nozzle directed toward the manifold within the casing, an ignition chamber mounted on the casing for which the torch nozzle is an outlet and provided with an expansion fuel inlet, and ignition means in the chamber for firing the fuel passing therethrough.

2. A regenerator for an internal combustion engine comprising a casing adapted to envelope a portion of the intake manifold of the engine, an ignition chamber mounted on the casing, a torch nozzle extending from an outlet of the chamber into the casing toward the manifold, an expansion head forming a fuel inlet to the chamber, and means for maintaining ignition of the charge passing through the chamber.

3. The combination of a source of fuel supply and the intake manifold of an engine, with a regenerator consisting of a casing adapted to envelope a portion of the manifold; a torch nozzle in the casing directed toward the manifold, an ignition chamber in the casing for which the nozzle is an outlet, means in the ignition chamber for igniting fuel passing therethrough and an expansion head connected with the source of fuel supply and arranged to deliver fuel into this chamber.

4. The combination of an intake manifold of a gas engine and a source of fuel supply with a casing adapted to envelope a perforated portion of the manifold and provided with a torch nozzle directed toward an imperforate portion of the manifold within the casing, an expansion fuel head adapted to deliver fuel vapor from the source of supply into the casing, a foraminous screen at the outlet of the expansion head into the casing and means for igniting the fuel.

5. The combination with the intake manifold of a gas engine and a source of fuel vapor supply, with a regenerator consisting of a casing concentrically disposed around a perforate portion of the manifold, a torch nozzle entering the casing toward an imperforate portion of the manifold, an ignition chamber mounted on the casing for which the nozzle is an outlet, an expansion head forming the inlet to the casing and having direct connection with the source of fuel supply, ignition means in the chamber between the head and nozzle and a safety screen between the ignition means and the outlet of the expansion head.

6. The combination of the source of fuel supply and a partially perforated portion of an engine manifold with a casing enveloping the perforate section of the manifold, a torch nozzle inserted in the casing and directed toward the imperforate portion of the manifold, an ignition chamber secured on the casing for which the nozzle is a fuel outlet, an expansion head forming the fuel inlet to the chamber and having connection with the source of fuel supply, a safety screen between the expansion head and chamber and a spark plug inserted in the wall of the chamber and arranged to be connected with the ignition system of the engine.

In testimony whereof, I sign this specification in the presence of two witnesses.

FRANK T. ARMSTRONG.

Witnesses:
S. E. Thomas,
Jno. Considine.