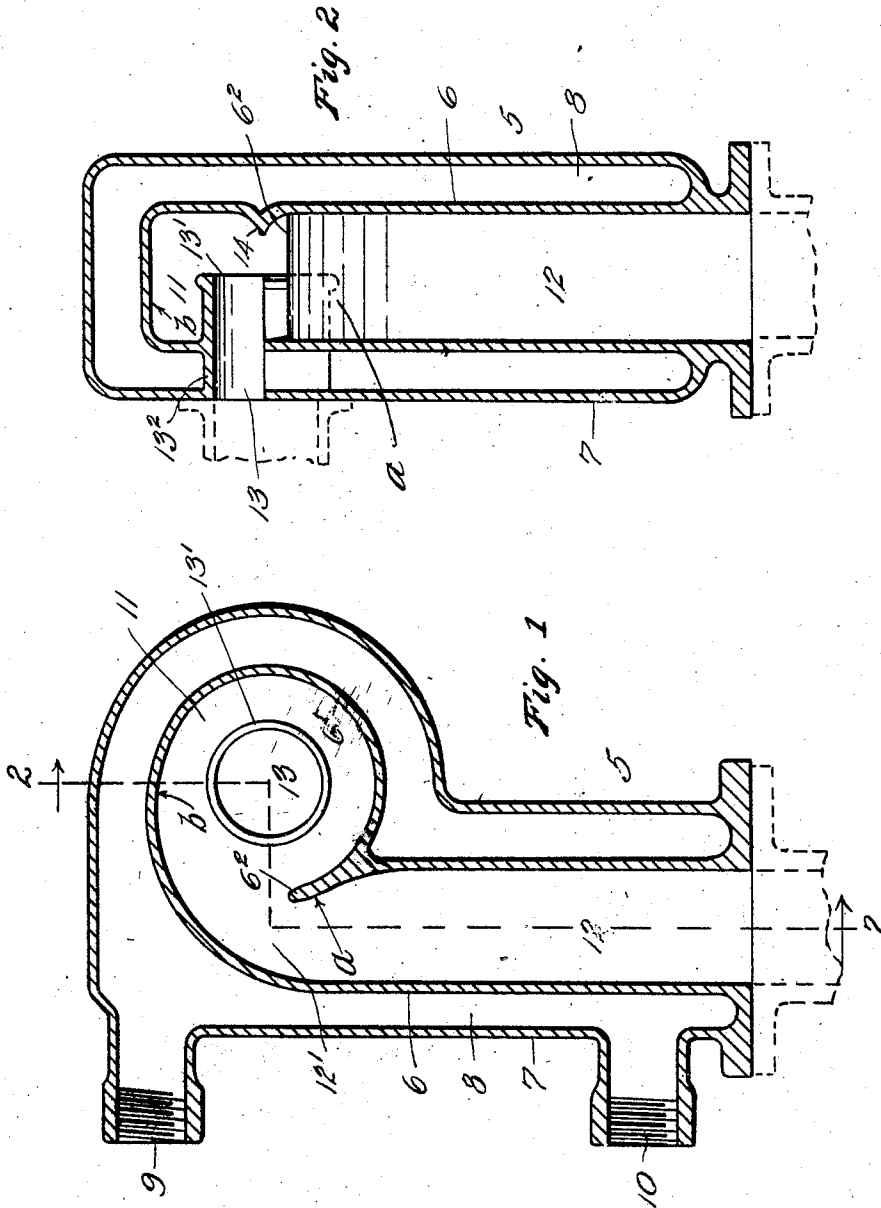


S. P. WATT.
GAS MIXER AND HEATER FOR EXPLOSIVE ENGINES.
APPLICATION FILED OCT. 21, 1912.

1,056,760.

Patented Mar. 18, 1913.



WITNESSES:

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SERN P. WATT, OF SEATTLE, WASHINGTON.

GAS MIXER AND HEATER FOR EXPLOSIVE-ENGINES.

1,056,760.

Specification of Letters Patent.

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Application filed October 21, 1912. Serial No. 726,912.

To all whom it may concern:

Be it known that I, SERN P. WATT, a citizen of the United States, residing at Seattle, in the county of King and State of Washington, have invented certain new and useful Improvements in Gas Mixers and Heaters for Explosive-Engines, of which the following is a specification.

This invention relates to internal combustion engines.

The object of the invention is the provision of improved mixing and vaporizing devices which are adapted to cause the combustible and air to be thoroughly commingled while under the influence of heat, thereby rendering the explosive mixture peculiarly efficient when drawn into the engine cylinder and with an economical consumption of power agent.

With these ends in view, the invention consists in the novel construction and arrangement of parts, as will be hereinafter described and claimed.

In the accompanying drawings, which illustrate an embodiment of the invention, Figure 1 is a vertical transverse sectional view, and Fig. 2 is a section taken on broken line 2—2 of Fig. 1.

The reference numeral 5 designates a casing comprising an inner shell 6 and an outer shell 7 which are spaced apart to afford therebetween a compartment 8 for a heating medium, such as hot water or the combustion products exhausted from an engine. Inlet and outlet openings 9 and 10 are provided near the top and bottom of said compartment for the supply and withdrawal of the heating medium. Near the top of the casing, said inner shell is formed to furnish a substantially cylindrical chamber 11 which communicates with an induction conduit 12 which is arranged tangentially with respect to said chamber. The circular wall 6¹ of said chamber is prolonged into said conduit, as shown, to serve as a deflector 6² and provide a contracted throat 12¹ at the juncture of the conduit with the cylinder. This conduit is connected from its lower end with the discharge opening of a carbureter. A delivery conduit 13 is provided axially of said chamber and is constituted of a nipple 13¹ which protrudes into the chamber, and coextensive with a tubular duct 13² extending through the compartment 8 to an opening provided in the outer shell for connection with a supply pipe leading to the engine cylinder.

The wall of the shell 6 opposite to the nipple 13¹ is preferably formed with protuberance 14 which is disposed in axial alinement with the nipple and serves as a pivot about which the gases are directed into the nipple.

In operation, the combustible mixture is drawn through the induction conduit 12, chamber 11 and delivery conduit 13 by the suction strokes of the engine, and in its passage such mixture impinges against the surface *a* of the deflector 6² and is thereby caused to flow with great rapidity through the relatively small throat 12¹ and sweep against the inner peripheral surface *b* of the chamber, resulting in the mixture taking a circular course or a succession of such courses, about the nipple 13¹ and during which the vaporized portion is drawn from the center of the whirling body of fluid into the nipple to accomplish the most intimate commingling of the explosive fluids which are delivered into the nipple.

In the flow of the fluids through the chamber, the inherent centrifugal force drives any liquid particles against the chamber surface *b* to cause such particles to be either broken by impact or dissipated by contacting with the relatively hot wall surface and rendering the atomized or vaporized liquid in suitable condition to be absorbed, as it were, by the current or successive currents of gases which course about the nipple and which is subsequently drawn into the nipple in a gaseous condition.

What I claim is—

1. A device of the character described, comprising a casing provided with a circular chamber, a nipple extending axially thereinto and serving as the terminal of a delivery conduit, a protuberance disposed in axial alinement with respect to said nipple, an induction conduit arranged in tangential relations to said chamber, and a heating compartment provided in the casing and inclosing said chamber and the conduits.

2. A device of the character described, comprising a casing provided with a circular chamber, a nipple extending axially thereinto and serving as the terminal of a delivery conduit, an induction conduit arranged in tangential relations to said chamber and connected therewith through a throat of less area than that of the conduit, and a heating compartment provided in the casing and inclosing said chamber and the conduits.

3. A device of the character described, comprising a casing provided with a circular chamber, a nipple extending axially thereinto and serving as the terminal of a delivery conduit, a protuberance disposed in axial alinement with respect to said nipple, an induction conduit arranged in tangential relations to said chamber and connected therewith through a throat of less area than that of the conduit, and a heating compartment provided in the casing and inclosing said chamber and the conduits.

4. In a device of the character described, a circular chamber, a delivery conduit communicating with the chamber in axial relations thereto, an induction conduit connected tangentially with the chamber, and a deflector projecting into the induction conduit to provide a contracted passage between said induction conduit and the chamber so as to direct the gases against the peripheral wall of the latter.

5. In a device of the character described, a circular chamber, a delivery conduit communicating with the chamber in axial relations thereto, a protuberance extending from the wall of the chamber opposite to the intake end of said conduit, an induction conduit connected tangentially with the chamber, and a deflector projecting into the in-

duction conduit to provide a contracted passage between said induction conduit and the chamber so as to direct the gases against the peripheral wall of the latter.

6. A device of the character described, comprising a casing having inner and outer shells, said inner shell being arranged to afford a chamber, and induction and delivery conduits respectively connected with the chamber in tangential and axial relations, said delivery conduit being of sufficient length to extend a distance into said chamber, and a heating compartment intermediate the casing shells and provided with inlet and outlet openings for the admission and discharge of a heating agent.

7. A device of the character described, comprising a casing provided with a circular chamber, a nipple extending axially thereinto and serving as the terminal of a delivery conduit, and an induction conduit arranged in tangential relations to said chamber.

Signed at Seattle, Wash., this 19th day of September, 1912.

SERN P. WATT.

Witnesses:

PIERRE BARNES,
E. PETERSON.