A. GRAY.

GASEOUS FUEL HEATER.

APPLICATION FILED SEPT. 27, 1916.

1,293,413.

Patented Feb. 4, 1919.

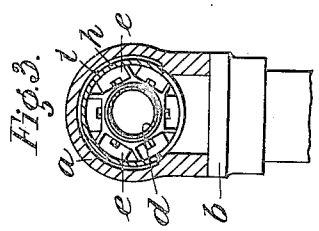


Fig. 3.

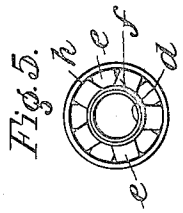


Fig. 5.

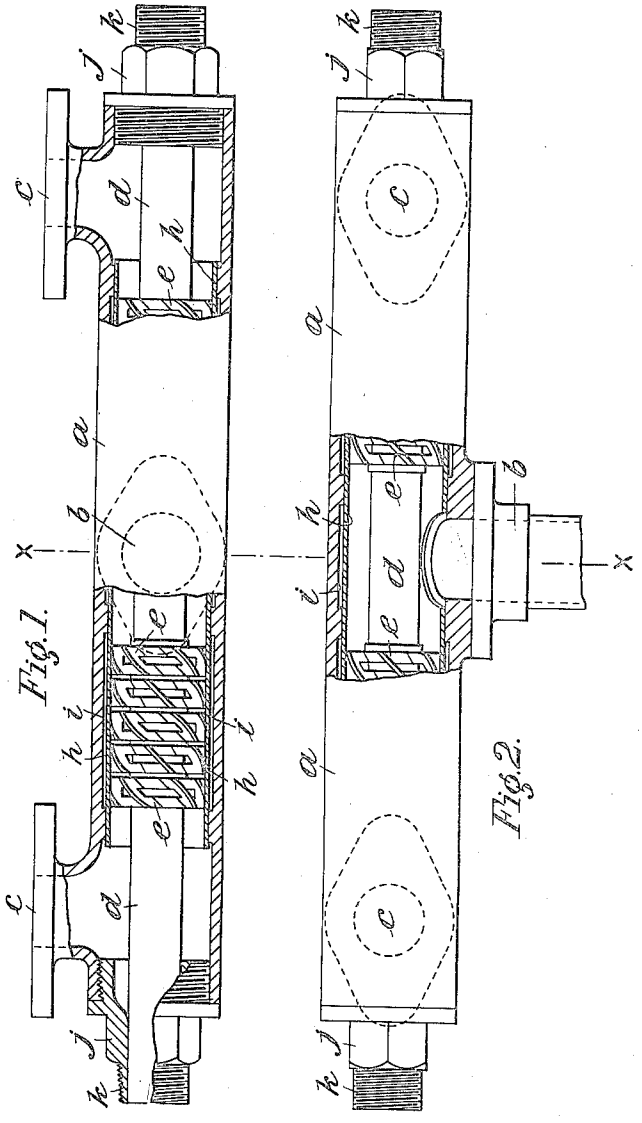


Fig. 1.

Fig. 2.

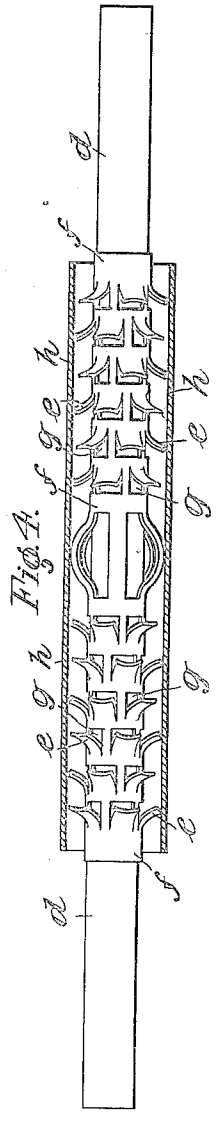


Fig. 4.

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UNITED STATES PATENT OFFICE.

ALBERT GRAY, OF CARDIFF, WALES, ASSIGNOR OF ONE-THIRD TO JOSEPH GASKELL AND ONE-THIRD TO WALTER THOMAS WILKES, BOTH OF COUNTY OF GLAMORGAN, WALES.

GASEOUS-FUEL HEATER.

1,293,413. Specification of Letters Patent. Patented Feb. 4, 1919.

Application filed September 27, 1916. Serial No. 122,337.

To all whom it may concern:

Be it known that I, ALBERT GRAY, a subject of the King of Great Britain, residing at Cardiff, Wales, have invented new and useful Improvements in Gaseous-Fuel Heaters for Internal-Combustion Engines, of which the following is a specification.

This invention relates to a combined vaporizing and induction pipe for using mixed or heavy fuels in connection with internal combustion engines, the exhaust gases being conveyed through said vaporizing pipe that is fitted within the induction pipe.

Vaporizers of this kind have already been constructed with a series of radiating pins or studs screwed into a part of the exhaust pipe, the flattened heads of such pins or studs extending into an annular chamber around said exhaust pipe and forming baffles which are so arranged that the mixture or heavy fuel from the carbureter is drawn through spiral or circuitous passages formed thereby within the annular chamber on its way to the engine.

The present invention relates to improvements in this class of vaporizer, and has for its object to simplify the construction and increase the efficiency by utilizing to the full extent the heat of the waste products of combustion, which effect is consequent upon a simple form of insulation whereby loss of heat is prevented.

In order that the improvements may be clearly understood, the invention will be now described with the aid of the accompanying sheet of drawings, in which Figures 1 and 2 are sectional elevations of a combined vaporizing and induction pipe constructed in accordance with the invention; Fig. 3 a transverse section on line X—X of Figs. 1 and 2; and Figs. 4 and 5 a similar sectional elevation and end view respectively of a modification of the construction of the vaporizing pipe without the surrounding induction pipe with which the combination forms a complete apparatus.

Similar letters of reference relate to like parts in all the figures of the drawings.

Referring to Figs. 1, 2 and 3, the induction pipe *a* is provided with the necessary branch *b* for connection to the carbureter, preferably situated at about the middle of its length as shown, and to the right and left thereof are provided branches *c* for connecting up to the inlet or admission to the engine. This induction pipe *a* is of a compound nature and is composed of a centrally disposed steel or other suitable tube *d* connected with the ordinary exhaust pipe. On the exterior surface of the tube *d* are mounted or slid a series of radiating fins *e* which are so arranged as to form spiral paths or passages for the mixed or heavy fuel from the carbureter to travel through on its way to the engine. These radiating fins *e* may be constructed in a variety of ways, for example as shown in these figures consisting of several disks slid on to the exterior of the tube *d*, and are preferably disposed to the right and left of the inlet branch *b* from the carbureter so that they may serve both the branches *c* to the engine.

The two sets of radiating fins *e* may be constructed as shown in Figs. 4 and 5, out of a piece of tube *f* preferably of copper or the like as a good conductor of heat, the internal diameter of which is equal to the external diameter of the tube *d* so that the same may be slid over into the position within the induction pipe *a*. This mutilated tube *f* may be longitudinally slit, as shown at *g*, around the whole of its circumference, and the pieces formed by such slits turned and bent up so as to form the radiating fins or baffles *e* which will in themselves constitute a zig-zag or spiral passage for the fuel on its way to the engine from the carbureter. These radiating fins *e* are contained within a close fitting exterior tube *h*, which is likewise preferably made of brass or copper as a good conductor of heat. This tube *h* closely fits the induction pipe *a* wherein is provided channels or chambers *i* that constitute insulating air spaces, whereby the heat of the exhaust gases is retained within the apparatus, and likewise the exterior of the apparatus kept at a lower temperature than otherwise would be the case. The ends of the induction pipe *a* are provided with screw caps *j* which support the centrally disposed tube *d* from which the heat is extracted for the purpose of vaporizing the fuel as described. The caps *j* are preferably provided with screw-threaded ends *k* to which the exhaust pipe from the engine is connected.

Claims:

1. In a combined vaporizing and induction pipe for using mixed and heavy fuels in internal combustion engines comprising

an induction pipe provided with branches for connecting up to the carbureter and to the inlet to the engine respectively, the combination of a centrally disposed heating tube, for the conveyance of the exhaust gases therethrough, radiating fins arranged on said heating tube to form circuitous passages for vaporizing the incoming fuel, a tube inclosing said radiating fins having a central orifice that communicates with the carbureter its ends being open to the admission conduits to the engine and an outer casing with branch conduits for connection to carbureter and engine constituting the induction pipe in which is provided annular chambers that together with the said inclosing tube, which is fixed to the interior of said outer casing, form insulating air spaces for the retention of heat within the apparatus, substantially as described.

2. In a combined vaporizing and induction pipe for using mixed and heavy fuels in internal combustion engines comprising an induction pipe provided with branches for connecting up to the carbureter and to the inlet to the engine respectively, the combination of a centrally disposed heating tube, for the conveyance of the exhaust gases therethrough a mutilated tube, on said heating tube, from which portions are bent outwardly to constitute radiating fins to form circuitous passages for vaporizing the incoming fuel, a tube inclosing said radiating fins having a central orifice that communicates with the carbureter its ends being open to the admission conduits to the engine and an outer casing with branch conduits for connection to carbureter and engine constituting the induction pipe in which is provided annular chambers that together with the said inclosing tube, which is fixed to the interior of said outer casing, form insulating air spaces for the retention of heat within the apparatus, substantially as described.

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

ALBERT GRAY.

Witnesses:

HENRY RICHARD FELLOWES PROCTER,
GEORGE FREDERICK JEFFREY.