No. 696,231. Patented Mar. 25, 1902.

J. FILLET.

CARBURETING DEVICE FOR EXPLOSION ENGINES.

(Application filed Jan. 12, 1901.)

(No Model.)

Fig. 1.

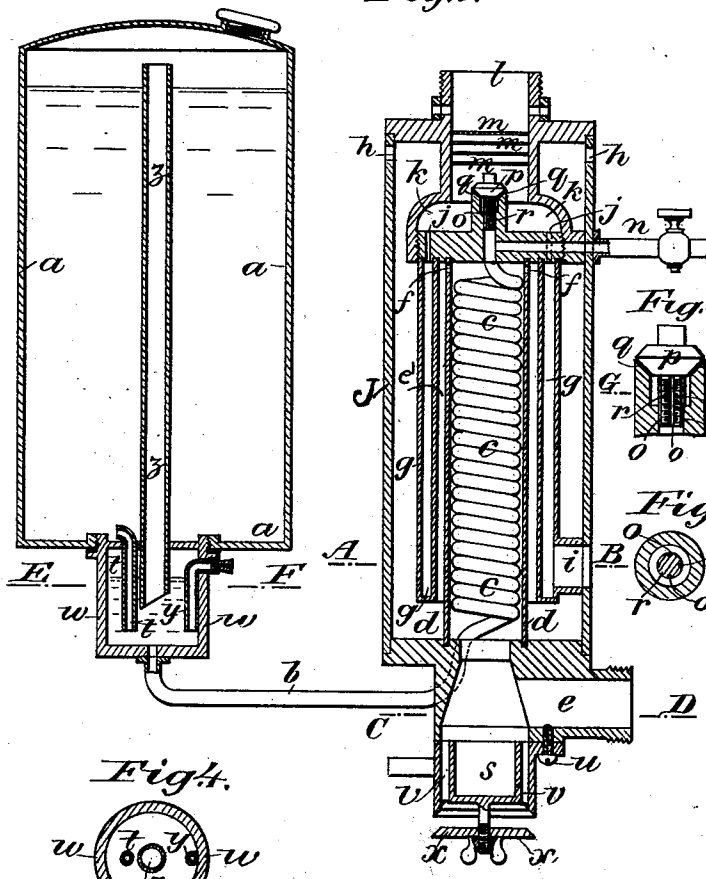


Fig. 5.

Fig. 6.

Fig. 4.

Fig. 2.

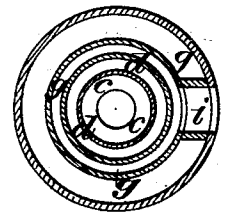
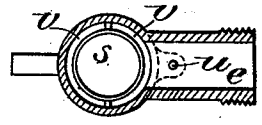


Fig. 3.



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CARBURETING DEVICE FOR EXPLOSION-ENGINES.

SPECIFICATION forming part of Letters Patent No. 696,231, dated March 25, 1902.

Application filed January 12, 1901. Serial No. 42,975. (No model.)

To all whom it may concern:

Be it known that I, JOSEPH FILLET, a citizen of the French Republic, residing in Neuilly-sur-Seine, France, have invented certain Improvements in Carbureting Devices for Explosion-Engines, of which the following is a specification.

This invention relates to devices for vaporizing a liquid hydrocarbon by heat from the exhausted gases from the engine and to mixing with the hot vapor air which has also been heated by the said gases, the object being to carburet the air.

One important object and feature of the invention is the employment of an upright vaporizing-coil communicating at its lower end with a supply-reservoir for the liquid hydrocarbon used, this reservoir being so situated relatively to the level of the vaporizing-coil and being provided with means controlling the delivery of the liquid to said coil that only the lower portion of the coil will be filled with the liquid, the upper part thereof serving as a vaporizing-chamber.

In the accompanying drawings, which serve to illustrate my invention, Figure 1 is a vertical axial section of the device. Fig. 2 is a horizontal section in the plane indicated by line A B in Fig. 1. Fig. 3 is a horizontal section at line C D in Fig. 1. Fig. 4 is a horizontal section of the liquid-delivery chamber at E F in Fig. 1. Fig. 5 is an enlarged axial section of the vaporizer-outlet, and Fig. 6 is a cross-section of same at G H in Fig. 5.

At the left in Fig. 1 is seen the reservoir *a* for the liquid hydrocarbon, and at the right the vaporizer and carbureter, connected therewith by a supply-tube *b*. This supply-tube communicates with the lower end of an upright vaporizing-coil *c*, the upper end of which is connected with an outlet controlled by a conical valve *p*, Fig. 5, having a screw-threaded stem *r*, whereby the valve may be adjusted with respect to its seat *q*, said stem having in it longitudinal flutes or grooves *o* for the passage of the vapor from the coil. The valve *p* delivers the vapor in such a way as to facilitate carbureting. The coil *c* is inclosed in an upright tube *d*, closed above, and hot exhaust-gases from the engine enter said tube at its lower end by way of a gas-inlet *e*. They flow up and about the coil *c*, pass out through outlet-apertures *f* into a jacket-space *e'* about the tube *d*, formed exteriorly by a tubular jacket *g*, exterior to the tube *d*, and thence up to outlets *h* in an outer inclosing casing J. Thus the hot gases of the exhaust heat the vaporizing-coil thoroughly and vaporize the hydrocarbon therein. Air to be carbureted is drawn into the casing J at an air-inlet *i* and flows up through the annular air-jacket *g* and through outlets *j* therefrom into a mixing-chamber *k*, which contains the vapor-outlet controlled by the valve *p*. In this chamber the heated air is carbureted, and the mixture passes to the engine by way of the outlet *l* through suitable strainers *m*, situated between the chamber *k* and outlet *l*. When the engine is started and before there are any hot products of combustion to effect vaporization of the hydrocarbon, some form of primary heater or starter is required to get the engine under way. Two means are provided for this purpose, either of which may be employed as occasion requires. A pipe *n* is provided to supply a very volatile hydrocarbon in vapor to the vaporizer-outlet just back of the controlling-valve *p*. This device will serve to carburet air drawn in by the engine at starting, the supply of the volatile hydrocarbon being cut off as soon as the vaporizing-coil *c* is sufficiently heated by the exhausted gases from the explosion. In this case the coil *c* is not primarily heated. In the other device for starting the engine the coil *c* is heated primarily. This device comprises a cup device *s* to contain some very volatile hydrocarbon, as alcohol. This cup is supported under the coil at *u*, so that it may be swung around horizontally to afford access for filling. The receptacle for the alcohol has an annular space *v* about it for the admission of air for combustion from below, and the air-inlet is controlled by a valve *x*, mounted on the screw-threaded stem of the cup, so that it may serve to regulate the quantity of air admitted.

In order to assure the constant level of the liquid hydrocarbon in the lower whirls of the coil *c* as it is gradually vaporized by the heat and carried off, the reservoir *a* is provided with a device for maintaining the said level. The reservoir *a* is closed at the top and has below its bottom a delivery-chamber *w*. A

pipe t connects this chamber with the reservoir a, and another pipe y connects it with the atmosphere. A third pipe or tube z extends from the desired level of the liquid in the chamber w up above the level of the liquid in the reservoir a. The liquid flows into the chamber w from the reservoir a through the pipe t until it rises in said chamber high enough to seal the lower end of the pipe z. When drawn off through the pipe b to an extent sufficient to unseal the lower end of the air-pipe y, air will enter the chamber through the contracted inlet of said pipe y to supply air to the upper part of the reservoir through the pipe z, and thus permit the liquid to again flow into the chamber. Thus the level of the liquid in the chamber w fluctuates slightly; but owing to the relative levels of said chamber and the coil the liquid is prevented from rising in coil, as a maximum, higher than the two or three lowermost whirls thereof.

Having thus described my invention, I claim—

1. In a device for the purpose specified, the combination with an upright vaporizing-coil, means for supplying a liquid hydrocarbon to the lower whirls only of said coil and maintaining the level of said liquid therein, an upright air-conduit adjacent to said coil, and a mixing-chamber into which the air and vapor are discharged, of means for heating the air-conduit and vaporizer simultaneously with the hot exhaust-gases from the engine, substantially as set forth.

2. In a device for the purpose specified, the combination with the upright, outer casing J, having outlets h at its upper part for the exhaust-gases, the inner upright tube d, open at the bottom to receive the exhaust-gases and having outlets f at its top for the same, the upright annular air-jacket g, said jacket forming the jacket-space e' for the exhaust-gases and having an inlet below for air and outlets above for the air to the mixing-chamber, the upright coil c in the tube d, said coil having its inlet for hydrocarbon at its lower end and its discharge-outlet above in the mixing-chamber, the said mixing-chamber, and means for supplying a liquid hydrocarbon to said coil c and maintaining the level of same therein, substantially as set forth.

3. A vaporizer and carbureter substantially as described, in combination with the reservoir a, the delivery-chamber w under the same, the pipe z, extending from the air-space in the reservoir down into the chamber w, the pipe t connecting the reservoir a with the chamber w, the air-pipe y, connecting the said chamber with the atmosphere, and the pipe b, connecting said chamber with the lower end of the vaporizer, the relative levels of the vaporizer and the delivery-chamber being substantially as set forth and for the purpose specified.

In witness whereof I have hereunto signed my name in the presence of two subscribing witnesses.

JOSEPH FILLET.

Witnesses:
JULES ARMENGAUD, Jeune,
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