F. BAVEREY.

CARBURETER FOR EXPLOSION MOTORS.

APPLICATION FILED MAR. 26, 1907.

907,953.

Patented Dec. 29, 1908.

3 SHEETS—SHEET 1.

FIG_1

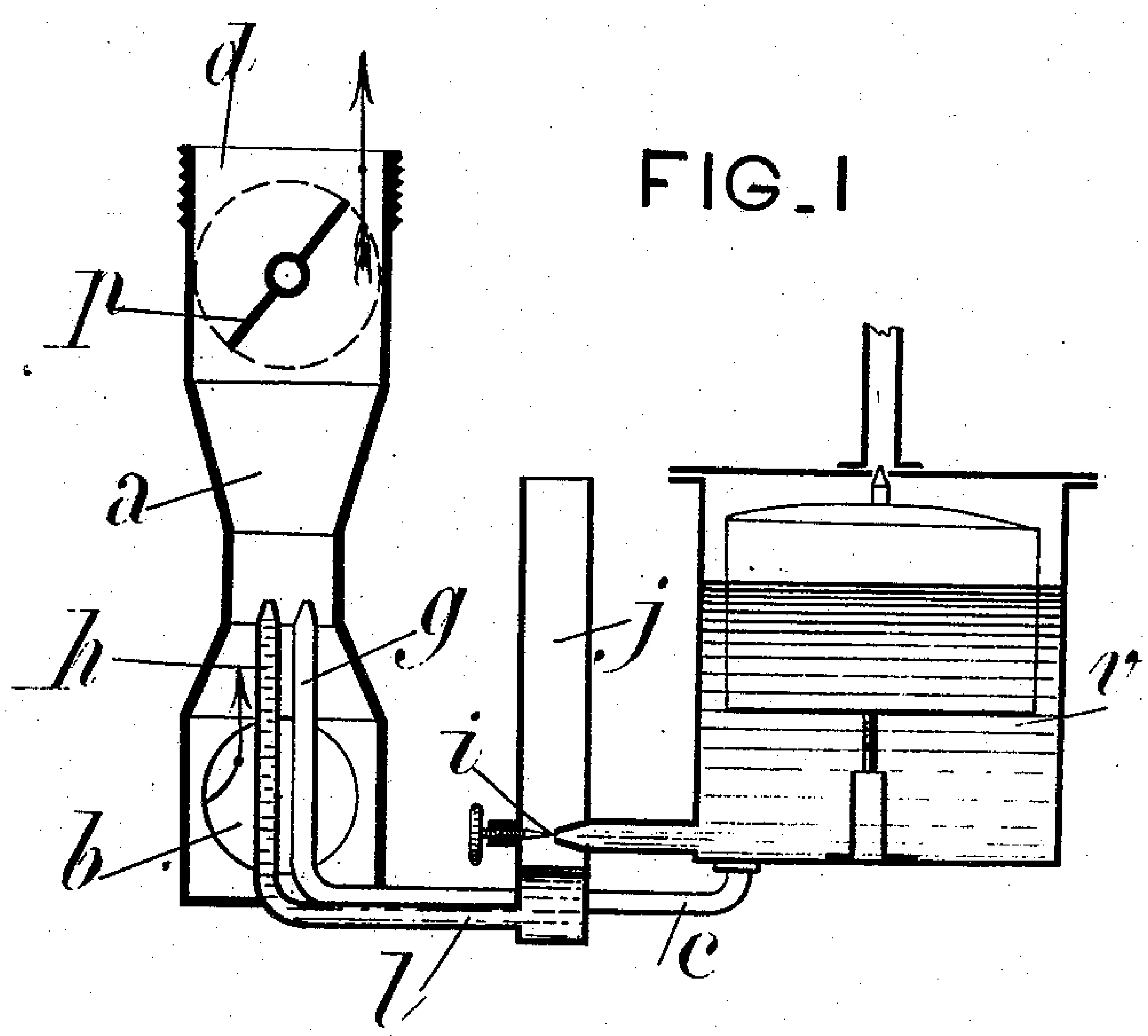
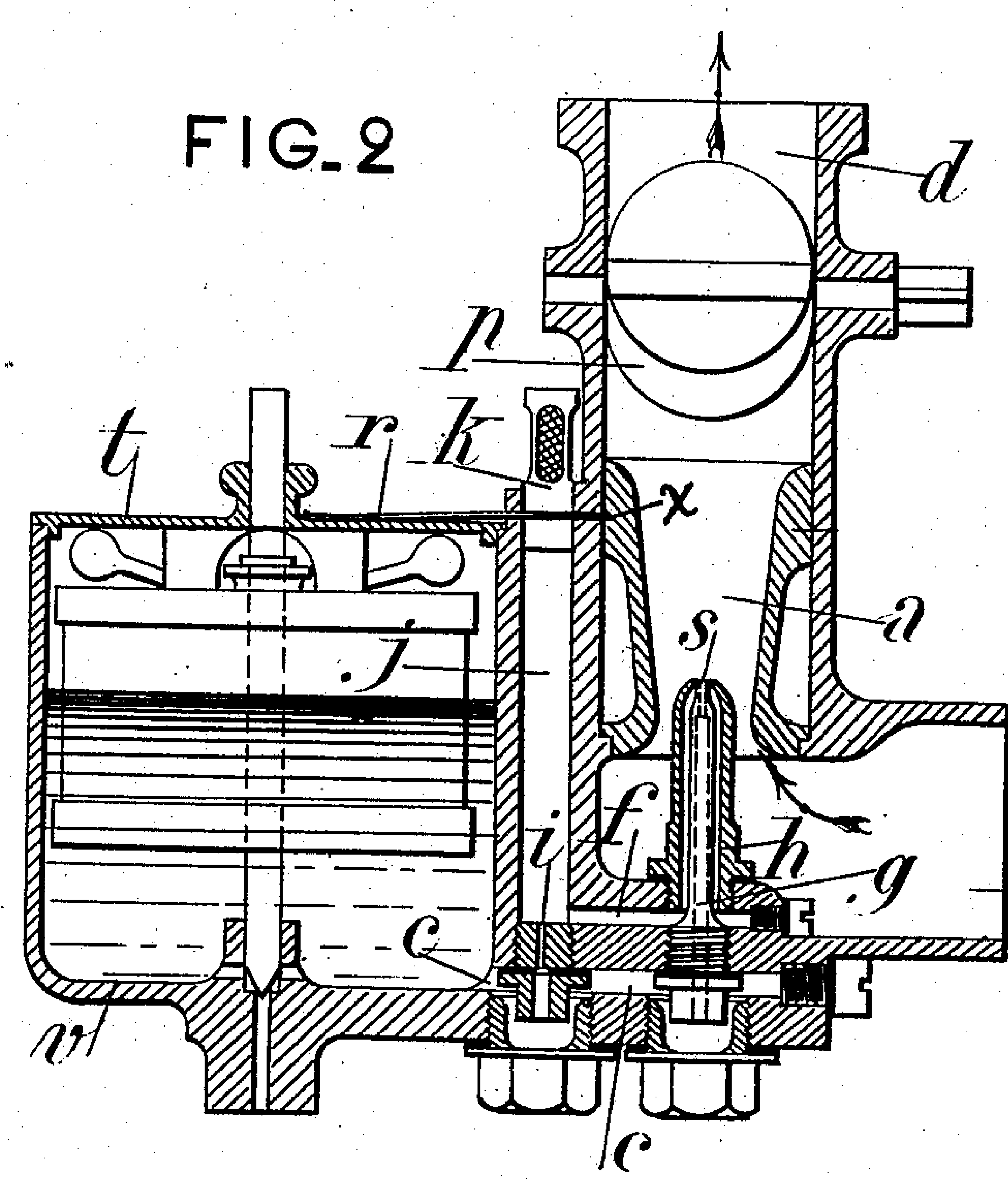


FIG_2



WITNESSES

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3 SHEETS—SHEET 2.

FIG_4

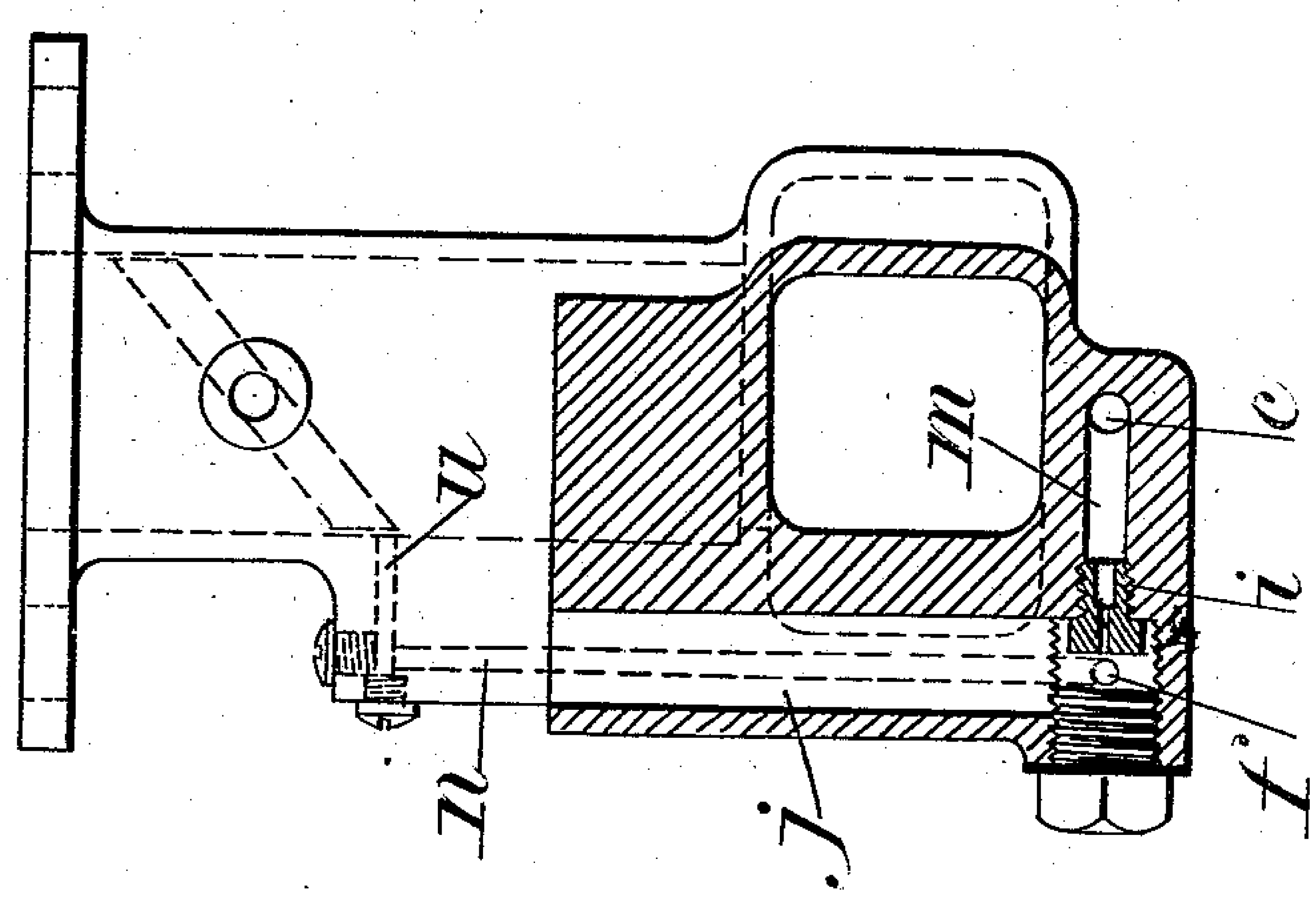
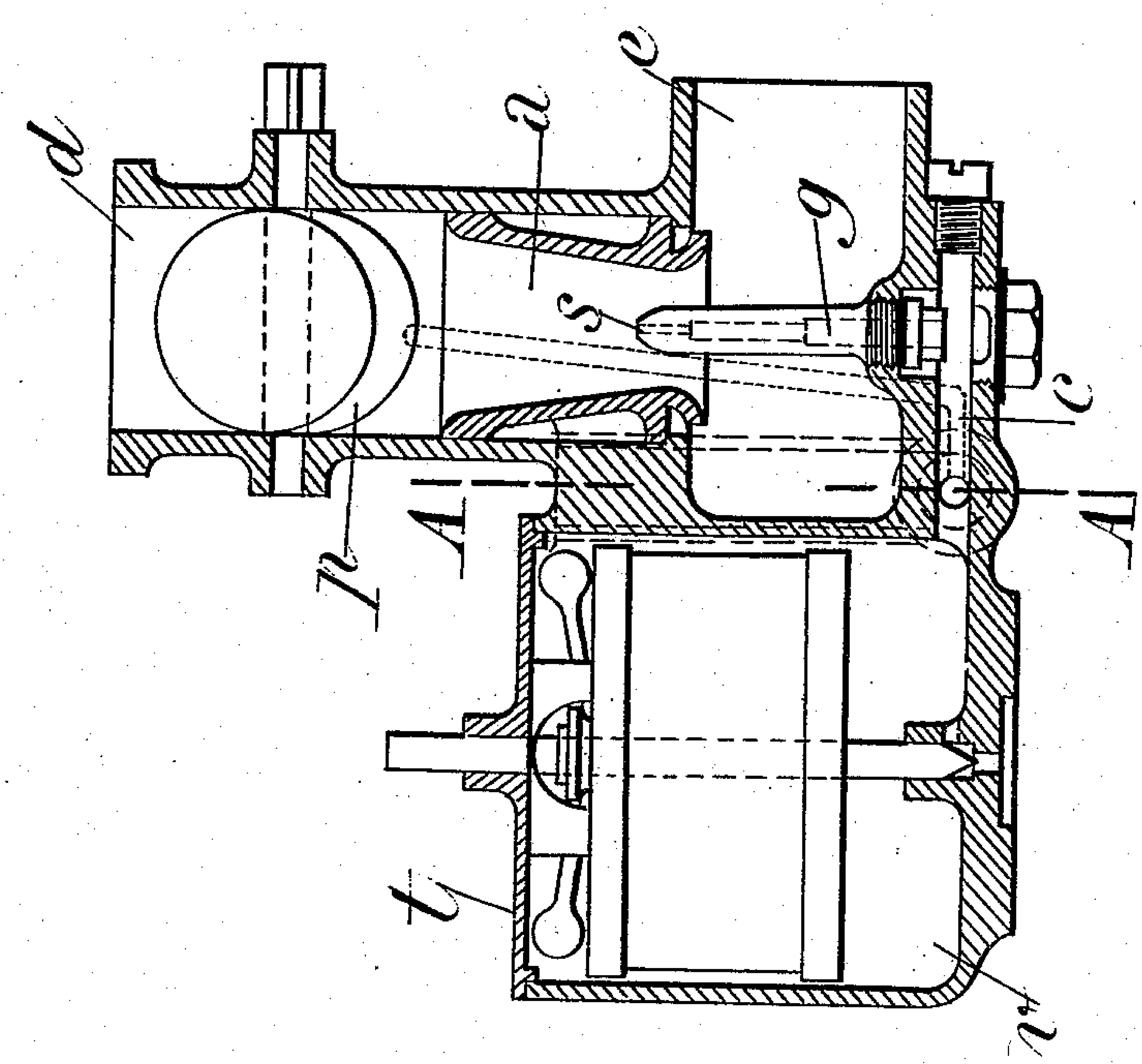


FIG_3



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3 SHEETS—SHEET 3.

FIG_6

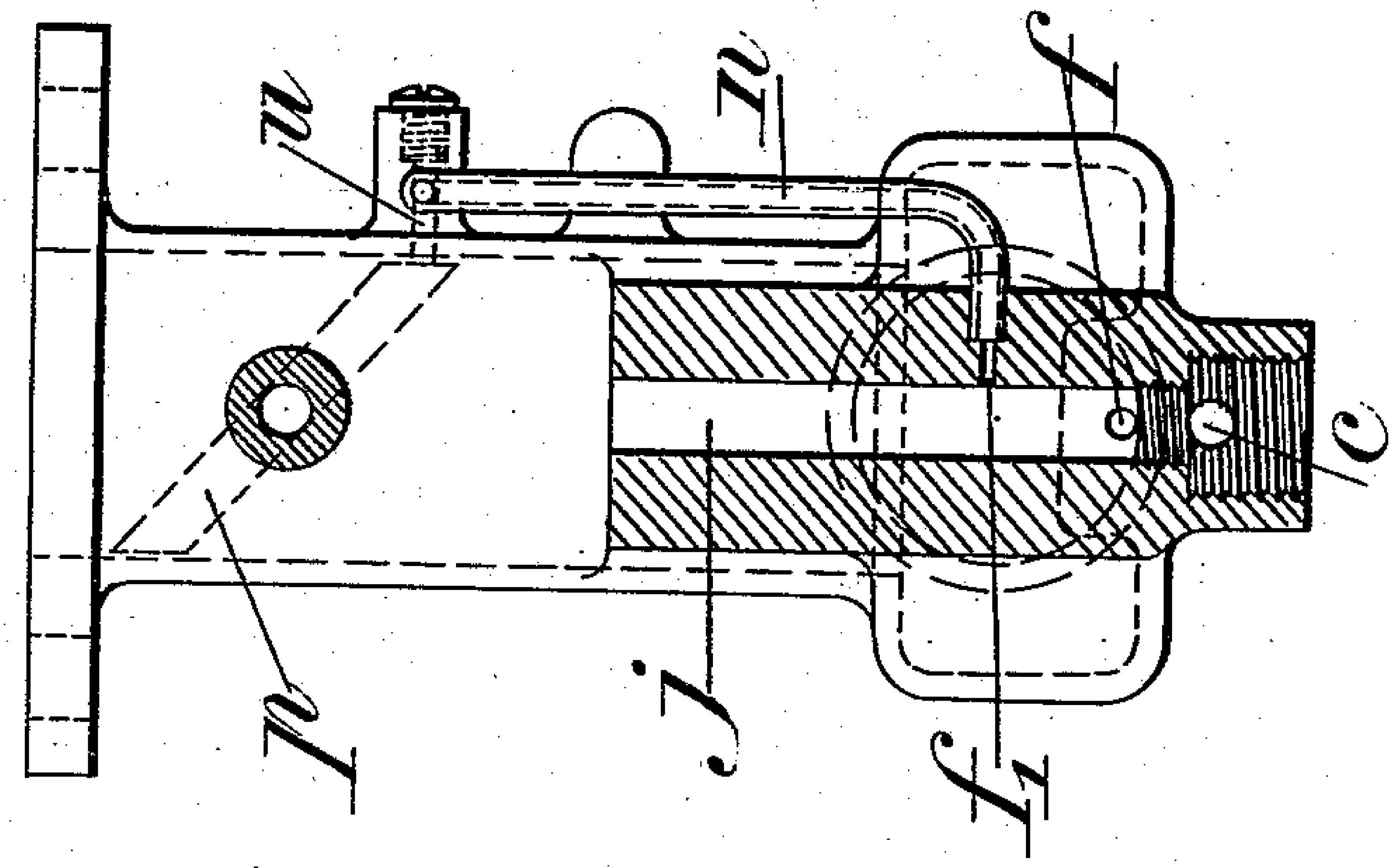
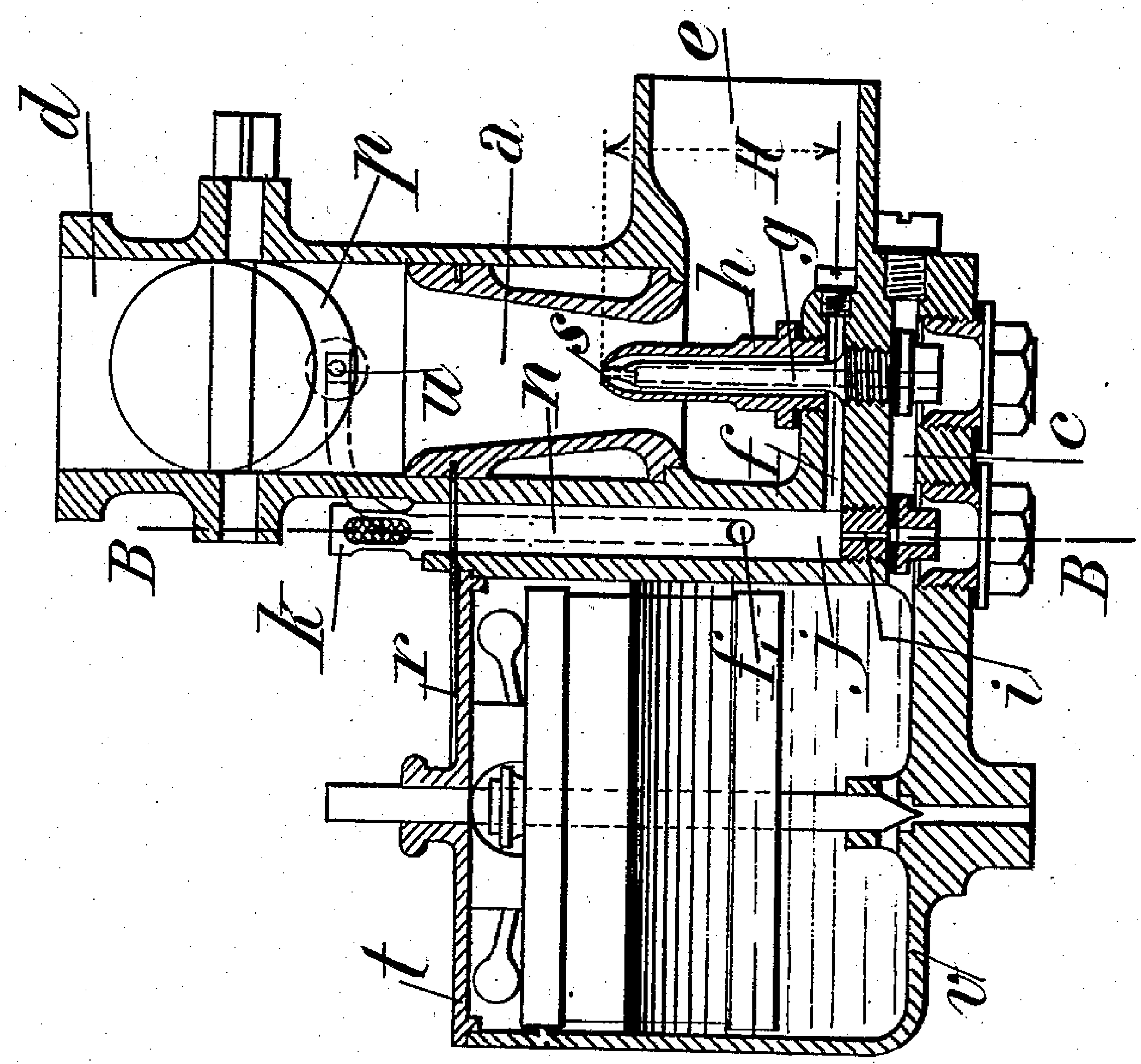


FIG.5



WITNESSES

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UNITED STATES PATENT OFFICE.

FRANÇOIS BAVEREY, OF OULLINS, FRANCE.

CARBURETER FOR EXPLOSION-MOTORS.

No. 907,953. Specification of Letters Patent. Patented Dec. 29, 1908.

Application filed March 26, 1907. Serial No. 364,702.

To all whom it may concern:

Be it known that I, FRANÇOIS BAVEREY, a citizen of the French Republic, residing at Oullins, Rhône Department, in France, have invented a certain new and useful Carbureter for Explosion-Motors, of which the following is a specification.

With ordinary spray carbureters the proportion of fuel in the mixture increases with the speed of the motor, the passage of fuel through the orifice leading into the suction conduit being not uniformly proportional to the quantity of air sucked into the conduit, but increasing on acceleration of the motor at a higher rate than the quantity of air, owing to the higher degree of vacuum produced at high speeds.

The purpose of the present invention is to remove this disadvantage and to render the proportions of the mixture constant at all speeds of the motor. For this purpose there is used, in conjunction with a supply nozzle the feed of which increases too rapidly with increasing speed, a supply nozzle the feed of which increases either at a lower than the normal rate or preferably not at all. These two nozzles can be so regulated that the aggregate amount of fuel passing through them increases in the same proportion as the quantity of air sucked in, so that the richness of the mixture remains constant.

Several forms of construction embodying the invention are illustrated in the annexed drawing, in which—

Figure 1 is a vertical section of a carbureter with two parallel nozzles and Fig. 2 a vertical section of a carbureter with two concentric nozzles. Fig. 3 is a vertical section illustrating a modification of the compensating device, and Fig. 4 is a section on the line A—A of Fig. 3. Fig. 5 is a sectional view of a carbureter in which the arrangements shown in Figs. 2 to 4 are combined, and Fig. 6 is a section on the line B—B of Fig. 5.

Referring to Fig. 1, air enters the vertical carbureter *a* through the orifice *b*, and the mixture passes out of the carbureter through the orifice *d*, *p* being the throttle which controls the supply of mixture to the cylinder. The fuel-chamber *v*, in which the liquid-level is kept constant by known means not illustrated, supplies fuel to the two nozzles *g* and *h*, which terminate in the constricted part of the carbureter.

The nozzle *g* is fed in the usual manner by the tube *c* and the discharge therefrom is regulated by known means.

h is the compensating nozzle, and the discharge therefrom per unit of time remains constant. Various devices may be used to secure this result, for example the tube *j* open to the atmosphere and projecting upwards from the tube *l* leading to the nozzle *h*. Fuel enters the tube *j* through the small orifice *i* at a constant pressure and is sucked through the nozzle *h* by the motor. The orifice *i* is controlled by a needle-valve or equivalent known device, together with the nozzle *g*, so that the combined feed through the two nozzles produces uniform carburization at the highest and lowest speeds of the motor.

It will be apparent that the rate of outflow from ajutage or nozzle *h* can be greater than the delivery from the nozzle *i* until the fuel in reservoir *j* is exhausted, and therefore up to this point the flow from nozzle *h* can be variable. After this point is reached the rate of flow from nozzle *h* will be constant irrespective of the speed of the motor as it depends for its supply on the fuel coming from nozzle *i* and having no surplus of fuel in the reservoir *j* to draw from. If upon cranking the engine, all surplus which has accumulated in reservoir *j* is removed and the valve controlling the nozzle or orifice *i* is so set that at the lowest speed at which both pipes *g* and *l* added together form a perfect mixture, no fuel will accumulate in reservoir *j* but will be taken therefrom as fast as delivered from nozzle or orifice *i*, and the delivery from nozzle *h* will be constant.

In Fig. 2, which illustrates a carbureter with concentric nozzles, *a* is the body of the carbureter, to which air, heated if necessary, is supplied through the orifice *e*. After flowing past the nozzles *g* and *h* and being carbureted this air flows through the orifice *d* to the motor, the flow being controllable by means of the throttle *p*. The nozzles *g* and *h* which terminate at *s*, are fed with fuel from the fuel-chamber *v*, in which the liquid level is constant. The central nozzle *g* communicates directly with the chamber *v* by means of the conduit *c*, and the feed through this nozzle is subject to the variations which occur in ordinary carbureters, that is to say the feed is not directly proportional to the quantity of air sucked in, but is excessive at high speed and insufficient at low speed. The compensating nozzle h surrounds the nozzle g and the annular space between the two nozzles communicates by means of the conduit f with the tube j, which communicates with the atmosphere through gauze-covered apertures at its upper end k and is supplied with fuel at a uniform rate through the calibrated orifice i. The feed through the orifice i, which is open to the atmosphere, is a function of the height of the liquid level in the chamber and this level is kept constant by means of a float and valve of known construction. Changes of speed do not affect the feed through the orifice i, and the suction at the small annular orifice at s merely has the effect of drawing fuel into the carbureter at the rate at which fuel normally passes through the orifice i into the lower part of the tube j. If the quantity of fuel passing through the orifice i per unit of time is smaller than the quantity which the suction at s is capable of removing, air-bubbles enter the conduit f, but no inconvenience arises therefrom. The apertures at the upper part k of the tube j are gauze-covered to prevent the entrance of dust. The part k serves as center of rotation for the flat spring r which bears on the cover t of the fuel-chamber to hold the said cover in position. By giving a quarter of a turn to the spring the cover is released so that it can be removed by hand. One end of the spring r is adapted to enter the groove x provided in the conical part a, and serves to hold the latter in position.

In the construction illustrated in Figs. 3 and 4 the nozzle g directly communicates with the fuel chamber v by means of the conduit c and the compensating fuel-orifice is so placed at u, that it is closed by the lower edge of the carbureter throttle when the latter is closed. The orifice u communicates by means of a conduit n and orifice f with the tube j, which is open to the atmosphere. The amount of fuel required to correct the feed through the nozzle g enters the lower end of the tube j through the orifice i, the said fuel being supplied from the fuel chamber v through the conduits m and c. In this case also the flow of fuel through the orifice i per unit of time remains constant, and the fuel is sucked from the lower end of the tube j through the conduit n to the orifice u. The reason for arranging the latter in the position shown and described is to utilize, for the purpose of suction at the compensating orifice, the rapid flow of air between the carbureter wall and the throttle when the latter is partly closed, so that the fuel passing through the orifice i is rapidly removed and converted into spray.

The construction illustrated in Figs. 5 and 6 combines the essential features of the constructions shown in Figs. 2 to 4.

In Figs. 5 and 6 g represents the ordinary nozzle, and the fuel passing through the orifice i at a uniform rate can enter the carbureter by two paths. One of these paths is the annular passage h, through which alone the compensating fuel flows to the carbureter when the motor is working normally, the said passage communicating with the duct f which terminates at the bottom of the tube j, a certain distance below the orifice f^1. The other path is the conduit n leading from the orifice f^1 to the orifice u, and this path is used when the motor is running idly at very low speed. When this is the case the quantity of fuel required by the motor is very small, and the force of suction in the passage h is smaller than the weight of a column of fuel of the height H (Fig. 5), so that the passage h does not carry off all the fuel which passes through the orifice i. Fuel therefore accumulates in the lower part of the tube j until its level reaches the orifice f^1, whereupon the said fuel is drawn into the carbureter by the powerful suction in the conduit n. When the compensating fuel is supplied through the annular passage h alone, as is usually the case, a small quantity of air passes through the orifice u, but owing to the smallness of the latter this quantity of air is too small to interfere with the proper working of the carbureter.

In all the forms of construction described the tube j becomes filled with fuel to the level of the fuel in the fuel chamber when the motor stops. On starting the motor the fuel thus accumulated is removed by a few turns of the crank, and facilitates the starting of the engine.

What I claim as my invention and desire to secure by Letters Patent of the United States is:—

1. In a carbureter the combination of a suction controlled fuel feed jet with an additional fuel feed regulated to give a constant supply per unit of time.

2. In a carbureter the combination of a suction controlled fuel feed jet, a constant level supply chamber therefor, an additional jet and means for supply to said additional jet constructed to permit of delivering equal quantities in equal time intervals.

3. In a carbureter the combination of a suction controlled fuel feed jet, a constant level supply chamber therefor, an additional jet and a chamber open to the atmosphere into which fuel is delivered at a uniform rate and from which it is drawn as fast as supplied.

4. In a carburettor the combination of a suction controlled fuel feed jet with an additional fuel feed regulated to give a constant supply per unit of time, the two jets being

relatively proportioned so that their combined supply is proportional to the air supply.

5. In a carbureter the combination of a suction controlled fuel feed jet, a constant level supply chamber therefor, an additional jet and a chamber connected to the latter and open to the atmosphere and to which fuel is delivered at a uniform rate, a suction pipe, a throttle therein and a passage from said reservoir to the suction pipe in proximity to the throttle.

In witness whereof I have signed this specification in the presence of two witnesses.

FRANÇOIS BAVEREY.

Witnesses:

GASTON JEANNIAUX,

MARIN VACHOY.