

No. 811,618.

PATENTED FEB. 6, 1906.

C. H. CLAUDEL.
CARBURETER FOR HYDROCARBON ENGINES.
APPLICATION FILED MAY 26, 1904.

2 SHEETS—SHEET 1.

Fig. 1.

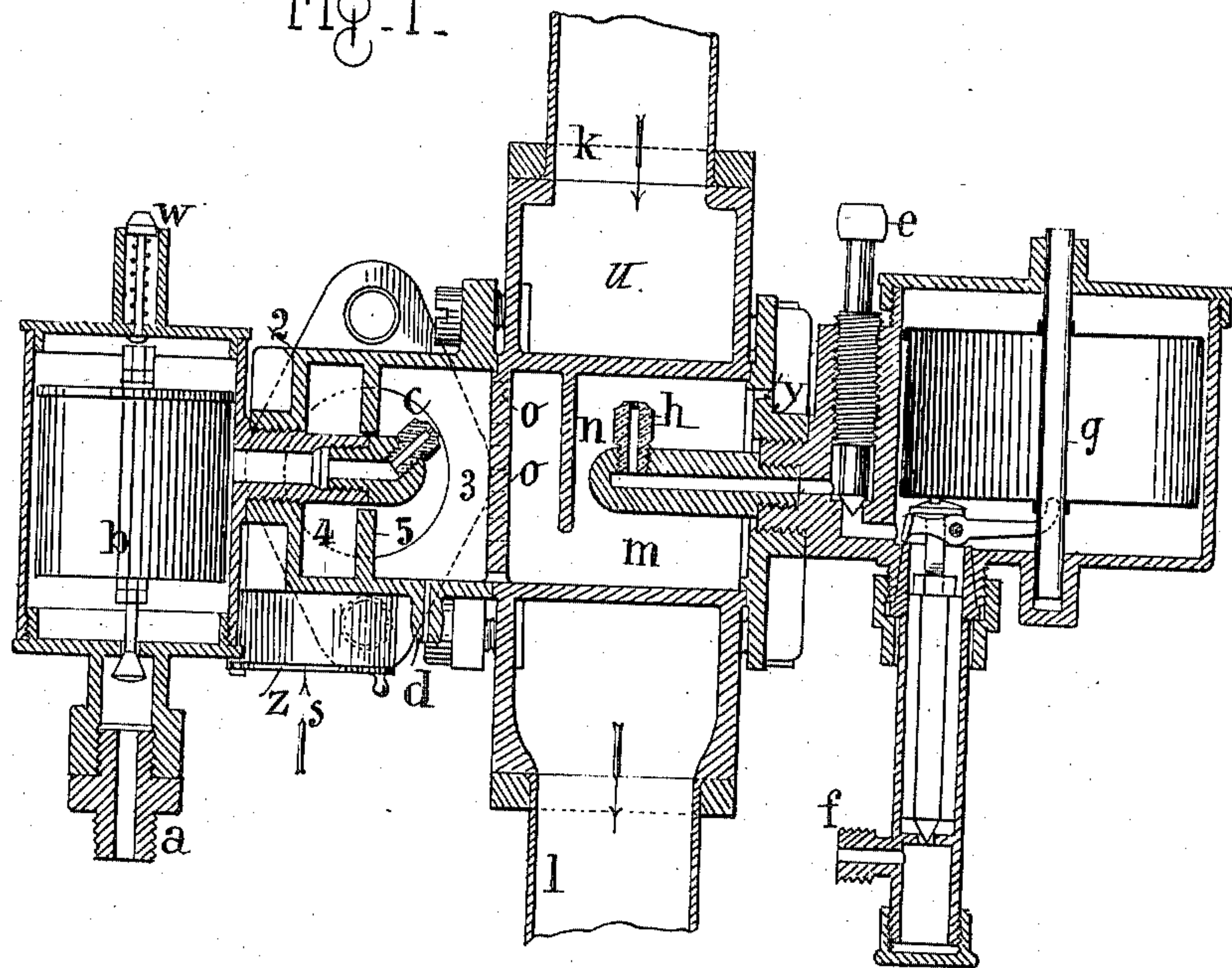
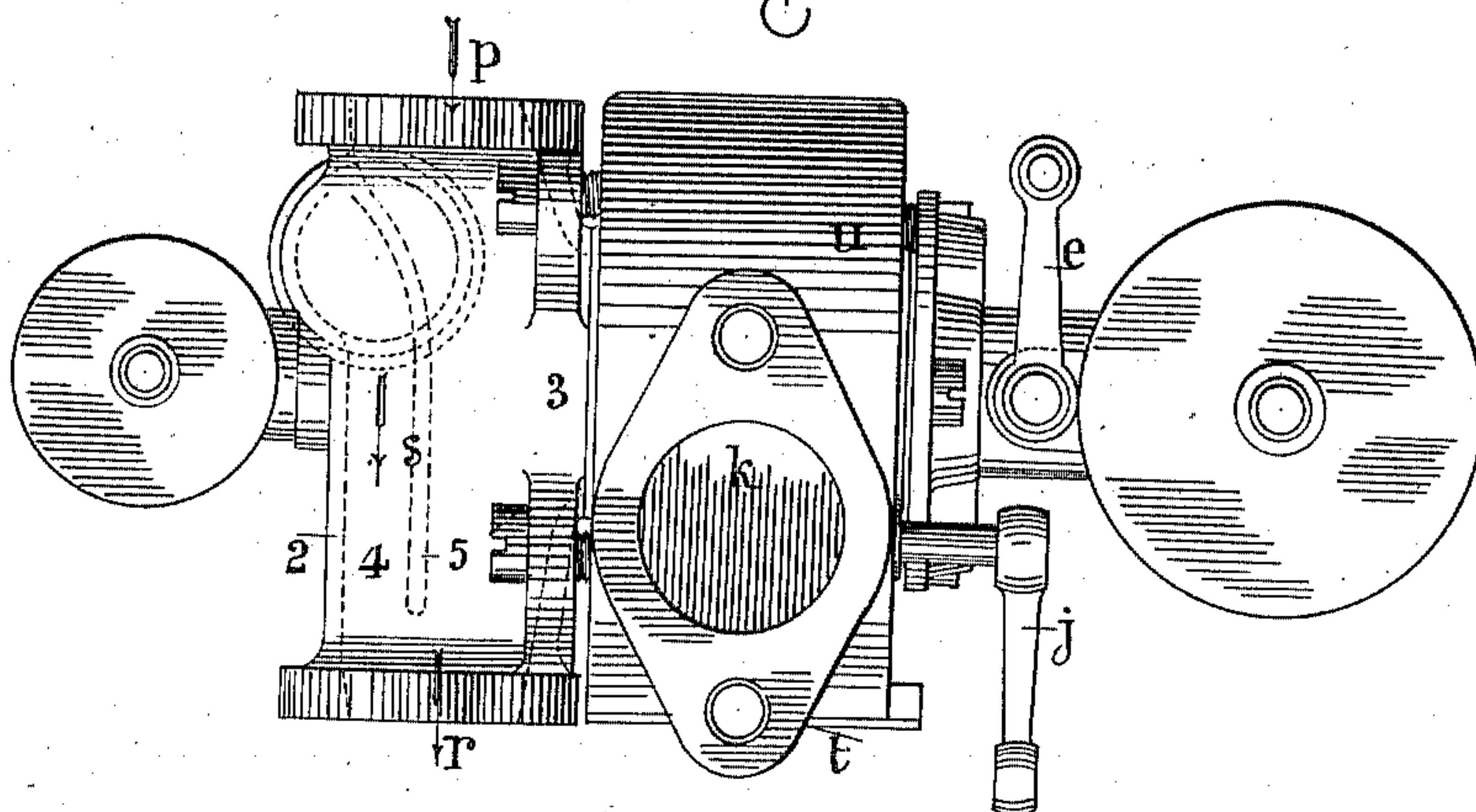


Fig. 2.



Witnesses:

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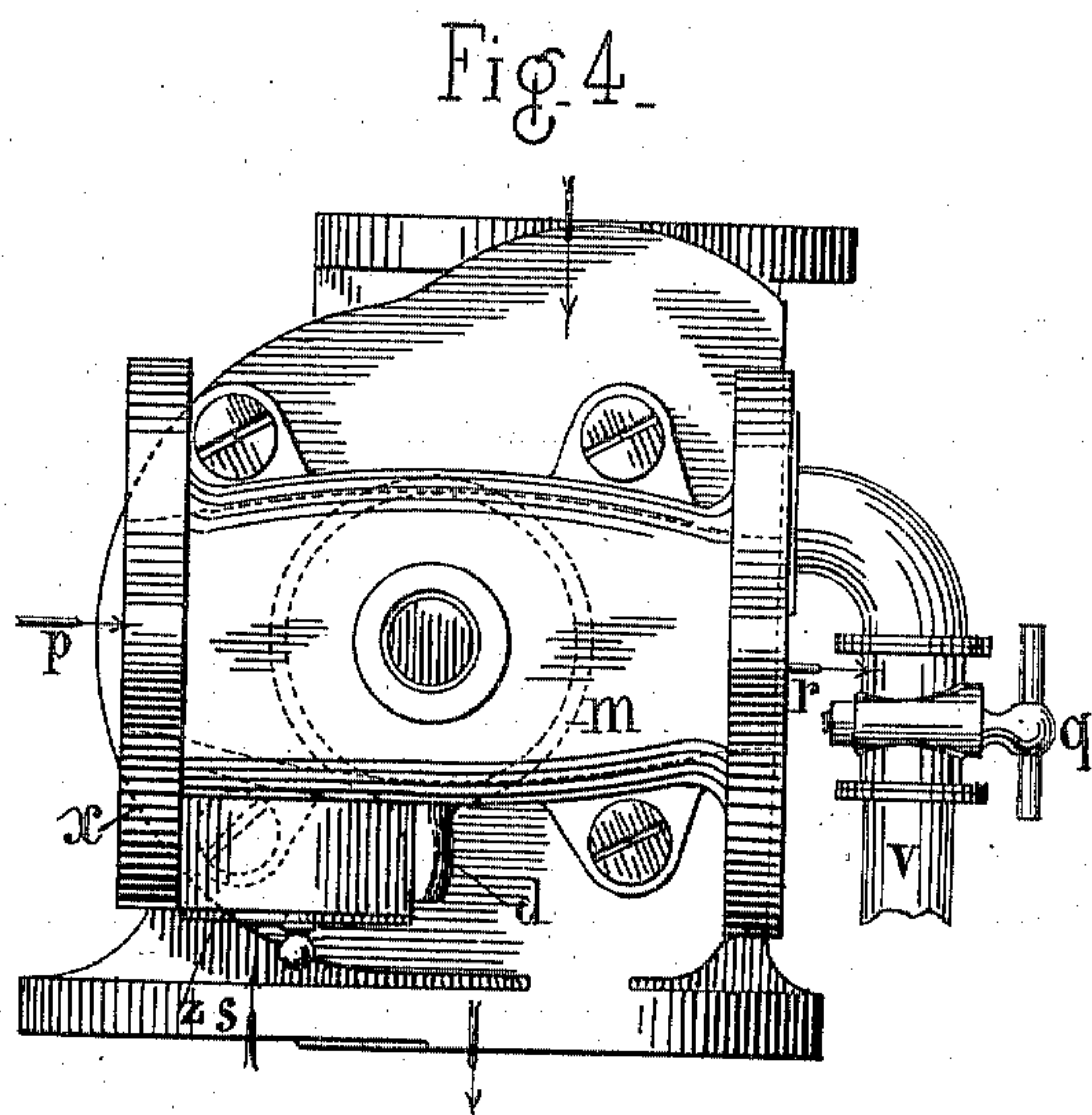
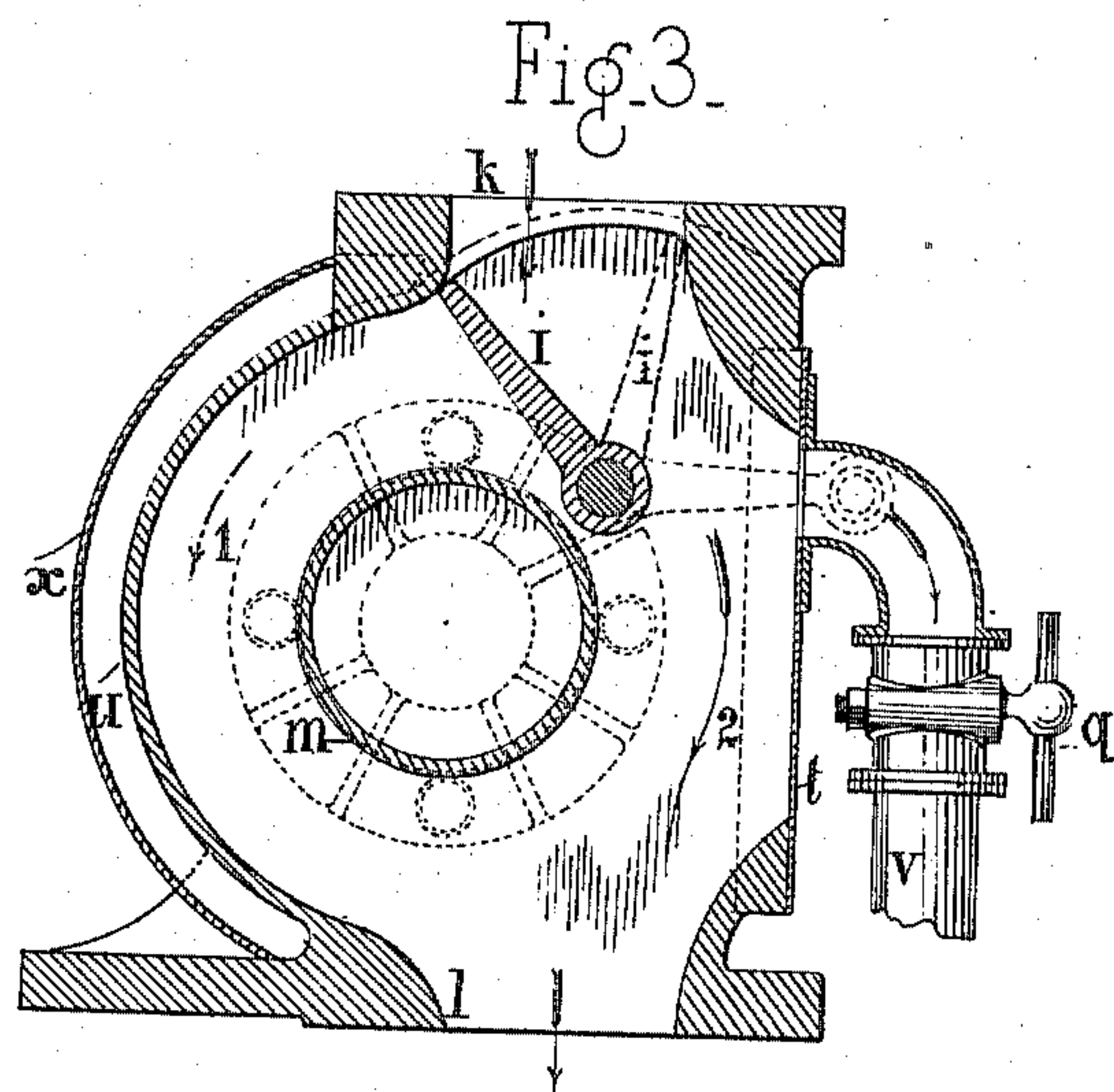
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UNITED STATES PATENT OFFICE.

CHARLES HENRI CLAUDEL, OF ARGENTEUIL, FRANCE.

CARBURETER FOR HYDROCARBON-ENGINES.

No. 811,618.

Specification of Letters Patent.

Patented Feb. 6, 1906.

Application filed May 26, 1904. Serial No. 209,976.

To all whom it may concern:

Be it known that I, CHARLES HENRI CLAUDEL, engineer, a citizen of the Republic of France, residing at 25 Rue Nationale, Argenteuil, in the Republic of France, have invented certain new and useful Improvements Relating to Carbureters for Hydrocarbon-Engines, of which the following is a specification.

Appliances for the carburization of air based upon the vaporization or gasification of combustible liquids which are not capable of being vaporized at the ordinary temperatures of the atmosphere necessarily comprise means for heating these liquids, and this heating is generally obtained by passing the whole or a part of the exhaust-gases of the motor which is being supplied around a chamber or vaporizer, into which the combustible liquid is injected. In order that appliances of this kind may be completely satisfactory, it is desirable to maintain the vaporizers at the minimum temperature of vaporization or gasification. If their temperature should rise, the gases produced expand and the energy that they are capable of developing per unit of volume decreases, the result of which is a diminution in the power of the motor. Now the temperature of vaporizers tends to vary from one moment to another, as it depends upon the time since starting took place, upon the external temperature, the hygrometric condition of the air, &c. It will therefore be understood that it is of the greatest importance either to be provided with means by which the temperature of the vaporizers or the difference between their temperature and that of the atmosphere may be maintained constant.

The invention relates mainly to means devised to this end, and which consists, broadly, in regulating the action of the exhaust-gases upon the vaporizer, utilizing for the heating of this latter a variable portion of the heat contained in these gases. To this end it is possible either to alter the quantity of exhaust-gases which pass over the vaporizer or to vary the conditions under which the exhaust-gases act upon the vaporizer—for example, by altering the extent of surface with which these gases come into contact or the losses of heat due to radiation. These different regulating means may either be employed separately or in combination.

In order that the invention may be readily and clearly understood, I will now describe,

by way of example, referring to the accompanying drawings, a carbureter or vaporizer by means of which it may be carried into practice.

Figure 1 is a longitudinal vertical section through a carbureter with horizontal vaporizer-chamber in which the heating of this latter is regulated in the manner indicated above. Fig. 2 is a corresponding plan view. Fig. 3 is a vertical cross-section of the vaporizer-chamber; and Fig. 4 is an end elevation, the chamber for the float *b* being omitted.

m is the vaporizer-chamber to be heated. It is placed at the center of the double envelop *u*, traversed by the column of exhaust-gases. This chamber *m* is arranged eccentrically in such a manner that the exhaust-gases may traverse at will two unsymmetrical circuits, as shown by the arrows 1 and 2.

In the path shown by the arrow 1, the door *i* being in the position represented in dotted lines, Fig. 3, the heating is especially intense, owing to the large vaporizer-surface placed in contact with the exhaust-gases. It is so much the more intense that the passage 1 is protected from external radiation by a double insulating layer *x*. When, on the contrary, the door *i* is in the position shown in full lines, Fig. 3, a smaller vaporizer-surface is placed in contact with the column of exhaust-gases. The heating is therefore less intense. It is the less so because the outer wall *t* is adapted to permit of loss of heat by radiation. The heating may be still further diminished by permitting of the egress of a greater or less quantity of the exhaust-gases through a branch pipe *v* with regulating-valve *q*.

It will be understood that the temperature of the vaporizer-chamber may be regulated perfectly by imparting to the door *i*, according to requirements, positions comprised between its two extreme positions—that is to say, by varying the ratio of the quantities of exhaust-gases which pass through 1 and 2. A more complete regulation may be obtained by operating the cock *q*, permitting of altering the respective quantities of hot gas which pass through 2 and *v*.

The following is a general description of the vaporizer or carbureter represented as a whole: *a* is an inlet for spirit. *b* is a float with valve insuring the constancy of the level of the spirit. *w* is a spring push-button which permits of depressing the float *b* by hand. *c* is an injector for spirit opening into

the compartment 3 of an air-suction conduit 2, which communicates at *p* with the atmosphere and at *r* with the suction-pipe of the motor. A partition 5 forms in the conduit 2 a second compartment 4, which is connected at *s* with the atmosphere by an orifice adjustable by means of a register or damper *z*. This latter permits of increasing or decreasing the admission of air, and consequently the suction of combustible fluid produced by this air. *d* is an exhaust-socket for the combustible liquid in excess. *e* is a pin-cock for the petroleum; *f*, the inlet for the petroleum; *g*, a constant-level float for the petroleum; *h*, an injector for the petroleum; *n*, a baffle which divides the vaporizer-chamber *m* into two compartments, in one of which the injector *h* is contained, while the other is in communication, by means of the perforations formed in the wall *o*, with the compartment 3 mentioned above. *y* is the air-inlet permitting of the oxidation of the coke which may be formed during gasification. *k* is the inlet for the exhaust-gases around the vaporizer; *i*, the regulating-door mentioned above; *j*, its operating-lever, and *l* the outlet for the exhaust-gases.

The operation is as follows: On starting, the pin-cock *e* is closed, and the suction of the motor causes air to enter through *p* and *s* and spirit through *a b c*. The mixture passes to the motor through *r*. When the exhaust-gases in circulating around the vaporizer *m* in the manner indicated by the arrows, Fig. 1, have heated it sufficiently, the cock *e* is opened. The suction of the motor then causes the burning petroleum (or other combustible liquid) to enter through *f g h*. The vaporization takes place in *m*, and the vaporized combustible proceeds to the motor through *r* after having mingled with the air sucked in through *p* and *s*.

In respect to its general construction, arrangement, and mode of operation the complete apparatus herein described has a number of features which are also found in a carbureter forming the subject-matter of another application for United States Letters Patent, Serial No. 209,975, filed by me on the same date herewith, and said features are not broadly claimed herein, being so claimed in the application just referred to.

What I claim, and desire to secure by Letters Patent of the United States, is—

1. In a carbureter for supplying motors, the combination of a vaporization or gasification chamber, a casing surrounding this chamber and providing for the exhaust-gases of the motor a passage having two parts which overlies different portions of said chamber, the outer walls of said parts being heat-conducting to an unequal extent, and means for varying the distribution or circulation of the exhaust-gases in the two parts of said passage.

2. In a carbureter for supplying motors, the combination of a vaporization or gasification chamber, a casing inclosing the same and providing for the exhaust-gases of the motor a passage having two parts which overlies different portions of said chamber, means for varying the distribution of the exhaust-gases in the two parts of said passage, and a heat-insulating layer covering the outer wall of one of said parts.

3. In a carbureter for supplying motors, the combination of a vaporization or gasification chamber, a casing inclosing the same and providing for the exhaust-gases of the motor a passage divided into two parts which overlies different portions of said chamber, the outer wall of one of these parts being thin and a good conductor of heat, and means for varying the distribution of the exhaust-gases in the two parts of said passage.

4. In a carbureter for supplying motors, the combination of a vaporization or gasification chamber, a casing inclosing the same and providing a passage for the exhaust-gases of the motor, a main outlet and a supplementary outlet for the exhaust-gases each leading from said passage, and means for regulating the flow of said gases through the supplementary outlet.

5. In a carbureter for supplying motors, the combination of a vaporization or gasification chamber, a casing inclosing the same and providing a passage for the exhaust-gases of the motor, said passage having two parts which overlies different portions of said chamber, means for varying the distribution or circulation of the exhaust-gases in the two parts of the passage, a supplementary outlet leading from one of the parts of said passage, and means for regulating the flow of said gases through the supplementary outlet.

6. In a carbureter for supplying motors, the combination of a vaporization or gasification chamber, a casing inclosing the same and providing for the exhaust-gases of the motor a passage having two parts which overlies different portions of said chamber, the outer walls of said parts being heat-conducting to an unequal extent, means for varying the distribution or circulation of the exhaust-gases in the two parts of said passage, a supplementary outlet leading from one of the parts of the passage, and means for regulating the flow of said gases through the supplementary outlet.

7. In a carbureter for supplying motors, the combination of a vaporization or gasification chamber, a casing inclosing the same and providing a passage for the exhaust-gases of the motor, said passage being divided into two parts which overlies different portions of said chamber, a heat-insulating layer covering a portion of the outer walls of one of said parts, means for varying the distribution or circulation of the exhaust-gases in the two

parts of the passage, a supplementary outlet leading from one of the parts of said passage, and means for regulating the flow of said gases through the supplementary outlet.

5 8. In a carbureter for supplying motors a vaporization or gasification chamber with horizontal axis divided into two communicating compartments by a vertical baffle-plate, a combustible liquid-injector, opening
10 into one of the compartments, and an air-suction conduit in communication on the one hand with the atmosphere on the other hand with the suction-pipe of the motor and separated from the second compartment of the
15 chamber by means of a perforated partition, substantially as described and represented.

9. A carbureter for supplying motors comprising in combination a vaporization or gasification chamber with horizontal axis and
20 divided into two communicating compartments by a vertical baffle-plate, a small air-inlet and an injector for combustible liquid opening into one of the compartments, and an air-suction conduit in communication on
25 the one hand with the atmosphere, on the other hand with the suction-pipe of the motor and separated from the second compartment of the chamber by a perforated partition substantially as described and illus-
30 trated.

10. A carbureter for supplying motors comprising, in combination, a vaporization or gasification chamber with horizontal axis divided into two communicating compart-
35 ments by means of a vertical baffle-plate, an injector for combustible liquid not capable of being vaporized at the ordinary temperature, opening into one of the compartments, means for heating the chamber, an air-suction con-
40 duit in communication on the one hand with the atmosphere, on the other hand with the suction-pipe of the motor and separated from the second compartment of the vaporization-chamber by means of a perforated partition,
45 and an injector for volatile liquid opening into the said conduit, substantially as described and represented and for the purpose indicated.

11. A carbureter for supplying motors
50 comprising, in combination, a vaporization or gasification chamber with horizontal axis divided into two communicating compartments by a vertical baffle-plate, an injector for combustible liquid not capable of being
55 vaporized at the ordinary temperature opening into one of the compartments, means for heating the chamber, an air-suction conduit divided into two longitudinal compartments by a partition, each of the said compart-
60 ments being in communication on the one hand with the atmosphere on the other hand with the suction-pipe of motor and one of them being separated from the second com-

partment of the chamber by a perforated partition, an injector for volatile liquid open- 65 ing into the compartment of the conduit which is connected to the chamber, and means for regulating the admission of air into the other compartment of the conduit, substantially as described and illustrated and 70 for the purpose indicated.

12. In a carbureter for supplying motors, the combination of a vaporization or gasifica-
tion chamber divided by a baffle-plate into two communicating compartments, a casing 75 enveloping said chamber and providing a passage for the exhaust-gases of the motor, means for varying the quantity of heat given up by these gases to said chamber, means for injecting liquid combustible into one of the 80 compartments of said chamber, and an air-suction conduit adapted to lead from the atmosphere to the suction-pipe of the motor and separated from the second compartment of said chamber by means of a perforated 85 partition.

13. In a carbureter for supplying motors, the combination of a vaporization or gasifica-
tion chamber divided by a baffle-plate into two communicating compartments, a casing 90 enveloping said chamber and providing a passage for the exhaust-gases of the motor, said passage being divided into two parts which overlie different portions of said cham-
ber, means for varying the distribution or cir- 95 culation of the exhaust-gases in the two parts of the passage, means for injecting liquid combustible into one of the compartments of said chamber, and an air-suction conduit adapted to lead from the atmosphere to the 100 suction-pipe of the motor and separated from the second compartment of said chamber by a perforated partition.

14. In a carbureter for supplying motors, the combination of a vaporization or gasifica- 105 tion chamber divided by a baffle-plate into two communicating compartments, a casing enveloping said chamber and providing a passage for the exhaust-gases of the motor, a supplementary outlet leading from said pas- 110 sage and means for regulating the flow of said gases through the same, means for injecting liquid combustible into one of the compartments of said chamber, and an air-suction conduit adapted to lead from the at- 115 mosphere to the suction-pipe of the motor and separated from the second compartment of said chamber by means of a perforated partition.

In testimony whereof I have hereunto set 120 my hand, in presence of two subscribing witnesses, this 9th day of May, 1904.

CHARLES HENRI CLAUDEL.

Witnesses:

RENÉ PICARD;

HENRY AUGUSTE BERTIN.