J. A. PRESTWICH.

CARBURETER FOR INTERNAL COMBUSTION ENGINES.

APPLICATION FILED DEC. 6, 1906.

910,018. Patented Jan. 19, 1909.

2 SHEETS—SHEET 1.

Fig. 1.

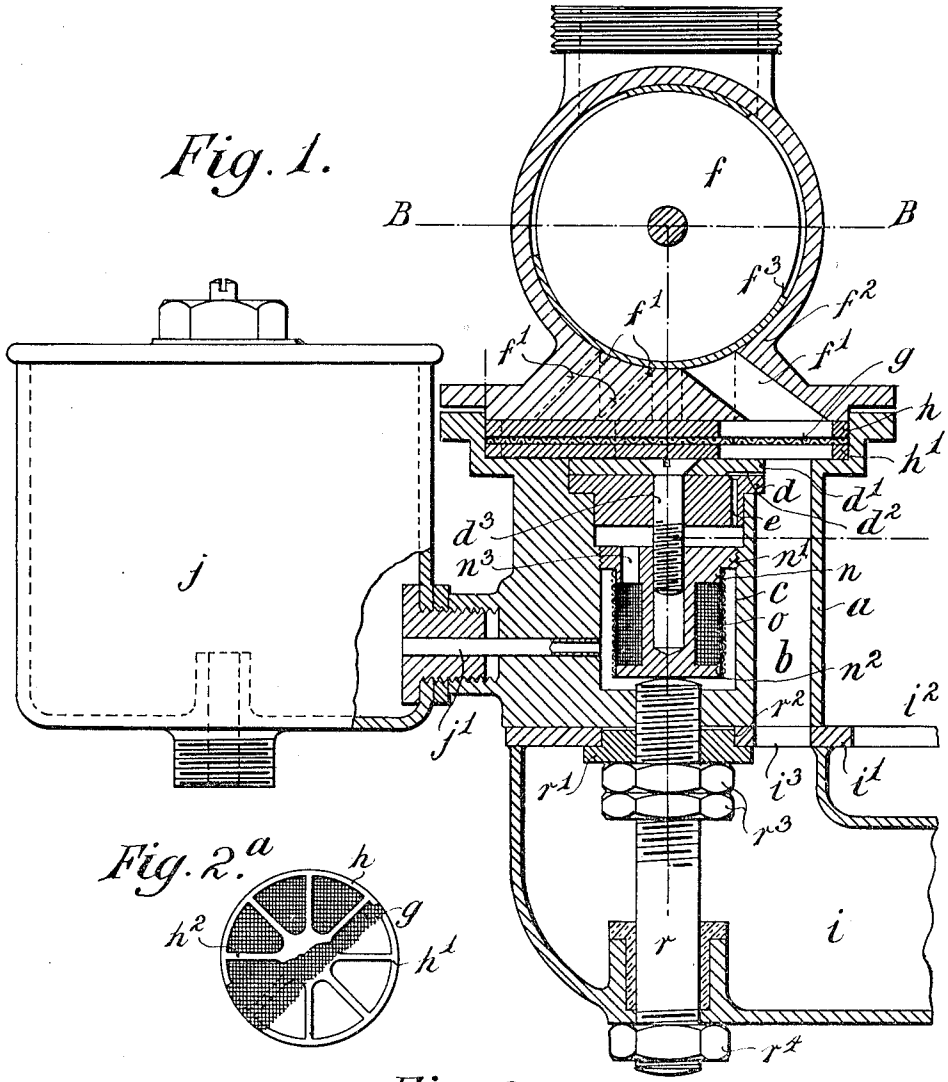
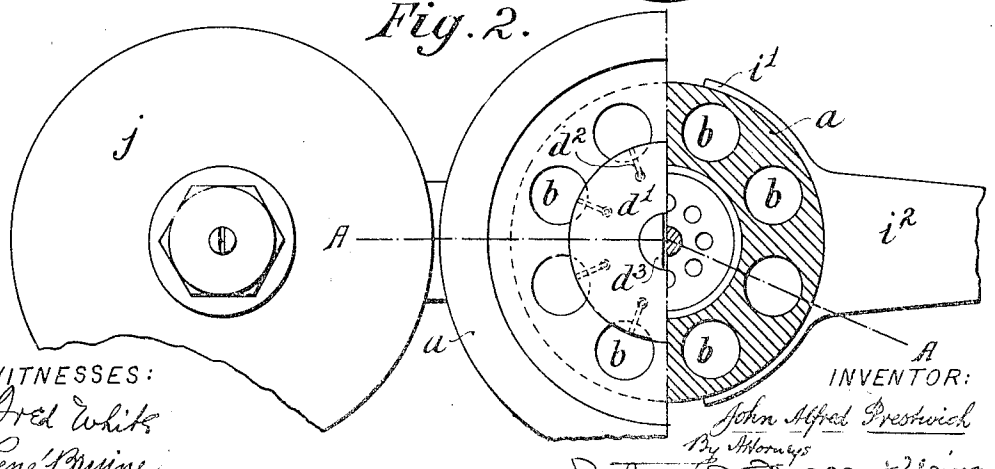


Fig. 2.a

Fig. 2.



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2 SHEETS—SHEET 2.

Fig. 3.

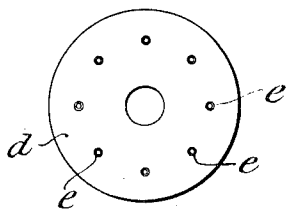


Fig. 4.

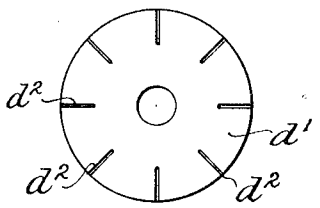


Fig. 5.

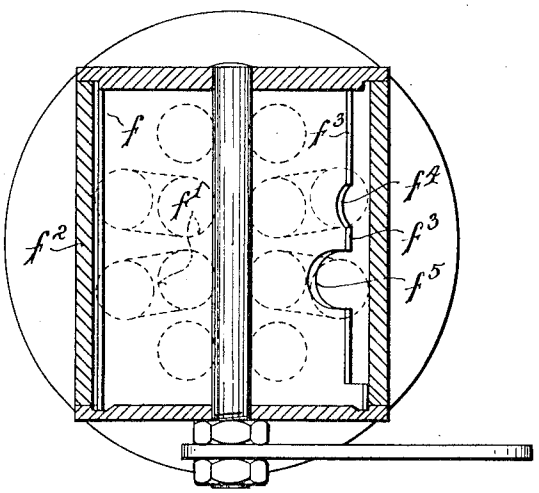
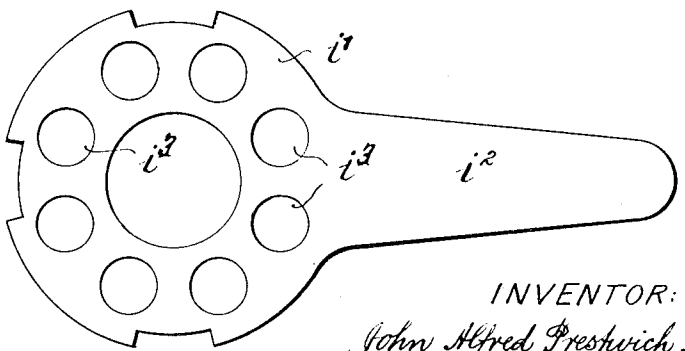


Fig. 6.



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UNITED STATES PATENT OFFICE.

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CARBURETER FOR INTERNAL-COMBUSTION ENGINES.

No. 910,018. Specification of Letters Patent. Patented Jan. 19, 1909.

Application filed December 6, 1906. Serial No. 346,687.

To all whom it may concern:

Be it known that I, JOHN ALFRED PRESTWICH, of 1 Lansdowne road, Tottenham, London, England, engineer, have invented certain new and useful Improvements in or Relating to Carbureters for Internal-Combustion Engines, of which the following is a specification.

This invention relates to carbureters or means for supplying, mixing and controlling the mixture of air and combustible fluid in internal combustion engines.

The object of the invention is to provide means whereby the same relative proportion between the combustible fluid and the air may be maintained whether the engine is running at high or low speed and at the different positions at which the mixture controlling throttle is set. This has been usually accomplished automatically by means of sliding pistons actuated by the partial vacuum in the inlet pipe and controlling the ingress of the air, or by varying the aperture of the jet from which the hydrocarbon fluid is supplied. These arrangements are complicated and not satisfactory and are very liable to derangement from dirt and wear.

According to this invention I provide a series of isolated air passages and a series of combustible fluid passages, said passages being disposed in pairs each corresponding pair of which is so isolated that one or more of the said pairs can be cut off to vary the volume of explosive mixture supplied to the engine without varying the proportion of air and combustible fluid. For example the combustible fluid and air is fed in separate quantities to each of a series of isolated passages or apertures the outlets of which are controlled by a throttle valve of suitable type adapted to throttle one or more of the passages so as to entirely cut off the corresponding supply of combustible fluid and air which passes to the engine from said passages. As each passage has its separate supply of combustible fluid the relative proportion between air and fluid remaining when some passages are cut out is exactly the same as when they are all in operation and thus the quantity of air and fluid may be reduced proportionally at all speeds. As is usual some means will be provided for regulating the quantity of air to the air passages whereby the relative proportion of air and combustible fluid as a whole may be regulated as required.

The accompanying drawings illustrate one form of carbureter made in accordance with this invention.

Figure 1 is a part sectional elevation, the section being taken on line A—A of Fig. 2; Fig. 2 is a plan partly in section with throttle valve and filter screen removed; Fig. 2^a is a part sectional plan of the gauze screen and clamping devices; Fig. 3 is a plan of that part which contains the separate fluid passages; Fig. 4 is an inverted plan of the disk-like head (which covers the part shown in Fig. 3) showing the continuation of the fluid passages; Fig. 5 is a section on line B—B of Fig. 1; Fig. 6 is a plan of the air controlling device.

As shown in the drawings, I employ a casing or part such as a in which is formed a series of passages b b suitably proportioned relatively to the intake of the engine, and said passages b b are arranged in a circular manner around a central fluid feeding chamber or vessel c also formed in the part a and which is provided at its upper part with a fluid supply nozzle. This nozzle consists of a disk-like head d just encroaching upon the circumference of the surrounding air passages b, the said disk having a number of fluid passages e e and having its top closed or covered by another disk-like cap or head d^1 formed on its underside with radial grooves d^2 one leading from each of the fluid passages e to the corresponding air passages b, the whole being suitably secured by a central screw d^3 and so fitted that the head or cap d^1 forming the top of the nozzle comes flush with the top of the air apertures b. The radial grooves d^2 constitute discharge nozzles which are directed substantially at right angles to the flow of air through the air passages. By the construction described the discharge nozzles are removable as a whole as distinguished from constructions in which each discharge nozzle is separately formed and required to be separately removed. The advantage of the present construction is obvious. The said series of air passages b are isolated from one another and communicate at their upper ends with the throttle valve f by ports f^1 formed in the valve casing f^2, the ports f^1 being suitably grouped together for the purpose. The throttle valve f is of the usual

drum-like form with the exception that the leading edge f^3, which moves over the ports f^1, is formed with gaps or cut-away parts f^4 f^5 of different dimensions so as to cut off or open, as the case may be, one air passage at a time in its throttling movement, or it may be arranged to cut off say first one and then two others gradually so as to suitably reduce the number of apertures through which the mixture of air and fluid is drawn under the suction of the piston. A suitable gauze screen is preferably provided for each aperture between the fluid nozzle and the throttle valve. In the form shown this screen consists of a disk of gauze g clamped between two wheel like plates h h^1 (as in Fig. 1) having apertures between the arms h^2 which arms form the divisions between the respective passages.

To vary the proportion of explosive mixture to suit differences of atmospheric conditions, or difference of quality in the hydrocarbon used, the inlet pipe i to the series of air passages b is provided with a regulator consisting of an annular plate i^1 with handle i^2 having a number of apertures i^3 corresponding to the air passages b, which plate when rotated by its handle serves to more or less close the entrance to the said passages. The annular plate i^1 is secured between the lower side of the part a and the upper part of the air inlet pipe i by a bolt r screwing into the underside of the part a and projecting down through a suitable gland in the said air inlet pipe, and, for the purpose of centering the plate i^1 in regard to the series of air passages b, a washer r^1 having a reduced portion r^2 fits into the central hole of the said plate i^1 and is secured in position by nuts r^3. A nut r^4 upon the lower end of the bolt r serves to keep the air inlet pipe tight against the face of the annular plate i^1. The said circular casing a is fitted adjacent to and parallel with an automatic fluid feeding and controlling device j of any suitable type adapted to maintain in the central liquor chamber c the required level of combustible fluid by means of pipe j^1 which connects the said feed controlling mechanism with the chamber c.

Upon the lower end of the central screw d^3 is fitted a plug n having flanges n^1 n^2 of smaller diameter, the plug n being screwed or otherwise fastened within the central chamber c and having holes n^3 for the passage of the liquid while a gauze filter screen o is disposed around the said flanges.

In operation, when all the mixture passages f^1 are uncovered by the throttle valve f, and the disk i^1 at the entrance to the air passages b is in such position that the apertures i^3 therein are in alinement with said air passages the maximum volume of mixture will be drawn in by the suction of the engine. Now, if it is desired to reduce the volume of mixture admitted, the throttle valve f is turned so as to shut off one or a number of the said mixture passages, and, by reason of the leading edge of said valve being so formed with gaps or cut-away parts of different dimensions the reduction of volume is effected. By this it will be seen that the volume only is affected, the proportion of air and fluid remaining the same, but should it be required to change the proportion of the mixture, this can be effected by turning the plate l^1 so that the holes l^3 are out of alinement and the air pasages are partially closed or throttled; thus the volume of air is reduced without affecting the supply of fluid and a mixture obtained having a greater proportion of fluid than if the entrance to the air passages b were fully open.

It is to be understood that the series of apertures may be otherwise suitably arranged in order that they may be cut off by one or some at a time, for instance, they may be arranged in a row or rows and they may be throttled by a reciprocating movement and the fluid passages and corresponding air passages may be similarly arranged in a row or rows or if required they may be arranged in the same circular manner as illustrated and corresponding passages may lead therefrom to a linear arrangement of throttling apertures.

What I claim and desire to secure by Letters Patent is:—

1. In carbureters, the combination of a body part, walls therein dividing the casing into a number of air passages and a central combustible fluid container respectively, the air passages being situated around said container, said container being provided with a series of fluid passages one for each air passage in the casing, and discharge nozzles for said fluid passages, said discharge nozzles constituting a unitary structure so that they are removable as a whole.

2. In carbureters, the combination of a body part, walls therein dividing the casing into a number of air passages and a central fluid container respectively, the air passages being situated around said central fluid container, a plug covering the top of said container, a series of fluid passages in said plug, and a superposed disk attached to said plug and having its underside formed with a number of channels corresponding to and communicating with said fluid passages and the air passages in the casing respectively.

3. In carbureters, the combination of a body part, walls therein dividing the casing into a number of air passages and a central combustible fluid container respectively, the air passages being situated around said container, a series of fluid passages in said container, one for each air passage, and discharge nozzles for said fluid passages, said

discharge nozzles constituting a unitary structure so that they are removable as a whole, a valve casing adjacent to said air passages, a throttle valve in said casing, a series of isolated mixture admission passages in the valve casing leading from the series of air passages to the throttle valve, the leading edge of said throttle being so formed as to successively shut off the said mixture admission passages.

4. In carbureters, the combination of a body part, walls therein dividing same into a number of air passages and a central fluid container respectively, the air passages being situated around said central fluid container, a series of fluid passages in said fluid container, one for each air passage, a filter screen disposed between the outlet of said air passages and the engine, said screen being clamped between wheel-like members, the arms of which correspond with the walls of the air passages and serve to preserve the isolation of the mixture passing from the air passages and means for successively cutting off said outlets from the screen to vary the volume without affecting the relative proportions of the mixture.

5. In carbureters, the combination of a body part, walls therein dividing same into a number of air passages and a central fluid container respectively, the air passages being situated around said central fluid container, a series of fluid passages in said fluid container, one for each air passage, a valve 35 casing adjacent to said air passages, a throttle valve in said casing, a series of isolated mixture admission passages in the valve casing leading from the series of air passages to the throttle valve, the leading edge of said throttle valve being so formed as to successively cut off the said mixture admission passages, a plate disposed at the inlet side of the said air passages and provided with a number of ports corresponding thereto whereby said plate can be moved to regulate the volume of air admitted.

6. In carbureters, the combination of a body part, walls therein dividing same into a number of air passages and a central fluid container respectively, the air passages being situated around said central fluid container, said container being provided with a nozzle formed with a plug covering the top of same and provided with a series of fluid passages and a superposed disk attached to said plug and having its underside formed with a number of channels corresponding to and communicating with said fluid passages and the air passages in the casing respectively, a sleeve beneath the underside of said plug where it projects into said central fluid container, and a filter screen upon the said sleeve.

7. In carbureters, the combination of a body part, walls therein dividing same into a number of air passages and a central fluid container respectively, the air passages being situated around said central fluid container, said container being provided with a nozzle formed with a plug covering the top of the same and provided with a series of fluid passages and a superposed disk attached to said plug and having its underside formed with a number of channels corresponding to and communicating with said fluid passages and air passages in the casing respectively, and means for maintaining a substantially constant level of fluid in the central fluid container.

8. In carbureters, the combination of a body part, walls therein dividing the casing into a number of air passages and a centrally arranged combustible fluid container respectively, the air passages being situated around said container, said container being provided with a series of fluid passages, one for each air passage in the container, said fluid passages having nozzles extended in a substantially radial direction into said air passages and being adapted to discharge the fluid at substantially right-angles to the flow of air in said passages.

9. In carbureters, the combination of a body part, walls therein dividing the casing into a number of air passages, and a centrally arranged combustible fluid container respectively, the air passages being situated around said container, said container being provided with two superposed members having formed between them a series of fluid passages one for each air passage in the casing, said passages being extended in a substantially radial direction into said air passages.

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

JOHN ALFRED PRESTWICH.

Witnesses:
ROBERT MILTON SPEARPOINT,
H. D. JAMESON.