C. J. GRACE.

CARBURETER.

APPLICATION FILED SEPT. 4, 1917.

1,322,560.

Patented Nov. 25, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

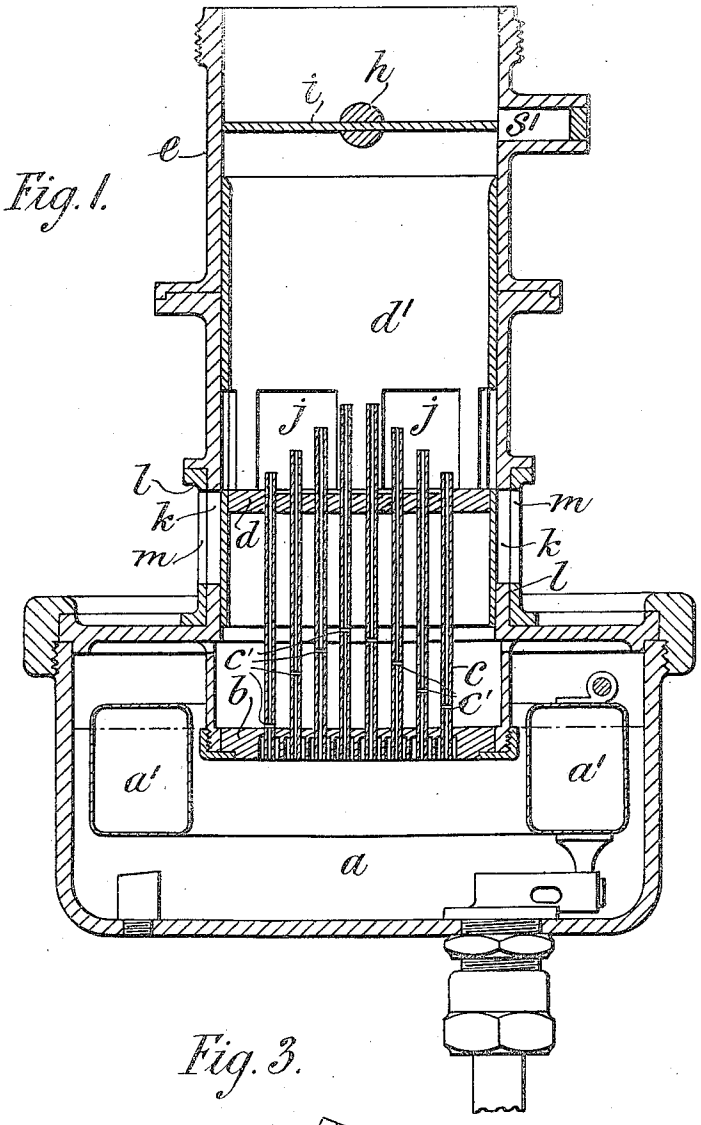
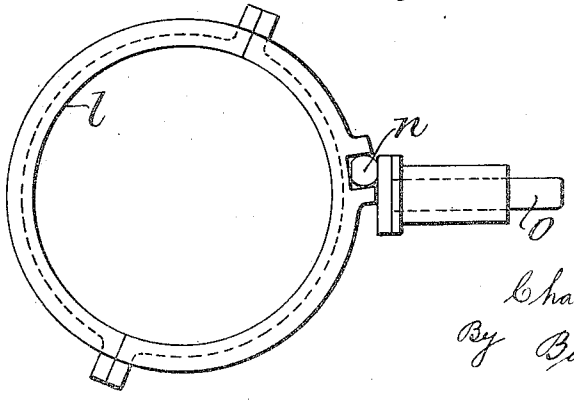


Fig. 3.



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2 SHEETS—SHEET 2.

Fig. 4.

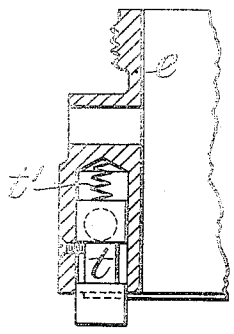
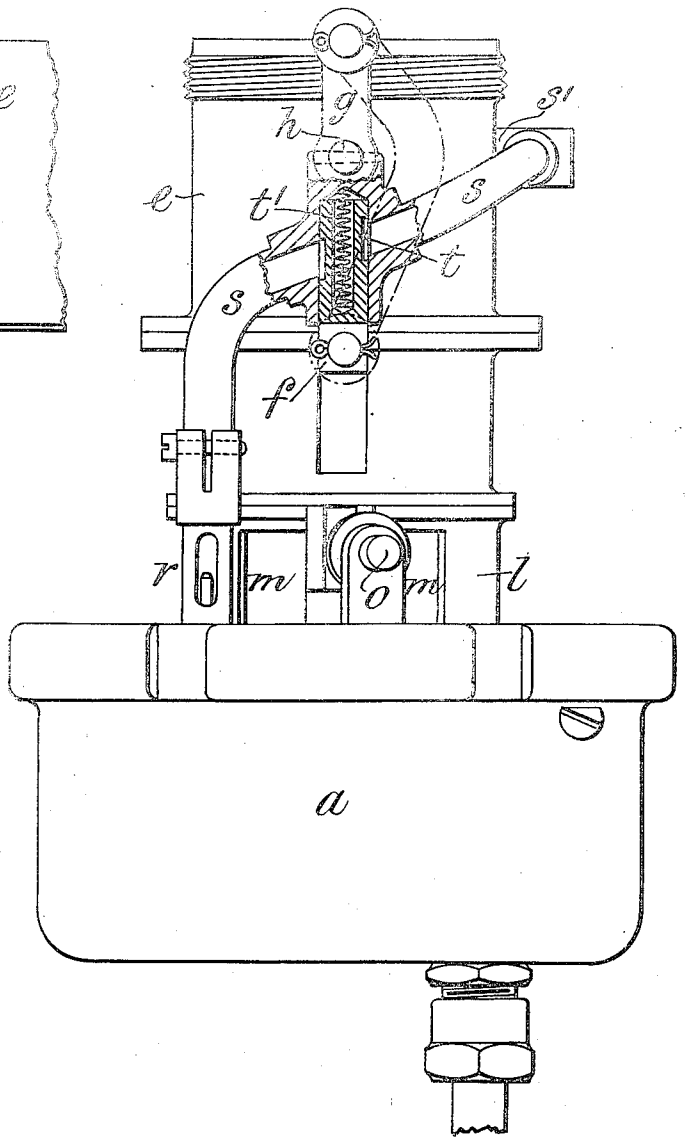


Fig. 2.



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UNITED STATES PATENT OFFICE.

CHARLES JEENS GRACE, OF TRURO, ENGLAND.

CARBURETER.

1,322,560. Specification of Letters Patent. Patented Nov. 25, 1919.

Application filed September 4, 1917. Serial No. 189,572.

To all whom it may concern:

Be it known that I, CHARLES JEENS GRACE, a subject of the King of Great Britain, residing at Tregrayth, Kenwyn, Truro, in the county of Cornwall, England, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improved means for carbureting air and for regulating the supply of liquid fuel to internal combustion engines in which the fuel is delivered by a number of capillary tubes.

The drawings show apparatus made in accordance with my invention. Figure 1 is a vertical section, Fig. 2 is a side view partly in section and Figs. 3 and 4 show details.

a is a chamber containing a float a^1 designed to keep the liquid fuel at a constant level; the cover of this chamber supports a level plate *b* through which can slide an assemblage of capillary tubes *c* having in them lateral openings c^1 at various heights as shown. These tubes are supported by a plate *d* carried by a sleeve valve d^1 which can be moved up or down in the induction pipe *e* by means of arms *f* actuated by rocking arms *g* on the spindle *h* of a throttle valve *i*. The assemblage of tubes is shown at its highest position. In the valve d^1 are ports *j* adapted to register with other ports *k* in the bottom of the pipe *e*. Surrounding the bottom of the pipe is a sleeve *l* having in it ports *m* and this sleeve can be turned through a small angle by means of an eccentric *n* on a spindle *o* (see Fig. 3) so as to vary the available aperture of the ports *k*. When the ports *m* exactly register with the ports *k* the amount of air admitted is a maximum at any position of the tubes, but by moving the sleeve *l* slightly the ports *m* are brought out of register with the ports *k* and therefore less air can enter.

As the throttle *i* is opened the sleeve valve d^1 is lowered, the ports *j* come opposite the ports *k* and *m* and the openings in the tubes dip successively beneath the surface of the liquid so that as the sleeve valve is lowered the fuel is delivered at the tops of more and more tubes and mixes with the air entering through the ports. With this arrangement I am enabled to obtain a constant ratio of air to fuel at any opening of the throttle and this ratio can be adjusted by moving the sleeve *l*.

The lower parts of the holes in the plate *b* are made slightly larger than the outsides of the tubes *c* in order that should the level of the liquid in the chamber *a* accidentally sink below the normal level and provided it does not sink below the bottom of the plate *b*, it may rise by capillary action in the holes in the plate, so that as soon as the lateral opening in any tube reaches the enlarged part of such hole it may at once be supplied with liquid.

r is a slow runner jet or capillary leading to a pipe *s* which enters the induction pipe at s^1. In the pipe *s* is located a valve *t*. During normal running the throttle being open to a greater or less extent the valve *t* closes the pipe *s* as it is brought down by gravity aided by a spring t^1 (see Fig. 4). When, however, the throttle is closed, as shown in Fig. 1, one of the arms *f* comes against the bottom of the valve *t* and lifts it to the position shown in Fig. 2, thus opening the pipe *s* and allowing the slow runner jet to come into action. By turning the throttle anticlockwise beyond the position shown in Fig. 1, the passage s^1 can be completely shut off from the induction pipe.

What I claim is:—

1. In a carbureter, a fuel chamber, an induction pipe, an assemblage of tubes in the pipe, each tube having in it a lateral opening capable of putting the tube into communication with the fuel chamber, the openings in the various tubes being at different levels, means for raising and lowering the assemblage of tubes and a fixed member adapted to screen the openings.

2. In a carbureter, a fuel chamber, an induction pipe, an assemblage of tubes in the pipe, each tube having in it a lateral opening capable of putting the tube into communication with the fuel chamber, the openings in the various tubes being at different levels, a valve adapted to control the flow of air through the pipe, means for raising and lowering the assemblage of tubes and for closing and opening the valve, and a fixed member adapted to screen the openings.

3. In a carbureter, a constant level fuel chamber, an induction pipe leading therefrom, ports in the wall of the induction pipe, a sleeve valve capable of longitudinal movement within the induction pipe, ports in the valve adapted to register with the ports in the induction pipe, an assemblage of capil-

lary tubes having lateral openings at varying levels and carried by the valve, a level plate in the fuel chamber through which the tubes can pass and means for raising and lowering the valve.

4. In a carbureter, a constant level fuel chamber, an induction pipe leading therefrom, ports in the wall of the induction pipe, means for varying the effective area of such ports, a sleeve valve capable of longitudinal movement within the induction pipe, ports in the valve adapted to register with the ports in the induction pipe, an assemblage of capillary tubes having lateral openings at varying levels and carried by the valve, a level plate in the fuel chamber bored to permit the passage of the tubes and means for raising and lowering the valve.

5. In a carbureter, a constant level fuel chamber, an induction pipe leading therefrom, ports in the wall of the induction pipe, a sleeve valve, ports therein adapted to register with the ports in the induction pipe, an assemblage of capillary tubes at varying levels carried by the valve and adapted to dip into the fuel chamber, a slow runner jet, a pipe connecting it with the induction pipe, and means for simultaneously moving the throttle valve and sleeve valve and for opening the slow runner jet as the throttle valve is closed.

6. In a carbureter, a constant level fuel chamber, an induction pipe leading therefrom, ports in the induction pipe, means for varying the effective area of such ports, a sleeve valve, ports therein adapted to register with the ports in the induction pipe, an assemblage of capillary tubes having lateral openings at varying levels and carried by the valve, a level plate bored to permit the passage of the tubes and means for raising and lowering the valve.

In testimony that I claim the foregoing as my invention, I have signed my name this 15th day of August, 1917.

CHARLES JEENS GRACE.