

A. D. BENHAM.
CARBURETER.
APPLICATION FILED NOV. 16, 1914.

1,199,747.

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Fig. 1

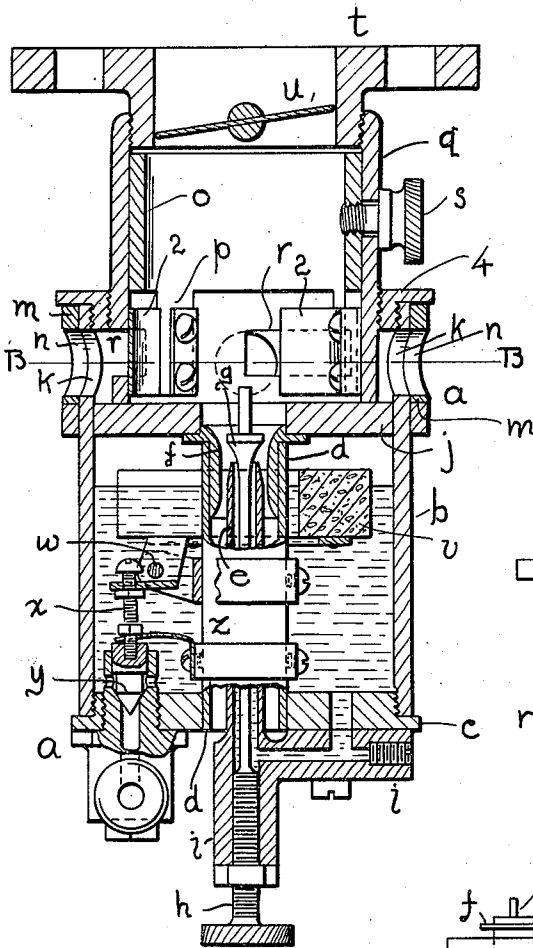


Fig. 2

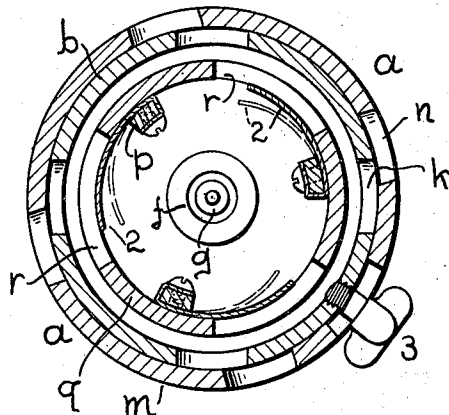


Fig. 3

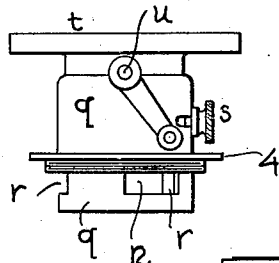


Fig. 4

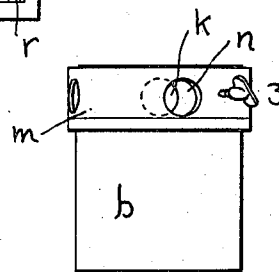
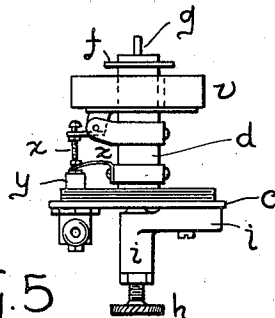


Fig. 5



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CARBURETER.

1,199,747.

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To all whom it may concern:

Be it known that I, ARTHUR D. BENHAM, a citizen of the United States, residing at Detroit, county of Wayne, State of Michigan, have invented a certain new and useful Improvement in Carbureters, and declare the following to be a full, clear, and exact description of the same, such as will enable others skilled in the art to which it pertains to make and use the same, reference being had to the accompanying drawings, which form a part of this specification.

My invention relates to carbureters and special objects of my invention are to provide an improved device for supplying the explosive mixture to an internal combustion engine which will cause the air and the fuel to be thoroughly mixed, and one that can be made largely of stock material so that cheapness as well as efficiency shall be secured. I attain this object in the device illustrated in the accompanying drawing in which,

Figure 1, is an elevation principally in central longitudinal section. Fig. 2, is a sectional plan view taken on the plane indicated by the line B—B Fig. 1. Figs. 3, 4 and 5 are detail elevations of separated parts.

a a indicates the principal part of the carbureter including the fuel reservoir and the lower part of the mixing chamber.

b b is a section of tubing having interior screw threads at its upper and lower ends.

c is a disk screwing in to the lower end of the tube *b* to form the bottom of the fuel reservoir.

d is a small section of tubing concentric with the tube *b* secured to the disk *c* with its lower end opening therethrough but forming a tight joint to retain the fuel in the reservoir.

e is a delivery conduit for the liquid fuel. This is secured by the part *i* to the lower surface of the disk *c* so that its interior shall open through passages in said part to the interior of the reservoir formed by the tube section *b b* and attached parts.

f is a strangling tube or tube adapted to fit into the upper end of the tube *d* to contract its diameter. The conduit *e* has its upper, and delivery, end opening at the center of the strangling tube *f*.

j is a disk pressed into the upper end of the tube *b b* so as to close the same and

form a top for the fuel reservoir. The disk *j* has a circular aperture at its center which fits over the strangling tube *f* to hold the same in position, the said tube opening through the central aperture in the disk *j*.

h is a needle valve screw-threaded into an aperture in a vertically extending portion of the part *i* and having a contracted shank extending diametrically through the conduit *d*.

g, is a conical expanded portion at the upper end of the shank of the needle valve *h* adapted to adjust the area of the opening from the conduit.

k indicates a series of apertures extending radially through the wall toward the upper end of the tube *b* above the disk *j*.

m is a ring, which may also be a section of tubing of standard size, which fits around and is adapted to turn upon the upper end of the tube *d*.

n indicates apertures in the ring *m* corresponding in size and location to the apertures *k*. By adjusting the angular position of the ring *m*, the area of opening through the apertures *k* and *n* can be adjusted. When the ring has been turned to the desired position it is secured in this position by the set-screw 3 (Figs. 2 and 4).

4, is a ring screwed into the upper end of the tube section *b b*.

q, is a section of tubing of standard size somewhat less in external diameter than the internal diameter of the tube *b*.

The tube *q* is provided with external screw threads which engage internal screw threads in the ring 4. The tube *q* passes through said ring and its lower end engages the disk *j*.

r r are rectangular apertures formed through the wall of the tube *q* toward its lower end and substantially opposite the apertures *k* in the wall of the tube *b*.

o is a tube section fitting within the tube *q* and adapted to turn therein. The tube *o* has integral downwardly projecting portions *p, p*, the lower ends of which rest upon the upper surface of the disk *j*.

2 2 2 are leaf springs secured at one end to the projections *p, p* from the tube *o* and normally pressing against the inner wall of the tube *q* adjacent to the apertures *r r r*.

s is a set-screw whereby when the tube *o* has been turned to its desired angular position it may be secured in such position. By

adjusting the angular position of the tube *o* the springs 2 2 2 either close the apertures *r r r* or open them to the required extent.

t is a securing plate attached to the upper end of the tube *q* by screw threads or otherwise. The plate *t* affords means for attaching the carbureter to the intake pipe of the engine.

u is a throttle valve by which the degree of opening from the carbureter may be adjusted.

v is a float valve pivoted at *w* to a stationary support.

y, is a valve adapted to govern the supply of liquid hydrocarbon to the reservoir.

x is an adjusting screw upon a lever arm extending from the float *v* by which screw the action of the float may be regulated to secure the required level of liquid in the reservoir.

The operation of the above described device is as follows: The intake pipe to the engine being secured to the part *t*, the air within the mixing chamber above the plate *j* is reduced in pressure by the suction of the engine and the liquid fuel is drawn through the conduit *e* and sprayed by the current of air passing through the tube *d*. At the same time air is drawn in through the apertures *n* and *k* and through the apertures *r* striking the springs 2 and bending them inward as shown by dotted lines in Fig. 2. In this position the air is deflected so that it shall enter the mixing chamber tangentially and cause a whirl of air therein that will assist to distribute the hydrocarbon vapor and commingle the vapor and air.

The float *v* is pivoted at *w* to a stationary support extending from the tube *d*.

z is a stationary guide for limiting the motion of the valve *y*, the guide *z* is supported by the tube *d* and extends laterally therefrom.

It will be observed that in the above described device the operative parts are secured together in groups so that each group may be taken apart for examination or may be adjusted for convenient assembly. Thus, the tubing *b*, the conduit *e* and regulating valve therefor, the conduit for supplying the hydrocarbon to the reservoir and the valve therefor, and the regulating apparatus for said valve consisting of the pivoted float *v* and adjustable part *x* are all secured to the plate *c* and may be removed therewith, as shown in Fig. 5, and the tube sections *q* and *o* with the springs 2 2 2 may be all removed by unscrewing the ring 4 from the upper end of the tubing *b b*, as shown in Fig. 3. These two parts being removed the tube *b* with its adjustable ring *m* is left as

the third group of elements as shown in Fig. 4.

What I claim is:

1. In a carbureter, a tube forming the vertical wall thereof, the lower portion of said tube being formed into a reservoir for containing the liquid fuel, a ring adapted to screw into the upper end of said tube above said reservoir, a section of tubing secured to and extending through said ring, automatic valves in the lower end of the last mentioned tube, the first mentioned tube being provided with an adjustable air passage through its wall above said reservoir adapted to supply air to said automatic valves.

2. In a carbureter, a mixing chamber having a cylindrical wall, an aperture extending through said wall, a separate deflecting plate secured so as to extend in front of said aperture at a small angle to the tangent to said cylindrical wall so as to deflect the air passing through said aperture in a tangential direction in said chamber.

3. In a carbureter, a mixing chamber having a cylindrical wall, an aperture extending through said wall, an elastic deflecting plate secured so as to extend in front of said aperture at a small angle to the tangent to said cylindrical wall so as to deflect the air passing through said aperture in a tangential direction in said chamber, said plate being adapted to yield to the pressure of air because of its elasticity so as to vary the inlet passage for the air.

4. In a carbureter, a mixing chamber, an aperture through the wall of said chamber, deflecting plates secured to the inner wall of said chamber and extending over said apertures so as to deflect the air passing therethrough to a tangential direction in said chamber, and means for adjusting said deflecting plates over said aperture to a greater or less extent.

5. In a carbureter, a mixing chamber having a wall, an aperture through said wall, a separate deflecting plate secured so as to extend in front of said aperture and located so as to deflect the air entering through said aperture into a direction approximately parallel to said wall and tangential to said mixing chamber so that the gases in said chamber shall thereby be given a whirling motion for the purpose described.

In testimony whereof, I sign this specification in the presence of two witnesses.

ARTHUR D. BENHAM.

Witnesses:

VIRGINIA C. SPRATT,
ELLIOTT J. STODDARD.