April 16, 1929. L. PODSZUS 1,709,151

CARBURETOR

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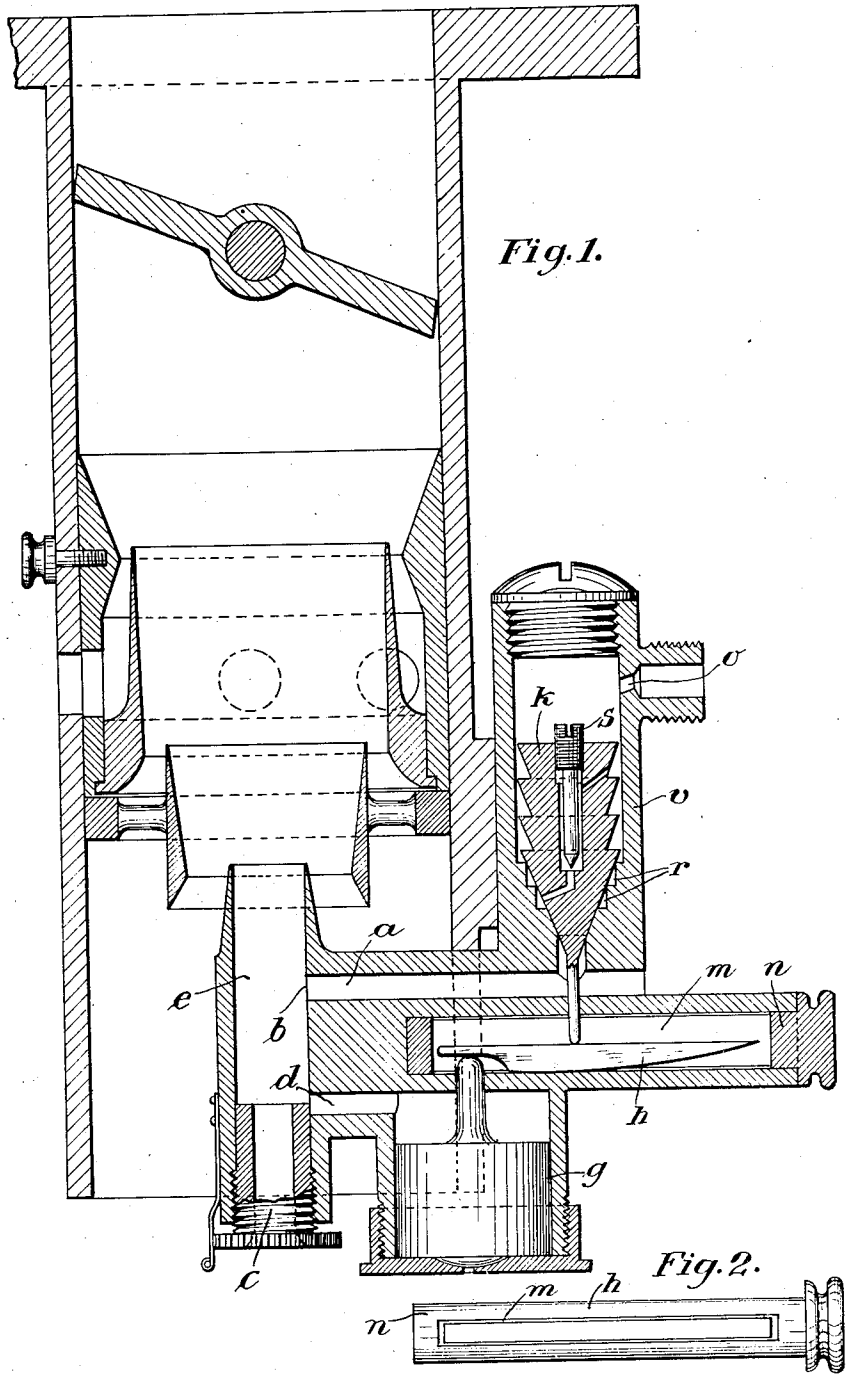


Fig. 1.

Fig. 2.

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CARBURETOR.

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This invention has reference to gasifiers or carburetors, and it is intended to provide means of insuring a more complete and more efficient mixture of air with the liquid fuel, and to generally improve and facilitate the construction of devices of this kind. Among other uses the invention may be applied to internal combustion engines, explosion engines and the like, and particularly to engines used in connection with automobiles, and it is one of the important objects of my invention to devise means for adjusting the admission of fuel, so as to exactly correspond to the load and to the consumption of power of the motor engine at the particular time, and in the practice of my invention the admission of liquid fuel is not merely made depending upon the amount of air admitted or upon the degree of the vacuum produced by the operation of the engine, but the ratio of fuel admitted is automatically adjusted in accordance with the power required, so that in consequence thereof the speed of the particular vehicle may, for instance, be kept uniform automatically, and the required amount of fuel may be fed to the motor engine upon the starting of the same. The nebulizing in this invention is substantially controlled merely by the fuel admission valve, mixing valves being dispensed with in this invention.

As a means of preventing excessive uncovering of the fuel admission valve, and of opening it only in accordance with the actual requirements a special construction of the valve opening lever is provided which is arranged in such a manner that the operative length of its lever arm may be changed. At its point of support the said lever has a curvature along a curve designed to correspond to the desired object, so that the force and length of stroke required for the opening and closing of the admission of fuel valve are variable.

By the provision of regulating and controlling means which may comprise a regulating screw adapted to control the sectional area of one of the air passages a distribution of the aspirating action upon the two air passages serving for the control of the admission of fuel is obtained.

For the purpose of increasing the action of the suction current passing by way of the fuel admission valve, and actuating to close said valve, this admission valve is provided at its periphery with abutments or the like, thus, for instance, with milled circumferential grooves upon which the violently inrushing motor fluid is adapted to operate by pressure. Similar grooves or circumferential steps are provided at the inside of the lower part of the fuel-admission cylinder, which grooves or steps by cooperating with each other and by engaging with the confronting straight walls of the cylinder and respectively of the lower part of the valve, constitute a means of adjusting the admission of fuel to a nicety and to break the force of the inrush.

An embodiment of the principles of my invention as applied to the construction of a gasifier for the purpose referred to is shown by way of example on the accompanying drawings in Figure 1 in longitudinal section, while Figure 2 is a top plan view of the mounting of the regulating lever.

The fuel is admitted through a suitable connecting nipple or the like not shown and flows into the opening *o*, and into the cylinder *v* surrounding the fuel admission at controlling valve *k*; in view of the fact that the fuel is compelled to make its way through the narrow space between the outer wall of the piston valve or plunger *k* and the cylinder casing the desired throttling action is produced which is still increased by serrated grooves circumferentially arranged on the piston wall and acting as flow-regulating means. Directly above its seat the valve *k* is surrounded by preferably serrated grooves *r* or stepped shoulders provided in the bottom of the cylinder, which are intended to reduce the admission of fuel and by cooperating with the serrated grooves or stepped formation of the piston walls in the upper part of the piston produce an extremely accurate proportioning of the amount of fuel admitted into the conduit *a*. The operation of the gasifier valve *k* is effected and adjusted by the medium of a one-armed lever *h* which is so arranged and constructed that its point of support is peculiarly curved. The forces acting upon the lever *h* are the following; on the left hand side the rod of the opening valve *g* and from the opposite side the preferably pointed end of the piston valve or plunger *k*. The curved formation of the supporting section of the lever *h* is for the purpose of causing the lengths of the lever to vary its operative extent in accordance with the raising and lowering of the opening valve *g* upon the movement of the lever, thereby also causing a corresponding change of the

force and of the stroke of the opening valve *g* required for the operation of the valve *k*. In the preferred construction shown herein the substantially segmental elongated and freely supported member or lever *h* is flat throughout its upper side which is engaged by the fuel admitting member, while an extension of the plunger-like suction-influenced regulating member *g* makes contact with a recess of the cam-shaped curved bottom part of the said cam-member or lever *h* and at a distance from the point of engagement thereof with the fuel-admitting member. By means of this particular construction and shape of the member *h* a very great movability thereof and of the engaging members is secured, and tilting movement thereof is prevented, while an absolutely smooth rolling movement of the said cam-member *h* free from jerks is maintained. The regulation of the automatically operating gasifier may be effected by means of the regulating screw *c* which is adapted to control the opening of the passage *d* leading to the valve *g*, and thereby to partially or entirely close said valve passage *d* which connects the valve *g* with the vacuum or low pressure space produced by the operation of the engine, so that the pressure of the outer atmosphere upon the opening valve or piston *g* may be increased or reduced according to the adjustment of the screw *c*. The aspirated current enters the aperture of the screw *c* and ascends in the tube *e*. At the point *b* the fuel admitted through the passage *a* meets the current of air, and is dispersed thereby.

In the beginning of the operation the adjustment of the amount of fuel is effected by the adjustment of the regulating screw *c*, by which means the communication with the passage *d* in which more or less of a vacuum is created, may be accordingly restricted. The further regulation of the amount of fuel is produced by the number of revolutions of the motor engine, and by the variations of the under pressure produced thereby in the passages *e* and *d* or around the opening valve *g*, the suction produced by the engine in the air passage *a* causing a sufficient vertical reciprocation of the valve *k* to feed a sufficiency of fuel to the engine for starting purposes. The fact that all the reentrant parts of the confronting walls of the piston and of the inner walls of the cylinder are filled with fuel, and that the piston is in contact with the surrounding walls at a very few points only, makes it easily responsive to the slightest variations of pressure in the suctional air passage *a*. This is aided by the fact that the weight of the fuel enclosed in the recessed portions of the piston *k* and of the part *r* of the fuel cylinder is, so to speak, distributed by the suction-operated member *g* supporting one portion of the rollingly and rockingly supported, substantially segment-shaped regulating member *h*, so that this member is under the combined action of the weight of the fuel and of the suction-operated valve member *g* which tend to impart thereto a rolling and undulating movement.

In view of the fact that the slot left between the valve *k* and the inner wall of the cylinder *v* is very narrow, and inasmuch as moreover the outer wall of the piston valve or plunger *k* is provided with pressure ribs by the weight of the fuel acting in the reentrant angular space between the shoulder-like projections the valve experiences a downward pressure, and is forced into the closing position upon its seat. This force is also employed for the additional control of the fuel delivery, the pressure upon the lever *h* varying in accordance with the number of revolutions of the fuel passing by way of the valve *k*. Hence, the fuel admission valve *k* and the opening valve *g* cooperate in such a manner as to reduce the variations of pressure resulting from the change of the degree of the vacuum in the passage *e*. The regulating lever *h* is loosely mounted in a slot or recess *m* of the casing *n*, and is thereby laterally guided. The admission valve *k* by its own weight rests upon the lever *h*, and always returns it into its position of rest. In the interior of the fuel admission valve *k* an additional passage for the fuel is provided by means of a central channel the free working sectional area of which may be controlled by means of an adjusting screw *s*, in order to be able to increase the admission of fuel, whenever required.

One of the important advantages of the new gasifier or carburetor according to my invention, therefore, results from the fact that the amount of fuel admitted may be adjusted independently of the regulation of the admission of air by the adjustment of the regulating screw *c*, and with the cooperation of the regulating lever *h*.

The construction of the opening valve, and of other parts of the device may differ from those herein shown and described merely as an exemplification of the principles of my invention, and without restricting the invention to the particular form of embodiment shown, the invention being susceptible of changes and modifications to better adapt the same to varying conditions of application and to the convenience of the operator, and without deviating from the spirit of my invention, as pointed out in the claims hereunto appended.

I claim:—

1. In a device of the kind described in combination, a fuel-admitting cylinder, fuel controlling means in the interior thereof and of slightly smaller diameter, a substantially central, laterally extended fuel-conducting passage in said controlling means, throttling

and flow-regulating means on the controlling means and on the cylinder-walls, and a substantially cam-shaped suctionally influenced cam member engageable with said fuel-controlling means and adjusting the same, a mixing chamber, fuel educting means connecting the chamber to the cylinder and to the said passage, and air admitting means on said chamber.

2. In a device of the kind described, a fuel admitting cylinder, an interior, downwardly conically reduced bottom part on said cylinder, a fuel-controlling valve in the interior thereof, and of slightly smaller diameter, and comprising an upper cylindrical and a lower conical portion, inwardly inclined stepped grooves circumferentially arranged on the cylindrical part of the valve, and circumferential stepped grooves on the conically reduced interior bottom part of the cylinder, said grooves engaging confronting straight walls of the cylinder and valve respectively, a substantially central, laterally directed fuel conducting passage in said fuel controlling valve, a substantially cam-shaped suctionally influenced cam member, engaging the fuel controlling valve and adjusting the same, a mixing chamber, fuel discharging means connecting the chamber to the cylinder and to the conducting passages, and air admitting means on said chamber.

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