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THROTTLE VALVE FOR CARBURETERS.

APPLICATION FILED MAR. 4, 1911.

1,130,103. Patented Mar. 2, 1915.

Fig. 1.

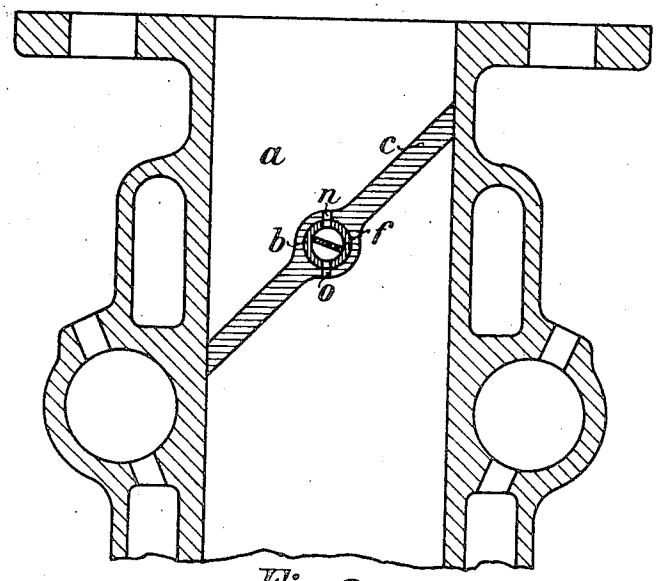


Fig. 2.

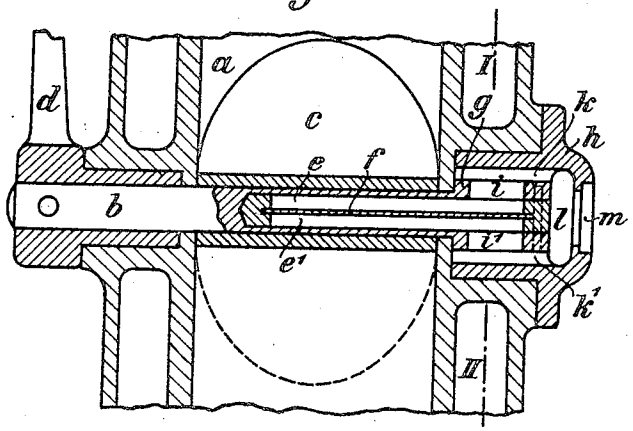
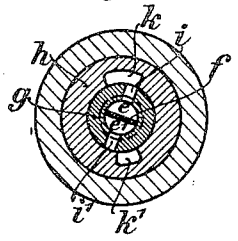


Fig. 3.



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UNITED STATES PATENT OFFICE.

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THROTTLE-VALVE FOR CARBURETERS.

1,130,103. Specification of Letters Patent. Patented Mar. 2, 1915.

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To all whom it may concern:

Be it known that I, GOTTFRIED PLUMM, a subject of the German Emperor, and residing at Berlin, German Empire, have invented certain new and useful Improvements in Throttle-Valves for Carbureters, of which the following is a specification.

My invention relates to improvements in throttle valves for the carbureters of engines or motors driven by the explosion of a mixture of air and atomized or vaporized liquid fuels. During the operation of stopping such a motor, that is to say, in throttling the current of gas and air by diminishing the sectional area of passage of the communication between the carbureter and the motor cylinder, the sucking action on the nozzle of the carbureter will be increased, owing to the continuation of the motion of the flywheel, so that there is really no reduction in the amount of fuel supplied to the motor cylinder. The motor, therefore, for the time being continues to run at the same speed, instead of at once slacking down as desired. Again, on the throttle valve being completely closed, the flywheel will not yet have stopped, whence a vacuum is caused in the cylinder, and the lubricating oil of the piston is thus drawn into the explosion chamber. When, therefore, the motor is started again, the lubricant will be burnt with the mixture of gas and air, and the products of combustion escape to the atmosphere through the exhaust pipe in the form of an obnoxiously smelling vapor. On restarting the motor, moreover, a gaseous mixture is drawn into the cylinder, which owing to the throttling, and thus increased sucking action on the carbureter nozzle, and to the subsequent complete closure of the throttle valve, has collected in large quantity in front of the latter and has partly condensed. Naturally, this supersaturated and wet gaseous mixture cannot be completely burned, and thus gives rise to greasy and sooty accumulations on all parts with which it comes in contact and forms with the burnt lubricant foul smelling gases at the exhaust. All these drawbacks can be entirely obviated, according to the present invention, by employing a throttle valve whose spindle is chambered or hollow and by furnishing it with perforations and air-regulating means in such manner that on pronounced throttling (but not at an earlier period) there is communication between the space in front of and behind the valve, and the atmosphere. Owing to the resultant supply of fresh air, the above-mentioned sucking action on the carbureter nozzle is greatly decreased; and the mixture of gas and air which results, being poor in fuel, causes immediate reduction of the speed of the motor. In the completely closed position of the throttle valve, outside air can continue to enter, so that the formation of a vacuum in the motor cylinder is prevented. If the interior of the hollow valve spindle is divided by a partition in such way that in the completely closed position of the valve the spaces in front of and behind the latter do not communicate with each other, then fresh air alone is supplied to the cylinder, so that the latter will be thoroughly scavenged of all fuel and residual combustion-products; while the accumulation of a mixture of gas and air in the carbureter chamber in front of the throttle valve is obviated. Without the said partition there would be uninterrupted communication between the spaces in front of and behind the throttle valve through the passages which conduct from the interior of the valve spindle to these spaces, so that on complete closing of the throttle valve a mixture of gas and air would still flow into the motor cylinder, even though such mixture would be very inferior, owing to the large amount of air contained.

One embodiment of my invention is illustrated in the accompanying drawing.

Figure 1 is a vertical section through the valve and its casing, taken centrally of Fig. 2 and showing the valve in its closed position. Fig. 2 is a vertical section taken centrally at right angles to Fig. 1, but with the valve slightly opened. Fig. 3 is a section on the line I—II of Fig. 2, the valve, however, being shown in completely closed position.

In the cylindrical communicatory passage *a* of the valve casing there is mounted the throttle valve *c*, having a chambered spindle *b*, which extends through the wall of the casing at each side and has an enlargement *g* at the one end, while the other end is provided with a crank lever *d*. The interior of the spindle is divided by a partition *f* into halves *e*, e^1. By means of passages *n*, *o*, located centrally of the valve spindle, and extending through the walls of the same and the body of the valve, the chambers *e*, e^1, communicate with the spaces on each side of

the valve, that is to say, with the motor cylinder and the carbureter respectively. The enlargement g of the spindle b is furnished with two slots i, i^1, and turns in a bushing h, which has two recesses k, k^1, the former of which is considerably wider than the latter, and a cavity l and an aperture m in front. So long as the valve is well open, air cannot enter the interior of the casing through the aperture m, since the slots i, i^1, are both closed by solid parts of the bushing h, wherefore neither of the chambers e, e^1, communicates with the outside air. When, however, the valve is nearly, but not quite, closed, as shown in Fig. 2 (that is to say, when the flow of the gaseous mixture is considerably throttled), the chambers e, e^1, are both in communication with the atmosphere. When, finally, the valve is completely closed (compare Figs. 1 and 3), only the chamber e remains in communication with the outside air. For the relative widths of the two ports k, k^1, is such that when the valve is quite shut, air entering at the aperture m finds an unobstructed path through the wide port k and slot i, but not through the narrow port k^1 and slot i^1, the latter being now closed by the wall of the bushing h. Thus when the valve is wholly closed there is an air passage solely to the motor cylinder.

Having thus described my invention, I declare that what I claim as new and desire to secure by Letters Patent is—

1. In combination, a casing, a rotary disk-valve located therein and in its open position permitting flow between itself and the casing-wall, and having an axially chambered spindle mounted at both ends in the casing-wall and furnished within the casing with outlets at opposite faces of the disk, constituting permanent communications with the valve-chamber, and provided externally of the latter with an outside-air inlet, said casing presenting a corresponding air-inlet which is normally closed by the spindle but is opened thereby when the valve has been brought into a position of pronounced throttling.

2. In combination, a casing having a perforated wall, and a throttle valve mounted therein and having a spindle presenting two separated axially directed chambers, the one of which communicates with the interior of the casing at the one side of the valve, and the other with the interior of the casing at the opposite side of the valve, and both chambers communicating with the outside air.

3. In combination, a throttle valve having a spindle presenting two separated axially directed chambers each furnished with an outlet, the two outlets conducting to opposite sides of the valve, and a casing in which the said valve is mounted, provided with air-ports which during closing of the valve admit outside air first to both the spindle-chambers and then to only one thereof.

4. In combination, a throttle valve having a spindle presenting two separated axially directed chambers each furnished with an outlet, the two outlets conducting to opposite sides of the valve, and each furnished with a radial inlet, and a casing in which the said valve is mounted, provided with two air-ports of different dimensions which during closing of the valve admit outside air first through both of the said spindle-chamber inlets and then through only one thereof.

In testimony whereof I affix my signature in presence of two witnesses.

GOTTFR. PLUMM.

Witnesses:
WOLDEMAR HAUPT,
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