N. P. MADER.

CARBURETER VALVE.

APPLICATION FILED MAR. 11, 1909.

973,056. **Patented Oct. 18, 1910.**

2 SHEETS—SHEET 1.

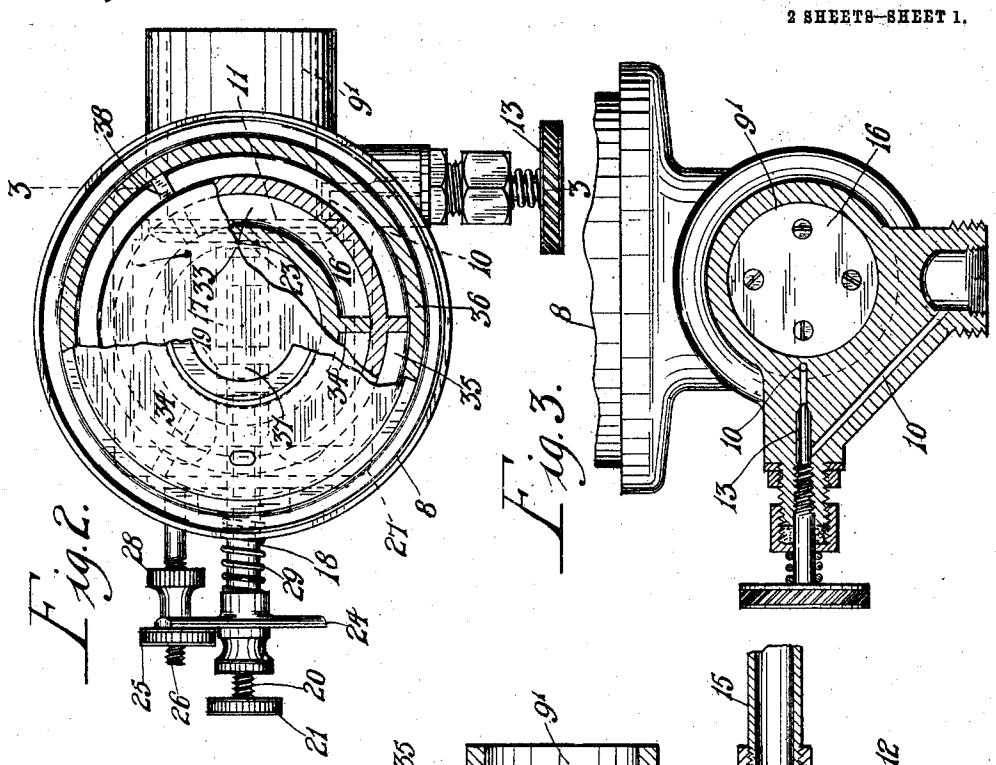


Fig. 2.

Fig. 3.

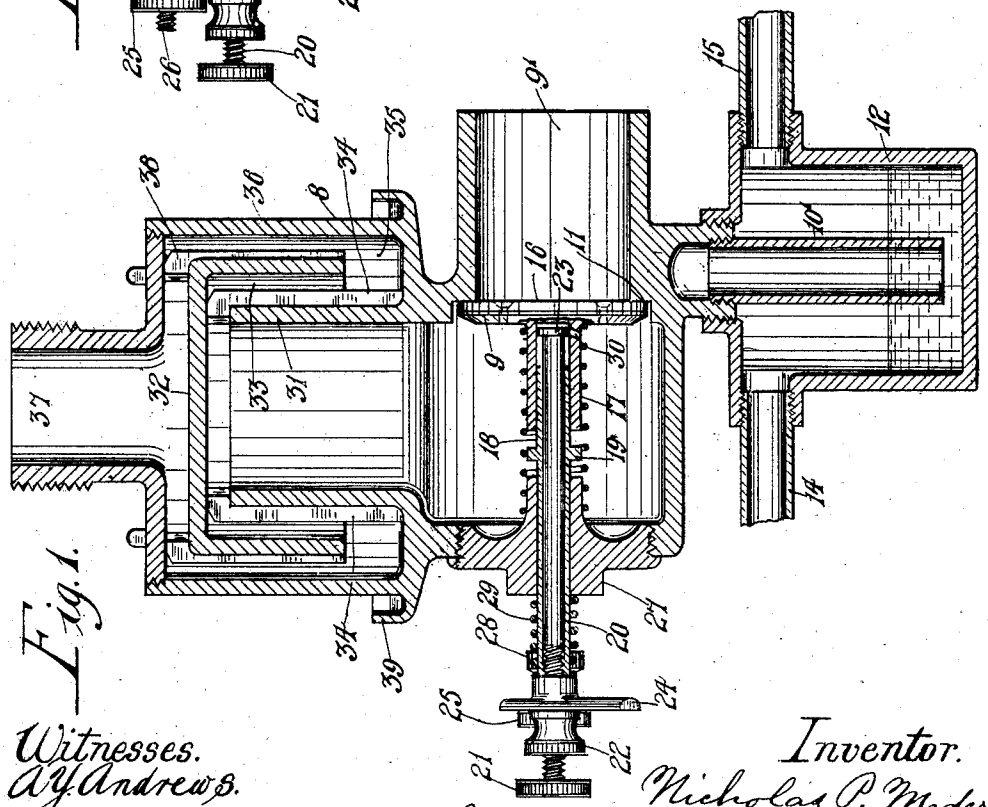


Fig. 1.

Witnesses.
A. J. Andrews.
Anna F. Schmidtbauer

Inventor.
Nicholas P. Mader
By Benedict, Morsell & Caldwell
Attorneys.

N. P. MADER.

CARBURETER VALVE.

APPLICATION FILED MAR. 11, 1909.

973,056. **Patented Oct. 18, 1910.**

2 SHEETS—SHEET 2.

Fig. 5.

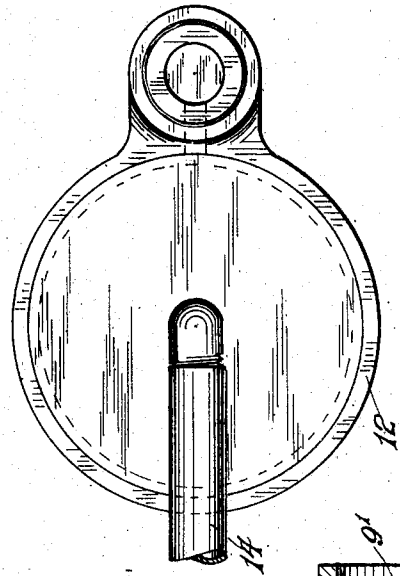
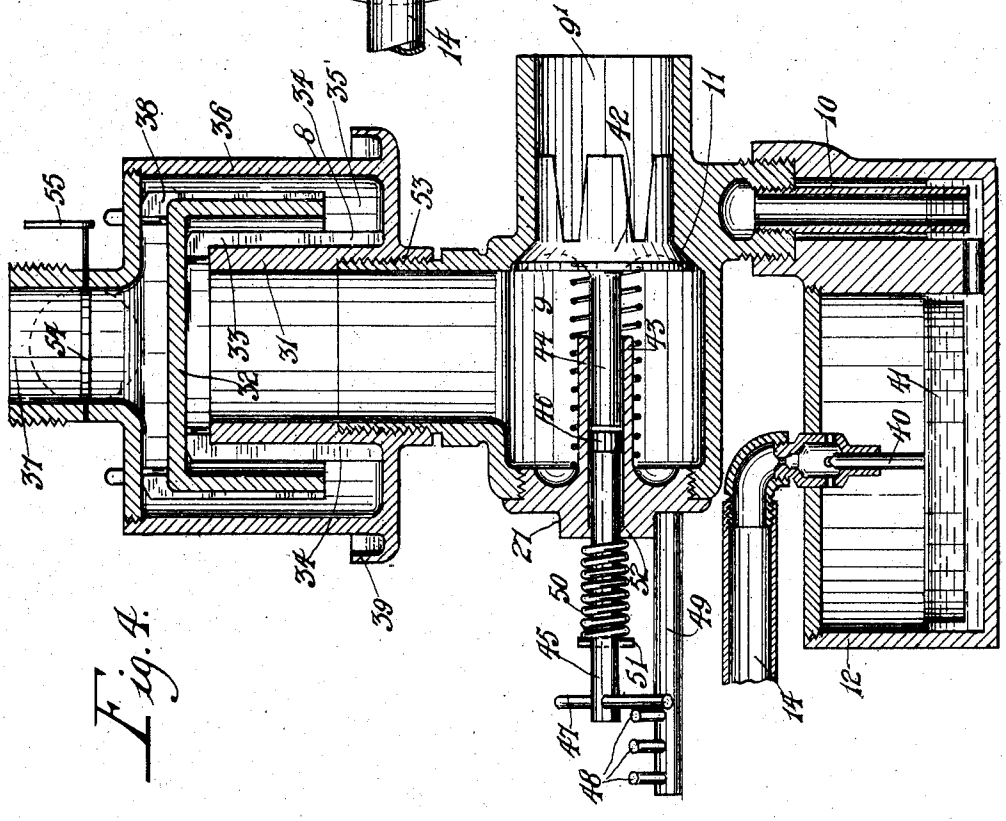


Fig. 4.



Witnesses.
A. Y. Andrews.
Anna E. Schmidtbauer

Inventor.
Nicholas P. Mader
By Benedict, Morsell & Caldwell
Attorneys.

UNITED STATES PATENT OFFICE.

NICHOLAS P. MADER, OF SUN PRAIRIE, WISCONSIN.

CARBURETER-VALVE.

973,056. Specification of Letters Patent. Patented Oct. 18, 1910.

Application filed March 11, 1909. Serial No. 482,652.

To all whom it may concern:

Be it known that I, NICHOLAS P. MADER, residing in Sun Prairie, in the county of Dane and State of Wisconsin, have invented new and useful Improvements in Carbureter-Valves, of which the following is a description, reference being had to the accompanying drawings, which are a part of this specification.

This invention relates to improvements in carbureters used in connection with engines impelled by explosive vapor.

One of the objects of this invention is to provide a carbureter in which the explosive fluid is vaporized and thoroughly mixed with air before entering into the engine cylinder.

Another object of this invention is to provide a carbureter in which the amount of explosive charge fed to the engine cylinder may be limited in starting the engine to prevent flooding of the cylinder without changing the adjustments of the valves controlling the feed of the explosive charge ordinarily used.

A further object of this invention is to provide a carbureter in which the gasolene supply is kept at a constant level and prevented from overflowing into the air inlet valve by means of a float valve.

A further object of this invention is to provide a carbureter in which the air may be independently adjusted.

A still further object of this invention is to provide a carbureter in which the supply of explosive vapor to the cylinder is controlled.

A still further object of this invention is to provide a carbureter with means whereby the explosive fluid may be initially heated in order to more easily start the engine.

With the above, and other objects in view, the invention consists of the device and its parts and combinations, and all equivalents thereof.

In the accompanying drawings, in which the same reference characters indicate the same parts in all of the views: Figure 1 is a central vertical sectional view of the complete device; Fig. 2 is a plan view thereof, parts broken away to show interior construction; Fig. 3 is a vertical sectional detail view taken on line 3—3 of Fig. 2; Fig. 4 is a vertical sectional view of a modification of the device; and Fig. 5 is a plan view of the lower portion thereof.

Referring to the drawings the numeral 8 indicates the carbureter casing and 9 the air valve thereof which is adapted to supply air from the opening 9′ to mix with the gasolene drawn through the passage 10. The passage 10 is formed in the casing and extends from the valve seat 11 to the short tube 10′ which depends from the carbureter to the supply receptacle 12 and having threaded connection therewith, and the feed of the gasolene through this passage is controlled by a needle valve 13. The supply receptacle is provided with an inlet pipe 14 and an outlet pipe 15 whereby the oil is prevented from overflowing into the carbureter.

A spring pressed air check valve 16 which engages the valve seat 11 and controls the amount of air supplied to the carbureter is provided with a tubular stem 17 which surrounds an adjustable guide tube 18 and is adapted to slide thereon, the guide tube constituting a hollow supporting member for said valve-stem. A shoulder 19 is formed on this guide tube to limit the outward movement thereof with reference to the carbureter casing and an adjustable rod 20 for adjusting the limit of movement of the air valve extends through the guide tube and has a threaded connection with the outer end thereof and is provided with a milled head 21 for convenience in turning the rod for adjustment. A milled jam nut 22 threaded on the rod and butting against the outer end of the guide is adapted to lock the rod in adjusted position. The inner end of the adjustable rod 20 is provided with a head 23 against which the valve strikes in opening and this head also acts as a stop to prevent the entire withdrawal of the rod from the hollow supporting member or guide tube.

An arm 24 rigidly connected to the outer end of the guide tube 18 is adapted to be moved inwardly and turned to engage the adjustable holding member 25 threaded on the stud rod 26 extending from and rigidly connected to the screw cap 27. The cap 27 serves as a cover for the opening through which the air valve is inserted in assembling the parts and also serving as a bearing for the guide tube. A jam nut 28 is also threaded to this stud rod to lock the holding member

in adjusted position. A coiled spring 29 interposed between the arm 24 and the screw cap 27 and surrounding the guide tube 18 is adapted to return the guide rod and connected parts to their normal position when the arm 24 is released from the holding member 25. In moving in the arm 24 the adjustable rod 20 threaded thereto is also moved inwardly and the end of the adjustable rod is thereby positioned to permit only a slight opening of the air valve and also the opening of the gasolene passage thus limiting the amount of the charge drawn in by the suction of the engine.

The tubular stem 17 of the valve 16 is provided with an opening 30 positioned to permit the free ingress and egress of air to the space between the head of the adjusting rod and the air valve to allow the adjusting rod to move freely within the tube. The air valve is provided with a fiber face or front screwed thereto to eliminate or deaden the noise of the parts striking against each other and also provides for replacing the parts when worn.

From the foregoing it will be seen that the rod 20 and tube member 18 after being adjusted relatively to each other to form a proper normal stop for the valve, these two members together may be slidably and quickly adjusted so as to prevent full opening of the valve upon starting up of the engine, the rod and tube member thereby forming a slidable stop.

The air and gasolene drawn into the carbureter casing 8 moves upwardly through the inner tubular extension 31 of the casing and is deflected outwardly and downwardly by the inverted cup-shaped deflector 32 overlapping said extension but spaced a distance therefrom to form an annular passage 33 by ribs 34 extending radially from the sides of the tubular extension 31. These ribs also extend above the top of the tubular extension to space the deflector therefrom. The lower edge of the inverted deflector is spaced a distance from the bottom of the annular space 35 formed by the inner tubular extension 31 and the outer tubular portion 36 of the carbureter casing. The deflected air and gasolene in striking the bottom wall of the space 35 is deflected upwardly between the outer tubular portion of the carbureter and the inverted deflector.

The air and gasolene, the latter now being completely mixed with the air and vaporized, strikes the upper portion of the casing and is deflected inwardly and passes out of the carbureter through the opening 37 and into the engine. The inverted cup-shaped deflector is held in position by the radial ribs 34 and ribs 38 extending radially from the outer portion of the deflector and projecting upwardly therefrom to engage the inner top surface of the casing.

The outer tubular portion of the carbureter is provided with an annular upstanding flange 39 to provide a space to hold gasolene adapted to be burned to initially heat the vapor within the carbureter in starting the engine in cold weather.

It will be noticed that the lower edge of the inverted cup-shaped deflector is spaced a greater distance above the bottom wall of the space 35 than the distance between the deflector and the tubular portion 36 and the extension 31. The purpose of this increased size of the passageway between the deflector and the walls of the carbureter is to provide a space to accommodate surplus gasolene which might pass over the inner tubular extension 31 of the carbureter without blocking the passageway. Any gasolene momentarily accumulating in the space would be quickly vaporized by the air passing thereover which is not so rich in gasolene. It will also be noticed that the top of the carbureter is threaded to the tubular portion thereby providing means of access to the interior portion of the carbureter for assembling and cleaning the parts.

With the arm and the adjustable rod in the position shown in Figs. 1 and 2 and the needle valve being unscrewed to open the passage the operation of the carbureter thus far described is as follows, in starting the engine the suction caused by the movement of the piston will open the air valve the slight distance permitted by the adjusting rod and a very small quantity of air and gasolene will be drawn into the carbureter and deflected back and forth and thoroughly mixed and vaporized and then pass into the engine. If the engine should require several turns of the crank shaft before the charge is ignited and exploded the limited amount of vapor fed to the engine is so small that there would be no danger of flooding the engine with gasolene. As soon as the engine is properly rotating under the impulse of the explosion, the arm is swung up from the holding member and the coiled spring surrounding the guide tube will force the guide tube and connected parts outwardly until the shoulder formed on said tube strikes against the inner portion of the screw cap. This change permits the air valve to open to the full extent permitted by the position of the adjustable rod and the engine to take in its full charge. The air and gasolene in passing through the carbureter will be deflected up and down and be thoroughly mixed and vaporized. If the engine is started in cold weather the carbureter may be initially heated by pouring a small quantity of gasolene into the space formed by the upstanding flange of the carbureter and burning the same. If a surplus amount of gasolene should be carried with the air over the inner tubular ex-

tension of the carbureter it will be deflected downwardly and settle in the space provided therefor and will serve to enrich other air passing thereover which is less charged.

The modified form shown in Figs. 4 and 5 is provided with a supply tank in which the supply of oil thereto is controlled by a float 41 positioned therein. The oil is drawn into the carbureter in the same manner as in the principal form. In this modified form the air valve 42 is of the conical seat type and the means for adjusting the travel of this valve is omitted although it is provided with the means for reducing the charge while starting the engine. The screw cap 27 is provided with a tubular extension 43 which is considerably longer than the first mentioned cap and the stem 44 is adapted to be guided in the opening formed therein. An adjustable rod 45 provided with a head 46 is also positioned in the cap opening and extends therethrough and has a turning member in the shape of a cross pin 47 which is adapted to engage one of the holding pins 48 extending from the holding rod 49 fast to the screw cap 27. A coiled spring 50 interposed between the screw cap 27 and a transverse pin 51 and surrounding the adjustable rod is adapted to move the rod outwardly to its normal position to permit the full opening of the air valve. The opening in the outer portion of the cap is of smaller diameter than the head of the adjustable rod to form a shoulder 52 to prevent the entire withdrawal of said rod. The holding pins 48 serve to adjust the opening of the air valve in the same manner as the adjustable holding member 25. In this form of construction the upper portion of the casing is in the form of a separate member which has a threaded connection with the lower portion as indicated at 53 and is easily removable therefrom. The opening 37 of the carbureter is provided with a damper 54 having an operating handle 55 and this damper is adapted to be turned to adjust the size of the opening to limit the amount of vapor passing therethrough.

What I claim as my invention is:

1. A carbureter valve comprising a casing having a discharge and an air-intake opening, a valve-seat in connection with the air-intake opening, the seat being provided with an oil passage, a valve having a stem projecting therefrom, a hollow supporting member carried by the casing with which the valve-stem has slidable engagement, a spring under permanent predetermined tension interposed between the valve and casing, a slidably adjustable stop fitted within the supporting member, the stop being engageable with the valve, a holding member carried by the valve casing, locking means in connection with the slidable adjustable stop exterior of said valve casing, and a spring in connection with the aforesaid stop in opposition to the holding member.

2. A carbureter valve comprising a casing having a discharge and an air-intake opening, a valve-seat in connection with the air-intake opening, the seat being provided with an oil passage, a guide tube slidably mounted in the casing and extending therethrough, the tube being concentric with the valve seat, a tubular stem slidably mounted upon the guide tube, an inwardly opening valve in connection with the stem for engagement with the valve-seat, a spring interposed between said casing and valve, whereby the same is held to its seat, a rod fitted within the guide tube engageable with the valve, means for adjusting the rod within said guide tube relative to said valve, a holding member carried by the casing, and means carried by the slidable guide tube exterior of the casing for engagement with the holding member.

3. A carbureter valve stem comprising a casing having a discharge and an air-intake opening, a valve-seat in connection with the air intake opening, the seat being provided with an oil passage, a guide tube slidably mounted in the casing and extending therethrough, the tube being concentric with the valve-seat, a tubular stem slidably mounted upon the guide tube, a head extending from said guide tube intermediate of the casing and tubular stem, an inwardly opening valve in connection with the opposite end of the stem for engagement with the valve-seat, a spring interposed between said casing and valve, the spring being under a predetermined permanent tension whereby said valve is held to its seat, a rod fitted within the guide tube and in screw-threaded connection therewith, one end of which rod constitutes a permanent stop for the valve, an adjustable holding member carried by the casing, means carried by said guide tube exterior of the casing for locking engagement with the holding member, and a coiled spring interposed between the casing and guide tube in opposition to the holding member.

4. A carbureter valve comprising a casing having a discharge and an air-intake opening, a valve-seat in connection with the air-intake opening the seat being provided with an oil passage, a cap in screw-threaded engagement with the valve casing, a guide tube slidably mounted within the cap, a valve for the seat, a hollow stem extending from the valve in slidable engagement with the guide tube, a head extending from said guide tube intermediate of the stem and casing, a rod fitted in the hollow tube having a head adapted to engage said valve and thereby limit the open-

ing movement of the same, a threaded end projecting beyond the outer end of the aforesaid tube and in engagement with an internal thread of the same, an arm secured to the outer end of the guide tube, a threaded stud extending from the cap, a holder member in threaded connection with the stud for temporary locking engagement with the arm, and a coiled spring surrounding said tube member interposed between said cap and arm.

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

NICHOLAS P. MADER.

Witnesses:
J. M. BATZ,
M. ANNA BATZ.