No. 891,322. PATENTED JUNE 23, 1908.

P. H. BRENNAN.

CARBURETER FOR EXPLOSIVE ENGINES.

APPLICATION FILED NOV. 21, 1902.

Fig. I.

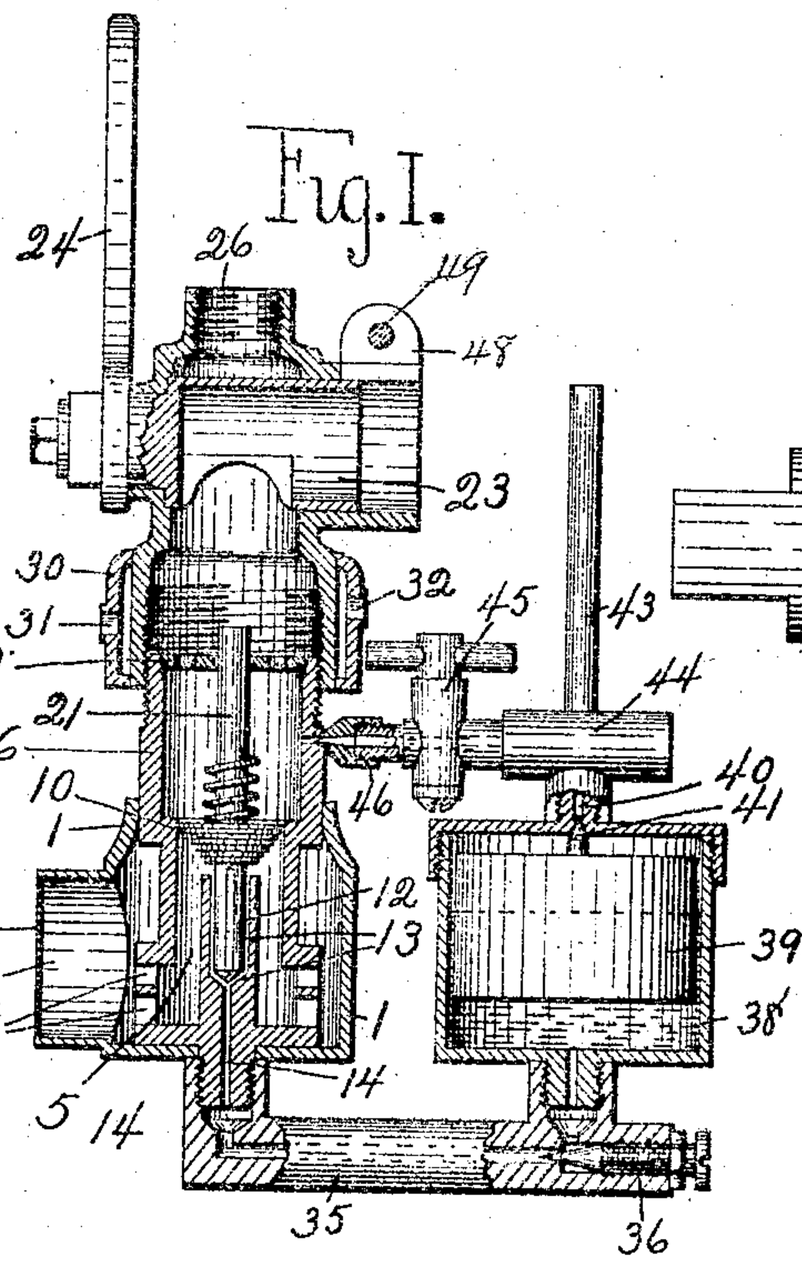

Fig. IV.

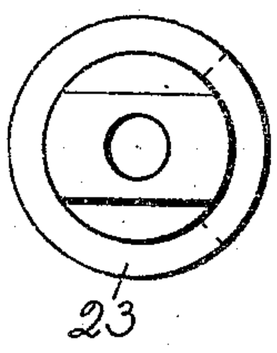

Fig. VII.

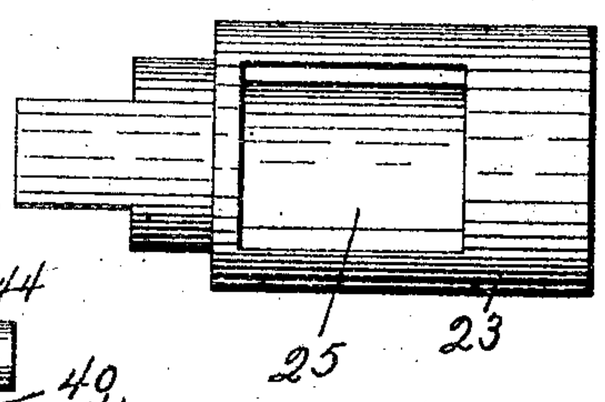

Fig. V.

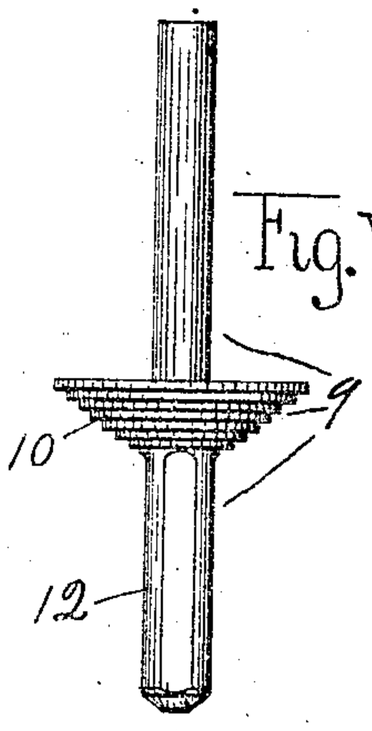

Fig. VIII.

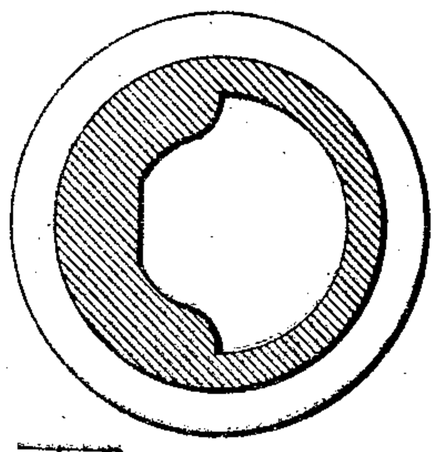

Fig. II.

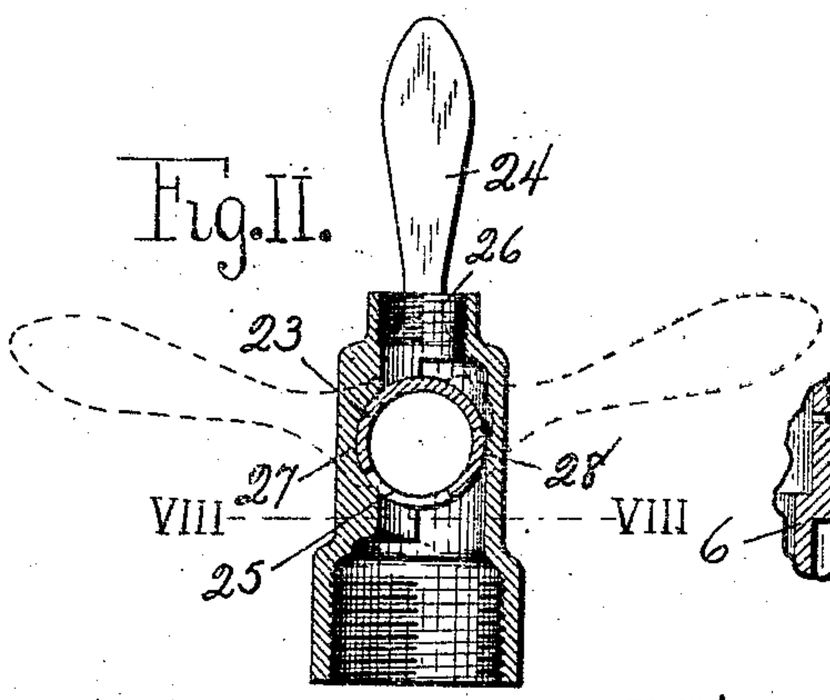

Fig. XI.

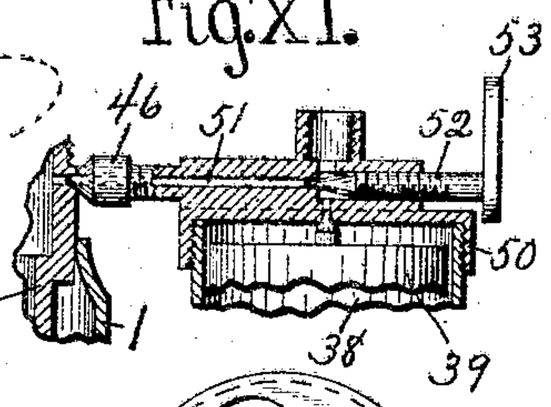

Fig. VI.

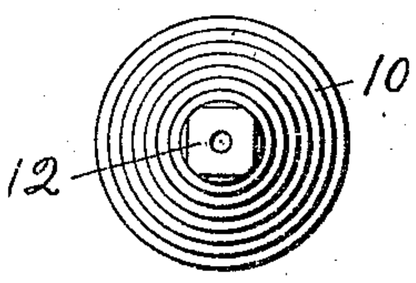

Fig. X.

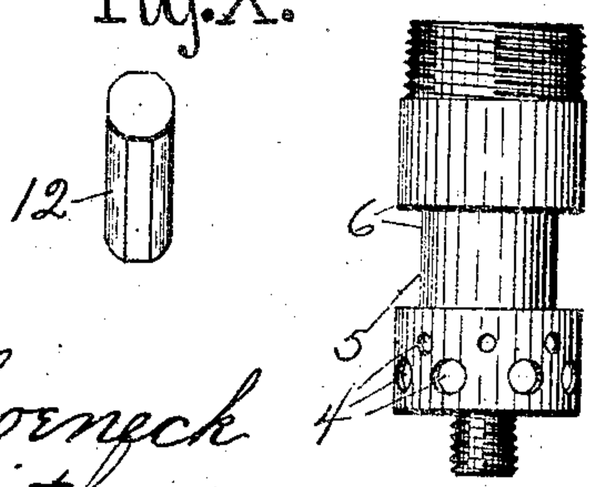

Fig. IX.

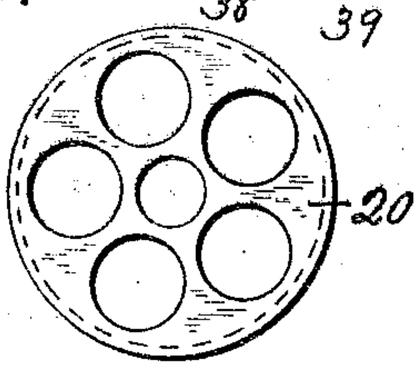

Fig. III.

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ATTORNEY.

UNITED STATES PATENT OFFICE.

PATRICK H. BRENNAN, OF SYRACUSE, NEW YORK.

CARBURETER FOR EXPLOSIVE-ENGINES.

No. 891,322. Specification of Letters Patent. Patented June 23, 1908.

Original application filed January 11, 1901, Serial No. 89,309. Divided and this application filed November 21, 1902. Serial No. 132,190.

To all whom it may concern:

Be it known that I, PATRICK H. BRENNAN, citizen of the United States, residing at Syracuse, in the county of Onondaga and State of New York, have invented certain new and useful Improvements in Carbureters for Explosive-Engines; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to the carbureter of a gas engine, and consists in a certain construction and arrangement of parts, whereby a new and more effective operation is obtained; it is substantially a division of my application Serial No. 89,309, filed January 11, 1901, and is preferably arranged and used with the two cylinder engine as there shown.

The principle of my invention and the various details of construction will be understood by reference to the drawing herewith, in which

Figure I is a vertical cross section of my carbureter mechanism. Fig. II is a section at right angles to the preceding of the upper shell showing the operation and the three-way valve. Fig. III is an elevation of the main shell detached. Figs. IV and VII are respectively end and side elevations of the three-way valve detached. Figs. V and VI are respectively an elevation and bottom plan of the plunger valve detached. Fig. VIII is a horizontal cross section on line VIII of Fig. II. Fig. IX is a plan of the guide plate detached. Fig. X is an isometric view of the plunger valve stem detached showing a modification in its construction. Fig. XI is a vertical cross section of the upper portion of the gasolene reservoir and starting or priming mechanism.

In the figures, 1 indicates the separable air case into which the air enters through opening 2, preferably protected by wire gauze 3, whence it passes through openings 4, to the lower contracted portion 5, of the main shell 6, raising plunger valve 9, having ribbed conical portion 10, fitting within the bore of the contracted portion so as to move up and down freely therein without any seat; the valve stem 12, of the plunger fits seat 13 of the inlet 14, and there being only this one seat to the valve it is easier to make and adjust. The plunger valve stem as shown in Fig. V with the flat surface and tapering tip, is raised by the action of the air to displace the gas and cut off the same by the stroke of the engine, giving a measured quantity of gas at each suction stroke.

The gas, broken up by the conical portion, mixes with air, thence passes up into the shell through the perforated guide plate 20 (threaded to engage positively with the top of the shell and acting as a guide for valve rod 21, fitted with a spring to limit without shock its upper movement) and thence into the upper shell whence by the three-way valve 23, operated by lever 24, its admission is controlled to the cylinder through mouth 25, the three-way valve also controlling the air inlet 23, being provided with the long bearing 27 on the left, and the short bearing 28 on the right, as shown in Fig. II. At the top of the main shell, the coldest point, frost sometimes forms in the coldest weather, particularly when lower grade oil is used not vaporizing so well as the higher grade; this point is protected by the jacket 30, to which hot air from the exhaust is admitted through opening 31, passing out through opening 32. By the admission of more cold air through the inlet, regulated by the three-way valve, a perfect explosive mixture of hydrocarbon gas is produced, so that at every inspiration of the cylinders the plunger is caused to rise by inflowing air, and as it falls back to place it closes the inlet 14 and forces out a measured quantity of gasolene from the seat.

The mouth of the carbureter is split and provided with integral lugs 48 and a binding-screw 49 by means of which the carbureter can easily be connected or disconnected from the suitable feed-pipe leading to cylinders; or the carbureter mouth may be threaded to be connected by an ordinary union.

The gasolene is admitted to the inlet 14, through pipe 35, controlled by needle valve 36 arranged in its end, from reservoir 38, containing the float 39 automatically regulating the amount of oil contained therein, and closing the inlet 40, through which the gasolene enters by the float tip 41.

43 is the air vent, 44 the pipe and 45 the cock, by means of which the gasolene is admitted directly to the main shell when necessary through nozzle 46. I prefer to construct these parts as shown in Fig. XI, in which 50 is the float-chamber or reservoir cover provided with the integral portion containing a channel 51, controlled by needle valve 52, having handle 53 to admit the gasolene directly through nozzle 46 to the main

shell. This is not used normally but is very convenient and often of great importance as to admit an initial or a temporary supply of gasolene to be adjusted by the needle valve to start the engine, or in case the flow or the plunger valve or the normal inlet passage becomes clogged or choked. I also construct aried form of plunger as shown in Fig. X (instead of the form shown in Fig. V) with d e square end and the truncated edges so that it does not cut off, but permits the gasolene to pass, acting like an atomizer to let it come through in a spray by the action or suction of the air.

The object of reducing the lower portion of the main shell is to give more velocity and pressure to the air, insuring the carrying of the gas through and the lifting of the valve to pump with greater force. This plunger valve acts like a displacement pump and in pumping pulverizes and converts into spray the gasolene. As the inward or suction strokes of the pistons take place, the air is drawn in, raising the plunger valve and allowing the gasolene to rise in the inlet around the lower end of the plunger. As the suction stroke is completed, the plunger falls back into place and displaces a measured quantity of gasolene, and at the same time breaks up and thoroughly mixes this gasolene with the air, so that at the next stroke, it is drawn in and supplied to one cylinder or the other. When the mixture or charge is thus pulverized, it is held in suspension between the motions of the two cylinders momentarily, so that the spray and air have a chance thoroughly to mix, the valve momentarily remaining idle.

The object of forming the conical portion of the valve to fit down into the bore is to make it easier to construct and adjust, and to avoid the inconvenience which cometimes arise from dirt collecting and ice forming under the valve where provided with a seat at the upper end of the contracted portion.

A short time only is afforded for the gasolene to flow into the lower space, the amount being regulated by the setting of the end needle valve, and quick pressure regulated by the flow in the float chamber. The object of the three-way valve, easily operated by its lever, is to promptly control the amount of charge, to admit extra air when necessary and to regulate the mixture, as in case the carbureter becoming flooded with oil or gas, with the lever and valve shown in the position in Figs. I and II, the flow charge is admitted, throwing the lever to the right, the long bearing on the left permits a throttling and positively shuts off the power. If the mixing chamber becomes flooded, the lever can be thrown to the left and through the short bearing on the right additional air is admitted through the valve port to insure combustion. This regulates itself quickly and the lever is then drawn to normal position to admit the flow charge.

Having thus described my invention, what I claim and desire to secure by Letters Patent, is:—

1. In the carbureter of a gas engine, the combination with the main valve shell, of a valve therein, a source of supply for the gasolene, a float chamber connected to the source of supply, a pipe from the float chamber to the shell, a supplementary pipe from the source of supply directly to the shell, a nozzle on said supplementary pipe to conduct the gasolene direct to the shell and a needle valve to control said supplementary supply.

2. In a carbureter for explosive engines, the combination with the main valve shell having a contracted lower portion provided with air inlets, a plunger valve arranged therein, a float chamber, a float arranged in the chamber, a pipe from the lower portion of the float chamber to the lower portion of the main shell, a pipe to supply gasolene to the float chamber, a supplementary pipe communicating with the source of supply above the float chamber and the spray nozzle on said supplementary pipe communicating with the main shell above the valve, and a controlling needle valve arranged in said supplementary pipe.

3. In the carbureter for a gas engine, a main valve shell having a contracted lower portion provided with air inlets, a plunger valve having a conical ribbed portion fitted to the bore of said reduced portion, a valve stem fitted to the oil inlet, said valve stem being flattened on one side, a rod on the valve fitted to a guide plate, said perforated guide plate threaded to be secured to the upper end of the main shell, an upper shell fitted to the upper end of the main shell, a hot air jacket arranged around the lower end of the upper shell, means to supply heated air from the exhaust to said jacket, a cylindrical three-way valve having a suitable port fitted to said upper shell and having an external operative lever, and means to supply gasolene to the carbureter through the oil inlet.

4. As a new article of manufacture, a carbureter for a gas engine, having in combination an oil reservoir and a shell inclosing a vaporizing chamber, a connecting pipe from the lower portion of the reservoir to the lower portion of the chamber, said chamber being provided with an air inlet and a vapor outlet, a plunger valve controlling the flow of oil into the chamber, an oil inlet pipe to the top of the reservoir, and a pipe provided with a nozzle and connected to the oil inlet pipe above the reservoir, to communicate directly with the vaporizing chamber above the plunger valve.

5. In the carbureter of a gas engine, the

combination with the main shell having openings in its lower portion for the admission of air, of a reservoir for the liquid to be vaporized connected to said shell, a tubular inlet through which the liquid enters the shell, a plunger valve having a stem extending down into said inlet, said stem having flattened sides, said shell having a vapor outlet and a valve controlling said vapor outlet.

6. In the carbureter of a gas engine, the combination with a shell inclosing a vaporizing chamber, having an oil inlet and an air inlet in its lower portion, and a vapor outlet and supplementary air inlet in its upper portion, of a cylindrical valve fitted in the shell and controlling the outlet and upper air inlet, the shell being formed with side bearings for said valve, narrow on one side and wide on the other, and said valve being provided with a mouth, not wider than the wide bearing and wider than the narrow bearing, whereby when turned to one side the vapor outflow is stopped and when turned to the other side, additional air is admitted to mix with the outflowing vapor.

7. In the carbureter of a gas engine, having an air-inlet, an out-let and a tubular inlet for the liquid fuel, a plunger-valve having a ribbed conical portion arranged immediately above the inlet and a stem extending into said tubular inlet, said stem being flattened at one side at least so as not completely to close the inlet.

8. In the carbureter of a gas engine having an air inlet, an outlet for the mixed vapor and a tubular inlet for the liquid fuel, a plunger-valve having a substantially tubular stem extending down into the tubular inlet, said stem being flattened at one side at least so as not completely to close the inlet.

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

PATRICK H. BRENNAN.

Witnesses:
C. C. SCHOENECK,
M. B. SMITH.