B. N. PIERCE.

CARBURETER.

APPLICATION FILED SEPT. 19, 1907.

**982,297.** **Patented Jan. 24, 1911.**

2 SHEETS—SHEET 1.

Fig. 1.

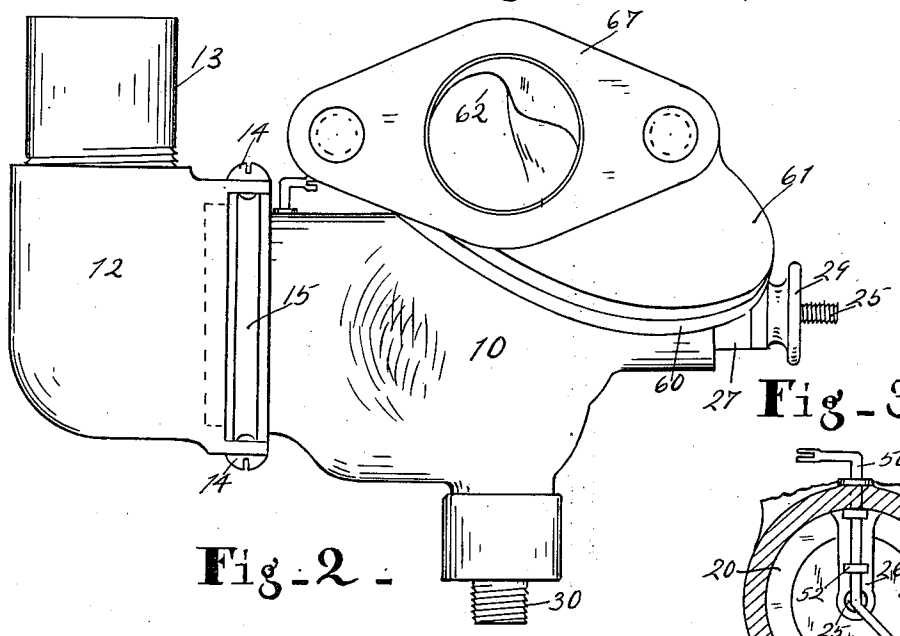



Fig. 2.

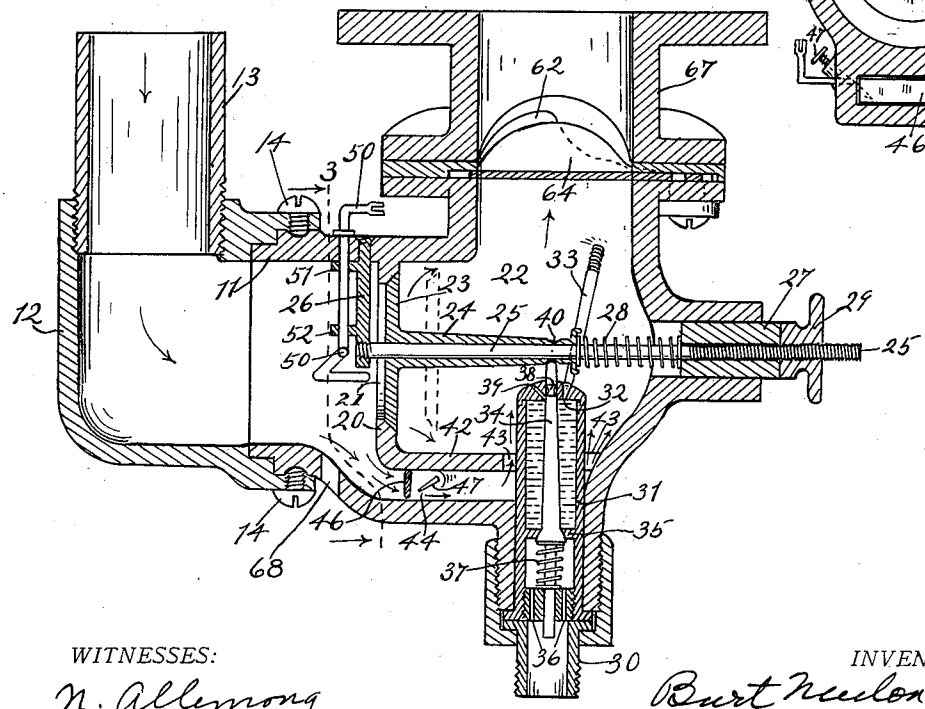
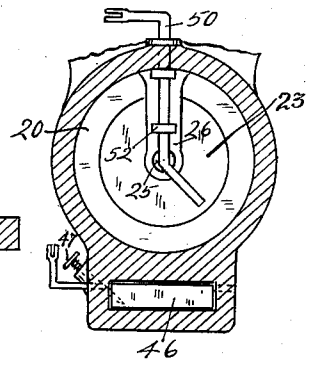



Fig. 3.

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2 SHEETS—SHEET 2.

Fig. 4.

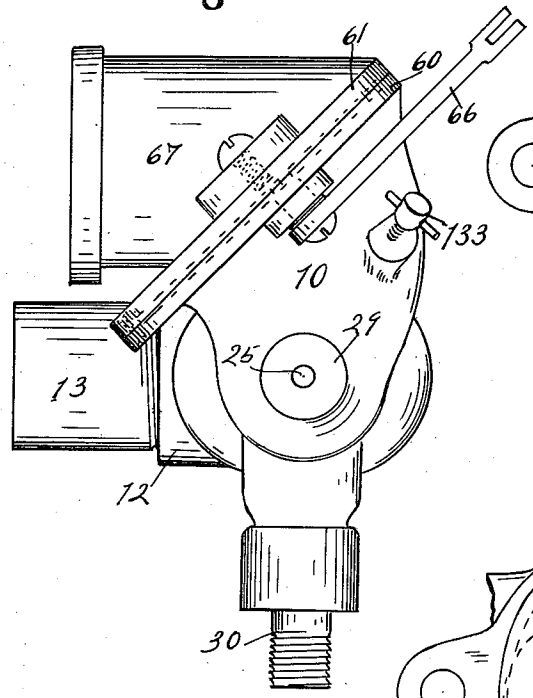



Fig. 5.

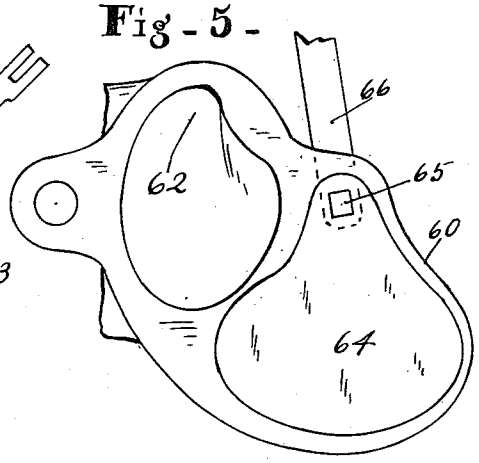



Fig. 6.

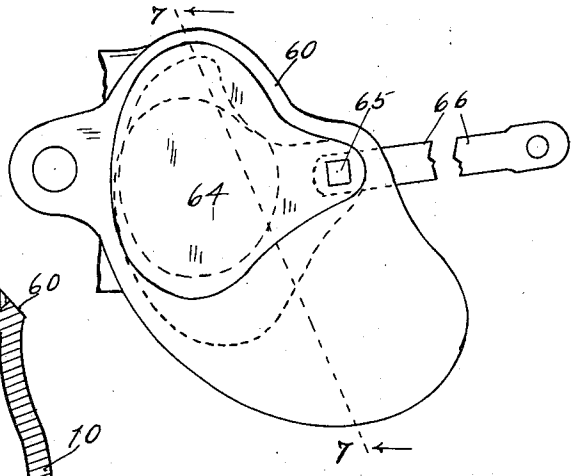
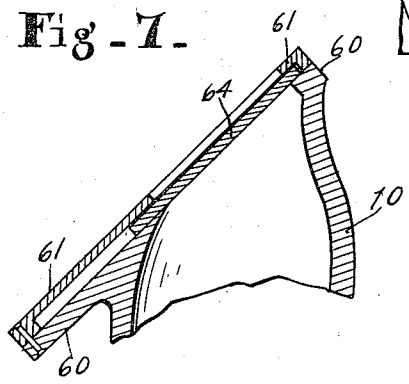



Fig. 7.

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# UNITED STATES PATENT OFFICE.

BURT NEULON PIERCE, OF INDIANAPOLIS, INDIANA.

## CARBURETER.

982,297. Specification of Letters Patent. Patented Jan. 24, 1911.

Application filed September 19, 1907. Serial No. 393,628.

*To all whom it may concern:*

Be it known that I, BURT NEULON PIERCE, of Indianapolis, county of Marion, and State of Indiana, have invented a certain new and useful Carbureter; and I do hereby declare that the following is a full, clear, and exact description thereof, reference being had to the accompanying drawings, in which like letters refer to like parts.

The object of this invention is to improve the construction of carbureters for combustion engines.

One feature consists in the means substantially set forth herein for regulating the operation of carbureters by controlling the exit therefrom of the gas. This controlling means is so arranged that it shuts off toward the last or opens up in the beginning with a very gradual change. This permits the carbureter to be regulated with great nicety and exactness and enables the engine to be started or stopped very slowly, gradually and noiselessly.

Another feature of the invention consists in providing a chamber of limited capacity for holding a fair priming charge and in the construction substantially as shown for the air taking up gasolene or fuel entering the carbureter and this prevents any excessive accumulation therein of the fuel or any waste thereof. This is accomplished by means for bringing in the air all around the point of introduction of gasolene or fuel into the carbureter.

Another feature of the invention consists in providing a readily adjustable means for directing the air inlet toward the heated portion of the engine with which the carbureter may be combined so that the air coming into the carbureter may be heated more or less.

Another feature of my invention consists in various means herein set forth for the accurate adjustment and regulation of different parts of the carbureter.

The features of my invention will be more fully understood from the accompanying drawings and the following description and claims.

Figure 1 is a side elevation of the carbureter with the adjustable outlet end in the horizontal position. Fig. 2 is a central vertical section through the same with the adjustable outlet end changed from the horizontal to the vertical position. Fig. 3 is a section on the line 3—3 of Fig. 2. Fig. 4 is an end elevation of Fig. 1 with the air inlet portion turned from a vertical to a horizontal position. Fig. 5 is a plan view with the outlet end and top plate removed and parts broken away to show the throttle valve construction, the valve being in its entirely open position. Fig. 6 is the same with the valve entirely closed, a partly open position being shown by dotted lines. Fig. 7 is a section on the line 7—7 of Fig. 6.

In detail the carbureter shell 10 has integral air inlet end 11. Upon the portion 11 an air inlet member is adjustably mounted, consisting of the portions 12 and 13 extending at a right angle to each other and secured together. The portion 12 carries some set screws 14 engaging the air inlet end 11 in the external annular groove 15, see Fig. 1. This construction is such that said air inlet member may be turned so that the inlet end thereof will point in any desired direction. The object of this feature of the invention is to enable this air inlet member to be turned toward the heated portion of the engine when the carbureter is mounted in place and this enables the carbureter to get a supply of warm air from the body of air around the heated portion of the engine. The value of this improvement is obvious as the heated air more readily mixes with the gasolene or fuel and forms a more perfect and combustible gas.

In the inlet portion of the shell there is a partition 20 with an inlet opening 21 for the admission of air to the mixing chamber 22. This opening 21 is controlled by the air inlet valve 23 secured on a tapering sleeve 24 slidably mounted on a rod 25 that is secured at one end in the bracket 26 and extends through the sliding bushing 27. A spring 28 lies between the sleeve 24 and the bushing 27 which is compressed or relaxed by the regulating nut 29 that screws on the rod 25.

The gasolene or fuel enters through the pipe 30 and valve chamber 31 which has a port 32 that is regulated externally by the needle valve 33 carrying on its outer end a nut 133. There is also a central vertical port from the casing 31 through which the main and automatic valve 34 extends. This valve is a tapering rod passing through the partition 35 in the chamber 31 and the perforated nut 36. The valve 34 is held in its

closed position by the spring 37. The upper end of the valve 34 projects beyond the upper end of the valve chamber 31 into engagement with the sleeve 24 of the air inlet valve. Said valve 34 has a reduced portion 38, the lower part of which forms a shoulder or valve surface that closes an oblique port 39 through the upper end of the casing 31. Therefore the valve 34 controls really two fuel ports to chamber 22, the port 39 and the main opening through which the valve extends. Some fuel passes through the last port because the valve is tapering. The fuel valve 34 is operated by the sleeve 24 of the air inlet valve. Under the influence of the suction of the engine the air inlet valve is moved to the dotted line position shown in Fig. 2. The farther to the right said air inlet valve is moved the greater will be the depression and actuation of the valve 34. The sleeve 24 has an annular recess 40 at the point where it engages the valve 34. When the air inlet valve 24 is closed the purpose of this is to cause a sudden opening of the fuel valve when the air inlet valve is first opened.

One object of the construction which has been described is to provide a considerable chamber within the casing 31 that will always be full of gasolene so that the gasolene will be immediately at the outlet ports ready to enter the mixing chamber as soon as said ports are open to any extent. This gives to the device very quick and responsive action.

The false bottom 42 is provided to surround the valve bottom 31 below the upper end and catch any gasolene or fuel overflowing therefrom that is not taken up by the air immediately. It is provided with openings 43 all around said casing 31 through which air rushes through the chamber 44 from the air inlet. It is obvious that under the influence of the engine's suction sufficient air will be drawn in through the chamber 44 and will pass up and immediately surround the casing 31 to immediately and effectively take up any gasolene or fuel that may flow down from the upper end of the casing 31. To regulate the passage of air through this by-pass I provide a swing valve 46, being a plate pivoted at its two ends in the sides of the shell or casing so it will by gravity be normally vertical but will swing under the influence of passing air. Its movement by the passing air may be limited by the set screw 47 extending through the shell and externally operative. I also provide external operative means for forcibly holding the inlet valve 23 open. This consists of a crank rod 50 extending through the portion 11 of the shell and mounted in two arms 51 and 52 from the bracket 26. The lower end of this crank rod 50 has an arm, as seen in Fig. 3 that when turned will engage and push the valve 23 open. This crank rod 50 is actuated at the upper end by any suitable means.

As seen in Fig. 4 the upper or outlet portion of the shell is formed or cut obliquely, that is extends at an angle of about forty-five degrees to a central vertical line through the shell and upon it there is an integral plate 60 and upon that a plate 61 is riveted. The outlet opening 62 through these parts or plates 60 and 61 is in the form shown in Fig. 5, substantially the same as an artist's palette so that it will have a greatly reduced or depressed end. Between these two plates 60 and 61 a throttle valve 64 in the frame of the plate is mounted on a shaft 65 that is actuated by the throttle lever 66. The body of this throttle valve is substantially the same in shape as the gas outlet port 62 so that as said valve closes the outlet port will very gradually be reduced as indicated by dotted lines in Fig. 6 until the valve reaches the point of the port. Likewise, the opening of this port will be gradually increased.

Upon the plate 61 the outlet member 67 is secured by screws. Its inner end is beveled at an angle of 45 degrees from a horizontal plane so that said member 67 may extend horizontally or vertically or in other directions to make it easy to mount the carbureter in connection with any particular engine.

A waste outlet 68 is provided in the bottom of the carbureter to limit the capacity of the chamber 44 so that the accumulation therein will never be excessive but will be sufficient to constitute a fair priming charge. This is an important feature of the invention, as it constantly supplies the device with a priming charge.

What I claim as my invention and desire to secure by Letters Patent is:

1. A carbureter including a shell with an outlet opening that is substantially the same in shape as an artist's palette, and a throttle valve adapted to close said opening by moving from the wider portion to the narrow portion thereof.

2. A carbureter including a shell with a main air inlet port, a valve casing extending upward into said shell with a port in the upper end thereof for admitting the fuel, a false bottom for the shell through which said valve casing extends with openings in the false bottom around the valve casing, and a by-pass leading from the air inlet opening in said shell to the openings around said valve casing.

3. A carbureter including a shell with a main inlet port, a valve casing extending upward into said shell with a port in the upper end thereof for admitting the fuel, a false bottom for the shell through which said valve casing extends with openings in the false bottom around the valve casing, a

by-pass leading from the air inlet opening in said shell to the openings around said valve casing, and means for regulating the passage of air through said by-pass.

4. A carbureter including a shell, a valve casing entering said shell with a plurality of ports for the admission of fuel, a valve for controlling one of said ports, an air inlet valve, means controlled by said air inlet valve for controlling said fuel inlet valve, and an externally operative valve for controlling the other fuel inlet port.

5. A carbureter including a shell with an air inlet port, a spring-pressed valve for closing it, a tapering sleeve extending from said valve reduced circumferentially at one point, a valve casing extending upward into said shell below said sleeve with an outlet port therein for the fuel, a spring-pressed valve for closing said port the upper end of which normally engages the reduced portion of said sleeve, whereby the initial movement of said inlet valve will cause a positive and sudden movement at the same time of said fuel inlet valve.

6. A carbureter including a shell, a valve casing extending into the same with a central port in the upper end thereof for the outlet of fuel, an inclined port leading from the lower portion of said central port, and a valve for closing said ports which extends through said central port and is reduced circumferentially in the portion thereof extending through said central port, substantially as set forth.

In witness whereof, I have hereunto affixed my signature in the presence of the witnesses herein named.

BURT NEULON PIERCE.

Witnesses:

OLIVE BREEDEN,

N. ALLEMONG