E. C. NEWCOMB.

CARBURETER.

APPLICATION FILED OCT. 25, 1915.

1,319,789.

Patented Oct. 28, 1919.

2 SHEETS—SHEET 1.

Fig. 1.

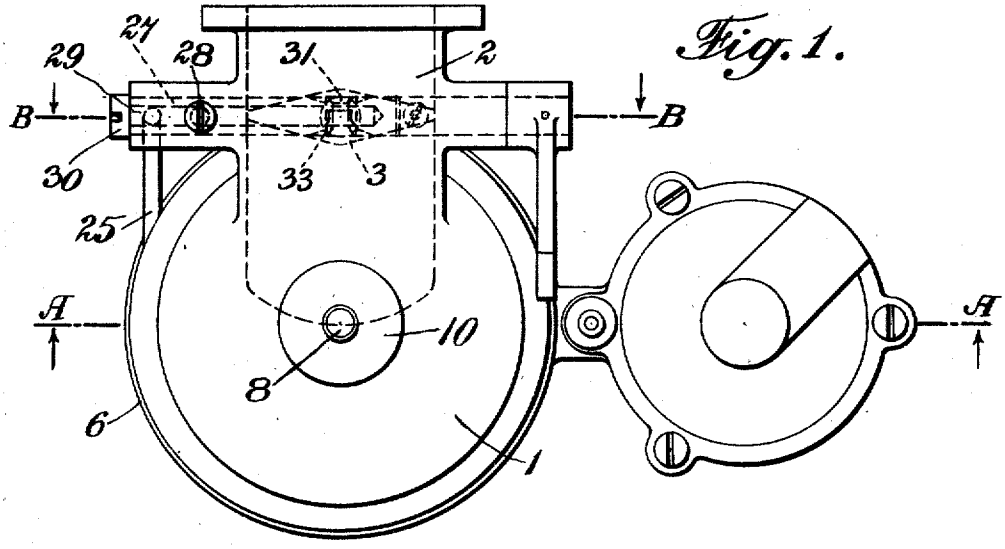
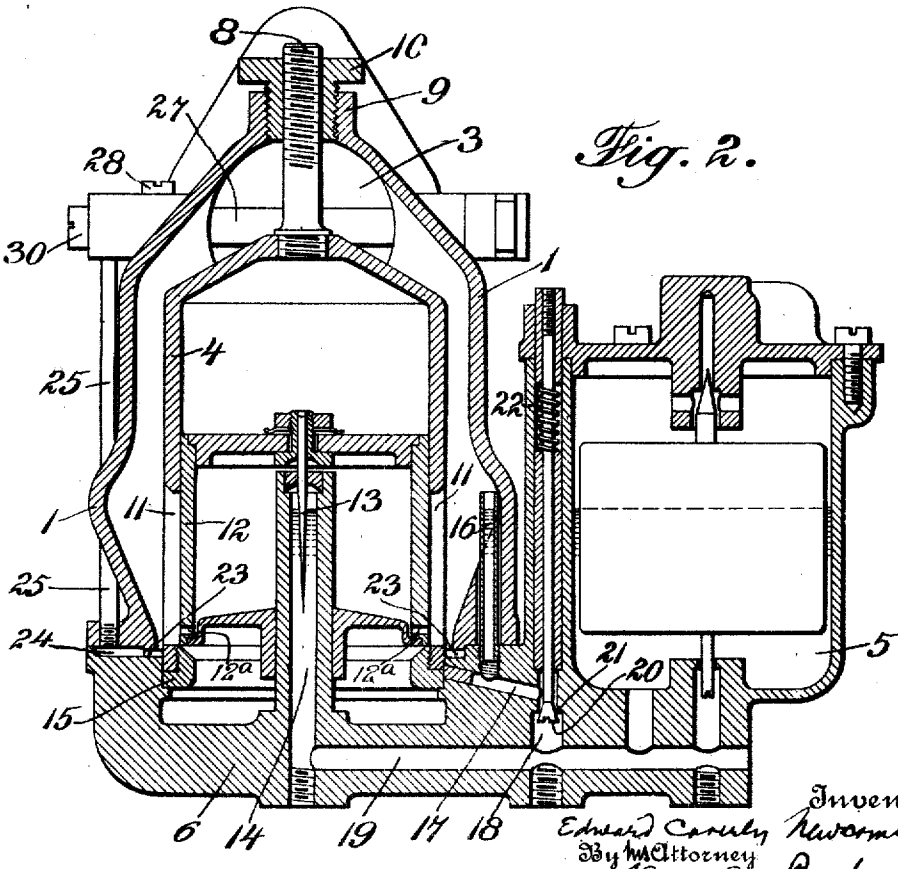


Fig. 2.



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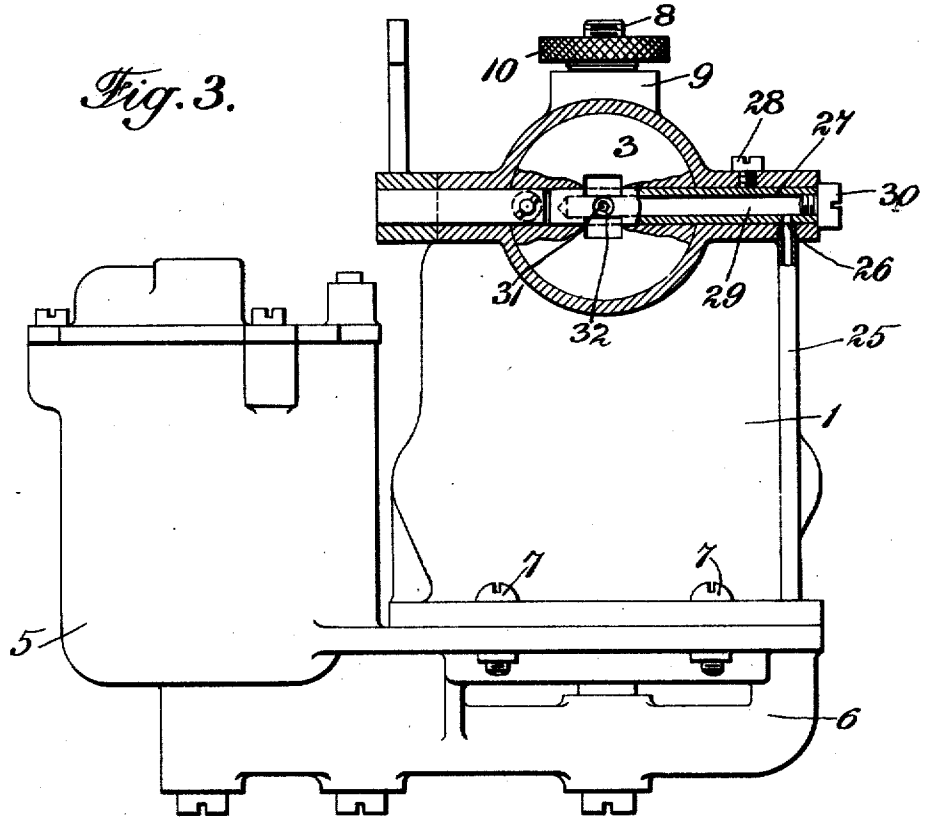
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2 SHEETS—SHEET 2.

Fig. 3.



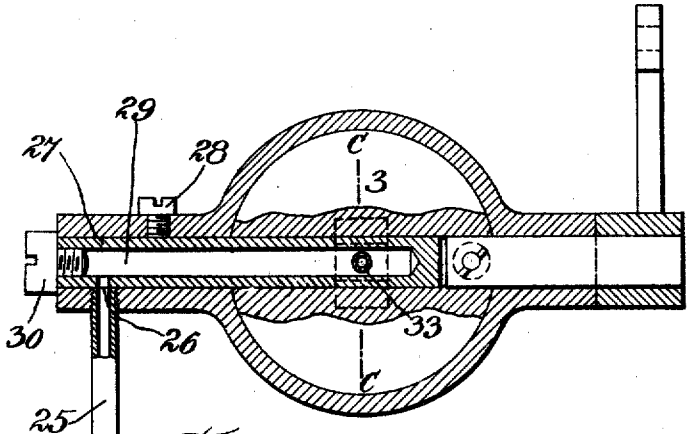


Fig. 4.

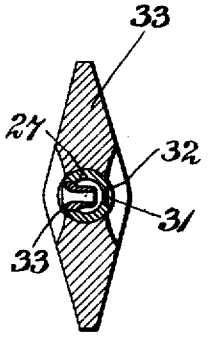


Fig. 5.

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UNITED STATES PATENT OFFICE.

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CARBURETER.

1,319,789. Specification of Letters Patent. Patented Oct. 28, 1919.

Application filed October 25, 1915. Serial No. 57,633.

To all whom it may concern:

Be it known that I, EDWARD COVERLY NEWCOMB, a citizen of the United States, and a resident of North Scituate, in the county of Plymouth and Commonwealth of Massachusetts, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

My invention relates to carbureters such as are used for supplying a mixture of fuel and air to internal combustion engines and is of the same general type as is shown in my former Patent No. 1,010,066, dated November 28, 1911 and the object of my present invention is to provide starting means whereby rich mixture, properly pulverized, to efficiently carburet the air at extreme ranges of temperature and with the various grades of liquid fuel which is used for this purpose will be supplied to start the motor to which my carbureter is attached, and which starting means shall under the normal operation of the carbureter serve to prevent undue accumulation of liquid fuel in the mixing chamber, when the carbureter is operated under small loads at low temperatures, under which conditions there is a tendency for the heavier fractions of the liquid fuel to condense in disturbing quantities. This and the other objects of my invention are fully explained in the following description.

In the drawings which are referred to herein and form a part hereof, is illustrated one embodiment of my invention, the same serving in connection with the description to explain the principles and construction thereof.

Figure 1 is a top plan view of my invention. Fig. 2 is a sectional elevation on the line AA of Fig. 1. Fig. 3 is a sectional view on the line BB of Fig. 1. Fig. 4 is an enlarged view in section of the throttle valve and atomizer, and Fig. 5 is a sectional view of the throttle valve on the line CC of Fig. 4. Similar characters of reference refer to similar parts throughout the accompanying drawings.

Referring to my drawings, my carbureter consists of a shell or casing 1, having an outlet for the mixture in the form of a flanged neck 2, adapted to be connected to the manifold of an engine. This outlet is controlled by a butterfly throttle valve 3. The casing 1 is open at its lower end and within this casing is secured the longitudinally adjustable tubular member 4, the lower end of the member 4 being inserted into the base 6, which serves as a guide therefor. The base 6 is removably secured to the shell 1 by the screws 7. In the upper end of the member 4 is secured a stud 8, which extends upwardly through the neck 9 of the casing 1. The neck 9 is interiorly threaded with a left hand thread to receive the knurled adjusting nut 10 which is itself tapped and interiorly threaded with a right hand thread to receive the threaded stud 8, the nut 10 and the stud 8 serving as means to secure the member 4 in the shell 1, and to adjust its position therein. The member 4 is held against rotation by the frictional contact with the base 6, or any other means. The member 4 is open at its lower end and is provided in its side walls with a multiplicity of narrow elongated slots 11. These ports are normally closed by the piston valve 12, the fit of which is such that the air will be gradually withdrawn from the chamber above the valve and the valve gradually raised by the suction of the engine so as to uncover the ports 11 more or less in accordance with the quantity of mixture demanded by the engine. The piston valve 12 is provided with ports 12^a which discharge into the elongated slots 11. Carried by the piston valve 12 is a needle valve 13 which extends downwardly into the fuel nozzle 14. In the lower end of the member 4 is secured a ring 15 upon which the piston valve 12 rests when the carbureter is not in action and which constitutes a stop limiting the downward movement of the valve. It is apparent that when the nut 10 is rotated so as to elevate the tubular member 4, the piston will be carried with it and the needle valve correspondingly withdrawn from the fuel nozzle and the mixture thereby enriched. In order to provide convenient and efficient means for starting the motor in cold weather or when a lower grade of fuel is used, I provide a standpipe 16, the upper open end of which is somewhat above the normal level of the liquid fuel in the float feed chamber 5, and discharges into the carbureting chamber. The lower end of the pipe 16 communicates through passages 17 and 18 with the passage 19, through which liquid fuel is supplied to the fuel nozzle. Interposed between the passages 17

and 18 is a valve 20 which is normally held against its seat 21 by the spring 22 so as to cut off the flow of fuel from the passage 19 to the standpipe 16. When, however, the valve 20 is depressed from the seat, fuel is free to flow from the float feed chamber to the standpipe 16. In the base 6 is formed an annular sump 23, which is partially covered by the shell or casing 1 when the shell or casing is in position on the base. At one point in the base I form a passage 24 which communicates with the sump 23 and immediately opposite this point I tap the shell 1 and insert a small pipe 25, the lower end of which opens into the passage 24, and the upper end of which is inserted at 26 in the hollow shaft 27, which is secured against rotation by the set-screw 28. This shaft 27 extends a little more than half way through the throttle disk or valve 3, and is provided with a central longitudinal passage 29, which is in open communication with the pipe 25. The outer end of the passage 29 is closed by the plug 30. The hollow shaft 27 at a point corresponding with the central axial line of the throttle valve is provided with a transverse passage 31, choked at the point 32. In the passage 31 is driven a bushing 33, the upper end of which is somewhat reduced in diameter, and which is of such length and diameter at its inner end as to leave but a small annular space for the passage of liquid about its inner end. The outer end of the bushing 33 is in open communication with the carbureting chamber in the casing 1. The throttle valve is recessed on both sides so that for a part of its opening movement it does not close or cover the ports of the transverse passage through the shaft 27. The time of closure may be determined by the recesses in the throttle valve. The stem of the priming valve 20 may be connected to a rod or any other means for operating it from the dash of the car to the engine to which the carbureter is attached.

The operation of my device is as follows: When the operator desires to start the motor to which my carbureter has been attached, the valve 20 is depressed from its seat 21, and the engine cranked. The suction produced will cause liquid fuel to overflow from the standpipe 16, from whence it will run into the sump 23. The throttle being then nearly closed, a high vacuum will be produced on the engine side of the throttle, which high vacuum will be communicated through the passage 31 to the pipe 25, which will cause the fuel in the sump 23 to be drawn through the passage 24 and the pipe 25 past the bushing 33, where it will be thoroughly pulverized or atomized and aerated by the air flowing through the discharged orifice of the bushing 33 at a high velocity and the rapidly traveling stream of mixture will be carried by its velocity, through the center of the manifold, to the engine without undue precipitation of the liquid fuel contained therein. As soon as the engine has been started and sufficiently warmed the valve 20 may be permitted to return to its seat, after which the carbureter will operate in its normal manner, the liquid fuel being then supplied from the fuel nozzle 14. With the low grades of fuel now available, the heavier fractions tend to condense in the mixing chamber in disturbing quantities when the carbureter is operated under a small load, and particularly in cold weather, and also when the engine is first started and the carbureter is cold. All of the liquid fuel so condensed is collected in the sump 23, from which it is carried by the high vacuum existing between the throttle valve and the engine, through the pipe 25 and past the inner end of the bushing 33, where it is finely pulverized by the air rushing at high velocity through this bushing. The recesses in the throttle valve are so formed that when the throttle valve is approximately one-half open the ports in the hollow shaft 27 will be closed and the mechanism thrown out of action, because with the throttle valve one-half open the travel of the mixture through the carbureting chamber and manifold is so rapid that there is little tendency on the part of the liquid fuel to condense.

With my device it is not possible to flood my carbureter beyond the operating point, because the fuel, as fast at it overflows from the standpipe 16, is swept away through the pipe 25 in a properly pulverized and aerated condition. It is also apparent that when the engine is at rest the standpipe 16 will not overflow even if the valve 20 is in the open position.

By rotating the nut 10 clockwise, the member 4 may be elevated and the needle valve 13 correspondingly withdrawn from the fuel nozzle 14, thereby enriching the mixture, and by rotating the nut 10 in the opposite direction the member 4 may be lowered, carrying with it the needle valve 13, thereby reducing the percentage of fuel in the mixture.

Having described my invention, I claim:

1. A carbureter comprising in combination a carbureting chamber provided with an interiorly threaded neck, a tubular member mounted therein having ports in its wall and provided with a threaded stud extending upward through said neck, an adjusting nut exteriorly threaded to fit said neck and tapped and threaded to receive the upper end of said stud, a chambered piston valve mounted in said tubular member, a fuel nozzle discharging into said chamber in said valve, a needle valve carried by the piston valve projecting into said nozzle and

a stop carried by the tubular member adapted to limit the downward movement of the piston valve.

2. A carbureter comprising in combination a carbureting chamber provided with an interiorly threaded neck, a tubular member mounted therein having ports in its wall and provided with a threaded stud extending upward through said neck, an adjusting nut exteriorly threaded to fit said neck and tapped and threaded to receive the upper end of said stud, said threads of said nut being respectively one a right-hand thread and the other a left-hand thread, a chambered piston valve mounted in said tubular member, a fuel nozzle discharging into said chamber in said valve, a needle valve carried by the piston valve projecting into said nozzle, and a stop carried by the tubular member adapted to limit the downward movement of the piston valve.

3. A carbureter comprising in combination a tubular member having air ports in its wall, a chambered piston valve mounted in said tubular member adapted to uncover said ports when raised by the suction of the engine, a spray nozzle discharging into the chamber in said piston valve, ports in the wall of the piston valve discharging into the ports in the wall of the tubular member, a needle valve carried by said piston valve projecting into said nozzle, a stop carried by said tubular member adapted to limit the downward movement of said piston valve, and means for adjusting said tubular member with reference to said nozzle.

Signed at New York city, in the county of New York, and State of New York, this 11th day of October, 1915.

EDWARD COVERLY NEWCOMB.

Witnesses:
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BENJAMIN T. ABRAMS.