

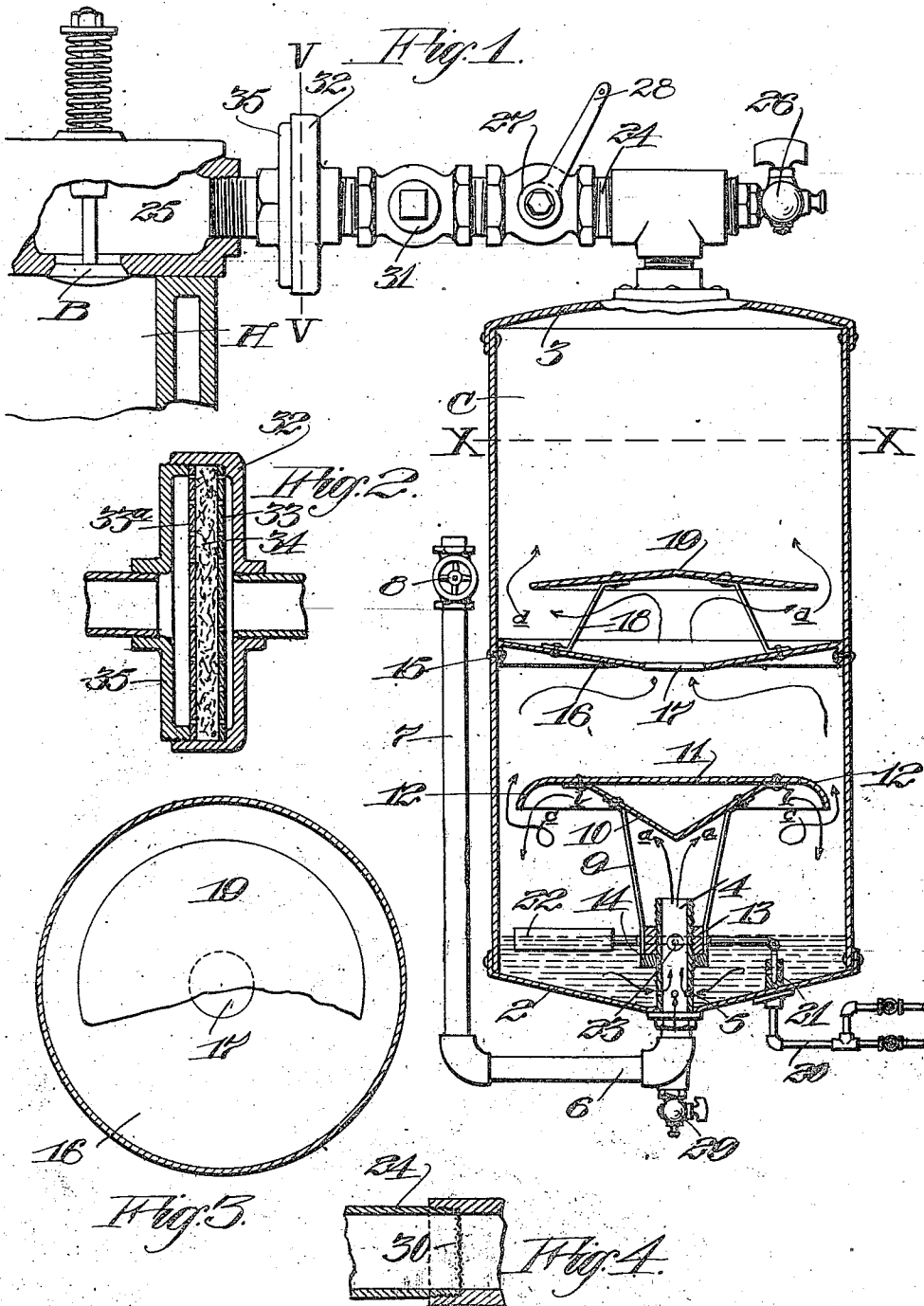
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CARBURETER.

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1,104,222.

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CARBURETER.

1,104,222.

Specification of Letters Patent.

Patented July 21, 1914.

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To all whom it may concern:

Be it known that we, CEDRIC E. RIMMER, FRED A. PLYMIRE, and WILLIAM WILLS, citizens of the United States, residing at Luning, in the county of Mineral and State of Nevada, have invented new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to a carbureter.

10 The object of the invention is to provide a simple, cheaply manufactured, easily adjusted carbureter which is particularly constructed for carbureting low gravity hydrocarbon fuels, such as distillate and the like.

15 Another object of the invention is to provide a carbureter which is so constructed that springs and delicate adjustments may be entirely eliminated, and in which water or dust accumulations will have no effect.

20 Further objects will appear hereinafter.

The invention consists of the parts and the construction and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings, in which,—

25 Figure 1 is a vertical longitudinal section of the carbureter showing its connection with a standard type of internal combustion engine. Fig. 2 is an enlarged cross section on the line V—V of Fig. 1. Fig. 3 is a horizontal cross section on the line x—x of Fig. 1. Fig. 4 is an enlarged section of the pipe showing the position of the back-fire preventing screen.

30 Referring to the drawings: A indicates an internal combustion engine of the four-cycle type, which is partly broken away, and B indicates the inlet valve of same, operable in the usual manner.

40 C indicates in general a tank provided with a tapering bottom 2 and a head 3. Extending through the bottom of the tank is a nozzle or tube 4, near the lower end of which is formed a plurality of small perforations

45 5. The portion of the tube 4 which projects through the bottom of the tank is connected, as at 6, with a standpipe 7, having a valve 8 mounted on its upper end.

Adjustably mounted above the outlet of the tube 4, upon arms 9 and in concentric position with the tube 4, is a conical shaped member 10, upon which is mounted a plate 11, having an annular downwardly-turned deflecting edge 12. For the purpose of adjusting the plate 11 and cone 10 with rela-

tion to the outlet opening of the tube 4, a thread is formed on the outside of the tube 4, and the arms 9 may thus be secured to a collar 13 which is also threaded. The plate 11 and cone 10 may thus be adjusted with relation to the mouth of the tube 4 by turning same in one direction or another, and the adjusted position may be retained by a lock nut 14 adapted to engage with the collar 13.

60 Mounted above the adjustable plate 11 and secured to the tank as at 15, is a stationary baffle plate 16, in which is formed a central opening 17, and positioned above the plate 16, upon arms 18, is a secondary deflecting plate or baffle plate 19. A suitable form of hydrocarbon liquid is delivered through a pipe 20 through a valve 21, and the fuel level within the tank is maintained by a suitable form of float 22, pivotally secured as at 23 and adapted to close the needle valve 21 when a predetermined fuel level has been attained within the tank. The tank is otherwise connected through a pipe 24 with the inlet chamber 25 of the internal combustion engine, and an auxiliary inlet valve 26 is also provided on this line.

The operation of this portion of the apparatus will be as follows: A downward movement of the piston within the cylinder of the engine will provide sufficient suction in the usual manner to open the inlet valve B and produce a suction in the pipe connection 24. Suction is thus transmitted to produce sufficient vacuum within the tank C to cause an inrush of air through the valve 8, pipe 7 and nozzle 4; the volume of air admitted being regulated by the valve 8. An inward rush of air through the tube 4 will create a vacuum in the lower portion of the tube and cause the hydrocarbon fuel to enter through the lower openings 5 formed in the tube. A mixture of fuel and air in the form of a spray will thus be ejected from the upper end of the tube and will be projected against the conical cover 10, where the spray and air are deflected up the inclined surfaces of the cone in the direction of arrows *a*. The spray is then deflected in a downward direction, indicated by arrows *b*, by the annular downward-turned flange 12 formed on the plate 11. A constant shower of spray in the direction of arrows *b* is thus produced through which the out-going air in the direction of arrows

c must pass. The air is then again deflected by the plates 16 and 19 before it is allowed to escape from the tank C through the pipe 24 to enter the cylinder of the engine. The spray projected against the conical surface of the cover 10 is first broken up and partly evaporated by this action. It is again further broken up by the down-turned deflecting flange 12, and still further broken up by the outwardly passing current of air indicated by arrows c. A most ideal carbureting and vaporizing action is thus secured. Any small globules of unvaporized fuel which might possibly rise with the upwardly passing current of air indicated by arrows c, will, however, become completely evaporated before escaping from the tank, as the upwardly rushing air current will first strike the plate 16 before escaping through the central opening 17, and any particles of fuel still remaining unvaporized will strike the under-surface of the plate 19 before escaping around the outer edge of same in the direction of arrows d and pipe 24.

Very low gravity distillates impossible to handle in the standard types of carbureters now in use are successfully carbureted in the device here shown. On account of the spray action and the great number of deflecting and evaporating surfaces a perfect carburetion and greater homogeneity of the final mixture is secured.

The quantity and richness of the mixture that an engine will take varies greatly with the speed; at low speeds the mixture should be richer than at high speeds, this being due to the fact that at low speeds more heat is lost through the cylinder walls by radiation, and also considerable compression is lost by leakage. At high speeds the compression is higher, due to less leakage and less loss of heat by radiation; therefore unless the mixture be leaner at high speed there might be danger of preignition. With this object in view we have provided means for quickly and easily adjusting the richness of the mixture. If a lean mixture is desired it is accomplished by partly closing the valve 8 and partly opening the auxiliary air inlet valve indicated at 26. If a rich mixture is desired, the valve 8 is accordingly opened while the auxiliary air inlet opening 26 is partly closed. Any variation of fuel mixture may thus be secured by turning one or the other of the valves 8 and 26, and the quantity of gas delivered to the engine may be throttled through the usual type of valve, indicated at 27. This throttling action may be operated either by hand through the lever 28, or through a governor connection not here shown.

By referring to Fig. 1 of the drawings it can easily be seen that a considerable quantity of water may collect in the bottom of

the tank C without interfering with the operation of the device, for the simple reason that the liquid contained within the tank C is constantly drawn up through the tube 4. The portion of the spray ejected from the tube 4 which is not evaporated or carbureted is deflected by the annular flange 12 and returned to again enter the openings 5, and is thus continuously circulated until finally carbureted or evaporated. Similarly any accumulation of sand or grit will have no effect upon the operation of the device, as the openings 5 may be sufficiently large to not be clogged by sand or like materials.

In the carbureter constructed as here shown all delicate adjustments are positively eliminated, as the only adjustments necessary are the valves 8 and 26, which are standard types of valves. Any accumulation of water or grit within the bottom of the chamber may be drawn off through a valve 29, from time to time.

For the purpose of positively preventing back-firing to the tank C, through the inlet valve B and the pipe 24, suitable means such as fire screens 30, see Fig. 4, may be placed in the pipe-line 24. A suitable form of check valve 31 may also be connected in the line, if desired. By referring to Fig. 2, it can be seen that a positive means of preventing back-firing has been provided. This means consists of an enlarged cap 32 adapted to receive a screen or perforated plate 33. One or more layers of asbestos cloth, indicated at 34, is placed on top of the screen and a second screen 33^a is then inserted and the whole secured together by a screw cap 35. The back-firing screen constructed as here shown is preferably placed as close to the engine as possible, as indicated in Fig. 1.

The carbureter constructed as here shown is neat and simple in appearance and positively always reliable in action, and takes very little more space than the ordinary types of carbureters now in use.

The materials and finish of the several parts of the carbureter are such as experience and judgment of the manufacturer may dictate.

Having thus described our invention what we claim and desire to secure by Letters Patent, is:

1. The combination in a carbureter, of a closed tank adapted to contain a hydrocarbon fuel, means for maintaining a predetermined fuel level within the tank, an air inlet pipe on the tank having its inlet end connected with the lower end of the tank, a tube extending above the fuel level connected to said inlet end and having a plurality of perforations formed in the tube near its lower end, a deflecting plate having an annular downwardly turned flange formed

on its outer edge mounted above the tube, a conical-shaped deflector secured to said plate, means for raising or lowering the deflectors with relation to the top of the tube, a plurality of stationary deflecting plates secured in the tank above the adjustable deflectors, an outlet pipe connected to the top of the tank, means in said pipe to prevent back-firing into the tank, and an auxiliary air valve in the pipe.

2. In a carbureter, a liquid fuel containing tank, an air inlet tube extending up through the bottom of the tank having a plurality of perforations located below the level of the liquid fuel, a deflecting plate having a downturned flange at its outer edge, a cone-shaped deflector secured to the under face of said plate and at the center

thereof and having its apex closed and alined with the upper end of said tube, a baffle plate secured to the tank and located above said deflecting plate and having its bottom provided with a central opening, and an imperforate secondary baffle plate connected to the first named baffle plate and located thereabove and in spaced relation to the tank side walls.

In testimony whereof we have hereunto set our hands in the presence of two subscribing witnesses.

CEDRIC E. RIMMER.
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Witnesses:

Mrs. H. R. WAGNER,
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