W. H. McANDREWS.

CARBURETER.

APPLICATION FILED JUNE 21, 1913.

1,093,343.

Patented Apr. 14, 1914.

2 SHEETS—SHEET 1.

Fig. 1.

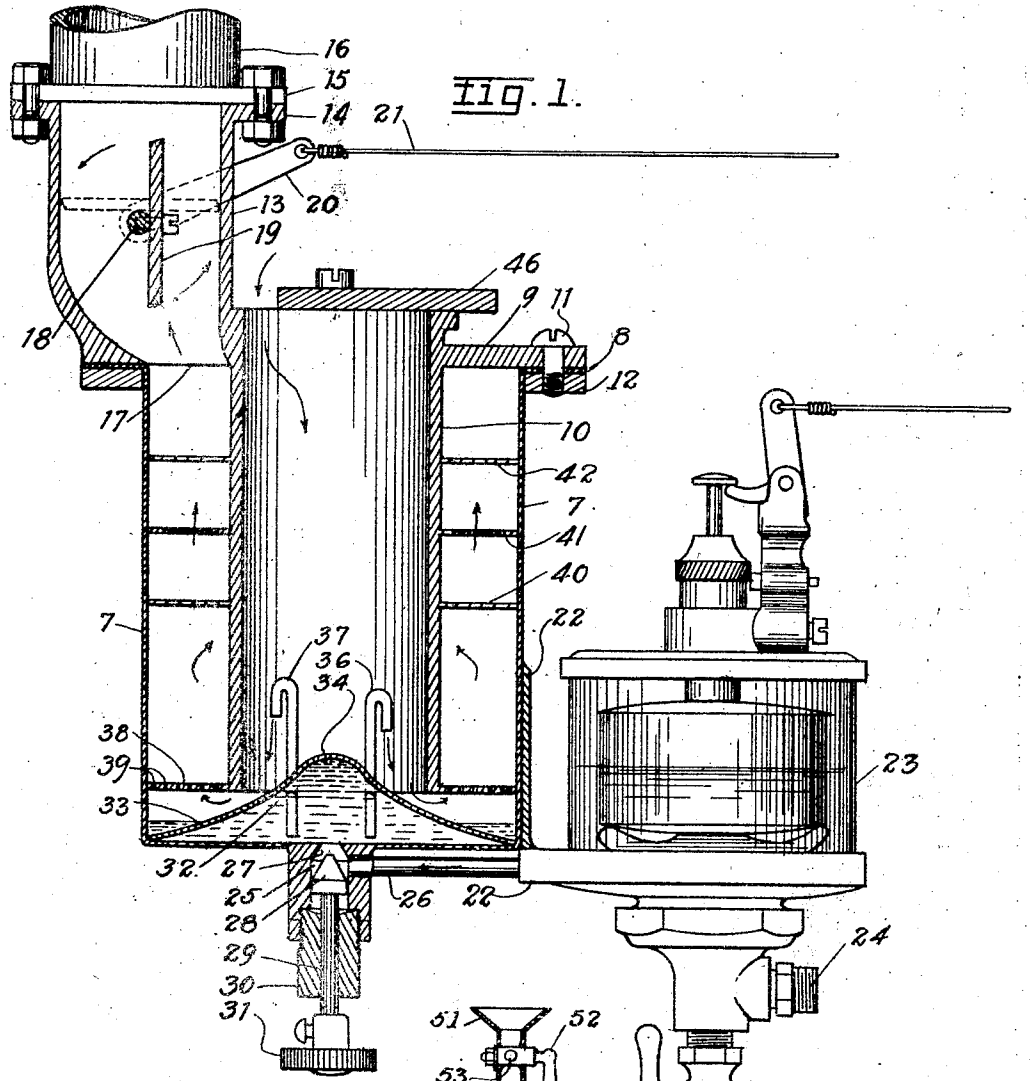
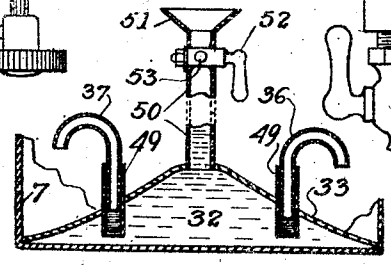


Fig. 5.



WITNESSES.

H. T. Palmer.

R. S. Phillips

INVENTOR.

William H. McAndrews

BY Chas. C. Tillman

ATTY.

W. H. McANDREWS.

CARBURETER.

APPLICATION FILED JUNE 21, 1913.

1,093,343.

Patented Apr. 14, 1914.

2 SHEETS—SHEET 2.

Fig. 2.

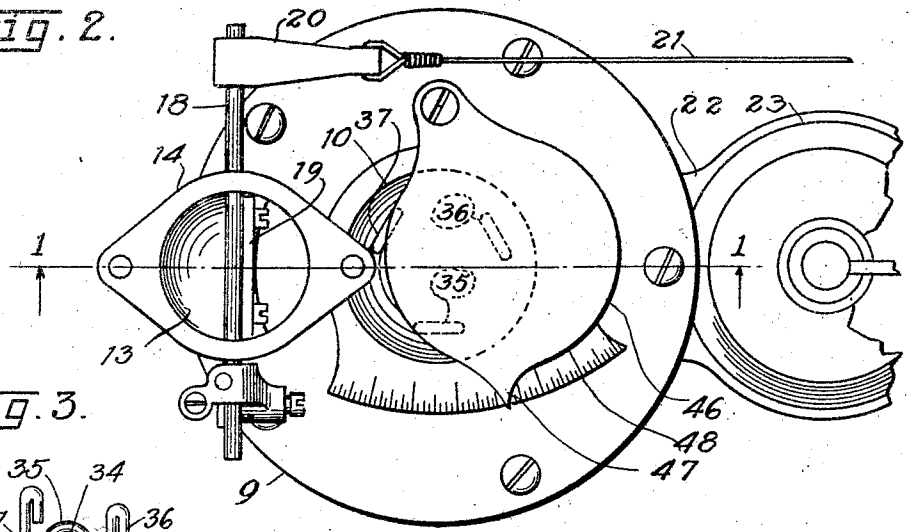


Fig. 3.

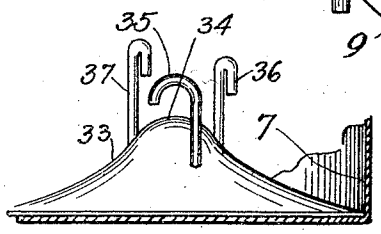
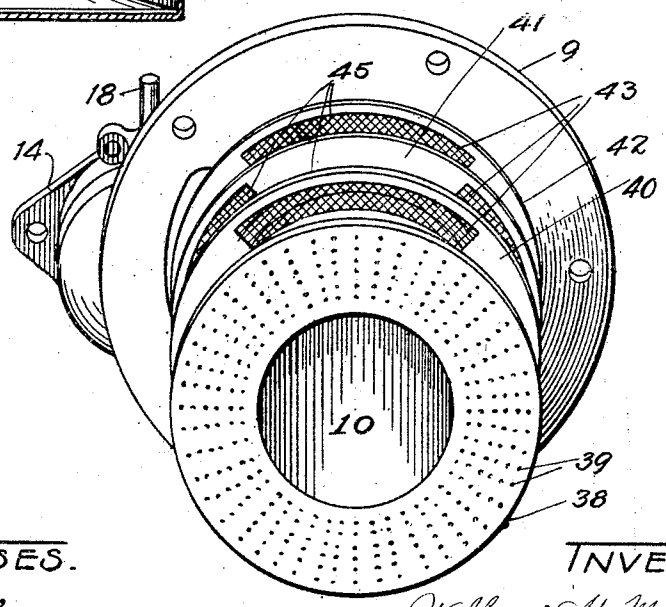


Fig. 4.



WITNESSES.

H. P. Palmer

A. S. Phillips

INVENTOR.

William H. McAndrews

BY Chas. C. Tillman

ATTY.

UNITED STATES PATENT OFFICE.

WILLIAM H. McANDREWS, OF CHICAGO, ILLINOIS.

CARBURETER.

1,093,343. Specification of Letters Patent. Patented Apr. 14, 1914.

Application filed June 21, 1913. Serial No. 774,974.

To all whom it may concern:

Be it known that I, WILLIAM H. McANDREWS, a citizen of the United States of America, residing at Chicago, in the county of Cook and State of Illinois, have invented certain new and useful Improvements in Carbureters, of which the following is a specification.

This invention relates to improvements in carbureters of the float-valve or gravity-feed type for internal combustion engines of various kinds, but particularly for gasolene engines used for operating motor vehicles.

The principal and general object of the invention is to simplify and improve the construction, operation and efficiency of carbureters of this type.

Other objects are to provide a carbureter which will afford a high vaporizing effect and thorough carburization, in such a manner that the range of automobile operation will be greatly increased and, so that the carbureter will respond to all variations in operating conditions of the engine to automatically cause the preparation of the proper mixture or gas supply for each condition; to afford means for supplying air and gasolene or hydrocarbon to the carbureter casing, and means for atomizing the latter, as well as, to cause it to be conveyed from the discharging nozzles therefor through circuitous and baffled passages or ways to the engine, to the end that a more perfect commingling of air and gas or more thorough carburization will be effected.

Various other objects and advantages of the invention will be disclosed in the subjoined description and explanation.

The invention consists in certain peculiarities of the construction, novel arrangement and operation of the various parts thereof, as will be hereinafter more fully set forth and specifically claimed.

In the accompanying drawings, which serve to illustrate an embodiment of the invention—Figure 1 is a view partly in section and partly in elevation taken on line 1—1 of Fig. 2, looking in the direction indicated by the arrows; Fig. 2 is a plan view of the carbureter showing the cover for the air inlet turned or positioned to admit air to said inlet; Fig. 3 is a fragmental view, partly in section and partly in elevation of a portion of the lower part of the casing, showing the discharging nozzles for the hydrocarbon or gasolene extended upwardly from the reservoir for the latter, and illustrating the respective positions of their discharging ends. Fig. 4 is a detached bottom perspective view of the air conduit of the carbureter and its foraminous baffle plates or partitions, and Fig. 5 is a view partly in section and partly in elevation of the lower portion of the carbureter casing, showing a modification in the construction of the manner of supplying hydrocarbon from the reservoir to said casing.

Like numerals of reference refer to corresponding parts throughout the different views of the drawings.

The reference numeral 7 designates the casing of the carbureter, which may be of any suitable size, form and material, but preferably of metal and cylindrical in shape, as shown in Fig. 1 of the drawings. The upper end of the casing 7, is open and is provided with an external annular flange 8, which is secured to the lower surface of an annular flange 9, with which the upper portion of the air conduit or inlet 10 is provided by means of screw bolts 11, and a ring 12, which latter is located on the lower surface of the flange 8, and screwed up against the same by means of the screws 11, which are passed through suitable openings in the flange 9, on the air conduit or inlet. This flange 9 has extended upwardly therefrom a tubular member 13, which is provided at its free end with a flange 14, adapted to be secured to a flange 15, on the pipe 16, leading to the engine or manifold (not shown). As shown in Fig. 1 the tubular member 13, has an opening 17, through the flange 9, and also has transversely journaled therein a shaft 18, on which is mounted a "butter-fly" or throttle-valve 19, to regulate the passage of the mixture or carbureted air from the carbureter to the engine. The shaft 18, and valve 19 thereon, may be operated by means of a lever 20, mounted on said shaft, and a rod or connection 21, leading from said lever to the proper position on the engine and in the usual or ordinary manner.

Mounted near the lower portion of the casing 7, and preferably connected therewith by means of a bracket 22, is a float-valve casing 23, of the ordinary or any well-known construction, to which hydrocarbon may be supplied through a nipple 24, which may be connected in any suitable manner to

a supply of gasolene or hydrocarbon (not shown). The lower portion of the casing 7, is provided with a channeled extension 25, which has communication through a pipe 26, with the float-valve casing 23, and the channel of said extension is provided in its upper portion with a valve seat 27, which is closed by means of a valve 28, on the inner end of a rod or stem 29, which is extended through a gland or follower 30, secured in or to the lower portion of the extension 25, and which stem may be operated so as to open and close the valve seat 27, by means of a knob or milled thumb piece 31 on the outer end of said stem. The float-valve casing and its valve is employed to maintain a constant level within the reservoir 32, of the carbureter casing, and the supply of hydrocarbon to the float-valve casing 23, and the regulation of the valve therein can be done in any well-known or suitable manner, and for this reason it is not deemed necessary herein to explain in detail the manner of such supply and regulation. The reservoir 32, of the carbureter casing is produced or formed by the bottom of said casing and a conical or cone-shaped partition 33, which is fitted at its periphery tightly to the bottom of the casing and its wall, as is clearly shown in Fig. 1 of the drawings, in which view it will be observed that the apex 34 of the partition 33, is located centrally with respect to the casing 7 of the carbureter. Extended through the partition 33, near its apex are a series of hydrocarbon discharging nozzles 35, 36, and 37, the lower ends of which are projected to near the bottom of the casing 7, and the upper ends of which are curved downwardly, as is clearly shown in Fig. 3 of the drawings, in which view it will be noticed that the upper ends of the nozzles 35, 36 and 37 are located in different horizontal planes.

Extended through a central opening in the head or flange 9, and preferably integral therewith is the air inlet pipe or conduit 10, which is of sufficient length to extend to near the bottom of the casing 7, when positioned therein, as shown in Fig. 1, and to encompass the central upwardly extended portion of the partition 33, or top of the reservoir. The pipe or conduit 10, is provided at its lower end with an external annular plate 38, which is provided with numerous minute openings 39, and between the plate 38, and the head or flange 9, the air inlet pipe or conduit 10, has located thereon a number of baffle plates 40, 41 and 42, each of which is provided with one or more segmental slots or openings 43, each of which openings is provided with foraminous material 45, such as wire cloth of very fine mesh, which material may be secured to said plates in any suitable manner, so that the air and gas or mixture will be caused to pass through the openings of this fabric or perforated material. By reference to Fig. 4 of the drawings, it will be seen that the openings or slots 43, as well as the material 45, over the same, are located alternately with respect to one another; that is, the openings 43 in the lower plate 40, will be located directly beneath the imperforate portions of the plate 41, while the openings 43 of the last named plate will be located directly beneath the imperforate portions of the plate 42, thus causing the fluids as they pass to be drawn upwardly through the perforations 39, of the plate 38, to be baffled and caused to travel in a circuitous route or passageway to the member 13, and from thence to the engine.

Pivotally mounted on the upper end of the air inlet 10, is a door or cover 46, which is employed for regulating the quantity of air admitted into and through the inlet pipe 10, and in order to gage the quantity of air so admitted the door or cover 46, may be provided with an indicator 47, used in connection with a scale 48, with which the upper portion of the air inlet may be provided.

In the modified construction illustrated in Fig. 5 of the drawings, the cover 33 of the reservoir 32, is provided with a series of upright tubular members 49, which extend to near the bottom of the casing 7, and are internally screw threaded at their upper portions to engage screw threads on their respective nozzles, which nozzles are thus adjustably supported on the cover of the reservoir, to the end that they may be raised or lowered by turning them in the proper direction, so that their free or discharging ends may be located at the proper distances from the cover of the reservoir. In this modification the apex or central portion of the cover 33, is provided with an upright pipe or tube 50, of any suitable length which, by preference, has its upper end flared as at 51, to receive air as it passes downwardly through the air inlet or conduit. This tube 50 is provided with a cock or valve 52, having an opening 53 to register with the bore of the tube 50, so as to permit the air to pass freely through said tube, and when desired the cock 52 can be turned so as to decrease the supply of air passing through the tube 50, or shut it off entirely, if desired. By this arrangement, it is obvious that as the air is drawn downwardly through the air inlet, it will be caught by the flared portion 51, of the tube 50, and when the cock 52 is open, the pressure of the air in the tube 50, will act on the hydrocarbon within the reservoir and force it upwardly through the nozzles.

From the foregoing and by reference to the drawings, it will be readily understood and clearly seen that in the operation of the engine, suction or exhaust will be created in

the tubular member 13, as well as in the casing 7, thus causing air to be drawn downwardly through the air inlet 10, and out between the lower end thereof and the partition 33, or top of the reservoir for the hydrocarbon, in which operation it is evident that if the engine is running at a low speed, and the pressure or suction is low, hydrocarbon or gasolene will be drawn through the nozzle 35, or shorter one, and that as the speed of the engine and the suction or pressure increases, hydrocarbon will be discharged through the nozzle 36, or the one longer than the first named nozzle, and so on throughout the series of nozzles. In this operation the air brought down through the pipe 10, will be impregnated with the hydrocarbon and the carbureted air and will pass through the perforations 39, of the plate 38, and from thence upwardly against the baffle plates 40, 41 and 42, and through the sieves or foraminous coverings of the openings in said plates, thus atomizing the hydrocarbon and air, and causing the most perfect and thorough carburization. As the hydrocarbon is discharged from the nozzles therefor, it is evident that some of it will accumulate in the space between the cover 33, of the reservoir, and the wall of the casing, which accumulated hydrocarbon will act for the purpose of priming the engine.

While I have shown and described my invention in its preferred embodiment, it will be understood that various changes may be made without departing from the scope of the appended claims; for instance, the number of discharging nozzles for hydrocarbon may be increased or diminished, and the number of baffle plates may be greater or less than those shown and above described. It is also obvious that the details of construction may be varied without departing from the spirit of the invention.

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

1. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, of means to supply hydrocarbon to said reservoir, an air conduit located in the casing and extended at its inner end to near the top of the reservoir, and a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly.

2. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, of means to supply hydrocarbon to said reservoir, an air conduit located in the casing and extended at its inner end to near the top of the reservoir, and a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly with their free or discharging ends located in different horizontal planes.

3. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, said reservoir having a conical cover or top, of means to supply hydrocarbon to said reservoir, an air conduit located in the casing and extended at its inner end to near the top of the reservoir and surrounding the central part thereof, and a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly with their free or discharging ends located in different horizontal planes.

4. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, of means to supply hydrocarbon to said reservoir, an air conduit located in the casing and extended at its inner end to near the top of the reservoir, a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly with their free or discharging ends located in different horizontal planes, and a series of foraminous baffle plates located horizontally and spaced apart between the air conduit and the casing.

5. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, said reservoir having a conical cover or top, of means to supply hydrocarbon to said reservoir, an air conduit located in the casing and extended at its inner end to near the top of the reservoir and surrounding the central part thereof, a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly with their free or discharging ends located in different horizontal planes, and foraminous baffle plates horizontally located at distances apart between the air conduit and the casing.

6. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, of means to supply hydrocarbon to said reservoir, an air conduit centrally located in the casing and extended at its inner end to near the top of the reservoir, a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly, a perforated plate horizontally

located between the lower portion of the air conduit and the casing, and a plurality of baffle plates horizontally located in spaced relation to one another above the first named plate and between the air conduit and casing, each of said plates having slots therein, and foraminous material extended across said slots.

7. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, said reservoir having a conical cover or top, of means to supply hydrocarbon to said reservoir, an air conduit centrally located in the casing and extended at its inner end to near the top of the reservoir and surrounding the central part thereof, a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly with their free or discharging ends located in different horizontal planes, a perforated plate surrounding the lower portion of the air conduit, a plurality of plates surrounding said conduit above the first named plate, said plurality of plates having slots located out of register with one another, and foraminous material extended across each of said slots.

8. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, of means to supply hydrocarbon to said reservoir, an air conduit centrally located in the casing and extended at its inner end to near the top of the reservoir, a plurality of nozzles adjustably supported on the cover of the reservoir and communicating therewith at their lower ends and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly.

9. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, of means to supply hydrocarbon to said reservoir, an air conduit centrally located in the casing and extended at its inner end to near the top of the reservoir, a plurality of nozzles communicating at their lower ends with the reservoir and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly, a tube communicating at its lower end with the central portion of the top of the reservoir and having its upper end enlarged, and a cock located in said tube to control the flow of air through the same.

10. In a carbureter, the combination with a casing having in its lower part a reservoir for hydrocarbon and in its upper part an outlet, of means to supply hydrocarbon to said reservoir, an air conduit located in the casing and extended at its inner end to near the top of the reservoir, a plurality of nozzles adjustably mounted on the top of said reservoir and communicating at their lower ends therewith and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly, and a valved tube communicating at its lower end with the upper portion of the reservoir and having its upper end enlarged.

11. In a carbureter, the combination with a casing having a reservoir for hydrocarbon in its lower portion, of means to supply hydrocarbon thereto and to maintain the supply of hydrocarbon at a constant level, an air conduit located in said casing and extended at its lower end to near the top or cover of the reservoir, a plurality of nozzles extended through the cover of the reservoir to near the bottom of the casing and extended upwardly into the lower part of said conduit and having their upper portions bent downwardly with their free or discharging ends located in different horizontal planes, and means for creating a downward passage of air through the air conduit and an upwardly passage of fluid between said conduit and the casing.

WILLIAM H. McANDREWS.

Witnesses:
CHAS. C. TILLMAN,
A. S. PHILLIPS.