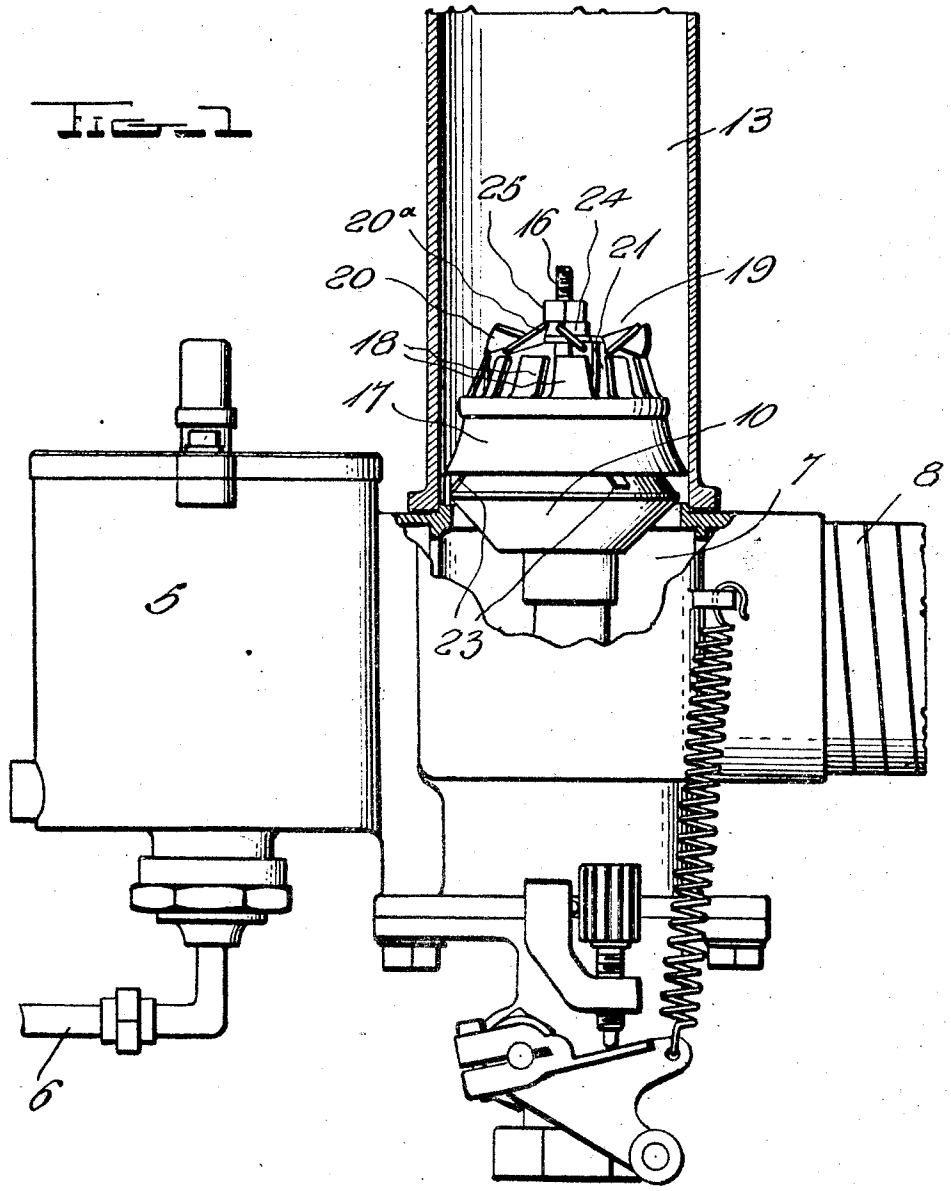
June 24, 1930. C. A. MUSALL 1,767,305

CARBURETING MEANS

Filed Dec. 7, 1928 2 Sheets-Sheet 1



Inventor

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CARBURETING MEANS

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FIG. 2

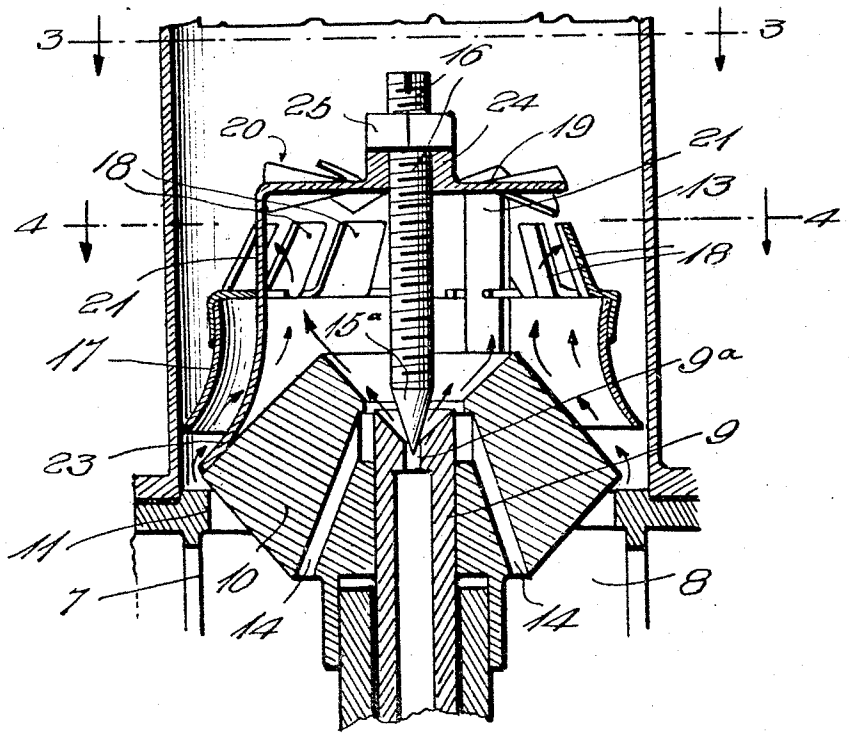


FIG. 3

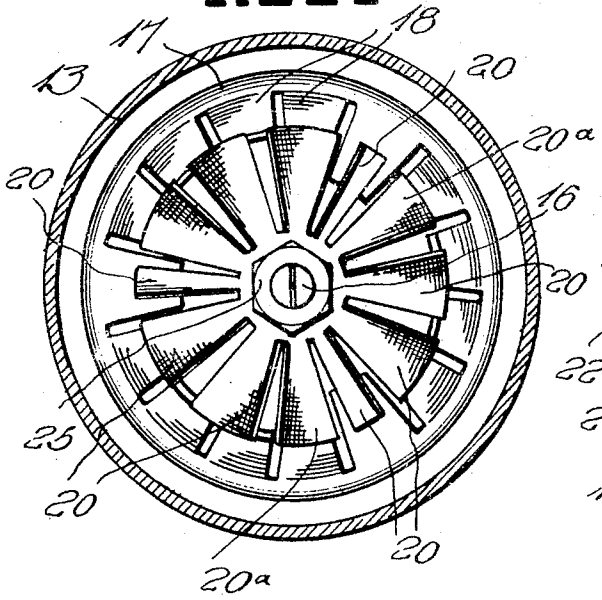
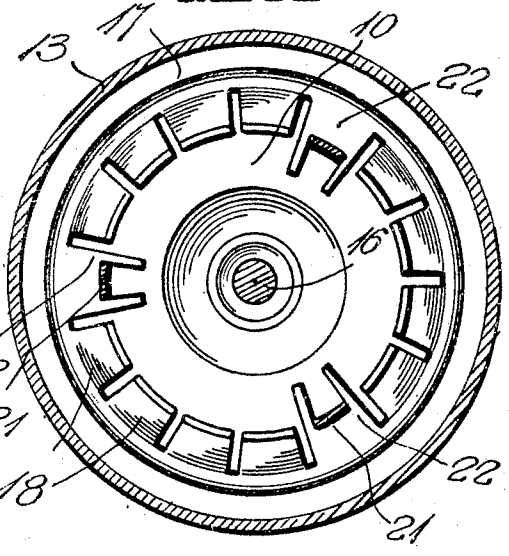


FIG. 4



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UNITED STATES PATENT OFFICE

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CARBURETING MEANS

Application filed December 7, 1928. Serial No. 324,462.

The invention relates to unique fuel and air mixing means for a carbureter and to certain unique relations of parts of the new subject matter with old parts of the carbureter, whereby a more thorough mixture of fuel and air is produced, the efficiency of the motor equipped with the carbureter is increased, and an unusual saving in fuel is effected.

It is the object of the invention to provide an exceptionally simple and inexpensive construction for attaining the above ends, yet one which will be efficient and cannot get out of order.

Fig. 1 of the accompanying drawings is a side elevation partly in section showing a carbureter improved in accordance with my invention.

Fig. 2 is an enlarged vertical sectional view through the new features of construction and related features of the carbureter.

Fig. 3 is a horizontal sectional view on line 3—3 of Fig. 2.

Fig. 4 is another horizontal sectional view on line 4—4 of Fig. 2.

In the drawings above briefly described 5 denotes a fuel bowl, 6 the fuel line leading thereto, 7 a vertical mixing chamber or passage having an air inlet 8, 9 denotes a vertically slidable fuel nozzle, and 10 has reference to a gravity lowered suction-raised air valve which normally rests upon a seat 11 at the upper end of the passage 7. The rise of fuel into the nozzle 9 is controlled in the usual way, namely, by a float valve in the bowl 5 for controlling the fuel level in the latter, the bowl and nozzle being in communication through known means forming no part of the present invention. The intake manifold 13 is coupled in the usual manner to the upper end of the carbureter and forms a continuation of the passage 7. At low engine speeds, air from the inlet 8 merely passes through small ports 14 which are formed in the valve 10 and converge to the upper end of the nozzle 9. At high speed, however, the suction of the motor elevates the valve 10 and air then passes around this valve. All of these features are known in the art and form no part of my invention except in connection with the new features of construction hereinafter described, and attention may here be invited to the fact that although description of these new features may be specific, variations may be made within the scope of the invention as claimed.

A spreader is provided for the fuel discharged from the nozzle 9, said spreader being preferably formed by the tapered lower end 15 of a vertical stem 16, said stem being mounted for vertical adjustment as hereinafter described so as to regulate the spreading of the fuel. The fuel is thrown outwardly by the spreader 15 and consequently must travel over the upper ends of the ports 14, with the result that all air passing through these ports necessarily comes into intimate contact with the fuel, whether the air be passing only through these ports or through them and around the valve 10. An annular air deflector 17 is provided above the valve 10 for inwardly directing the air which passes upwardly around said valve, so that this air also must come into intimate contact with the fuel spread by the spreader 15. At its lower end, the deflector 17 is substantially in contact with the manifold although a trivial space may exist, and this deflector decreases in diameter towards its upper end. This upper end, in the present showing, is provided with a plurality of spaced inwardly inclined fingers 18 which permit some of the intermingled air and gas to pass between them, although the greater part of the mixture is directed inwardly by said fingers, due to the fact that they are comparatively wide. What fuel and air does pass between the fingers does so only after being agitated and well mixed by contact therewith. Slightly above these fingers and extending entirely over the space surrounded by them, is a plate 19 having such formations as to thoroughly agitate the ascending air and fuel. In the present showing, plate 19 is radially slit and the portions of the plate between the slits are bent to provide pitched vanes 20 and 20ª, the vanes 20 being all pitched in one direction and the vanes 20ª

in the other direction so that violent agitation of the air and the entrained fuel will be produced to effect homogeneous mixture for passage to the engine cylinders. In the present showing, a number of the vanes 20 are somewhat narrower than the others and the plate 19 is provided with vertical legs 21 integral with the outer ends of said narrow vanes and projecting downwardly therefrom. These legs pass downwardly within the air deflector 17, are rigidly secured in bifurcated lugs 22 which project inwardly from said deflector, and have their lower ends 23 soldered or otherwise secured to the valve 10. Thus, as this valve moves vertically, the parts 17—18—19—21 move with it as a single unit. Moreover, the stem 16 is carried by the plate 19 and hence it moves also so as to maintain its proper relation with the discharge orifice 9^a of the nozzle 9. The stem 16 is threaded through a central boss 24 on the plate 19, permitting adjustment of said stem to obtain the best results, and a lock nut 25 is provided for holding this stem in adjusted position.

When the motor is running at relatively low speed all air passing through the ports 14 must contact with the outwardly spread fuel from the orifice 9^a of the nozzle 9 and consequently intimate contact of the air and fuel takes place and all of this partially mixed air and fuel must pass through the superposed agitating means before it reaches the engine cylinders, insuring thorough mixture and good results. When the motor is running at a greater speed, the suction produced unseats the valve 10 to a greater or lesser extent and the high speed air then passes around the valve 10. This air encounters the deflector 17 which directs it inwardly away from the wall of the passage 7—13, so that this air also must contact with the fuel which is outwardly spread by the spreader 15. Hence, good initial mixing of air and fuel takes place and by the time all of the mixture passes the agitating means at the upper end of the deflector 17, a homogeneous and comparatively dry mixture has been produced giving excellent results. In actual operation of an automobile equipped with the invention, I have increased the efficiency of the motor by 15% and have reduced the fuel consumption about 30%. These advantageous results were obtained by the relation of the new features of construction with the previously old type of carbureter herein illustrated. It is to be understood that the various parts need not necessarily be used in the exact positions herein disclosed and hence such terms as "upper", "lower", "vertically", etc., are to be considered as relative rather than limiting.

I claim:—

1. In a carbureting means embodying a passage, a vertically slidable fuel nozzle in said passage, a suction-raised air valve around and secured to the upper end of said nozzle, said passage having an air inlet below said valve and the latter being formed with air ports from its lower side to the upper end of said nozzle; a vertical stem having a pointed lower end disposed at the delivery end of said nozzle for spreading the fuel and directing it over the upper ends of said air ports to insure intimate contact of fuel and air, an annular air deflector over said valve for inwardly directing air passing around the valve to insure contact of this air also with the fuel, and an air and fuel agitator above said air valve through which all air and fuel must pass, said stem, deflector and agitator being unitarily connected with each other and mounted on said air valve for movement therewith.

2. In a carbureting means embodying a passage, a vertically slidable fuel nozzle in said passage, a suction-raised air valve around and secured to the upper end of said nozzle, said passage having an air inlet below said valve and the latter being formed with air ports from its lower side to the upper end of said nozzle; legs secured to and rising from said air valve, a plate supported by said legs and having air and fuel agitating formations, a vertical stem threaded through said plate and having a pointed lower end disposed at the upper end of said nozzle for spreading the fuel therefrom and directing it over the upper ends of said ports to insure intimate contact of fuel and air, and an annular air deflector surrounding and secured to said legs for inwardly directing air passing around said air valve and insuring contact thereof with the spread fuel.

3. In a carbureting means embodying a passage, a suction-raised air valve in said passage, and a fuel nozzle mounted centrally with respect to said air valve and having its upper end near the upper end of said valve, said air valve having air ports from its lower to its upper side and converging toward said upper end of the nozzle; a vertical stem having a fuel spreading formation over said nozzle for spreading the fuel over said air ports, an annular air deflector in said passage over said air valve for inwardly directing air passing around said valve, and an air and fuel agitator above said nozzle through which all air and fuel must pass, said stem, deflector and agitator being unitarily connected with each other and mounted on said air valve for movement therewith.

4. In a carbureting means embodying a passage, and a fuel nozzle and suction-raised air valve in said passage; legs secured to and rising from said air valve, a plate

supported by said legs and having air and fuel agitating formations, a vertical stem projecting downwardly from said plate and having a fuel spreading formation at its lower end disposed over said nozzle, and an annular air deflector secured to said legs for inwardly directing air passing around said valve.

5. A structure as specified in claim 4; said agitating formations being spaced above said air deflector, and a plurality of circumferentially spaced inwardly inclined fingers rising from said air deflector substantially to said agitating formations.

In testimony whereof I have hereunto affixed my signature.

CHARLES A. MUSALL.