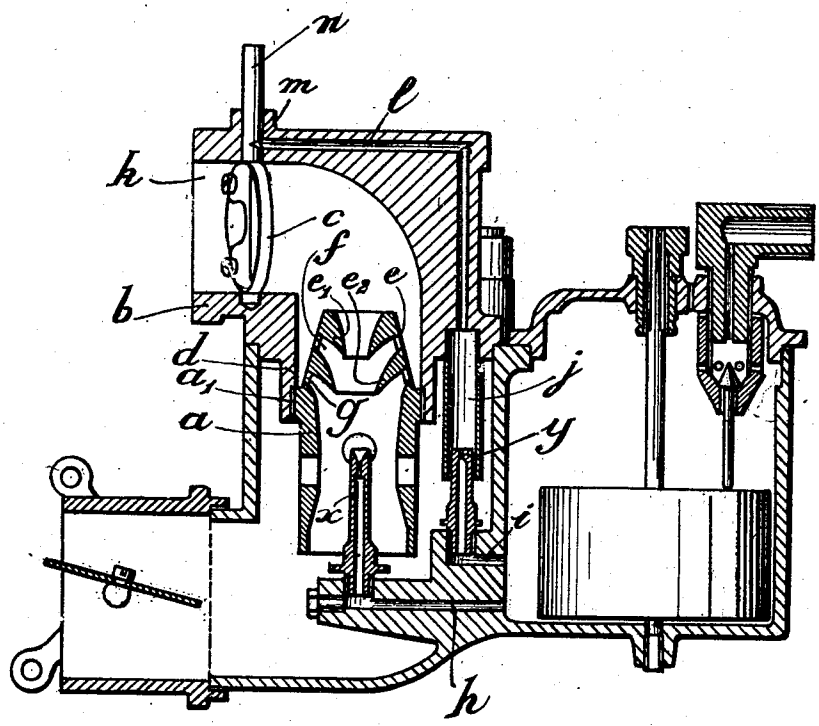
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CARBURETOR

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Fig. 1.



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Fig. 2.

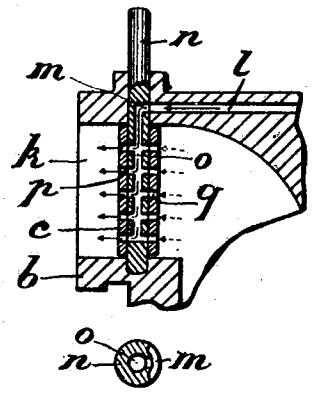


Fig. 3.

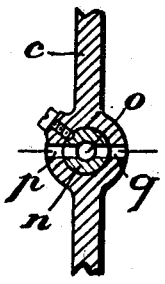


Fig. 4.

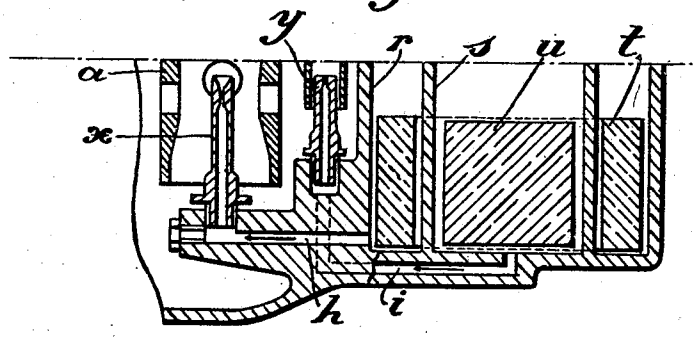
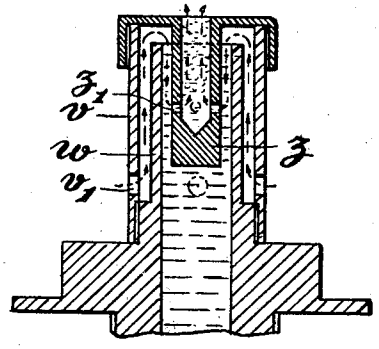


Fig. 5.



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UNITED STATES PATENT OFFICE

PAUL MEUNIER, OF FLEURUS, BELGIUM

CARBURETOR

Application filed May 19, 1927, Serial No. 192,715, and in France and Luxemburg December 13, 1926.

The present invention consists in providing a carburetor having a diffuser with radial air intakes, disposed in several rows if necessary, and situated approximately at the tops of the main and of the low speed nozzles which are both fed by the same gasoline pipe.

Such air intakes, which really furnish the main air supply, are used for the purpose of insuring a particularly energetic agitation of the carbureted mixture formed in the diffusers and of thus obtaining a more homogeneous mixture as well as a more rapid ignition of the latter, i. e. a more complete combustion giving therefore a better thermal efficiency for all operating conditions.

In order to further improve the results thus obtained, the invention provides in addition for the use of a main diffuser the tapered top of which is formed by bell shaped members forming together a bell mouth surrounded by annular passageways, which have the effect of producing a very strong turbulence in the carbureted mixture and of thus avoiding any condensation before admission to the engine cylinders.

Moreover, in order to improve the operation at low speed, while insuring more rapid and uniform acceleration, the invention provides for feeding the main nozzle and the low speed nozzle through separate pipes.

In addition, the butterfly throttle valve can be designed so as to enable the explosive mixture suitable for operating the engine at low speed, to be obtained by means of the adjusting screw cooperating with the closing stop and impoverishing the mixture coming from the low speed nozzle with air drawn through one or several air intakes on the main diffuser, it being thus possible to suitably reduce the richness of the mixture given by the low speed nozzle, which is that necessary for proper acceleration.

Moreover by a special form of construction, the invention provides for the combination of two separate concentric float chambers, for the purpose of enabling heavy oils to be used. The outer chamber containing an annular float is supplied with the heavy hydrocarbon and feeds the main nozzle, while the inner chamber with an ordinary float is supplied with gasoline or other light fuel and feeds the low speed nozzle.

The invention finally provides that, for using residual oils, the main nozzle must be formed by an emulsifier, so as to overcome the viscosity of the oil and to enable the latter to be more easily atomized by the mixing intakes and bell mouths in the diffuser. By way of example, several forms of construction embodying the invention are described below in reference to the accompanying drawings, in which:

Fig. 1 is a vertical axial section of a carburetor built according to one of the forms of construction provided by the invention.

Fig. 2 is a partial vertical axial section, of the butterfly valve in a carburetor designed according to a special form of construction of the invention.

Fig. 3 is a horizontal axial section of the butterfly valve shown in Fig. 2.

Fig. 4 is a partial section of a carburetor with two separate float chambers, for using heavy oils.

Fig. 5 is a vertical axial section showing details of an emulsifier substituted for the main nozzle in case mineral residual is used.

According to the form of construction shown in Fig. 1, the straight part q of the main diffuser acting on the main nozzle x, is screwed at a_1 into the connecting fitting b containing the butterfly valve c and mounted on the engine intake. The said diffuser also has a tapered part e extending into the straight vertical passage in the said fitting and shaped inside so as to form a double bell mouth. This tapered extension is actually made as if it were composed of two funnels e_1 e_2 nested together but held a certain distance apart so as to leave an annular passage f between them, the lower funnel e_2 covering the flared upper opening of the diffuser but leaving an annular passage g.

The said annular passages f and g are narrow toward the outside, so that the explosive mixture passing through them is subjected to a throttling action and is directed in broken annular streams against the walls of the straight passage in the fitting b.

The said mixture thus divided, baffled,

throttled and broken, is therefore in a very "turbulent" condition on leaving the diffuser, and no condensation can occur.

The fuel is supplied to the main nozzle x through the conduit h.

The auxiliary nozzle y, fed by a special canal i, discharges into the diffuser which is connected to the carburetor outlet opening k through the canal l opening into an annular groove m in the stem n of the butterfly valve c. The said groove m communicates with the said outlet opening by a suitable passage, not shown.

In this case also, the explosive mixture from the low speed nozzle is subjected to an energetic agitation, to sudden changes of direction and to throttling which, on account of the high velocity of flow, put the said mixture into a very "turbulent" condition.

In addition, it is to be noted that the outlet opening on the main nozzle, and if necessary that on the compensating nozzle, is preferably funnel shaped or similarly flared, so that a certain reserve quantity of combustible liquid will always be available in the said funnel in order to facilitate starting and accelerating the engine fed through the carburetor.

It will be understood that under such conditions a carburetor built according to the invention will permit the utilization, with perfectly satisfactory results, of heavy oils the use of which is becoming general especially with heavy vehicles, on account of the economy obtained.

Evidently, the invention is not limited to providing two bell mouths in the diffuser. The number of such bell mouths can be increased and the area of the annular passages can be varied from one bell mouth to another.

In the form of construction shown in Figs. 2 and 3, the butterfly valve c can also be designed so that it will be possible to obtain a mixture suitable for low speed operation by means of the adjusting screw co-operating with the closing stop (not shown) by reducing the richness of the mixture coming from the low speed nozzle y with air taken from the main diffuser through one or several inlets such as q. The said low speed nozzle is in this case connected to the carburetor outlet opening k by the conduit l opening into a groove or notch m in the butterfly valve stem n, and by a vertical conduit o communicating with one or several openings p directed towards the engine and preferably coinciding with the air intake openings q. It is evident that the notch m will be designed with a suitable length so that the communication with the conduit conducting the low speed mixture will be cut off as soon as the engine has accelerated, i. e. when the latter receives a sufficient supply of fuel from the main nozzle.

In order to enable heavy oils to be used, the invention provides for the use of two concentric float chambers r and s, of different diameters, in a single carburetor. The outer chamber r, intended for receiving the heavy hydrocarbon, contains an annular float t and communicates with the main nozzle x through a supply conduit h while the central chamber q with an ordinary float u and containing the gasoline, communicates with the low speed nozzle through the conduit i.

In this way the motor is easily started in any weather and operated at low speed by light fuel fed through the low speed nozzle. Acceleration is insured by the addition of gasoline to the heavy hydrocarbon fed from the main nozzle, up to the moment when the notch provided in the butterfly valve stem no longer communicates with the conduit conducting the mixture from the low speed nozzle, on account of the angular movement of the said butterfly valve. At this moment, the main nozzle only will feed the engine. Heavy hydrocarbons such as kerosene, catalytic gasoline, heavy benzole, etc. can be used.

Fig. 5 shows a type of main nozzle designed especially in view of the use of residual petroleum. This nozzle, which acts as an emulsifier, is composed of a tube w into which is inserted the tubular part of a cap z supported by a sleeve v surrounding the tube w and provided with air intake openings.

The central tubular part of the cap z is also provided with openings z_1 enabling the liquid filling the tube w to pass into the said part. This arrangement has the effect of setting up a circulation of air passing through the liquid in the direction indicated by the arrows, and of thus producing an emulsion of the residual oil for the purpose of overcoming its viscosity and helping the air passages and bell mouths in the diffuser to atomize it.

Claim:

In a carburetor for internal combustion engines, a diffuser formed by a Venturi tube, a cross head of exterior truncated form surmounting this tube, and having a central, widened opening in the top, said head also having its wall thickened and overhanging on the inner side and provided with annular passages, one above another, said bent passages extending upwardly and outwardly and narrowing from the interior toward the conical surface of the said head.

In witness whereof I affix my signature.

PAUL MEUNIER.