

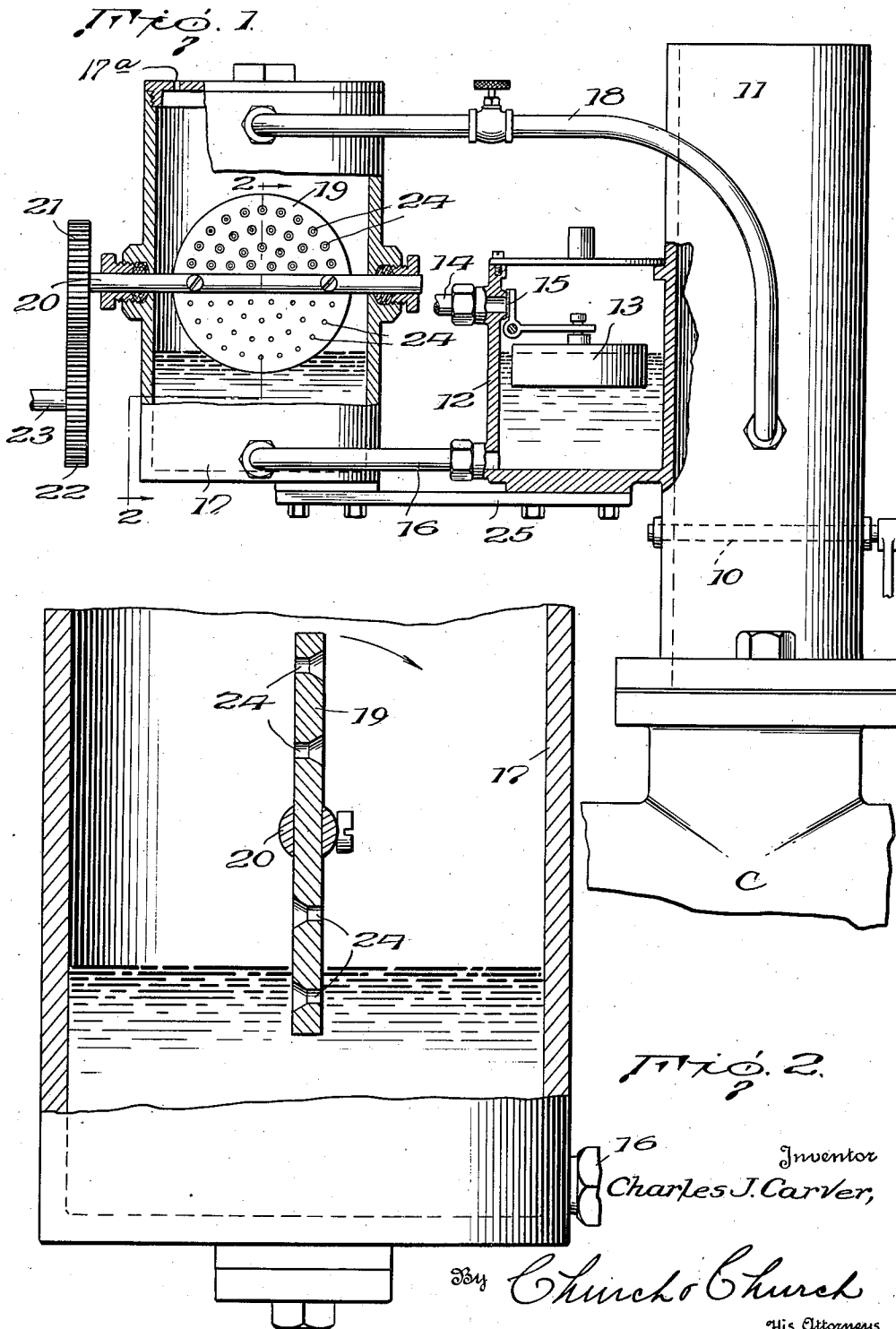
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C. J. CARVER

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FUEL FEEDING ATTACHMENT FOR CARBURETORS

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FUEL FEEDING ATTACHMENT FOR
CARBURETORS

Charles J. Carver, Berryville, Va., assignor, by direct and mesne assignments, of sixty per cent to Ernest A. Carper and twenty per cent to Goodwin G. Baker, both of Winchester, Va., and twenty per cent to Ansel B. Solenberger, Winchester, Va.

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3 Claims. (Cl. 299—63)

This invention relates to improvements in fuel feeding attachments for carburetors.

Primarily, the object of the invention is to preliminarily treat, so to speak, the liquid fuel used in internal combustion engines and the like before it reaches the carburetor, in order to produce a state or condition of the fuel whereby it will be more efficiently vaporized when fed into the combustion chambers of the engine.

More particularly, the invention contemplates an attachment for carburetors by means of which the liquid fuel supplied to the carburetor will be fed to that unit in a finely divided state, whereby the minute globules can be more thoroughly vaporized by that unit and thus be supplied to the combustion chambers of the engine in a state which will insure a higher efficiency in the operation of the engine.

More specifically, the invention comprises a receptacle in which the liquid fuel is maintained at a substantially constant level with means in the interior of said receptacle for more or less violently agitating the liquid and breaking it up so as to reduce it to a finely divided state, in which condition it is conveyed from the receptacle to the carburetor.

Another object of the present invention is to provide agitating means which will require a minimum amount of power for its operation, this being accomplished by the use of a perforated disc mounted upon a shaft within the receptacle before mentioned at a point above the liquid level in said receptacle and spaced from said liquid level a distance such that peripheral portions only of the disc enter the body of liquid to be agitated. In this way, a minimum amount of resistance is encountered by the disc as it impinges against, or passes through, the body of liquid.

A still further object is to provide means for effectively reducing the liquid fuel to a finely divided state in said receptacle, such means consisting in forming the apertures in said disc of gradually diminishing cross-section in a direction rearwardly from the leading face of the disc.

With these and other objects in view, the invention consists in certain details of construction and combinations and arrangements of parts, all as will hereinafter be more fully described, and the novel features thereof particularly pointed out in the appended claims.

In the accompanying drawing—

Figure 1 is an elevational view, partly in section, illustrating the present attachment asso-

ciated with a fuel carburetor, the latter being indicated more or less diagrammatically; and

Fig. 2 is an enlarged sectional view on the line 2—2 of Fig. 1.

As is well understood, in the down-draft type of carburetor illustrated in the present instance, the air for the fuel mixture is supplied to the carburetor, shown more or less diagrammatically at C, through an air inlet pipe 11. The flow through pipe 11 is controlled by a butterfly valve 13 therein and the fuel mixture is drawn by suction to and through the carburetor to the combustion chambers of the engine. In accordance with the present invention, it is proposed that the fuel supplied to the carburetor C shall be fed to that device in a finely divided state, so that vaporization thereof by the carburetor is greatly facilitated and the efficiency of the motor increased. In the preferred embodiment of the apparatus, as illustrated in the drawing, the liquid fuel is fed from the source of supply to a float chamber 12 having a float 13 therein for the purpose of controlling the supply of fuel to said chamber, the supply of fuel being checked when the level of the fuel in said chamber rises to a point where the flow of fuel into the chamber through a pipe 14 is cut off by a valve 15 actuated by said float. Chamber 12 may be supported in any suitable fashion, in the present instance being shown as supported on the side of pipe 11.

From chamber 12, the fuel flows through a pipe 16 to a receptacle 17 in which the fuel will be maintained at a level corresponding to that in float chamber 12, as will be readily understood. Pipe 16 communicates with the lower end of receptacle 17 and extending from the upper portion of said receptacle is a discharge pipe 18, which discharges into pipe 11 and, hence, communicates with the carburetor mechanism. In order that fuel in receptacle 17 will be broken up, so to speak, or reduced to a finely divided state before it reaches the carburetor, means are provided in the interior of receptacle 17 for more or less violently agitating the body of fuel therein. Preferably, these agitating means comprise a disc 19 mounted on a shaft 20 journaled in the side walls of receptacle 17 and adapted to be driven from any suitable source of power. In the present instance, said shaft 20 is illustrated as being provided with a gear 21 meshing with a gear 22 on shaft 23, to which power is transmitted from a suitable source.

The spacing of shaft 20 from the normal level of fuel in receptacle 17, and the diameter of the

disc 19 is such that only the peripheral portion of the disc will enter the body of fuel in the receptacle. In the present instance, the disc fixed on the shaft 20 is rotated so that opposite edge portions of said disc alternately enter the upper portion of a body of fuel. Shaft 20 is driven at a sufficiently high speed to not only agitate the upper strata, so to speak, of the body of fuel in receptacle 17, but the opposite edge portions of disc 19 pass through the body of fuel in such rapid sequence that small quantities of the fuel are constantly thrown into the upper portion of the receptacle so that, in normal operation, there will be a large number of these particles in the otherwise unfilled portion of the receptacle. The float valve 15 maintains the level of the liquid at a point to provide this air space in the upper portion of the receptacle. An orifice 17^a permits air to enter this air space in the upper portion of the receptacle. This is an important feature in the present device because, as the opposite halves of the disc pass through this field of more or less suspended particles, the latter are broken down into still smaller globules. To further aid in reducing the fuel to a very finely divided state, the disc is provided with a multiplicity of perforations 24 which not only facilitate the breaking up of the fuel as the edge portions of the disc impinge against and pass through the body of fuel in the receptacle but, in addition, the presence of these perforations cause any particles of fuel suspended in the upper portion of the receptacle on their way to the outlet opening to be more thoroughly broken up.

The efficiency of the perforated disc is still further augmented by the peculiar cross-sectional shape of perforations 24. Assuming disc 19 is rotated in the direction of the arrow in Fig. 2, the forward portion of each aperture tapers or is gradually restricted inwardly or rearwardly from what might be termed the leading face portion of the disc. This tapering preferably extends to a point midway the thickness of the disc and, from this point to the opposite face of the disc, the aperture is preferably of a uniform or constant cross-sectional area. Hence, a globule entering the enlarged portion of an aperture in the rapidly moving disc, and passing there-through, will first be subjected to a gradually increasing pressure with the result that it will tend to expand and break up into smaller particles as it is discharged from the restricted portion of the aperture at the rear or following face portion of said disc. Again, the enlarged forward portion of the aperture facilitates entry of liquid globules into the aperture and, regardless of the feature of placing pressure on the globules, each globule passing through an aperture is broken into smaller particles as it is thrown off the rear face of the rapidly moving disc.

As shown, the apertures in opposite halves of

the disc, or at opposite sides of shaft 20 are reversely formed, so that the flared portions of the two groups of apertures are located at the leading face of the disc.

If desired, receptacle 17 may be mounted on a bracket 25 secured to float chamber 12. From the foregoing, it will be readily appreciated that the present apparatus not only increases the efficiency of the motor to which the fuel is supplied, but the structural details of the attachment, and the arrangement of the several elements thereof is such that the apparatus will function efficiently on a minimum quantity of fuel. Furthermore, the simplicity of the structure is such that there is very little likelihood of the same accidentally becoming inoperative and, while there is practically no wear on the few parts employed, nevertheless any part of the mechanism may be readily renewed.

What I claim is:

1. In a liquid fuel feeding attachment for carburetors, the combination of a receptacle, means for supplying the liquid to said receptacle, means for maintaining an air space in the upper portion of the receptacle, a plate rotatable about its diameter as an axis, said plate being positioned with respect to liquid in the receptacle to cause at least portions of the plate to pass through said liquid, said portions of the plate having apertures therein with the entrance to each aperture tapering inwardly, and a discharge conduit leading from the upper portion of the receptacle.

2. In a liquid fuel feeding attachment for carburetors, the combination of a receptacle, means for supplying the liquid to said receptacle, means for maintaining an air space in the upper portion of the receptacle, a plate having a plurality of apertures extending therethrough, said plate being revoluble about its diameter as an axis to pass the apertured portions thereof through liquid in the receptacle, the end portions of said apertures being tapered inwardly and the apertures at opposite sides of the axis of rotation of the plate being reversely tapered, and a discharge conduit leading from said receptacle.

3. In a liquid fuel feeding attachment for carburetors, the combination of a receptacle, means for supplying liquid to said receptacle, means for maintaining an air space in the upper portion of the receptacle, a disk having openings extending therethrough, means for rotating said disk flatwise to submerge it at peripheral portions thereof in the liquid, the forward portion of each opening being tapered inwardly from the leading face of the disk to a point approximately medial of the thickness of the disk with the remainder of each opening of uniform cross-sectional area, and a discharge conduit for said receptacle.

CHARLES J. CARVER.