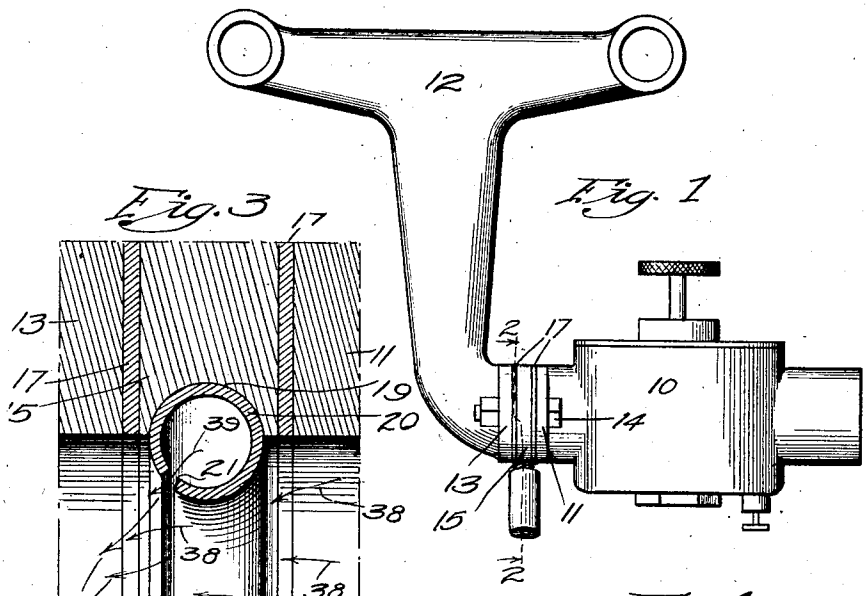
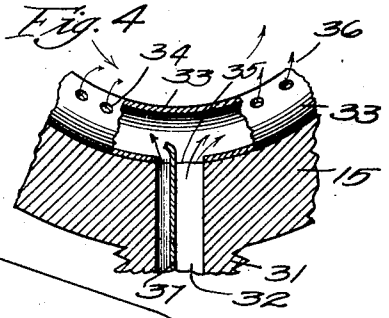
May 22, 1923. 1,456,213

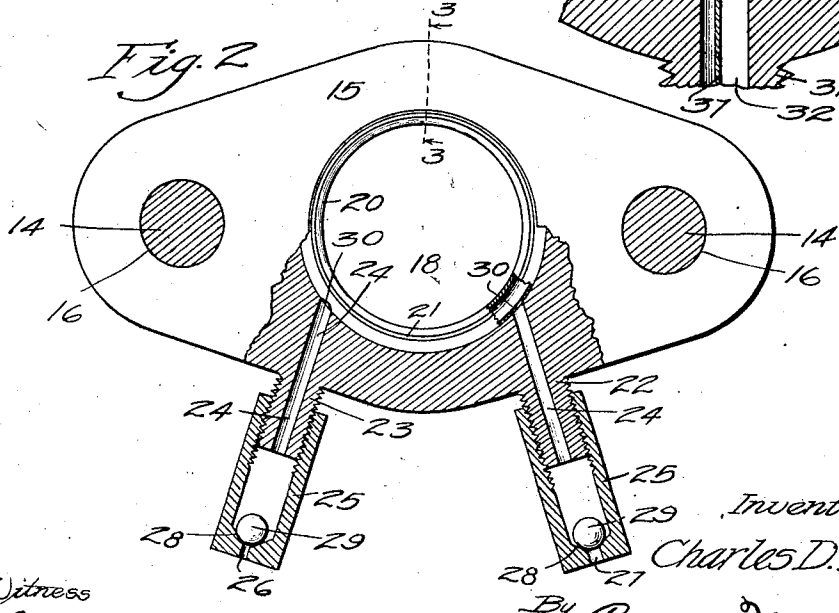
C. D. BOWLES

CARBURETOR ATTACHMENT

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UNITED STATES PATENT OFFICE.

CHARLES D. BOWLES, OF DES MOINES, IOWA.

CARBURETOR ATTACHMENT.

Application filed July 30, 1921. Serial No. 488,546.

To all whom it may concern:

Be it known that I, CHARLES D. BOWLES, a citizen of the United States, residing at Des Moines, in the county of Polk and State of Iowa, have invented a certain new and useful Carburetor Attachment, of which the following is a specification.

The object of my invention is to provide a carburetor attachment adapted to be interposed in the path of travel of the fuel mixture from the carburetor to the engine, the parts being of simple, durable and comparatively inexpensive construction.

More particularly my invention relates to an auxiliary air attachment for carburetors adapted to be placed between the carburetor and the intake manifold of the engine; the auxiliary air device being so arranged that an annular spray of air is shot inwardly towards the center of the path of travel of the fuel mixture, whereby any unvaporized gas will be carried inwardly by the spray of air from the air device and become thoroughly mixed with the thoroughly vaporized gases.

It is well known that the heavier particles of gases which are not thoroughly vaporized hang near or flow along as a film on the walls of the intake manifold and when received in the cylinders and the explosion occurs the heavier particles of gases form carbon, which adheres to the cylinder walls.

My device is designed to provide an annular jet of air flowing into the fuel passage from position entirely surrounding the column of fuel into the center of such column, carrying with it all fuel flowing along the passage wall and breaking it up and thus supplying such fuel in proper form to the cylinders, and preventing the feeding of raw gasoline or the like.

While one advantage is the preventing of carbon being formed, at the same time the heavier particles of gases which have been moved by my device towards the center of the path of travel of the gases will cause a better combustion to be had, thus adding to the efficiency and power of the engine. The adding of power and efficiency means that I am able to get more miles per gallon of gasolene than when my device is not used.

Still another object is to provide a pair of intake openings for securing air to the distributing ring, the air intake openings being of substantially different sizes so that the intake from one being greater than the other, it will cause to a certain extent a whirling motion to be given to the air discharged from the sprayer ring.

With these and other objects in view my invention consists in the construction, arrangement and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claim, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of an intake manifold and carburetor with my improved attachment installed therebetween.

Figure 2 is a sectional view taken on line 2—2 of Figure 1, parts being broken away and shown in section to better illustrate the construction of my device.

Figure 3 is a central, vertical, sectional view taken on the line 3—3 of Figure 2, the parts being shown greatly enlarged to more clearly bring out the construction; and

Figure 4 is a detail, sectional view of a slightly modified form of device.

In the accompanying drawings I have used the reference numeral 10 to indicate an ordinary carburetor which is provided with a flange 11 at its discharge end. An intake manifold 12 of the ordinary construction is provided which has a flange 13 formed thereon; which flange 13 is designed to normally rest against the flange 11 of the carburetor.

The flanges 11 and 13 are each provided with openings through which are normally extended bolts 14 for securely holding them together.

My improved carburetor attachment is designed to be received between the flanges 11 and 13.

My device consists of a plate 15 of substantially the same outline as the flanges 11 and 13 and is provided with a pair of openings 16 near its ends, which openings register with the openings in the flanges 11 and 13 so that the bolts 14 may be extended therethrough for holding the plate 15 of my device between the flanges 11 and 13.

I provide gaskets 17 on each side of the plate 15 so that a tight joint may be had between the plate 15 and the flanges on each of its sides.

The plate 15 is provided with an enlarged central opening 18 which is in alignment with the opening in the intake manifold 12 and the discharge openings of the carburetor 10.

The edge of the opening 18 is provided with an annular groove 19 which is designed to receive a part of the tubular ring 20, as clearly illustrated in Figure 3 of the drawings. The tubular ring 20 may be welded in the groove 19, or otherwise secured therein.

The tubular ring 20 is provided with a slot 21 which is cut diagonally through the wall of the tubular ring 20, the purpose of which will be hereinafter more fully set forth.

The slot 21 is arranged substantially close to the inner surface of the plate 15 and faces the intake manifold 12.

The plate 15 is provided with a pair of extensions 22 which are exteriorly screw-threaded as at 23. The extensions 22 are provided with a central bore 24; caps 25 being provided with an interiorly screw-threaded portion are designed to be placed on the screw-threaded portion 23 of the extensions 22. Each of the caps 25 are provided with openings of different sizes.

An opening 26 in one of the caps is about half the size of the opening 27 in the other cap 25.

The caps 25 are provided with a valve seat 28; balls 29 are received within the caps 25 and are designed to rest upon the valve seat 28.

The bores 24 extend also through the plate 15 and communicate with the tubular ring 20 through the openings 30 arranged in the walls of the tubular ring 20.

From the construction of the parts just described it will be seen that when my device is placed in operative position as shown in Figure 1 of the drawings, the vacuum from the engine will cause the balls 29 to be raised off of their seats 28 thereby permitting air to be drawn through the openings 26 and 27, which air will pass into the ring 20 and from the ring 20 be discharged through the slot 21; the slot 21 being cut diagonally through the wall of the ring causes the spray of air which will be discharged from the ring 20 to be shot or moved towards a common center.

The spray of air will move towards the center of the incoming fuel mixture. Any of the heavier particles of gases which have passed from the carburetor and which normally cling to the walls of the manifold in their passing over the ring 20 will engage the spray of air which is being discharged through the slot 21 and will be shot inwardly with the thoroughly mixed fuel.

The advantage of moving heavy particles of gas to the center of the fuel mixture can readily be seen.

When the engine is traveling at a slow rate of speed the ball 29 which seals the small opening 26 will be first opened and air will be received in the ring 20 only through that opening.

When the engine is traveling at a high rate of speed and more fuel is being used the more air it is possible to mix with the fuel making the fuel more efficient.

When the engine is traveling at a high rate of speed the air will be sucked in through both the small opening 26 and the larger opening 27. In this way the proper portion of air is always received with the fuel mixture.

When the engine is traveling at a high rate of speed and air is being sucked in through each of the openings 26 and 27 about twice the amount of air will be taken in through the opening 27 as is taken in through the opening 26. The air thus taken in, due to the fact that it is received in different proportions through the openings 26 and 27 will cause, to a certain extent a whirling motion to be given to the air within the ring 20.

The air which is in a whirling condition in the ring 20 will be also in a whirling condition when discharged through the slot 21. In this way the air which is in a whirling condition will also be shot inwardly and towards the center of the fuel mixture, positively assuring me that all of the heavy particles of gases will be thoroughly mixed and carried towards the center of the fuel mixture.

In Figure 4 of the drawings I have shown a slightly modified form of device. In this form of device only one extension is provided which is referred to by the numeral 31. The extension 31 is screw-threaded similar to the extensions 22 and is designed to receive a cap 25.

The extension 31 is provided with a substantially large bore 32. A tubular ring 33 is provided similar to the ring 20. The ring 33 in place of having a continuous slot as is cut in the ring 20, it is provided with a series of spaced openings 34.

The ring 33 has an opening 35 in its side which opening communicates with the bore 32 of the extension 31.

From the construction of the parts just described it will be seen that the air drawn in through the bore 32 will be discharged into the ring 33 and pass out into the fuel mixture through the opening 35 as shown by the arrows 36.

In order to give the air within the ring 33 a whirling motion I provide what is called a divider plate 37 which divider plate is so spaced that about two-thirds of the air passes up one side and only one-third passes up the other side of it.

The divider plate with a single extension performs the same function as is performed when two extensions are used with openings of various sizes therein.

In Figure 3 of the drawings, the arrows 38 indicate the path of travel of the heavy

particles of gas while the arrows 39 indicate the direction of the spray of air which will be discharged from the ring 20.

The side of the ring 20 on the side toward the carburetor is bevelled or rounded. This gives the passage something of the ventura tube shape, so as to permit maximum flow, and the ring thus does not reduce the fuel mixture flow. Further this shape of the ring tends to cause the fuel mixture to be divided toward the center of the passage and the incoming air picks up the film of raw gasoline off the passage wall. This film is also aided in its flow along the wall to the opening in the ring by the bevelled or rounded shape and is carried inwardly and with the fuel mixture current away from the carburetor by the air jet.

The advantages of my device can readily be seen. The parts are simple and occupy only a minimum amount of space and can be completely assembled and ready to put into operation.

By arranging the plate 15 of various sizes and shapes I am able to make my device fit on to any type of manifold or type of carburetor.

Another advantage of my device is the equal distribution of the air which is drawn into the intake manifold through my attachment. The equal distributing of the air insures me that all of the heavy particles of gases will be taken care of and not permitted to follow the walls of the manifold and permit carbon to be formed in the cylinders.

Another advantage is the more thorough mixing of the gases so that a better combustion is had which increases the efficiency of the engine.

Some changes may be made in the construction and arrangement of the parts of my device without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claim, any modified forms of structure or use of mechanical equivalents, which may be reasonably included within its scope.

I claim as my invention:

A carburetor device, comprising a fuel passage having an annular chamber projecting into the path of travel of fuel passing through said passage, said chamber having its outer surface inclined to direct the fuel from the wall of the passage inwardly and having an annular slot located to admit air from said chamber to said passage for picking up the fuel on said surface, and means for admitting air to said chamber from the atmosphere, having an air inlet opening and a valve for coacting with said opening subject to actuation according to the degree of vacuum in the passage.

Des Moines, Iowa, July 27th, 1921.

CHARLES D. BOWLES.