

[54] AIR INTAKE SILENCER FOR INTERNAL COMBUSTION ENGINES

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[58] Field of Search 181/35 A, 33 K, 33 HA, 181/33 P; 55/510, 276, 418

[56] References Cited

UNITED STATES PATENTS

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[57] ABSTRACT

An air intake silencer for internal combustion engines to be attached directly to a carburetor intake having a large volume central chamber connected to the carburetor intake and surrounded by a peripheral tortuous passage feeding air from an outside inlet to the carburetor intake. The construction includes a gravity low point for the collection of fuel wherein it may be caught up into the incoming air stream and re-introduced into the engine. A relief valve is also provided to relieve the unit against back-fire pressures.

4 Claims, 5 Drawing Figures

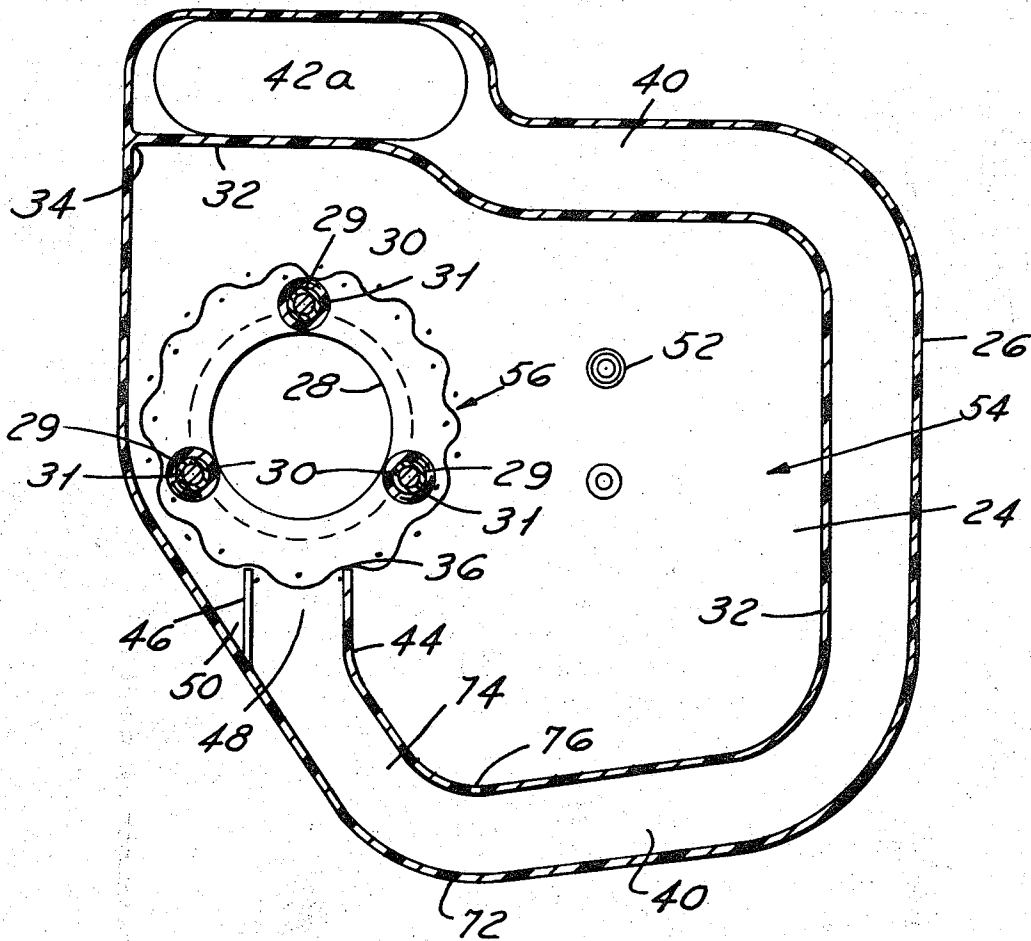


FIG. 1

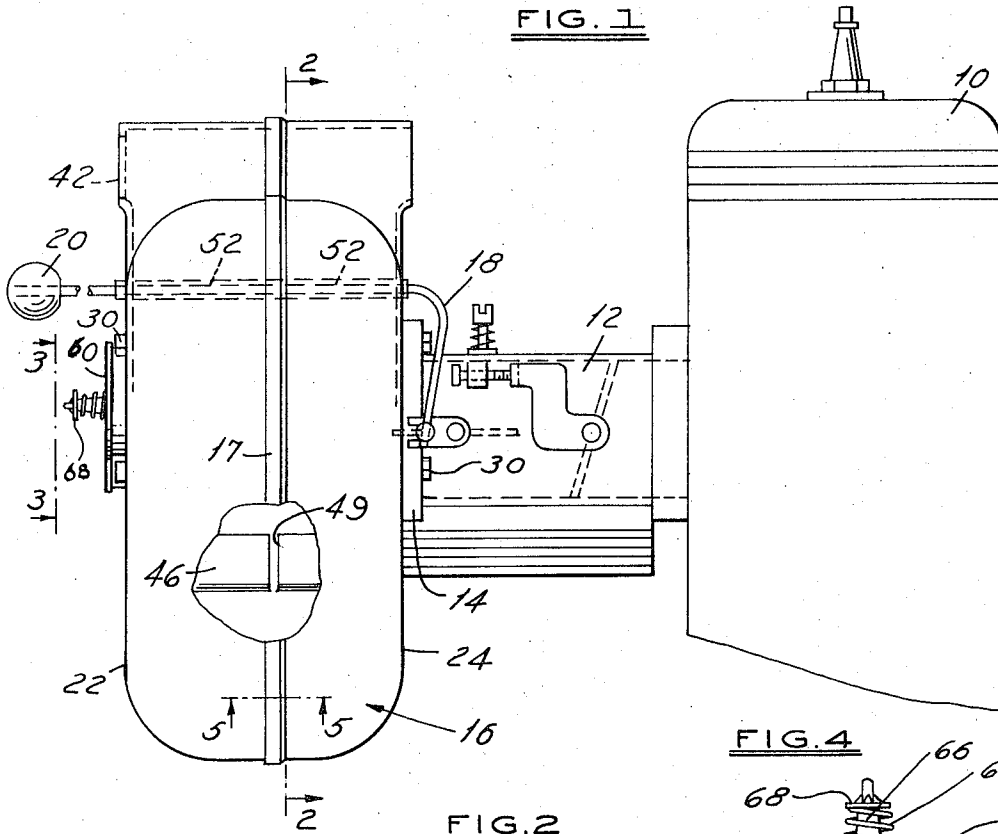


FIG. 2

FIG. 4

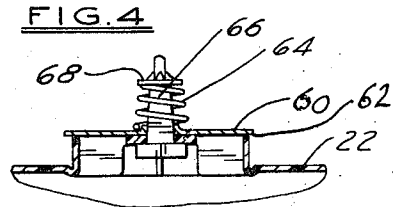


FIG. 3

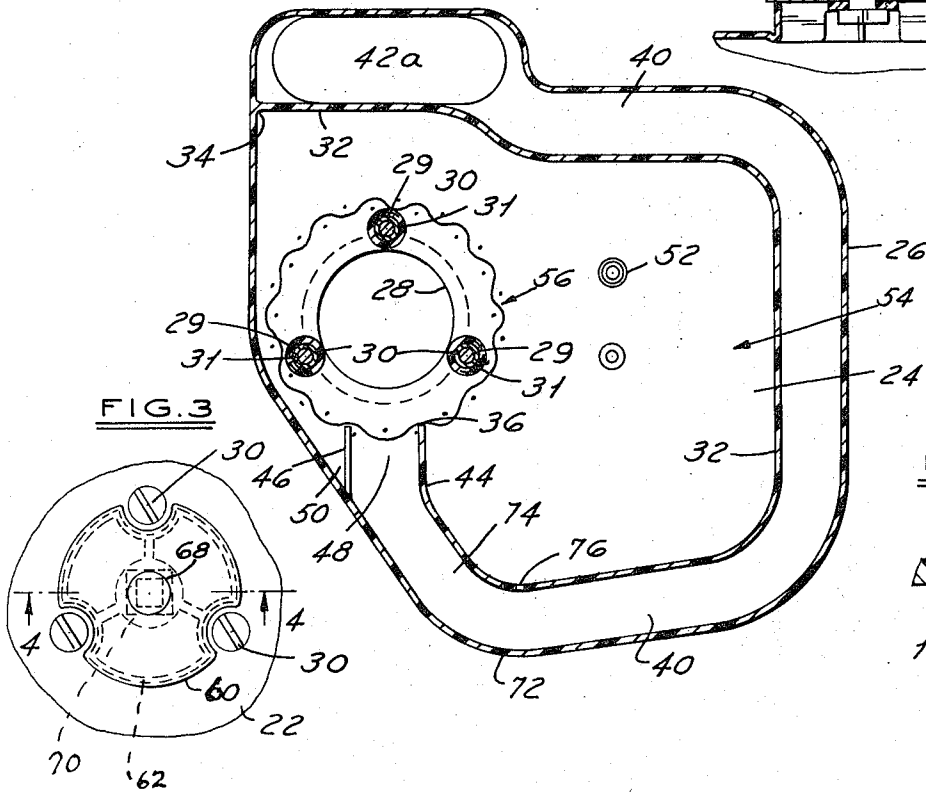
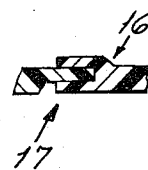


FIG. 5



AIR INTAKE SILENCER FOR INTERNAL COMBUSTION ENGINES

This invention relates to an Air Intake Silencer for Internal Combustion Engines and is more particularly directed to a construction for an air intake for carburetors which will reduce the amount of noise resulting from the rush of large volumes of air into a carburetor.

It is a further object of the invention to provide a structure which will permit fuel which is accidentally ejected from the carburetor to drain back into a pick-up area so that it will not be wasted and will not accumulate in places where it is not useful.

It is another object of the invention to provide a low-cost silencer construction which consumes a minimum amount of space and which can be attached directly to a carburetor as it is mounted on an engine.

Other objects and features of the invention relating to details of construction and operation will be apparent in the following description and claims in which the manner of use and the principles of operation are set forth together with the best mode presently contemplated for the practice of the invention.

DRAWINGS accompany the disclosure and the various views thereof may be briefly described as follows:

FIG. 1, a view of an air intake silencer mounted on a carburetor and an engine.

FIG. 2, a sectional view on line 2—2 of FIG. 1.

FIG. 3, an elevation at line 3—3 of FIG. 1.

FIG. 4, a sectional view of a relief valve construction taken on line 4—4 of FIG. 3.

FIG. 5, a sectional view taken on line 5—5 of FIG. 1.

REFERRING TO THE DRAWINGS

An internal combustion engine is shown diagrammatically at 10 with a carburetor 12 mounted thereon, the carburetor having an external flange 14 on which is mounted an air intake silencer housing 16. This housing is preferably formed of two substantially identical molded plastic shells having a good strength characteristic and joined together at a telescoping middle seam 17 shown in cross-section in FIG. 5.

A choke cable for the carburetor is shown at 18 operated by a handle 20, the cable passing through the air intake housing through suitable passages to be described. It will be seen that the air intake housing 16 is formed of relatively parallel and generally rectangular end walls 22 and 24 connected by a continuous side wall 26. The dimension between the end walls is approximately one-half that of the dimensions of the rectangular shape and while the end walls are essentially identical in many respects, one of them, namely, wall 24, has an opening 28 which registers with the air intake opening of the flange 14 of the carburetor. Around the opening 28 on the inside of the end walls of the shells are tubular extensions 29 which register with each other in assembly so that fastening bolts 30 can pass through these registering tubes to the fastening flange 14. Thus, the fastening bolts are protected from moisture and these tubular extensions 29 form a reinforcement between the walls to add strength and prevent undue vibration. The tubular extensions 29 are provided with steel tubes 31 which pass through the extensions to receive the bolts 30.

A second inner side wall 32 originates at a point 34 shown in FIG. 2 and terminates at another point 36. This wall extends in parallel relation to the outer wall 24 along the top, right side, and bottom as viewed in FIG. 2 to form a peripheral serpentine air passage 40. The intake opening for this passage is an elongate hole 42 in the end wall 22 at the upper right-hand corner as viewed in FIG. 1. This hole would have the same configuration as the closed panel opening 42a shown in FIG. 2 which can also serve as an optional opening in some installations. Spaced from the terminal portion 44 of the inner wall is a short stub wall 46 which completes the passage 40 as it discharges at 48 adjacent the carburetor opening 28.

The stub walls 46 projecting from each end wall toward each other are dimensioned to leave a small gap 49 centrally of the unit so that any fuel ejected from the carburetor will not remain in the pocket 50 behind the walls 46. A second series of registering tubes 52 are provided on each end wall to form a passage for the choke cable 18.

It will be seen, therefore, that the encircling portion 40 surrounds a large central chamber 54 and the passage 48 discharges into this chamber in proximity to the carburetor opening 28. The carburetor opening is surrounded by a screen filter which extends between the two end walls surrounding the posts 29 to form an air filter screen 56 and also a spark arrester. This large central chamber 54 may receive back-fire pressure from the carburetor and it is desirable that this chamber be provided with a relief valve which will relieve this pressure to prevent damage to the unit. This relief valve is located in one wall of the air silencer more particularly the outer wall 22 just opposite the inlet 28.

The outside view of this unit is shown in FIG. 3 in which the valve plate 60 closes against a valve seat 62 by reason of a resilient coil spring 64 surrounding a stem 66 and seated against a retainer ring 68. A supporting spider construction 70 in an opening in a wall 22 has a square opening through which the stem 66, which is preferably square, protrudes. This prevents rotation or displacement of the valve due to vibration.

It will be noted that the passage 40, as viewed in FIG. 2, extends to a low point 72 as it comes down the right-hand side and along a lower portion of the bottom run. It then rises in a section 74 to the outlet 48. The inner wall 32 of the passage has an opening 76 just at this low point. This opening 76 permits fuel which may "spit-back" from the engine into the central chamber 54 to flow down into the passage 40. This fuel can collect at this low point in the inner wall 32 and pass through the opening 76 so that the in-rushing air will carry it again into the carburetor. As previously pointed out, the opening 49 between the ends of the projections 46 will also permit fuel to reach this low point where it can again be picked up into the air supply.

Thus, in the completed assembly, air will enter either the port 42 or the alternate port 42a and pass through the tortuous passage 40 around the periphery of the unit to the central chamber 54 and the outlet 48 where it reaches the carburetor intake 28. This peripheral flow passage, together with the large central chamber opening 54, results in a silencing of the noise that otherwise might result from the in-rushing volume of air. In addition, the large volume chamber provides a space for blow-back which is adequately relieved if necessary and also serves as a muffling chamber for the engine

noise that may otherwise emit from the carburetor itself.

I claim:

1. An air intake silencer for internal combustion engines to be attached to a carburetor air intake passage which comprises:

a. a housing having relatively flat, parallel, generally rectangular, end walls connected by a continuous sidewall, the dimension between the end walls being approximately one-half that of the dimensions of the rectangle, one of said end walls having an inlet opening for air near a first top edge thereof and one outlet opening spaced from said inlet positioned near an adjacent second edge to be fastened in communication with a carburetor inlet opening,

b. a second side inner wall extending in substantially parallel relation to said first side wall along said first edge to a contiguous third edge opposite said second edge and then along a fourth edge to a point adjacent said outlet, the area dimension between said sidewalls being approximately that of the inlet opening to form a continuous, tortuous passage from said inlet to said outlet around a remaining central chamber within said walls,

c. said sidewalls being shaped along said fourth edge to descend to an extreme position below said first edge and to rise from said position toward said outlet, and an opening formed in said inner sidewall in the vicinity of said extreme position to permit accumulated fuel in said central chamber to flow to said passage.

2. An air intake silencer for internal combustion engines to be attached to a carburetor air intake passage which comprises:

a. an enclosed housing having an outlet opening in one side to be mounted adjacent a carburetor air inlet and an air inlet opening spaced from said outlet,

b. means forming a confined passage in conjunction with the walls of said housing leading tortuously from said inlet to said outlet and a relatively large central chamber surrounding said outlet,

c. said passage originating near the top of said housing as mounted and descending to a low point just upstream of said outlet, and

d. means forming a fuel drain passage leading from

said central chamber to said low point in said passage to permit accumulated fuel in said central chamber to drain into said passage and be picked up by inlet air flowing through said passage.

3. An air intake silencer for internal combustion engines to be attached to a carburetor air intake passage which comprises:

a. an enclosed housing having an outlet opening in one side to be mounted adjacent a carburetor air inlet and an air inlet opening spaced from said outlet,

b. means forming a confined passage in conjunction with the walls of said housing leading tortuously from said inlet to said outlet and a relatively large central chamber surrounding said outlet, and

c. a unidirectional relief valve disposed in a wall of said housing in communication with said central chamber to relieve excessive pressure within said housing due to engine backfire.

4. An air intake silencer for internal combustion engines to be attached to a carburetor air intake passage which comprises:

a. a housing having relatively flat, parallel, generally rectangular, end walls connected by a continuous sidewall, the dimension between the end walls being approximately one-half that of the dimensions of the rectangle, one of said end walls having an inlet opening for air near a first top edge thereof and one outlet opening spaced from said inlet positioned near an adjacent second edge to be fastened in communication with a carburetor inlet opening,

b. a second side inner wall extending in substantially parallel relation to said first side wall along said first edge to a contiguous third edge opposite said second edge and then along a fourth edge to a point adjacent said outlet, the area dimension between said sidewalls being approximately that of the inlet opening to form a continuous, tortuous passage from said inlet to said outlet around a remaining central chamber within said walls, and

c. a unidirectional relief valve disposed in a wall of said housing in communication with said central chamber to relief excessive pressure within said housing due to engine backfire.

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