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P. M. CLAYTON
AIR CLEANER ATTACHING MEANS

3,174,775

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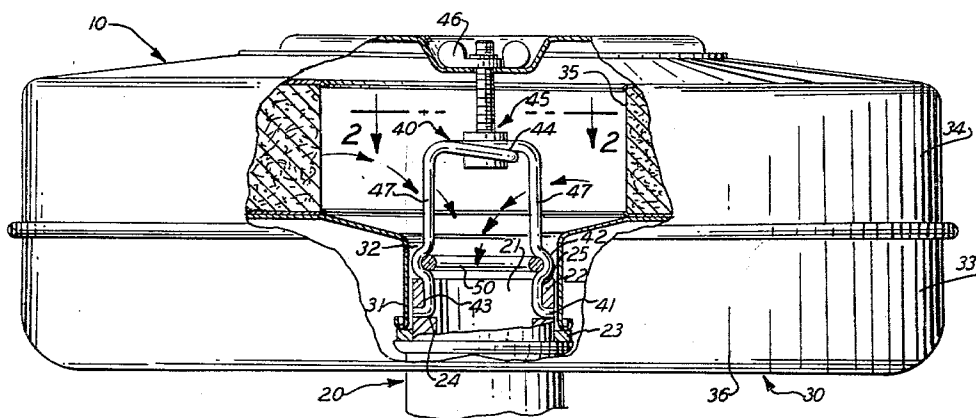


FIG. 1

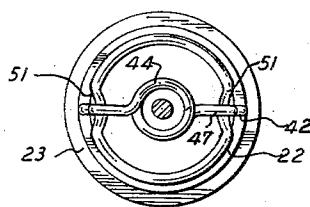


FIG. 2

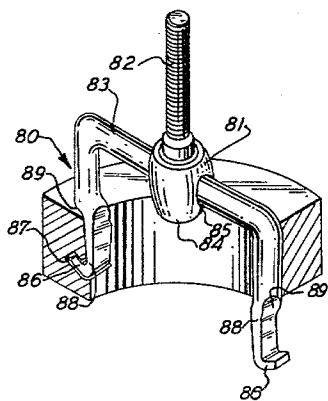


FIG. 3

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AIR CLEANER ATTACHING MEANS

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This invention relates to a fluid conduit for use with internal combustion engines for automotive and other purposes. More particularly, this invention relates to an air intake system which includes a means for attaching an air supply device to an air inlet. The air inlet may be the air horn of a carburetor, and the air supply device may be an air cleaner.

The invention hereinafter described in detail includes a bail member which is attached to the interior of an air inlet means. The bail member is held in a fixed position by urging a plurality of bail legs into contact with an internal retaining means or more particularly with holes placed in the air inlet means. The bail member is also secured to an air supply device so that the air supply device is held in a fixed relation to the air inlet means. The bail member may also serve to hold the parts of the air supply device together.

It should be understood that although the preferred embodiment embraces an air supply device and air inlet means, it is within the scope of the invention to employ the disclosed device in combination with any fluid conduit system.

The object of this invention is to provide a means for connecting a fluid conduit device to a fluid inlet means.

Another object of this invention is to provide a means for connecting an air supply device to an air inlet means and for holding the air supply device in an assembled relationship.

Other objects and advantages of the invention will become apparent as the detailed description is read in conjunction with the accompanying drawings, wherein:

FIGURE 1 is a fragmentary cross sectional view of an air intake system for an internal combustion engine utilizing the invention.

FIGURE 2 is a cross section of the device taken along line 2-2 of FIGURE 1.

FIGURE 3 is another embodiment of the bail member utilized in the invention.

Referring to FIGURE 1, the fluid supply system or more particularly the air supply system 10 includes fluid or air inlet means 20. The air inlet means 20 may form a part of the carburetor or other means included within the induction system of an internal combustion engine. The air inlet means 20 has an internal portion 25 that is formed to provide an air passage 21 through which air may flow.

In order to supply clean air to the air passage 21, and to attenuate sounds resulting from the operation of the engine, and that may emanate from the air passage 21, it is desirable to employ a fluid conduit or more particularly an air supply device 30. The air supply device 30 may be constructed to attenuate sound and/or to clean air or to perform other functions. The air supply device 30 has an air outlet 31 forming an outlet passage 32 and adapted to be connected to the air passage 21 of the air inlet means 20. The air outlet 31 is somewhat larger than the reduced end 22 of the air inlet means 20, so that the air outlet 31 will telescope about and substantially fit the exterior surface of the reduced end 22. Beyond the reduced end 22 the air inlet means 20 is formed to provide an outwardly projecting flange or shoulder means 23 against which the end of the air outlet 31 may be disposed.

The air supply device 30 may be formed by a lower casing 33 and an upper casing 34. The casings may be

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separable so that the interior of the air supply device 30 may be accessible for service and assembly purposes. An annular filter element 35 may be disposed on a support formed in the lower casing 33. The annular filter element 35 is positioned adjacent the air inlet 36 and held in position by securing the upper casing 34 to the lower casing 33. Air from the atmosphere may flow into the air inlet 36 and through the annular cleaner element 35 and then into the air inlet means 20 by way of the passageways 21, 32.

In order to secure the air supply device 30 to the air inlet means 20 a bail member 40 is attached to the air inlet means 20. The bail member 40 is attached to the internal portion 25 of the air inlet means 20 by the bail legs 47 which have prongs 41. The prongs 41 fit into the internal retaining means or more particularly the holes 24 in the air inlet means 20. The bail legs 47 are made of a flexible and resilient metal. This permits the bail legs 47 to be compressed when passing through the internal portion 25 of the air inlet means 20 to be placed in the holes 24. When the bail legs 47 reach the holes 24, the prongs 41 will tend to snap into the holes 24.

Each bail leg 47 has a shoulder 42. The shoulders 42 abut the reduced end 22 of the air inlet means 20 when the prongs 41 are snapped into the hole 24. The shoulders 42 on the bail legs 47 are urged outwardly by an expandable member 50. The expandable member 50 is a resilient ring which has two irregular curved portions 51 (FIGURE 2). The curved portions 51 contact the inner surface of the shoulders 42. The expandable member 50 is supported on the top of the reduced end 22 of the air inlet means 20, thus preventing the expandable member 50 from being sucked into the air inlet means 20. The expandable member 50 urges the prongs 41 of the bail member 40 into the holes 24. The expandable member 50 also urges the shoulders 42 and the bail leg surfaces 43 into contact with the internal portion 25 of the air inlet means 20.

The bail member 40 has a loop or eye 44 in the middle thereof. The loop 44 rigidly secures a shoulder bolt or stem portion 45. The details of one possible bolt and loop construction are described in United States Patent 2,836,257.

Referring to FIGURE 1, the stem portion 45 projects through an opening formed in the upper casing 34 of the air supply device 30. A fastening means or more particularly a wing nut 46 may be disposed on the threaded end of the stem portion 45 to form a fastening means. The tightening of the wing nut 46 against the upper casing 34 will hold the air supply device 30 securely upon the shoulder means 23 of the air inlet means 20.

When assembling the air supply device 30 to the air inlet means 20, the bail member 40 is compressed so that the prongs 41 can pass freely through the air passage 21 of the air inlet means 20 and snapped into the holes 24. The expandable member 50 is then placed on top of the reduced end 22 with its curved portions 51 in contact with the shoulders 42 of the bail member 40, thereby urging the prongs 41 into the holes 24 and the bail surfaces 43 into contact with the internal portion 25. An air supply device 30 may then be placed in an assembled relation on the shoulder means 23 of the air inlet means 20 and over the bail member 40. The stem portion 45 will project through an opening in the upper casing 33 of the air supply device 30. Thereafter the air supply device 30 may be secured rigidly in an assembled relation to the air inlet means 20, and the parts of the air supply device 30 may be secured rigidly together by placing the wing nut 46 on the stem portion 45 and tightening the wing nut 46 against the upper casing 34. Tightening of the wing nut 46 will cause the prongs 41 to be urged into contact with the top surface of the holes 24 and consequently the air outlet 31 of the air supply device 30 will be tightened

against the shoulder means 23 of the air inlet means 20.

An alternative embodiment of the invention is shown in FIGURE 3. This embodiment utilizes a bail device 80 having prongs 86. The prongs 86 are formed at an angle to a horizontal plane that intersects the air inlet means 20. The angular prongs are snapped into the holes or more particularly angular holes 87. The angular holes 87 may be cast in the air inlet means 20. The bail legs have a flattened portion 88 and shoulders 89. When the prongs 86 are snapped into the angular holes 87, the flattened portions 88 abut the inner surface of the air inlet means 20 and the shoulders 89 abut the reduced end 22 of the air inlet means 20.

A threaded stem portion 82 is attached to the bail legs by a readily deformable split member 81 which is unitary with the threaded stem portion 82. The split member 81 is placed in contact with the middle portion 83 of the bail device 80. The two legs 84, 85 of the split member 81 are hammered or stamped into a press fit with the middle portion 83. The hammering or stamping of the legs 84, 85 will tend to cause the middle portion 83 to form a rectangular cross section which will not rotate.

The threaded portion 82 extends through the air supply device 30 when the air supply device is placed over the bail device 80. Placing the wing nut on the threaded portion 82 and the tightening of the wing nut against the upper casing 34 will tend to cause the angular prongs 86 to be urged into contact with the surfaces of the angular holes 87.

It should be understood that it is within the scope of the invention to fasten the prongs of the bail member to the air inlet by extending the prongs from the interior of the air inlet through the holes in the inlet and bending the prongs into contact with the external surface of the air inlet. Further, it is also possible to form the bail device by stamping or punching, thus forming one unitary member rather than a stem portion attached to the bail legs by means of a loop, eye or split member.

Although several embodiments of the invention have been discussed and described, it is obvious that many changes may be made in the size, shape and details of the various elements of the invention, without departing from the spirit and scope as defined by the appended claims.

I claim:

1. In combination, an air inlet means having walls defining an air passage, a ledge formed at one end of said

air inlet means, at least two apertures formed in the walls of said air inlet means, a bail device having at least two flexible legs, each of said flexible legs comprising substantially straight portions extending along the axis of said air inlet means, said legs each terminating in a prong that extends into one of said apertures, each of said flexible legs further having a re-entrant offset portion forming a shoulder, said shoulder being disposed in engagement with said ledge when said prongs are in said apertures for locating said bail device relative to said air inlet means, resilient means in engagement with the re-entrant portions of said flexible legs for urging said prongs into said apertures and said shoulders into engagement with said ledge, conduit means co-axially disposed over said air inlet means, adjustable means securing said bail to a portion of said conduit means, and support means to restrain movement of said conduit means relative to said air inlet means upon adjustment of said adjustable means.

2. A combination as recited in claim 1 wherein the straight portions of flexible legs extend into the air passage of the air inlet means, the apertures open into said air passage, and the resilient means comprising an expandible means for urging the legs outwardly toward the walls of said air inlet means.

3. The combination as recited in claim 1 wherein the support for restraining movement of the conduit means comprises another ledge formed upon said air inlet means and the adjustable means exerts an axial force upon the conduit means into engagement with said another ledge.

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