May 18, 1937. W. H. SCHULZ 2,080,988

COUPLER FOR CONNECTING AIR CLEANERS TO CARBURETORS

Filed May 9, 1935

Fig. 1

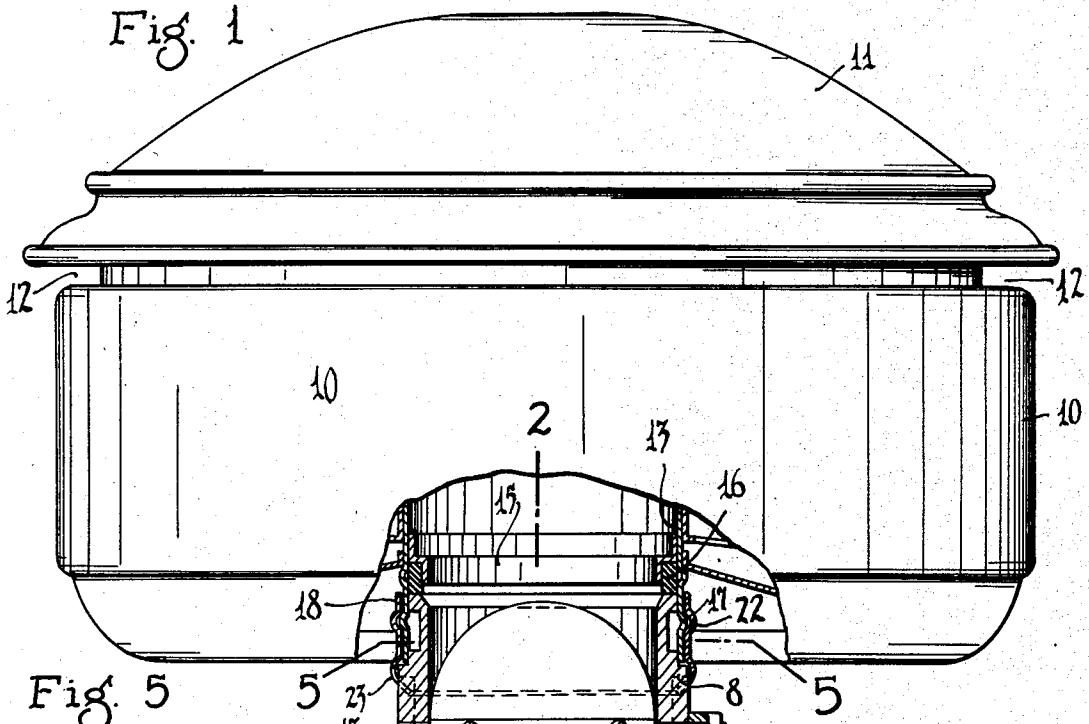


Fig. 5

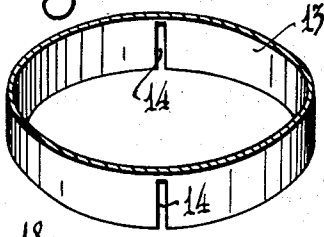


Fig. 4

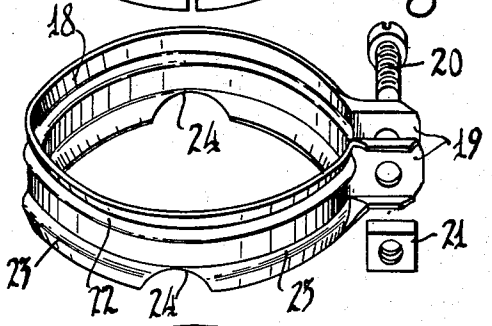


Fig. 3

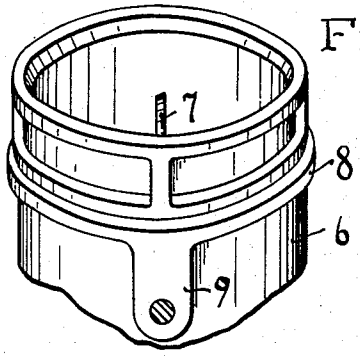
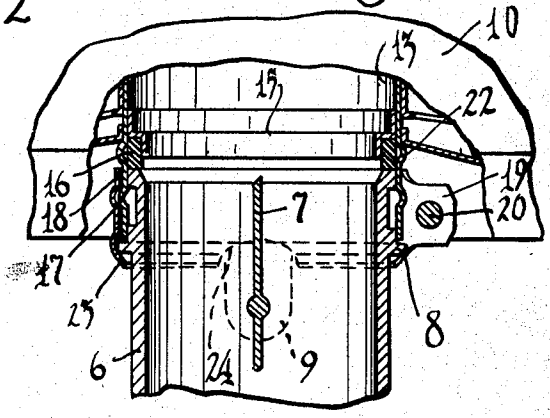


Fig. 2



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COUPLER FOR CONNECTING AIR CLEANERS TO CARBURETORS

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Application May 9, 1935, Serial No. 20,577

8 Claims. (Cl. 285—129)

My present invention provides a simple and highly efficient device for connecting an air cleaner to the intake of a carburetor and, generally stated, consists of the novel devices, combinations of devices and arrangement of parts hereinafter described and defined in the claims.

While capable of more general application, the coupler is especially designed for connecting air cleaners of the type disclosed and claimed in the application of Wilfred W. Lowther, Serial Number 16,189, filed April 13, 1935, to the upstanding air intake tubes of carburetors such as used in the engines of Ford automobiles.

A preferred form of the coupling device, designed for the purpose above indicated, is illustrated in the accompanying drawing wherein like characters indicate like parts throughout the several views.

Referring to the drawing:

Fig. 1 is a view partly in elevation and partly in vertical axial section showing the improved coupler applied as above stated;

Fig. 2 is a fragmentary section taken on the line 2—2 of Fig. 1;

Fig. 3 is a perspective with parts broken away showing the air intake tube of the carburetor such as above indicated;

Fig. 4 is a perspective showing the coupling collar removed from working position; and

Fig. 5 is a section taken through the depending air delivery tube of the air cleaner substantially on the line 5—5 of Fig. 1.

The carburetors used in connection with internal combustion engines such, for example, as Ford automobile engines, have air intake tubes 6 to which the air cleaners are adapted to be attached and which air tubes are provided with the customary throttle valves 7. In the particular design of air intake tube just considered, said tubes are provided with surrounding and outstanding peripheral ribs or flanges 8 and with external bosses 9, which latter afford good bearings for the spindles of the throttle valves 7. The ribs 8, it will be noted particularly by reference to Fig. 3, are located a considerable distance below the extreme upper ends of the said air intake tubes and provide axially spaced upper and lower radial shoulders, the former serving as a stop shoulder and the latter thereof serving as a camming surface.

The air cleaner here illustrated, being of the type disclosed in said pending Lowther application, may be briefly described as follows: An outer casing 10 and an upper dome structure 11 are spaced to afford an air intake passage 12 and are both secured to and arranged to deliver clean air to an axial clean air delivery tube 13, the lower end of which projects below the bottom of the casing 10 and is of a size to telescope over the upper end of the carburetor air intake tube 6. To adapt the extreme lower end of the air delivery tube 13 to be tightly and closely clamped against the upper end of the carburetor intake tube 6, it is slit at 14, as shown in Fig. 5. The air delivery tube 13, at a point considerably above its lower end, is provided with a rigidly secured annular internal flange 15 that holds a pliable gasket 16 in position for engagement directly against the extreme upper end of the air intake tube 6 to thereby insure an air-tight joint between the air delivery tube and the air intake tube. When the gasket 16 rests upon the upper end of the air intake tube 6 the extreme lower end of the air delivery tube 13 will be close to but will not quite engage with the upper radial shoulder formed by rib 8 of said tube 6, and hence, the tube 13 is capable of being drawn slightly downward so as to compress the gasket against the upper end of said intake tube. At a point considerably below the gasket 16 the air delivery tube 13 is formed with an outwardly pressed bead or shoulder 17.

The clamping collar 18, which constitutes the major important element of the present invention, is in the form of a split, strap-like, collar rolled or pressed from thin sheet metal, preferably sheet steel. This collar is flexible and, at its split ends, is provided with perforated outstanding ears 19 through which a screw or short bolt 20 is adapted to be passed, and in co-operation with a nut 21 to tightly clamp the collar around the lower end of the air delivery tube 13 and the upper portion of the air intake tube 6. This collar has further important features, to wit: for engagement with the outwardly pressed bead 17 of the tube 13, said collar is formed with an outwardly pressed bead 22 and at its lower edge, for engagement with the outstanding rib 8 of the air intake tube 6, said collar is provided with an internally concave or externally convex clamping flange 23 which has a cam-acting engagement with said rib. The outwardly pressed beads 17 and 22 are preferably formed with approximately the same outwardly pressed concavo-convex formation so that the inner convex curve of the bead 22 will be slightly less than the convex curve of the bead 17. This will cause the bead 22 to engage the exterior of bead 17 as shown in the drawing

with slight clearance between the crowns of the said beads. This arrangement prevents play or slippage between the engaged beads of the tube 13 and collar 18. The curve of the clamping flange 23 is such that when the gasket 16 is seated against the upper end of tube 6 and the clamping collar is tightened around the depending end of tube 13, said flange 23 will have a sort of a camming action that will pull upward on the rib 8 and downward on the air cleaner tube 13, thereby compressing gasket 16 and insuring an air-tight engagement between the tubes 6 and 13. Of course, the engagement of the beads 17 and 22, as already stated, prevents slippage of the collar in respect to the tube 13. In other words, the engagement of the beads 17 and 22 serves to hold the clamping collar axially anchored with respect to the delivery tube 13.

Under a downward drawing action produced by clamping the collar onto the tube 13 and the rib 8, gasket 16, which is preferably of cork or felt, will be compressed until the lower edge of said tube 13 will be drawn downward and stopped against the said rib 8, thereby very rigidly and definitely seating the air cleaner on the carburetor and insuring against rattling of parts. It is now important to note that the clamping flange 23 in a radial direction is very much deeper than the beads 22. With this arrangement, the clamping collar may be loosened sufficiently to disengage the beads 17 and 22 without entirely disengaging flange 23 from rib 8, so as to permit removal of the air cleaner from the carburetor without removing the collar from the carburetor tube.

As best shown in Fig. 4, the flange 23 is notched or cut away at 24 to clear the bosses 9.

With the device described, the air cleaner can be very quickly and securely anchored to the carburetor and when desired, the air cleaner may be quickly removed. The device is of small manufacturing cost and, in practice, it has been found efficient for the purpose had in view. Of course, the preferred structure illustrated is capable of modification within the scope of the invention herein disclosed and claimed.

What I claim is:

1. The combination with an engine air intake tube having an outstanding peripheral rib located below its extreme upper end, of an air cleaner having a depending air delivery tube adapted to be telescoped over that portion of the upper end of said engine intake tube that is above said rib, an annular gasket secured within the air delivery tube of said air cleaner for engagement with the upper end of said carburetor intake tube, means independent of said gasket for positively limiting inward telescoping movements of the tubes to a position wherein the gasket is partially compressed to a predetermined extent, the depending end of the air delivery tube to said air cleaner having an outwardly pressed bead located below said gasket, and a clamping collar interlocked to the air delivery tube of said air cleaner and having a depending cam-acting flange engageable with the rib of the air intake tube of said engine and having a drawing action thereon for drawing said gasket against the upper end of said engine air intake tube.

2. The structure defined in claim 1 in which said cam-acting flange has such radially extended engagement with said rib that it will maintain interlocking engagement therewith when said collar is released from clamping action with said air intake tube, thereby permitting the air cleaner to be removed when said collar is attached to said air delivery tube.

3. The structure defined in claim 1 in which said collar is detachably interlocked to said air delivery tube by nested beads formed on said members, and in which the clamping flange of said collar has such radial engagement with said rib that it will maintain said collar secured to said air intake tube when said collar has loosened sufficiently to permit disengagement of said nested beads and removal of said air cleaner therefrom.

4. The combination with an engine air intake tube having radial shoulder axially spaced from its intake end, of an air cleaner having an axially slit air intake tube, means limiting axial telescoping movement of the air delivery tube onto said air intake tube, and a flexible strap-like clamping collar anchored to said air delivery tube and having a downwardly converging cam-acting flange at its lower edge portion that is engageable with the said radial shoulder of the air intake tube, the said cam-acting flange of the clamping collar serving, when the clamping collar is tightened, to draw telescoped parts axially together and the clamping collar proper serving to bring the slit delivery tube into tight telescopic engagement with the delivery tube.

5. The combination with an engine air intake tube having an external radial shoulder axially spaced from its intake end, of an air cleaner having an air delivery tube adapted to be telescoped onto said air intake tube, means limiting axial telescoping movement of the air delivery tube onto said air intake tube, an outwardly pressed bead on said air delivery tube above the lower end thereof, and a clamping collar having an outwardly pressed bead adapted to fitting and receive the bead of the air delivery tube when the said clamp collar is tightened about the air delivery tube, said clamping collar being provided with an axially converging cam-acting flange that is engageable with the said radial shoulder of the intake tube to draw the telescoped parts together axially, the cam-acting flange being deeper in a radial direction than the said beads, so that the clamping collar may be loosened sufficiently to release the said beads from interlocking engagement without releasing the cam-acting flange from interlocking engagement with the radial shoulder of the intake tube.

6. The structure defined in claim 5 in which the delivery tube is slit so that it will be reduced circumferentially and drawn into tight clamping engagement with the intake tube of the radial clamping action of the clamping collar.

7. The structure defined in claim 4 in which said radial shoulder serves to positively limit the extent of telescopic engagement of the tubes.

8. The structure defined in claim 4 in which said collar is detachably interlocked to said air delivery tube by nested beads formed on said members, and in which the clamping flange of said collar has such radial engagement with said rib that it will maintain said collar secured to said air intake tube when said collar has loosened sufficiently to permit disengagement of said nested beads and removal of said air cleaner therefrom.

WILLIAM H. SCHULZ.