April 23, 1957 J. B. SEBOK 2,789,840

DAMPER RETAINER FOR AIR CLEANING AND INTAKE SILENCING UNITS

Filed July 30, 1953

Fig 1

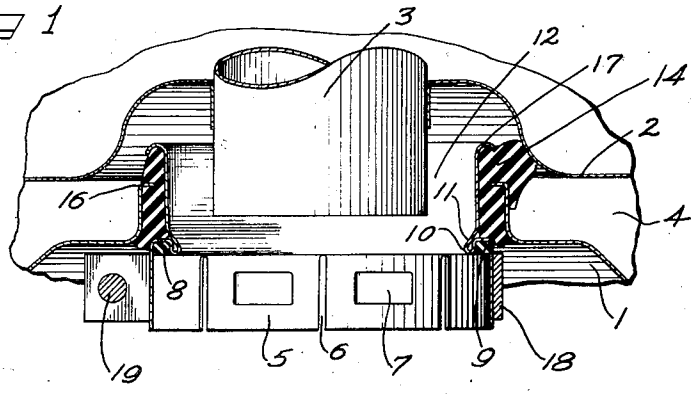


Fig 2

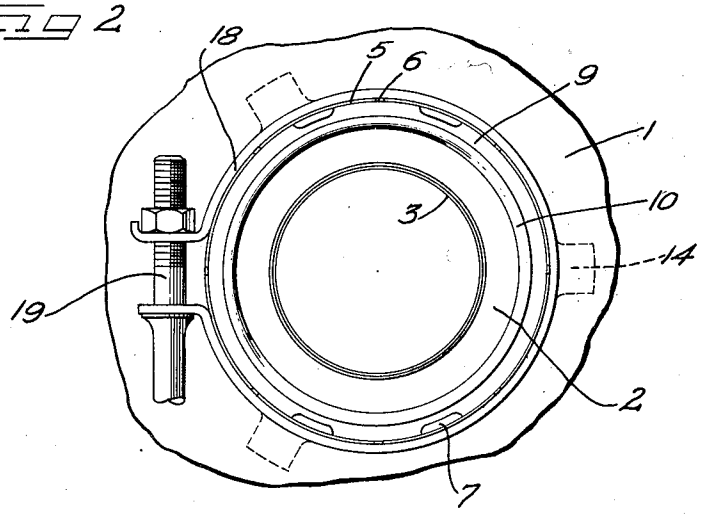
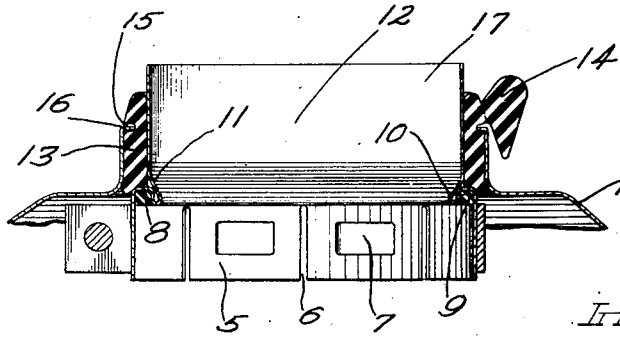


Fig 3



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DAMPER RETAINER FOR AIR CLEANING AND INTAKE SILENCING UNITS

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8 Claims. (Cl. 285—158)

This invention relates to improvements in a damper retainer for air cleaning and intake silencing units, and more particularly to an individual structure for not only connecting the unit with an air intake horn of a carburetor, air compressor, or some other device requiring a supply of clean air, but which structure also retains and holds firmly in position a sound and vibration dampening element, although the invention may have other uses and purposes as will be apparent to one skilled in the art.

Since the advent of air cleaner and intake silencing units, particularly those of the type utilized with internal combustion engines of the automotive type, it has been found necessary to dampen large bottoms and internal partitions of the silencing structure against vibration in order to prevent the setting up of vibratory noises with the resultant amplification of those noises to such an extent that they supersede the desired effectiveness of attenuating one or more of the predominant engine tones. To this end, a damper has been utilized which is in the nature of a resilient band of synthetic rubber or the like and to which the large bottom of the silencer unit is connected in a manner to eliminate any direct metal to metal contact or continuation to the intake horn of the device being supplied with clean air and giving birth to the particular sounds that it is desired to attenuate. Difficulty has heretofore been experienced in manufacturing a suitable arrangement to properly retain the damper in position, give satisfactory stability and rigidity to the structure as a whole, and still eliminate the objectionable metal to metal contact continuation from the bottom of the unit to the intake horn. Formerly known damper retainer means of this character have been found objectionably expensive. Since the saving of even a fraction of a penny in the manufacture of an air cleaner and silencing unit is of paramount importance, owing to the high competitive character of that business, any economical advantage is extremely desirable.

With the foregoing in mind, it is an important object of the instant invention to provide a damper retainer of an extremely economical yet highly functional character.

Another object of the invention is the provision of a damper retainer embodying a one-piece construction that performs both functions of holding the damper firmly, and providing a means for connecting the entire cleaning and silencing unit to an air intake horn.

Still another feature of the invention resides in the provision of a unitary one-piece damper retainer of the character set forth herein, which is so constructed as to enhance its rigidity and strength.

Still a further object of the invention resides in the provision of a unitary one-piece damper retainer constructed to provide a depending skirt for engagement with an air intake horn, a gasket holding formation thereabove to support a gasket to be contacted by the intake horn, a seat for a dampening element, and means for locking the retainer firmly to the element to provide a substantially permanent structure.

While some of the more salient features, characteristics and advantages of the instant invention have been above pointed out, others will become apparent from the following disclosures, taken in conjunction with the accompanying drawing, in which—

Figure 1 is a fragmentary central vertical sectional view, with a part shown in elevation, of an air cleaning and intake silencing unit provided with a damper retainer embodying principles of the instant invention;

Figure 2 is a fragmentary bottom plan view of the structure of Fig. 1; and

Figure 3 is a fragmentary central vertical sectional view taken in the same location as Fig. 1, but showing the retainer just prior to its permanent union with the dampening element.

As shown on the drawings:

The illustrated embodiment of the instant invention is shown associated with an air cleaner and intake silencing unit, partially illustrated, of a known type including any suitable form of air cleansing means and silencing chambers operating upon the resonator principle. The unit or cleaning and silencing assembly includes a bottom **1**, an internal partition **2** thereabove, and an outlet conduit **3** for clean air, carried by the partition **2**. Between the bottom **1** and the partition **2** is a silencing chamber **4** to which communication is had around the clean air outlet conduit **3**.

My novel retaining element is generally cylindrical in form and is made of one piece, preferably out of relatively thin sheet metal. The retainer includes a depending skirt **5** slotted at spaced intervals as indicated at **6** to permit contraction of the skirt. Inwardly extending detents **7** may be provided in the skirt, if so desired, depending upon the particular construction of the air intake horn with which the retainer is to be associated.

Above the skirt **5** the retainer is provided with a substantially inverted U-bend to define an annular gasket seat opening downwardly, and the upper face of the lateral portion of this bend defines a shoulder. A suitable gasket **9** may be provided in the gasket seat, and this gasket is to contact the upper edge of the intake horn with which the retainer is associated.

To one side of the gasket seat formation **8**, the retainer is provided with a reverse bend as indicated at **10** and the upper portion of this reverse bend slopes backwardly toward the top shoulder of the formation **8**, as indicated at **11**. Immediately above the sloping portion **11** is an upstanding cylindrical part **12** around which a dampening element may be seated on the shoulder **8**.

The dampening element is in the form of a resilient band or ring **13** which may satisfactorily be made of synthetic rubber or equivalent material. Periodically this ring is provided with projections **14** extending outwardly away from the body of the ring, and being substantially triangular in cross section as seen clearly in Fig. 3. In the illustrated instance, there are three such projections spaced equidistantly on the ring **13**. The outer side face of the ring is also provided with an annular groove, preferably located just under the neck portion of the projections **14**, and this groove **15** is initially slightly open as seen in Fig. 3.

The groove **15** is to accommodate an inwardly and laterally extending flange **16** defining a central opening in the bottom **1** of the cleaner and silencer casing.

In assembling the structure, the dampening ring or band **13** is disposed against the upstanding portion of the bottom **1** carrying the flange **16**, and with the flange extending into the groove **15** as seen in Fig. 3. The cylindrical portion **12** of the retainer is then pushed through the dampening ring **13** to the position seen in Fig. 3, with the shoulder on the formation **8** abutting the bottom of the dampening ring. Thereafter, the up-

per marginal portion 17 of the retainer is rolled or spun outwardly over the upper edge of the dampening ring to the position seen in Fig. 1, and is thereby firmly locked to the dampening ring, and the groove 15 in the dampening ring is closed, the sides of this groove being compressed over the flange 16, so as to tightly grip the flange. This locking of the upper margin of the retainer over the upper edge of the dampening ring also brings the lower free portions of the projections 14 into closer proximity with the upstanding wall portion on the bottom 1, as also seen best in Fig. 1, and these projections then abut the aforesaid partition 2 to dampen any tendency of that partition to vibrate. Any tendency of the bottom 1 to vibrate is dampened by virtue of its engagement with the dampening ring, and it will be noted that there is no metal to metal contact or any metal to metal contact continuation between any part of the air cleaner and silencing unit and the retainer, which is the only element of the unit that comes into contact with an air intake horn.

Disposed around the skirt 5 of the retainer is an open ended clamp ring 18, and this ring may be spotted to the skirt of the retainer at suitable points, if so desired. The free ends of the ring may be turned outwardly, as clearly seen in Fig. 2, and the ring is tightened or released around the skirt 5 of the retainer by means of an adjusting bolt 19 in any well known manner. Tightening of the bolt causes a compression of the skirt 5 around an air intake horn to mount the cleaning and silencing unit on that horn, the slots 6 in the skirt portion of course permitting a definite tightening or squeezing of the skirt 5.

From the foregoing, it will be noted that I have provided a retaining element for a dampening means utilized in an air cleaning and intake silencing assembly, which retaining element is extremely simple in construction, comprising only one single piece of material, renders the adjacent parts easy to assemble, and is far more economical than any such retaining means made of a multiple of pieces heretofore used. Further, my simple form of retainer not only mounts the entire cleaning and silencing assembly on an air intake horn, but holds a gasket for contact with that horn, provides a seat for a dampening element, and firmly locks to that dampening element causing it in turn to be substantially permanently engaged with adjacent portions, particularly the bottom, of the cleaning and silencing unit.

It will be understood that modifications and variations may be effected without departing from the scope of the novel concepts of the present invention.

I claim as my invention:

1. A retainer for a resilient damper for use in an air cleaner and intake silencer assembly, including a one-piece annular member having a depending cylindrical skirt with spaced slots therein for engagement over an air intake horn, said member having an inverted U-shaped bend above said skirt to provide a gasket seat, and said member having a reverse bend adjacent the gasket seat and a cylindrical portion thereabove with the upper margin turned outwardly over the top of a damper.

2. A retainer for a resilient damper for use in an air cleaner and intake silencer assembly, including a one-piece annular member having a depending cylindrical skirt with spaced slots therein for engagement over an air intake horn, said member having a lateral bend above said skirt to cooperate with the upper part of the skirt and hold a gasket, and a reverse bend extending to one side of said lateral bend and partially back over the lateral bend, and a cylindrical portion extending above said lateral bend to support a damper.

3. A retainer for a resilient damper for use in an air cleaner and intake silencer assembly, including a one-piece annular member having a depending cylindrical skirt with spaced slots therein for engagement over an air intake horn, said member having a lateral shoulder extending inwardly above said skirt, a reverse bend to one side of said shoulder, and a cylindrical portion extending above said shoulder, said shoulder being located to function as a seat for a gasket on one side and a seat for a damper on the other side.

4. A retainer for a resilient damper for use in an air cleaning and intake silencing assembly, comprising a single-piece member having a lower intake horn engaging portion, an inverted U-bend laterally above said portion to hold a gasket for abutment by the intake horn, a reverse bend at one side of said U-bend which stiffens the member, and a tubular portion above the U-bend to support a damper.

5. A retainer for a resilient damper for use in an air cleaning and intake silencing assembly, comprising a single-piece member having a lower intake horn engaging portion, an inverted U-bend above said portion to hold a gasket for abutment by the intake horn, a reverse bend at one side of said U-bend which stiffens the member, and a tubular portion above the U-bend associated with a damper, said U-bend providing an annular shoulder on its top face to seat the damper.

6. A retainer for a resilient damper for use in an air cleaning and intake silencing assembly, comprising a single-piece member having a lower intake horn engaging portion, an inverted U-bend above said portion to hold a gasket for abutment by the intake horn, a reverse bend at one side of said U-bend which stiffens the member, a tubular portion above the U-bend to support a damper, said U-bend providing an annular shoulder on its top face to seat the damper, and the upper margin of said tubular portion being rolled laterally outward to embrace the upper part of the damper.

7. In combination, an intake silencing assembly including a bottom having a central opening defined by an annular lateral flange, a retainer element comprising a one-piece structure having a depending skirt for engagement with an air intake horn, a gasket formation inwardly and above said skirt providing an annular shoulder on its upper face, a reverse bend inside said formation, and a cylindrical portion extending above said shoulder, a resilient damper band around said cylindrical portion seating on said shoulder, and said band having an annular groove therein to receive said lateral flange on the assembly bottom.

8. In combination, an intake silencing assembly including a bottom having a central opening defined by an annular lateral flange, a retainer element comprising a one-piece structure having a depending skirt for engagement with an air intake horn, a gasket formation laterally above said skirt providing an annular shoulder on its upper face, a reverse bend inside said formation, a cylindrical portion extending above said shoulder, a resilient damper band around said cylindrical portion seating on said shoulder, and said band having an annular groove therein which is normally slightly open and which receives the lateral flange on said bottom, and the upper margin of said cylindrical portion being rolled over the upper part of said band to lock the band and retainer together and clamp the sides of said groove on said flange.

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