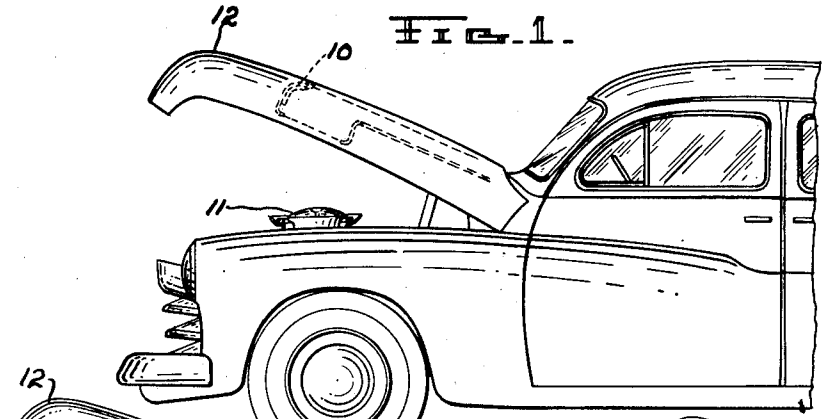
Feb. 1, 1955 C. W. THOMAS 2,701,024

RESONATOR MOUNTING ON UNDERSIDE OF HOOD

Filed Oct. 1, 1947

Fig. 1.



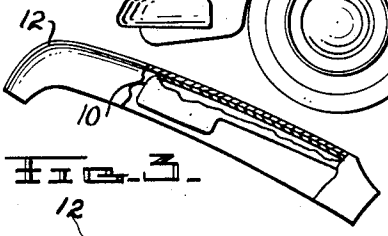


Fig. 3.

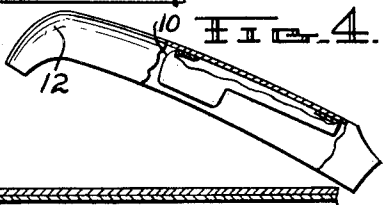


Fig. 4.

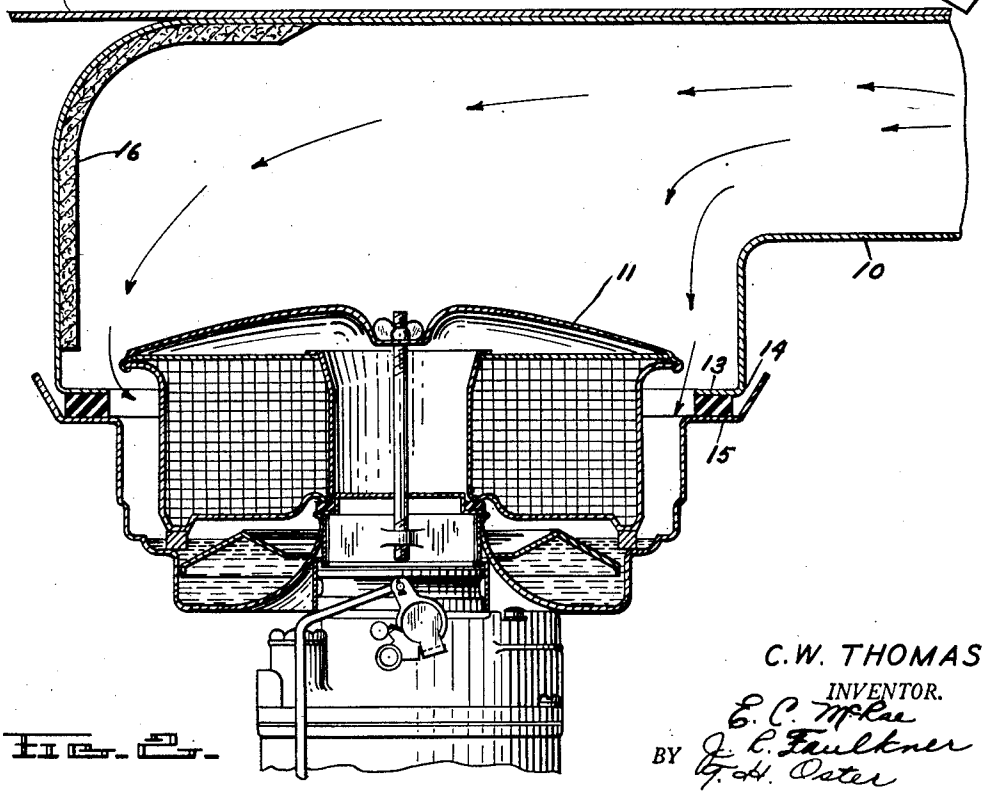


Fig. 2.

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RESONATOR MOUNTING ON UNDERSIDE OF HOOD

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3 Claims. (Cl. 180—69)

This application is concerned with an arrangement of the motor compartment of an automotive vehicle, and more particularly with a structure designed to give more quiet engine operation and to relieve to some extent the under hood congestion now existent in most modern cars. This congestion is the natural result of the efforts of designers to employ larger and larger power plants and the increasing tendency to add as standard equipment accessories not formerly so furnished.

Air cleaners have long been standard equipment in the automotive industry and serve the dual purpose of removing suspended abrasive material from the air supply of the engine and of silencing to some extent the noises associated with the air induction system. Air cleaners as now supplied do not uniformly suppress all noises generated by the engine air intake, but preferentially absorb the high frequency noises, or what is commonly known as the "hiss." The low frequency noises are not effectively suppressed by present day air cleaners and are unfortunately productive of very adverse effects upon the human auditory and nervous systems.

In an effort to prevent these low frequency noises from reaching the passenger compartment, a type of silencer known as a resonant silencer has been developed. Such a silencer is adequately described in a patent issued to E. E. Wilson, July 13, 1943 as Number 2,323,955. This type of resonant silencer is very effective in attenuating the low frequency noise associated with the air intake. However, due to the fact that these silencers are particularly designed for low frequency suppression, large physical dimensions are inherent in their design. This fact has militated against their use since it is necessary that this large structure be accommodated in an already overcrowded engine compartment. This large size has also been undesirable since most modern engines are resiliently mounted and the stresses associated with the vibration of a large silencer would require special structural provisions. In an effort to overcome these difficulties and make a resonant silencer practical for modern motor vehicles, the instant invention has been made.

Accordingly, it is an object of this invention to provide a method of mounting a resonant silencer which will complicate to a minimum extent the design of the equipment in the engine compartment.

It is a further object of this invention to present a method of mounting a resonant silencer which will permit the design of such a silencer to be dictated by acoustic requirements rather than by space limitations.

It is a further object of this invention to so mount a resonant silencer that ordinary routine repair work on the engine will not be interfered with despite the large size of a resonant silencer.

With these and other objects in view, the invention comprises the arrangements, constructions and combinations of the various elements of the structure described in the specification, claimed in the claims and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of a motor vehicle showing the relative position of the resonant silencer and the remainder of the vehicle.

Figure 2 is a cross section taken through the resonant silencer in part and through the associated air cleaner and carburetor.

Figure 3 illustrates a construction in which the resonant silencer is fabricated separately and then secured to the hood as by welding or riveting.

Figure 4 shows a structure in which the underside of the hood forms the top of the resonant silencer.

The objects specified above are accomplished primarily by welding or otherwise securing the resonant silencer to the underside of a motor hood so that in the closed position of the hood the resonant silencer and air cleaner intake are properly positioned with respect to each other. In Figure 1 a resonant silencer is indicated by the numeral **10** and shown by the dotted lines. This resonant silencer co-operates with the air cleaner indicated at **11**. This air cleaner **11** is preferably a standard oil bath air cleaner. Resonant silencer **10** is shown secured to the underside of alligator hood **12**.

Figure 2 is a cross section in detail of the forward end of the resonant silencer and the associated air cleaner in the position assumed when the hood is closed and the silencer is in the operative position. It is to be understood that only the forward end of the resonant silencer is shown here. For further details of the silencer construction, reference is again made to U. S. Patent 2,323,955. The lowermost portion of resonant silencer **10** is provided with inturned flange **13** which supports gasket ring **14**. Air cleaner **11** is provided with outturned flange **15** which is positioned so that when the hood is closed a slight compression of gasket material **14** results between inturned flange **13** and outturned flange **15**. This results in an approximately air-tight joint between the resonant silencer **10** and air cleaner **11** despite slight movements of the engine during operation of the vehicle. Thus, all the air necessary for the operation of the engine will enter through resonant silencer **10** and follow the courses indicated by the arrows in Figure 2. The low frequency noises inherent in the air induction system of an internal combustion engine are attenuated in that portion of the resonant silencer not shown in Figure 2. The high frequency sounds frequently referred to as "hiss" are partially attenuated by pad **16**. Thus the greater part of the annoying sounds attendant upon the operation of the air reduction system of the engine are attenuated to such a degree that they are no longer objectionable to the occupants of the vehicle.

The structure shown in the drawing is that obtained by spot-welding or otherwise securing a prefabricated resonant silencer to a hood. However, the invention also contemplates the production of the combined hood and silencer by employing the hood itself as the top closure of the resonant silencer. In this construction the resonant silencer would be fabricated with an open top and this open top closed by welding the resonant silencer to the hood. The saving in metal by this procedure is obvious.

While this invention has been particularly described with reference to an alligator type hood, it is not so limited, but can be adapted by obvious mechanical expedients to any type of movable hood. Any structure in which a resonant silencer is secured to an automotive hood and is normally moved therewith is construed to be within the scope of applicant's contribution to the art.

What is claimed is:

1. In a motor vehicle, an alligator engine hood, a resonant silencer secured to the underside of said hood, and an air cleaner, said silencer having an outlet coaxial with the inlet of the cleaner and in the closed position of the hood closely abutting the inlet of the cleaner, said silencer outlet and said air cleaner inlet being widely separated when the hood is in the open position.

2. In a motor vehicle, an alligator engine hood, a resonant silencer secured to the underside of said hood and terminating in a vertical outlet, and an air cleaner having a vertical inlet, said outlet and inlet being coaxial and closely abutting each other in the closed position of the hood and widely separated in the open position of the hood.

3. In a motor vehicle driven by an internal combustion engine, an air cleaner for said engine, a movable hood, a resonant silencer secured to the underside of the hood, the inlet of the air cleaner and the outlet of the silencer being coaxial only when the hood is in the closed position, said hood being movable from the closed to the

open position, said silencer being movable with the hood so that in the closed position of the hood the silencer outlet resiliently abuts the air intake opening of the air cleaner and in the open position of the hood the air outlet of the silencer is spaced from the intake opening of the air cleaner leaving the opening of the air cleaner exposed.

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