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AIR CLEANER COMBINATION UNIT

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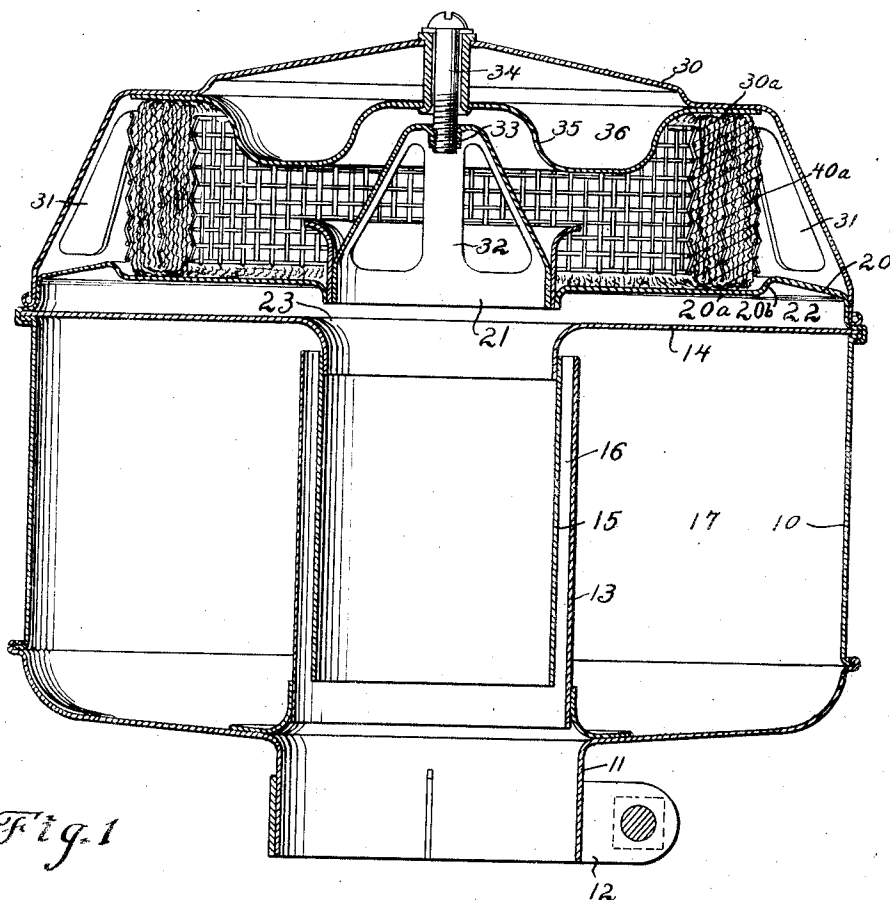


Fig. 1

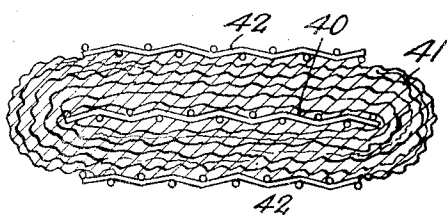


Fig. 2.

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## UNITED STATES PATENT OFFICE

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## AIR CLEANER COMBINATION UNIT

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## 1 Claim. (Cl. 183—44)

The present invention relates to air cleaning devices and to combinations of air cleaning and other devices, for example, silencers.

Among the objects of the invention is an air cleaning unit, which, in addition to being a highly efficient cleaner, has other characteristics which enable its combination with other devices in a practicable and advantageous manner.

Another object is a combined device which overcomes certain of the difficulties heretofore encountered when attempts have been made to produce similar combinations.

Still another object is a combined air cleaner and other device of which the efficiency in cleaning is not impaired by use conditions.

Other objects will readily occur to those skilled in the art upon reference to the following description and the accompanying drawing in which

Fig. 1 is a vertical central section through a combined air cleaner and silencer embodying the invention.

Fig. 2 is a section through the air cleaning or filtering unit included in the combined device of Fig. 1.

The particular combined device chosen to illustrate the invention is a combined cleaner and silencer for the intake air of an internal combustion engine for automotive vehicles, and the device as illustrated in the drawing comprises a cylindrical casing 10 closed at its bottom and provided with an outlet 11 adapted to be fixed, as by the clamping ring 12, to the air intake of a carburetor (not shown).

Within the casing 10, a tube 13, of substantially the size of outlet 11, is fixed over the latter and extends upwardly. Further, the casing 10 is provided with a cover plate 14 having an opening at its center, which opening is surrounded by a tube 15 telescoping downwardly into and concentric with tube 13 the two tubes 13 and 15 together forming an air duct leading to the outlet 11. These two tubes are however spaced from each other to provide a narrow annular passage 16 leading into the relatively large chamber 17 thus formed.

A second cover plate 20 also having a central opening 21, overlies plate 14, being dished upwardly to provide a small chamber 22, open through a narrow annular slot 23 to the central passage.

Superposed on plate 20 is a domed cover 30 having air inlet openings 31 and held in position in any suitable fashion. The means for this purpose shown comprises a spider 32 welded or

otherwise secured to plate 20 and threaded as at 33 to receive a screw 34 passing down through the domed plate 30.

This form of silencer is also known as a resonator because of the fact that chambers 17 and 22 are designed to be resonant to certain vibratory sounds and to neutralize these through being located at the proper distance from the source of these sounds.

In order to further reduce the noise, it is preferred to provide in connection with plate 30 a false cover 35 providing a space 36 which may be filled with sound deadening material.

Thus far the description relates to a silencer of more or less conventional type. It has, however, been found to be highly desirable to combine with such devices means for cleaning the incoming air and such a combined structure is shown as involving an air filter unit of which a section is shown in Fig. 2.

In Fig. 2 the unit is indicated as comprising a central core or supporting element 40 of foraminous material, such as wire mesh fabric, having wound upon it Gramme ring style, strands of flattened crinkled wire 41 and outer confining rings of similar foraminous material 42 of a width somewhat less than the width of core 40. This unit is described more in detail and claimed in applicant's copending application Serial No. 645,024, filed November 30, 1932, except for the particular form herein shown in which the wire core 40 is used.

Referring again to Fig. 1 of the drawing, it will be noted that both plate 20 and cover 30 are provided with flat annular surfaces 20a and 30a near their peripheries and, if desired, these may be defined by suitable shoulders such as is indicated at 20b. These flat surfaces permit the clamping between them of the filter unit indicated as a whole in Fig. 1 at 40a. Further, clamping the unit 40a between these parts compresses the strands of material 41 against the edges of core 40 so that, in effect, the material forms a gasket effectively preventing the bypassing of air around the unit. Also being supported by core 40, no amount of vibration or other incidents of use, can cause the filter material to settle away from the walls 20a or 30a, as might occur without the core.

In the use of the device, air coming into the openings 31, of which there will be sufficient to prevent restriction of flow, will pass through the unit 40a and through spider 32 into the central passage and then to the engine or other place of use. It is preferred to provide a film

of oil on the multitude of surfaces presented by material 41 in order that the dirt particles carried by the air may stick to such surfaces and thus be removed. It is also desirable that the unit 40a be cleaned from time to time by washing out such dirt with thin oil.

Now having described the invention and the preferred embodiment thereof, it is to be understood that said invention is to be limited, not to the specific details herein set forth, but only by the scope of the claim which follows.

What I claim is:

In combination with a plurally chambered casing, at least one chamber of which constitutes a resonator for silencing the air intake of an engine or the like, an air filter unit arranged in another chamber, an air inlet into said filter chamber, an air delivery duct extending through said resonator portion of the casing

from the chamber containing said filter unit, said duct having a telescoping double walled portion within the resonator chamber, the walls of said portion being spaced to provide a passage connecting the duct with the resonator chamber, an outlet coupling attached to said casing at the side thereof remote from the filter chamber and communicating with said duct, the distance through said communicating duct and double walled portions from the filter unit to the resonator chamber being greater than either the distance between the unit and the outlet coupling or the resonator chamber and the outlet coupling, said unit being compressible at its ends and interposed in its chamber between the inlet and duct, said chamber being provided with surfaces for compressing said ends, whereby to seal said unit in position and prevent by-passing of air.

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