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G. HOOTON

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AIR CLEANER

Filed May 1, 1925

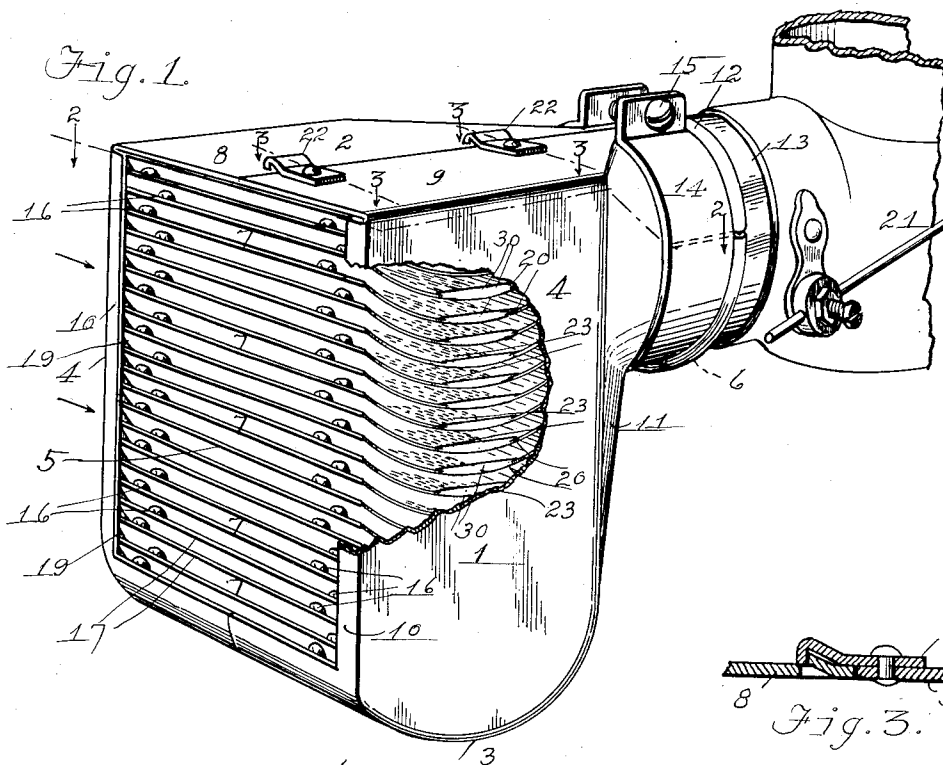
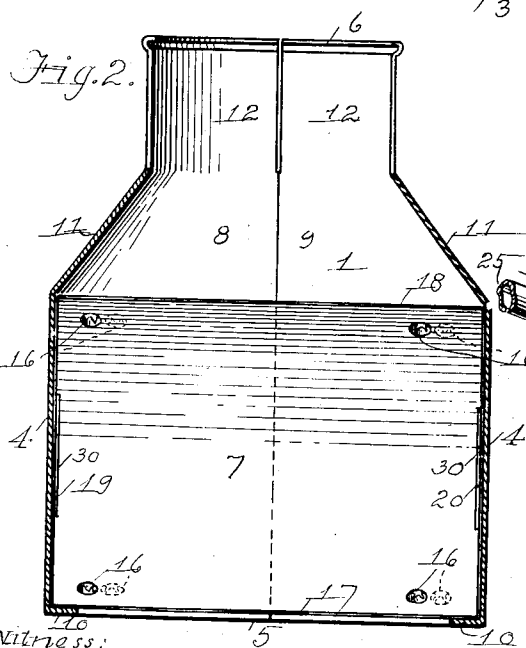
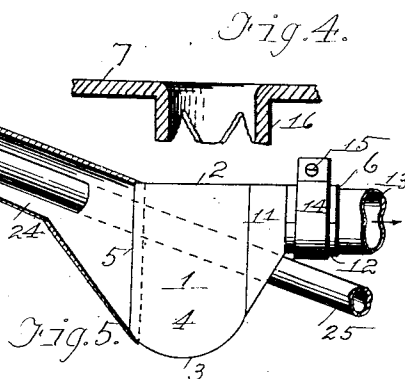


Fig. 5.

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AIR CLEANER.

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The present invention relates to air cleaners; and its object is, generally, to provide improved means for cleaning air; and more particularly, to provide an improved device for removing dust and dirt particles from the air passing into the carburetor of an internal-combustion engine.

This and any other objects hereinafter appearing are attained by, and the invention finds preferable embodiment in, the structure hereinafter particularly described in the body of this specification and illustrated by the accompanying drawings, in which:—

Figure 1 is a view in perspective of my air cleaning device applied to the intake of the carburetor of an automobile's internal-combustion engine, a side wall of the device being broken away;

Figure 2 is a transverse sectional view of said device taken on line 2—2 of Figure 1;

Figure 3 is a sectional view (much enlarged), taken on line 3—3 of Figure 1, of a fastener for connecting side portions of the device;

Figure 4 is a vertical sectional view (much enlarged) of a portion of one of the vanes of the device showing means for spacing the vanes apart; and

Fig. 5 is a side view of the device showing the same provided with air-heating means.

In the embodiment of the invention illustrated by the drawings, my air cleaning device comprises a box or casing, designated generally 1, having top and bottom walls 2 and 3, side walls 4, and an air passage through the casing extending from its air inlet 5 at its front to its air outlet 6 at its rear. A plurality of parallelly disposed vertically-spaced vanes 7 in the casing extend between said inlet and outlet, first downwardly and then upwardly, being cross-sectionally downwardly concavo-convex in planes parallel with the side walls 4 of the casing.

This box or casing 1 desirably comprises separate lateral portions or halves 8, 9, each having one side wall 4 of the casing, an inwardly-extending front flange 10 adjacent said air inlet and an inwardly-extending rear flange 11 adjacent said air outlet, terminating in a cross-sectionally-arcuate half neck 12, the front flanges 10 being laterally spaced and the rear flanges 11 being also laterally spaced to provide said inlet and outlet respectively.

In the assembled position of the parts

shown in Figures 1 and 2, the half necks 12, 12 embrace between them the pipe 13 leading to the carburetor 21 of the engine, and are removably held, for mounting the device, on said pipe by suitable means as the collar 14 clamped in place by the screw 15. The vanes 7 are held in parallel spaced relation by their projections 16 preferably formed by striking down a portion of the vanes as illustrated in Figure 4. These vanes are preferably formed of thin sheet metal and are sprung into their concavo-convex shape by being inserted into the separated halves or portions 8, 9 of the casing, their front and rear edges 17, 18 being held in said shape between the front flanges 10, 10 and rear flanges 11, 11 of the casing, and the side edges 19, 20 of the vanes being retained in place between the casing's side walls 4, 4.

Means, such as the clips 22, additionally to the collar 14, may be employed for detachably connecting the halves or portions 8, 9 of the casing together.

A suitable liquid, preferably oil, is held in the concave vanes 7 as indicated at 23 in Figure 1 to engage and hold dust and dirt particles carried by the air passing through the device. It will be seen that the air and such particles in being thus drawn through the device pass both by gravitation and centrifugal force into contact with the surface of the oil and said particles are engaged and held thereby.

These vanes are desirably made of a material having roughened or scaly surface (such as hot-rolled iron or steel), so that the oil may spread upwardly in a film by capillary action along the surface of the vanes, thus coating such surface more or less thoroughly throughout.

The air drawn into and through the device may first be heated as by passing through the sleeve 24 surrounding and spaced from the engine's exhaust pipe 25, this sleeve venting into the air inlet 5 of the device, as indicated in Figure 5. It will be seen that the halves or portions 8, 9 of the casing may be disconnected and the vanes 7 removed for cleaning; although, if desired, the casing may comprise parts permanently connected, in which case the vanes may be cleaned by gasoline or the like poured between them. The vanes desirably have upwardly-extending flanges 30 at their side edges 19, 20 to confine the oil.

A prominent feature of the present inven-

tion is the provision of a surface coated with oil or other substance adapted to engage and hold the dust and dirt particles carried by an air-stream contacting such surface; and therefore in the invention's broadest aspect, such a coated surface may be disposed in various positions—uprightly as well as substantially horizontally. The particles-engaging substance is desirably of a character which will not only engage and hold such particles but will also envelop or cover the same so that other such particles may contact said substance and be held thereby.

It will be seen that, inasmuch as the air passages are shown as being cross-sectionally greater horizontally than vertically, the air stream passing therethrough is thin vertically and wide horizontally and thus brought into more perfect contact with the oil or other particles-engaging substance, on the bottom of the passage.

The invention being intended to be pointed out in the claims, is not to be limited to or by details of construction of the particular embodiment thereof illustrated by the drawings or hereinbefore described.

I claim:

1. In a device of the character described: a casing comprising top and bottom walls and side walls having mutually-approaching spaced front flanges and mutually-approaching spaced rear flanges; a plurality of parallelly disposed vertically-spaced vanes in the casing downwardly concavo-convex in planes parallel with the side walls and adapted to contain a liquid, the front and rear edges of the vanes being held between the front and rear flanges and the vanes' side edges being held between the side walls.

2. In a device of the character described: a casing comprising top and bottom walls and detachably connected side walls having mutually-approaching spaced front flanges and mutually-approaching spaced rear flanges; a plurality of parallelly disposed vertically-spaced vanes in the casing downwardly con-

cavo-convex in planes parallel with the side walls and adapted to contain a liquid, the front and rear edges of the vanes being held between the front and rear flanges and the vanes' side edges being held between the side walls.

3. In a device of the character described: a casing comprising separate lateral portions each having one side wall of the casing, an inwardly-extending front flange and an inwardly-extending rear flange terminating in a cross-sectionally-arcuate half neck, the flanges of said assembled portions being laterally spaced; a plurality of parallelly disposed vertically-spaced vanes in the casing downwardly concavo-convex in planes parallel with the side walls and adapted to contain a liquid, the front and rear edges of the vanes being held between the front flanges and the rear flanges respectively and the vanes' side edges being held between the side walls; means surrounding the half necks in the assembled position of the parts for detachably holding them together.

4. In a device of the character described: a casing comprising separate lateral portions each having one side wall of the casing, an inwardly-extending front flange and an inwardly-extending rear flange terminating in a cross-sectionally-arcuate half neck, the flanges of said assembled portions being laterally spaced; a plurality of parallelly disposed vertically-spaced vanes in the casing downwardly concavo-convex in planes parallel with the side walls and adapted to contain a liquid, the front and rear edges of the vanes being held between the front flanges and the rear flanges respectively and the vanes' side edges being held between the side walls; means for detachably connecting the half necks to hold the parts together.

In testimony whereof I have hereunto set my hand at Grand Rapids, Michigan, this 23rd day of April, 1925.

GORDON HOOTON.