Oct. 13, 1936. L. A. KOCH, JR 2,057,196

DYNAMO-ELECTRIC MACHINE FILTER

Filed Dec. 23, 1932

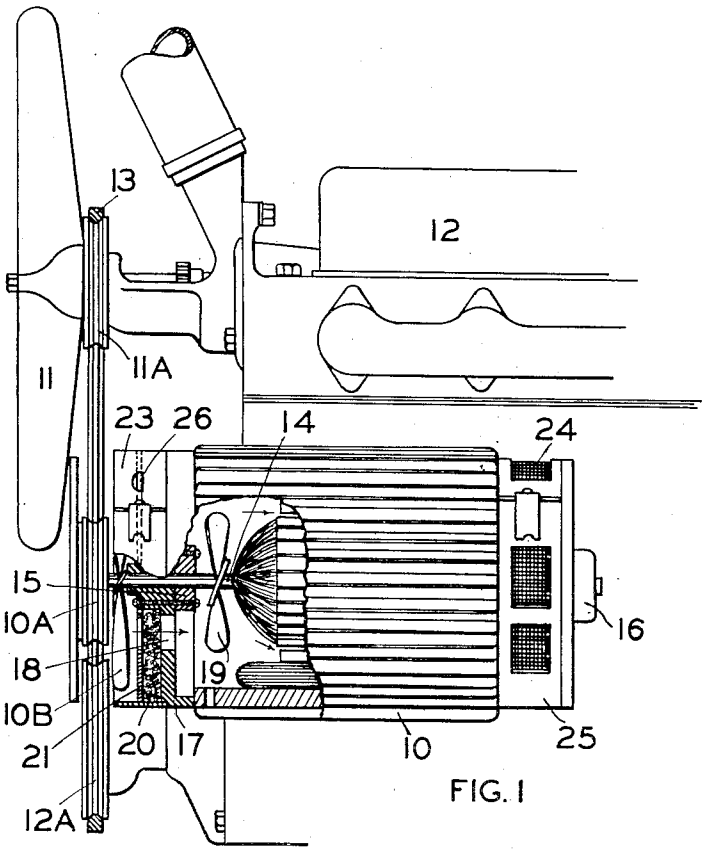


FIG. 1

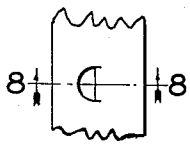


FIG. 7

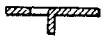


FIG. 8

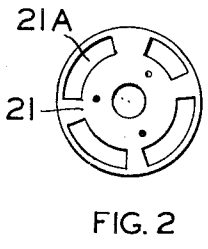


FIG. 2

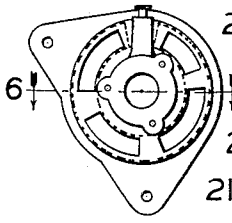


FIG. 5

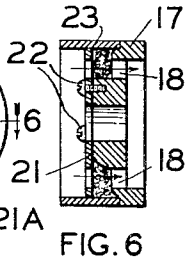


FIG. 6

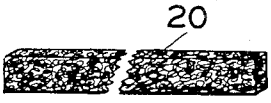


FIG. 4

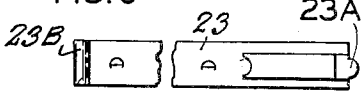


FIG. 3.

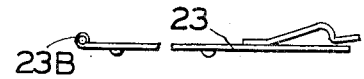


FIG. 3A.

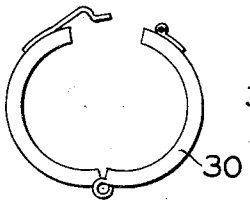


FIG. 9

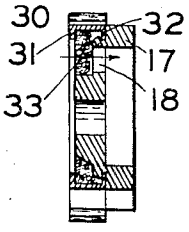


FIG. 10

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DYNAMO-ELECTRIC MACHINE FILTER

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Application December 23, 1932, Serial No. 648,523

4 Claims. (Cl. 171—252)

This invention relates to replaceable air filter structure particularly applicable to dynamo-electric machines, such as used on automotive vehicles.

The principal object of this invention is the production of an air filter structure that will occupy unused limited space adjacent an automotive dynamo and effectively remove foreign matter from air as it is forced through a wall of the dynamo to the interior for removing destructive heat incident to electric overloads that are imposed on the windings, commutator and brushes and has a direct application to the principles of generator cooling set forth in applicant's copending application, Ser. No. 641,481.

A further object is the accomplishment of the above stated object with positive and inexpensive equipment and of a type that can be readily understood and sufficiently accessible and easily manipulated to insure the desideratum.

The means employed according to this invention constitutes structure wherein the special air filter or cleaning equipment can be built into the unit during its manufacture or it can be subsequently lodged adjacent, or to same, and organized to function as if it has been originally built into the apparatus.

It is at once apparent that the apparatus provided by this invention for maintaining the generator at full normal capacity would enable a given size of generator unit to care for a greater volt-ampere output than if the unit were not so equipped.

Other objects and advantages of the structure are hereinafter set forth in detail and will be apparent to persons skilled in the art to which the invention relates and to these advantages in so far as they are patentably novel I will claim, the same as hereinafter set forth.

Drawing

The preferred forms are particularly illustrated in the accompanying drawing, which form part of this application for Letters Patent, and wherein corresponding characters refer to like parts in the several different views.

Figure 1 represents a partial side elevation of an internal combustion engine on which is installed a specially prepared type generator shown partially cut away to expose rotating parts, including the end of the armature shaft, and two fans disposed on same and details of an external air filter.

Fig. 2 is an elevation of the air filter arcuately apertured face plate shown in cross section in Fig. 1, also in Fig. 6.

Figs. 3 and 3A represent respectively the top and elevational views of the air filter strap or cover.

Fig. 4 is a perspective view of the air filter medium on an enlarged scale.

Fig. 5 is an elevation of the end view of the drive end housing member of the generator to disclose the part as prepared for admitting air, dotted lines indicate the filter location.

Fig. 6 is a cross sectional view of Fig. 5 along line **6**, **6**, together with the filter strap of Fig. 3, and the filter face plate of Fig. 2 added and forming a housing or frame for the filter medium shown in Fig. 4.

Fig. 7 is a plan view of a section of the air filter strap, while Fig. 8 is a cross section of Fig. 7 along the line **8**, **8**.

Fig. 9 is a side elevational view of a modified structure of an air filter strap or cover.

Fig. 10 is a cross sectional view of an end plate of the generator to which is attached the air filter strap Fig. 9, with an air filter medium lodged therein.

Structure

Numeral **10** indicates an electric generator, **11** a radiator cooling fan, both of which are attached to and operated by internal combustion engine **12** by belt **13** in the conventional way, there being pulley **12A** attached to the main crank shaft of the engine, pulley **11A** fixed on the shaft that operates the radiator fan and pulley **10A** fixed on to shaft **14** of the generator mounted in bearings **15**, **16**. This shaft **14** carries the armature on which are mounted the commutator, laminae and windings after the conventional practice.

Bearing **15** is a part of end housing **17** which is altered to provide openings **18** to admit air currents, indicated by arrows, created by fan blades **10B** disposed between pulley **10A** and the end housing, also by auxiliary fan **19** fixed to shaft **14** and disposed between said housing and the windings.

Between fan blades **10B** and housing **17** there is located a special type of air filter medium **20**, disposed in a very special type of housing or matrix consisting of face plate **21** secured to end housing **17** by screws **22** and a strap member **23** which surrounds the face plate and is lodged on same as well as on the end plate **17**. It is essential to keep filter pad **20** clean, therefore easy means are provided by employing a flimsy amorphous medium which is incompetent, by reason

of its structure, to take and keep a sufficiently definite form and still function as a filter under the encountered conditions. This medium is easy to remove, clean and return to a frame or matrix provided on the generator, the mere insertion of which results in an effective filter.

It will be noted that strap **23** is of sufficient width to extend over the area in which fan blades **10B** rotate. This strap serves not only to protect the fan from injury, but to assist in directing air currents through openings **21A** and **18** which communicate with the interior of the generator, where the air currents are again accelerated by interior fan **19**. Both fans work together to expel air from openings **24** disposed at the other end of the generator, preferably in commutator strap **25**. While these fans are of the same general structure, the blades of fan **19** have an increased pitch according to the velocity of the air, as a means of deriving the full benefit of both groups of blades which would not be the case if both sets of blades had the same pitch owing to the fact that when the air reaches blades **19** it is already well accelerated.

Operation

Inasmuch as these generators are disposed under the hoods of automobiles, it was found desirable to provide means for an easy and quick removal of the filter medium that becomes laden with foreign matter, and to be able to instantly replace it with a fresh medium. Therefore the filter strap **23** is provided with a latch **23A**, which is arranged to engage the eye **23B**, when in place, at the other end of the strap, and thereby secure same in a permanent way and confine the medium. Therefore the latch can be sprung, strap removed, used media removed, a media replaced and strap returned, all in a very brief period of time.

It will be noted that this filter normally is in a bar form shown in Fig. 4 and that it is radially applied to the circular filter housing and forced to take up a generally circular form. To assist in locating this strap, lip **26**, which is pressed or bent out of the strap **23** as illustrated in Figs. 7 and 8, is provided and so located that it will engage the inner surface of face plate **21** and thereby prevent the strap from displacement.

Modification

The strap **30** shown in Fig. 9 is made with depending walls **31**, **32**, the object being to suitably attach filter media **20** to the strap and to further increase the facilities with which the filter can be changed. It will be noted that depending wall is arranged to fit into groove **33** of end housing **17** which serves to lock and secure the filter.

Scope

With the object of this invention and the structure of the means for accomplishing same having been disclosed, many further modifications, substitutions or eliminations can be indulged and the means for accomplishing same can be varied without departing from the spirit of this invention, therefore I do not wish to be limited to the specific forms shown and described, and desire to be limited only by the appended claims.

I claim:

1. In a dynamo-electric machine having an enclosing housing with an outlet at one end and an inlet at the other end, a shaft mounted in bearings carried by said ends, a fan carried by said shaft and cooperating with the inlet to force air through said housing via the inlet and the outlet, a removable filter medium associated with said inlet, a fixed frame for said medium, and a detachable band encompassing said frame and extended to embrace at least a portion of said fan.

2. In a dynamo-electric machine having an enclosing housing with an outlet at one end and an inlet at the other end, a shaft mounted in bearings carried by said ends, a fan carried by said shaft and cooperating with the inlet to force air through said housing via the inlet and the outlet, and a removable filter medium associated with said inlet, a fixed frame for said medium, said frame being disposed between the fan and the inlet and a detachable band encompassing said frame and longitudinally extended to embrace at least a portion of said fan.

3. In a dynamo-electric machine having an enclosing housing with an outlet at one end and an inlet at the other end, a shaft mounted in bearings carried by said ends, a fan carried by said shaft and cooperating with the inlet to force air through said housing via the inlet and the outlet, a removable filter medium associated with said inlet, a fixed frame for said medium, said frame comprising a pair of discal juxtapositioned members and a detachable band encompassing said frame.

4. In a dynamo-electric machine having an enclosing housing with an outlet at one end and an inlet at the other end, a shaft mounted in bearings carried by said ends, a fan carried by said shaft and cooperating with the inlet to force air through said housing via the inlet and the outlet, a removable filter medium associated with said inlet, a fixed frame for said medium, said frame comprising a pair of discal juxtapositioned members and a detachable band encompassing said frame and extended to embrace at least a portion of said fan.

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