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COMMUTATOR COOLING

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FIG. 2.

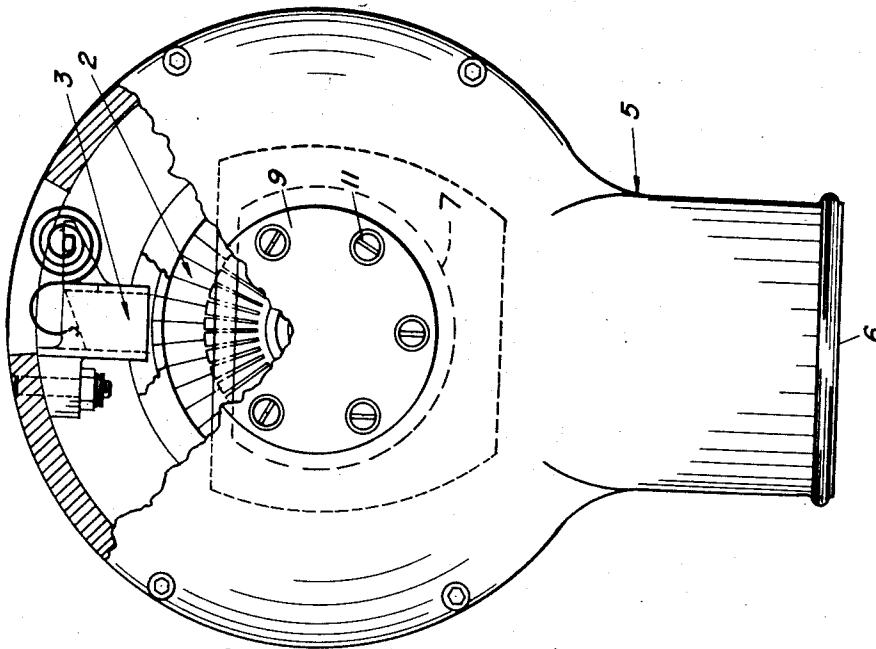
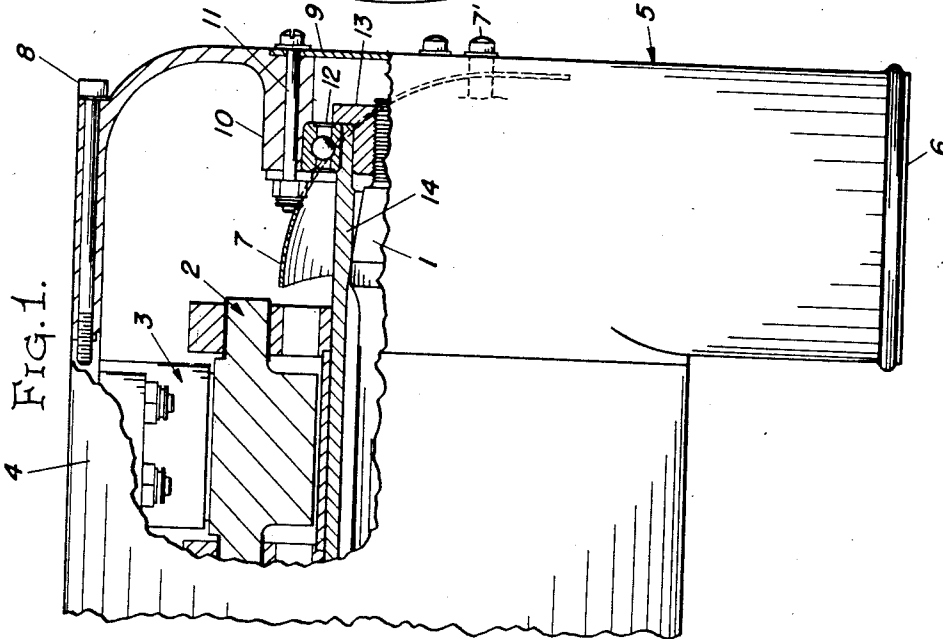


FIG. 1.



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1 Claim. (Cl. 310—227)

This invention relates in general to commutators and more particularly to improvements in construction and means for cooling of commutators used in high speed electrical machines.

The conventional electrical machines comprises a two piece construction employing a bearing support for the commutator shaft and a separate air intake scoop mounted on the bearing support and provided with a baffle for the intake air flowing through the air intake scoop to cool the commutator. This two piece construction has many disadvantages in that it is expensive and heavy in weight. A large air pressure drop occurs across the bearing, causing loss of lubricant and a reduction in the effectiveness of cooling air. Moreover, in the usual construction, the air is not guided by the baffles towards the center of the rotor of the unit, which results in inefficient cooling.

One of the primary objects of this invention is to eliminate the foregoing disadvantages by providing an air intake scoop intake assembly that is designed to include the bearing support for the commutator shaft, so that the bearing support and the air intake scoop are in one piece, rather than in two pieces, as is the usual construction.

Another object is to provide a unitary machine construction in which the air intake scoop and bearing support will reduce the weight and space required for effective cooling of the commutator.

Another object in the provision of such a unitary construction is to eliminate the large pressure drop that normally occurs across the bearing so as to eliminate the loss of lubricant and improve the effectiveness of the cooling air.

Another object in the provision of this unitary construction is to enable the air to be guided by the baffles into the center of the rotor for improving the cooling of the commutator.

Another object in the provision of such a unitary construction is to provide a unit that is designed for the maximum ease in assembly and disassembly.

With the foregoing and other objects in view, the invention resides in the combination of parts and in the details of construction hereinafter set forth in the following specification and appended claim, certain embodiments thereof being illustrated in the accompanying drawings, in which:

Figure 1 is a fragmentary view of the commutator, partly in side elevation and partly in section, and showing the air intake scoop, its bearings and baffles in longitudinal section; and

Figure 2 is a view in end elevation of the air intake scoop and commutator, the air intake scoop being shown partly broken away to show that end of the commutator.

Referring more particularly to the drawings, the improved commutator construction constituting the present invention includes the usual rotative shaft 1. Carried by the shaft is the usual commutator bar construction generally referred to at 3. The housing proper for the commutator is shown at 4.

The air intake scoop generally indicated at 5 has an intake 6 and is provided with an internally located baffle 7 secured by a rivet 7' to the air inlet scoop 5. The air intake scoop housing is secured by means of bolts 8 to the commutator housing 4. This air intake scoop constitutes the only air inlet into the commutator structure.

Departing from the usual construction, the air intake scoop housing includes a retainer plate 9 and an axially inwardly extending support 10. This external plate 9 is secured to the support 10 by means of bolts 11. The support 10 constitutes a support for an end ball bearing assembly 12 secured by a bearing retainer nut 13 for supporting the commutator shaft 1 and sleeve 14 splined thereto.

In this manner the air intake scoop is designed to include the bearing support so that the bearing support and air intake scoop are in one piece rather than in two pieces and the air intake scoop includes the bearing support rather than being mounted on the bearing. The combined air intake scoop and bearing support makes it possible to reduce the weight and space required for the commutator unit. There has also been eliminated the large pressure drop that normally occurs across the bearing which would cause loss of grease and a reduction in the effectiveness of the cooling air. The novel construction enables the air to be guided by the baffles into the center of the rotor so as to improve the cooling of the unit. The novel bearing support is more rigid because the closed surface of the air intake scoop provides the support. The novel one piece construction is more simple and cheaper to manufacture and lends itself to easy assembly and disassembly.

We claim:

In a commutator, a rotary shaft, a main bearing for supporting said shaft, a rotor supported by said shaft, a commutator housing and an air intake scoop releasably secured to said commutator housing and constituting the sole inlet into said commutator, the air inlet to said air inlet scoop being angularly disposed with respect to the rotor main bearing, said air intake scoop having rigidly mounted therein a bearing and a support therefor in said intake air scoop, said last named bearing constituting an end bearing for said commutator shaft that is removable with said air intake scoop from said commutator, said air intake scoop also having mounted therein an air baffle that is so angularly disposed with respect to the axis of rotation of said commutator shaft and its main bearing and end bearing as to direct incoming cooling air from said air intake scoop into the center of the rotor of the commutator and in a path past and out of contact with the end bearing in the air intake scoop.

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