

July 17, 1951

R. E. SEARS

2,560,784

GENERATOR COOLING SYSTEM

Filed Aug. 6, 1948

2 Sheets-Sheet 1

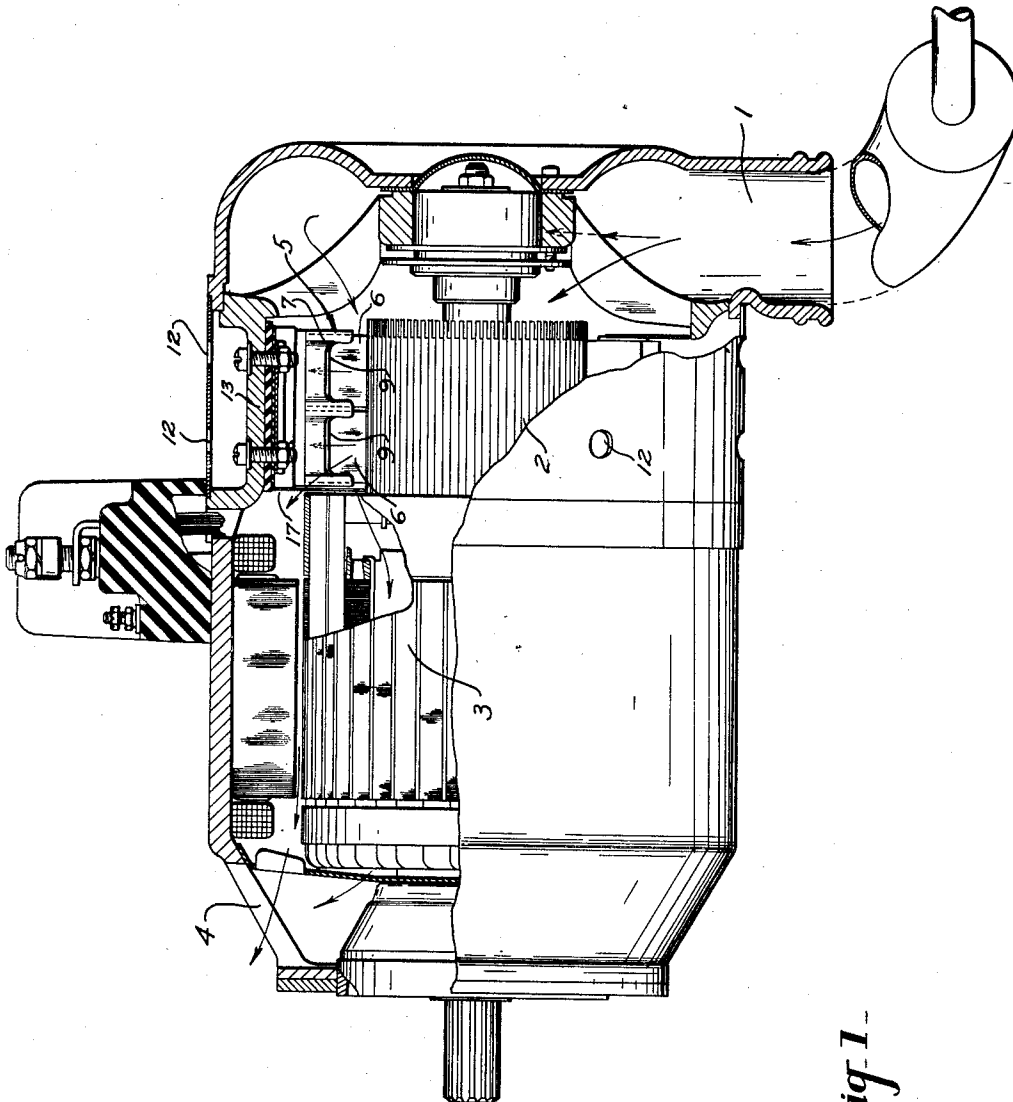


Fig. 1-

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2 Sheets-Sheet 2

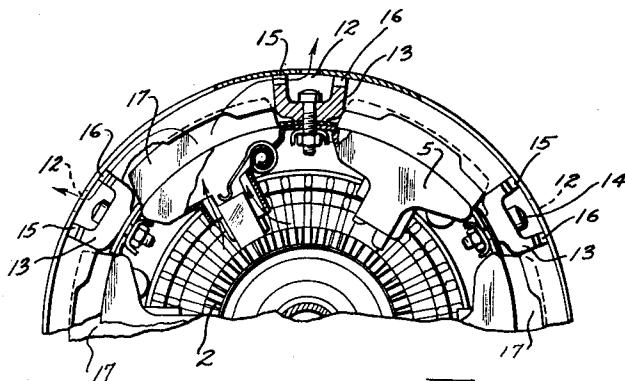


Fig-2-

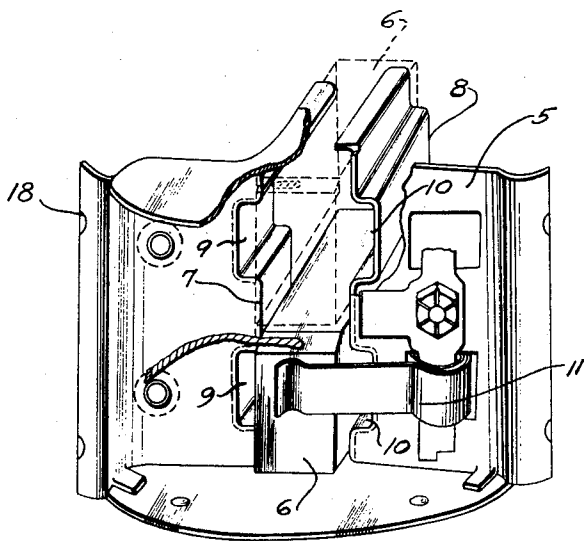


Fig-3-

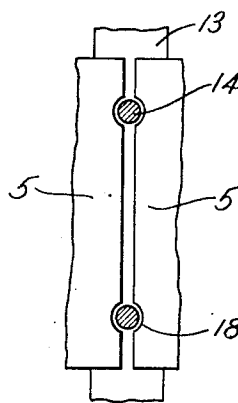


Fig-4-

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UNITED STATES PATENT OFFICE

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GENERATOR COOLING SYSTEM

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1 Claim. (Cl. 171-252)

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This invention relates in general to a method and apparatus for cooling such electrical devices as generators and the like and their moving parts, including the armature, commutator and brushes.

The conventional approach toward the solution of this problem has fallen short of its purpose, due in part to an inadequate supply of pressure air and also to the absence of means for positively insuring adequate air flow, not only about the armature and commutator but also about the brushes.

One of the primary objects of this invention is to provide an adequate supply of pressure air in the form of a blower fan for blowing pressure air into the intake at the commutator end.

Another object is to provide means for confining the passage of air about the commutator and armature to a discharge opening at the opposite end of the generator.

One of the most important objects is to provide an improved brush holder and baffle system for positively confining and directing an adequate supply of cooling pressure air about both sides of each brush and directly to atmosphere through housing openings arranged adjacent to and radially of the brush holder.

Another object is to provide baffle means for preventing the cooling pressure air normally used to cool generator parts aft of the brush holders from escaping into the atmosphere through the housing openings radially disposed of the brush holders.

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 view generally in side elevation of a generator, with part of the housing broken away, showing the armature partly in elevation and partly broken away, the commutator in elevation and the brush holder, without the brushes, in longitudinal section;

Figure 2 is a fragmentary view in cross section through the generator, showing the commutator and brush holder assemblies in end elevation;

Figure 3 is an enlarged view in perspective of a brush holder with one brush shown in full lines and the other brush in dotted lines; and

Figure 4 is a fragmentary view of a brush, brush holder and bolt attachment.

Referring more particularly to the drawings, pressure air from a suitable external fan source

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is forced into the generator housing through an air inlet 1. As indicated by arrows, the pressure air is confined by the generator housing to be blown over the commutator 2 and armature 3 out through the exhaust ports 4 at the opposite end of the generator.

In addition to this cooling means, I am primarily concerned with the cooling of the commutator brushes. In general, I propose to so form the brushes and brush holders as well as openings to the exterior through the housing as to so confine and direct the flow of pressure air that it must pass through the brush holders and also flow on both sides of the brushes and to atmosphere through housing openings disposed radially of the brush holders for purposes of effective cooling.

In detail in Figure 3 I have shown a brush holder assembly 5 comprising a pair of opposed side members 7 and 8 for holding a pair of brushes 6. The side members 7 and 8 are so formed as to provide a channel 9 on one side and a channel 10 on the other side of each brush in slidable engagement. Each brush is normally held against the commutator 2 by the action of a leaf spring 11. The channels 9 and 10 are provided for by the corrugation of the brush holder side members.

Each brush holder assembly 5 is held in place by a supporting bracket 13 by means of bolts 14 extending through bolt slots 18. The housing is provided with openings 12 to atmosphere but each of such openings is disposed radially of the bolts 14. The supporting brackets 13 are provided with side openings 15 and 16.

As shown in Figures 2 and 3, pressure air, in order to escape through openings 12, must first pass through channels 9 and 10 and thus on both sides of each brush, thence through side holes 15 and 16 in the supporting bracket 13, and out through openings 12. A baffle 17 prevents cooling air which is normally used to cool parts in the generator aft of the brush holders, such as armature 3, from escaping through housing openings 12.

Thus, in marked contrast to the conventional, I provide for an adequate supply of cooling pressure air; confine and insure its flow around the commutator and armature throughout their lengths to housing discharge outlets; confine and insure air flow through brush holder channels on each side of each brush through discharge openings arranged radially adjacent each brush holder and baffle means for preventing escape through such openings of air normally used for cooling of parts aft of the brush holders.

I claim:

In an electrical apparatus having a housing, an armature, a commutator and commutator brushes, a source of pressure cooling air and an intake for same at the commutator end of the housing and discharge outlets at the other end thereof, brush holders for said brushes each formed with brush receiving openings and a channel on each of two sides of each brush to form passages for said pressure cooling air, supporting brackets for said brush holders with side openings, said housing having openings to atmosphere adjacent to and substantially radially of each brush holder and otherwise closed with respect to that part that encloses the commutator for confining and insuring air flow on both sides of each brush, through the side openings of each bracket holder and through said housing openings to atmosphere.

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