

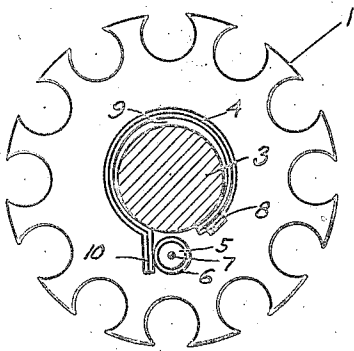
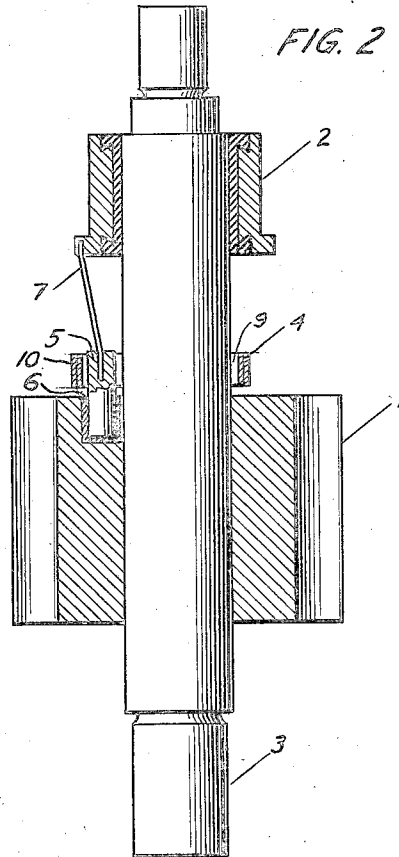
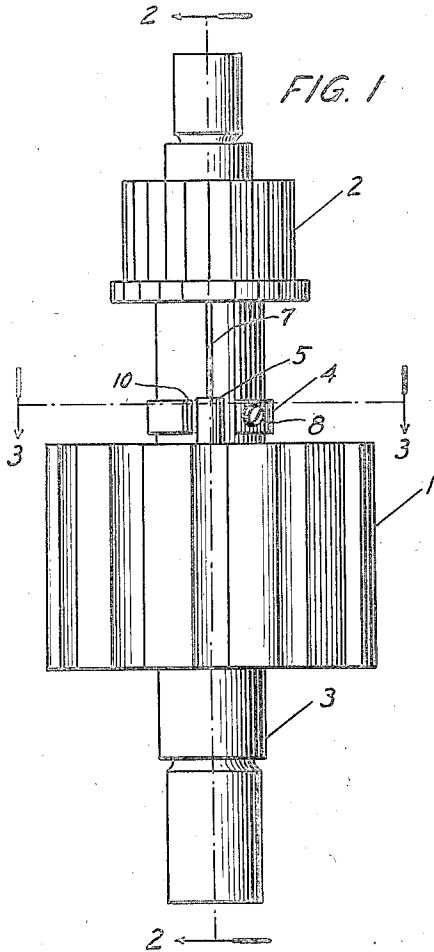
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DEVICE FOR PREVENTING OVERHEATING OF GENERATORS

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DEVICE FOR PREVENTING OVERHEATING
OF GENERATORS

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3 Claims. (Cl. 171—206)

This invention relates to a novel device for preventing overheating of electric generators. The invention has special application and utility in low voltage electric systems of the character employed in automobiles, airplanes, and the like.

Generators in such low voltage systems have one grounded brush. In accordance with this invention means are provided for grounding the armature windings and one of the commutator bars to the armature shaft whenever there is a tendency for the generator to overheat for any cause. The grounding of the armature windings causes an unloading process which takes place with each revolution of the armature. The unloading process is greater than the building characteristics of the generator and the generator thus returns to the zero point, where it remains until the generator cools and the ground is automatically released.

The present invention is directed to the provision of extremely simple, effective and economic means for thus preventing the overheating and burning out of the generator.

The specific advantages and purposes of the invention will become apparent as the description proceeds.

Referring to the drawing:—

Figure 1 is a top plan view of an armature without windings showing the invention applied thereto;

Figure 2 is a view in cross section taken on the line 2—2 of Figure 1; and

Figure 3 is a sectional view on the line 3—3 of Figure 1.

Referring to Figures 1 and 2, the core 1 and commutator 2 are carried on the shaft 3 in conventional form.

The thermal responsive bi-metal contact member 4 substantially encircles the shaft 3 adjacent the core and between the core 1 and the commutator 2. It will be understood that the outer metal layer of the bi-metal contact member 4 has a greater coefficient of linear expansion than the inner metal layer thereof.

A post 5 is set in the end of the core 1 and insulated therefrom as shown at 6. A conductor in the form of an insulated copper wire 7 electrically connects the post 5 and one of the bars of the commutator 2.

It will be observed that the bi-metal contact member 4 is secured to the shaft 3 by the screw 8 and that normally the contact member 4 is in expanded position with its central portion spaced at a considerable distance from the shaft 3, as shown at 9. The thermal responsive contact

member 4 is provided at its free end with a bent out portion 10 (see Figure 3) which is adapted, upon expansion of contact member 4 under influence of heat, to be brought into engagement with the post 5 and thereby ground one of the bars of the commutator 2 through the wire 7 to the shaft 3.

The operating parts of the anti-overheating device, namely the contact member 4, post 5 and wire 7, are all adapted to be affixed before the armature is wound. It will be noted that these elements in no way interfere with the windings and that after the armature is wound, the device is enclosed.

Since the bi-metal contact member 4 is in direct contact with shaft 3 and through shaft 3 with the core 1, it is readily responsive to heat, whether it is generated at the commutator surface due to arcing brushes or within the windings due to operating against open circuits and overloads. It is apparent that from any possible point of heat generation in the armature windings there is a substantially direct metal conductor to the thermal responsive contact member 4, whereby the heat is effectively and immediately transmitted thereto with a minimum amount of resistance.

From the foregoing description it is clear that when the armature starts to overheat for any cause, the outer portion of the bi-metal thermal responsive contact member 4 expands causing the same to bend so that the portion 10 makes contact with the post 5, thus grounding windings of the armature and causing a cessation in the generating. As soon as the armature has cooled to a safe operating temperature, the contact member 4 contracts to its normal position, drawing portion 10 away from post 5 and restoring the armature windings to operative condition.

Having thus described my invention, what I claim is:—

1. A device for preventing overheating and burning out of electric generators of the character having a normally grounded brush, comprising a thermal responsive contact member adapted to act in response to abnormal heat to ground the armature windings, said contact member having direct metallic contact with the armature shaft and core whereby heat developed either in the commutator or within the windings of the armature is readily conducted to said contact member.

2. In combination with an electric generator having an armature composed of a shaft, a commutator, a core having metal contact with said shaft, a thermal responsive contact member car-

ried by said shaft and in metal to metal contact therewith, and means for grounding the armature windings upon expansion of said thermal responsive contact member effected by abnormal heating
5 up of either said commutator or of said armature windings.

3. In combination with an electric generator having an armature composed of a shaft, a commutator, a core having metal contact with said
10 shaft, a thermal responsive contact member car-

ried by said shaft and in metal to metal contact therewith, and means for grounding the armature windings upon expansion of said thermal responsive contact member including a stop member
5 carried by and insulated from said armature core, a conductor connecting said stop member and said commutator adapted to ground armature windings when said thermal responsive member is actuated.

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