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ELECTRICAL SMOKE GENERATOR
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4 Claims. (Cl. 46—9)

The present invention relates to smoke generating apparatus, and more particularly, to an electrical smoke generator designed primarily, though not exclusively, for use with scale model electric trains.

Generally, it is an object of the invention to provide a small, compact smoke generator that can be mounted within the smokestack of a scale model engine, including the very small "HO" scale models.

It is a feature of the invention to provide an electrical smoke generator adapted for connection conveniently to existing electrical terminals in a scale model engine, and including a perforated, insulated housing which precludes short circuiting yet permits egress of the smoke from the unit.

It is another feature of the invention to provide a smoke generator which includes oil-saturable material that may be resaturated with oil periodically to increase the longevity of the smoke-producing function of the unit.

Additionally, it is a feature of the invention to provide an electrical smoke generator wherein electrically induced heating is applied to both the interior and exterior of the mentioned oil-saturable material to enhance the smoke-producing capability thereof.

A further feature of the invention is to provide an electrical smoke generator which constitutes an inexpensive unit that is simple to assemble and also to install in the scale model engine.

These, as well as other, objects and features of the invention will become more apparent from a perusal of the following description of the structure illustrated in the accompanying drawings wherein:

FIG. 1 is a fragmentary side elevation of a scale model engine, the forward portion thereof being broken away and illustrated in section to indicate the general mounting arrangement of an electrical smoke generator embodying the present invention, and

FIG. 2 is an enlarged perspective view of the smoke generator with portions thereof broken away to illustrate details of its interior construction.

With initial reference to FIG. 1, a portion of an electrically-energized scale model engine, indicated generally at E, is shown on a track T through the medium of which electrical current is supplied to the engine in a conventional fashion. Suitable terminals 10, 12 mounted in the forward, upper portion of the engine housing enable the supply of electrical current through wires 14 and 16 to the electrical smoke generator, indicated generally at 20. It will be understood that the illustrated electrical connections are purely exemplary and will vary dependent upon the structure of the particular scale model engine.

Also, depending upon the structure of the engine E, the smoke generator 20 can be physically mounted in any suitable manner. However, as illustrated in FIG. 1, the smoke generator 20 is preferably mounted within the smokestack 18 of the engine. This enables the smoke to emerge therefrom immediately after its production, and furthermore, facilitates replenishment of the oil supply in the smoke generator 20 directly through the open upper end of the smokestack 18, as will be described in detail hereinafter.

With additional reference to FIG. 2, the smoke generator 20 includes, as a central core member, an electrical resistor 22 having the normal cylindrical configuration and having wires 22a, 22b projecting from opposite ends thereof for soldered connection to the previously described wires 14 and 16. While the precise resistance and power requirements of the resistor 22 are not extremely critical, it is necessary that these values be chosen so that considerable heat will be generated by the resistor when the existant potential source is applied thereto. With potential sources conventionally applied to the energization of scale model engines, a resistor 22 having a resistance value of between 1200 and 3300 ohms and with a 1/10 watt power capability is preferred.

A layer of oil-saturable material such as lamp-wick or asbestos is wrapped around the body of the resistor 22 to provide an annular oil-saturable member 24 and may, if desired, be glued to the body of the resistor 22 to establish permanent connection therebetween.

However, if desired, such gluing may be omitted in the assembly of the unit since another resistance member, preferably in the form of No. 42 Nichrome wire 26, is wound in a helical configuration consisting of at least three or four turns around the exterior of the annular oil-saturable member 24 to, accordingly, hold the latter on the resistive core member 22. At its opposite extremities, the helical wire 26 is soldered or otherwise secured to the wires 14 and 16 so as to be electrically parallel with the resistor 22. Thus, when electrical current is supplied through the wires 14 and 16, heating of both the resistor 22 and the electrically-parallel Nichrome wire 26 results to assure maximum generation of heat and ultimately maximum production of smoke from a given voltage or potential source. In order to obtain maximum generation, it will be obvious that the Nichrome wire 26 is left exposed and thus in direct close contact with the encompassed oil-saturable member 24.

In order to complete the smoke generator unit, a generally cylindrical exterior housing 28 is secured in surrounding relationship to the previously described elements of the smoke generator 20. More particularly, such housing 28 is composed of "Teflon" or other insulating material, molded or otherwise formed to provide a cylindrical side wall and an integral top plate which are perforated to allow egress of smoke therefore. The bottom of the housing 28 is left open to permit ready insertion of the remaining elements of the smoke generator 20 thereinto.

It will be seen that the perforated housing 28 allows egress of smoke from the unit at a plurality of positions, yet insulates the interior elements and particularly the Nichrome wire 26 from contact with the metal walls of the smokestack whereby shorting of the unit is effectively avoided.

The smoke generator unit 20, as described, is suitably mounted in the engine E at the time of manufacture or by the scale model hobbyist at any time thereafter. Such installation into the open smokestack 18 is rendered particularly simple at either time. After the unit is installed, a few drops of machine oil are placed into the oil-saturable member 24 and the unit is ready for utilization.

Upon supply of electrical current to the engine E, a portion of such current flows through the wires 14 and 16 and in parallel paths through the resistor 22 and the Nichrome wire 26. As these members 22 and 26 become heated by the flow of current, such heat will be passed into the oil-saturable member 24 whereupon smoke will be produced. Such smoke will find its way through the plurality of apertures in the perforated housing 28 and thence be carried upwardly from the smokestack 18. The effect is extremely realistic and will continue as long as the supply of oil remains within the smoke generator 20. Obviously, when production of smoke ceases, the supply of oil in the smoke generator 20 can be quickly replenished by the simple expedient of dis-
charging several drops of oil through the open upper end of the smokestack 18 into the smoke generator 20.

Various structural modifications and alterations can obviously be made in the described smoke generator unit without departing from the spirit of the invention, and the foregoing description of one embodiment is accordingly to be considered as purely exemplary and not in a limiting sense. The actual scope of the invention is to be indicated by reference to the appended claims.

What is claimed is:

1. An electrical smoke generator which comprises a generally-cylindrical, electrically-resistive core member, an annular oil-saturable member closely encompassing said core member, a second electrically-resistive member contiguous encompassing said oil-saturable member, there being no effective electrical insulation between said saturable member and said resistive members and means for connecting the opposite extremities of each of said electrically resistive members to the terminals of a source of electrical potential whereby current flow is established through each of said resistive members.

2. An electrical smoke generator according to claim 1 wherein said oil-saturable member and said housing are composed of insulating material.

3. An electrical smoke generator which comprises an electrically-resistive core member, an oil-saturable member substantially entirely encompassing said core member, a second electrically-resistive member contiguous encompassing said oil-saturable member, there being no effective electrical insulation between said saturable member and said resistive members and means for connecting the opposite extremities of each of said electrically resistive members to the terminals of a source of electrical potential whereby current flow is established through each of said resistive members.

4. An electrical smoke generator which comprises a generally-cylindrical, electrically-resistive core member, an annular oil-saturable member closely encompassing said core member, a second electrically-resistive member partially encompassing said oil-saturable member, there being no effective electrical insulation between said saturable member and said resistive members, a perforated exterior housing encompassing all of said members, and means for connecting the opposite extremities of each of said electrically resistive members to the terminals of a source of electrical potential, said second electrically-resistive member comprising a high resistance wire wound in helical configuration about said oil-saturable member to hold the same on said core member.

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