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ELECTRICALLY OPERATED SMOKE PRODUCER

Filed March 19, 1942

FIG. 1.

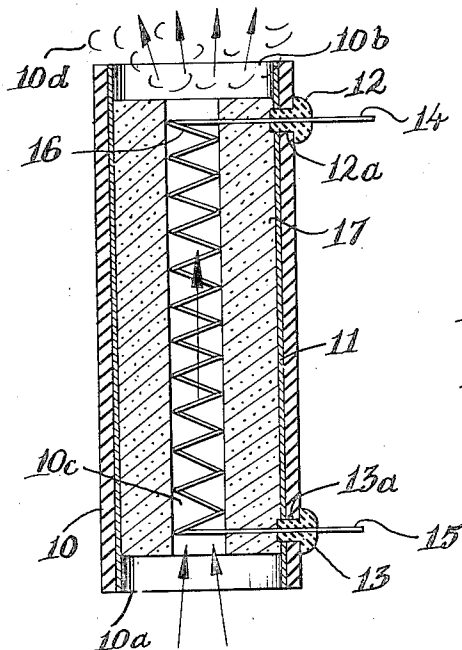


FIG. 2.

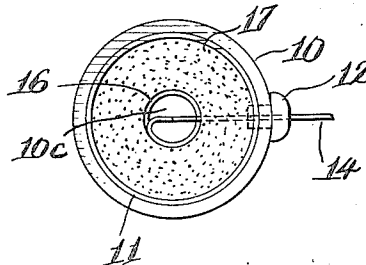
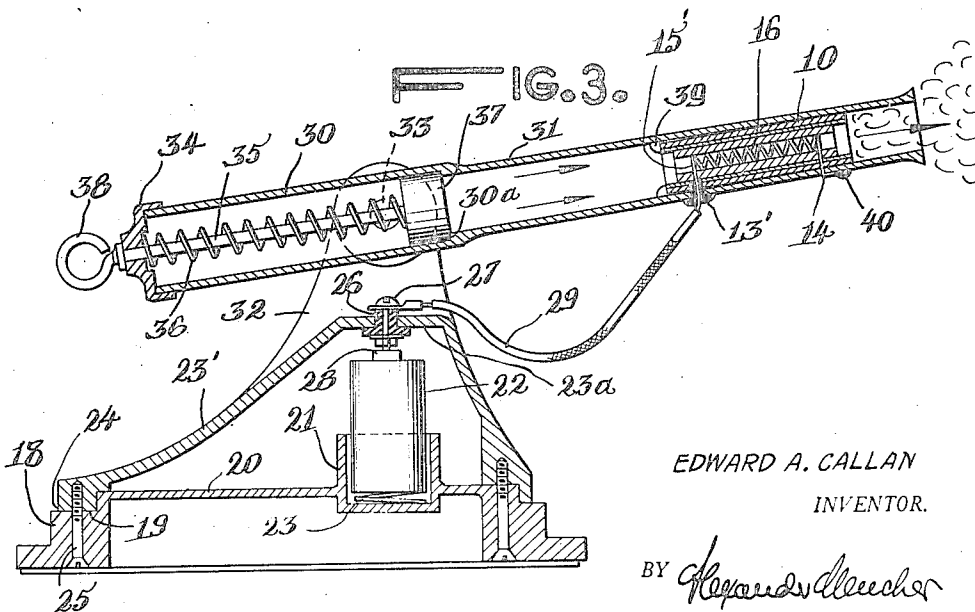


FIG. 3.



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ELECTRICALLY OPERATED SMOKE PRODUCER

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3 Claims. (Cl. 46—9)

This invention relates generally to smoke producers, but more specifically to an electrically operated smoke producer for toys, advertising and theatrical displays, motion picture production and disinfecting purposes.

The main object of the invention resides in the provision of an electrical appliance which produces smoke in a simple, safe and effective manner for simulating smoke or steam emanating from the cylinder of toy locomotives and producing smoke emanating from a theatrical prop and for producing smoke in connection with an advertising sign.

Another object of the invention resides in the provision of an electrically operated smoke producer which may be installed in toy cannons, guns, ships, houses for homes, and pumping plants to simulate smoke and to simulate flames in conjunction with lighting effects and color filters. The device may also be used as an incense burner or as a deodorizer for disinfecting purposes when installed in a suitable container for homes and factories.

Another object of the invention resides in the provision of an electrically operated smoke producer which is durable and which causes smoke to issue in its natural form such as belches, puffs or steady streams for prolonged periods.

These objects and other incidental ends and advantages of the invention will hereinafter appear in the progress of the disclosure and as pointed out in the appended claims.

Accompanying this specification is a drawing showing a preferred form of the invention and the application thereof to a toy cannon, corresponding reference characters designating corresponding parts throughout the several views:

In the drawing:

Figure 1 is a vertical sectional view of the electrically operated smoke producer.

Figure 2 is a top plan view of Figure 1.

Figure 3 is a sectional view of the smoke producer incorporated in a toy cannon.

In accordance with the invention and in accordance with preferred forms shown, a metallic tube 10 is provided the inner walls of which are lined with insulating material such as mica 11. Adapted to penetrate tube 10 and mica 11, are a pair of insulators 12 and 13 each being attached to tube 10 adjacent the opposite ends, the said insulators being provided with central openings through which pass the terminal wires 14 and 15 of a heating coil 16, said heating coil being disposed concentrically of the tube. The space between mica insulation 11 and coil 16 is

filled with ordinary flour and then saturated with light lubrication oil.

When electric current of suitable voltage is applied to terminals 14 and 15, coil 16 is made to glow thereby causing the flour to toast and cling to coil 16 and mica lining 11. In this manner the flour is converted into a porous binder to receive oil for future burning to produce smoke. The binder shown on the drawing is indicated by numeral 17. Without the use of flour as a binder the oil on contact with coil 16 would burn up immediately whereas with the use of the flour binder the unit acts as a reservoir for fuel and produces smoke for periods of two hours.

As shown in Figure 1, the bottom of tube 10 indicated by numeral 10a acts as an air inlet entering a draught shaft 10c formed along coil 16, the said shaft 10c terminating at the top of tube 10 in outlet 10b, the generated smoke indicated by numeral 10d flowing therefrom in the direction indicated by the arrows in Figure 1. Ends 10a and 10b together with the draught duct 10c may be suitably formed by first making a paste from the flour and the lubricating oil and then packing the mixture between the ends of tube 10 and around heating coil 16. In the alternative, flour only may be packed within the lined tube 10 and then toasted by the heating coil. Thereafter, shaft 10c may be excavated out in a conventional manner before the application of odorless smoke producing fuel such as lubricating oil.

In Figure 3 the smoke producer is incorporated in a toy cannon of any conventional construction, the said cannon being provided with a compression spring operated piston which may be made to operate manually or mechanically and cause smoke to belch out from the barrel in a realistic manner. Thus the cannon is provided with a metallic base 18 having a peripheral shoulder 19 and a horizontal plate 20 spaced above the bottom, the plate 20 carrying a socket 21 adapted to receive a battery 22. The battery 22 is maintained in place within socket 21 against spring 23 electrically connected between the negative of the battery 22 and the cannon. Adapted to engage metallic base 18 at shoulder 19 is a metallic cover member 23' secured together by means of screws 25 penetrating metallic base 18 and the lower edge 24 of cover member 23'. The positive terminal 28 of battery 22 is connected through the top wall 23a of cover member 23' to the end of a binding post 27 mounted within an insulator 26 attached to top wall 23a.

The cannon is provided with metallic side mem-

bers 32 having opposing pivots 33 adapted to engage the cannon barrel 30, the latter having a forward compartment 31. The cannon barrel 30 is provided with an end closure cap 34 through which a piston rod 35 penetrates, the said piston rod at the forward end having a piston head 37 and at the opposite end outside of closure cap 34 having an eye 38. Between the inner wall of closure cap 34 and the inner wall of piston head 37 is a helical spring 36 slidably engaging piston 35 whereby the piston head 37 may be drawn toward the end of barrel 30 by pulling on eye 38, the said piston head being forced back along the inner wall of barrel 30 by the action of compression spring 36 upon release of eye 38, piston head 37 having a stop member in the form of shoulder 30a formed between barrel 30 and compartment 31.

The smoke producer may be inserted within the forward end of compartment 31 of the cannon as shown in Figure 3, elements 39 within the compartment serving as stop members. Terminal 14 of heating coil 16 is adapted to be connected to compartment 31 as at binding post 40, the latter being connected to the negative of battery 22 through the cannon construction while the other terminal 15' of heating coil 16 is connected to binding post 27 through conductor 29 and through insulator 13'. It is to be observed that by manipulating eye 38 of piston 37, smoke may be caused to belch out from the mouth of compartment 31 at controlled intervals in the direction of the arrows shown in Figure 3.

It is understood that the smoke producer may be utilized in toy steamships or locomotives provided with a piston and cylinder to act as a breather. Moreover, the smoke producer may be

used by itself in a toy house or plant to simulate desired effects.

I wish it understood that minor changes and variations in the construction, location, integration and materials used in the preferred embodiment of the invention may be resorted to without departing from the spirit of the invention and the scope of the appended claims.

I claim:

1. A smoke producer including a tubular section having insulated inner walls, a heating element disposed concentrically within and along said tubular section, terminal conductors for said heating element penetrating said tubular section for connection to a battery, a porous filler between said heating element and the inner walls of said tubular section to receive fuel for smoking purposes when the heating element is energized, the tubular section being provided with a draft opening to cause the smoke to issue from one end.
2. A smoke producer as set forth in claim 1 wherein the draft opening is disposed concentrically of the tubular section passing through the heating element.
3. In combination with a tube having an outlet at one end and a breathing device at the other end, a smoke producer insertable at the outlet side of said tube, said smoke producer including a tubular section, a heating element disposed concentrically within and along said tubular section, a porous filler between said heating element and the inner walls of said tubular section to receive fuel for smoking purposes when the heating element is energized, an opening within said tubular section to serve as a draft and to cause smoke to issue from one end.

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