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CLEANING APPARATUS

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Fig. 1

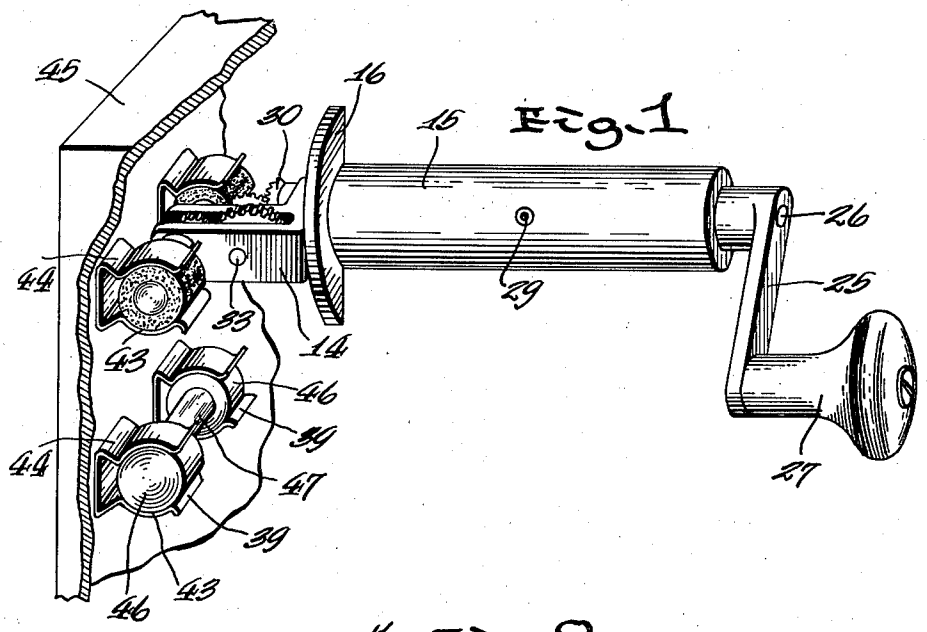


Fig. 2

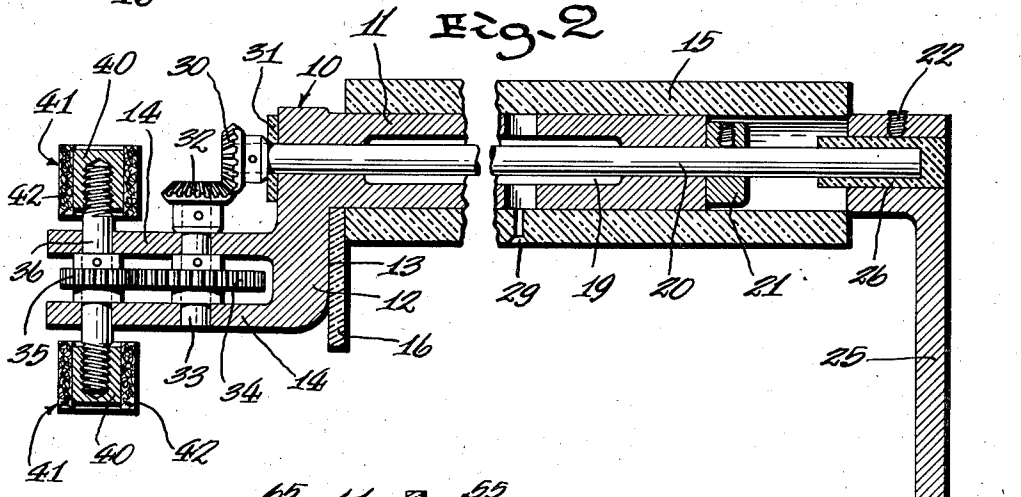
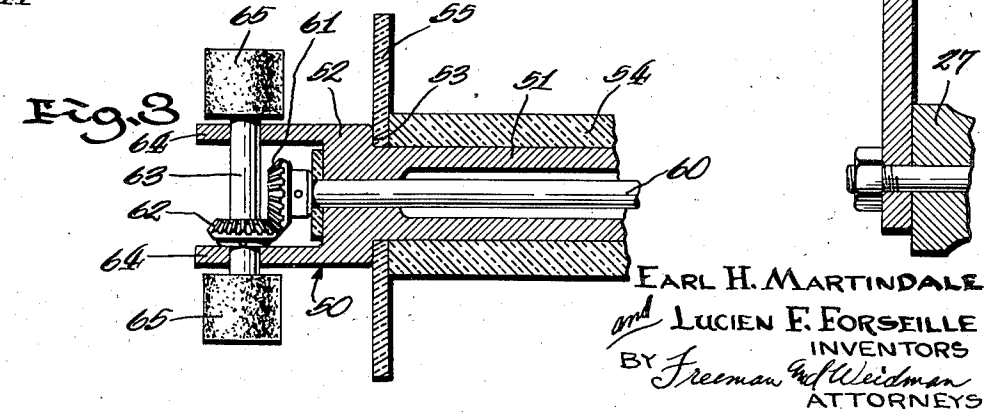


Fig. 3



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CLEANING APPARATUS

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8 Claims. (Cl. 51—170)

This invention relates to cleaning apparatus, more particularly adapted for use in cleaning and polishing fuse holders, and the like, and an object of the invention is to provide a new and improved apparatus of this character.

In the drawing accompanying this specification and forming a part of this application, we have shown, for purposes of illustration, certain embodiments which our invention may assume, and in this drawing:

Figure 1 is a perspective view of one embodiment of the invention, as applied to a cartridge fuse holder,

Figure 2 is a central broken sectional view of the embodiment shown in Figure 1, while

Figure 3 is a fragmentary central sectional view, disclosing a different embodiment of the invention.

Referring to Figures 1 and 2, the embodiment therein disclosed comprises a casting 10 having an elongated tubular member 11, terminating at one end in a laterally offset portion 12, forming with the tubular member 11 a shoulder 13, and the offset portion 12 is provided with bifurcated extensions 14, for a purpose hereinafter described, and rigidly secured to the exterior surface of the tubular member 11 is a hand grip 15, of "Bakelite", or other suitable electric insulating material, and interposed between the shoulder 13 and the adjacent end of the hand grip 15 is a semi-circular disk 16, also of "Bakelite", or other suitable electric insulating material, against which the side of the hand of the user who grasps the hand grip 15, may rest.

Centrally disposed and longitudinally extending through the tubular member 11 is a bore 19 reduced at its opposite ends for the rotatable reception of a drive shaft 20, which is limited in longitudinal movement to the left with respect to the tubular member 11, as viewed in Figure 2, by means of a collar and screw 21 abutting against the extreme end of the tubular member 11. Detachably secured to one end of the drive shaft 20, by means of a screw 22, is a crank 25, suitably electrically insulated from the drive shaft 20 by insulation interposed therebetween, as indicated at 26, and the crank 25 is provided with a knob 27 adapted to be grasped by the other hand of the user. A bore 29 extends radially through the tubular member 11 and hand grip 15 and communicates with the longitudinal bore 19, whereby the drive shaft may be oiled.

Rigidly connected to the opposite end of the drive shaft 20 is a beveled gear 30, and interposed therebetween and the end of the tubular member 11 is a fibre washer 31. The gear 30 meshes with a correspondingly beveled gear 32 rigidly carried at one end of a shaft 33 journaled in the bifurcated extensions 14, and between which is a larger gear 34, also secured to the shaft 33 and in mesh with a smaller gear 35 rigidly carried by a shaft 36 journaled in the bifurcated extensions 14.

The ends of the shaft 36 project equidistant beyond the bifurcated extensions 14 and are each threaded for engagement with a correspondingly threaded member 40, of a cleaning and polishing member 41. Embracing each of the members 40 is suitable, electrically non-conducting, flexible cleaning material 42 adapted to intimately engage the fuse engaging surfaces 43 of each of the opposed resilient jaws 39 of a pair of fuse clips or holders 44, which are disposed in a fuse-box 45 and are connected in an electric circuit, and the fuse clips 44 are space in predetermined relation with respect to each other to normally detachably grip and hold the terminal contacts 46 of a cartridge fuse 47, as will be understood by those skilled in the art.

In operation, the fuse 47 is removed from the fuse engaging surfaces 43 of the fuse clips 44, and the hand grip 15 is grasped, in this instance, with the left hand of the user, the side of the left hand being in contact with the insulated semi-circular disk 16. The cleaning elements or members 41 are then inserted between the opposed resilient jaws 39 of the fuse holders 44, by pressing the left hand against the insulated semi-circular disk 16, with consequent yielding of the flexible material 42 which intimately contacts each of the fuse engaging surfaces 43 of the jaws 39 of the fuse clips 44, and the fuse engaging surfaces 43 grip and hold the cleaning member 41 in the same position as that normally occupied by the fuse 47. The right hand of the user then grasps the knob 27 and upon rotation of the crank 25 the cleaning members 41 revolve and the flexible material 42 conforms to the contour of the fuse engaging surfaces 43 of the fuse holders 44, and rubs against the same, removing the foreign matter, and polishing the fuse engaging surfaces 43.

In Figure 3 we disclose a somewhat different embodiment of the invention, comprising a casting 50 having an elongated tubular member 51, not completely shown, terminating at one end in a longitudinally extending yoke 52, forming with the tubular member 51 an annular shoulder 53, and rigidly secured to the exterior surface of the tubular member 51 is a hand grip

54, not completely shown, similar to the hand grip 15 hereinbefore described, and interposed between the shoulder 53 and the adjacent end of the hand grip 54 is a circular disk 55, of "Bakelite", or other suitable electric insulating material, against which the side of the hand of the user who grasps the hand grip 54, may rest.

Centrally disposed in the tubular member 51 is a drive shaft 60, not completely shown, to which is secured at one end a beveled gear 61, and at the opposite end a crank, not shown, all respectively similar in construction and operation to the drive shaft 20, beveled gear 30, and crank 25 hereinbefore described. The beveled gear 61 is in mesh with a correspondingly beveled gear 62 rigidly carried by a shaft 63 journaled in the arms 64 of the yoke 52, and the shaft 63 is supplied with cleaning and polishing members 65 similar to the cleaning members 41, hereinbefore described, and are adapted for rotatable frictional engagement with the fuse engaging surfaces 43 of the fuse clips 44.

From the foregoing it will be perceived that our apparatus can be used with perfect safety on live circuits; that the foreign matter is completely removed from the fuse engaging portion of the fuse clips, cleaning the fuse clips, providing a smooth surface for uniform contact with the terminal ends of a fuse, with consequent saving in power loss, reduction in resistance, reduction in heat, and premature blowing of the fuses. It will also be seen that the force exerted by the hand of the user grasping the hand grips 15 and 54 is applied against the insulated semicircular disk 16 and circular disk 55 and transmitted centrally between the cleaning members 41, whereby the pressure exerted on the fuse clips 44 is equally distributed thereon.

Our apparatus can easily be motor driven by removing the crank 25 and connecting the drive shafts 20 or 60 to a suitable source of power. The shape of the cleaning members 41 can be as required, and the abrasiveness of the cleaning material 42 altered, all depending upon the type of fuse clips to be cleaned.

It will be understood by those skilled in the art that we have accomplished at least the principal object of our invention, and at the same time it will be obvious that the embodiments of our invention herein disclosed and described embody advantages other than those particularly pointed out or suggested herein, and that they may be variously changed and modified without departing from the spirit of our invention or sacrificing the advantages thereof; accordingly it will be understood by those skilled in the art that the disclosure herein is illustrative only and that our invention is not limited thereto.

We claim:

1. A cleaning apparatus for removing foreign substances from surfaces disposed in a live circuit, comprising: an elongated support having a bifurcated portion; a rotatably mounted axle extending transversely through and terminating beyond the furcations of said portion and carrying a gear member; a cleaning element secured to each terminal end of said axle, and engageable with the surface to be cleaned; a drive shaft extending through said support; gear means operatively connecting said drive shaft with the gear member on said axle; means for rotating said drive shaft, and an electrically insulated hand rest, carried by said support and projecting laterally therefrom, against which a hand of the user of said cleaning apparatus may apply pressure without receiving electric shock.

2. A cleaning apparatus for removing foreign substances from surfaces disposed in a live circuit, comprising: an elongated support having a bifurcated portion; a rotatably mounted axle extending transversely through and terminating beyond the furcations of said portion and carrying a gear member; a cleaning element secured to each terminal end of said axle, and engageable with the surface to be cleaned; a drive shaft extending through said support; gear means operatively connecting said drive shaft with the gear member on said axle; means for rotating said drive shaft; a hand rest of rigid insulating material projecting laterally from said support; and a shoulder on said support forming an abutting surface for said hand rest, against which a hand of the user of said cleaning apparatus may apply pressure without receiving electric shock.

3. A cleaning apparatus for removing foreign substances from surfaces disposed in a live circuit, comprising: an elongated support having a bifurcated portion; a rotatably mounted axle extending transversely through and terminating beyond the furcations of said portion and carrying a gear member; a cleaning element secured to each terminal end of said axle, and engageable with the surface to be cleaned; a drive shaft extending through said support; gear means operatively connecting said drive shaft with the gear member on said axle; means for rotating said drive shaft; electrically insulated hand grip means carried by said support; a shoulder on said support spaced from one end of said hand grip means; and an electrically insulated hand rest interposed between said hand grip means and said shoulder, whereby a hand of the user of said cleaning apparatus may grasp said hand grip means, resting said hand against said hand rest, applying pressure thereagainst, without receiving electric shock.

4. Apparatus for cleaning electric fuse holders, comprising: means carrying a cleaning element engageable with said fuse holder; an elongated supporting member for said carrying means, and having hand grip means for the user of said cleaning apparatus; a rest extending laterally from said supporting member and having an abutting surface against which a hand of the user may rest, said supporting member and said abutting surface being insulated to protect the user of said cleaning apparatus from electric shock; and mechanism, operatively connected with said cleaning element, for imparting operative movement thereto.

5. Apparatus for cleaning electric fuse holders, comprising: a cleaning element engageable with a fuse holder; carrying means for carrying said cleaning element; an elongated member having a portion thereof rotatably supporting said carrying means, and having an electrically insulated portion adapted to be gripped by a hand of the user of said cleaning apparatus; a drive shaft journaled in said elongated member; means for operatively connecting said drive shaft with said carrying means; means for rotating said drive shaft; and an electrically insulated hand rest, carried by said elongated member and projecting laterally therefrom, against which a hand of the user of said cleaning apparatus may rest.

6. Apparatus for cleaning electric fuse holders comprising: a cleaning element engageable with a fuse holder; carrying means for carrying said

cleaning element; elongated supporting means, for supporting said carrying means, so constructed and arranged that said cleaning element is supported laterally from and for operative movement relative to said supporting means; means, carried by said supporting means and operatively related to said carrying means, constructed and arranged to impart operative movement to said cleaning element; and protecting means for protecting a user of said apparatus from electric shock in applying said apparatus to and in using it in cleaning fuse holders, including an insulated hand grip portion on said elongated supporting means, and including also means for preventing the hand of a user, grasping said hand grip portion, from slipping off of said hand grip portion toward said cleaning element thereby to prevent engagement of the hand of a user with an exposed fuse holder.

7. Apparatus for cleaning electric fuse holders comprising: a cleaning element engageable with a fuse holder; metallic carrying means for carrying said cleaning element; elongated metallic supporting means, for supporting said metallic carrying means, so constructed and arranged that said cleaning element is supported by and for operative movement relative to said supporting means; means, carried by said supporting means and operatively related to said carrying means, constructed and arranged to impart operative movement to said cleaning element; and protecting means for protecting a user of said apparatus from electric shock in applying said apparatus to and in using it in cleaning fuse holders, including insulating means serving as a hand grip portion, said insulating means overlying said supporting means and leaving exposed a part thereof between said insulating means and said cleaning element, and said protecting means including also means for preventing the hand of a user, grasping said hand grip portion, from slipping off of said hand grip portion onto said exposed part or against an exposed fuse holder.

8. Apparatus for cleaning electric fuse holders comprising: a cleaning element engageable with a fuse holder; metallic carrying means for carrying said cleaning element; elongated supporting means, for supporting said carrying means, so constructed and arranged that said cleaning element is supported laterally from and for operative movement relative to said supporting means; movement imparting metallic means, carried by said supporting means and operatively related to said carrying means, constructed and arranged to impart operative movement to said cleaning element; actuating means, including an exposed metallic portion, constructed and arranged to actuate said movement imparting means; and protecting means, for protecting a user of said apparatus from electric shock in applying said apparatus to and in using it in cleaning fuse holders, including means for insulating said exposed portion of said actuating means from said movement imparting means, and including also an insulated hand grip portion on said elongated supporting means, and including also means for preventing the hand of a user, grasping said hand grip portion, from slipping off of said hand grip portion toward said cleaning element thereby to prevent engagement of the hand of a user with an exposed fuse holder.

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