

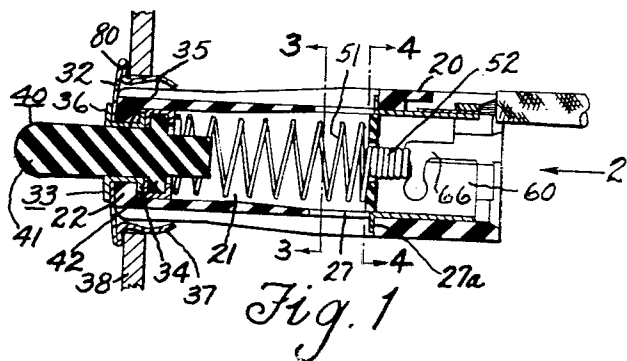
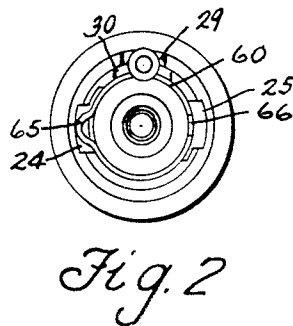
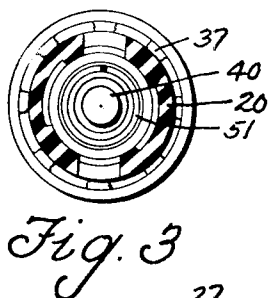
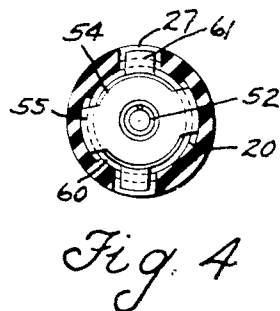
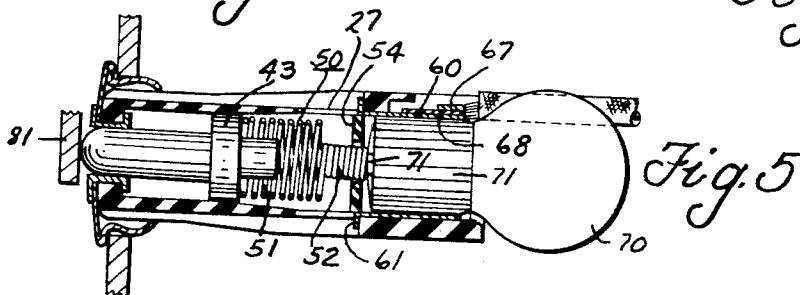
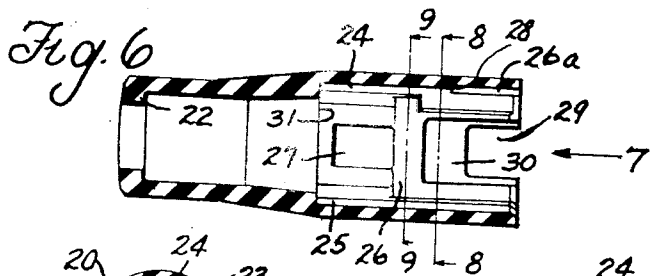
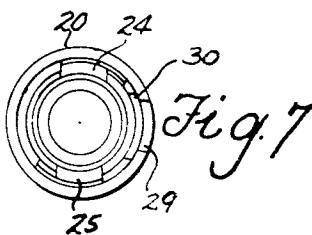
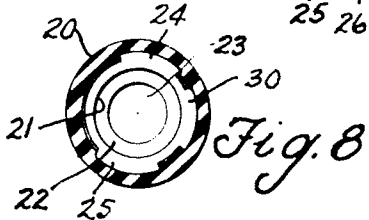
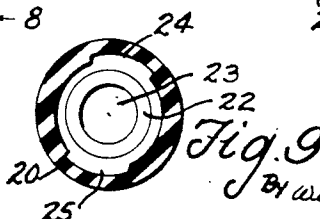
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LAMP SUPPORTING AND OPERATING STRUCTURE

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## UNITED STATES PATENT OFFICE

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LAMP SUPPORTING AND OPERATING  
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This invention relates to improvements in circuit continuing devices, and more particularly to circuit continuing devices of the type which includes a light bulb.

An object of the present invention is to improve and simplify the details of construction and assembly of a circuit continuing device which may be readily manufactured and assembled at low cost, and which, all parts may be assembled without use of solder and objectionable means. To accomplish these and other objects, the circuit continuing device comprises a one-piece casing of molded insulating body supporting a metallic socket adapted to be connected with a source. The sleeve is adapted to receive and support a lamp base having a metal sheath connected with one end of a lamp filament and having a terminal connected to the other end of the lamp filament, the sheath making electrical connection with the sleeve. The circuit opening device comprises, a movable contact and a grounding terminal with a preformed current conducting spring located between the terminal of the lamp base and the movable contact to complete a circuit through the lamp. The spring operates to urge the movable contact into engagement with the grounding terminal. A plunger of insulating material carries the movable contact and operates to separate the movable contact from the ground terminal to disconnect the lamp from the circuit and compresses the spring when a door of a compartment is substantially closed. When the door is opened a certain amount the spring expands to urge the movable contact and plunger in a direction such that the movable contact engages the ground terminal.

Further objects and advantages of the present invention will be apparent from the following description, reference being had to the accompanying drawings wherein a preferred embodiment of the present invention is clearly shown. In the drawings:

Fig. 1 is a sectional view taken on line 1—1 of Fig. 2, with the lamp removed.

Fig. 2 is an end view looking in the direction of arrow 2 of Fig. 2.

Figs. 3 and 4 are sectional views taken on lines 3—3 and 4—4, respectively of Fig. 1.

Fig. 5 is a sectional view like Fig. 1 with a lamp assembled.

Fig. 6 is a sectional view of the body alone.

Fig. 7 is an end view of the body looking in direction of arrow 8 in Fig. 6.

Figs. 8 and 9 are sectional views taken on lines 8—8 and 9—9, respectively of Fig. 6.

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Referring to the drawings, 20 designates a one-piece molded body or housing of insulating material or plastic. The body 20 is formed with a cylindrical recess 21 extending from one end and terminating short of the other end to provide an end wall 22 having a central opening 23. The recess is interrupted by a pair of diametrical longitudinal grooves 24 and 25, a circumferential groove 26, communicating with grooves 24 and 25, a pair of rectangular openings 27 spaced between the grooves 24 and 25. The groove 24 has a lateral extending groove 26 formed therein to provide a shoulder 28. A notch 29 is formed in a groove 30 which extends a certain distance from the mouth of the recess but terminating short of one of the openings 27. The grooves 24 and 25 extend within the body and terminate short of the end wall 22 to provide shoulders or abutments 31. The open end or mouth of the body is tapered to provide easy assembly of parts to be assembled within the recess.

The body 20 carries an apertured metallic retainer clip or button 32 abutting the outer face of the end wall 22 and secured thereto by an eyelet 33 having a flange 34 engaging the inner face of the wall 22 and a shank 35 extending through the openings of the body and the clip. The shank is spun over the clip into good electrical contact therewith as at 36. The clip is provided with a plurality of resilient prongs 37 which are adapted to snap into an opening provided by a metallic support 38.

The eyelet 32 slidably supports a plunger 40. The plunger is formed from molded insulating material or plastic and includes a stem 41 and an enlarged head 42. The head is embraced by a cup-shaped contact 43 which is secured to the head by spinning over the rim of the cup against the head 42. The contact is adapted to engage the flange 34 of the eyelet. The plunger and contact assembly is assembled in the recess by inserting same at the mouth of the recess. The contact 43 has a sliding fit with the recess to guide the plunger in straight line axial movements with respect to the body. The spun over portion contact 43 is adapted to engage the flange 34 of eyelet 32 to form the ground for an electrical circuit and limit the outward movement of the plunger.

A composite conducting spring 50 as shown in Figs. 1 and 4 is formed from a single length of music wire. The spring 50 is formed to provide two coils 51 and 52. The coil 51 comprises a plurality of relatively large spaced convolutions and the coil 52 comprises a plurality of relatively small convolutions in contact with each other.

The coils 51 and 52 are formed along the same axis. The spring is inserted at the mouth of the recess so that the end convolution of the large coil 51 engages the contact 43. The small coil 52 extends thru an aperture of an insulating disc 54 which has diametrical peripheral extensions 55 which, when inserted in the recess, the projections register with the grooves 24 and 25.

A lamp sleeve socket construction 60 is preferably formed from an elongated flat piece of relatively resilient sheet metal. The socket is provided with projecting fingers 61, an L-shaped opening having an axial leg and a circumferential leg at a sufficient distance from the outer end of the socket speaking with reference to the showing in Figs. 1 and 5. The socket has a radial projection or lug 65, formed by striking portions of the socket 60 outwardly, and a diametrical bayonet slot 66 extending inwardly from the outer end of the socket. A tongue 67 is provided by the socket and is adapted to be bent over upon itself to secure a bared end 68 of a cable 69 thereto.

To assemble the socket 60 within the recess 21, the lug 65 must be properly aligned with groove 24 and the bent over tongue 67 is in registry with notch 23 so that the inner end of the socket will engage the extensions 55 of the disc 54. When the inner edge of the lugs 65 engages the shoulder 28 the fingers 61 will be opposite the openings 27. A suitable tool is used to bend the fingers 61 outwardly into the openings 27 and against the end marginal wall 21a, see Figs. 1 and 5, thereby locking the sleeve socket 60 within the recess 21. After the tool is removed from the openings 27 the spring portion 51 will tend to return to its normal state until the extensions 55 of disc 54, engages the inner end of the socket 60, thus holding the spring portion 51 under compression between the disc 54 and the contact 43, thus the contact 43 is held firmly against the flange 34 of eyelet 33, as seen in Fig. 1.

Adapted to cooperate with the socket is an electric lamp 70 having a base portion 71 provided with an axial contact 72 connected to one end of a filament, the other end of the filament is suitably connected to the metal sheath or shell of the base portion which is well known in the art. A pair of diametrical bayonet pins extend radially from the base for cooperation with the bayonet slot and the lug and its associated opening. When the lamp is inserted in the socket, with the pins in alignment with the entrance of slot and the lug and the contact 72 in engagement with the end and coil portion 52, it will be against the urging force of the coil 51 until the bayonet pins are in registry with the wall of circumferential portions of the slot and opening in the socket and the lamp is rotated to bring the pins opposite the bayonet seats provided by the bayonet-joint socket and opening in the socket. With the parts thus assembled the spring coil 51 is operable to return yieldably the pins of the lamp in engagement with the seats as is well known.

The body and lamp construction may now be assembled as a unit in the opening of the support. This assembly is effected by inserting the body in the opening with the prongs 37 yielding until the flange 30 of the clip abuts the supporting means. When this happens the prongs will tend to return to their normal state and hold the body in place and provide a ground connection with the support 38. It will of course be under-

stood that if desired, the lamp may be assembled after the body is assembled with the support.

The operation of the devices is best illustrated in Figs. 1 and 5. As shown in Fig. 1, the lamp is removed, but the various parts of the unit are shown in the "On" position with the plunger extended by the biasing force of the spring 50. When a lamp is in the socket the end of the coil 52 will bear against the contact 43 and the coil 51 will bear against the contact 71 and force same against the flange 34 of eyelet 33 to form a ground for an electric circuit; the circuit is completed from the conductor, socket 60, base 71, filament in lamp, contact 71 spring 50, contact 43, eyelet 33, clip 32 and then support 38.

As illustrated in Fig. 5 when a closure member 81 bears against plunger 40, the plunger moves contact 43 from the eyelet 33 to compress the coil 51 and open the connection between eyelet 33 and contact 43.

While the embodiment of the present invention as herein disclosed, constitutes a preferred form, it is understood that other forms might be adopted.

What is claimed is as follows:

1. A lamp supporting and operating structure comprising a molded insulating body having a recess therein and opening to one end thereof and terminating short of the other end to provide an end wall for the body, said end wall having a central opening; tubular terminal means extending through the opening and secured to the end wall; a plunger of insulating material slidably extending through terminal means; a contact within the recess carried by the plunger and movable into and out of engagement with the terminal; an electrical socket carried within said recess and adapted to receive and hold a lamp; an apertured insulating disc located with the recess and seated against the socket; a conducting helical spring having a portion disposed between the disc and the movable contact for urging said contact against the terminal and having a portion extending through the aperture of the disc adapted to engage a contact of the lamp; means for retaining the lamp in the socket; and a conductor connected to the socket to provide electric current to the lamp.

2. A lamp supporting and operating structure comprising a molding insulating body having a recess therein and opening to one end thereof and terminating short of the other end to provide an end wall for the body, said end wall having a central opening; a hollow terminal extending through the opening and having portions overlying inner and outer surfaces of the end wall; a movable plunger of insulating material guided by the terminal; a contact carried by the plunger adapted to be moved into and out of engagement with the terminal; a metal socket supported within the recess for receiving a lamp base, said base having a metal sleeve connected with one lead of the lamp filament and also having an end contact connected with the other lead of the lamp, said socket making electrical connection with the sleeve; an insulating disc having an opening and having radial extension resting on the innermost end of the socket; a one-piece conducting wire formed to provide a plurality of spaced relatively large convolutions and a plurality of contacting relatively small convolutions, said large convolutions being disposed above the disc with the innermost convolution engaging the movable contact, and said small convolutions adapted to extend through the aperture of the

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disc with the outermost end making electrical connection with the end contact of the base, said spring operating to conduct current from the contact of the lamp to the movable contact and also to urge the movable contact into engagement with the hollow terminal; a conductor connected to the socket to provide electric current to the lamp; and means for actuating the plunger to separate the contact from the hollow terminal.

3. A lamp supporting and operating structure comprising a one-piece body of insulating material having a recess therein and opening to one end thereof and terminating short of the other end to provide an end wall for the body, said wall having a central opening; a tubular metallic member extending through the opening and having a portion to serve as a terminal, an electrical socket non-rotatably supported within the recess and adapted to hold a lamp and for making an electrical connection; an apertured insulating non-rotatable support within the recess and adapted to seat against the socket; a one-piece conducting spring having relatively large convolutions disposed beyond the support and having relatively small convolutions adapted to extend through the aperture of the support to engage a contact of the lamp; a plunger slidably extending through said tubular metallic member, a contact carried by the plunger between the tubular metallic member and the spring, said spring operating to urge the plunger in one direction and the contact into engagement with the terminal to complete an electric circuit through the lamp; and a conductor connected to the socket to provide electric current to the lamp.

4. In combination, a body; a pair of metallic members carried by the body in longitudinally spaced relation, one to be connected to ground, the other to receive a lamp; a movable actuator extending through the grounded member and carrying a contact located within the body; an apertured insulating member supported within the body, yieldable conducting means between the contact and the insulating member and yieldably resisting movement of said contact by said actuator, said conducting means comprising a one-piece conducting wire formed to provide at least two coils, one of said coils comprising a plurality of spaced relatively large convolutions disposed between the movable contact and the insulating member while the other coil comprises a plurality of relatively small convolutions extending through the aperture of the insulating member and adapted to engage a terminal provided by the lamp.

5. In combination with a body, of a terminal carried by the body and adapted to be connected to ground; a movable contact; an apertured disc supported within the body; a one-piece conducting wire formed to provide two coils disposed

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around the same axis, one of said coils comprising a plurality of relatively large spaced convolutions to act as a spring and the other of said coils being of less diameter to form a contact portion, said contact portion extending through said aperture of the disc and adapted to connect another terminal, and said disc adapted to support the large coils at one end thereof whereby said large coils urge the movable contact into engagement with the first mentioned terminal; and means for actuating the movable contact from the first mentioned terminal.

6. In combination with a body, of a tubular terminal carried by the body and adapted to be connected with ground; a movable contact located within the body; an apertured disc supported within the body; a one-piece conducting wire formed to provide two coils, one of said coils comprising a plurality of spaced convolutions to act as a spring and the other of said coils comprising contacting convolutions extending through the aperture of the disc and adapted to connect another terminal, said disc adapted to support the spaced convolutions at one end thereof whereby said spaced convolutions urge the movable contact into engagement with the tubular terminal; and an actuator guided by the tubular terminal and operable for actuating the movable contact from the tubular terminal.

7. In combination with a body, of a tubular terminal carried by the body and adapted to be connected with ground, a nonconducting plunger guided by the terminal; a movable contact carried by the plunger adapted to be moved into and out of engagement with the terminal; an apertured disc supported within the body; a conducting spring, said spring having one end engaging the movable contact and having an intermediate portion engaging the disc and having the other end passing through the aperture of the disc and adapted to connect another terminal said portion of the spring between the disc and the movable contact operating to urge movable contact into engagement with the tubular terminal; and means for actuating the plunger relative to the tubular terminal to separate the movable contact from the tubular terminal.

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