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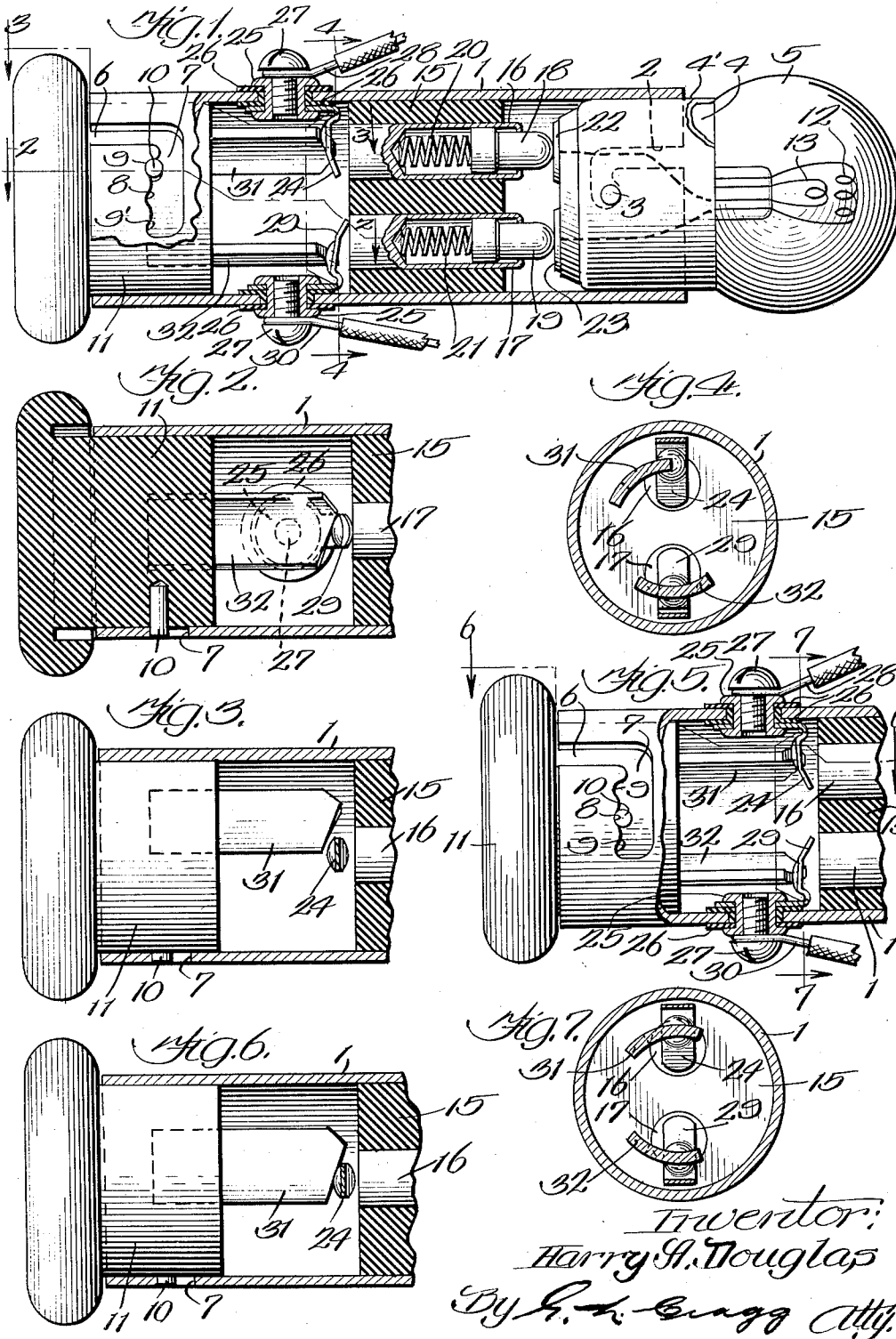
1,657,004

H. A. DOUGLAS

CIRCUIT CONNECTER

Filed Sept. 3, 1925

2 Sheets-Sheet 1



Inventor:
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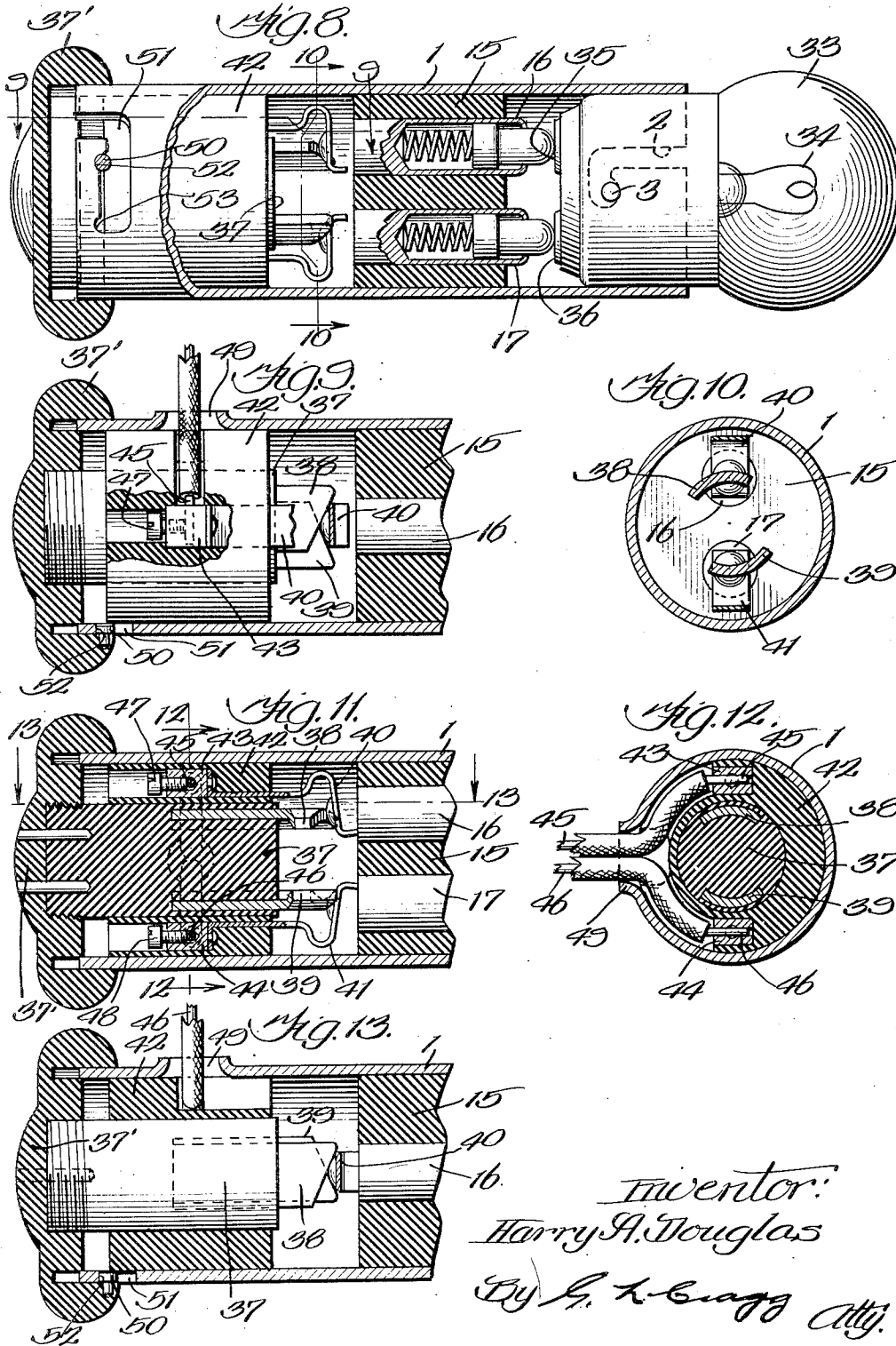
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2 Sheets-Sheet 2



Inventor:
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UNITED STATES PATENT OFFICE.

HARRY A. DOUGLAS, OF BRONSON, MICHIGAN.

CIRCUIT CONNECTER.

Application filed September 3, 1925. Serial No. 54,281.

My invention relates to circuit connectors employing shells that carry contacts within their interiors and switching plugs in ends thereof for bringing current conducting terminals into and out of connection with said contacts to close and open circuit provided with the connectors. Hitherto, these switching plugs have also carried the current conducting terminals, the wires leading to and from these terminals, therefore having been also mechanically connected with the switching plugs. Because of this union between the switching plugs, the current conducting terminals, and the circuit wires, the manipulation of the switching plugs was rendered cumbersome and the mechanical and electrical connections between the current conducting circuit wires and the terminal contacts have become impaired.

In carrying out my invention, the circuit wires and the terminal contacts which were hitherto assembled with the switching plugs are, instead, assembled with the shells, the terminal contacts being so related to the plugs that, as the plugs are rotated or otherwise moved with respect to the shells, they may bring the terminals into and out of connection with the contacts within the shells with the same electrical effect as before.

The invention will be more fully explained in connection with the accompanying drawings in which Fig. 1 is a view partially in side elevation and partially in longitudinal section illustrating a circuit connector employed for including an incandescent lamp in circuit; Fig. 2 is a longitudinal sectional view of a part of the structure on line 2—2 of Fig. 1; Fig. 3 is another longitudinal sectional view of a part of the structure on line 3—3 of Fig. 1; Fig. 4 is a sectional view on line 4—4 of Fig. 1; Fig. 5 is a view of a portion of the structure as it appears in Fig. 1 but with some of the parts shown in changed positions; Fig. 6 is a longitudinal sectional view on line 6—6 of Fig. 5; Fig. 7 is a cross-sectional view on line 7—7 of Fig. 5; Fig. 8 is a view partially in side elevation and partially in longitudinal section illustrating another form of circuit connector embodying the invention; Fig. 9 is a longitudinal sectional view of a part of the structure taken on line 9—9 of Fig. 8; Fig. 10 is a cross section on line 10—10 of Fig. 8; Fig. 11 is a longitudinal sectional view of a part of the structure as it appears in Fig. 8 but showing the switching plug adjusted to close circuit;

Fig. 12 is a cross-sectional view on line 12—12 of Fig. 11; and Fig. 13 is a longitudinal sectional view on line 13—13 of Fig. 11.

There is employed a metallic cylindrical or tubular shell 1 having bayonet slots 2 at one end adapted to receive the bayonet pins 3 projecting from the sides of the base 4 of an incandescent lamp 5. At the other end of the shell, there is another bayonet slot having an entrance opening 6 and a transverse continuation 7, this transverse continuation having seats 8, 9, and 9' for receiving the bayonet pin 10 provided upon the switching plug 11, a form of insulating material. When the bayonet pin 10 is in the seat 8, the lamp circuit is opened and when said bayonet pin is in the seat 9, one circuit is established and when it is in the seat 9', another circuit is established as will more fully appear. The lamp 5 has two filaments 12 and 13. As will later appear the filament 12 is alone in circuit when the bayonet pin 10 is in the seat 9. When this bayonet pin is in the third seat 9', then the filament 13 is alone in circuit, as will also later more fully appear. There is employed a contact carrier that is preferably in the form of an insulating body 15 within the shell and which is desirably normally in fixed relation thereto. This contact carrier supports two spring contact members respectively inclusive of spring barrels 16 and 17, plunger contacts 18 and 19 projecting toward the lamp, and springs 20 and 21 which urge the contacts 18 and 19 into engagement with the lamp contacts 22 and 23. The spring barrels 16 and 17 are rigidly held in the contact carrier 15 and serve as abutments for the springs 20 and 21 whereby these springs not only urge the contacts 18 and 19 into engagement with the lamp base contacts but also serve to hold the bayonet pins 3 firmly in the seats in the bayonet channels 2. The base for the lamp 5 is provided with a metallic sheath 4' adapted for electrical engagement with the metallic shell 1. One terminal of each of the filaments 12 and 13 is connected with this sheath. The other terminal of filament 12 is connected with the lamp base contact 23 and the other terminal of filament 13 is connected with the lamp base contact 22. A strip metal spring contact member 24 is mechanically assembled with a side of the tubular shell 1 preferably by means of the tubular rivet 25 between

whose flanged ends the contiguous portion of the shell wall is clamped, there being insulation 26 between the tubular rivet and the shell. A binding screw 27 is screwed into the bore of the tubular rivet and establishes firm mechanical and electrical connection between the current conducting wire 28 and the tubular rivet and as this tubular rivet is in electrical connection with the contact spring 24, the circuit wire and this contact are in connection. Another strip metal spring contact 29 is assembled with the shell in a manner similar to the assembly of the contact 24 with the shell whereby the current conducting wire 30 is connected with the contact spring 29 by connecting means passing through the contiguous opening in the side of the shell as in the case of the conductor 28. The contiguous ends of the leaf springs 24 and 29 are arranged to be engageable with the adjacent or base ends of the spring barrels 16 and 17, respectively.

The switching plug 11 is provided with formations for bringing said contact springs 24 and 29 into engagement with their complementary contacts 16 and 17, which are the base ends of the spring barrels 16 and 17, these formations desirably residing in the metallic prongs 31, 32 projecting inwardly from the plug and having cam formations upon their inner ends for engaging said contact springs. When the plug is turned to bring its bayonet pin 10 into the seat 9, the spring 29 is pressed, against its own resilience, into engagement with the spring barrel 17 whereby the bright light producing filament 12 is included in circuit. When the bayonet pin 10 of the switching plug is in the seat 9', the spring contact 29 is released because of the releasing movement of its actuating prong 32 therefrom while at the same time, the actuating prong 31 is brought into pressing engagement with the spring contact 24 to engage this spring contact with the spring barrel 16 to include the dim light filament 13 in circuit. When the switching plug is turned to bring the bayonet pin 10 into the seat 8, both prongs 31 and 32 are out of actuating relation with the spring contacts individually pertaining thereto so that the lamp is then totally in open circuit. Each spring engaging prong 31, 32 and the portion of the spring contact engaged thereby are, as is understood, on one side of the shell axis. It will be observed that the springs 24 and 29 function to hold the bayonet pin 10 in the various seats 8, 9 and 9' so that the switching plug is always firmly assembled with the shell. When the cams 31 and 32 do not press the leaf springs 24 and 29 into engagement with the contacts 16 and 17, these springs, by their own resilience, remove themselves from engagement with said contacts.

The structure shown in Figs. 8 to 12 in-

clusive is generally similar to the structure shown in Figs. 1 to 7 inclusive, similar parts being given similar characters of reference. The lamp 33 has but one filament 34 however, the terminals of this filament being connected with the lamp base contacts 35 and 36. The switching plug 37 is assembled with shell 1 similarly to the assembly of the switching plug 11 with the shell as shown in Figs. 1 to 7 inclusive. The plug 37, of insulating material, is provided with an added actuating flange end 37' by which it may be readily turned. This plug carries the contact operating prongs or cams 38 and 39 that are provided for engaging the leaf contact springs 40 and 41 with the base ends of the spring barrels 16 and 17. These contact springs are carried by the annular contact carrier 42, of insulation, this contact carrier being rigidly assembled with and within the shell 1 in whose bore the plug 37 may be turned. The contact springs are provided with metallic terminal blocks 43 and 44 adapted to receive the ends of current conducting wires 45 and 46 and also clamping screws 47 and 48 for holding these terminal wires in electrical and mechanical connection with said plugs. The side of the shell is formed with an opening or passage 49 therethrough, through which opening these circuit wires are passed into the shell. The plug 37 carries a bayonet pin 50 receivable in a bayonet slot 51 formed in the shell. This bayonet slot has seats 52 and 53. When the bayonet pin 50 is in the seat 52, the contact springs 40 and 41 are permitted to separate, due to their own resilience, from the base ends of the spring barrels 16 and 17. When said bayonet pin is received in the seat 53, the springs 40 and 41 are pressed into engagement with said spring barrels by the cam ends of the prongs 38 and 39. In either alternative adjustment of the plug, the springs 40 and 41 serve to hold the bayonet pin 50 in the selected seat.

Changes may be made without departing from my invention.

Having thus described my invention, I claim as new:—

1. The combination with a tubular shell formed at one end for assembly with an incandescent lamp and at the other end for receiving a rotatable switching plug and holding it in the alternative switching positions to which the plug is turned; of a contact carrier assembled with and within said shell; a spring contact member that is provided upon said contact carrier and urged toward the first aforesaid end of the shell to engage a lamp contact; a second spring contact member assembled with and within the shell between the contact carrier and the other end of the shell and engageable with the first contact member and having a portion upon one side of the shell axis to be en-

gaged for its operation, this second spring being of leaf formation and adapted, by its own resilience, to break its engagement with the first contact member; a switching plug 5 received in the latter end of the shell and adapted to turn therein to different switching positions and having a portion cooperating with the shell formation at this end to enable the location of the switching plug 10 in its different switching positions, said switching plug having a cam formation upon one side of the shell axis and engageable with the aforesaid portion of the second spring contact member to effect engagement 15 of this contact member with the first contact member, when the switching plug is turned to one position, such formation releasing the second contact member from such engagement when the plug is turned to an alternative position, the second spring contact member 20 serving to hold the plug in each of its positions.

2. The combination with a tubular shell formed at one end for assembly with an incandescent lamp and at the other end for 25 receiving a rotatable switching plug and holding it in the alternative switching positions to which the plug is turned; of a contact carrier assembled with and within said 30 shell; a spring contact member that is provided upon said contact carrier and urged

toward the first aforesaid end of the shell to engage a lamp contact; a second spring contact member assembled with and within the shell between the contact carrier and the 35 other end of the shell and engageable with the first contact member and having a portion upon one side of the shell axis to be engaged for its operation, this second spring being of leaf formation and adapted, by its 40 own resilience, to break its engagement with the first contact member; a switching plug received in the latter end of the shell and adapted to turn therein to different switching 45 positions and having a portion cooperating with the shell formation at this end to enable the location of the switching plug in its different switching positions, said switching plug having a cam formation upon one 50 side of the shell axis and engageable with the aforesaid portion of the second spring contact member to effect engagement of this contact member with the first contact member, when the switching plug is turned to one position, such formation releasing the 55 second contact member from such engagement when the plug is turned to an alternative position.

In witness whereof, I hereunto subscribe my name.

HARRY A. DOUGLAS.