Sept. 29, 1942. H. A. DOUGLAS 2,297,349

ELECTRICAL SWITCHING DEVICE

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Fig. 1

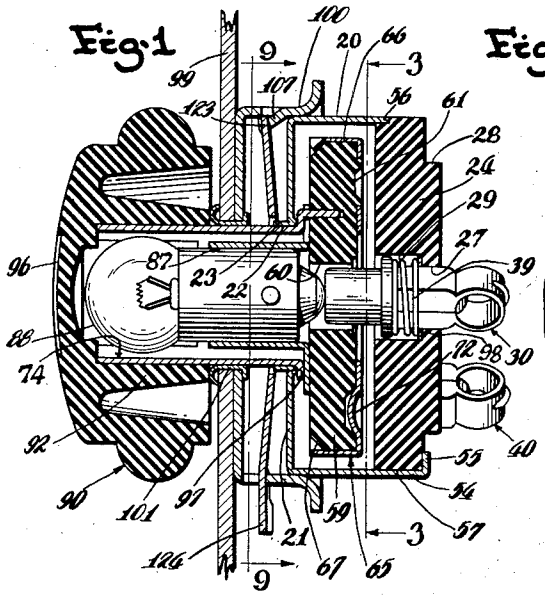


Fig. 2

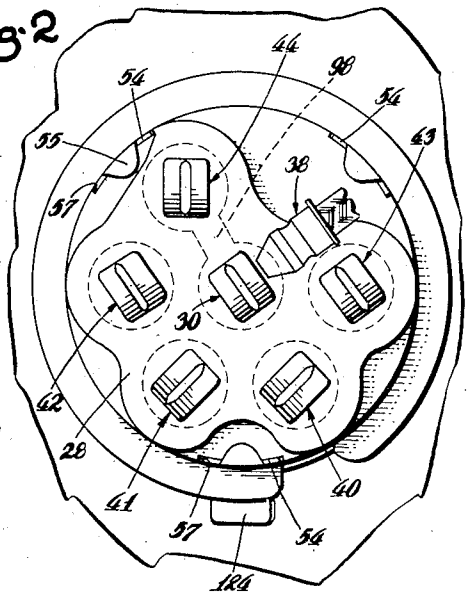


Fig. 3

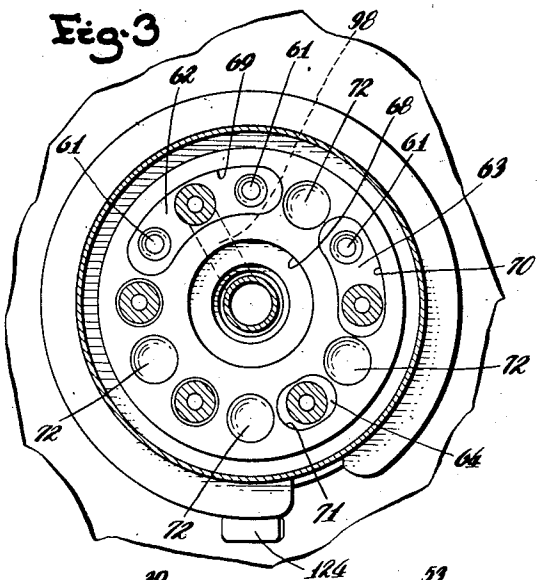


Fig. 4

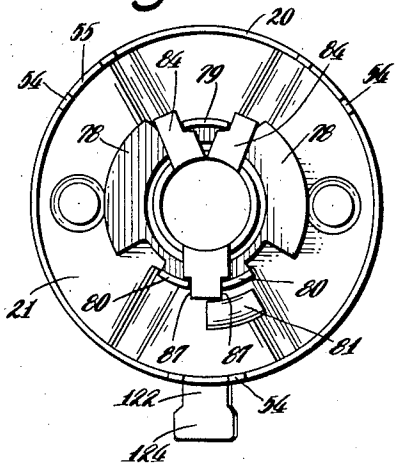


Fig. 5

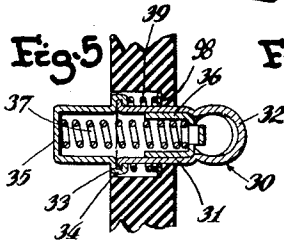
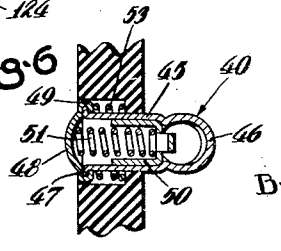


Fig. 6



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Fig. 7

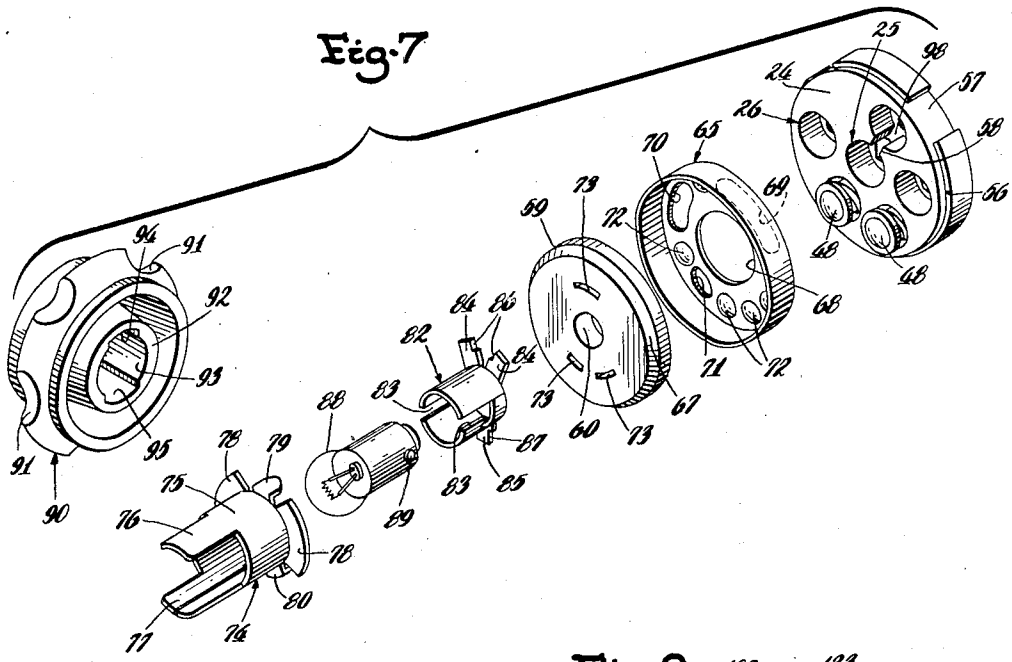


Fig. 8

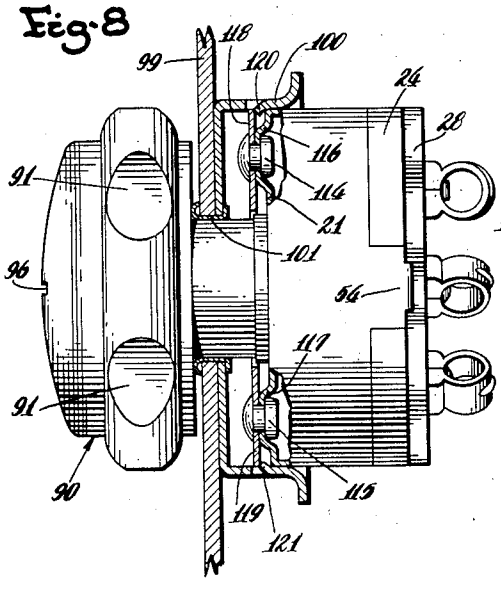
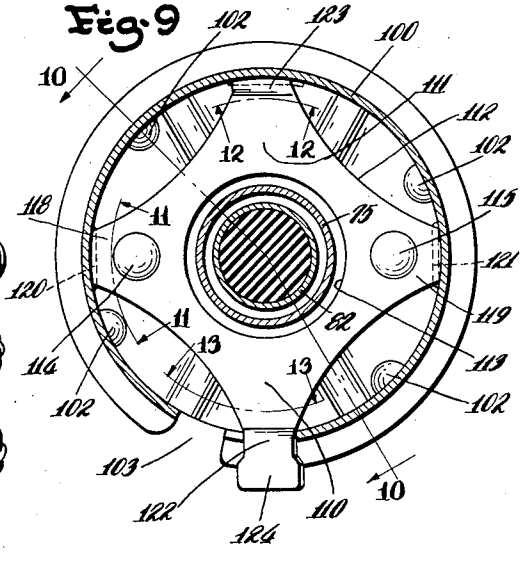


Fig. 9



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Fig-10

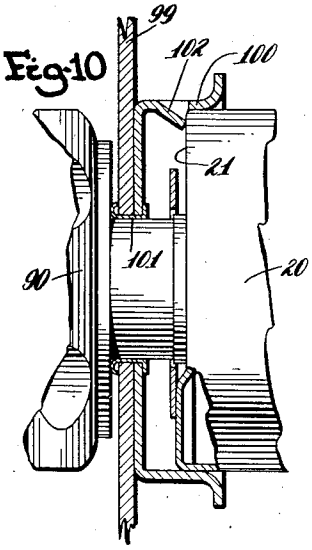


Fig-11

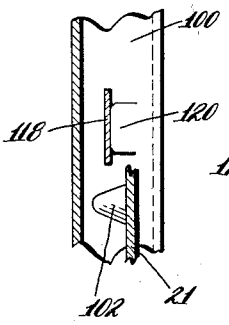


Fig-12

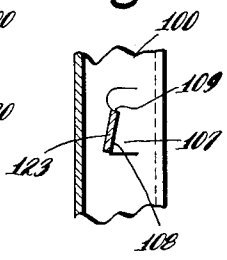


Fig-13

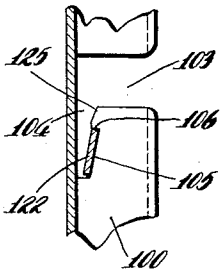


Fig-14

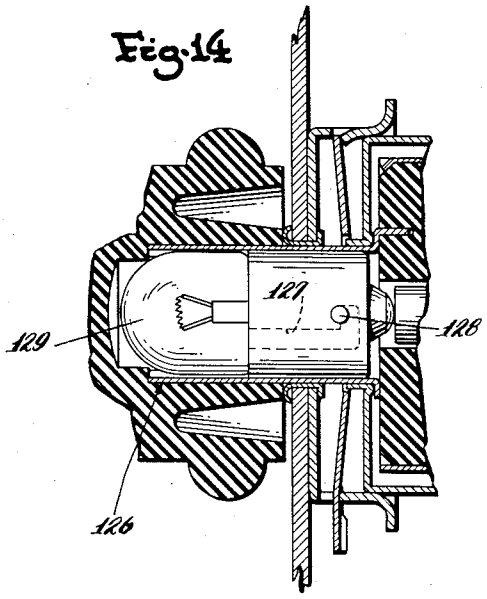
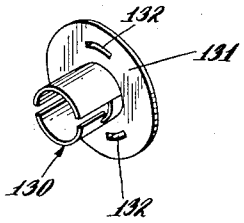


Fig-15



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ELECTRICAL SWITCHING DEVICE

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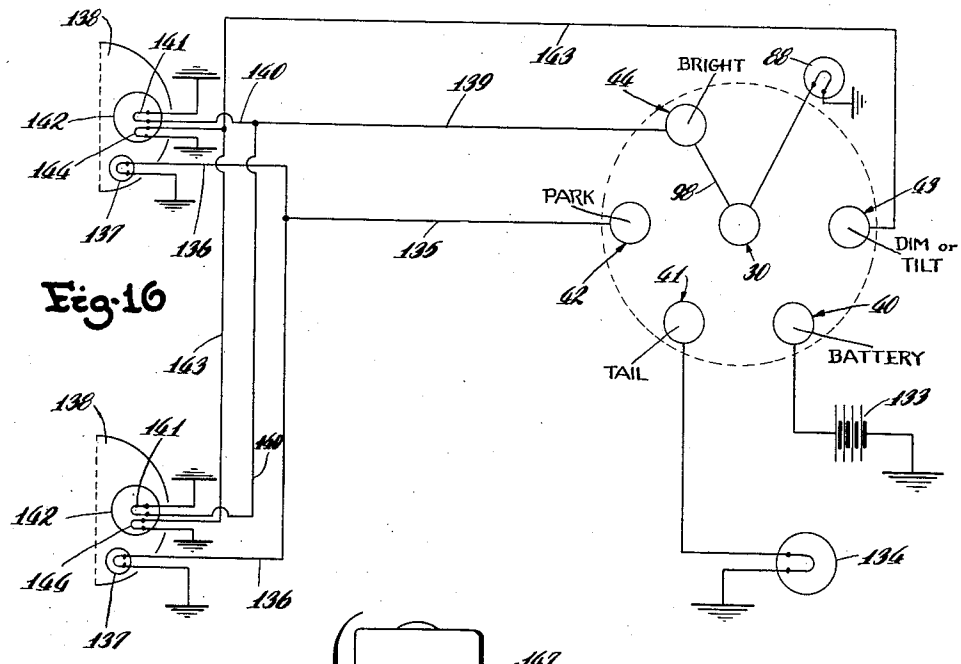


Fig. 16

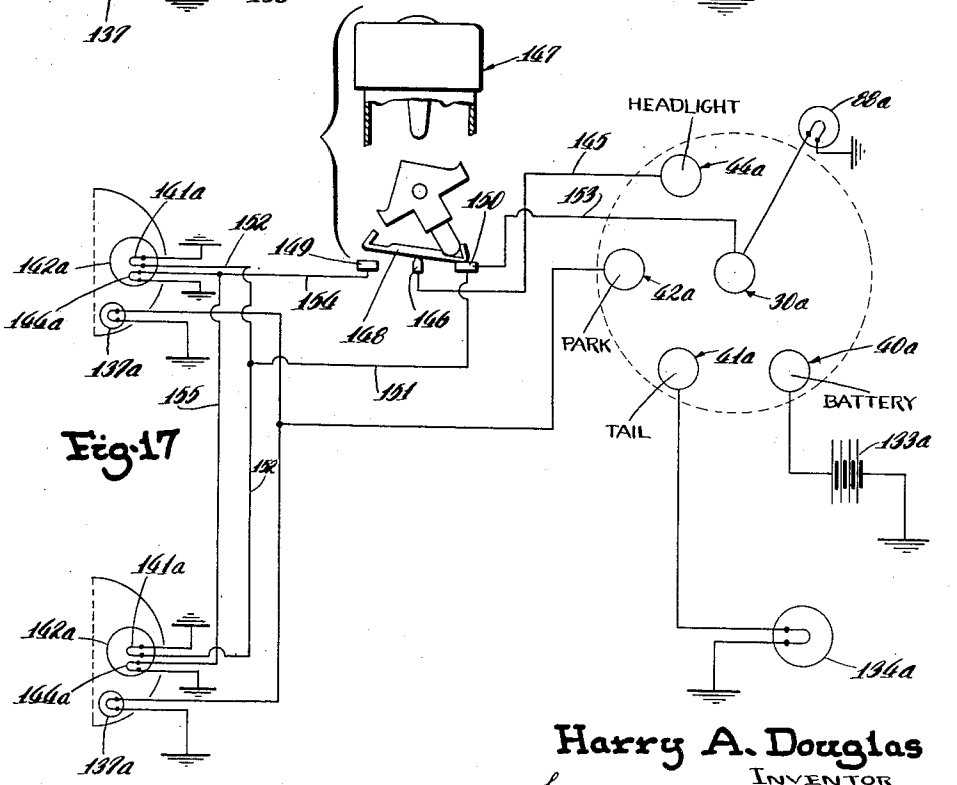


Fig. 17

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Patented Sept. 29, 1942

2,297,349

UNITED STATES PATENT OFFICE

2,297,349

ELECTRICAL SWITCHING DEVICE

Harry A. Douglas, Bronson, Mich., assignor to Kingston Products Corporation, a corporation of Indiana

Substituted for abandoned application Serial No. 115,075, December 10, 1936. This application November 20, 1939, Serial No. 305,411

14 Claims. (Cl. 200—167)

This invention relates to electrical switching devices, more particularly to switching devices adapted to be used with automotive vehicles, and the principal object of this invention is to provide new and improved devices of this character.

This application is substituted for my application, Serial Number 115,075, filed December 10, 1935.

In the drawings accompanying this specification and forming a part of this application, there is shown, for purposes of illustration, several embodiments which the invention may assume, and in these drawings:

Figure 1 is a central sectional view of an embodiment of the invention, certain parts being shown in elevation,

Figure 2 is a rear view of the embodiment shown in Figure 1,

Figure 3 is a transverse sectional view corresponding substantially to the line 3—3 of Figure 1,

Figure 4 is an elevational view looking into the casing of the electric switch, the bridge carrier and the contact support being omitted,

Figure 5 is a detailed sectional view of the center contact shown in Figure 1,

Figure 6 is a detailed sectional view of one of the contacts shown spaced from the center in Figure 2,

Figure 7 is a disassembled perspective view of some of the parts comprising the embodiment shown in Figure 1,

Figure 8 is a side elevational view, partly in section, showing parts of the connection for fastening the switching device to a mounting,

Figure 9 is a transverse sectional view corresponding generally to the line 9—9 of Figure 1,

Figure 10 is a fragmentary sectional view corresponding generally to the line 10—10 of Figure 9, and showing some parts broken away, and some parts in elevation,

Figures 11, 12, and 13 are detailed views illustrating the connection for fastening the switching device to the mounting,

Figure 14 is a fragmentary sectional view of a different embodiment of the invention,

Figure 15 is a perspective view illustrating a different construction for the lamp socket used in the embodiment of Figures 1 through 13,

Figure 16 is a diagrammatic view illustrating an electrical circuit combined with the so-called four-position switch disclosed in Figures 1 through 13, and

Figure 17 is a diagrammatic view illustrating an electrical circuit combined with a so-called three-position switch and with a foot switch.

Referring particularly to Figures 1 through 13, the embodiment of the invention therein disclosed comprises a generally cup-shaped casing 20, having its closure wall 21 provided with an aperture 22, the closure wall 21 having an integral tubular part 23 margining the aperture 22. Closing the open end of the casing 20 is a switchback or contact support 24, preferably formed of insulating material, the support or carrier 24 being provided with a central aperture 25 and apertures 26 spaced about the central aperture 25. The apertures 25 and 26 are preferably alike in construction, and description of one aperture will fit all of the apertures. Each of the apertures is provided with a polygonal portion 27 leading from a boss 23 formed on the exterior surface of the support 24, the polygonal portion communicating with a well portion 29 countersinking the polygonal portion 27 and leading to the inside surface of the support 24.

Disposed in the central aperture 25 is a contact means 30, best shown in section in Figure 5, and comprising a tubular body portion 31, preferably formed of complementary U-shaped halves, and having an integral loop portion 32 providing a recess at one end of the body portion 31. At the other end of the body portion 31, each of the U-shaped halves is provided with a generally semi-circular flange, so that when the halves are brought together, the flanges cooperate to form a generally circular foot 33, about which is spun a flange 34 formed on a generally thimble-shaped closure 35. Before the parts 31 and 35 are assembled, a detent means 36 and a spring 37 are disposed within the tubular body portion 31, the spring 37 being interposed between the detent means 36 and the inner surface of the closure 35, and urging a portion of the detent means to position within the recess formed by the loop portion 32.

A plug conductor 38 may be received within the recess formed by the loop portion 32, this plug conductor having a tapered nose and an annular furrow spaced from the nose, so that when the plug conductor is inserted in the recess provided by the loop portion 32, the tapered nose will cam the detent means inwardly of the tubular body portion 31 until the annular furrow aligns with the detent means 36, whereupon the detent means will snap into the annular furrow, and mechanically and electrically hold the plug conductor 38 to the contact means 30. It will be

appreciated that the cross-sectional outline of the body portion 31 corresponds to the polygonal portion 27 of the center aperture 25 so as to hold the contact means 30 from turning. A spring 39 is interposed between the bottom of the well 29 and the spun-over portion 34 of the thimble 35, so as to urge the contact means 30 to the left as viewed in Figure 1.

Contact means 40, 41, 42, 43, and 44 are arranged in the apertures 26 about the center contact 30, and inasmuch as these contact means are preferably similar in construction, only the contact means 40 will be particularly described. As best shown in Figure 6, the contact means 40 comprises a tubular body portion 45, preferably formed of complementary U-shaped halves, the body portion at one end having an integral loop 46, and at its other end having a generally circular foot 47, formed by generally semicircular flanges on the halves of the body portion 45. A contact head 48 is provided to close the open end of the tubular body portion 45, and is secured by spinning an integral peripheral flange 49 about the foot 47. The contact head 48 is formed with a central dome-shaped portion as best shown in Figure 6. Before the contact head 48 is secured to the body portion 45, detent means 50 and a spring 51 are disposed within the tubular body portion 45, the spring 51 being interposed between the detent 50 and the inner surface of the contact head 48, and urges a portion of the detent means to a position within the recess formed by the loop 46. It will be appreciated that a plug conductor similar to the plug conductor 38 may be connected to any one of the contact means 40, 41, 42, 43, and 44 in a manner hereinbefore described. The cross-sectional outline of the body portion 45 of each of the contact means 40, 41, 42, 43, and 44 corresponds to the outline of the polygonal portion 27 of the apertures 26, so as to hold the contact means from turning. Interposed between the bottom of each well of the apertures 26 and the adjacent surface of the spun-over flange 49 of the respective contact means, is a spring 53, urging the contact means to the left as viewed in Figure 1. Referring to Figure 2, it will be noticed that the contact means 30, 40, 41, 42, 43, and 44 have been arranged so that a plug conductor may be inserted within the recesses formed by the respective loop portions without danger of contacting a portion of an adjacent plug terminal. The loop portion of each of the contact means may be provided with a strengthening rib, if desired.

The contact means above referred to are disclosed and claimed in my co-pending application entitled Electrical contact means, Serial Number 51,069, filed November 22, 1935.

The casing 20 is provided with axially extending fingers 54, here shown to be three in number and unequally spaced, and each finger having a reduced tapering part 55. The contact means support 24 is provided with a generally annular rabbeted part forming a shoulder 56, the shoulder being interrupted by slots 57 corresponding generally in size and location to the fingers 54. The support 24 may be held to the casing 20 by bringing the shoulder 56 against the marginal surface defining the open end of the casing 20, with the fingers 54 disposed in the respective slots 57, and the extremities 55 of the fingers 54 bent over the exterior surface of the support 24. As best shown in Figure 7, the center aperture 25 and one of the apertures 26 are brought into communication by means of a slot 58 for a purpose hereinafter apparent.

Disposed within the casing 20 is a bridge carrying block or carrier 59, preferably disc-shaped and formed of insulating material, and having a central aperture 60 adapted to pass the thimble portion 35 of the contact means 30. The surface of the block 59, adjacent the inner surface of the support 24, is provided with a plurality of inwardly tapering depressions 61 equally spaced apart in a circle about the center of the block 59. As best shown in Figure 1, some of the recesses 61 are of a smaller size than other of the recesses, and those of smaller size are formed in arcuate bosses 62, 63, and 64. A generally cup-shaped bridge means 65 is secured to the block 59, the peripheral side wall 66 of the bridge 65 fitting close to the outer periphery of the block 59, and at certain portions along the defining margins of the wall 66, portions are struck inwardly to overlie a chamfered surface 67 formed on the block 59, the inwardly struck portions holding the bridge 65 to the block 59. The bridge 65 is provided with a central aperture 68, and arcuate apertures 69, 70, and 71 corresponding to the arcuate bosses 62, 63, and 64 formed in the block 59, the arcuate recesses and shoulders cooperating to provide a flush outer surface, as best shown in Figure 1. The bridge 65 is provided with depressions 72 pressed into the larger sized recesses 61, the depressions 72 being constructed so as to provide recesses substantially of a character as the smaller sized recesses 61 formed in the block 59. The block 59, in the surface opposite the surface having the recesses 61, is provided with axially extending recesses 73, and as best shown in Figure 7, these recesses are preferably unequally spaced.

Actuating means 74 are provided for driving the block 59, these actuating means preferably comprising a split tubular member 75, having interrupted portions at one end to provide axial extensions 76 and 77, the extensions 77 being shown preferably wider than the extensions 76, and formed by portions on opposite sides of the split. The other end of the tubular member 75 is provided with spaced lateral flanges 78. Formed in one space between the flanges 78 is a finger 79, and formed in the other space between the flanges 78 are spaced fingers 80, each of the fingers 79 and 80 comprising an integral lateral extension of the tubular member 75, and an axial part integral with the laterally extending part, the extremity of the axially extending part being tapered. The fingers 79 and 80 are constructed and arranged to fit within the recesses 73 formed in the block 59, it being appreciated that because of the unequal spacing, the block 59 and the tubular member 75 can be assembled in only one relation. The tubular member 75 is journaled for rotation by the tubular flange 23 formed on the closure wall 21 of the casing 20. Rotational movement of the actuating means 74 is limited by abutment of parts of the laterally extending flanges 78 adjacent the fingers 80 with opposite margins of an inwardly struck portion 81 of the closure wall 21 of the casing 20, as best shown in Figure 4.

An electric lamp socket 82 is adapted to be carried within the actuating means 74, and preferably comprises a split tubular body provided with bayonet slots 83, leading inwardly from one end of the tubular body, the other end of the tubular body being provided with laterally extending fingers 84 and 85. As best shown in

Figures 4 and 7, the fingers 84 are spaced apart, the adjacent surfaces being notched as shown at 86, the notches forming shoulders and a recess, for accommodating the finger 79 formed on the actuating means 74. The single finger 85 has its opposite surfaces notched as shown at 87 to provide shoulders and a reduced extension fitting between the fingers 80. The finger 79 cooperates with the fingers 84, and the fingers 80 cooperate with the finger 85, so as to put the socket 82 in driving relation with the actuating means 74. The shoulders formed by the notches 86 and 87 engage the inner surfaces of the fingers 79 and 80, as shown in Figure 4, to predeterminedly space the socket 82 within the tubular portion 75 of the actuating means 74.

An electric lamp 88 is received within the socket 82, the lamp 88 having a base provided with the usual bayonet-joint lateral projections 89 adapted to seat within the seats of the bayonet slots 83. Operating means 90 are provided for effecting movement of the actuating means 74, and comprise a generally circular knob-like member preferably formed of translucent insulating material, having notches 91 formed in the peripheral surface to facilitate movement of the operating means. The operating means 90 is provided with a boss 92 having a recess 93, the recess being formed with axially extending notches 94 and 95 constructed and arranged to respectively receive the extensions 76 and 77 formed on the actuating means 74. Because of the different widths of the extensions 76 and 77, the operating means can be assembled with the actuating means in only one predetermined relation. It will be appreciated that when the operating means 90 is assembled with the actuating means 74, the margins adjacent the split, which normally are spaced apart slightly, will be brought together, and therefore the resilient spring of the split tubular portion 75 will cause the operating means 90 to be frictionally held to the actuating means 74. The closure end of the operating means 90, substantially in alignment with the recess 93, is provided with an indicating marking, such as the indicating arrow 96, which provides at this point a reduced thickness of the knob. Obviously, this reduced thickness causes the indicating arrow to appear more distinct than the remaining portion of the knob when the electric lamp 88 is illuminated, so as to indicate the position of the electric switch.

With the electric switch assembled as best shown in Figure 1, it will be obvious that the fingers 84 and 85 formed on the lamp socket 82 are interposed between an adjacent surface of the block 59, and the laterally extending parts of the fingers 79 and 80, and the opposite surface of the laterally extending parts of the fingers 79 and 80, and the adjacent surfaces of the flanges 78, bear against an annular offset 97 formed adjacent the tubular part 23 of the closure wall 21 of the casing 20. The springs 53 surrounding the body portion of the contacts 40, 41, 42, 43, and 44 urge the block 59 and the bridge 65 carried thereby to the left as viewed in Figure 1, this thrust being taken up by the bearing 97. The spring surrounding the body portion of the center contact 30 urges the thimble portion 35 into engagement with the contact formed on the electric lamp 88, and as the lamp 88 is moved with the actuating means 74 of the operating means 90, the center contact of the lamp will move relative to the contact means 30. It will also be obvious that the springs surrounding the contact means 40, 41, 42, 43, and 44 urge the respective contact heads 48 into either the recesses 61 formed in the block 59, or the recesses provided by the depressions 72. When the block 59 is rotated, the inwardly tapering sides of the recesses will cam the contact heads and the entire contact means to the right as viewed in Figure 1, these contact heads then riding over the flush surfaces of the block 59 and bridge 65 until other recesses are brought into alignment, whereupon the contact heads 48 will snap into the aligned recesses. In some instances it is desirable to directly electrically connect the contact means 30 and 44, and this connection may be effected in any suitable manner. In this instance, a metallic jumper strap 98 is disposed in the wells 29 of the apertures for receiving the contact means 30 and 44, and in the slot 58, the strap 98 having apertures permitting passage of the body portions of the contact means 30 and 44.

The switching device may be secured to a mounting 99 in any suitable manner, the manner herein shown being similar to that shown in applicant's Patent, Number 2,057,885. As best shown in Figure 1, a cup-shaped member 100 may be fixedly mounted on the mounting 99 by means of a bushing 101 fitting through openings in the mounting 99 and the cup-shaped member 100, the bushing having its ends crimped or beaded over the edges of these openings. The peripheral wall of the cup-shaped member 100 is provided with a plurality of inwardly struck abutments 102 adapted to engage the closure wall 21 of the casing 20 to limit movement of the casing 20 inwardly of the cup-shaped member 100.

In this particular case a quick connectable and disconnectable connection is provided to hold the casing 20 assembled with the cup-shaped member 100 and mounting 99, and includes a bayonet type connection, one part of which is carried by the cup-shaped member 100 and the other part is carried by the casing 20. The cup-shaped member 100 is formed with a single bayonet slot having an axially extending portion 103 connected with a circumferentially extending portion 104, as best shown in Figure 13. The circumferentially extending portion 104 is provided with a bayonet seat 105, which is inclined with respect to a plane at right angles to the axis of the cup-shaped member 100. On the side of the seat 105 nearest the axially extending portion 103, the seat 105 is provided with a shoulder 106 extending substantially at right angles to the seat 105.

The bayonet connection also includes a struck-in portion 107, best seen in Figure 12, the struck-in portion extending radially inwardly on the member 100, and serves to provide a bayonet seat 108, which may also be inclined to a plane perpendicular to the member 100. The struck-in portion 107 is provided with a projection forming a shoulder 109, the projection being desirably of rounded form on both sides, so that the shoulder 109 merges into the seat 103. The seat 108 of the struck-in portion 107 is diametrically opposite with respect to the seat 105 formed as part of the single bayonet slot, as best illustrated in Figure 1.

The portion of the bayonet conection carried by the casing 20 comprises two bayonet projections 110 and 111, the bayonet projections forming oppositely extending parts of a cross-shaped member 112 which is made of sheet spring metal.

The cross-shaped member 112 is provided with a central opening 113 through which the tubular portion 75 of the actuating means 74 is disposed, and the cross-shaped member 112 is fastened to the end wall 21 of the casing 20 by means of rivets 114 and 115, located at diametrically opposite points intermediate the bayonet projections 110 and 111. The cross-shaped member 112 is spaced from the wall 21 by bosses 116 and 117, through openings in which the rivets 114 and 115 pass.

The arms of the cross-shaped member 112 through which the rivets 114 and 115 pass, extend radially outwardly a short distance beyond the rivets substantially to the inner periphery of the cup-shaped member 100 to form projections 118 and 119. The projections 118 and 119 are adapted to cooperate with struck-in portions 120 and 121 formed on the peripheral wall of the cup-shaped member 100. The relation of parts is such that when the switch casing 20 is in abutment with the struck-in portions 102, the projections 118 and 119 are adapted to firmly ride onto the seats formed by the struck-in portions 120 and 121, as shown in Figures 8 and 11. The struck-in portions 120 and 121 are substantially in a plane at right angles to the axis of the member 100, as are also the portions of the projections 118 and 119.

The bayonet projections 110 and 111 are provided with offset portions 122 and 123 respectively. In the case of the projection 110, the offset portion 122 is so twisted out of the general plane of the cross-shaped member 112 that the portion 122 will lie substantially flat upon the bayonet seat 105 when engagement between the parts is completed. In like manner the bayonet projection 111 has its portion 123 so offset that it will lie substantially flat upon the inclined seat 108 when the parts have been connected.

The offset portion 122 is adapted to extend radially outwardly through the slot portion 103, and may be provided with an enlarged head 124. The offset portion 123 extends radially outwardly only to the inner periphery of the cup-shaped member 100.

To assemble the switching device carried within the casing 20 with the cup-shaped member 100, the casing 20 is moved bodily toward the member 100 and is brought in generally coaxial alignment therewith. The casing 20 is then positioned about its axis so that the bayonet projection 110 may enter the axial portion 103 of the bayonet slot. The casing 20 is then moved axially until the closure wall 21 of the casing 20 comes into engagement with the abutments 102, and the offset portion 122 of the bayonet projection 110 is then in a position to ride up by cam action onto the projection forming the shoulder 106. At the same time the offset portion 123 is in a position to ride up by cam action onto the projection forming the shoulder 109, and the projections 118 and 119 are ready to ride onto the seats formed by the struck-in portions 120 and 121. With the parts in this position, relative rotation of the casing 20 with respect to the member 100 will cause a beveled portion 125 of the projection forming the shoulder 106 to cam the offset portion 122 in a direction away from the end wall 21 of the casing 20, thereby putting the projection 110 under stress. At the same time the offset portion 123 is cammed in a direction away from the closure wall 21 by the projection forming the shoulder 109, thereby putting the projection 111 under stress. While the projections 110 and 111 are put under stress, the projections 118 and 119 will ride onto the seats formed by the struck-in portions 120 and 121. When the relative rotating movement of the parts has been completed, the offset portions 122 and 123 will snap onto the seats 105, 108 respectively, and the parts are yieldably held against relative movement.

To intentionally disconnect the casing 20 from the member 100, the offset portion 122 may be disconnected manually from its seat 105 by pressing upon the enlarged head 124, and then turning the casing 20 until the offset portion is in axial alignment with the axial slot 103. During that turning motion, the offset portion 123 rides from the seat 108, up onto the projection formed by the shoulder 109 and is entirely disengaged from the shoulder. Since only one of the bayonet projections, that is, the projection 110, needs to be unlocked when it is desired to disconnect the casing 20 from the cup-shaped member 100, it will be evident that disconnection of the parts can be readily effected manually without the use of tools.

Referring to Figure 14, the embodiment of the invention therein disclosed is somewhat similar to the embodiment disclosed in Figures 1 through 13; however, in this instance, the lamp socket 82 is omitted, and an actuating member 126, similar to the actuating member 74, is constructed and arranged to provide bayonet slots 127 for the projections 128 provided on the base of the electric lamp 129. In this case it will be seen that the lamp 129 is disposed directly within the tubular portion of the actuating means 126.

In Figure 15, is shown a socket 130 similar in some respects to the socket 82, disclosed in the embodiments shown in Figures 1 through 13; however, the socket 130, instead of being provided with the laterally bent fingers 84 and 85, is provided with a laterally extending generally circular flange 131, this flange being provided with recesses 132 constructed and arranged to receive the axially extending portions of the fingers 79 and 80 of the actuating member 74.

Figure 16 discloses a wiring diagram which may be used with the so-called four-position switch hereinbefore disclosed. This switch is diagrammatically shown, and has the center contact 30 and the contacts 40, 41, 42, 43, and 44 spaced about the center contact. For convenience, the contact 40 has been marked the "battery" contact, the contact 41 marked the "tail light" contact, and contact 42 marking the "parking" light contact, the contact 43 marked the "dim or tilt" light contact, and the contact 44 marked the "bright" light contact. The jumper strap 98 is diagrammatically shown as connecting the contacts 30 and 44, and the center contact 30 is diagrammatically shown as connected to the electric lamp 88. The contact 40 is connected to the battery 133, or any other suitable source of current, and the contact 41 is connected to the tail lamp 134. The contact 42 is connected by a conductor 135 to branch conductors 136 leading to the parking lamps 137 which may be contained within the head lamps 138. The contact 44 is connected by a conductor 139 to branch conductors 140 leading to the bright filament 141 of a pair of electric lamps 142. The contact 43 is connected by means of a conductor 143 to branch conductors leading to the dim or tilt filaments 144 of the electric lamps 142.

In one position of the bridge means, none of the contacts 41, 42, 43, or 44 are connected to

the battery, and this constitutes the position known as the "off" position of the switch. The bridge means may be moved to another position to engage the contacts **40**, **41**, and **42**, at which time the tail light and parking lights will be energized. The bridge means may also be moved to a position to engage the contacts **41**, **43**, and **43**, at which time the tail light and the dim or tilt lights will be energized. The bridge means may also be moved to a position to engage the contacts **40**, **41**, and **44**, at which time the bright lights and tail light will be energized, and also, the indicating device or signalling light **93** will be energized by means of the jumper strap **98** connecting the contacts **44** and **93**, so that when the bright lights are energized, the operator will have means of knowing this fact. Of course it will be obvious that the elongated slots **69**, **70**, and **71**, formed in the bridge means **65**, permits the various switching movements of the bridge means.

Referring to Figure 17, the switch therein shown comprises what is commonly known as a three-position switch. Parts similar to those used in the circuit diagram shown in Figure 16, will be designated by like numbers supplemented by the subscript "*a*." In this case, the contact **43** for the dim or tilt light is omitted, the contacts **40***a*, **41***a*, **42***a*, being marked as before, while the contact **44***a* is now marked only with the wording "headlight." As before, the contact **40***a* is connected to the battery **133***a*, the contact **41***a* is connected to the tail lamp **134***a*, and the contact **42***a* is connected to the parking lamps **137***a*. In this instance, however, the contact **44***a* is connected by a conductor **145** to a central terminal **146** of a switch **147**, which switch may be operated by the foot of an operator. As shown, the terminal **146** provides a fulcrum for a swinging bridge member **148**, which may engage either a terminal **149** or a terminal **150**. With the bridge member **148** in engagement with the terminal **150** as shown, current flows from the contact **44***a* through the conductor **145**, the terminal **146**, bridge **148**, terminal **150**, conductor **151**, to branch conductors **152** leading to the bright filaments **141***a* of the electric lamps **142***a*, and the terminal **150** is also connected by a conductor **153** with the center contact **30***a*, so as to cause illumination of the electric lamp **93***a* when the bright filaments **141***a* are energized. It will be obvious that in this case the jumper strap **98** is omitted, and connection is made with the contact terminal **30***a* by means of a conductor engaged by the detent means of the contact **30***a*. When the bridge **148** is swung to engage the terminal **149**, current will flow from the contact **44***a* through the conductor **145**, the terminal **146**, bridge **148**, terminal **149**, a conductor **154**, branch conductors **155** to the dim or tilt filaments **144***a* of the electric lamp **142***a*, and in this case the lamp **88***a* is not energized.

It will be apparent to those skilled in the art that I have accomplished at least the principal object of my invention, and it also will be apparent to those skilled in the art that the embodiments herein described may be variously changed and modified, without departing from the spirit of the invention, and that the invention is capable of uses and has advantages not herein specifically described; hence it will be appreciated that the herein disclosed embodiments are illustrative only, and that my invention is not limited thereto.

I claim:

1. An electric switch, comprising: a switchback, having a reciprocable center contact, and a plurality of off-center contacts, one of said off-center contacts being connectable to a source of electrical energy; jumper means extending between said center contact and another of said off-center contacts; bridge means, having an aperture through which said center contact extends whereby said bridge means is rotatable about the axis of said center contact to selectively engage said off-center contacts; indicating means, connected to said center contact; said jumper means being constructed and arranged to continue an electrical circuit from said other off-center contact to said indicating means, so as to energize said indicating means when said bridge means engages both said one and said other off-center contacts.

2. An electric switch, comprising: a support, having spaced apertures, each being countersunk by a well leading to one surface of said support, said support having also a recess providing communication between said wells; contact means, in each of said apertures, each being mounted for reciprocatory movement through its respective aperture; resilient means, cooperating with each contact means, interposed between the bottom of the respective well and a portion of the respective contact means, for urging said contact means in a direction toward said one surface of said support; and a jumper strap, having portions interposed between each of the resilent means and the bottom of the respective well, and a portion disposed in the recess in said support, for electrically connecting said contact means.

3. An electric switch, comprising: a support, having a central aperture; a contact, mounted for reciprocation through said aperture, and being spring-pressed so that a portion of said contact is urged in a direction away from a surface of said support; another contact mounted on said support in spaced relation with respect to said central contact; bridge means, having a surface disposed adjacent said surface of said support, for engagement with said other contact, and having a central aperture through which said portion of said central contact extends; actuating means, including an electric lamp socket, having driving connection with said bridge means, said lamp socket being provided with bayonet slots; and an electric lamp, having projections for bayonet connection with said lamp slots, said central contact portion being urged into engagement with the lamp contact, the urging force of said spring-pressed contact yieldably opposing disengagement of said bayonet connection.

4. An electric switch, comprising: bridge means; a split tubular member, having means at one end for connection with said bridge means, and fingers at the opposite end extending in a generally axial direction, one of said fingers being formed by extensions of said tubular member on opposite sides of said split; and operating means, having a recess for receiving said fingers, said operating means being held assembled with said tubular member by the force provided by the resiliency of said split tubular member.

5. An electric switch, comprising: bridge means; a split tubular member, having means at one end for connection with said bridge means, and fingers of unequal widths at the opposite end extending in a generally axial direction, one of said fingers being formed by extensions of said

tubular member on opposite sides of said split; and operating means, having a recess formed with marginal slots of a size to receive respective fingers, said operating means being assemblable with said tubular member in only one predetermined relation, and being held assembled by the force provided by the resiliency of said split tubular member.

6. An electric switch, comprising: bridge means; a split tubular member, having at one end a driving connection with said bridge means, said connection being so constructed and arranged that said member and said bridge means may be assembled in only one predetermined relation, said tubular member having fingers at the opposite end extending in a generally axial direction, one of said fingers being formed by extensions of said tubular member on opposite sides of said split; and operating means, having a recess for receiving said fingers, said operating means being held assembled with said tubular member by the force provided by the resiliency of said split tubular member.

7. In a device of the character described; tubular actuating means having a plurality of axially extending fingers; and a lamp socket located in said actuating means having a plurality of radially projecting means, each having a reduced extremity providing a shoulder, said projecting means being so constructed and arranged that when said socket is assembled with said actuating means, said shoulders engage said axially extending fingers whereby to position said socket in concentric spaced apart relation to said actuating means.

8. A switch including a casing, a movable carrier having bridge means secured thereto, a recess provided adjacent the center of said carrier, a switchback secured to said casing and having an aperture therein, contact means extending through said aperture, means at one extremity of said contact means for resiliently retaining a terminal, and means adjacent the other extremity providing an elongation projecting into said recess and out of engagement with said bridge means.

9. An electric switch, comprising: bridge means; a split tubular member, a lamp socket disposed in said tubular member having transverse extensions arranged between said bridge means and one end of said tubular member; said tubular member having means at said end for connection with said bridge means and said extensions, and fingers at the opposite end extending in a generally axial direction, one of said fingers being formed by extensions of said tubular member on opposite sides of said split; and operating means, having a recess for receiving said fingers, said operating means being held assembled with said tubular member by the force provided by the resiliency of said split tubular member.

10. A switch including, a casing, a movable carrier having bridge means secured thereto, a hole in said bridge means and a recess provided adjacent the center of said carrier, a second carrier secured to said casing and having an aperture therein, contact means extending through said aperture, means at one extremity of said contact means providing means to which a terminal may be connected, and means adjacent the other extremity providing an axially extending elongation projecting into said recess and through the hole in said bridge means.

11. In combination: a support, having an aperture; a tubular body, extending through said aperture and having means engaging portions of said support; means for receiving an electric lamp, having parts interengaging portions of said body to hold said receiving means assembled with said body, said receiving means also having means constructed and arranged to releaseably hold the electric lamp; an apertured carrier supporting contact means carried by said support; a bridge carrier supporting a bridge for engagement with certain of said contact means, an aperture in said bridge carrier; one of said contact means passing through the aperture in said contact carrier and the aperture in said bridge carrier adapted to engage the terminal means of the electric lamp; and single resilient means for urging said contact means into engagement with the terminal means of the electric lamp, the urging force of said resilient means being transmitted through the electric lamp to said lamp receiving means and said body, so as to yieldably oppose movement tending to release the lamp from said receiving means, said receiving means from said body and the engaging means of said body from said support.

12. An electric switch including in combination, a casing, a carrier supporting bridge means movably arranged in said casing, a recess provided in said carrier, a piece of insulating material carried by said casing, an aperture provided in said piece, contact means including a contact reciprocably mounted in said aperture, one extremity of said contact providing means to which a conductor may be connected and the other extremity being extended so as to fit within the recess of said bridge carrier out of contact with the bridge means, and means connected to said bridge carrier for rotating same and extending free of said casing.

13. An electric switch, comprising: bridge means; a split tubular member, a lamp socket disposed in said tubular member having transverse extensions arranged between said bridge means and one end of said tubular member, said tubular member having means at said one end for connection with said bridge means and said extensions, and fingers at the opposite end projecting in a generally axial direction, one of said fingers being formed by extensions of said tubular member on opposite sides of said split; and operating means, having a recess for receiving said fingers, said operating means being held assembled with said tubular member by the force provided by the resiliency of said split tubular member.

14. A contact assembly for an electric switch including a first carrier, an aperture provided in said carrier, a body member slidably mounted in said aperture, a second carrier having a contact plate secured thereto, said second carrier and plate having apertures aligned with said first mentioned aperture, one extremity of said body providing means to which a conductor may be secured, and having an elongated cap member permanently secured to the opposite extremity of said body forming an extension thereof projecting into the apertures provided in said second carrier and in said plate and clearing the latter whereby to provide a contact adapted to engage a contact member constituting a part of the switch.

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