Nov. 27, 1934. L. O. PARKER ET AL 1,981,967

SWITCH DEVICE

Filed Oct. 8, 1930

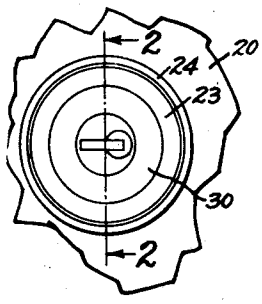


Fig. 1

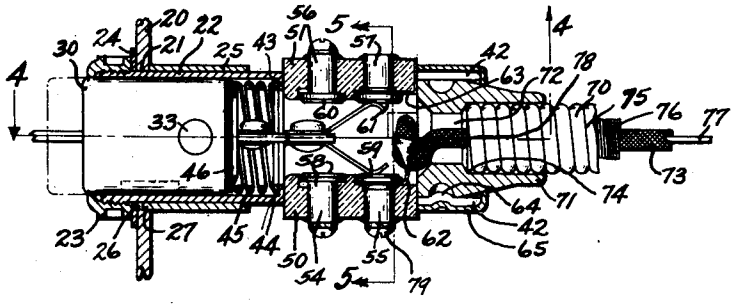


Fig. 2

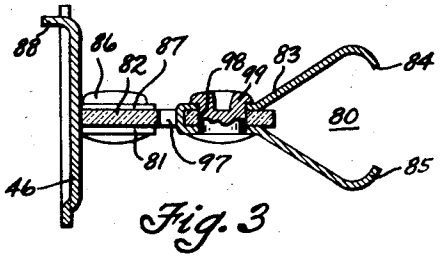


Fig. 3

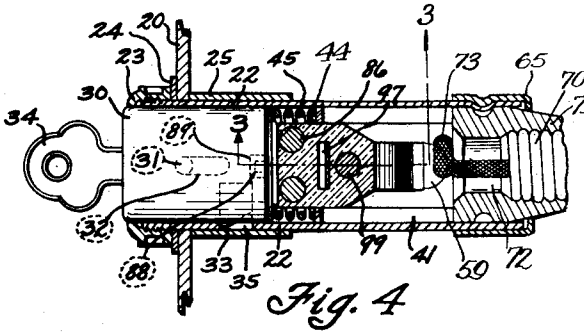


Fig. 4

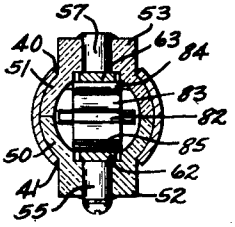


Fig. 5

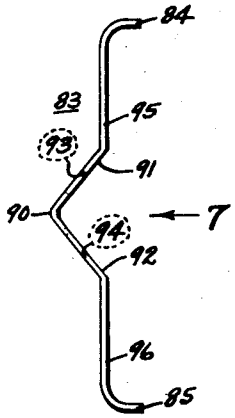


Fig. 6

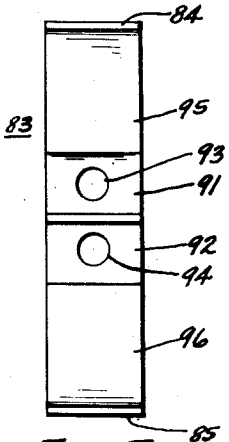


Fig. 7

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SWITCH DEVICE

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Application October 8, 1930, Serial No. 487,145

3 Claims. (Cl. 200—166)

This invention relates to ignition switches and is particularly adaptable to the lock controlled form.

One of the objects of the invention is to improve switches of the type stated.

Another object of the invention is to provide for simplification of manufacture and assembly of lock controlled switches.

Another object of the invention is to improve contacting elements of circuit closers in general.

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

In the drawing:

Fig. 1 is a face view of the lock device of the character described as mounted upon the dash of an automotive vehicle.

Fig. 2 is a longitudinal sectional view of the device substantially as indicated by the line and arrows 2—2 of Fig. 1.

Fig. 3 is an enlarged detailed view of the movable contact assembly contributing to the instant invention.

Fig. 4 is a longitudinal section through part of the switch structure substantially as indicated by the line and arrows 4—4 of Fig. 2.

Fig. 5 is a transverse section through the switch device substantially as indicated by the line and arrows 5—5 of Fig. 2.

Figs. 6 and 7 are detail views on an enlarged scale of a bridging contact member contributing to the instant invention.

With particular reference to the drawing, 20 indicates a portion of a dash or instrument panel, or other suitable support for the mounting of the instant switch, and provides an aperture 21 for the reception of a tubular casing 22 of a switch housing. The forward end of the housing is in threaded engagement with a spanner nut 23 operating against a washer 24 that draws the tubular housing 22 through the said aperture against the shoulder of a sleeve 25 secured to the switch housing. The aperture 21 through the member 20 provides a peripheral notch 26 for the reception of an axial lug 27 carried by the sleeve 25 that operates as a positioning means when the switch unit is mounted upon the support 20. It is not material how the sleeve 25 is secured to the switch housing 22 but any of the permanent forms of connection will answer the purpose, and in practice this is accomplished by spot welding, a means that is commonly known to artisans of this class.

The switch housing 22 is of tubular form and carries at its forward end, that is the end mounted in the support 20, a key plug or actuating member 30 that is capable of reciprocation therein to the extent defined by the pin and slot means 31 and 32 respectively; the spanner nut 23 acting as an escutcheon or finishing ring to present a pleasing appearance. The lock plug 30 also carries a spring pressed locking bolt 33 operable by means of a proper key 34 to be withdrawn from a lock bolt recess 35 provided by the casing 22, the recess 35 being so related with respect to the plug 30 and casing 22 as to receive the bolt 33 when the plug is depressed to the full line position illustrated in Figs. 2 and 4, known as the contact off position.

The inward end of the casing 22 is cut away at 40 and 41, or otherwise slit or bifurcated so as to provide a pair of axially extending parallel tongues 42, for the reception of insulators or terminal supporting members as will presently appear. At the bottom of the notches 40 and 41 tongues or lugs 43 may be struck inwardly to provide a seat for a ring 44, against which is disposed a return spring 45, or the lugs and ring may be dispensed with and the spring arranged to seat directly on the aforesaid insulators. At all events the other end of the spring engages a dished plate or cup 46 of a contact actuator assembly, and urges the projection of the plug 30 to the dotted line position of Fig. 2.

Substantially filling the bifurcated end of the housing 22 there are a pair of complemental insulators 50, 51, each similar and of substantial semi-cylindrical form, as illustrated in Figs. 2 and 5, that act as a lining sleeve for this portion of the housing, and each of which have a turret member 52, 53 respectively for disposition in the notches or cut-away portions between the tongues 42 of the housing. The inner face of the insulators, coexistent with the turrets are recessed and thence apertured for the reception of terminal members as illustrated in Figs. 2 and 5. The insulator 50 carries the terminals 54 and 55 while the insulator 51 carries the terminals 56 and 57, and when the insulators 50 and 51 are placed together in complemental form so as to pass within the housing 22 between the tongues 42, the terminal members 54, 55, 56 and 57 will present contact faces 58, 59, 60 and 61 disposed in pairs substantially as indicated in Fig. 2. Each of the insulators 50, 51 provides one of the terminal members of each with a connector or link as the member 62 connected with the terminal 55 and the member 63 connected with the terminal 57.

As the elements of the insulators and housing are preferably assembled, the terminal members 55 and 57 with their attendant connectors 62 and 63 are disposed toward the open end of the casing 22, after which an armored conductor 70 is passed between the tongues 42 to substantially engage the insulators, where it is maintained by staking as indicated at 64 to prevent withdrawal of the armor from the housing 22. To prevent withdrawal of the connector from the tongues 42 through spreading of the same, and to additionally maintain the armor conductor in association with the housing and insulator, a flanged sleeve 65 is passed over the tongues of the casing and engages the turrets 52 and 53 of the insulators where it is secured in position by staking as at 66.

The armored conductor 70 includes a ferrule for a conduit sleeve 71 designed for fitting within the housing 22, as has been described, and is provided with an axial bore 72 for the passage of an electrical lead 73, the bore being enlarged at the outer end at 74 for the reception of an armored loom 75 secured therein as by swedging or other equivalent means suiting the option of the builder. The armor 75 encloses a second protective means 76 that more closely embraces the insulation 73 of the electrical conductor and that makes access to the wire 77 more difficult.

In assembling the armored conductor 70 with the switch device, the connector 63 fixed to the terminal 57 is bent outwardly so as to lie within the cut away portion 40 of the housing where it may be engaged by the ferrule 71 when the same is assembled therewith, thus making electrical connection from the armored conductor through the connector 63 with the terminal member 57 and thence to the contact point 61, which is commonly known as the grounded terminal. The connector 62 is bent toward the axis of the housing, where electrical connection is made with the wire 77 of the lead 73 by bending the ears 78 of the connector 62 thereabout and completing with solder if desired. Thus, electrical connection is made between the conductive element 77 of the lead 73 and the contact point 59, through the agency of the connector 62 and terminal member 55. Each of the terminal members 54, 55 and 56 is designed for electrical connection with other elements about the automotive vehicle and is therefore each provided with a lock washer and a clamp screw 79 by which appropriate electrical leads may be secured thereto. The terminal member 57 having its electrical connection with its associated elements through the interior of the structure as has already been described, no provision is made for attaching a lead thereto.

Means for selectively controlling circuits through pairs of the contact points provided by the opposed contact members is afforded through the agency of the movable contact assembly 80, the details of which are fully illustrated in Figs. 3 to 7 inclusive. Reference has already been made to the dished plate 46 as being maintained against the end of the controller 30, or caused to follow the axial movement of the plug 30 along the housing 22 by the spring 45, and it is apparent that any movement of this member 46 will carry with it portions of structure attached thereto. The cup 46 forms a supporting member for the contact actuator assembly and has one or more lugs 81 struck out from the bottom of the dished portion to which is secured an insulator, as a dielectric tongue 82, that carries a movable contact 83 providing a pair of diverging spring lead conducting elements 84 and 85.

The insulator 82 may be secured to the lugs 81 in any preferred form but in the present instance is accomplished by means of rivets 86 passing through the lug 81, the insulator 82 and a hard washer 87 against which they may be headed or clinched. The peripheral edge of the disc 46 is struck rearwardly at one or more points to provide an axially extending lug 88 that cooperates with a recess 89 at the inner end of the plug 30 whereby relative rotation between the contact actuator assembly in the plug 30 may be prevented. The movable contact 83 is of detailed formation exhibited in Figs. 3, 6 and 7, and is formed from a single strip of resilient conductive material, as brass or the like, and embodies a central bight 90 from which each end of the strip is similarly formed to include a straight portion 91, 92 apertured at 93, 94 and thence flaring outwardly in the spring arm 95, 96 and finally terminating in the curved or rounded engaging portions 84 and 85. The movable contact member, as initially formed prior to assembling with the insulator 82, is of the form illustrated in Figs. 6 and 7, which makes it convenient to pass the element through an aperture 97 of the insulator until the bight 90 rests therein, after which the straight portions 91 and 92 are bent together so that the member 83 is folded into engagement with the insulator 82 whereupon the apertures 93 and 94 will be disposed for alignment with an aperture 98 of the insulator which accommodates an attaching rivet 99. In that formation, the resilient arms 95 and 96 will be disposed in the relative position illustrated in Figs. 2 and 3, with a sufficient lateral separation such that, when passed between the insulators 50 and 51, the contacting portions 84 and 85 will be maintained in engagement with one pair or another of the contact points provided thereby.

From this it is seen that movement of the controller 30 along the switch casing 22 by reason of the return spring 45 carries with it the movable contact assembly and thereby functions to electrically engage and connect the fixed contact points 59, 61 when in the inner full line position, and the contacts 58 and 60 when in the projected or dotted line position, illustrated in Fig. 2. As the device is mounted upon the vehicle the terminal 56 is connected with the battery or source of energy, while the terminal 54 has connection with the ignition coil and with a gas gauge or other registering instrument that may be desired. The terminal 55 also has electrical connection with the coil and thence with the distributor as is the usual practice through the conductor 73 attached to the connector 62. The terminal member 57 has connection with the armor or housing of the structure through the agency of the connector 63 and thence the ferrule 71 etc.

The position of the elements illustrated in Fig. 2 represents the locked position of the device in which the conductive element 73 running from the distributor is grounded to the frame by reason of its connection to the connector 62, terminal post 55, movable contact assembly 80, fixed contact 61, connector 63 and ferrule 71 and thence to the frame of the structure. While the ignition coil is connected to the terminal 55 it also is grounded to the same connection and is therefore rendered nonoperative. When the movable contact assembly is moved to the forward position, such that element 80 bridges the contact points 58 and 60, then it is clear that an electrical circuit is made from the battery coming in at terminal 56 through the bridging member 80

and thence by way of the terminal 54 to the coil, the grounding connection having been removed since the contact point 61 has connection only with the ferrule 71 through the link 63. Of course it is understood that manipulation of the proper key 34 will optionally control the position of the movable contact relative to the various contact points of the device described.

While the form of embodiment of the present invention as herein disclosed, constitutes a preferred form, it is to be understod that other forms might be adopted, all coming within the scope of the claims which follow.

What is claimed is as follows:

1. In a switch of the class described, the combination comprising, means for completing a circuit between a pair of spaced terminals including a contact bracket of dished form having ears struck from the bottom thereof, an insulating plate secured to the said ears, and a spring leaf conductor carried by the said insulator, said conductor providing a pair of diverging arms with rounded ends for engagement with the respective contact faces.

2. In a switch of the class described the combination comprising, an insulator having an aperture, a movable contact member integrally formed from a strip of resilient material, said member providing an attaching portion and a pair of diverging flexible contact arms, and means for securing said attaching portion to said insulator.

3. In a switch of the character described, a movable contact assembly comprising in combination, an insulator provided with apertures, a continuous strip of resilient metal passing through one of said apertures and whose intermediate portion is folded and apertured to firmly embrace the insulator, and whose free ends are deflected into resilient arms providing yielding engagement with cooperable contacts, and means for securing said folded portion to said insulator.

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