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2,809,262

FOOT DIMMER SWITCH

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FIG. 1

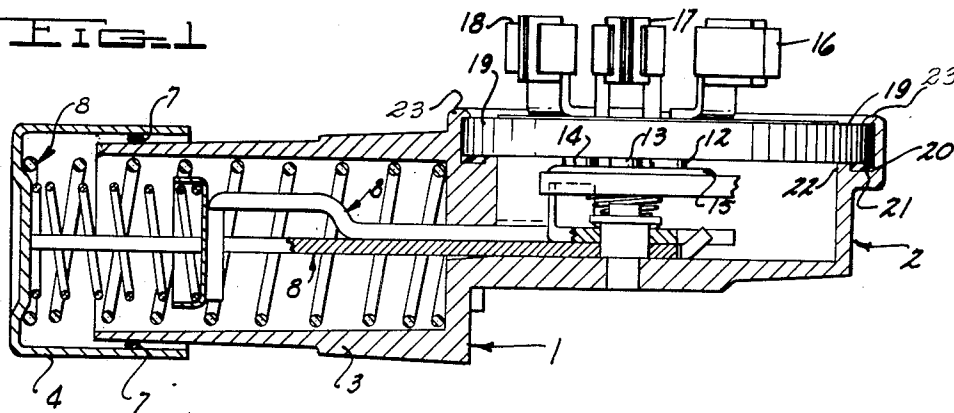
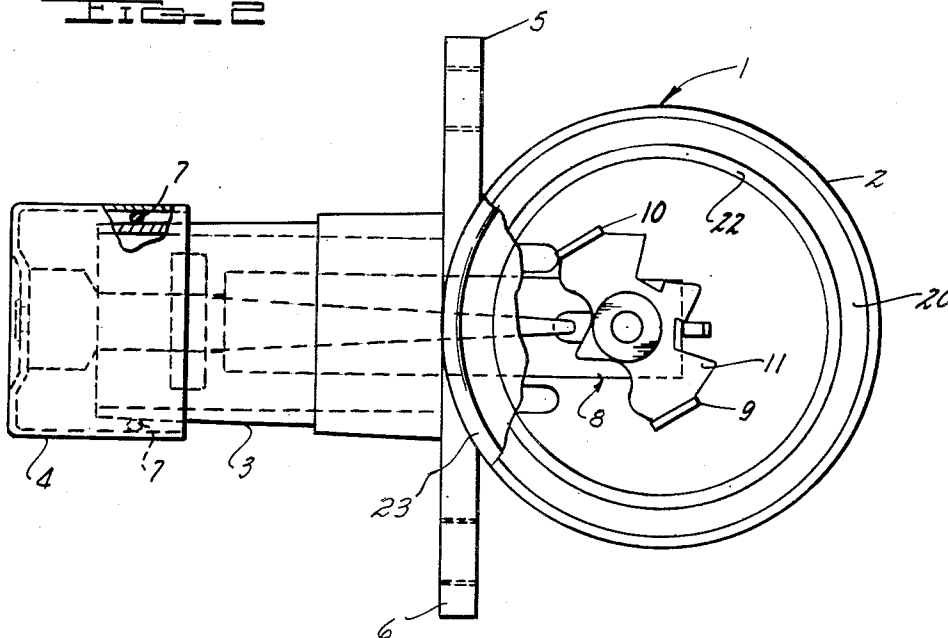


FIG. 2



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FOOT DIMMER SWITCH

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2 Claims. (Cl. 200—168)

This invention relates to a foot dimmer switch of the type particularly but not exclusively used in the controlling circuit of the headlights of a motor vehicle. Certain of the mechanisms employed in practicing the instant invention are those disclosed in United States Patent No. 2,604,793.

The invention disclosed in said Patent No. 2,604,793 relates to a mechanism whereby foot actuation of a cap member causes certain switch elements to be moved so as to effect engagement and disengagement of certain circuit-controlling terminals. In order to protect the switch elements against failure caused by the presence of dirt and moisture the switch elements are enclosed in a housing or casing. One wall of the casing is open for the reception of a board or cover member. This board or cover member carries the aforementioned terminals and is referred to as a terminal board. In order that the various terminals be suitably insulated from one another it has been found advisable (for reasons of manufacturing economy) to construct the entire terminal board out of an insulating material such as a phenolic material. Unfortunately phenolic materials shrink as they age. It was found therefore that when such materials were used in the construction of the terminal board the board would in time shrink to the extent that the joint between the board and casing was opened and unwanted road dust and moisture was allowed to enter the casing.

Dust and moisture also was found to enter the casing at the joint between the casing and previously mentioned cap member.

As distinguished from the disclosures of said Patent No. 2,604,793, the present invention proposes to so design and construct the assembly as to provide a sealed switch mechanism which is dust and moisture free during its expected useful life.

The primary object of the present invention is to provide a foot dimmer switch wherein the switch elements are isolated from dirt and moisture.

A secondary object is to provide a foot dimmer switch wherein the terminal board can be formed entirely out of insulating material in such a manner as to provide a tight joint between it and the switch casing thus barring unwanted road dust and moisture from the interior of the casing.

Another object is to provide a switch wherein the terminal board can be formed entirely out of insulating material, and wherein means are provided for sealing the joint between the terminal board and switch casing at all times and to compensate for shrinkage of the terminal board after its installation in the casing.

Another object is to provide a switch wherein the terminal board can be formed entirely out of an insulating material, and wherein a resilient sealing means is compressively retained between the terminal board and switch casing to compensate for any changes in terminal board dimension.

Another object is to provide a foot dimmer switch

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wherein the joint between the switch casing and foot-engaged member is sealed at all times to prevent entrance of dust and moisture into the casing.

Other objects of this invention will appear in the following description and appended claims, reference being had to the accompanying drawings forming a part of this specification wherein like reference characters designate corresponding parts in the several views.

In the drawings:

Fig. 1 is an elevational view of a preferred embodiment of the invention, parts thereof being broken away to show certain details of construction.

Fig. 2 is a plan view of the embodiment shown in Figure 1.

Before explaining the present invention in detail, it is to be understood that the invention is not limited in its application to the details of construction and arrangement of parts illustrated in the accompanying drawings, since the invention is capable of other embodiments and of being practiced or carried out in various ways. Also, it is to be understood that the phraseology or terminology employed herein is for the purpose of description and not of limitation.

Referring now to the drawings there will be seen to have been provided a casing 1 comprised of a circular body portion 2 and a tubular extension 3. A foot-actuated cap member 4 fits over the free end of extension 3. Two apertured arms, numbered 5 and 6 in the drawings, are provided for mounting casing 1 beneath an automobile foot board (not shown) in such position that cap member 4 projects therethrough sufficiently to permit its being depressed by pressures exerted through the foot of the person driving the automobile.

Between cap member 4 and tubular extension 3 there is provided a resilient sealing ring 7. This sealing ring has been found to effectively prevent the entrance of dirt and moisture into the space between tubular extension 3 and member 4.

Member 4 is interconnected with a switch actuating means indicated generally by numeral 8. In the preferred embodiment this actuating means is the same as the corresponding means disclosed in United States Patent No. 2,604,793 to which reference is hereby made. Accordingly a detailed description of this actuating means is not repeated here.

Actuating means 8 is arranged so as to rotate a pair of switch elements 9 and 10 which are positioned on a rotor element 11. The rotor and switch elements are preferably constructed and arranged to function in the same manner as the corresponding elements disclosed in United States Patent No. 2,604,793.

Elements 9 and 10 are, through the mechanism of contact strip 15 and studs 12, 13 and 14, designed to control current flow between the terminals 16, 17 and 18. These terminals must, of course, be insulated from one another, and accordingly they are mounted on a terminal board 19 which is formed of insulating material. Preferably board 19 is formed of a plastic material such as a phenolic material. Unfortunately, phenolic materials shrink to a certain extent as they age. It is economically unfeasible to completely age the phenolic terminal boards prior to their installation in the switch housings. It was found, however, that when the phenolic terminal boards were installed in the switch casings while in a partially aged condition the joint between the board and casing would open up and allow unwanted road dust to enter the casing. Accumulation of road dust in the casing was found to clog the switching mechanisms and thereby cause the switch to fail.

To prevent entrance of dust into the casing there is provided a resilient ring member 20 formed of rubber or other resilient material. This ring member is positioned

on an endless shoulder 21 formed on the interior faces of the casing walls. An endless wall is provided at 22 for retaining the ring member against movement out of engagement with shoulder 21. To securely retain board 19 in the casing there is provided on the casing wall an endless flange 23.

Assembly of the terminal board within the switch casing is such that initially flange 23 is formed as a straight line extension of the casing wall. Resilient ring 20 is then inserted in the groove formed by shoulder 21 and wall 22. Ring 20 is at this time in an uncompressed state and extends beyond the upper edge of wall 22. As the next step in the assembly operation board 19 is pressed into facial engagement with resilient element 20 to put the resilient element in compression. While element 20 is still under compression flange 23 is turned down into engagement with the exterior face of board 19. This step completes the assembly of the terminal board in the casing.

As was stated earlier, terminal board 19 is formed out of a plastic material which is subject to shrinkage. Therefore, board 19 will, after the switch has undergone a period of use, be of a reduced thickness. The joint between the board and casing will not open up, however, because element 20 will compensate for the reduction in board thickness. Thus, as board 19 decreases in thickness the compressive forces on the resilient element 20 are reduced thus allowing it to expand and maintain a dust and moisture-proof seal between the terminal board and casing. In order for element 20 to be fully effective as a sealing medium it is initially compressed to a greater extent than the calculated shrinkage of the terminal board. Element 20 is thereby always in compression and the seal between the terminal board and switch casing always is closed.

The structural relationships whereby the desired sealing action is maintained are set forth in the following claims.

Having thus described my invention, I claim:

1. A switch comprising a casing, said casing including a body portion and a tubular extension, switch elements positioned within the body portion, actuating means within the tubular extension and in operative engagement with the switch elements, a cap member interconnected with the actuating means and having wall portions thereof encircling the tubular extension, an endless resilient sealing ring positioned between said wall portions and tubular extension portions, the aforementioned body por-

tion being provided with an aperture in registry with the switch elements, means forming an endless shoulder on the interior faces of the body portion walls around the periphery of the aperture, an endless groove formed in the face of said shoulder, an endless resilient expandable gasket positioned in the groove and having an expanded thickness greater than the depth of the groove, a terminal board of shrinkable material positioned within the aperture in facial engagement with the resilient gasket, and flange means projecting from the body portion walls into compressive relation with the exterior face of said terminal board so as to squeeze the gasket between the board and groove-forming surfaces, whereby when the terminal board shrinks after its installation the gasket will expand so as to maintain the seal between the board and casing.

2. A switch comprising a casing, actuating means extending through one wall of the casing and into the interior thereof, switch elements positioned within the casing in operative engagement with the actuating means and in registry with an opening formed in the casing, means forming an endless shoulder on the interior faces of the casing walls around the periphery of the opening, an endless groove formed in the face of said shoulder, an endless resilient expandable gasket positioned in the groove and having an expanded thickness greater than the depth of the groove, a terminal board formed out of a plastic material which is subject to shrinkage during an aging period after its formation, said board being positioned within the aforementioned opening in facial engagement with the resilient gasket, and flange means projecting from the casing walls into such overlapping compressive relationship with the exterior face of said terminal board that the resilient gasket will be compressed through a greater distance than the difference in thickness of the terminal board between the time when it is formed and the time when it is completely aged.

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