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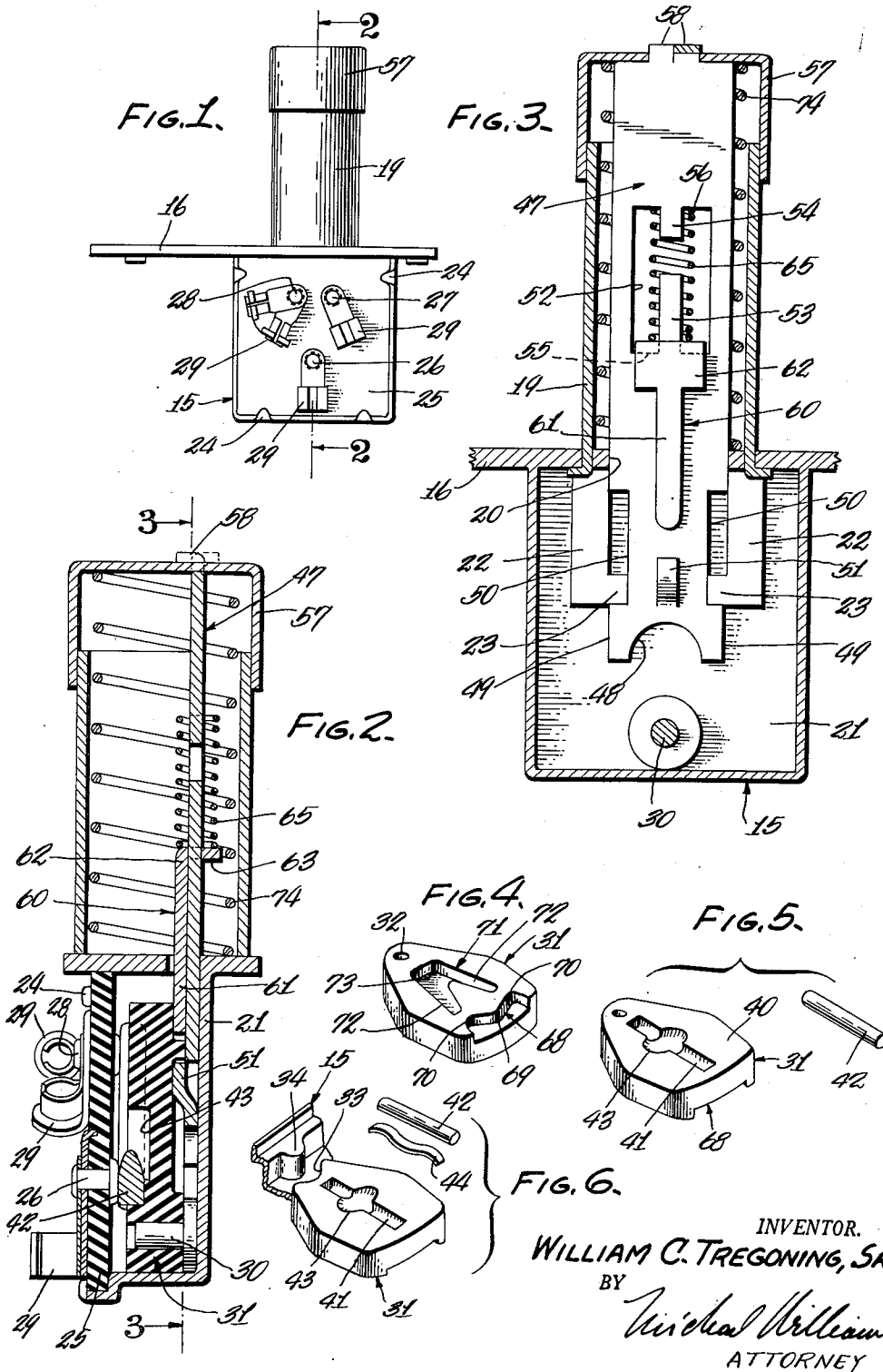
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2,647,180

SWITCHING MEANS

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2 Sheets-Sheet 1



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2 Sheets-Sheet 2

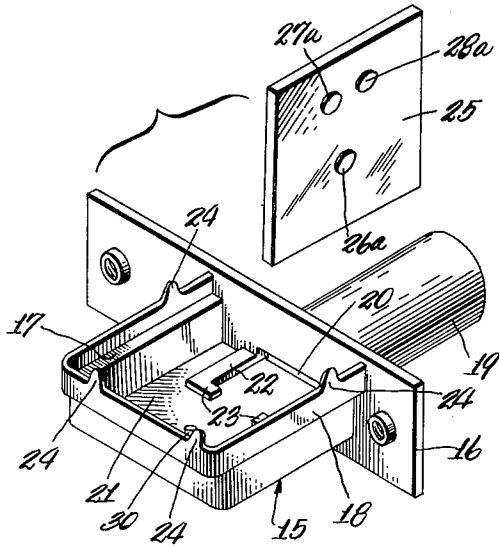


FIG. 7.

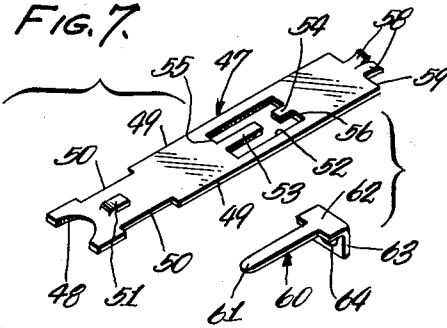


FIG. 8.

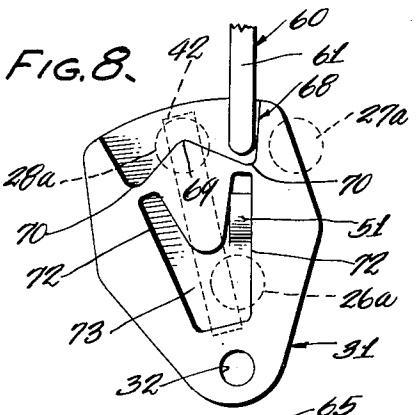


FIG. 9.

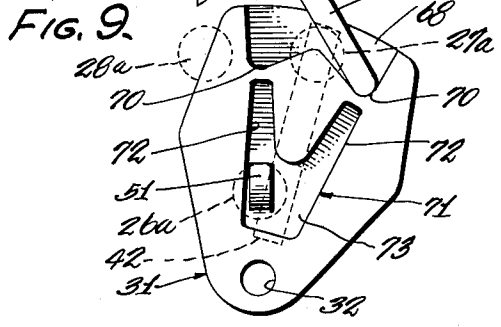


FIG. 11.

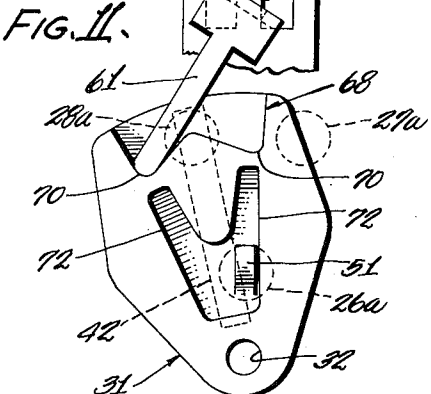
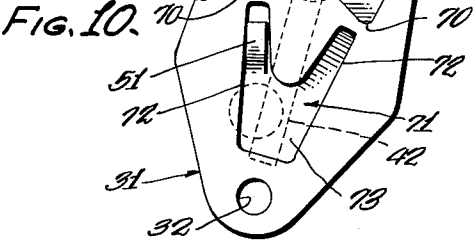


FIG. 10.



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SWITCHING MEANS

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2 Claims. (Cl. 200—68)

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My invention relates to switching means, and more particularly to electrical switch means adapted to be used in the automotive field for the control of headlight beams, and the principal object of my invention is to provide new and improved switching means of this character.

The switching means of my invention provides a sturdy and efficient construction that may be easily and economically manufactured and assembled on a commercial basis. Although my invention is herein disclosed as embodied in a foot-dimmer switch, it is to be understood that the invention is not limited to such use.

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

Figure 1 is an elevational view of a foot-dimmer switch embodying my invention,

Figure 2 is an enlarged cross-sectional view corresponding generally to the line 2—2 of Figure 1,

Figure 3 is a fragmentary sectional view corresponding generally to the line 3—3 of Figure 2,

Figure 4 is a perspective view of a bridge-carrying member,

Figure 5 is a perspective view of the member shown in Figure 4, with the member inverted from position shown in Figure 4, and also disclosing a bridge,

Figure 6 is a fragmentary perspective view showing a slightly modified bridge-carrying member and means for supporting such member with respect to the housing,

Figure 7 is an exploded perspective view showing parts included in the embodiment of my invention, and

Figures 8, 9, 10, and 11 show relationship of parts during certain positions.

The embodiment herein shown to disclose the invention comprises an open-sided housing 15 (see especially Figure 7) which may be formed as a fabrication or a casting. Integral with, or secured to, the housing is a flange 16 forming one side of the housing, and also forming means for securing the housing to a support.

The side wall of the housing (with the exception of the flange 16) is of stepped formation, providing a shoulder 17 and a peripheral lip 18, the latter circumscribing a larger area than the defining wall of the housing proper. Secured to the housing 15, at the flange 16, either integral or otherwise, is a tubular member 19, and the flange 16 is apertured, as shown at 20, to pro-

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vide communication between the interior of the housing 15 and the interior of the tubular member 19. At either side of the aperture 20 the bottom wall 21 of the housing is formed with raised portions 22, each terminating in an inwardly turned foot 23. The peripheral lip 18 may be formed with a plurality of tabs 24 for a purpose later to be described.

A contact carrying plate 25, formed of suitable insulating material, is adapted to closely fit within the space defined by the lip 18 and the flange 16, and to have its inner surface seat upon the shoulder 17. After proper assembly of all parts, the tabs 24 are bent over the outer surface of the contact carrying plate 25, as seen in Figure 1, to hold the parts in assembled relation.

The plate 25 carries three contacts 26, 27 and 28, having heads 26a, 27a, 28a which extend from the inner surface of the plate. The shanks of the contacts pass through the plate 25 and have their outer extremities headed over terminal engaging clips 29 which provide for electrical connection to a suitable circuit, such as the light circuit of an automobile.

Extending upwardly from the bottom wall 21 of the housing 15 is a pin 30 which provides a pivot for a bridge-carrying member 31. The member 31 is formed of insulating material and has an aperture 32 for receiving the pin 30. As an alternate construction, as seen in Figure 6, the bridge-carrying member may be formed with a generally semi-circular recess 33 adapted to fit a rounded abutment 34 formed on the housing 15, so that the bridge-carrying member may rock about the abutment in substantially the same manner as it does through use of the pin and aperture construction.

The upper surface 40 of the bridge-carrying member 31, (as viewed in Figure 5) is formed with an elongated recess 41 substantially in line with the major axis of the member 31. A bridge 42, of round cross-section and formed of suitable current conducting material, is adapted to fit within the recess in such manner that at least a portion of it throughout its longitudinal length extends beyond the upper surface 40 of the member 31. This relationship of parts is best seen in Figure 2. The recess 41 is formed with an enlargement 43 intermediate its ends to facilitate manipulation of the bridge 42.

The bridge 42 preferably fits the recess 41 in such manner that it may rotate about its longitudinal axis, whereby it may having rolling engagement with the contact heads 26a, 27a and 28a and thus prevent wear at any particular

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portion of bridge. As best seen in Figures 8 through 11, the bridge-carrying member rocks in predetermined relation with respect to the contacts 26, 27, and 28, so that a portion of the bridge 42 is always in engagement with the contact head 26a and an opposite portion of the bridge is moved into and out of engagement with respective ones of the contact heads 27a and 28a.

In some instances, it may be desirable that the bridge 42 have resilient engagement with the contact heads, and to accomplish the desired result, the recess 41 may be proportioned to receive yieldable means, such as the flat spring 44 (see Figure 6) so that such means is interposed between the bridge-carrying member 31 and the bridge 42.

Operating means are provided for effecting rocking movement of the bridge-carrying member 31, and in the embodiment disclosed, such means comprise an operating member 47 formed of generally flat stock. The member 47 has a recess 48 in its lower margin, referring to the disposition of parts as shown in Figure 3, the recess being for clearance purposes with respect to the pin 30 and the strengthening boss surrounding such pin, or for clearing the rounded abutment 34, so that the member 47 may have maximum stroke.

The member 47 is movable in a generally rectilinearly manner through the aperture 20 in the housing 15, and in this respect the side margins 49 thereof preferably have sliding engagement with adjoining margins of the apertures 20 for bearing purposes. The side margins 49 are provided with similar recesses 50 to receive the intumed feet 23 formed on the bottom wall 21 of the housing 15, and thus limit movement of the member 47 in either direction.

The member 47 has an abutment 51 which may be struck-up from the body of the member by a stamping process. Spaced from the abutment, the body of the member 47 is formed with a recess 52 which provides facing projections 53, 54, each being of less width than the recess to provide respective shoulders 55, 56. The member 47 may be secured to a cap 57 in any desired manner, for example by means of a split end forming tabs 58 which may extend through an opening in the closure wall of the cap 57, and are bent over the exterior surface of such wall, thus clamping this wall against a shoulder 59 formed between the tabs and the body of the member 47.

An intermediate member 60 is provided to effect rocking movement of the bridge-carrying member 31 through rectilinear movement of the operating member 47, and such member comprises a finger 61 formed integrally with a leg 62 of an angular portion which includes another leg 63 formed with an aperture 64 which freely passes the projection 53, so that the intermediate member 60 may rock about the projection 53, as suggested in Figures 9 and 11. Yieldable means, such as the coil spring 65, is interposed between the leg 63 and the shoulder 56, the projections 53 and 54 cooperating to hold the spring in position. As best seen in Figure 3, the spring 65 urges the relatively flat leg 63 to seat on the shoulder 55 in such manner that the finger 61 is held substantially in alignment with the line of movement of the rectilinear movement.

The finger 61 is cooperable with a cam surface 68 formed in a recess on the bridge-carrying member 31. Referring particularly to Figures 4 and 8 through 11, the cam surface 68 is sub-

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stantially symmetrically arranged about the major axis of the bridge-carrying member 31, and comprises a crest 69 on the major axis and a pair of troughs 70, one on each side of this axis. One or the other of the troughs 70 is adapted to be adjacent to the lower end of the finger 61 when the operating member 47 is in its outermost position.

The bridge-carrying member 31, on the same side as the cam surface 68, is also formed with a recess 71 providing branches 72, one or the other of which is adapted to be generally in alignment with the line of movement of the operating member and to receive the abutment 51 to lock the bridge-carrying member against movement. The branches 72 are joined by a relatively wide recess portion 73 into which the abutment is moved when the bridge-carrying member is to be moved from one position to another.

In assembling the switch parts, the cap 57 is secured to operating member 47. The intermediate member 60 may then be assembled with the projection 53, and the spring 65 positioned about the projections 53 and 54 and interposed between the leg 63 of the intermediate member 60 and the shoulder 56 of the operating member 47, and the entire assembly up to this point may be assembled with the housing 15 by moving the operating member 47, and coil spring 74 disposed thereabout, through the tubular portion 19.

The end of the operating member will project through the aperture 20 and the coil spring 74 will bear against the adjacent surface of the flange 16. Compression of the spring 74 will permit further inserting movement of the operating member, and this member may be tilted slightly so that its inner end raises above the intumed feet 23, so that such inner end may be moved beyond the feet. The member 47 may then be moved from tilted position to a position substantially flat with respect to the bottom wall 21 of the housing 15, so that the feet 23 hook behind marginal edges of the recesses 50 and hold the operating member in assembled position. It will be clear that this assembly may be made in a very short time, without the requirement of special tools or independent fastening means, and thus reduces assembly cost.

The bridge-carrying member 31, with bridge 42 in seated relation, may next be assembled, by disposing the member 31 about the pin 30 (or the rounded abutment 34) with the bridge 42 disposed toward the open side of the housing. The plate may next be assembled, by disposing it in seating relation on the shoulder 17 within the lip 18, making sure that the contacts 27 and 28 are positioned adjacent to the flange 16. The tabs 24 may then be bent over the outer surface of the plate 25 to complete the assembly.

In operation, the coil spring 74 normally urges the operating member 47 to outermost position, as shown in Figures 2 and 3. The finger 61 is held to substantial alignment with the line of movement of the operating member 48, by means of the coil spring 65, and the finger 61 is positioned in one or the other of the troughs 70, preferably just short of engagement with the adjacent surface of the cam. The troughs 70, as best seen in Figures 8 through 11, form pockets disposed off-center with respect to the line of movement of the operating member 47, so that as a pushing pressure is applied to the cap 57, the operating member will move inward, causing the end of the finger to seat in the off-center pocket. Further

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inward movement of the operating member 47 causes the finger to move upwardly (with respect to the disposition of parts in Figures 8 through 11) along the projection 53 to compress the spring 65 and thus store energy. At the same time, the off-center relation of the pockets formed by the troughs 70 tends to urge the finger from in-line to out-of-line relation, and when the stored energy is sufficient to overcome the inertia of the bridge-carrying member 31 and the friction caused by interengagement of the bridge 42 with the contacts, and when the operating member 47 has been moved sufficiently inward so that the abutment 51 is moved out of the respective branch 72 and into the wide recess portion 73, the bridge-carrying member will be snapped from one position to the other position.

When pushing pressure is released from the cap 57, the spring 74 urges the operating member 47 to its outermost position, and the finger 61 will drag over the crest 69 and be disposed in the other trough 72 in position for further operation. At the same time, the abutment will ride up in the respective branch 72 and hold the bridge-carrying member 31 against movement.

Thus, it will be seen that the bridge 42 may be moved to bridge either contacts 26 and 27, or 26 and 28, and because of the rolling action of the bridge, no undue wear will result even after a multitude of operations.

From the foregoing, 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 embodiment 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 embodiment is illustrative only, and that my invention is not limited thereto.

I claim:

1. An electrical switch, comprising: a base; at least two contacts carried by said base and being

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insulated from each other; a bridge carrying member having an elongated recess; an elongated conductive member round in cross-section and rotatably seated in said recess; said bridge-carrying member being rockable about a center so that said conductive member is always in engagement with one of said contacts and may be moved into and out of engagement with the other contact.

2. In an electrical switch, a base, at least two contacts carried by said base and insulated from each other, a generally flat bridge-carrying member shiftable flat-wise relative to said base, a bridge, round in cross-section, and extending from a flat surface of said member, said bridge being mounted for rotation about its axis, said bridge-carrying member being held in spaced relation with respect to said base so that shifting of said member causes said bridge to traverse said contacts with a rolling action, said bridge being of a length as compared to the spacing of said contacts so that it is in substantially constant engagement with one of said contacts and movable into and out of engagement with the other of said contacts.

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