MULTICIRCUIT ELECTRICAL SWITCHES


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3 Claims

ABSTRACT OF THE DISCLOSURE

An electrical switch includes a casing supporting first and second contacts. An operating member is pivotally mounted on the casing and is moveable to cause pivoting movement of the cam member which is also pivotally mounted in the casing. A cam form on the cam member engages a rigid conductive bridging member associated with the contacts of the switch, and the arrangement is such that movement of the operating member is transmitted through the cam member to the rigid conductive bridging member to move the bridging member so as to complete the various circuits of the switch.

This invention relates to electrical switches.

An electrical switch according to the invention comprises in combination a casing, first and second contacts secured to the casing, an operating member pivotally mounted on the casing, a cam member pivotally mounted on the casing and movable in response to movement of the said operating member, a cam form on said cam member, and a rigid conductive bridging member engaged with said first contact and pivotable about said first contact to a position wherein the bridging member bridges said first and second contacts to complete a circuit therebetween, said bridging member being engaged by said cam form and said cam form being such that movement of said cam member is transmitted to said bridging member to pivot said bridging member.

One example of the invention is illustrated in the accompanying drawings wherein:

FIG. 1 is a sectional view of an electrical switch,
FIG. 2 is a sectional view on the line 2—2 in FIG. 1, and FIG. 3 is a sectional view on the line 3—3 in FIG. 1.

Referring to the drawings the switch includes a moulded synthetic resin casing 11 of open box-like construction. The base 12 of the casing includes a pair of parallel longitudinally extending channels 12a, 12b which are separated by a rib 13. Each of the channels 12a, 12b houses four contacts 14, 15, 16, 17, 18, 19, 21, 22, respectively the contacts having electrically connected therewith respective blade terminals on the exterior of the casing. The base 12 is stepped to define a central raised land 23 on which the contacts 15, 16 and 19, 21 are positioned.

Resting on the contacts 15, 16 and 19, 21 respectively are a pair of conductive plates 24, 25. By virtue of the raised land 23 the ends of the plates 24, 25 are spaced vertically from the contacts 14, 17 and 18, 22 respectively.

A cam member 26 is pivotally supported within the casing 11 by means of two pairs of lugs 26a on opposite sides thereof which engage the lower ends of two pairs of short channels 11a in opposite walls respectively of the casing 11. The lower surface of the cam member is formed with a slot 27 within which the rib 13 is located, and a transversely extending rib 28 which engages the upper surfaces of the plates 24, 25 mid-way between the contacts 15, 16 and 19, 21 respectively. The opposite ends of the lower surface of the member 26 are formed with further ribs 29, 31 respectively which are parallel with the rib 28, the ribs 28, 29, 31 being divided into two parts by the slot 27. The upper surface of the cam member 26 is formed with a transverse groove 32 the walls of which are defined by a lower pair of sloping surfaces 33, 33a which meet in a line vertically below an imaginary line joining the lugs 26a when the switch is in the position shown in FIG. 1, a pair of intermediate surfaces 34, 34a parallel with the base 12 of the casing 11 and a pair of upper sloping surfaces 35, 35a.

Closing the upper end open of the casing 11 is an operating member 36 which is pivotally engaged with the casing 11 through a pair of outwardly directed posts 37 integral with the casing 11 which extend through holes 38 in opposite walls respectively of the member 36. Extending downwardly from the member 36 is an integral hollow finger 39, the central bore 41 of which houses a compression spring 42, and a plunger 43 the lower end 43a of which is hemispherical. The spring 42 urges the plunger downwardly so that its end 43a engages the groove 32 in the upper surface of the member 26.

The operation of the switch is as follows:

In use the contacts 15, 16 are connected in a first circuit, the contacts 16, 17 are connected in a second circuit and the contacts 19, 21 and 22 are similarly connected in third and fourth circuits being appreciated that the contacts 16 and 21 are the supply contacts for their respective circuits. The contacts 14, 18 are not connected in any electrical circuit in this example. The switch is shown in its first position wherein the first and third circuits are completed through the plates 24, 25 respectively. In order to complete the second and fourth circuits and break the first and third circuits the operating member 36 is pivoted in a counter clockwise direction, whereupon the end 43a of the plunger 43 is caused to ride up the surface 33 of the groove 32 in the cam member 26 and to engage the surfaces 34, 35 of the groove 32. The spring 42 urging the plunger 43 towards the groove 32 causes the cam member 26 to pivot about one pair of the lugs 26a in a clockwise direction thereby moving the rib 28 away from the plates 24, 25 and moving the rib 29 into engagement with the adjacent ends of the plates 24, 25. Thus the plates 24, 25 are caused to pivot about the contacts 16, 21 respectively to a position wherein they bridge the contacts 16, 17 and 21, 22 respectively so completing the second and fourth circuits.

Pivotal movement of the operating member 36 from its first position in a clockwise direction moves the switch to its off position. Such movement pivots the cam member 26 about the other pair of lugs 26a thereby pivoting the plates 24, 25 about the contacts 15, 19 respectively to bridge the contacts 14, 15, 18, 19 respectively but since the contacts 14, 18 are not operatively connected no circuits are completed.

It will be appreciated that by altering the connections to the contacts, the position of the contacts, the positions of the ribs 18, 19, 21 on the cam member 26 or the position of the plates 24, 25 the operation of the switch can be varied to suit a great number of operations. Furthermore the operating member 36 can be of the rocker type shown or could be of the more conventional lever type in which case the casing 11 is modified slightly to receive the lever.

Having thus described my invention what I claim as new and desire to secure by Letters Patent is:

1. An improved, multi-circuit, electrical switch comprising in combination:
   a. a casing having a base;
   b. first, second and third contacts aligned on the base, the first and second contacts being positioned on the base in a common plane above the plane of the third contact;
   c. a first rigid, flat, conductive, bridging strip engaged with the first and second contacts;
fourth, fifth and sixth contacts aligned on the base and
disposed laterally with respect to the first, second and
third contacts, the fourth and fifth contacts being positioned in a common plane above the plane of the
sixth contact;
the second rigid, flat, conductive, bridging strip en-
gaged with the fourth and fifth contacts;
a cam member;
means pivotally mounting the cam member in the
casing;
an operating member;
means pivotally mounting the operating member on
the casing;
means coupling the operating member and the cam
member so that pivotal movement of the operating
member causes pivotal movement of the cam mem-
ber; and
cam forms on said cam member, at least one of said
cam forms being engaged with said first and second
bridging strips respectively, at least one further cam
form spaced from said at least one cam form toward
said third and six contacts so that pivotal movement
of the cam member causes rocking movement of the
first and second bridging strips to alter the circuits
completed by the first and second bridging strips
between the first, second and third contacts, and the
fourth, fifth and sixth contacts respectively.

2. A switch as claimed in claim 1 further including
seventh and eighth electrical contacts, the seventh elec-
trical contact being aligned with the first, second and
third contacts and lying in the plane of the third con-
tact, and the eighth electrical contact being aligned with
the fourth, fifth and sixth electrical contacts and lying in
the plane of the sixth electrical contact; the first and sec-
ond electrical contacts being disposed between the third
and seventh electrical contacts, and the fourth and fifth
electrical contacts being disposed between the sixth and
eighth electrical contacts; at least one other cam form
spaced from said at least one cam form toward said
seventh and eighth contacts and the cam forms on the cam
member being such that in a first position of the operating
member of the switch the first bridging strip completes
an electrical circuit between the second and third con-
tacts while the second bridging strip completes an elec-
trical circuit between the fifth and sixth contacts, in a
second position of the operating member the first bridg-
ing strip completes an electrical circuit between the first
and second contacts while the second bridging strip com-
pletes an electrical circuit between the fourth and fifth
electrical contacts, and in a third position of the operat-
ing member the first bridging strip completes an electrical
circuit between the first and seventh contacts while the
second bridging strip completes an electrical circuit be-
tween the fourth and eighth contacts, the first bridging
strip pivoting about the second contact during movement
of the operating member from the first position to the
second position, while the second bridging strip pivots
about the fifth contact, and the first bridging strip pivot-
ing about the first contact during movement of the op-
erating member from the second position to the third
position while the second bridging strip pivots about the
fourth contact.

3. A switch as claimed in claim 2 wherein opposite
walls of the casing each include a pair of spaced depres-
sions which are engageable by respective projections on
said cam member said cam member pivoting about an
an axis passing through the first depression of each pair
of depressions when the operating member is moved from
its first position to its second position, and the cam mem-
ber pivoting about an axis passing through the second de-
pression of each pair of depressions when the operating
member is moved from its second position to its third
position, the four depressions being engaged simultane-
ously by their respective projections on the cam member
when the operating member is in its second position.

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ROBERT K. SCHAEFER, Primary Examiner
D. SMITH, Jr., Assistant Examiner

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