

W. J. BROWN ET AL

LIGHT CURRENT ELECTRIC SWITCH SUITABLE FOR WIRELESS RECEIVERS

Fig. 1

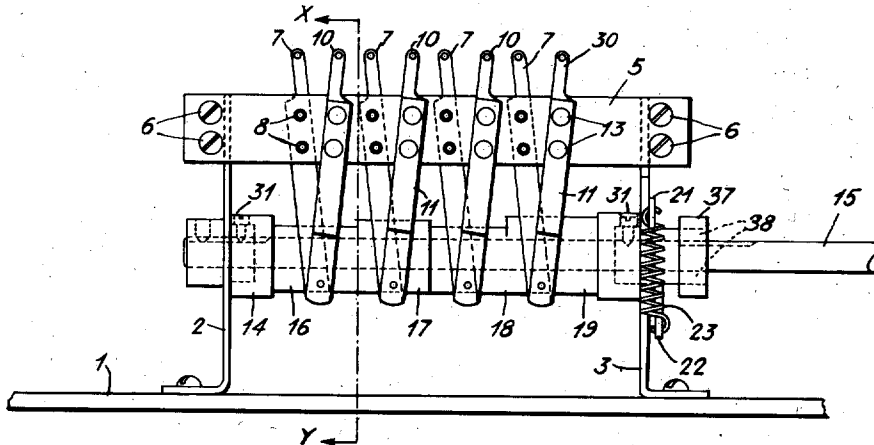


Fig. 2

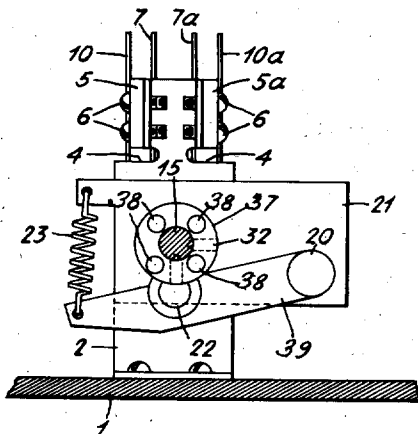


Fig. 3

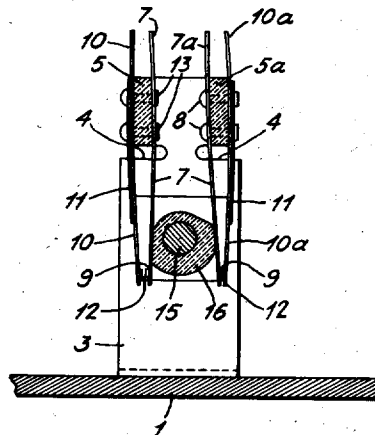
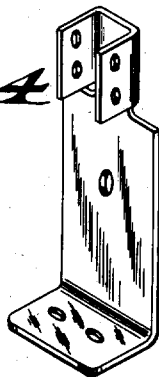


Fig. 4



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LIGHT-CURRENT ELECTRIC SWITCH SUITABLE FOR WIRELESS RECEIVERS

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6 Claims. (Cl. 200—1)

The present invention relates to electric switches of the kind comprising two blade contact members mounted upon an insulating support and means for pressing contacts upon the blade contact members into or out of engagement with one another.

Usually in switches of this kind the contacts are normally out of engagement with one another and means such for example as a cam serves to bend one of the blades and thus to move one of the contacts into engagement with the other. The blades are commonly mounted opposite to one another upon opposite sides of an insulating strip and are fixed to the strip by securing means such as one or more rivets each of which passes through both blades. This construction necessitates the provision of insulating means between at least one of the blades and the rivet or rivets which secure it. Since the blades are opposite to one another and are separated for a portion of their lengths by an insulating material, which may have a comparatively high dielectric constant, the electric capacity between the blades may be appreciable, and such capacity may have a detrimental effect if the switch be employed in circuits carrying radio frequencies.

It is an object of the present invention to provide an improved form of switch of the kind described in which no insulating means are required between any of the securing rivets and the blades.

It is a further object of the present invention to provide an improved form of switch of the kind described in which the inter-blade capacity has a low value making its use advantageous in circuits carrying currents of radio frequency.

According to the present invention there is provided an electric switch of the kind specified, wherein the two blade contact members are secured at different places along the insulating support, the securing means, such as rivets, passing from front to back of the support.

According to a further feature of the present invention an electric switch comprises an insulating support, two substantially straight blade contact members secured to said support and means for pressing contacts upon the blade contact members into or out of engagement with one another, the blade contact members being inclined relatively to one another in such a way that they are offset relatively to one another at their points of attachment to the support and overlap one another at the points bearing the contacts.

An application of the invention to a switch mechanism suitable for effecting the various changes of connection required in a wireless receiver will now be described by way of example with reference to the accompanying drawing, wherein

Fig. 1 represents a side elevation of a switch according to this invention;

Fig. 2 represents an end elevation of the switch of Fig. 1; and,

Fig. 3 shows a transverse sectional elevation on the line X—Y of Fig. 1.

In Fig. 4 is shown a perspective view of a detail. Like parts in the various figures are indicated by like references.

Referring to the drawing, on a base 1 are mounted vertical supporting brackets 2 and 3, one of which is shown in perspective in Fig. 4. Slots 4 are formed in the supporting brackets and portions of the brackets above these slots are bent outwards through a right angle so as to form parallel lugs to which two strips 5 and 5a of insulating material are attached by self-tapping screws 6. Four metallic spring blades are arranged upon the inner surface of each strip, those upon the strip 5 being indicated by reference 7 and those on the strip 5a by reference 7a. Each blade is secured to its strip by means of two rivets 8 which pass through to the outer surface of the strip. The blades 7 are inclined slightly to one side of the vertical or at an acute angle with reference to strip 5 and the blades 7a are inclined by an equal amount upon the opposite side of the vertical. The greater part of each blade extends below the strip to which it is attached and a small part of each blade extends upwardly and is shaped to serve as a soldering tag as shown at 30.

The blades are provided upon their outer surfaces and near their lower ends with contact points 9. Upon the outer major surface of each insulating strip are arranged four further blades 10 and 10a of the same kind as the blades 7 and 7a but having strips of spring steel 11, of length about two-thirds that of the blades, in contact with their outer surfaces and extending downwardly from the upper edge of insulating strip. These strips of spring steel increase the resistance of the blades 10 and 10a to flexure due to outward pressure. The outer blades 10 and 10a are disposed in staggered relation with respect to the inner blades 7 and 7a and are also inclined to the vertical in such a way that the contact 9 upon an inner blade lies opposite to the contact 12 upon a neighboring outer blade on the same strip. The rivets 13 securing the outer blades 10 and 10a and strips of spring steel 11 to the insulating strips 5 pass through to the inner surfaces of the insulating strips as shown. Thus with this particular arrangement there are eight electrically independent pairs of co-operating contacts so that eight separate circuits of a radio receiver or other device can be closed or opened.

Between the two downwardly projecting rows of blades is arranged a drum 14 of insulating material fixed to a shaft 15 as by screws 31 which is journaled in the two supporting brackets 2, 3. The surface of the drum 14 is shaped to form

four cams 16, 17, 18, 19, each of which is adapted, upon rotation of the shaft, to engage in turn one of the inner blades on each of the strips, thus pressing the contacts 9 on these blades into engagement with the contacts 12 upon the cooperating outer blades respectively.

A mechanism is provided and shown in Figs. 1 and 2 whereby the shaft 15 is prevented from remaining in any except one of four required positions. A collar 37 is fixed to the shaft 15 by suitable set screws 32 and has four cylindrical pins 38 fixed thereto. These pins are arranged symmetrically around the shaft axis and project parallel to the shaft 15. A lever 39 pivoted at 20 on a plate 21 fixed to the bracket 3 carries a roller 22. This is pulled into engagement with pins 38 by a helical spring 23 connected between the lever 39 and a lug upon the plate 21. When the shaft 15 is rotated one of the pins 38 depresses the lever 39 and extends the spring 23. When the pin has passed over the dead centre position, the spring 23 aids the rotation of the shaft until the roller 22 is once more in engagement with two pins.

A section of the cam 16 is shown in Figure 3. By virtue of the mechanism described in the last paragraph, the drum 14 can be given any one of four different positions, these positions being displaced by 90° around the axis relatively to one another. The drum can be rotated in either direction. In the position shown in Fig. 3 of the drawing, the right hand pair of contacts is closed and the left hand pair is open. It will be seen that a rotation of the cam through one right angle in a clockwise direction will cause the right hand contacts to open and the left hand pair to close. Rotation through another right angle in the same direction produces no change in these contacts. Rotation through one or two more right angles brings the contacts to their initial state. By suitably shaping and disposing the cams 16, 17, 18 and 19, a great variety of different sequences and durations of contact can be obtained for the eight pairs of cooperating contacts. As shown, the cams are placed in staggered positions along the shaft.

A switch of the character described offers the advantage over well known switches that since the blades of each cooperating pair are arranged side by side on the insulating strip the rivets securing the blades to the strip pass through the strip and only one blade, and no insulation has to be provided between the rivets and the blades.

Instead of arranging the cooperating blades upon opposite sides of the strip they can clearly be arranged upon the same side, the blades being suitably bent so that normally the contacts are out of engagement with one another.

Although in the switch described the contacts are pressed into engagement with one another by the cam the arrangement may be such that the contacts are normally in engagement and are pressed out of engagement with one another by suitable means such as a cam.

Having now particularly described and ascertained the nature of our said invention, and in what manner the same is to be performed, we declare that what we claim is:—

1. An electric switch comprising an insulating strip, a contact blade secured to one face of said strip at an acute angle thereto, a second contact blade secured to the opposite face of said strip at an acute angle thereto but arranged in the opposite direction to said first named strip,

a contact secured to the end portion of at least one of said strips and rotatable means arranged to cause said contact to engage the other of said strips.

2. An electric switch comprising an elongated supporting member, a plurality of contact blades secured to one face of said supporting member and being spaced apart, a plurality of contact blades secured to the opposite face of said supporting member opposite the spaces between said first named blades, the end portions of said pairs of blades lying in a common plane normal to the long dimension of said elongated supporting member and rotary means for urging one set of said contact blades into contact with the opposite set.

3. An electric switch comprising a pair of parallel elongated supporting members, a pair of cooperating contact blades carried by each of said supporting members, a shaft extending parallel to said supporting members, a plurality of cams carried by said shaft and arranged to engage the inner of said contact blades, a disc carried by said shaft, a plurality of pins carried by said disc, a pivoted lever having an extending portion arranged to engage said pins and resilient means urging said lever toward said shaft.

4. In a switching device, the combination of an elongated insulating strip having a plurality of apertures, a plurality of contact blades provided with apertures, rivet means passing through the apertures of said insulating strip and blades and arranged to hold said blades in spaced apart positions against one face of said strip, a plurality of flexible switch members provided with apertures, rivet means passing through certain apertures of said insulating strip and switch members and arranged to hold said switch members against the opposite face of said strip and opposite the spaces between said contact blades, the end portions of corresponding contact blades and switch members lying in a common plane normal to the length of said strip, and rotary means for urging said switch members into engagement with said contact blades.

5. An electric switch comprising two end supporting members, an insulating strip carried by said members, a contact blade secured to said strip at an acute angle thereto, a flexible switch member secured to said strip at an acute angle thereto and being oppositely inclined to said contact blade, the end portions of said contact blade and switch member lying in the same plane, a shaft journaled in said end supporting members, a cam on said shaft arranged to engage said switch member, a member secured to said shaft, at least two pins carried by said member, a pivoted lever having an extending portion arranged to engage said pins and resilient means urging the extending portion of said lever into engagement with said pins.

6. An electric switch comprising an elongated supporting member, cooperating contact blades secured to the opposite sides of said member, a shaft, a cam secured to said shaft and arranged to engage a plurality of said contact blades, a collar secured to said shaft, a plurality of pins carried by said collar, a pivoted lever having a roller arranged to engage said pins and a spring connected to said lever for holding said roller in contact with said pins.

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