May 6, 1947. W. R. BROWN 2,419,986

ROTARY GANG ASSEMBLY

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FIG. 1

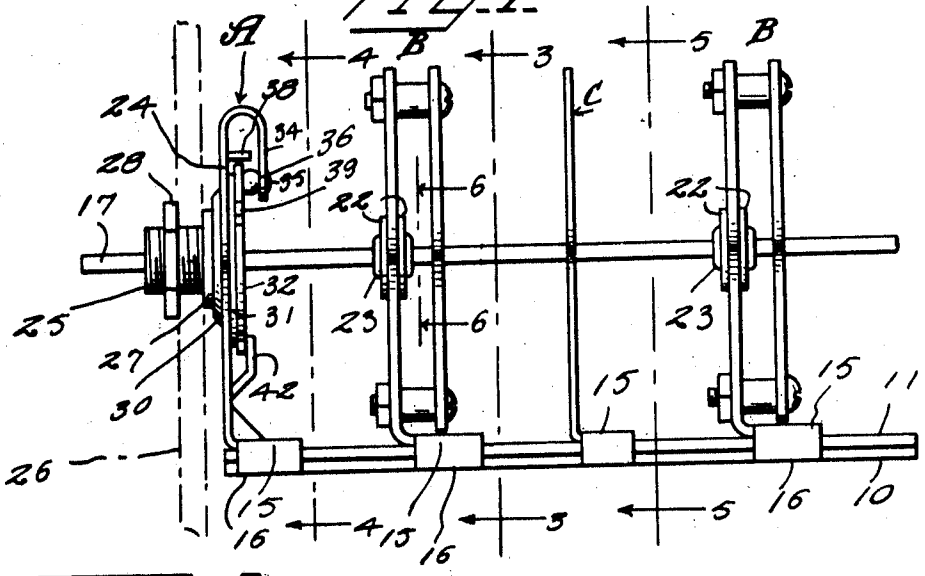


FIG. 3

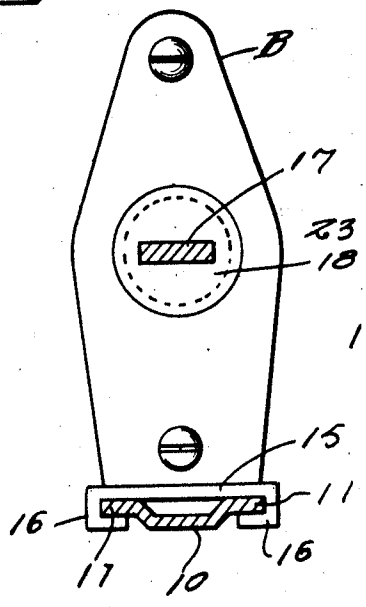
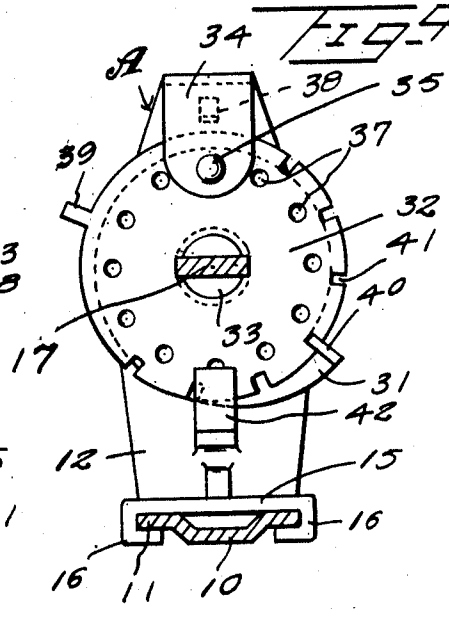


FIG. 4



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Fig. 2.

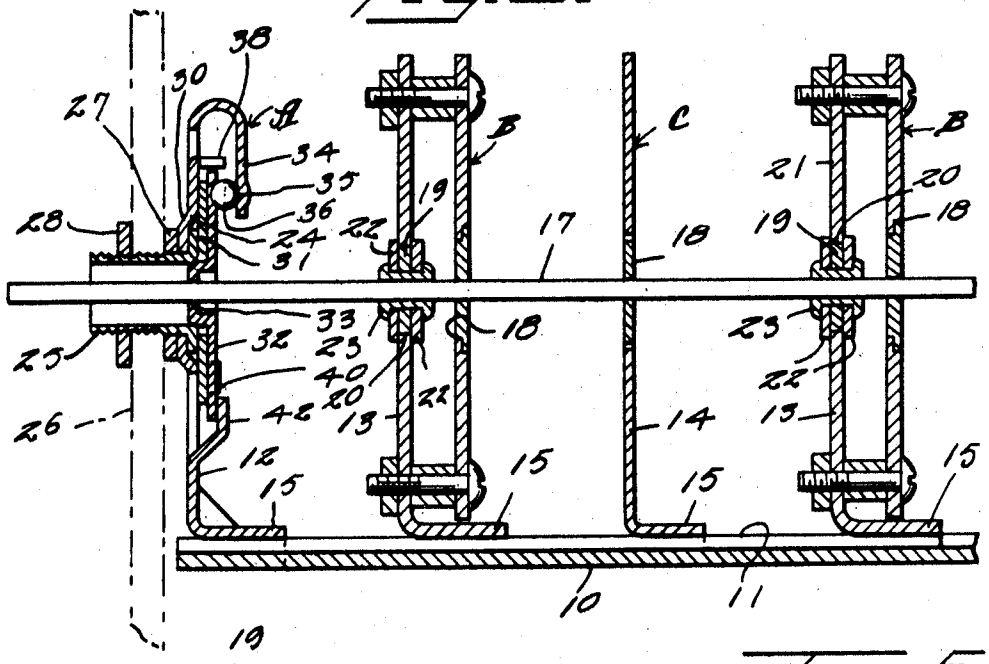


Fig. 6.

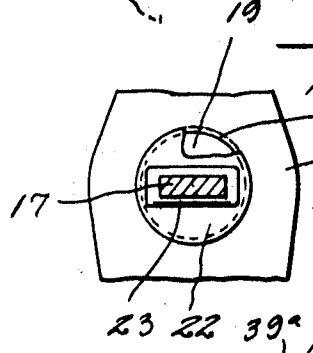


Fig. 8.

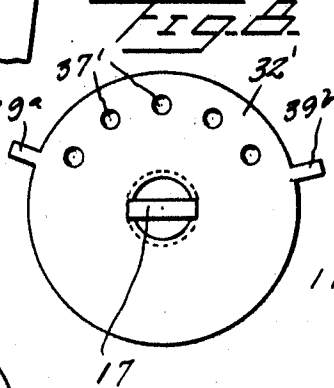


Fig. 5.

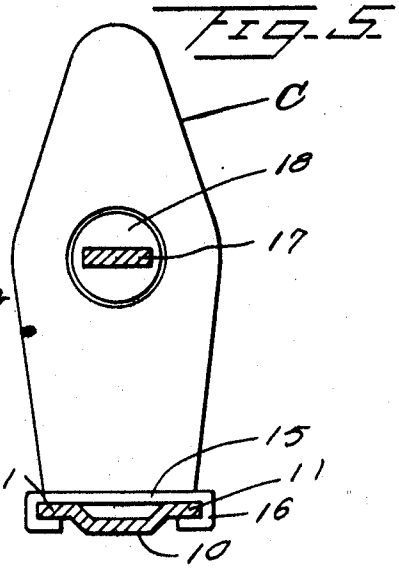
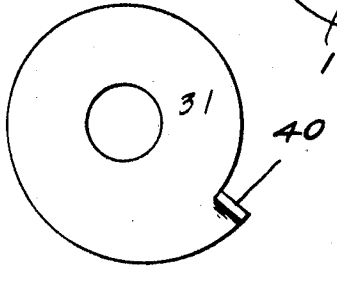


Fig. 7.



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Fig. 9.

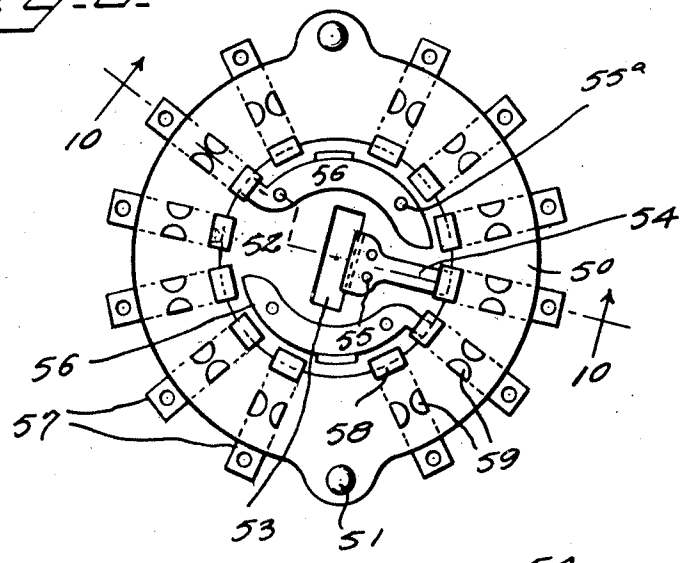
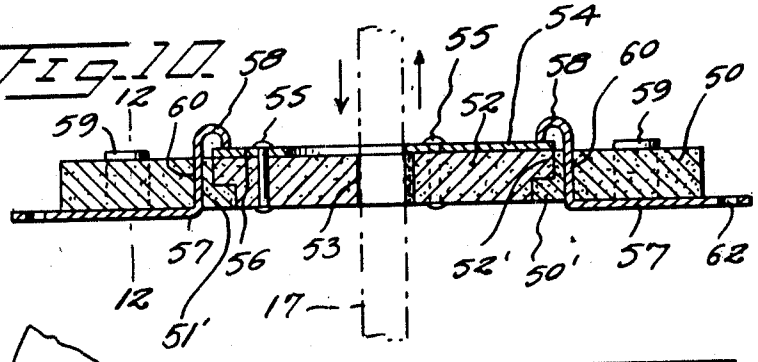


Fig. 10.



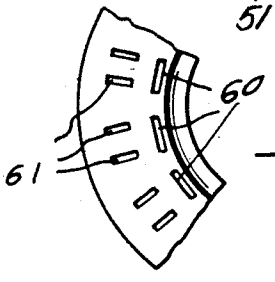
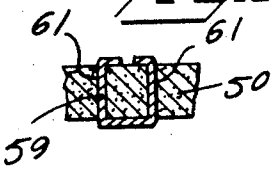


Fig. 11.

Fig. 12.



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UNITED STATES PATENT OFFICE

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ROTARY GANG ASSEMBLY

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Application May 3, 1944, Serial No. 533,913

4 Claims. (Cl. 74—10)

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This invention relates to an assembly or means of mounting rotary switch sections or parts to facilitate compact disposition and manipulation in a radio chassis, with a view to utilizing the shortest practical wiring, rendering additional space available, and elimination of the spacer and rod method of assembly.

It is particularly aimed to provide such assembly which includes a mounting element, switch sections or parts strung along the same, and held in place by clasp engagement therewith, with or without set screws, in combination with an operating rod engaged in rotatable bearing means mounted by the sections or parts.

Another important object is to provide a novel switch wafer embodying a practicable bearing and rotor combination wherein the mounting parts for the conductors are of ceramic material.

In addition, it is also aimed to provide a position locator and stop means in connection with a novel panel bearing.

The more specific objects and advantages will become apparent from a consideration of the description following taken in connection with accompanying drawings illustrating an operative embodiment.

In said drawings:

Figure 1 is a view in elevation showing the main parts or sections of a switch assembled or constructed in accordance with the invention;

Figure 2 is a view substantially in central vertical longitudinal section through the parts of Figure 1;

Figure 3 is a vertical section taken on the line 3—3 of Figure 1;

Figure 4 is a vertical section taken on the line 4—4 of Figure 1;

Figure 5 is a vertical section taken on the line 5—5 of Figure 1;

Figure 6 is a fragmentary detail of one of the brackets and particularly the rotatable bearing thereof;

Figure 7 is a detail elevation of one form of stop lug plate which may be used with the adjustable position locator;

Figure 8 is a detail elevation of a modified form of selector plate;

Figure 9 is an elevation of one of the switch wafers which may be employed wherein the mounting parts are of ceramic material;

Figure 10 is a diametric section taken on the line 10—10 of Figure 9;

Figure 11 is a fragmentary elevation of the stator of such switch wafer; and

Figure 12 is a detail section taken on the line 12—12 of Figure 10.

Referring specifically to the drawings wherein

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like reference characters designate like or similar parts, all sections or elements of the switch are adapted to be mounted or strung on a supporting element as generally shown at 10, which is rigidly fastened in any suitable manner within a radio chassis, as by holding one end rigid in a panel bearing and the other end by a machine screw bolted to the chassis. This element may be flat or may have raised side flanges as at 11, as best shown in Figures 3, 4 and 5.

The gang or switch consists primarily of mounting and control section as at A, and any desired number of brackets B mount or support switch sections. Section C is an electrostatic shield, its use being optional. Said sections respectively include brackets 12, 13 and 14, each of which has horizontally disposed mounting bases at 15, in the form of clasps, in that each has a downwardly and inwardly extending string finger 16 at each side edge, such fingers frictionally and resiliently clasping the flanges 11, to maintain the sections in adjusted position frictionally, although slidable along the mounting element 10.

A flat rotatable control rod is provided at 17 on which the parts are also strung and which is rotatable to move the switch parts to on and off position, and intermediate controlling position. It is to be borne in mind that the sections A, B, C are capable of ready assembly or disassembly with respect to the mounting element 10 and rod 17, either before or after attachment of all of the parts thereto and attachment of the wiring to the same.

All of the sections A, B, and C are of a construction to enable the necessary rotation of the flat rod 17, some of them having relatively large clearance openings at 18, and the remaining parts having appropriate bearings. To the latter end, rotatable bearings 19 are disposed in central annular openings 20 of the brackets 21 of the section B. Such bearings 19 are overlapped by plates or discs 22 which also overlap the brackets 13, and such parts are all secured together by tubular rivets 23, to the bores of which, the rod 17 passes, or by any other means whereby rod 17 is held in alignment horizontally but free to rotate in a circular direction. The bracket B serves two purposes; one to mount the switch wafer (Figure 2) and to hold rod 17 to a central axis thereto and projecting through the rotor part of wafer by a flat slot corresponding in size and shape to rod 17.

In the case of the section A, it has a bracket 24 through which a tubular bearing 25 passes, and which bearing also passes through a front panel 26 of the radio chassis and is clamped thereto by a flange 27 on one side thereof and a nut 28 is screwed on the bearing and engaging the other

side thereof. Elements 30 and 31 are loose on the bearing 25 and disposed at opposite sides of the bracket 24 and element 31 is the supporting body for a stop lug.

A position selector plate 32 is journaled on the bearing 25, having a slot 33, through which the rod 17 passes and which conforms in shape and size thereto. Turning of the rod 17 will thus turn the plate 32. Bracket 24 has a down turned arm 34 provided with a notch at 35, in which a ball latch 36 is seated. This ball latch 36 is adapted to snap successively into notches 27 arranged in a row of any desired number on the adjacent face of the selector or locator 32, to hold the latter in different positions. Arm 34 is somewhat resilient to enable flexing to accommodate the latch action at the ball 36.

A stop lug 38 is struck out from the bracket 24 extending over the position locator 32 and it is engageable by stop lugs 39 and 40, provided respectively on the plates 32 and 31. Stop lug 40 may be selectively positioned in any of a series of radial notches 41, provided peripherally of the plate 32, the adjustment being effected when the plates 31 and 32 are loose with respect to the bearing and rod 17. Elements 31 and 32 are held spring tight to bracket 24 by lugs 34 and 42, as in Figure 2. This spring action allows lug 31 to be adjusted at will without disturbing other parts. The lugs 39 and 40 are engageable with the aforesaid stop lug 38 at the opposite extremes of movement. A lug 42 may be struck from the bracket 24 to extend over the face of the plate 32.

In lieu of the selector plate 32, separate lug plate 31, I may employ the modified form of selector plate 32' disclosed in Figure 8. It has a limited number of impressions or sockets 37' which function like those at 37 in connection with the ball latch 36. In addition, it has lugs integral with it at 39a and 39b which function like those at 39 and 40, with respect to the stop lug 38.

It will be understood that one or more wafers can be mounted on each bracket of the sections, such as might be desired in a single stage shield. Any suitable means such as a key or retainer ring may be placed on the rod 17 at any convenient place or places to prevent the same from moving forward and the pointer knob which will be attached to the front thereof, will prevent backward movement of such rod. A cuff and set screws could also be used. Any switch section may be removed for repair or replacement without disturbing the remainder of the switch. The various pieces may be each stamped in a single piece from sheet metal.

In lieu of the assemblies B for switch mounting means or the equivalent, I may employ the novel modified form disclosed in Figures 9 to 12. In this form, 50 designates a stator, for instance of ring form, stationarily mounted in any suitable manner to the chassis as by bolts or rivets 51 passing through openings in the stator. Rotatable within the stator 50 is a bearing 52 and it will be noted that at the junction of the bearing and stator, they have overlapping flanges at 50' and 51'. These parts 50 and 52 are preferably made of ceramic material and the rotor or bearing 52 or any desired number of them may be strung on the rod 17 since the bearing has a central opening 53 of the same cross-sectional area as rod 17, so that they will intimately interfit.

The various metallic parts are suitably fastened to the ceramic parts 50 and 52. For instance, a grounding contact 54 is riveted at 55 to the bearing and disposed so that rod 17 will engage the latter. Also, riveted to the bearing or rotor 52 as at 55, are arcuate contacts 56. Coacting with the arcuate contacts 56 are radially disposed stator contacts 57, also constituting individual circuit contacts. Such stator contacts 57 are generally of L-shape having inverted portions 58 to wipe the contacts 54 and 56 and each also has fastening lugs at 59. It will be noted that contact proper and the lugs 59 pass through slots as at 60 and 61, respectively, through the stator 50 and are suitably offset to secure the contact 57 in place. The latter contacts project outwardly beyond the periphery of the stator 50 so as to expose holes 62 therein, for the connection of individual circuit wires thereto. This construction of Figures 9 to 12 is a two-pole, five-position wafer switch.

Various changes may be resorted to provided they fall within the spirit and scope of the invention.

I claim as my invention:

1. A structure of the class described comprising a mounting element, mounting brackets, said brackets having bases slidable along the element, a rotatable actuating rod, rotatable bearing means in the brackets, said rod passing through said bearing means.

2. A structure of the class described comprising a mounting element, mounting brackets, said brackets having bases slidable along the element, a rotatable actuating rod, rotatable bearing means in the brackets, said rod passing through the bearing means, the bearing means and rod having non-circular engagement.

3. A structure of the class described comprising a mounting element, mounting brackets, said brackets having bases slidable along the element, a rotatable actuating rod passing through rotatable bearings in the brackets, a selector through which the rod passes so as to turn with the rod, latch means for the selector, comprising an arm, a ball latch, coacting depressions on the selector and arm, stop means for the selector, and a stop lug on the bracket engageable by the stop means.

4. A structure of the class described comprising a mounting element, mounting brackets, said brackets having bases slidable along the element, a rotatable actuating rod passing through rotatable bearings on the brackets, a selector on one of the brackets through which the rod passes so as to turn with the rod, latch means for the selector comprising an arm, a ball latch, coacting depressions on the selector and arm, stop means for the selector, and a stop lug on the bracket engageable by the stop means including a plate journalled on the bearing, said plate having a lug and the selector having a series of peripheral notches selectively engageable by said lug.

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