

Nov. 1, 1932.

P. C. SMITH

1,885,147

PLURAL SWITCH OPERATING MEANS

Filed Oct. 30, 1930

2 Sheets-Sheet 1

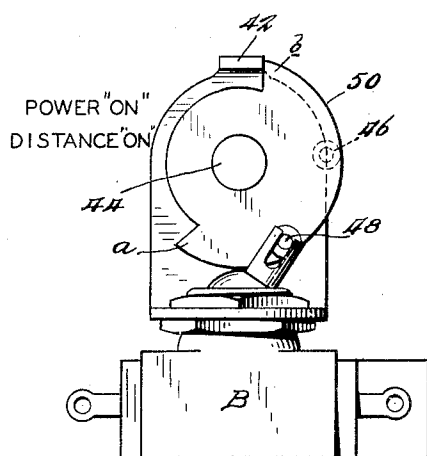


Fig. 4.

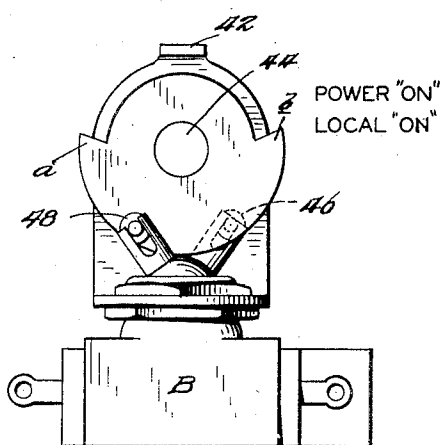


Fig. 3.

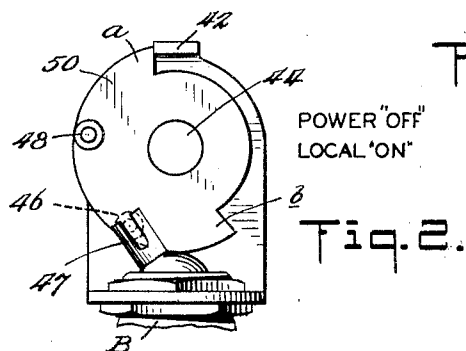


Fig. 2.

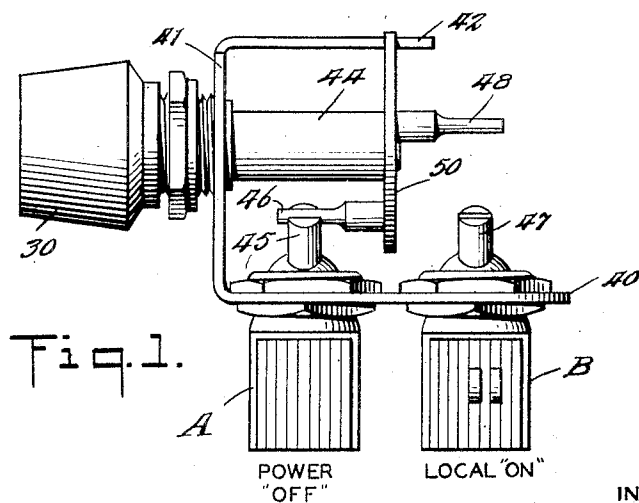


Fig. 1.

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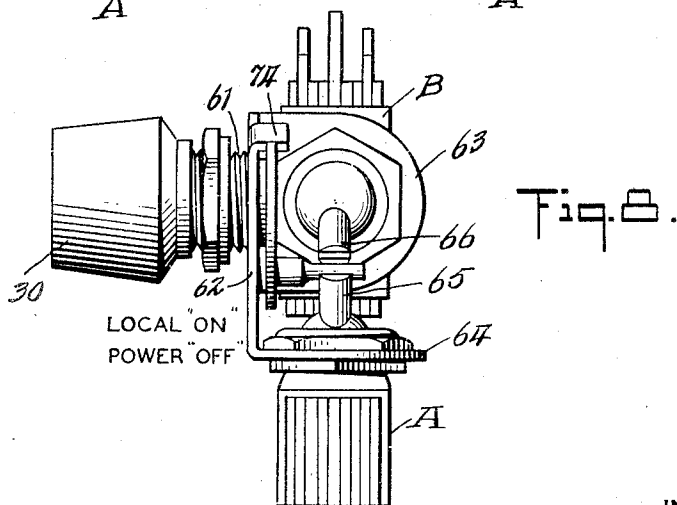
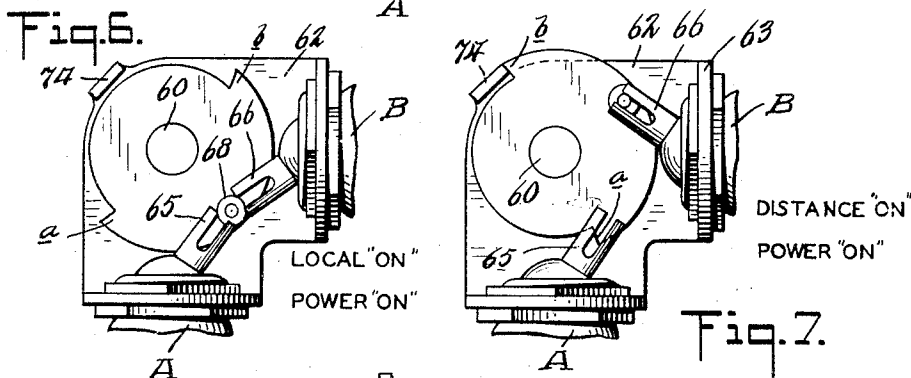
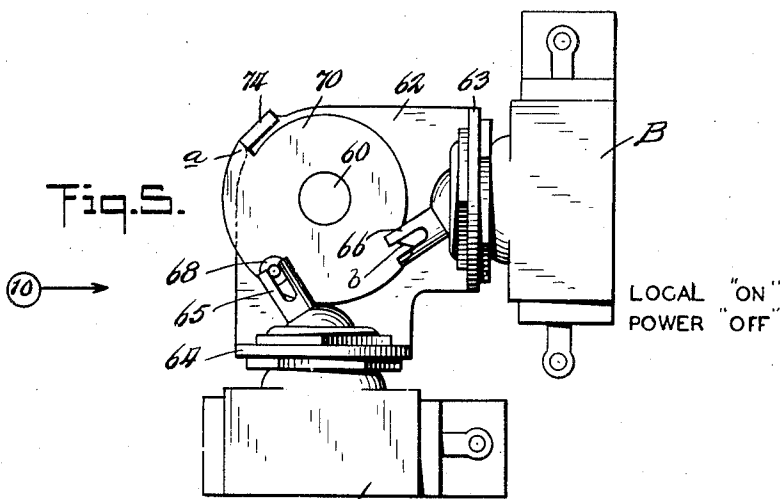
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PLURAL SWITCH OPERATING MEANS

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2 Sheets-Sheet 2



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UNITED STATES PATENT OFFICE

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PLURAL SWITCH OPERATING MEANS

Application filed October 30, 1930. Serial No. 492,308.

In radio receiving sets all the amplifying tubes may be needed when the set is tuned to "bring in" a distant station but, it is often desirable to "cut out" a number of amplifying tubes when the set is tuned to a local station. It is possible by means of known circuits to use a three element switch which when in one position will put all the tubes in circuit and in the other position will connect only certain selected tubes in the circuit. Besides this three element switch another switch is usually provided to disconnect the source of power from the radio set. These switches often are toggle snap switches.

It is an object of my invention to provide a single actuator to turn on the power switch and also to control the local-distance switch. Another object of my invention is to provide a single actuator to control two toggle snap switches which are adapted for use in the above circuit.

Another object of my invention is to provide an operating means for switches of the above type, which will be compact, easy to operate and composed of a small number of easily made parts.

Other objects will appear as my invention is described in connection with the accompanying drawings.

In the drawings:

Fig. 1 is a side view of one form of my invention.

Fig. 2 is an end view of the device in Fig. 1 showing the operating means and switches in one position.

Fig. 3 is a view similar to Fig. 2 but showing the operating means and switches in a second position.

Fig. 4 is a view similar to Fig. 2 but showing the operating means and switches in a third position.

Fig. 5 is an end view of another form of operating means constructed according to the principles of my invention.

Fig. 6 is a view similar to Fig. 5 but with the operating means and switches in a second position.

Fig. 7 is a view similar to Fig. 6 but with the switches and operating means in a third position.

Fig. 8 is a side view of the switches and operating means shown in Fig. 5 looking in the direction of the arrow 10.

Referring to the drawings, the switches A and B, which are to be controlled are toggle type switches having a switch mechanism of the type shown in Guett Patent No. 1,280,018, and having a switch base and contact structure of the type shown in Guett Patent No. 1,744,629, dated January 21, 1930. In the present invention one of the switches, A, need only be provided with fixed contacts at one end of the base, since that switch will be used ordinarily to make or break the circuit to the power supply. The other switch, B, however must have one or more contacts at each end of the base in order to control the circuits for local or distance reception as above mentioned.

The drawings show two forms of operating means in which both power switch A and the local-distance switch B are operated by the rotation of a knob 30, and in each modification the switches must be operated in a predetermined order. In the form shown in Figs. 1 to 4 the switches are secured parallel to each other on one arm 40 of a U-shaped bracket while the switch control shaft 44 is rotatably mounted in a boss secured at right angles to the switches, in the base 41 of the bracket. The toggle levers of the switches are longitudinally slotted to receive pins 46, 48 which project from the opposite faces of a disc 50 which is rigidly secured on the end of the control shaft 44. The pins 46 and 48 are placed at angularly spaced points around the periphery of the disc 50 in order that, as the disc 50 is rotated by the shaft 44, first one pin will engage the toggle lever on one switch and actuate that switch and then the other pin will engage the toggle lever of the other switch and actuate it. In order to limit the rotative movement of the disc 50 a portion of the periphery of the disc 50 is cut away forming two shoulders *a*, *b*, which engage the upper arm 42 of the U-shaped bracket as the disc 50 is rotated from one extreme position to another.

Referring to Figure 2, it will be noted that the shoulder *a* is engaging the arm 42.

In this position of the device the power switch A is in "off" position and the local-distance switch B is in position to connect the tubes for local reception or in other words the local circuit is "on". As the disc 50 is rotated counterclockwise from the position shown in Figure 2 the pin 46, engaging with the toggle lever 45 of the power switch A will cause the switch A to move to "on" position. When this has taken place, the parts of the device will occupy the position shown in Figure 3. As the disc 50 is rotated counterclockwise from the position shown in Figure 3, the pin 48, engaging with the toggle lever 47 of the local-distance switch B will cause that switch to be actuated to complete the circuit for distance receiving. During this movement of the switch B from local to distance receiving, or vice versa, the power switch A remains stationary, the pin 46 moving out of the slot in the toggle lever 45 of the power switch A as the pin 48 moves into the slot of the toggle lever 47 of the switch B. When the disc 50 has reached the position shown in Figure 4 the shoulder *b* engages the upper arm 42 of the U bracket and prevents further movement of the disc in counterclockwise direction. Thus it will be seen that the local-distance switch may be actuated from one position to the other when the power is "on" without changing the position of the power switch. To turn the power off the disc is rotated clockwise from the position of Figs. 3 or 4, into the position of Fig. 2.

Referring to Figures 5, 6, 7 and 8 wherein is shown another form which my invention may take, the switch actuating shaft 60 is rotatably mounted in a boss 61 secured in a right-angle bracket 62 which has two arms 63, 64 bent up from it at right angles to it and to each other. In these arms are secured respectively the local-distance switch B and the power switch A by the same means as the switches are secured in the modification previously described. As in the form shown in Figures 1 to 4, the toggle levers 65 and 66 of the switches A and B are longitudinally slotted. These slots are adapted to receive successively a pin 68 which projects from the face of a disc 70, secured on the end of the actuating shaft 60. As in the case of the disc 50 hereinbefore described the disc 70 has a portion of its periphery cut away forming shoulders *a* and *b* which are adapted, as the disc 70 is rotated, to engage the lug 74 bent up from the bracket 62. The switches A and B in this modification are located in the same plane, parallel to the plate 62, and for this reason only one operating pin 68 is required.

Referring to Figure 5, it will be noted that the shoulder *a* is engaging the lug 74. In this position of the parts, the power switch A is in "off" position and the local-distance

switch B is in position for local reception i. e. local is "on". As the disc 70 is moved counterclockwise from this position to the position shown in Figure 6, the pin 68 engaging in the slot of the toggle lever 65 of the power switch A causes actuation of that switch to "on" position. As the disc 70 is rotated counterclockwise from the position in Figure 6 to the position shown in Figure 7, the pin 68 disengages itself from the slot in the toggle lever 66 of the switch B and causes actuation of the switch B from local receiving to distance receiving position. At the end of this movement the shoulder *b* of the disc 70 engages the lug 74 preventing further counterclockwise rotation of the disc 70. Thus in this form of the device, as in the form previously described, the local-distance switch may be moved from one position to the other, when the power switch is "on", without actuating the power switch.

It will be observed that in both the forms shown the switches must be operated in a predetermined sequence, thus the power must be turned "on" before the "local" and "distance" circuits can be controlled.

Although I have shown the actuator actuating only two switches it is obvious that three or more could be actuated in the same manner. The invention is not limited to use with switches constructed as shown herein or in the Guett Patents No. 1,744,629 and 1,280,018, nor is it limited to use in radio receiving circuits, in fact, by reason of the fact that the actuator operates the switches in sequence the invention is particularly useful in a variety of situations having nothing to do with radio but requiring switches operated in sequence.

I claim:—

1. The combination comprising a stamped sheet metal bracket having a portion bent perpendicular to the central portion thereof, a toggle switch mounted in said perpendicularly-bent portion and having a slotted actuating shaft projecting therefrom, a bearing boss mounted in the central portion of said bracket, an operating shaft rotatably mounted in said bearing boss, a disc mounted on said shaft, and a pin projecting perpendicularly from said disc in the opposite direction from said shaft, said pin engaging in said slot to cause actuation of said switch as said shaft is rotated.

2. The combination comprising a stamped sheet metal bracket having a portion bent perpendicular to the central portion thereof, a toggle switch mounted in said perpendicularly-bent portion and having a slotted actuating shaft projecting therefrom, a bearing boss mounted in the central portion of said bracket, an operating shaft rotatably mounted in said bearing boss, a disc mounted on said shaft, and a pin projecting perpendicularly from said disc in the opposite direction from

said shaft, said pin engaging in said slot to cause actuation of said switch as said shaft is rotated, and a lug bent up from said bracket and cooperating with said disc to limit the rotation thereof.

3. The combination comprising a stamped sheet metal bracket having arms bent perpendicularly to the central portion thereof into mutually perpendicular planes, toggle switches mounted in said arms and having slotted levers projecting therefrom, a bearing boss mounted in the central portion of said bracket, an operating shaft rotatably mounted in said boss, a disc mounted on said shaft a pin projecting from said disc in the opposite direction from said shaft, said pin engaging in said slots to operate said switches in sequence, and a lug bent out from said bracket and cooperating with said disc to limit the rotation thereof.

4. The combination comprising a stamped sheet metal bracket having arms bent perpendicularly to the central portion thereof into mutually perpendicular planes, toggle switches mounted in said arms and having slotted levers projecting therefrom, an operating shaft rotatably mounted in the central portion of said bracket, a disc mounted on said shaft, a pin projecting from said disc, said pin engaging in said slots to operate said switches in sequence, and means formed integrally with said bracket to limit the rotation of said disc.

5. The combination comprising a stamped sheet metal bracket having arms bent perpendicularly to the central portion thereof into mutually perpendicular planes, toggle switches mounted in said arms and having slotted levers projecting therefrom, an operating shaft rotatably mounted in the central portion of said bracket, a disc mounted on said shaft, a pin projecting from said disc, said pin engaging in said slots to operate said switches in sequence.

6. The combination comprising a stamped sheet metal bracket having an arm bent perpendicularly to the central portion thereof, a pair of switches mounted side by side in said arm and having slotted operating levers projecting therefrom, a bearing boss mounted in the central portion of said bracket, a shaft rotatably mounted in said boss, a disc mounted on the end of said shaft, two pins mounted on opposite sides of said disc in angularly spaced positions and projecting perpendicularly thereto, said pins engaging in said slots to operate said switches in sequence as said shaft is rotated, and a finger bent out from the central portion of said bracket and engaging with said disc to limit the rotation thereof.

7. The combination comprising a stamped sheet metal bracket having an arm bent perpendicularly to the central portion thereof, a pair of switches mounted side by side in

said arm and having slotted operating levers projecting therefrom, a shaft rotatably mounted in said central portion, a disc mounted on the end of said shaft, two pins mounted on opposite sides of said disc and projecting perpendicularly thereto, said pins engaging in said slots to operate said switches as said shaft is rotated.

8. The combination comprising a stamped sheet metal bracket having an arm bent perpendicularly to the central portion thereof, a pair of switches mounted side by side in said arm and having slotted operating levers projecting therefrom, a bearing boss mounted in the central portion of said bracket, a shaft rotatably mounted in said boss, a disc mounted on the end of said shaft, two pins mounted on opposite sides of said disc in angularly spaced positions, and projecting perpendicularly thereto, said pins engaging in said slots to operate said switches in sequence as said shaft is rotated, and a finger bent out from the central portion of said bracket and engaging with said disc to limit the rotation thereof, and means formed integral with said bracket and engaging with said disc to limit rotation thereof.

9. The combination comprising a stamped sheet metal bracket having an arm bent perpendicularly to the central portion thereof, a pair of switches mounted side by side in said arm and having slotted operating levers projecting therefrom, a shaft rotatably mounted in said central portion, a disc mounted on the end of said shaft, two pins mounted on opposite sides of said disc in angularly spaced positions and projecting perpendicularly thereto, said pins engaging in said slots to operate said switches in sequence as said shaft is rotated, and means formed integral with said bracket and engaging with said disc to limit rotation thereof.

In testimony whereof I have signed my name to this specification.

PERCY C. SMITH.