

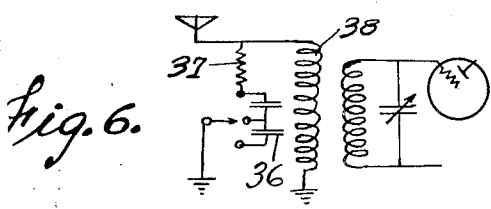
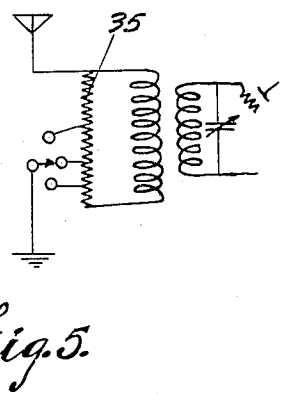
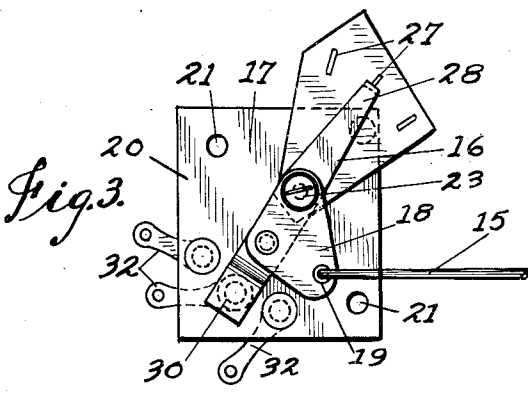
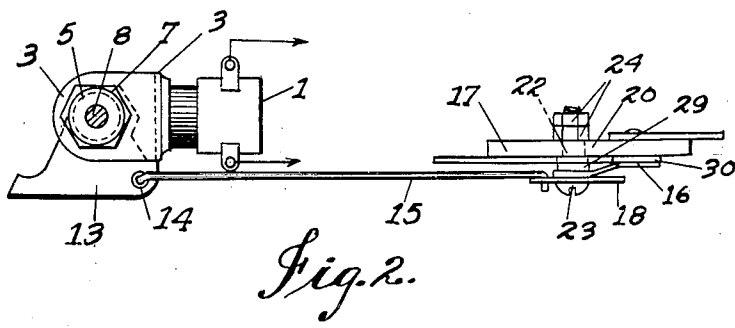
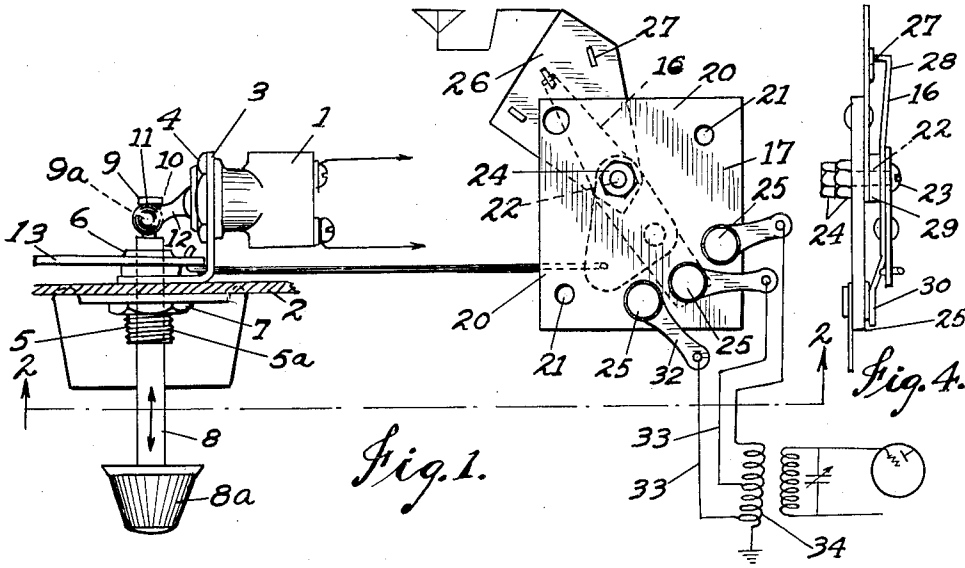
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1,985,506

ANTENNA AND POWER SUPPLY SWITCH

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## UNITED STATES PATENT OFFICE

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## ANTENNA AND POWER SUPPLY SWITCH

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9 Claims. (Cl. 250—16)

My invention relates to the type of switches used for controlling the power supply and the selectivity of a radio receiving set from a centrally located position without the addition of operating handles.

It is an object of my invention to provide an arrangement by which the control of an antenna switch may be combined with the control of a power supply switch.

Another object is to combine the controls of the power supply and antenna switches and thereby eliminate the necessity of additional control knobs.

Another object of my invention is to provide an additional volume control means for a radio receiving set to vary the selectivity of the receiver without the addition of control knobs.

Broadly it is the object of my invention to provide an arrangement by which the control of an antenna switch may be combined with the power supply switch on a radio receiver so that no additional knobs are necessary on the front panel of the set and its symmetrical appearance is maintained.

These and other objects will be more specifically pointed out in the detailed description of parts in the specification and the drawing which illustrates a preferred embodiment of my combination switch.

In the drawing:—

Figure 1 is a top plan view of the power supply and the antenna switches with their control connection.

Figure 2 is a front elevation of the power supply and the antenna switches with their control connections.

Figure 3 is a bottom plan view of the antenna switch.

Figure 4 is a side elevation of the antenna control switch.

Figure 5 is a diagram showing the switch applied to a tapped potentiometer resistance.

Figure 6 is a diagram showing the switch applied to a shunt resistance and condensers.

In modern radio sets there are three control knobs on the front panel. First, a tuning control; second, a volume control; and third, a power supply switch to turn the set on and off. If any additional control operations are necessary, it is preferable that they be combined on the same knobs in order to preserve the symmetrical appearance of the front panel and avoid the appearance of increased complication of control.

The two normal methods of securing volume control are first, by means of a rheostat or similar

device which controls the radio frequency amplification of the receiver; and second, by a rheostat or other suitable means which adjusts the signal voltage actually delivered from the antenna to the first tube. In many recent receivers the volume control, so called, has been arranged to perform double function; that is, to take care of both of these adjustments simultaneously by the rotation of a single knob. This method, however, has proved unsatisfactory in practice because of the limited motion of such a volume control knob and the fact that due to the enormous ratio between the weakest and the strongest signals, the adjustment of the compound volume control is very critical.

One method of controlling the amount of signal voltage delivered to the first tube is to vary the coupling between the antenna and the grid circuit of the tube. This may be accomplished by means of a vari-coupler or similar device, but is more conveniently obtained by means of taps on the primary of the first transformer or on the winding of an auto transformer, and a switch by which the antenna may be connected to any one of these taps so as to produce two or more degrees of coupling.

To accomplish this last mentioned method I use a power supply switch 1 which is rigidly mounted on a panel 2 of the radio receiver in the usual manner by a bracket 3. The switch is mounted on the bracket and secured thereto by means of the lock-nut 4 which keeps it in place. A bushing 5 with a threaded end 5a passes through holes provided in the panel 2 and the bracket 3 and clamps the bracket in place on the panel by means of the lock-nut 7 screwed on it. A shoulder 6 on the bushing prevents it from sliding through the holes when the lock-nut is tightened thereon.

A stem 8 passes through the bushing and is free to slide or rotate within it while turning or pushing on a control knob 8a. The end 9 of the stem is a button with the portion 9a turned down to a smaller diameter than that of the stem so as to fit into a slot 10 provided in the ball-like end 11 of the switch lever 12. This slotted arrangement permits linear or rotary motion of the stem within the bushing.

A lever 13 in the form of a plate is fixedly mounted on the stem and moves with it whatever its motion, linear or rotary. This lever has a hole 14 in which is loosely mounted a connecting rod 15 for operating a rotative contactor 16 of an antenna switch 17. Fixedly mounted on the rotative contactor is another lever 18 to which

the other end of the connecting rod is loosely connected in a hole 19.

The antenna switch has a base panel 20 of any kind of suitable insulating material. In this panel are holes 21 for fastening it in a suitable manner in proximity of the power supply switch. Centrally located is a hole 22 in which is a screw 23 that is the pivot point for the rotative contactor. This screw stud is held in place by means of the two nuts 24 which can be adjusted to fix the pressure necessary to keep the rotative contactor in touch with the taps 25 and the antenna plate 26. The antenna plate can be made of any suitable conducting material and has three high points 27 to which an end 28 of the rotative contactor is free to make spring contact. The rotative contactor can be made of any suitable spring material that is a good conductor. It is insulated from its pivot point by means of an insulating bushing 29 and the plate lever 18 which is also preferably made of insulating materials. The end 28 is bent as shown in Figure 4 so as to make good contact with the antenna plate high points. The other end 30 of the contactor arm is also bent so as to allow it to ride freely from one to the other of the contact buttons 25 and make good electrical contact. Fastened to and extending from these contact buttons are solder lugs 32 to which are electrically connected wire leads 33 which run to different taps taken on the transformer 34 which is in the circuit with the first tube of a radio receiver.

Figure 5 illustrates the antenna switch attached to a tapped potentiometer resistance 35 of an antenna circuit, while in Figure 6 I show the antenna switch applied to a set of condensers 36 in series with a resistance 37 that are in shunt with a transformer 38.

In operating my device I push or pull on the control knob 8a which turns on the switch completing the circuit and allows the flow of current. After a signal has been brought in I may rotate the knob 8a until the rotative contactor has made connection with the proper tap of the transformer or coil, as will be indicated by the clearness of reception and volume of the particular station being tuned in.

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

1. In a radio receiving set, the combination of a fixed power supply control switch, a rotatable lever for said fixed power supply control switch, an antenna control switch with a rotative element, contacts on an antenna connecting plate, and other contact points adapted to be selectively interconnected by said rotative element of said antenna control switch, with positive means for connecting and operating said rotatable lever for said power supply and antenna control switches from the same source.

2. In combination with a coil or transformer of a radio receiving set, a fixed power supply control switch, a rotatable lever operating said power supply control switch, an antenna control switch comprising a rotative element, antenna contacts and other contacts adapted to be interconnected by said rotative element of said antenna control switch, operating means for said rotatable lever operating said power supply switch, and other means for operatively connecting said operating means with the rotative element of said antenna control switch.

3. In combination with a radio receiving set having a coil or transformer, a fixed power sup-

ply control switch, a rotatable lever operating said power supply control switch, an antenna control switch comprising a rotative element, a series of contacts and other contacts adapted to be selectively interconnected by said rotative element of said antenna control switch, operating means for said power supply switch, and other means for operatively direct connecting said operating means with the rotative element of said antenna control switch, said direct connecting means arranged to operate said power supply and antenna control switches separately.

4. In a fixed power supply control switch for a radio set, an antenna control switch comprising a rotative element, antenna contacts and other contacts adapted to be interconnected by said rotative element of said antenna control switch, operating means for said fixed power supply switch, and other means for operatively connecting said operating means with the rotative element of said antenna control switch, said connecting means arranged to operate said power supply and antenna control switches by motions in different directions.

5. In a controlling switch for a radio set, in combination with a support, a stem having an operating knob, said stem mounted in said support to slide and to rock a rocking switch having an operating lever offset laterally to said stem, a rotative connection between said stem and said lever, an element non-rotatively but slidably mounted on said stem, a rotary switch having a contact arm and an operative link connection between said element and said arm.

6. In a controlling switch for a radio set, in combination with a support, a stem having an operating knob, said stem mounted in said support to slide and to rock a rocking switch having an operating lever offset laterally to said stem, a rotative connection between said stem and said lever, an element non-rotatively but slidably mounted on said stem, a rotary switch having a contact arm and a plurality of contacts, and an operative link connection between said element and said arm.

7. In combination in a power supply control switch having a support, a power supply switch having an operating knob adapted to motivate said switch, an operating stem operably connected to said operating knob, a lever on the operating stem, a control switch mounting, a control switch, a link connection between said lever on said stem and a lever on said control switch, said lever fixed to a rotative element of said control switch, spring mounting means for said rotative element, a plate mounted on and insulated from the control switch mounting, contacts on the plate, contacts on the control switch mounting means, and means for selectively engaging said contacts with said rotative element.

8. In combination in a power supply control switch having a support, a power supply switch having an operating knob adapted to motivate said switch, an operating stem operably connected to said operating knob, a lever on the operating stem, a control switch mounting, a control switch, a link connection between said lever on said stem and a lever on said control switch, said lever fixed to a rotative element of said control switch, spring mounting means for said rotative element, a plate mounted on and insulated from the control switch mounting, contacts on the plate, contacts on the control switch mounting means, and means for selectively engaging said contacts with said rotative element, said rotative

element being operated by the same means operating said power supply control switch.

9. In combination in a power supply control switch, having a support, a power supply switch  
5 having an operating knob adapted to motivate said switch, an operating stem operably connected to said operating knob, a lever on the operating stem, said stem and lever having longitudinal as well as rotative movement, a control switch  
10 mounting, a control switch, a link connection be-

tween said lever on said stem and a lever on said control switch, said lever fixed to a rotative element of said control switch, spring mounting means for said rotative element, a plate mounted on and insulated from the control switch mounting, contacts on the plate, contacts on the control switch mounting means, and means for selectively engaging said contacts with said rotative element.

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