Feb. 10, 1970 J. A. BIGGS 3,495,060

COAXIAL SWITCH ASSEMBLY

Filed Nov. 13, 1968

FIG. 1

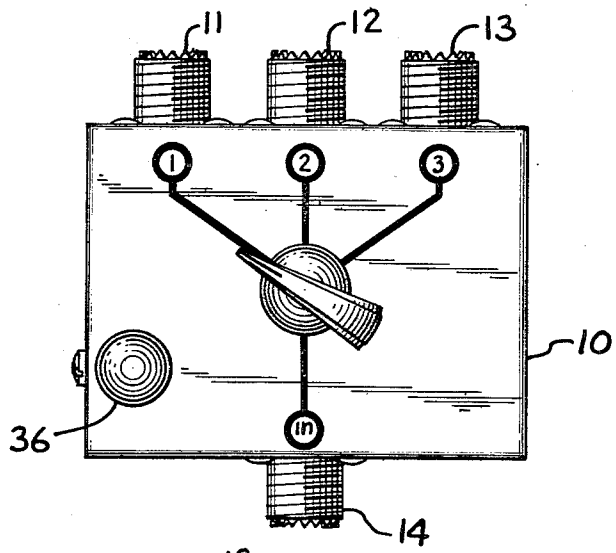


FIG. 2

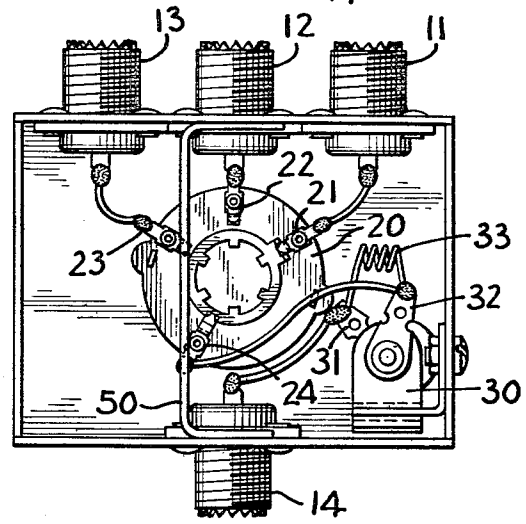
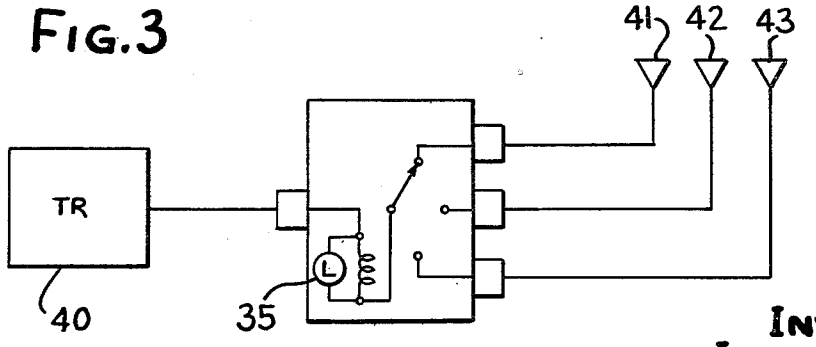


FIG. 3



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COAXIAL SWITCH ASSEMBLY

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ABSTRACT OF THE DISCLOSURE

A switch assembly for switching a radio transmitter between a plurality of antennas or alternatively switching a plurality of transmitters selectively into a single antenna, including an indicator lamp shunted by a small coil for providing continuous indication of relative antenna current.

In the use of low power radio transmitters, particularly radio transmitters intended for operation in the Citizens' Band, it is frequently desirable to select an antenna which is best suited to conditions. Also it is desirable to have some constantly operating indication that the transmitter is operating and putting out antenna current. Most Citizens' Band transmitters are not equipped with an antenna current indicator or the like to show the effectiveness of the transmitter from day to day, the relative effectiveness of the several antennas which may be used with the same transmitter, or the relative effectiveness of several transmitters which can be employed with a given antenna. As a result, the operator of a Citizens' Band transmitter must operate on faith and without the relative readings which are so valuable in evaluating performance.

It is, accordingly, an object of the present invention to provide a coaxial tap switch mounted in a small shielded housing provided with coaxial connectors and with an indicator lamp connected to provide constant indication of relative current readings. It is another object of the invention to provide a coaxial switch which is particularly intended for use with a Citizens' Band transmitter or the like, which may be manufactured efficiently and at low cost, which provides constant assurance that the transmitter is putting a signal on the air and which provides a high degree of convenience in switching between alternate types of equipment while providing relative indication of the current flowing in such equipment as a measure of relative capability.

Other objects and advantages of the invention will become apparent upon reading the attached detailed description and upon reference to the drawings in which:

FIGURE 1 is a front view of a tap switch assembly constructed in accordance with the present invention;

FIG. 2 is a rear view of the assembly with the rear cover removed to expose the internal components.

FIG. 3 is a schematic diagram corresponding to FIGS. 1 and 2.

Turning now to the drawing, there is disclosed a switching and indicator assembly **10** having coaxial connectors **11**, **12**, **13** and a coaxial input connectors **14**. Included in the housing is a tap switch **20** of the single deck wafer type taps **21**, **22**, **23** and a central terminal **24**. The tap switch **20** will be recognized as one frequently used in the electronic art having a suitable mechanical detent (not shown) and limited to the positions in which the central contact **24** is respectively connected to the switch taps.

Connected in series with the central terminal of the coaxial connector **14** is a lamp socket **30** having terminals **31**, **32** shunted by a small coil **33** which may, for example, consist of four turns of hookup wire closely

spaced wound about a mandrel of approximately one eighth inch. Plugged into the lamp socket **30** is a lamp **35** which is preferably of the type 49 having a rated voltage of 2.0 volts. It is found that the combination of a number 49 lamp and a coil having four turns of about one eighth inch I.D. connected in the common or input lead gives a useful level of brilliance when used with a conventional Citizens' Band transmitter having an input power of five watts to the final stage working into a suitably designed antenna. The lamp **35** is protected by a plastic dome **36** which is threaded into an opening in the housing and which is preferably of amber color. The amber color insures that even low level readings are given with reliability by making the filament, glowing a dull red, clearly visible.

The usefulness of the present switching and indicator assembly may be illustrated by reference to the schematic diagram shown in FIG. 3 in which the transmitter is indicated at **40** and the selectively available antennas are indicated at **41**, **42**, **43**, respectively. The antenna **41** may be a directional antenna, the antenna **42** and omnidirectional antenna, and **43** a so-called "quad" antenna. Each of such types of antennas is useful depending upon the conditions. The tap switch **20** makes each available immediately at the click of a switch. Moreover, the brilliance of illumination of the indicator lamp **35** provides a clear and graphic relative indication of the amount of antenna current being supplied. While the human eye is not an accurate judge of quantitative illumination, particularly under variable conditions of ambient lighting, the eye is nevertheless a highly sensitive judge of relative levels of illumination. Thus the indicator may be used for tuning or adjustment either of the antenna circuitry of the transmitter or of the antennas themselves. In a rudimentary sense, the transmitters and antennas may be adjusted to produce indication of maximum current. Once adjusted, the antennas should continue to exhibit the same relative levels of current from day to day and week to week as the equipment is used. Any change in the current to one of the antennas relative to the other two indicates that such antenna requires checking and readjustment to insure efficiency of operation.

Moreover, the operator will learn to expect the general level of illumination which can be achieved by his transmitter, and any general falling off in the level of illumination, applicable to all three of the antennas, provides an indication that the transmitter itself is not working properly and should be checked.

Many of the different commercially available Citizens' Band transmitters do not contain any antenna indicator whatsoever and when the user of the transmitter makes a call he must rely largely upon faith that the signal is going out over the air as intended. By employing the present switching and indicating assembly as an accessory, the fact that the indicator lamp is lit provides adequate indication that a signal is being transmitted.

While the operation of the assembly has been described in connection with a single transmitter and a plurality of antennas, it will be apparent to one skilled in the art that a plurality of transmitters may be used to feed, with convenience, a single transmitting antenna while providing a constant and accurate relative indication of the output power of the several transmitters. When used in this fashion, the assembly may be employed to permit immediate switching, into the antenna circuit, of a standby transmitter thereby to insure a high degree of transmission reliability.

A substitute transmitter may be selected from a number available depending upon the output indication which is achieved.

While the unit provides a continuous and accurate indication of antenna current flow, it is to be noted that

the amount of power which is subtracted from the system to provide the indication is negligible indeed. Stated in other words, the insertion loss of using the selector and indicator assembly is so low as to be of no practical concern.

While the unit has been shown in FIG. 2 with an open back, it will be understood that in use such back is enclosed by a suitable cover plate which may be secured in position by small machine screws.

The unit is particularly well suited for use with Citizens' Band transmitters, but usage is by no means limited thereto. On the contrary, the unit may be employed on many different types of transmitters, both amateur and commercial, and with power capability all of the way up to several hundreds of watts of power to the final stage. It will be apparent to one skilled in the art that where the output power exceeds the capacity of the filament of a type 47 lamp, other types of lamps may be substituted having a lower resistance. Alternatively, the number of turns of the coil may be reduced.

Where the enclosure is made of aluminum, the surface of which is anodized, and hence insulating, a jumper such as indicated at **50** may be used to insure a low resistance connection between the bodies of the input and output connectors.

I claim as my invention:

1. In a coaxial switch for switching a transmitter selectively to a plurality of antennas or for switching

a plurality of transmitters selectively to a single antenna, the combination comprising a small shielded housing, a tap switch in said housing having a central connection and a plurality of tap connections, coaxial connectors on the wall of the housing directly coupled to the tap connections, a coaxial connector on the wall of the housing coupled to the central connection, a lamp having a lamp socket recessed in the housing so that the illumination of the lamp is visible from outside of the housing, said lamp socket having terminals interposed in the circuit of the central connection, and a small coil connected in shunt with the lamp socket terminals to provide an impedance drop sufficient to light the lamp upon flow of RF antenna current.

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