

Sept. 9, 1969

R. E. DEASY

3,466,254

THREE POSITION RF CIRCUIT ROTARY SWITCH

Filed Nov. 20, 1967

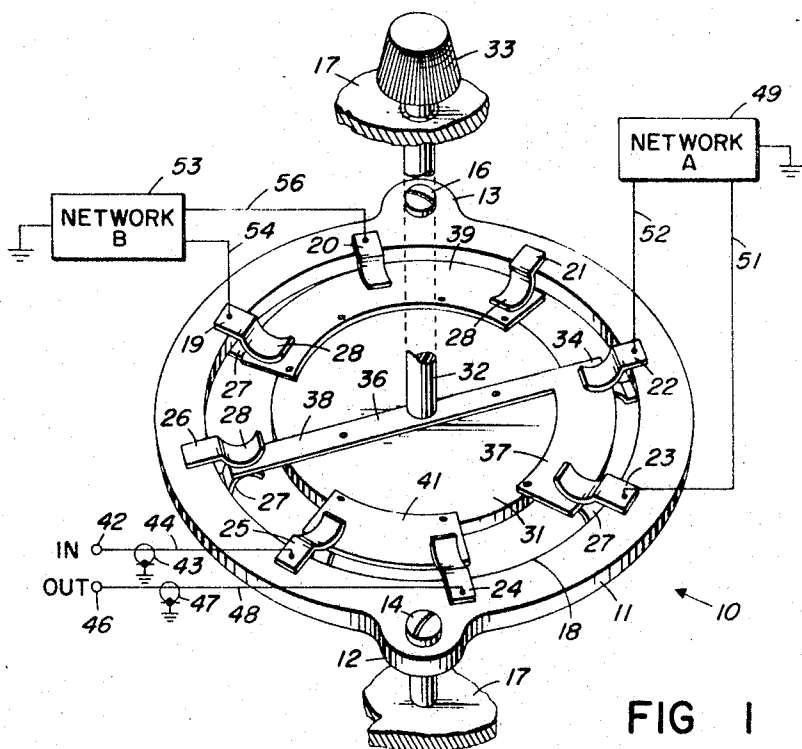


FIG 1

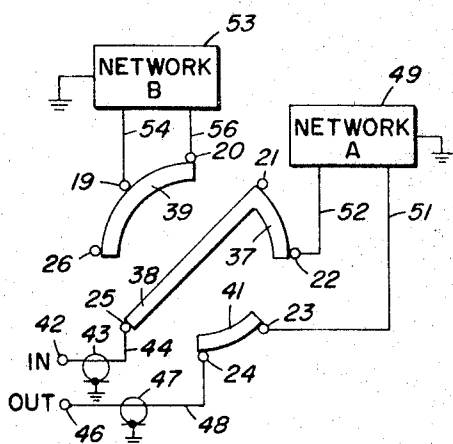


FIG 2

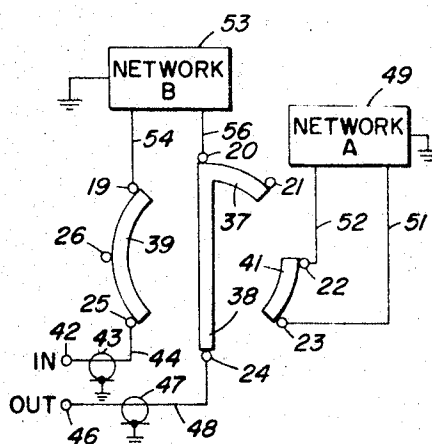


FIG 3

INVENTOR.
RICHARD E. DEASY

BY
Warren A. Kutzinger
ATTORNEY

1

3,466,254

THREE POSITION RF CIRCUIT ROTARY SWITCH
Richard E. Deasy, Cedar Rapids, Iowa, assignor to Collins
Radio Company, Cedar Rapids, Iowa, a corporation of
Iowa

Filed Nov. 20, 1967, Ser. No. 684,384

Int. Cl. H01h 19/58, 21/78

U.S. Cl. 200—11

5 Claims

ABSTRACT OF THE DISCLOSURE

A switch is disclosed which is capable of connecting input and output lines directly to each other or to one of two networks. The elements not connected in circuit are shorted out.

This invention relates in general to a rotary switch and in particular to a switch for connecting either of two networks into an electrical circuit. The network not connected into the electrical circuit is shorted out.

At radio frequency it is desirable to short input terminals to output terminals of networks not in the circuit to prevent stray reactances. The present invention discloses a switch which is capable of connecting either of two networks in a circuit with input and output lines and which shorts out circuits not connected in the line.

An object of the invention is to provide an improved switch for connecting networks in a circuit.

A feature of the invention is found in the provision for a rotary switch capable of connecting networks in a circuit such that networks not connected are shorted out.

Further features, objects and advantages of this invention will become apparent from the following description and claims when read in view of the accompanying drawings, in which:

FIGURE 1 illustrates a rotary switch in accordance with this invention with a pair of networks bypassed;

FIGURE 2 illustrates the position of the rotary switch with one of the networks connected in the circuit; and

FIGURE 3 illustrates the position of the switch when the other network is connected in circuit.

FIGURE 1 illustrates a switch designated generally as 10 which comprises a stator member 11 with suitable mounting tabs 12 and 13. The switch stator may be attached to a suitable frame member by bolts 14 and 16 which extend through openings formed in the tabs 12 and 13 to attach it to a frame member 17. The stator 11 is formed with a central opening 18 and a plurality of equally spaced wiper contacts 19, 20, 21, 22, 23, 24, 25 and 26 are mounted about the stator 11 and extend into the central opening 18. Each one is formed with wiper blades 27 and 28.

A rotor designated generally as 31 is supported by a shaft 32 which is in turn rotatably supported by the frame member 17. A knob 33 is attached to shaft 32 to rotate it. A first L-shaped contact member 34 of conductive material is attached to the rotor 31 and has a long arm portion 36 which extends across the rotor from one side to the other and has a short portion 37 attached to one end of said long portion 36 which extends along the opening 18. The length of the portion 37 is sufficient to extend between a pair of contacts 19 through 26. The end 38 of contact 34 extends radially far enough relative to the opening 18 that it is engageable by the contacts 19 through 26. A second crescent-shaped electrical contact 39 is attached to the periphery of the rotor 31 and is of a length sufficient to simultaneously engage three of the contacts 19 through 26. A third crescent-shaped electrical contact 41 is attached to the rotor 31 and has a length sufficient to engage two of the contacts 19 through 26.

2

An input lead 44 connects contact 25 to an input terminal 42, and the outer coaxial sheath 43 of lead 44 is connected to ground. A lead 48 is connected between contact 24 and an output terminal 46, and the outer coaxial sheath 47 of lead 48 is connected to ground. A first network (A) 49 has a shield connected to ground and has its input lead 51 connected to contact 23. Its output lead 52 is connected to contact 22. A second network (B) 53 has an input lead 54 connected to terminal 19 and an output lead 56 connected to contact 20. The shields of networks A and B are connected to ground.

With rotor 31 in the position shown in FIGURE 1, the shorting contact 39 shorts the input lead 54 to the output lead 56 through the contacts 19 and 20. Also, portion 37 of contact 34 connects input lead 51 to output lead 52 of network A through contacts 23 and 22. The input terminal 42 is connected through lead 44, contact 25, shorting contact 41, contact 24 and lead 48 to the output terminal 46. Thus, in this position the switch merely connects input terminal 42 to output terminal 46 and networks A and B are shorted out so that they do not reflect any impedance into the circuit.

FIGURE 2 illustrates a second position of the switch wherein the shaft 32 has been rotated 45° counterclockwise relative to FIGURE 1 so that contact 34 has its end 38 in engagement with contact 25 and portion 37 engages contacts 21 and 22. The wiper blade 41 has moved so that it engages contacts 24 and 23. The wiper contact 39 has moved so it engages contacts 26, 19 and 20. In this position, network B has its input lead 54 shorted to output lead 56 through contacts 19 and 20 and wiper blade 39. The input terminal 42 is connected by lead 44 through contact 25 through wiper contact 34 and contact 22 to the output lead 52 of network A. Contact 46 is connected by lead 48, wiper blade 41 and contact 23 to lead 51 of network A. Thus, in this position of the switch, network A is connected between the input and output terminals 42 and 46 and network B has its terminals shorted and is out of the circuit.

By rotating the shaft 32 an additional 45° counterclockwise relative to FIGURE 2, the position of FIGURE 3 is obtained wherein the network B is in circuit between the input and output terminals 42 and 46 and the network A is shorted out. In this position it is seen that the wiper blade 39 engages stator contacts 25, 26 and 19, thus connecting lead 44 to lead 54 of network B. End 38 of contact 34 engages the contact 24 and its upper end engages contacts 20 and 21. The wiper blade 41 shorts out network A by engaging contacts 22 and 23.

It is seen that a switch is provided which selectively connects either of two networks in circuit with a pair of input and output terminals while simultaneously shorting out the unused network. Alternatively, it connects the input and output terminals together while shorting out both of the networks.

Although this invention has been described with respect to a particular embodiment thereof, it is not to be so limited, as changes and modifications may be made therein which are within the spirit and scope of the invention as defined by the appended claims.

I claim:

1. A rotary switch comprising a stator having at least six usable contacts, a four contact grouping with one-eighth section spacing and a two contact one-eighth section spaced grouping with substantially one-quarter spacing from said four contact grouping extending into a central opening of the stator, a rotor supported within the central opening of the stator and formed with three wiper contacts, a first one of said wiper contacts extending across the diameter of the rotor and being generally L-shaped so that one end has a segment substantially one-

3

eighth section long to selectively conductively span one-eighth section spaced stator contacts and with the other end of said contact simultaneously engageable with a stator contact; a second wiper contact on the rotor being a crescent-shaped blade long enough to engage and conductively span two of the one-eighth section spaced stator contacts, and the third wiper contact of the rotor a crescent-shaped wiper contact long enough to engage and conductively span two of the stator contacts with substantially one-quarter spacing.

2. In apparatus according to claim 1, an input terminal connected to a first one of the stator contacts of said four contact grouping, an output terminal connected to a second stator contact of said four contact grouping, a first circuit with its output and input terminals connected to the third and fourth stator contacts of said four contact grouping, and a second circuit with its input and output terminals connected to the two stator contacts of said two contact one-eighth section spaced grouping.

3. In apparatus according to claim 2, location of said four contact grouping and said two contact grouping wherein in a first position of the rotor, the second wiper contact electronically conductively spans said first and second stator contacts to connect the input and output terminals together, the first wiper contact conductively span shorts said third and fourth contacts as input and output terminals of said first circuit, and the third wiper contact electronically conductively shorts the input and output terminals of the second circuit.

4

4. In apparatus according to claim 3, with location of said usable contacts further defined wherein in a second position of the rotor, the first wiper contact of the rotor connects the input terminal to a terminal of said first circuit, the second wiper contact connects the output terminal to the other terminal of said first circuit, and the third wiper circuit shorts the output and input terminals of the second circuit together.

5. In apparatus according to claim 4, further characterized with location of said usable contacts wherein, in a third position of the rotor the first wiper contact connects the output terminal to the output of the second circuit, the third wiper contact connects the input terminal to the input of the second circuit, and the second wiper contact electronically span connects shorts the output to the input of the first circuit.

References Cited

UNITED STATES PATENTS

3,152,228	10/1964	Broadhead.
3,337,699	8/1967	Miller.

ROBERT K. SCHAEFER, Primary Examiner

J. R. SCOTT, Assistant Examiner

U.S. Cl. X.R.

200—166