

455/5

(2)

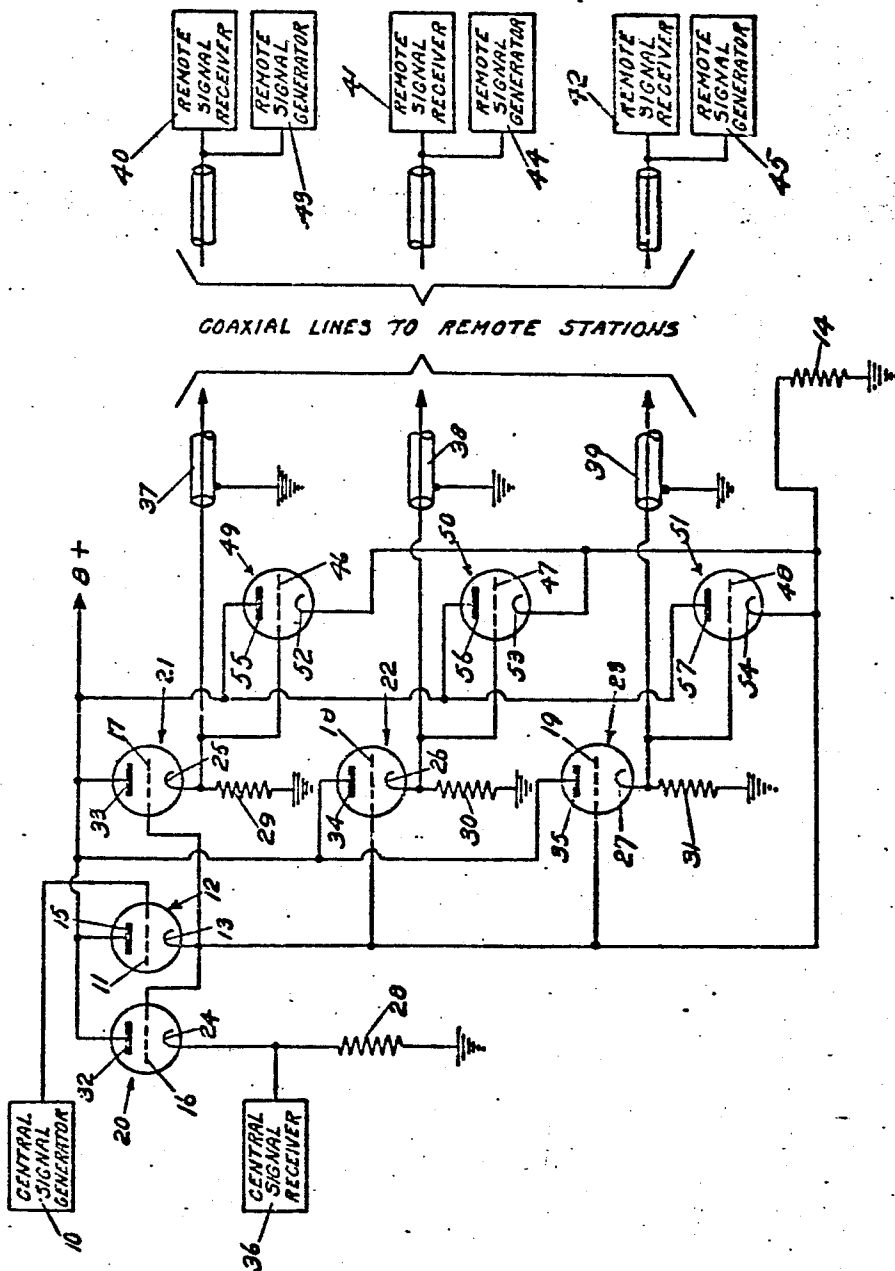
April 12, 1949.

W. M. HALL

2,466,701

COMMUNICATION SYSTEM

Original Filed Sept. 24, 1945



INVENTOR
WILLIAM M. HALL

BY *Chas. J. G.*
ATTORNEY

UNITED STATES PATENT OFFICE

2,466,701

COMMUNICATION SYSTEM

William M. Hall, Lexington, Mass., assignor to Raytheon Manufacturing Company, Newton, Mass., a corporation of Delaware

Continuation of application Serial No. 618,181, September 24, 1945. This application December 23, 1947, Serial No. 793,453

3 Claims. (Cl. 177-353)

1

This invention relates to communication systems, and more particularly to a communication system which enables the transmission of electrical signals from a central station to a group of remote stations, and the transmission of electrical signals from any one of said remote stations back to said central station, and to all of the other remote stations.

This application is a continuation of applicant's copending application entitled Communication Systems, Serial No. 618,181, filed September 24, 1945, now abandoned.

It is the main object of the present invention to provide a communication system of the general character indicated in which each of the branches thereof is so isolated from the remainder of the system that should a particular branch be rendered inoperative, the remainder of the system is unaffected, and can continue to function in a normal manner.

This, and other objects of the present invention, which will become more apparent as the detailed description thereof progresses, are attained, briefly, in the following manner:

There is provided a first group of switching devices, preferably of the electron-discharge type, for example, in the form of cathode-follower amplifiers, corresponding in number to the number of stations in the system. The input circuits of such devices are connected, in parallel, to a local-signal generator located at one of said stations, namely, at the central station.

There is provided a second group of similar switching devices, corresponding in number to one less than the number of stations in the system, the input circuits of said second group of switching devices being connected to local-signal generators and signal receivers located at the various remote stations.

The output circuits of all but one of the first group of switching devices are connected, respectively, to the input circuits of said second group of switching devices, and are also connected, respectively, to the signal receivers at the remote stations, the output circuit of said one of said first group of switching devices being connected to a signal receiver located at the central station.

The output circuits of the second group of switching devices feed a common load which is, in turn, connected back to the input circuits of the first group of switching devices.

By means of this system, signals originating at the central station are received there by the local receiver, and at the remote stations as well; and signals originating at any of the remote stations are received by their local receivers, and at the

2

central station and remaining remote stations as well.

By using cathode followers in the circuit outlined, the various stations are so isolated with respect to all others that damage to any one is confined thereto, and does not interfere with continued operation of the rest of the system.

In the accompanying specification there shall be described, and in the annexed drawing shown, an illustrative embodiment of the communication system of the present invention. It is, however, to be clearly understood that the present invention is not to be limited to the details herein shown and described for purposes of illustration only, inasmuch as changes therein may be made without the exercise of invention and within the true spirit and scope of the claims hereto appended.

In said drawing, the single figure is a partial block, partial schematic diagram of a communication system assembled in accordance with the principles of the present invention.

Referring now more in detail to the aforesaid illustrative embodiment of the present invention, with particular reference to the drawing illustrating the same, the numeral 10 designates a local-signal generator located at a central station, the output of said local-signal generator being applied to the grid 11 of a vacuum tube 12, said tube having a cathode 13 connected, through a resistor 14, to ground, and an anode 15 connected to the positive terminal of a suitable source of "B" voltage. The negative terminal of said source of "B" voltage (not shown) is conventionally grounded.

The cathode output of the tube 12 is applied, in parallel, to the grids 16 to 19, inclusive, of a first group of vacuum tubes 20 to 23, inclusive, said tubes having cathodes 24 to 27, inclusive, respectively connected, through resistors 28 to 31, inclusive, to ground, and anodes 32 to 35, inclusive, connected to the above-mentioned "B" voltage supply.

The cathode output of the tube 20 is applied to a receiver 36 located at the central station and the cathode outputs of the tubes 21 to 23, inclusive, are respectively applied, through, for example, coaxial lines 37 to 39, inclusive, to remote receivers 40 to 42, inclusive.

Thus, the signals originating at the central generator 10 are applied, through the cathode follower 12, to the cathode followers 20 to 23, inclusive, and, through the latter, to the central and remote receivers 36 and 40 to 42, inclusive.

Now as stated in earlier portions of this specification, it is also desirable that signals originating

at the remote stations be received at the central station and at the other remote stations as well. For this purpose, the remote stations may be provided with signal generators 43 to 45, inclusive, similar to the signal generator 10.

The outputs of the signal generators 43 to 45, inclusive, may be respectively applied, through the coaxial cables 37 to 39, inclusive, to the grids 46 to 48, inclusive, of a second group of vacuum tubes 49 to 51 inclusive, said tubes having cathodes 52 to 54, inclusive, connected, in parallel, to the previously-mentioned resistor 14, constituting a common load, and anodes 55 to 57 inclusive, connected to the previously referred to "B" voltage supply. It will thus be noted that the signals of each of the remote stations appear across the common load resistor 14 and, therefore, are applied to the input circuits of the tubes 20 to 23, inclusive. Hence, these signals appear at the central receiver 36, and also, at the receivers 40 to 42, inclusive, at each of the remote stations.

This completes the description of the aforesaid illustrative embodiment of the present invention. It will be noted from all of the foregoing that by means of the present invention two-way communication may be established between a plurality of separated stations, while at the same time said stations are so isolated with respect to each other that a failure at one has no effect upon the remainder, thereby enabling continued operation of the system among said remainder.

Other objects and advantages of the present invention will readily occur to those skilled in the art to which the same relates.

What is claimed is:

1. In a system for intercommunication between a plurality of stations each of which includes a signal source and a signal receiver, the combination of a first group of switching devices, corresponding in number to the number of said stations, and having input circuits connected, in parallel, to the signal source of a first of said stations; a second group of switching devices, corresponding in number to one less than the number of said stations, and having input circuits connected, respectively, to the signal sources of the remainder of said stations; all but one of said first group of switching devices having output circuits connected, respectively, to the input circuits of said second group of switching devices, and also connected, respectively, to the signal receivers of said remainder of said stations; said one of said first group of switching devices having an output circuit connected only to the signal receiver of said first of said stations and said sec-

ond group of switching devices having a common output circuit connected to the input circuits of said first group of switching devices.

2. In a system for intercommunication between a plurality of stations each of which includes a signal source and a signal receiver, the combination of a first group of electron-discharge devices, corresponding in number to the number of said stations, and having input circuits connected, in parallel, to the signal source of a first of said stations; a second group of electron-discharge devices, corresponding in number to one less than the number of said stations, and having input circuits connected, respectively, to the signal sources of the remainder of said stations; all but one of said first group of electron-discharge devices having output circuits connected, respectively, to the input circuits of said second group of electron-discharge devices, and also connected, respectively, to the signal receivers of said remainder of said stations; said one of said first group of electron-discharge devices having an output circuit connected only to the signal receiver of said first of said stations and said second group of electron-discharge devices having a common output circuit connected to the input circuits of said first group of electron-discharge devices.

3. In a system for intercommunication between a plurality of stations each of which includes a signal source and a signal receiver, the combination of a first group of cathode-follower amplifiers, corresponding in number to the number of said stations, and having input circuits connected, in parallel, to the signal source of a first of said stations; a second group of cathode-follower amplifiers, corresponding in number to one less than the number of said stations, and having input circuits connected, respectively, to the signal sources of the remainder of said stations; all but one of said first group of cathode-follower amplifiers having output circuits connected, respectively, to the input circuits of said second group of cathode-follower amplifiers, and also connected, respectively, to the signal receivers of said remainder of said stations; said one of said first group of cathode-follower amplifiers having an output circuit connected only to the signal receiver of said first of said stations and said second group of cathode-follower amplifiers having a common output circuit connected to the input circuits of said first group of cathode-follower amplifiers.

WILLIAM M. HALL.

No references cited.