455/3

79-1

Oct. 20, 1936. E. J. QUINBY ET AL 2,058,108

DISTRIBUTION SYSTEM INDICATOR

Filed March 20, 1931

Neon tube indicator

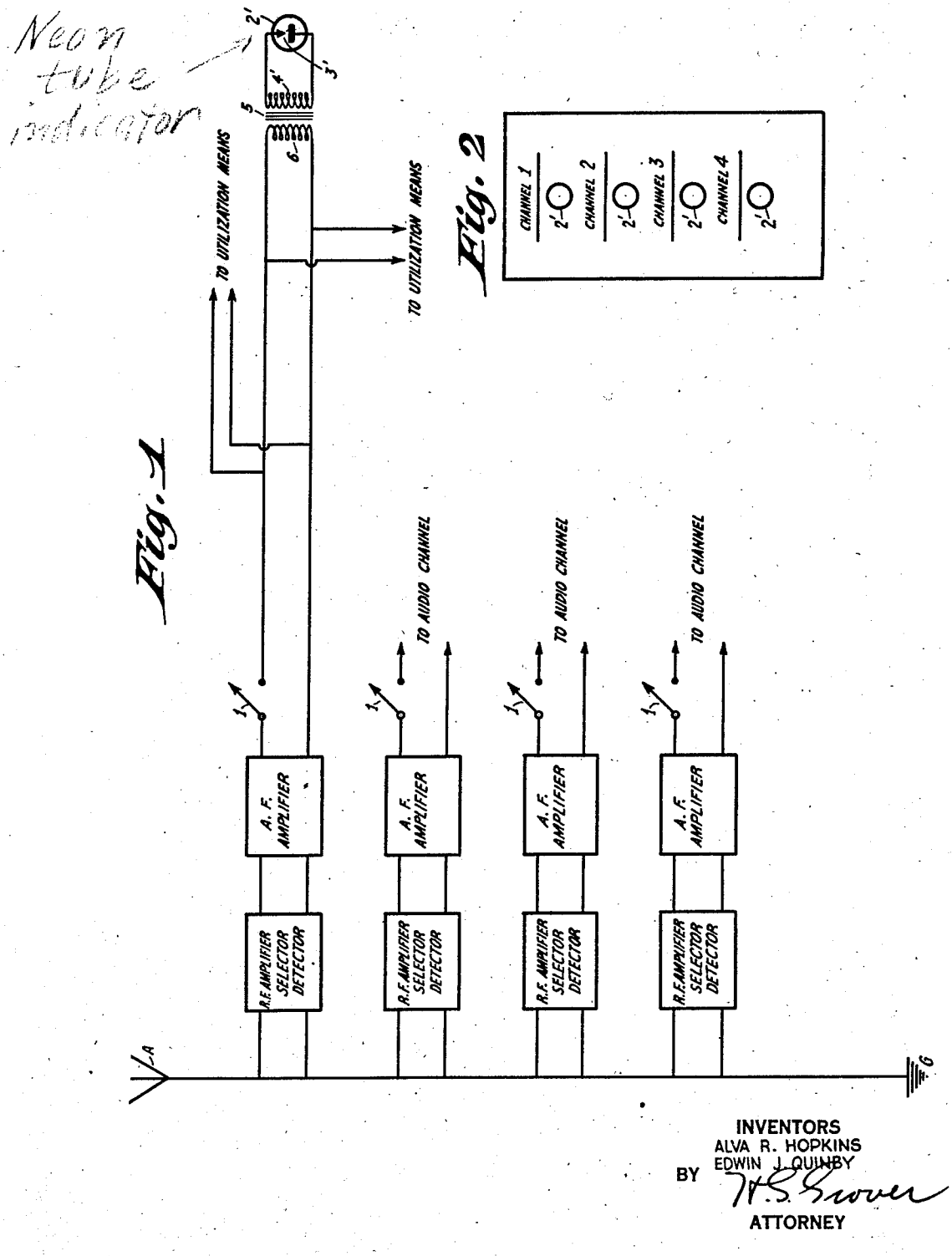


Fig. 1

Fig. 2

INVENTORS
ALVA R. HOPKINS
EDWIN J. QUINBY
BY H. S. Grover
ATTORNEY

UNITED STATES PATENT OFFICE

2,058,108

DISTRIBUTION SYSTEM INDICATOR

Edwin Jay Quinby, Yonkers, N. Y., and Alva R. Hopkins, Merchantville, N. J., assignors to Radio Corporation of America, a corporation of Delaware

Application March 20, 1931, Serial No. 524,100

3 Claims. (Cl. 179—1)

The present invention relates to electrical distribution systems, and more particularly to an indicator adapted for use in an audio frequency distribution system.

In connection with electrical distribution systems, and particularly those adapted to distribute audio frequency impulses used in hotels, apartment houses, and the like, it is often necessary to utilize a visual indicator device to inform the supervisor of the system as to the performance of each distribution channel.

Accordingly, it is one of the main objects of the present invention to provide, in an electrical distribution system provided with one, or more, distribution channels, an indicating device associated with each of the channels to immediately indicate to a supervisor located at any convenient place on the system when the performance of each individual channel becomes abnormal, or unsatisfactory.

Another important object of the present invention is to provide an audio frequency distribution system provided with one, or more, audio channels, each of the channels being additionally provided with one, or more audio frequency utilization means, a visual audio frequency indicator device which can be installed at the central station, or any other supervisory point, to show when each of the channels is performing in a normal manner, and, also, to immediately indicate when the performance becomes abnormal, or unsatisfactory.

Other objects of the present invention are to improve generally the efficiency of electrical distribution systems, and to particularly provide an electrical distribution system of the audio frequency type which is reliable in operation.

The novel features which we believe to be characteristic of our invention are set forth in particularity in the appended claims, the invention itself, however, as to both its organization and method of operation will best be understood by reference to the following description taken in connection with the drawing in which we have indicated diagrammatically one organization whereby our invention may be carried into effect.

In the drawing,

Fig. 1 diagrammatically shows a distribution system embodying the invention,

Fig. 2 is a representation of the supervisory panel embodying the invention.

Referring to the accompanying drawing in which like characters of reference indicate the same parts in the different views, there is shown in Fig. 1 a diagrammatic, and conventional, representation of a typical electrical distribution system of the audio frequency type. As is well known to those skilled in the art, such a system usually embodies, when employed in connection with radio broadcast programs, a central collecting means, such as a grounded antenna A, G. A plurality of radio frequency amplifiers, selectors, and detectors are coupled to the central antenna, each of the units being adjusted to select a different broadcast program. In order to preserve simplicity of disclosure, a radio frequency amplifier, selector and detector have been shown as combined in a single conventionally represented unit. Of course, it is well known that for such a combined unit a plurality of tuned radio frequency amplifier stages and a detector stage can be employed. It is, also, to be understood that any other type of receiver can be utilized, such as the superheterodyne type. The essential requirement for the arrangement is that there be produced in the output of each combined unit modulated audio frequency impulses corresponding to the program signal selected by each unit.

Again, instead of employing a single grounded antenna arrangement A, G it is well understood that each combined unit may have its input connected to an independent antenna system. The audio frequency output of each combined amplifier, selector and detector unit is impressed upon an audio frequency amplifier. While each of these amplifiers has been shown in conventional form, it is to be understood that they may comprise one, or more, stages of audio frequency amplification. The amplified audio frequency output is, then, usually fed into a desired transmission path.

Each of these transmission, or distribution, paths may, also, be considered an audio channel through which are distributed the audio frequency impulses from each of the audio frequency amplifiers. Thus, in the present arrangement there are shown four audio channels, each of these channels distributing a different program to a plurality of audio frequency utilization means. The particular type of utilization means connected to any one audio channel may vary. For example, they may all be loud speakers of the electromagnetic, or electrodynamic type. Again, they may be headphones for individual reception; or, they may be so-called musical pillows. That is to say, sound reproducers disposed within a pillow may be used so that individual reception may be provided while a person reclines. Also, it is well understood that any other type of utilization means may be employed

in a given audio channel which is adapted for the reproduction of voice, music, or even visual modulated carrier impulses.

Only the first audio channel is shown in detail in Fig. 1, this channel showing only two connections to utilization means. It should be understood that in the usual distribution system of this type, each audio channel feeds into each guest, or subscriber's, room to the utilization means provided therein. There usually is provided adjacent the utilization means a selector device for switching the utilization means from one channel to another channel, so that any desired program carried by a particular channel may be reproduced.

Each of the distributing channels is provided with a switching device 1 so that a given channel may be rendered inoperative without affecting the operation of the remaining channels. These switches 1 are provided at the central station with the combined radio frequency amplifier, selector and detector units and the audio frequency amplifiers, each switch 1 being arranged adjacent its respective audio frequency amplifier so that the supervisor of the system may readily render a given audio channel inoperative.

As stated heretofore, it often becomes necessary to indicate the operation of each audio channel during operation thereof. It has been found that it is extremely desirable to provide a visual audio frequency indicator device in connection with each of the distribution channels to show the supervisor of the system when each of the channels, and in the present case each of the four channels, is performing in a normal manner, and, also, to immediately indicate to him when the performance becomes abnormal, or unsatisfactory. In order to meet this requirement in an economical and efficient manner, there has been devised an arrangement of neon tubes, one for each distribution channel.

As shown particularly in the first channel in Fig. 1, the neon tube 2' has its electrodes 3' connected to opposite terminals of the secondary coil 4' of an audio frequency transformer 5. The primary coil 6 of the transformer has its opposite terminals connected to the audio channel line. Thus, the tube 2' has its electrodes energized by the audio frequency lines which supply the utilization means connected to the audio channel, and this energization is provided through a suitably designed audio frequency transformer 5.

In practice, when the lines of each audio channel are performing in a satisfactory manner, the neon tubes will glow continuously, or flicker intermittently. However, in the event of a short circuit, a ground, or an open circuit on any one of the four audio channels, the neon tube corresponding to the defective channel will cease to glow, or flicker.

In Fig. 2 there is shown a portion of the supervisory panel 7, which panel is, of course, disposed at the central station, or any other point, where the supervisor of the system is located. Usually, the panel 7 is disposed adjacent the channel switches 1, the radio receivers and amplifiers. As shown in Fig. 2, each of the lamps 2' has arranged adjacent it a designation showing the channel whose performance it is to indicate. Each of the tubes is shown as glowing, thus indicating that each of the audio channels is performing in a normal manner.

Of course, as a particular switch 1 has been opened, thus rendering a given channel inoperative, the indicator tube 2' associated with that channel will, also, cease to glow. However, in that case the supervisor can readily see that the reason for this non-glow of a tube is the fact that he has rendered a channel inoperative. Thus, it should be clear that there has been provided an efficient and simple arrangement for indicating at any time the performance of a given channel in a system of this type.

While it has been specified that a neon glow tube is to be employed as the visual indicator, it is, of course, understood that any other type of gas tube may be utilized, such as a helium, argon, or any other type of gas tube which is adapted to produce a characteristic color when its electrodes are energized. Of course, any other type of indicating device may be utilized for this purpose, the essential requirement being, however, that the indicator be visible.

Again, instead of mounting the visual channel indicators on a single panel 7, it should be clear that each indicator may be disposed adjacent the receiver and audio amplifier for a given audio channel, assuming that individual channel racks are employed, as is usual in systems of this type.

While the distribution system shown in Fig. 1 has been explained as particularly adapted for use in connection with the reception of broadcast programs, it is to be understood that there may be injected into the input terminals of each audio frequency amplifier local programs, such as from a phonograph or an announcing microphone, the present invention applying to such arrangements with equal efficiency.

While we have indicated and described one arrangement for carrying our invention into effect, it will be apparent to one skilled in the art that our invention is by no means limited to the particular organization shown and described, but that many modifications may be made without departing from the scope of our invention as set forth in the appended claims.

What we claim is:

1. A supervisory monitor for a program distribution system which comprises means for collecting broadcast programs of different radio frequencies, means for selecting such programs, means for amplifying the selected programs, a plurality of channels for distributing the amplified programs, a plurality of sound reproducers associated with each channel, each channel comprising a pair of electrical conductors, the monitor including an audio transformer having its primary connected across said pair of conductors, and a glow tube connected across the secondary of each of said transformers, said tubes being rendered luminous when broadcast signals are impressed on said selecting means and amplifiers.

2. A centralized radio system comprising a plurality of radio receivers located at a central station and each tuned to a different modulated carrier frequency, means connected to each receiver for detecting and amplifying the modulation frequency, a two wire transmission line connected to each of said amplifying means and extending to remote points, audio frequency transformers having primary and secondary windings said primary windings being connected to different ones of said transmission lines, a plurality of glow tubes each having its terminals conductively connected to the terminals of said secondary windings and a plurality of sound reproducers connected to said transmission lines at said remote points, said glow tubes being located at said central station within view of the operator of said receivers and each of said tubes being ar-

ranged to glow when its connected receiver is tuned to a carrier frequency and to become non-luminous when its transmission line is short circuited.

3. A program supervisory system comprising the combination of a plurality of tunable radio receivers, each tuned to a different signal frequency located at a central station, means for supplying broadcast signal currents of different frequencies to said receivers, an audio frequency amplifier connected to the output of each of said receivers, an audio frequency transformer having a glow discharge tube connected across its secondary winding, means connecting the primaries of said transformers to the output terminals of said amplifiers, said audio frequency transformers and glow tubes being mounted in said central station within view of a supervisor and a two wire transmission line conductively connected to the output terminals of each of said amplifiers and extending to a translating device located at a distance from said central station whereby said tubes glow when said transmission lines are in normal operating condition and if one of said transmission lines is short circuited the glow tube connected thereto is extinguished.

EDWIN JAY QUINBY.
ALVA R. HOPKINS.