

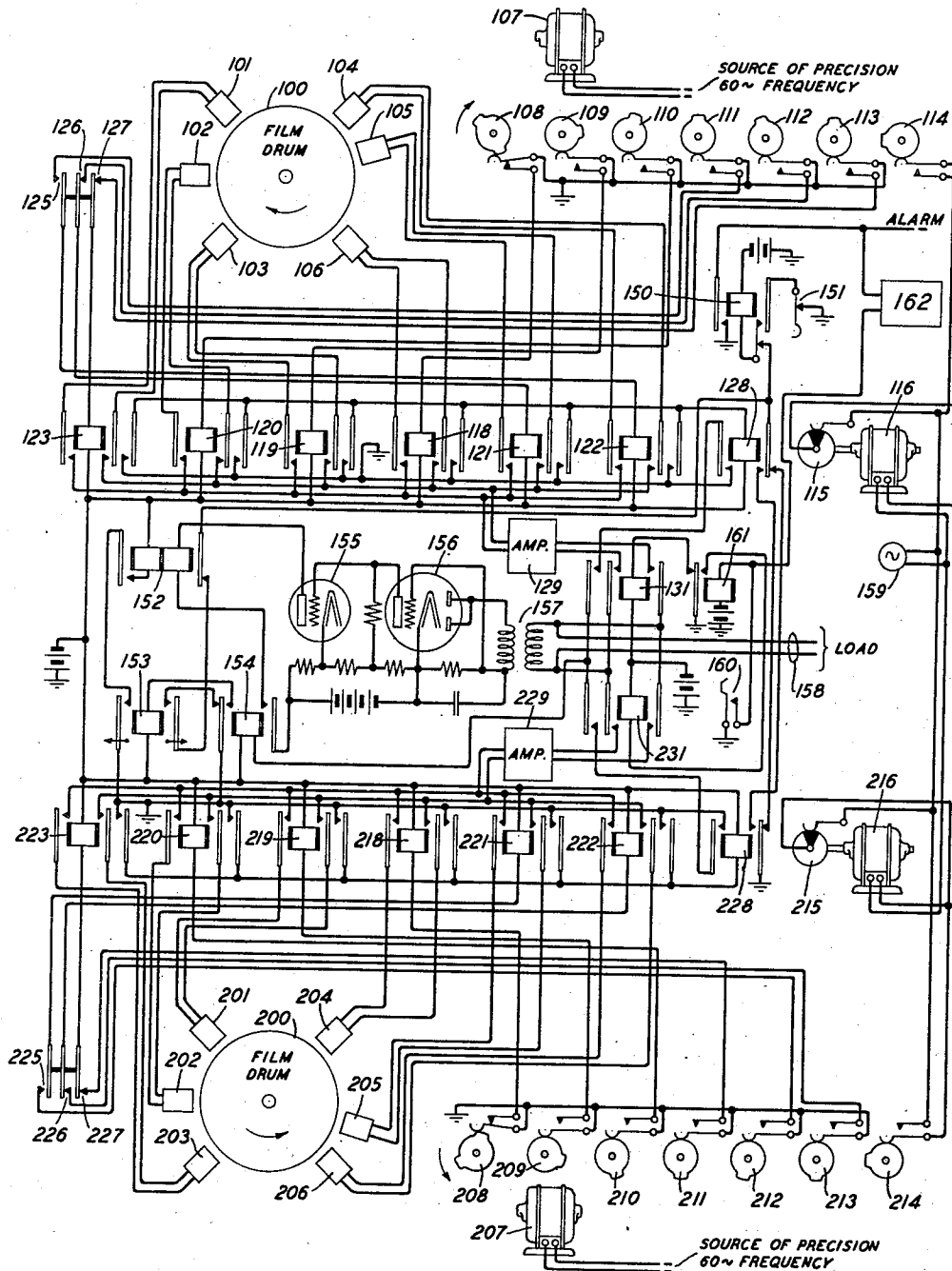
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TIME-OF-DAY ANNOUNCING SYSTEM

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TIME-OF-DAY ANNOUNCING SYSTEM

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This invention relates to equipment for automatically announcing the time of day and has for its object to prevent faults in the announcements made by such equipment.

One form of equipment for announcing the time of day is disclosed in Patent No. 2,364,147, granted to E. H. Jones, Dec. 5, 1944. This equipment employs film records of the elements making up the announcements and these films are mounted over openings in an opaque drum or on a transparent drum. Individual scanning devices are arranged in registration with the film records, the scanning devices being moved in accordance with the time of day. The drum is constantly in motion, being driven by a motor under the control of a source of precision frequency. This motor also drives a set of cams which control the connection of the scanning devices to the outgoing circuit.

In order to insure uninterrupted service, and reliable time keeping, two units of the announcing equipment are provided and are operated simultaneously although only one unit is connected to the outgoing circuit at a time together with means to indicate when one unit fails to keep accurate time as shown by a failure of the two units to keep step. Another source of improper announcements would be the breakdown of any element of the equipment whereby part of the announcement would fail to reach the outgoing circuit.

In accordance with the present invention means is provided, operated by each announcing equipment to sound an alarm if faults exist in the equipment.

More specifically means is provided under the joint control of said units to sound an alarm if the units get out of step. In addition, said alarm is also operated if the effective unit fails to produce any element of the announcement.

The invention will be more clearly understood from a consideration of the following description, read in connection with the drawing which shows schematically two announcing machines and the alarm control means of the present invention.

The announcing machine at the top of the sheet will be briefly described. For a detailed description and a showing of the mechanical structure, reference may be made to the above-identified Jones patent.

As spoken by the machine shown, the time of day announcement is made up of a preamble, the hour, minute and fractional minute announcements and a time tone. The minute announcement is made from one film for the first nineteen

minutes of each hour and from two films for subsequent minutes, the tens digit being spoken by the first film and the units digit by the second film. The fractional minutes are stated as tens of seconds and two scanning devices are provided, one in advance of the other, the latter used during the time when only one minute film is functioning.

The device for scanning the preamble film is shown at 106, the hour scanner at 103, the primary minute scanner at 102, the secondary minute scanner at 101 and the two seconds scanners at 104 and 105. These scanners are arranged around the film bearing drum 100 and are moved in accordance with the time of day by means of cams (not shown) driven by a motor 116 which is operated by a source of commercial current.

The drum 100 is operated by a motor 107 driven by a precision source of 60-cycle frequency and is, constantly in motion. Motor 107 also operates a set of cams 108 to 114, which are so geared to the drive as to make one revolution for the two revolutions of the drum which are necessary for a complete announcement. Following each announcement, cam 114 closes a circuit from source 159 of alternating current, over the contact of cam 114 through the winding of motor 116 and back to source 159. Motor 116 starts to rotate, and as soon as the motor starts to move, a supplementary circuit is closed for the motor winding at cam 115, thereby causing the motor to complete one revolution. As shown in the above-identified Jones patent this advances the seconds scanner into position opposite the next ten-second announcement and also advances the driving shafts for the other scanners so that they will be advanced at the proper time intervals.

At the beginning of the announcement, cam 108 closes its contact, operating relay 118 which connects scanning device 106 to the amplifier 129, starting the preamble. When the preamble is finished, cam 109 comes into position to close its contact, operating relay 119 to render the hours scanner 103 effective. Subsequently, cam 110 operates relay 120 to connect the primary minutes scanner 102 to the amplifier 129. The effect of cams 111, 112 and 113 depends on the operated or non-operated condition of contacts 125 to 127. These contacts are operated by an auxiliary cam carried by the cam which drives the primary minutes scanning device. During the first nineteen minutes of each hour these contacts are moved to the alternate position, in which contact 125 is closed and contacts 126 and 127 are opened. During the balance of the hour the contacts are

as shown. Therefore, during the first nineteen minutes of the hour, following the primary minutes announcement, cam 11 is effective to operate relay 122 and connect the early seconds scanning device 104 to the amplifier 129. During the remainder of the hour cam 111 is ineffective, while cam 113 operates relay 123 to connect the secondary minutes scanner 101 to the amplifier 129, after which cam 112 operates relay 121 to connect the late seconds scanner 105 to the amplifier. After the seconds announcement, cam 108 again closes the circuit of relay 118 to transmit the time tone. Each of the relays 118 and 123 closes an obvious circuit for relay 128.

The announcing machine shown at the bottom of the figure is identical with that described. As stated above, the two machines are run simultaneously but only one machine is connected with the outgoing circuit 158. Which machine is to be effective is determined by the position of key 160. With key 160 in the position shown relay 161 is not energized and relay 131 is operated, connecting the output of amplifier 129 to the outgoing trunk 158.

Relay 131 also prepares a circuit from battery through the winding of relay 154, outer left contacts of relay 131 to the left contacts of relay 128. Each time that relay 128 operates, the circuit of relay 154 is extended to ground.

Across the talking conductors of trunk 158 is connected the primary winding of transformer 157, the secondary of which is connected to the input circuit of a rectifier-amplifier tube 156. The output of tube 156 is connected to the input of the trigger tube 155. The circuits of these tubes are so arranged that each time that speech current reaches the outgoing trunk, tube 155 becomes conducting and prepares a circuit for relay 152. Since relay 154 is operated each time that one of the scanning devices is connected to the amplifier, each operation of relay 154 should coincide with the flashing of tube 155 thereby completing a circuit from the plate of tube 155, through the right winding of relay 152, right contacts of relay 154 to the cathode of tube 155, for operating relay 152. Each time that relay 154 operates, it also closes a circuit for relay 153, which, being slow to release remains operated for an interval following the release of relay 154 and provides a locking circuit for relay 152 from battery through the left winding and contacts of relay 152 and the left contacts of relay 153 to ground.

Between the phrases of an announcement, relay 154 releases, followed after a short interval by relay 153 and relay 152.

If, during any portion of an announcement, no speech current passes to the outgoing trunk, relay 152 is not operated and, during the interval between the release of relay 154 and the release of relay 153, a circuit is closed from ground over the back contact of relay 154, right front contact of relay 153, back contact of relay 152, normal contacts and winding of relay 150 to battery. Relay 150 operates, locks over its right alternate contacts and the normal contacts of key 151 to ground and at its left contacts closes a circuit for an alarm.

The attendant, in response to the alarm, may move key 160 to its alternate position, operating relay 161, releasing relay 131 and operating relay 231. Relay 231 connects amplifier 229 and the associated announcing machine to the outgoing trunk 158. It also places relay 154 under the control of relay 228 and the relays 218 to

223 of the machine which is now effective. Key 151 permits the release of relay 150 and the silencing of the alarm while the attendant finds the trouble.

5 As mentioned above, relay 128 operates each time that one of the relays 118 to 123 operates, while relay 228 operates each time that one of the relays 218 to 223 operates. If the two announcing machines are operating in step, relays 128 and 228 are operated at the same time. However, if the speeds of the machines differ enough to permit relay 128 to release while relay 228 is operated, or vice versa, indicating that one of the machines is not keeping time, a circuit is closed from ground over the back contact of one relay and the front contact of the other relay to battery through the normal contacts and winding of relay 150. Relay 150 operates, locks to ground under the control of key 151 and closes the alarm circuit. Means is provided, as set forth in the above-identified Jones patent, to return the two announcing machines into step.

15 It is apparent from the foregoing description, that any fault which might lead to a defective time announcement causes an alarm to be sounded so that the fault may be corrected.

20 It is also clear that, using well-known switching apparatus indicated at 162, relay 161 could be actuated by the operation of alarm relay 150 to shift the load automatically to the machine not in use whenever a fault occurs.

What is claimed is:

1. In a time-of-day announcing system, two identical announcing machines driven at the same speed, each machine having records of the elements of a time-of-day announcement, a plurality of reproducers cooperating respectively with said records, means for successively rendering said reproducers effective, and means under the control of said last-mentioned means for detecting faults in the operation of said machines individually or with respect to each other, and means under the control of said detecting means for sounding an alarm.

45 2. In a time-of-day announcing system, two identical announcing machines driven at the same speed, each machine having records of the elements of a time-of-day announcement, a plurality of reproducers cooperating respectively with said records, means for successively rendering said reproducers effective, and means under the control of said last-mentioned means for detecting faults in the operation of said machines individually or with respect to each other, an outgoing line, means for normally connecting the reproducers of one of said machines to said outgoing line, and means under the control of said detecting means for disconnecting said outgoing line from said one machine and connecting it to said other machine.

50 3. In a time-of-day announcing system, an announcing machine having records of a preliminary announcement and of the hour, minute and fractional minute divisions of the time of day, a plurality of reproducers cooperating respectively with said records, a speech output detector, a series of relays for successively rendering said reproducers effective and for associating them in succession with said speech detector, means under the control of each of said relays for preparing an alarm circuit and means under the control of said speech detector for disabling said alarm circuit.

75 4. In a time-of-day announcing system, two identical announcing machines, each of said machines having records of the preliminary an-

nouncement and of the hour, minute and fractional minute divisions of the time of day, a plurality of reproducers cooperating respectively with said records, a series of relays for successively rendering said reproducers effective and a supplementary relay operated by each of said series of relays, a speech detector, means for connecting said speech detector to one of said announcing machines, an alarm device and means under the control of the supplementary relay belonging to said one announcing machine for rendering said speech detector and the supplementary relay belonging to said other announcing machine effective to operate said alarm device.

5. In a time-of-day announcing system, an announcing machine comprising records of a preliminary announcement, and of the hour, minute and fractional minute divisions of the time of day and a plurality of reproducers each cooperating with one of said records, a connector relay for each of said reproducers, a load circuit, means for successively operating said connector relays to connect said reproducers to said load circuit, speech detecting means permanently connected with said load circuit, and means under the control of each of said connector relays for rendering said speech detecting means effective only while a reproducer is connected with said load circuit.

6. In a time-of-day announcing system, an announcing machine comprising records of a pre-

liminary announcement, and of the hour, minute and fractional minute divisions of the time of day and a plurality of reproducers each cooperating with one of said records, a connector relay for each of said reproducers, a load circuit, means for successively operating said connector relays to connect said reproducers to said load circuit, speech detecting means permanently connected with said load circuit, and means under the control of each of said connector relays for rendering said speech detecting means effective each time that a reproducer is connected with said load circuit.

7. In a time-of-day announcing system, an announcing machine comprising records of a preliminary announcement, and of the hour, minute and fractional minute divisions of the time of day and a plurality of reproducers each cooperating with one of said records, a connector relay for each of said reproducers, a load circuit, means for successively operating said connector relays to connect said reproducers to said load circuit, speech detecting means permanently connected with said load circuit, a speech indicating relay, means under the control of each of said connector relays for associating said speech indicating relay with said speech detecting means, and means under the control of said speech indicating relay for sounding an alarm.

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