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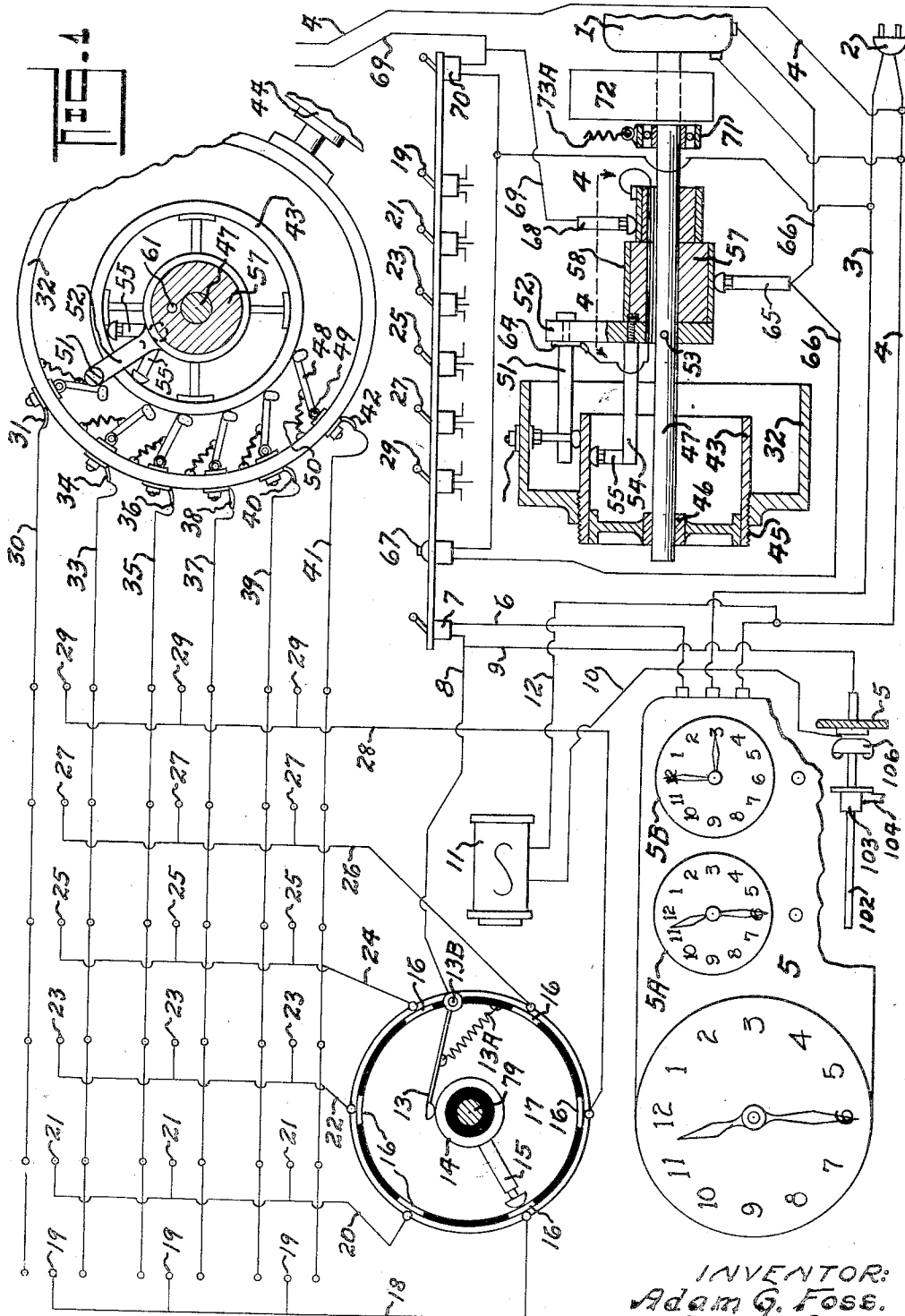
A. G. FOSS

2,187,851

RADIO STATION CONTROL SYSTEM

Filed Dec. 20, 1937

2 Sheets-Sheet 1



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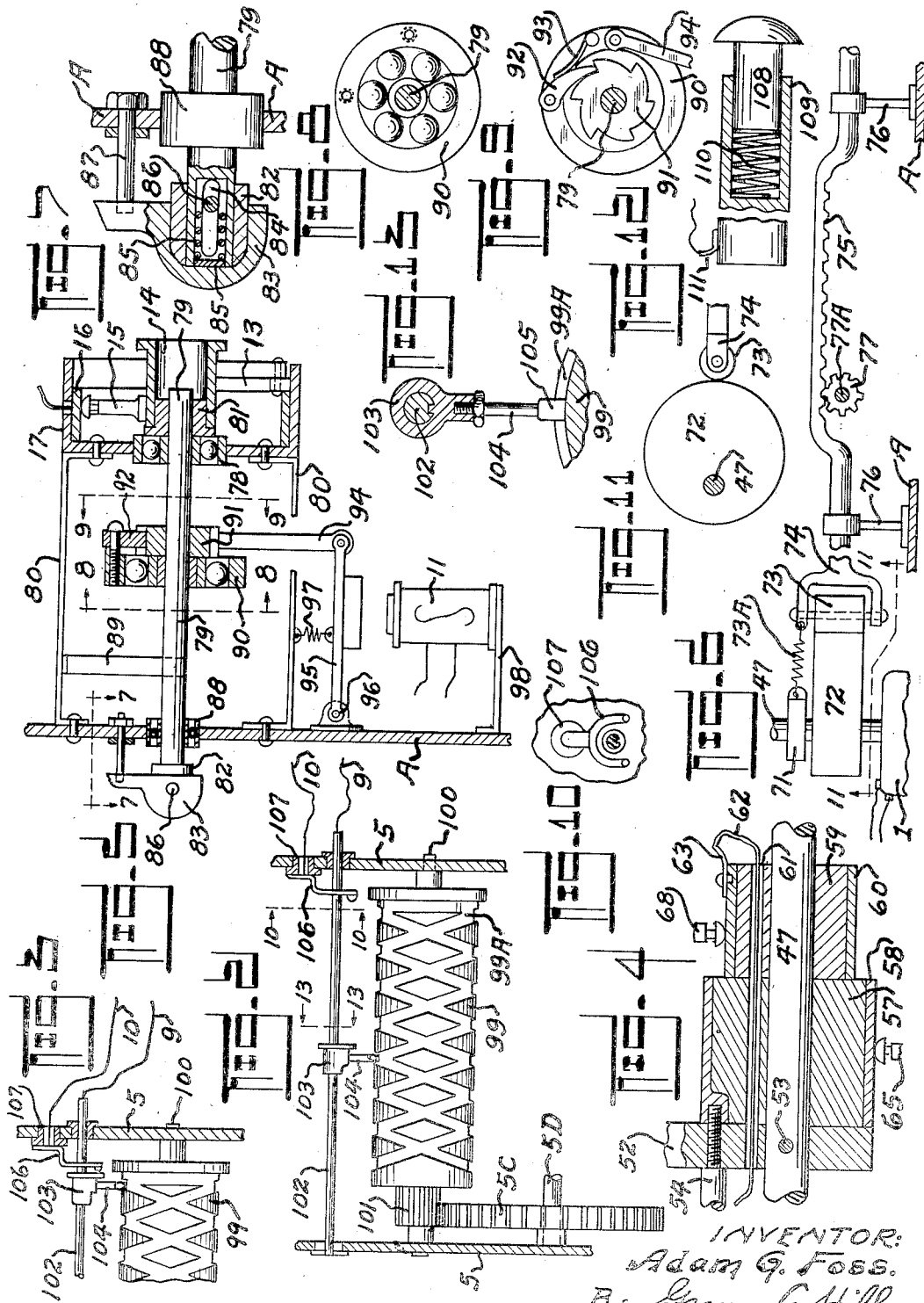
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UNITED STATES PATENT OFFICE

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RADIO STATION CONTROL SYSTEM

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3 Claims. (Cl. 250—40)

The present invention relates to improvements in the art of radio control systems and has particular reference to an improved system which is constructed and arranged in a manner whereby a number of switches may be adjusted so that a corresponding number of programs may be heard during the period of a single evening without the necessity of turning the customary dial for tuning in for a particular station, or for changing from one station to another.

Another important advantage of the invention is that when the particular stations desired for the evening entertainment have been adjusted, each of them will come in at the designated time and stop when the program is complete, and the starting and stopping of each station is entirely automatic.

Inasmuch as radio programs are based upon intervals of fifteen minutes or the multiples thereof, for illustration I have arranged so that six programs of fifteen minutes each may be heard with a single adjustment of the system, or one program of one hour and another of thirty minutes; in fact, any combination of programs may be heard within the range of one and one-half hours. However, the system is not limited to the range of one and one-half hours. It may provide for less than six fifteen minute periods, or any number of periods in excess of six may be likewise used. The system which I disclose is also susceptible of application to the control of apparatus of various kinds of other than radio receiving sets, as will be apparent to those skilled in the art.

With reference to the drawings:

Figure 1 is a diagrammatic view of the complete electric circuit, also showing the time clock arrangement, distributor, and part of the principal mechanism.

Figure 2 is a view showing how the spooling device is coordinated with the mechanism of the clock, the tracer above the mechanism is indicated as being out of electric contact; and Figure 3 is a similar view but showing the tracer in a contacted position.

Figure 4 is an enlarged sectional view taken at the position of line 4—4 of Figure 1.

Figure 5 is a sectional view of the distributor assembly.

Figure 6 is a cam, rack, and gear assembly; the latter being positioned at 90 degrees with respect to the former.

Figure 7 is an enlarged sectional view taken at the position of line 7—7 of Figure 5.

Figure 8 is a section upon line 8—8 of Figure 5.

Figure 9 is a section upon line 9—9 of Figure 5. Figure 10 is a sectional view upon line 10—10 of Figure 2.

Figure 11 is a view upon line 11—11 of Figure 6.

Figure 12 is an enlarged sectional view of one of the self-adjusting contact members.

Figure 13 is an enlarged section upon line 13—13 of Figure 2.

In further carrying out my invention, I employ the use of conventional type electric motor which is geared so as to rotate approximately 1 to 6 times per minute, and may operate on A. C. or D. C. current.

Referring to Figure 1, wall plug 2 is the means by which the system connects with the electric supply circuit, and leading from said plug are wires 3 and 4 to clock 5. The path of the current is carried through wire 6 to toggle switch 7 through wires 8 and 9, returning through wire 10 to magnet 11. Wire 12 has permanent connection with wire 4. Wire 8 connects with contact arm 13 through copper sleeve 14, contact member 15 of metal and any of metal contacts 16 upon distributor 17 through wire 18 to toggle switches 19. Wire 20 connects with toggle switches 21. Wire 22 connects with toggle switches 23. Wire 24 connects with toggle switches 25. Wire 26 connects with toggle switches 27; and wire 28 likewise connects with toggle switches 29.

Toggle switch 19 moved to contact wire 30 connects with contact 31 mounted upon insulating drum 32, and this switch, when moved to contact wire 33, connects with contact 34.

Switch 19 moved to contact wire 35 connects with contact 36, and when moved to contact wire 37 connects with contact 38.

Switch 19 moved to contact wire 39 connects with contact 40, and when moved to contact wire 41 connects with contact 42.

Toggle switches 21, 23, 25, 27, and 29 operate similar to that of toggle switch 19.

Still referring to Figure 1, it is understood that electric conducting cylinder 43 is disposed within drum 32 and said drum is permanently fixed as at 44, also cylinder 43 is secured to the drum by threads 45. Bushing 46 is provided within cylinder 43 in which is journaled one end of horizontal shaft 47.

A plurality of trolleys 48 are provided and each of said trolleys being pivoted at 49 to drum 32 in spaced apart relation where indicated, also spring 50 is for purpose of holding said trolleys normally in contact with outer surface of cylinder 43 until at such time when any one of the trolleys is raised out of contact with said cylinder by

copper arm 51, and said arm is secured to vertical lever 52 as shown. Lever 52 is secured to shaft 47 by pin 53. Arm 54 is secured to lever 52 where shown and has contact members 55 secured thereto so that said members will be in normal contact with inner surface of cylinder 43.

Referring now to Figure 4, it is clear that pressed upon shaft 47 and integral therewith is large insulating sleeve 57 adjacent lever 52, and having metal band 58 pressed upon sleeve 57. Adjacent to sleeve 57 is small insulating sleeve 59 upon which is pressed metal band 60. Passage 61 extending through lever 52, sleeves 57 and 59 are for the purpose of accommodating wire 62 through both sleeve elements and said lever. One end of said wire is connected to terminal 63 upon band 60. The opposite end of wire 62 connects with terminal 64 upon arm 51.

Member 65 permanently contacts band 58, and wire 66 therefrom leads to push-button make switch 67 and also to motor 1. Member 68 permanently contacts band 60, and wire 69 leading therefrom to radio power supply, also switch 70 where indicated.

With reference to Figures 6 and 11, it is clear that ball bearing 71 is pressed upon shaft 47, and close to said bearing is cam 72 also pressed upon said shaft, and the cam permanently engaging roller 73, said roller is supported by yoke 74 of gear rack 75, and said rack being permanently supported and guided by members 76, said members are fixed with radio chassis A. Gear 77 permanently engages rack 75, and is the gear secured to shaft 77A of variable tuning condenser of the radio apparatus. It is also noted that roller 73 is held in contact with cam 72 by means of spring 73A being connected to ball bearing 71 and to 74.

Referring now to Figures 1, 5, 7, 8, and 9, distributor 17 is pressed upon ball bearing 73 and said bearing is in turn pressed upon horizontal shaft 79. The distributor is anchored to radio chassis A by braces 80 where indicated. Insulating bushing 81 is pressed upon shaft 79 and copper sleeve 14 is in turn pressed upon said bushing. At the opposite end portion of shaft 79 metal sleeve 82 is formed within manually operated knob 83 and is adapted to turn with said knob upon shaft 79. This end of shaft 79 has elongated slot 84 therein and is hollow so as to receive spring 85 against pin 86, said pin is secured to knob 83. Arm 87 is permanently fixed with chassis A and extends outwardly therefrom so as to stop knob 83 from turning, which will be explained later.

Shaft 79 is journaled within roller bearing 88 where shown. Spring steel member 89 is fixed with brace 80 and bears against shaft 79 thus performing as a governor for said shaft.

Ball bearing 90 is pressed upon shaft 79, and ratchet 91 is likewise pressed upon said shaft with pawl pivoted to bearing 90 and engaging said ratchet as indicated, also tension spring 93 for said pawl. Arm 94 is pivoted to bearing 90 and to retracting arm 95, and the latter arm is pivoted to chassis A as at 96. Also spring 97 for arm 95 is provided where shown. It is also noted that magnet 11 is anchored to chassis A by brace 98. Again referring directly to the distributor, contact arm 13 is provided with spring 13A, and is pivoted to the distributor as at 13B.

Referring more particularly to Figure 1, 2, 3, 10, and 13, the mechanism coacting with time clock 5, comprises double spirally grooved spool 99 which is mounted upon horizontal shaft 100,

and said shaft is journaled within the walls of said clock, and having pinion 101 secured thereto and engaging gear 5C upon shaft 5D of the clock mechanism. Disposed above spool 99 and in axial alignment therewith is shaft 102, both ends of which are fixed with the walls of clock 5, said shaft is composed of conductive metal. Also insulating bushings for shaft 102 are provided where shown. Tracer 103 of conductive metal is slidably mounted upon shaft 102, and has depending arm 104 secured thereto, said arm being non-conductive and having metal shoe 105 secured to the lower end thereof, said shoe permanently engages spiral grooves 99A of spool 99. Shaft 102 is provided with a keyway coacting with key within tracer 103 so that said tracer is prevented from turning upon said shaft.

Double metal contact member 106 is secured to insulating bushing 107 and straddles shaft 102 with wire 10 leading therefrom, also wire 9 leading from shaft 102.

With reference to Figure 12 in which appears an enlargement of contact members 15, 55, 65, and 68, each of said members having floating tip within tube 108 and spring 110 acting against said tip. Also contact 111 upon said tube where indicated.

The details of construction of the complete invention having been set forth in the several preceding paragraphs the precise manner in which the same operates immediately follows:

The source of supply of electric current is through wires 3 and 4 to clock 5, and it is assumed that the time desired for various programs to be heard covers a period of from eleven thirty a. m. to three p. m., and this is controlled by starting dial 5A, which is set for eleven thirty, and stop dial 5B is likewise set so as to stop at three p. m., switch 7 is then turned on, and toggle switches 19, 21, 23, 25, 27, and 29 each controls the system so that a program of fifteen minutes may be heard, thus the entire time would be one and one-half hours, however, the clock is set for a period of three and one-half hours, and in this case switch 29 will allow the system to continue until three o'clock, the time set on stop dial 5B. Distributor knob 83 is then set on start.

There are three switches 19, and each of said switches are capable of selecting two broadcasting station, but in the series of switches 19 only one of them may be used to select a single station during the fifteen minute period, and this advantage and operation is identical with switches 21, 23, 25, 27, and 29, however, switch 29 will remain in effect until stopped by dial 5B on clock 5.

The system is now in readiness for operation and will select the particular stations as they have been set according to the programs desired.

When clock 5 reaches the time set on starting dial 5A current passes through wire 6 and switch 7 to wire 3 to contact member 13, and wire 9 to shaft 102, then tracer 103 moves in a horizontal path, and by virtue of depending arm 104 it is adapted to move forwardly or rearwardly through double spiral groove 99A simultaneous with the rotating of spool 99 which is actuated by pinion 101 and clock gear 5C. Tracer 103 is carried the full length of spool 99 and returned every fifteen minutes, and at the expiration of this period said tracer contacts member 106 which passes current through wire 10 operating magnet 11 thereby drawing arm 95 to said magnet and simultaneously rotating ratchet 91 a single notch thereby moving contact member 15 from one of contacts 75

16 to the next one of said contacts. The current flows through arm 13 to 14, 15, and 16 and through wire 18 to switches 19 through any one of said switches being turned on, and from this switch the current flows through the corresponding wire of the wires 20, 33, 35, 37, 39, 41 to the corresponding of trolleys 43, said trolleys normally contact metal cylinder 43 through contact members 55 and arm 54 to 58, 65, and 66 to motor 1 thus operating same rotating shaft 47 moving lever 52 and arm 51 thus lifting the one of trolleys 48 carrying the current to 43 and to motor 1 so as to move this trolley out of contact with cylinder 43, thereby stopping said motor.

During the period in which motor 1 is in operation through shaft 47 cam 72 is rotated thereby moving rack 75 forwardly and rearwardly simultaneously rotating gear 77, said gear being attached to the variable tuning condenser shaft of the radio, thus causing said condenser to operate consistent with the stations selected.

While I have described a particular embodiment of my invention as an example, it will be evident to those skilled in the art that my invention is susceptible of other embodiments, and all such embodiments which are covered by the scope of the appended claims I consider to be within the spirit of the invention.

Having thus fully described my invention, what I claim as new is:

1. In a radio station control system, a shaft, a driving motor therefor, a drum secured thereto, a metal cylinder within said drum and secured thereto, a plurality of trolleys pivoted on the inner surface of said drum and spring means to bias said trolleys against the outer surface of said cylinder, a lever secured to said shaft, an arm cooperating with said trolleys and secured to the end of said lever at right angles thereto, a source of current and a plurality of selectable circuits from said source, through said trolleys and cylinder to said motor whereby, upon energization of one of said circuits through one of said trolleys, said motor moves said lever and arm to a position where said arm moves said trolley out of contact with said cylinder to open said circuit and stop the motor.

2. In a radio control system, a shaft, a driving motor therefor, a drum secured thereto, a metal cylinder within said drum and secured thereto, a plurality of trolleys pivoted on the inner surface of said drum and spring means to bias said trolleys against the outer surface of said cylinder, a lever secured to said shaft, an arm cooperating with said trolleys and secured to the end of said lever and at right angles thereto, a source of current, a large insulating sleeve fixed to said shaft and a first metal sleeve upon said large sleeve, a small insulating sleeve and a second metal sleeve thereon fixed to said shaft and adjacent said large insulating sleeve, said lever and insulating sleeves being provided with a passage extending through said lever and both of said insulating sleeves and parallel to said shaft, so that a wire may pass entirely through all three elements, a contact point upon said lever and a similar point on said second metal sleeve, a first contact member permanently engaging said second metal sleeve, a second contact member permanently engaging said first metal sleeve, and a plurality of selectable circuits from said source, through said trolleys and cylinder to said motor whereby, upon energization of one of said circuits through one of the trolleys, said motor moves said lever and arm to a position where said arm moves said trolley out of contact with said cylinder to open said circuit and stop the motor.

3. In a radio receiver control system, a cam fixed to the shaft of an electric motor, a roller normally engaging said cam, a gear rack and a yoke formed upon one end thereof, said roller operatively supported by said yoke end, a spring secured to aforesaid ball bearing and to said yoke end for purpose of retaining the roller normally in contact with said cam, a gear engaging said rack, said gear secured to shaft of the variable condenser of the radio receiver, and means for securing and supporting said rack on the radio receiver chassis.

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