

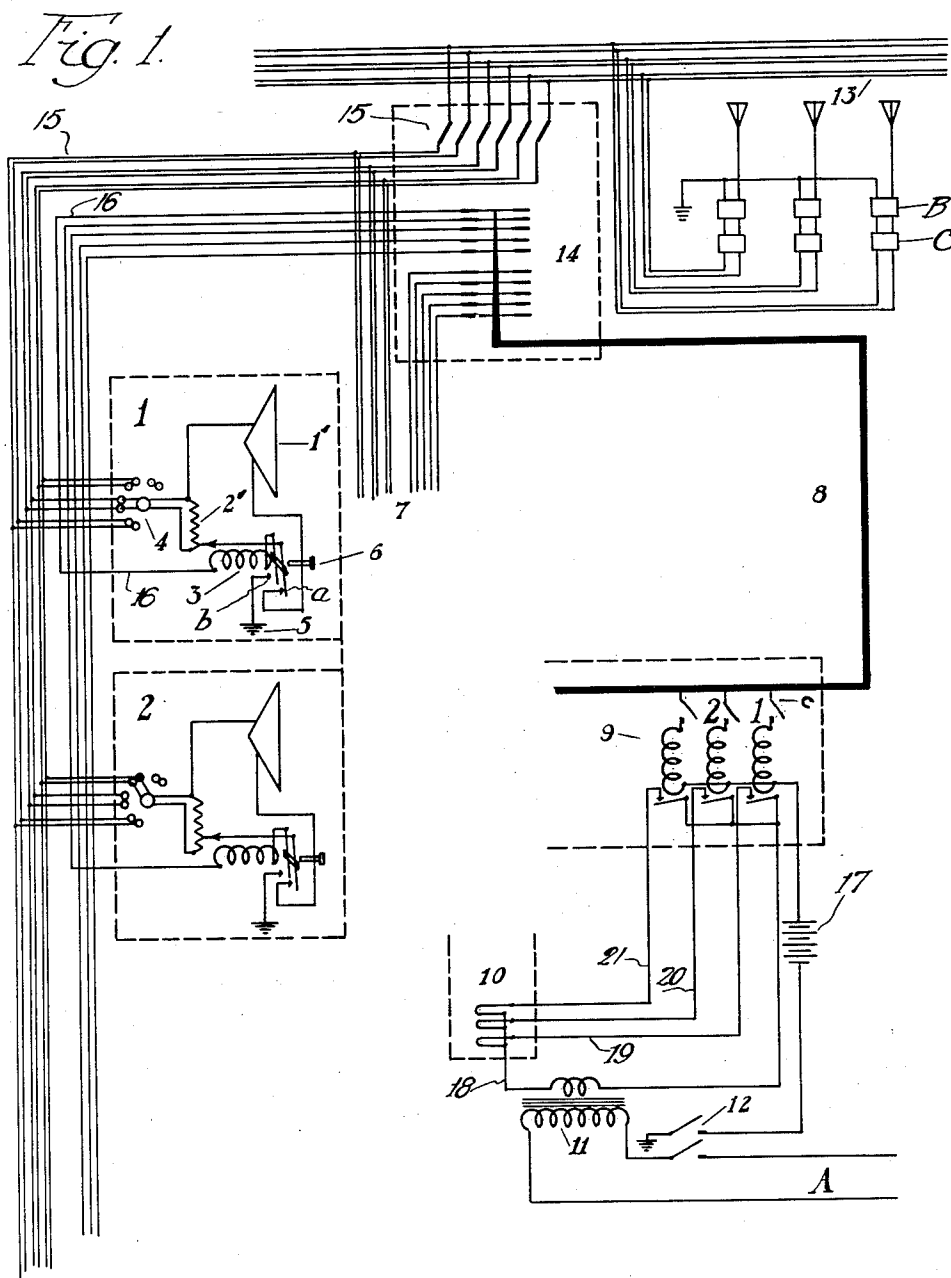
June 25, 1935.

B. E. MORITZ, JR
CENTRALIZED RADIO SYSTEM

2,006,077

Filed Sept. 3, 1932

4 Sheets-Sheet 1



INVENTOR.

Burt E. Moritz, Jr.

BY

Jabel & Banning
ATTORNEYS

June 25, 1935.

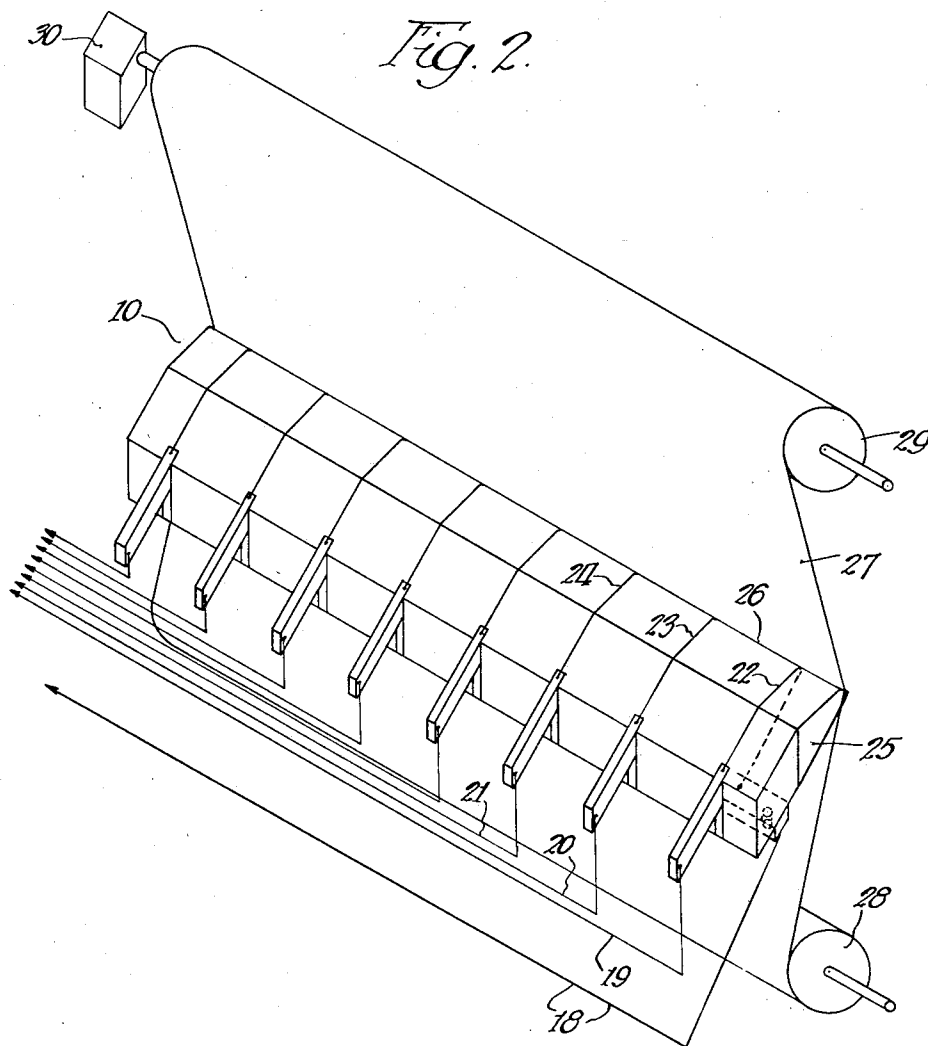
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4 Sheets-Sheet 2



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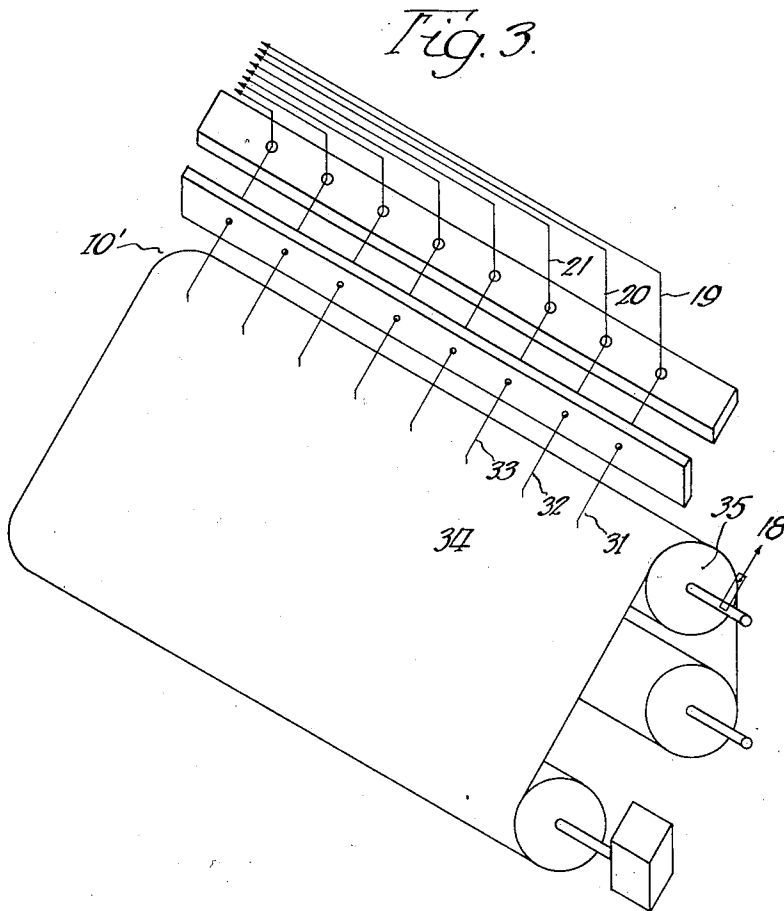
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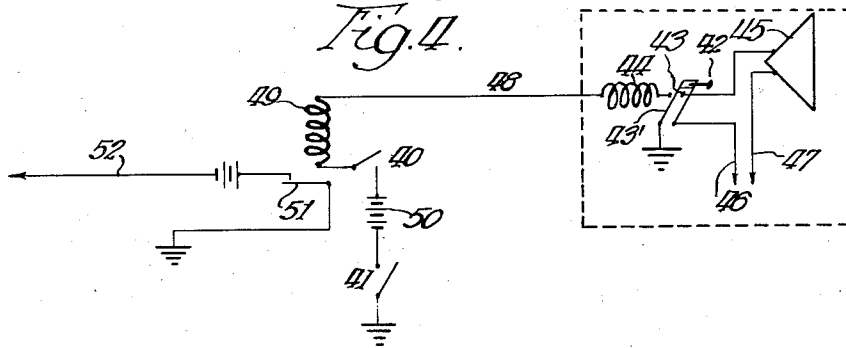
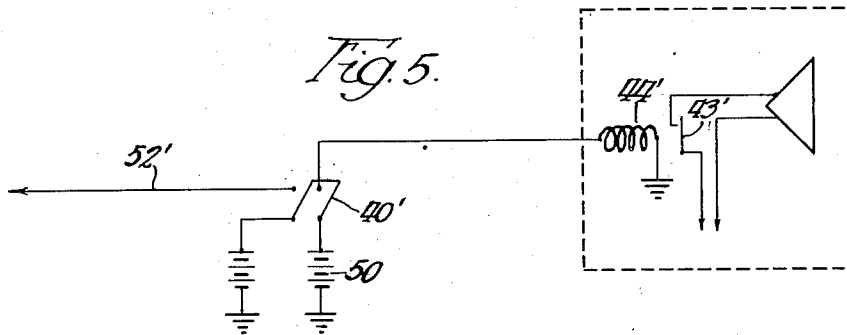
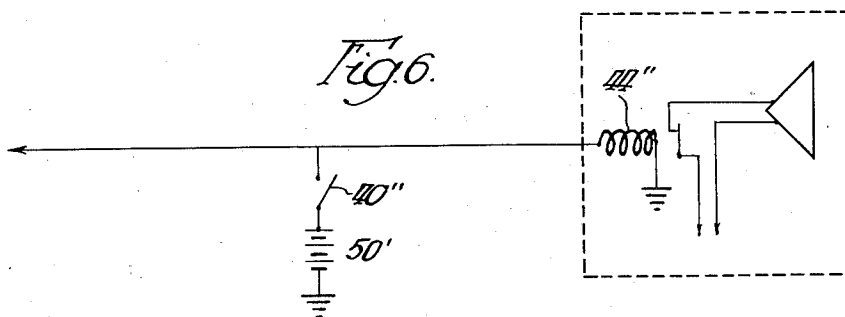
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CENTRALIZED RADIO SYSTEM

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4 Sheets-Sheet 4



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UNITED STATES PATENT OFFICE

2,006,077

CENTRALIZED RADIO SYSTEM

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a corporation of Colorado

Application September 3, 1932, Serial No. 631,695

2 Claims. (Cl. 179—7.1)

My invention relates to a controlling and recording system for supplying radio program and television service or similar information to occupants of hotel rooms, apartments, hospitals, and various offices and rooms in office buildings, banks, factories, and the like.

My invention contemplates the provision of a main distributing station which in the case of radio and television may be the receiving station for receiving broadcast programs in combination with a central control station including a switch arrangement for supplying or cutting off the program service and a recording or metering system for maintaining a permanent record of all service supplied to the various rooms or sub-stations fed from the central station.

More specifically my invention contemplates the provision in combination of a central broadcast receiving station and a multiplicity of individual stations where the programs received by the central station may be used by subscribers together with a central control station embodying a metering system for maintaining a record in permanent form of the individual service delivered to each of the individual stations.

My invention also contemplates as one of its objects the provision of a novel metering system which automatically takes care of the recording of the time service delivered to any individual station.

Other and more specific objects and advantages of the invention will appear as the description proceeds in connection with the accompanying drawings wherein the preferred form of the invention is shown. It is to be understood, however, that the drawings and description are illustrative only and are not to be taken as limiting the invention except in so far as it is limited by the claims.

In the drawings—

Fig. 1 is an assembled view showing diagrammatically the several component parts making up the system;

Fig. 2 is a detailed view in perspective of a metering device employed;

Fig. 3 is a detailed view of a modified form of metering device; and

Figs. 4, 5, and 6 illustrate various forms of connecting means which may be used to connect the individual subscriber's stations to the central control station and the metering device.

Referring now in detail to the drawings, I will describe briefly the different component parts of the main system.

In this system B indicates a series of the broad-

cast receivers directly connected to suitable antennas for receiving broadcast programs. C indicates a plurality of amplifiers for amplifying the programs received by the receivers, these amplifiers being connected individually to the main trunk lines 13 which lead throughout the building to the distribution boxes 14 which are employed to distribute the program to the various lateral or vertical lines leading to the rooms of a floor or to the floor as the case may be. As shown, the control box 14 connects the main trunk lines to the lateral lines as indicated at 15 which lateral lines lead to a plurality of individual stations 1 and 2. In the form shown in Fig. 1, each individual station such as 1 and 2 includes a loud speaker 1', a volume control 2', and a station selector 4 which enables the individual subscriber to select any one of a plurality of receivers B.

Now when the guest wants radio reception from his room unit, he presses the push button 6 which manually operates the armature of relay 3 closing the contacts of this relay. When the relay contacts are closed, the voice circuit to the speaker is closed from the central receiver B through the amplifier, the main trunk line, the auxiliary trunk line, selector 4, the loud speaker, and contacts a of the armature back through the selector 4 to the receiving station B. This puts the speaker into normal operation, and it may be further regulated by the guest to obtain the proper volume by use of the volume control at 2'.

The pushing of the button 6 by the operator also closes the control or metering circuit at contacts b, and relay 3 locks itself energized at this time under control of the switch 12 in the following manner:

The closing of the contacts b completes a circuit from the ground at 5 through the coil of relay 3 and over the control conductors 16 to the main control cable 8 leading from the distribution box 14 then through this main control cable to the repeated relay at 9 corresponding to the individual subscriber's station 1, then to battery 17 and through switch 12 to ground. Energizing of relay 9 closes a circuit through the secondary of the transformer 11 and through the recording unit of the metering device 18 which corresponds to the individual station 1 thus starting the recording of the time the subscriber uses the service. Relay 3 locks itself energized over the path just described and will remain energized until switch 12 is open, or until the contact is broken at c. The switches c are preferably located at the clerk's desk. The subscriber can turn off his local station by using the open set of

contacts on the station selector 4. It is to be understood, of course, that cable 2 is really made up of a plurality of small conductors separately connecting each of the control wires 16 to an individual relay 9 so that the closing of any relay 3 will cause the closing of the corresponding relay 9 to connect up the proper metering unit 10 for that particular subscriber's station. The transformer 11 receives its power over the conductors A from any suitable source of current.

Referring now to Fig. 2 in connection with Fig. 1, it will be noted that the unit 10 shown merely diagrammatically in Fig. 1 consists of a series of heating elements 22, 23, 24, etc. which heating elements are in series with the conductor 18 leading from the secondary of the transformer and such conductors as 19, 20, and 21 leading to the repeater relays 9. These heater units 22, etc. are mounted on a suitable frame member 25 and pass over the edge 26 thereof where they contact with the sensitized record sheet 27. This record sheet 27 is carried on rolls 28 and 29 which rolls are driven by clock mechanism indicated diagrammatically at 30. The heated element 22 oxidizes the emulsion on the roll 27 and thus produces a line on the roll wherever the paper comes in contact with one of the heated elements. The paper 27 is moved past the edge 26 of the member 25 at the rate of about four inches a day or more if desired. Thus a graphic record of the time when a subscriber's station is turned on and off is permanently formed on the paper 27.

In the sensitizing of the paper 27, I preferably use an emulsion solution sensitive to heat which consists of a one per cent solution of sulphuric acid. The paper is first wet with water and the solution is then applied by dipping the paper in the solution as it rolls about a drum. The paper is then dried by passing it over several other rollers which places it in condition for use. The action of the heat when applied to the coated paper is to dehydrate the sulphuric acid and cause it to attack the fiber in the paper and thus make a line that is clearly visible.

I may also use another solution for coating the paper in the same manner which consists of a solution containing one half of one per cent mercuric nitrate and one and one-half per cent glycerin. The paper is prepared in the same fashion as in the case of the sulphuric acid. In this case, however, upon the application of heat to the paper, the mercuric nitrate actually breaks down with heat thus making a color providing a line, and the glycerin merely preserves the paper.

I find that the sulphuric acid solution is more sensitive to heat and, therefore, is better for my purpose as it takes less current in the heating element. In a large installation where a large number of elements are in use, the amount of current used by the metering device becomes an appreciable factor and makes the sulphuric acid treated paper more economical.

Referring now to Fig. 3, I have shown another meter which may be utilized for the same purpose as that shown in Fig. 2. This meter which I have numbered 10' is connected to the wires 18, 19, 20, and 21 in the same fashion as meter 10. In this case, however, the contacts 31, 32, 33, etc. directly engage the paper 34 which is electrically sensitized, and current passes through this paper to the metal roller 35 that is directly connected to the lead 13. The passing of current through the paper at the point of contact causes the formation of a line in the same fashion as described in connection with Fig. 2.

Referring now to Fig. 4, the circuit included within the dotted lines is contained in the subscriber's station, and the remainder of the circuit constitutes the connecting leads and switching devices for the metering apparatus. The switches 40 and 41 are normally closed.

A subscriber desiring broadcast service, presses the button 42 closing the contacts 43 which in turn closes a circuit through the relay 44 and completes the voice circuit through the loud speaker 45 over the leads 46 and 47 which lead to the broadcast receiver such for example at B of Fig. 1. Closing of the circuit at 43 also completes a circuit over conductor 48 through the coil of relay 49, switch 40, battery 53, and switch 41 to ground. The armature 43' of relay 44 is grounded so relay 44 is locked energized at this time. Relay 49 actuates its armature 51 to close the circuit over conductor 52 to the metering device which records the time the station is in use in the manner already described.

The switch 41 is a master switch operated if desired by means of a time clock that is set to open switch 41 at a suitable hour at night and thus prevent all radio service after the hour set by the management of the hotel. The switch 40 at the clerk's desk is used when a man checks out before the end of the day, and there is sufficient time to rent the speaker. This switch 40 is often used when a man decides to change his room and after he has pressed the button 42 of Fig. 4, only occupying the room a short while.

In Fig. 5, this figure differs from Fig. 4 only in the fact that the subscriber must call into the local operator who closes the switch 49' to energize relay 44' and thus give the subscriber radio service. Closing of the switch 49' connects the metering device over the lead 52' and at the same time connects battery 50 to relay 44' to close the armature at 43'' for the subscriber's loud speaker.

Fig. 6 merely shows the same structure as in Fig. 5 with the exception that it uses a single battery 50' and a single pole switch 49'' to set both the subscriber's station and the metering device in operation.

The preferred form of structure is that shown in Figs. 1 and 4, and the wiring devices shown in Figs. 5 and 6 are merely modifications which may be employed.

It is believed to be clear from the foregoing description that I have provided a simple system wherein the individual subscribers may obtain the broadcast service with a minimum amount of difficulty and one in which the metering of the service is automatically taken care of without any operation by either the subscriber or the clerk other than that of merely turning the system on and off and turning on and off the individual subscriber's station. The subscriber turns it on, and the clerk turns it off, only when necessary, before the time clock. In the system shown in Fig. 1, if it is desired to turn off an individual subscriber's station, then it is only necessary for the clerk to open one of the switches c corresponding to the particular station. Switches c are located convenient to the clerk's desk so that she may cut off the individual subscriber's station at the subscriber's request.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A system of the character described comprising a central station having units for re-

ceiving a plurality of programs simultaneously, a plurality of subscriber's stations each including a selector for selectively connecting it to said units, a control connector individual to each subscriber's station for connecting the subscriber's station to the central station, and a metering device actuated by the control connector for recording the time of connection between the subscriber's station and the central station, said selector being operable to temporarily break connection with the central station in transferring the subscriber's station from one unit to another without stopping the metering device.

2. A system of the character described comprising a central station having units for receiving a plurality of programs simultaneously, a plurality of subscriber's stations each including a selector for selectively connecting it to said units, a control connector individual to each subscriber's station for connecting the subscriber's station to the central station, and a metering device actuated by the control connector for recording the time of connection between the subscriber's station and the central station, said control connector including a manually operable means at the subscriber's station for making connection, and holding means common to the subscriber's station, central station connection, and the metering device for maintaining the connection, said selector being operable to temporarily break connection with the central station in transferring the subscriber's station from one unit to another without stopping the metering device.

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