

H55/3

when volume is turned down.

Aug. 23, 1932.

C. H. BERGMANN
PROGRAM SERVICE SYSTEM
Filed Nov. 15, 1930

1,873,813

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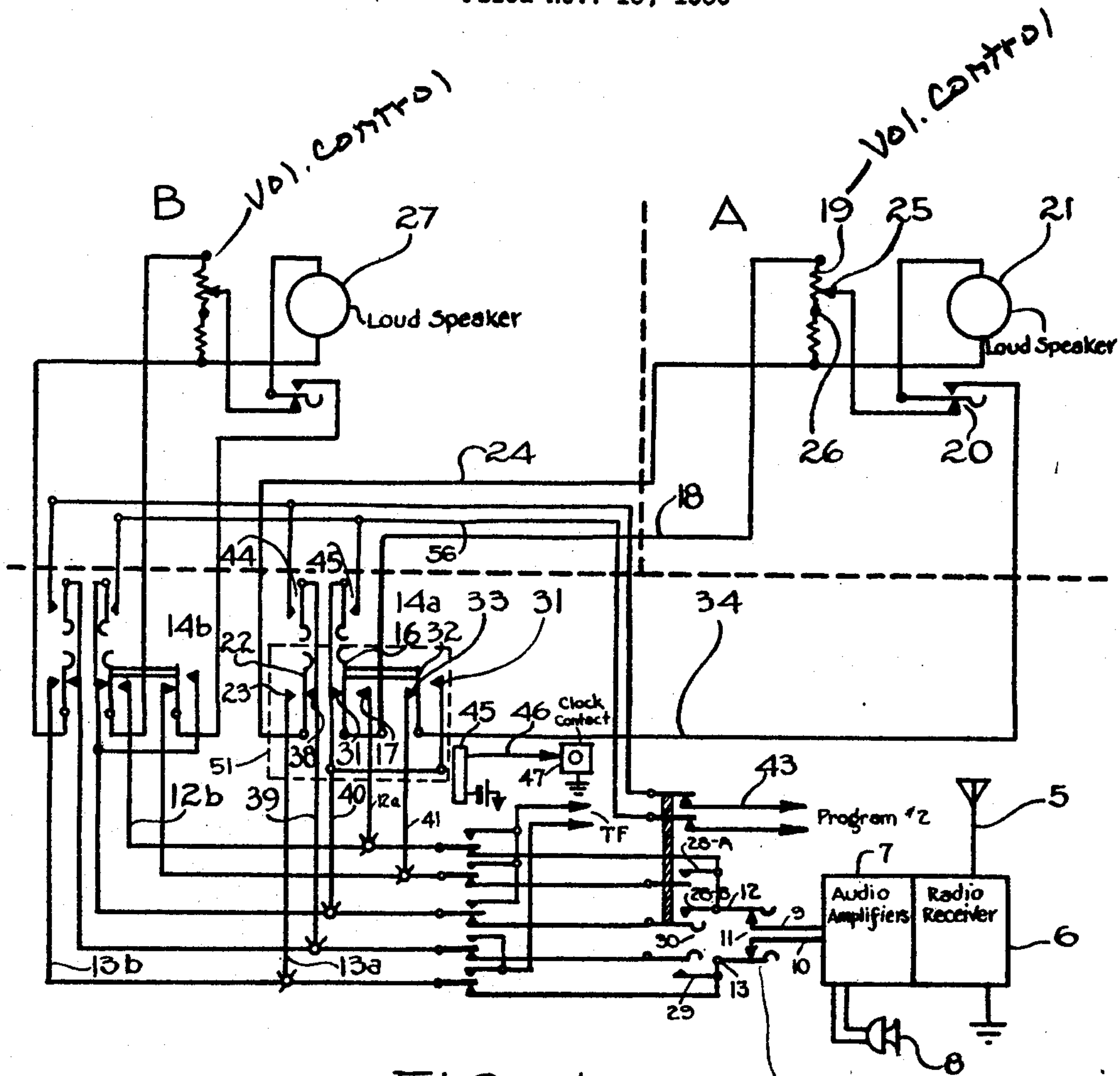


FIG. 1

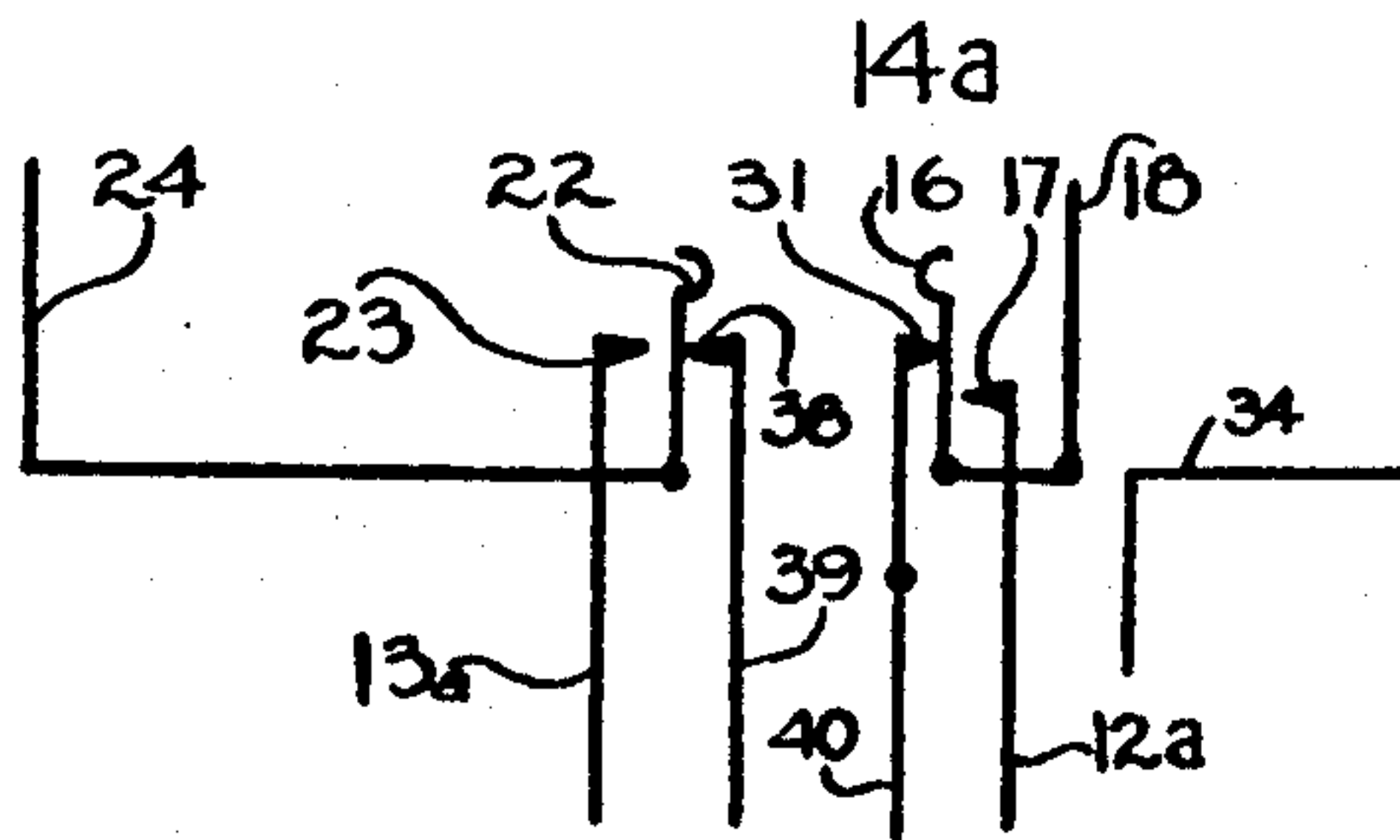


FIG. 2

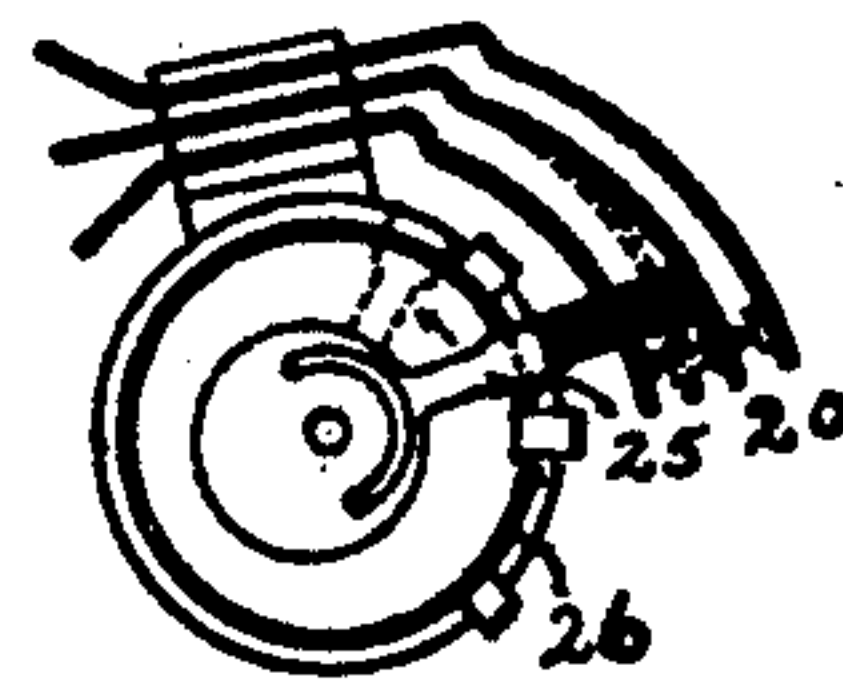


FIG. 3

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PROGRAM SERVICE SYSTEM

Application filed November 15, 1930. Serial No. 495,888.

This invention relates to radio receiving systems and more particularly to systems adapted to transmit programs and announcements to several widely separated loud speakers. It is now the practice where such systems are provided in schools, hospitals, hotels and similar installations to employ a radio receiver and an announcing microphone to transmit programs to the various rooms of the building from a central control room where selected programs are intercepted or originated. Suitable switching means is also provided at the loud speaker in each room whereby the listener may disconnect at will the program being received. However, it is frequently desirable, such as in the case of an emergency, to be able to transmit an announcement to all the rooms even though the switching means thereat has disabled the loud speaker for the normal reception of programs.

In some institutions, particularly in schools, it is customary to give a distinctive signal to mark the termination of certain predetermined intervals of time as measured by a program clock. In the past, it has been the practice to provide at a central point a program clock which is connected by conductors in the form of a bell in each room, which is actuated by the program clock at the end of predetermined time intervals. Thus such a system in addition to the clock and room bells or other signals has required a separate wiring installation for effecting this result.

In accordance with the present invention, a novel circuit arrangement is provided whereby such an emergency announcement may be transmitted to desired rooms and there announced through the loud speaker irrespective of the conditions of the switching means at the associated loud speaker.

In accordance with a further feature of the present invention, a program clock system and a radio signalling system have been combined in such a way that the two systems function satisfactorily together and yet the total wiring is reduced and the installations are simplified. In such an arrangement the need for bells is obviated since the room loud

speakers reproduce the time signals which are transmitted over the wiring network of the radio system.

For a clearer understanding of the invention reference is made to the drawing in which Fig. 1 is a diagrammatic showing of a system embodying the present invention; and Fig. 2 is a different form of the switching means shown in Fig. 1; Fig. 3 is a view of a suitable volume control device.

Referring to Fig. 1 there is diagrammatically represented a program distributing system for schools, hospitals, and the like wherein the portion below the heavy dotted line represents the part of the system located at a central point and wherein the portions of the system above the dotted line and separated by a dotted line represent the parts of the equipment in the individual rooms where the program is to be received. If the system is to be used in a school, the central equipment is preferably located in the principal's office where the distribution of the program to the several rooms is controlled. This central equipment includes an antenna 5 on which broadcast signals or programs are intercepted which antenna is connected to a radio receiver 6 of any well-known type. The out-put of the radio receiver is connected to an audio amplifier 7 capable of developing a large output. An announcing or pick-up microphone 8 is also connected to the input of the audio amplifier 7 or to a separate audio amplifier as the conditions of the installation may require. In this way programs received from the radio receiver and also programs locally picked up by the microphone 8 are introduced into the conductors 9 and 10. In order that the attendant at the central office may cut off the programs thus originated from the distribution system, a cut-off key 11 is provided at the central office whereby the output conductors 9 and 10 are connected to or disconnected from the conductors 12 and 13 by means of this key. These conductors branch off to other conductors 12a, 12b, 13a, and 13b, the continuity of which is controlled at the back contacts and armatures of relay 45. It will be understood that there are as many branches as there are

rooms or outlets to be served from the central equipment.

In such an installation, it is essential that the program may be transmitted to certain of the rooms and not to the others depending on which rooms should receive the program. For this purpose, double-throw keys 14a and 14b are provided in the central office and are so arranged that they remain in the position to which they have been actuated. Branch conductors 12a and 13a of the conductors 12 and 13, when the key 14a is operated to reverse the condition of its contacts, as illustrated, are respectively extended through springs 16 and 17 to conductor 18 and through contacts 22 and 23 to conductor 24; conductor 18 extends the circuit through the volume control device 19, switch contacts 20 to one side of the loud speaker 21, and conductor 24 extends the circuit to the other side of the loud speaker. It should be mentioned that the volume control device 19 is in the form of a rheostat connected after the manner of a potentiometer across the conductors 18 and 24. In this device the movable element or wiper 25 is adapted to move in its off position to the point 26 and when it does so, it reverses the position of the switch 20 to open its normally-closed contacts and close the alternate contact. The connections from the branch conductors 12b and 13b to the loud speaker 27 in the room B are similar to the connections to the room A and, therefore, need not be further described.

When the attendant at the main office desires to distribute a program, for example to room A, the program originating equipment including either the radio receiver 6 or the microphone 8 is connected over the conductors 9 and 10 through the closed contacts of the cut-off key 11, conductors 12 and 13, thence over conductors 12a and 13a (now closed at the back contacts and armatures of relay 45) to the contacts of the key 14a closed at this time, and therefrom over the conductors 24 and 18 to the loud speaker 21. It will be understood that if the person at room A does not wish to receive the program, the volume control device 19 is actuated to move the wiper 25 thereof to position 26 whereby the condition of the switch 20 is reversed. This operation is effective normally to prevent the program from being reproduced through the loud speaker 21.

If at the same time that the switch 14a is operated to close its normally open contacts, the switch 14b is similarly actuated, the program is delivered to the loud speaker 27 of the room B wherein the volume control device can be actuated to prevent the delivered program from being reproduced through the loud speaker 27. It will thus be seen that the central office equipment is arranged to deliver programs to any of the desired rooms A and B and in either of these rooms the

loud speakers 21 and 27 can be disabled for receiving the normal program.

In such a system it is frequently desirable to make an emergency announcement and for this reason the system is so arranged that even if the volume control device, such as 19 in room A, is adjusted so that its wiper is moved to position 26 whereby the loud speaker does not reproduce programs distributed through the normal channels, it will still be possible to make an emergency announcement through its loud speaker and through the loud speakers in the other rooms. This is effected by connecting the conductors 12 and 13 to branches 28A, 28B and 29 which terminate in the contacts of an emergency key generally designated 30. Thus when it is desired to make an emergency announcement in all of the rooms, the emergency key 30 is actuated to close its contacts. Then, in the event that the loud speaker 21 is disabled for normal reception of programs due to the fact that the normally open contact of its switch 20 is closed, and with the key 14a in its actuated condition, the announcement may be transmitted to the loud speaker 21. The circuit for accomplishing this is traceable from the microphone 8, the amplifier 7, conductor 9, cut-off key contacts 11, conductor 12, branch 28B, contacts of the emergency key 30, conductor 40 and thence through the front contacts 31 and 32, conductor 34, normally open contact of switch 20, loud speaker 21, conductor 24, contact springs 22 and 23, conductor 13a, conductor 13, cut-off key 11, conductor 10, to the amplifier 7 and microphone 8. With the key 14a in its normal position as shown, the emergency announcement can be transmitted over conductors 9 and 10, cut-off key 11, conductors 12 and 28A, contacts of key 30, conductor 41, contacts 32 and 33, conductor 34, normally open contact of switch 20, loud speaker 21, conductor 24, contacts 22 and 38, conductor 39, lowermost contact of the emergency key 30, conductor 29 and thence to the common conductor 13. From the foregoing, it will be seen that an emergency announcement can be transmitted to any of the loud speakers in the several rooms irrespective of the condition of the volume control and disabling device thereat, and independently of the actuated or normal-condition of the keys 14a and 14b.

The system of Fig. 1 is also arranged so that a second program may be provided for the several rooms. The program source No. 2 as in the case of program No. 1, includes a radio receiver provided with an antenna system, an audio amplifier and a pick-up microphone, although it has not been deemed necessary to duplicate the showing of this equipment in the present disclosure. In the operation of this system, if it is desired to make program No. 2 available to the loud speaker

in room A, the double-throw key 14a is moved to close its upper set of contacts, in which case the program is transmitted over conductor 43, uppermost normally closed contact of the emergency key 30, key contacts 44, and contacts 38 and 22 in normal condition, conductor 24, loud speaker 21, normally closed contacts 20, contact 25 and winding of the resistor 19, conductor 18, key contacts 16 and 31, key contacts 45, conductor 56, through the closed contacts of the key 30 to the other side of the program source.

The present system is also arranged to provide a program clock service by which the termination of predetermined time intervals may be indicated by a tone or other signals in the loud speakers 21 or 27 of the several rooms in accordance with the setting of a program clock diagrammatically indicated at 47. Such a clock, as is well-known, is arranged to close electrical circuits at predetermined times and thereby actuates a relay 45 which attracts its armature. At the front contacts and armatures of this relay, a source of tone frequency TF is connected to the several conductors leading to the various rooms wherein this tone frequency actuates the loud speakers located thereat to give a distinctive signal. It will be understood that the present system may be used with or without the program clock service and in the event that it is desired to omit the service, the clock 47, together with the relay 45 is omitted and the system then operates merely for the distribution of programs in the manner previously set forth.

The modified form of switching means shown in Fig. 2 may be substituted for the contacts of key 14a, enclosed within the dotted rectangle, and may also be substituted for the corresponding contacts of the switching key 14b. When this modified form of switching means is used, the second program source together with the conductors 43 and 46 and the contacts of keys 14a and 14b above the dotted rectangle will be omitted. The switching means of Fig. 2 performs substantially the same functions as the corresponding means of Fig. 1 but permit a reduction in the number of switch contacts employed.

The present disclosure is merely typical of applicant's invention and there may be many modifications and variations thereof within the scope of the following claims without departing from the spirit of the present invention.

What I claim is:

1. In a program distributing system, a central station having a source of programs, a plurality of rooms each provided with a loud speaker, means for connecting the program source to any loud speaker in any room, means in each room to normally disable its associated loud speaker from receiving programs from said source, and means includ-

ing a portion of said first means located at the central station for transmitting signals to said loud speakers irrespective of the condition of said disabling means.

2. In a program distributing system, a program source, a plurality of rooms each provided with a loud speaker, switching means and conductors for transmitting signals from said program source to any desired loud speaker, switching means associated with each loud speaker for preventing said loud speaker from reproducing signals normally transmitted thereto, and a transmission path which may be completed to said loud speakers from said program source irrespective of the condition of their related switching means.

3. A program distributing system having a plurality of loud speakers widely separated with respect to each other, a plurality of sources of programs, switching means at a central point for connecting any desired program source with any loud speaker, means at each loud speaker for normally disabling the same for the normal reception of programs, and means common to a plurality of loud speakers for controlling the transmission of an emergency signal to said loud speakers irrespective of the condition of their disabling means.

4. In a program transmission system, a central station provided with a radio receiver, a plurality of rooms each provided with a loud speaker, transmission paths from said radio receiver to said loud speakers including a pair of common conductors and a plurality of pairs of branch conductors leading therefrom, the loud speaker in each room being connectible to a pair of branch conductors, switching means associated with each loud speaker for disabling it for the normal reception of programs over its pair of branch conductors, and means including an emergency circuit and an emergency key for connecting said common conductors to a loud speaker independently of said disabling means, said emergency circuit including at least one of said branch conductors.

5. In combination with a program distributing system comprising a plurality of loud speakers widely separated with respect to each other, a program source and conductors for linking said program source to said loud speakers, a source of time signals, and means including a program clock for connecting said time signals to said loud speakers over said conductors.

6. In combination with a program distributing system comprising a plurality of loud speakers widely separated with respect to each other, conductors for connecting a program source to the loud speaker in any room, means in each room for normally disabling its associated loud speaker from receiving programs from said source, means including

certain of said conductors for transmitting signals to said loud speakers irrespective of the condition of said disabling means, a source of time signals, and means including

5 a program clock for connecting said time signals to said loud speakers over certain of said conductors.

7. In a program distributing system, a central station having a source of programs, a

10 plurality of signal reproducers remotely placed with respect to one another, means for connecting said program source to desired signal reproducers, means associated with

15 each signal reproducer operating normally to disable said signal reproducer from reproducing signals from said source, and means including said disabling means for transmitting signals to said signal reproducers irrespective of the condition of said dis-

20 abling means.

8. In a program distributing system, a central station having a source of programs, a plurality of signal reproducers remotely placed with respect to one another, three con-

25 ductors only connecting said central station and a signal reproducer, means including two of said conductors for connecting the program source to any signal reproducer for the normal reproduction of programs, means as-

30 sociated with each signal reproducer operating normally to disable its related signal reproducer from receiving programs from said source, and means including one of said last-

35 mentioned conductors and said third conductor for connecting said program source to said signal reproducer when said disabling means is in condition normally to disable its signal reproducer.

9. In a program distributing system, a

40 central station having a source of programs, a plurality of signal reproducers remotely placed with respect to one another, conducting channels connecting said program source with said signal reproducers, means at said

45 central station for disabling any signal reproducer, means associated with each signal reproducer operating normally to disable the same, and switching means at a central point common to a plurality of signal reproducers

50 for controlling the transmission of an emergency signal to said signal reproducers irrespective of the condition of all of said mentioned disabling means.

10. In a program distributing system, a

55 source of programs, a plurality of signal reproducers remotely placed with respect to one another, a central switching station common to and remotely placed with respect to said signal reproducers for connecting said pro-

60 gram source to desired signal reproducers, means associated with each signal reproducer operating to disable the same for the normal reception of programs from said source, switching means at said control station for

65 controlling the transmission of an emer-

gency signal to all of said signal reproducers irrespective of the condition of their respective disabling means.

11. In a program distributing system, a plurality of program sources, a plurality of

70 signal reproducers remotely placed with respect to one another, means including a control station common to and remotely placed with respect to said signal reproducers for connecting desired program sources to a de-

75 sired signal reproducer or signal reproducers, disabling means associated with each signal reproducer operating normally to disable the same, and switching means at said control station for controlling the transmission of an

80 emergency signal to said signal reproducers irrespective of the connection of a program source thereto and irrespective of the condition of their respective disabling means.

12. In a program distributing system, a

85 central station having a source of programs, a plurality of signal reproducers remotely placed with respect to one another, means for connecting said program source to a desired signal reproducer, a combined volume control

90 and switching device associated with each signal reproducer whereby the volume of signal reproduced through said signal reproducer may be regulated and whereby said signal reproducer may be disabled for the

95 normal reception of signals, and means including said device for transmitting signals to the related signal reproducer irrespective of the condition of said device.

In witness whereof I hereunto subscribe

100 my name this 7th day of November, A. D. 1930.

CHARLES H. BERGMANN.

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