

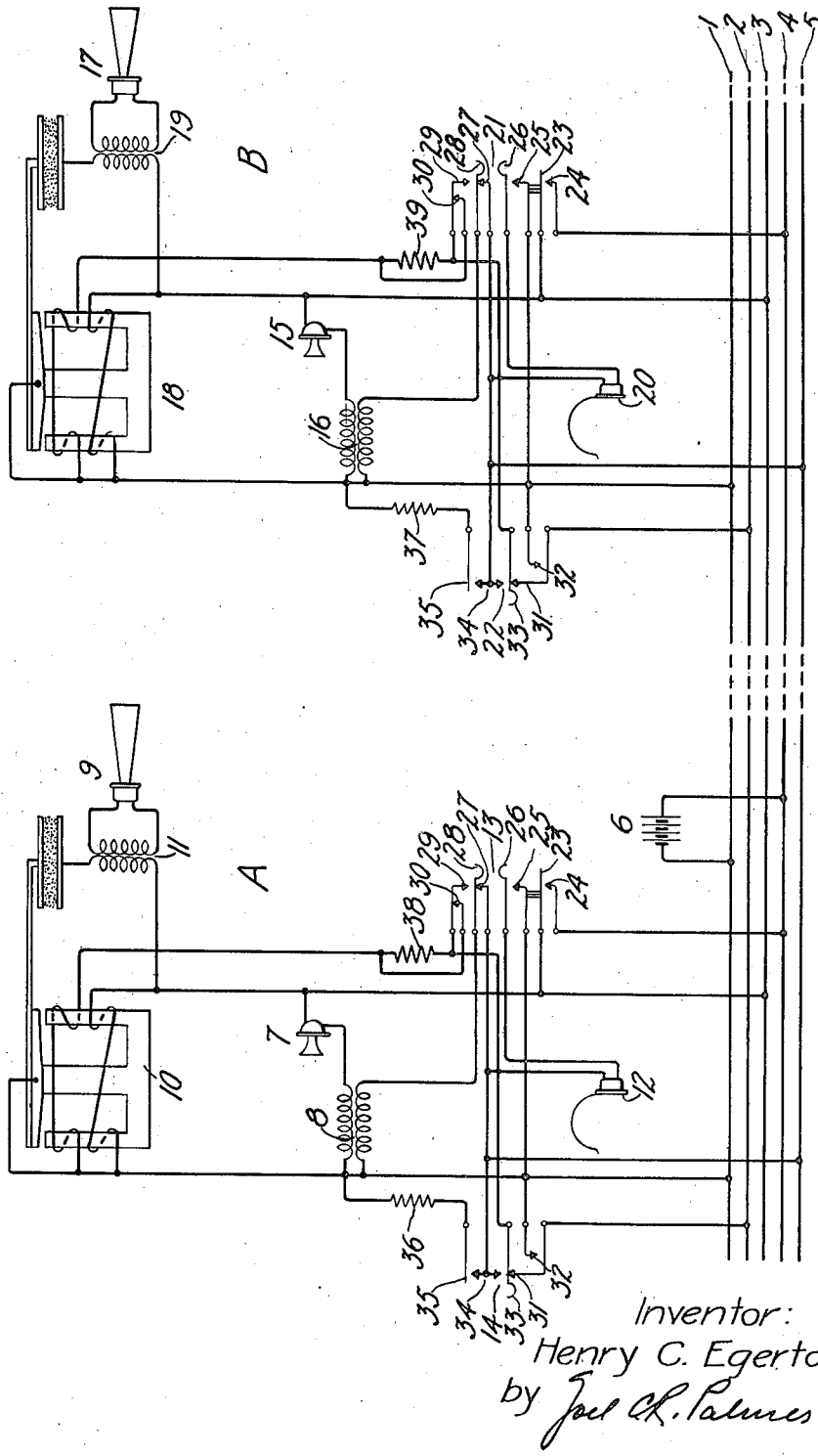
March 18, 1924.

1,486,868

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INTERCOMMUNICATING TELEPHONE SYSTEM

Filed May 27, 1920



## UNITED STATES PATENT OFFICE.

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## INTERCOMMUNICATING TELEPHONE SYSTEM.

Application filed May 27, 1920. Serial No. 384,537.

*To all whom it may concern:*

Be it known that I, HENRY C. EGERTON, a citizen of the United States, residing at Maplewood, in the county of Essex and State of New Jersey, have invented certain new and useful Improvements in Intercommunicating Telephone Systems, of which the following is a full, clear, concise, and exact description.

10 This invention relates in general to telephone systems and especially to intercommunicating systems.

The invention is applicable to paging or announcing systems about hotels, warehouses, factories or the like, where it is of advantage to use an alternative system for loud speaking or private communication.

15 The object of the invention is to provide an intercommunicating telephone system which may be used for the purpose of announcing from any station or for private conversation between stations.

In accordance with this invention in its preferred form, a plurality of similar stations are bridged to a number of common feeder lines or wires and provided with switching means to connect a common battery source. Each station is provided with a telephone transmitter, a head receiver and a loud speaking receiver. Additional switching means is located at each of the stations, which, when operated at any two or more stations, cuts off the loud speaking receivers of all stations and permits persons at such stations where the switches are operated to carry on a private conversation between stations.

20 The invention may be more completely understood by referring to the drawing which shows it in its preferred form. The system comprises a plurality of similar stations, of which station A and station B only are shown.

Five common conductors are provided as follows: a common lead 1, a talking lead 2, a battery feed lead 3, a battery supply wire 4, a talking lead 5.

25 A common battery supply 6, is bridged across leads 1 and 4 for the purpose of supplying energizing current to the various stations.

Station A comprises a transmitter 7, an induction coil 8 associated therewith, a loud speaking receiver 9, a mechanical amplifier

10, which, through the induction coil 11, transmits speech current to the loud speaking receiver 9, a head receiver 12, a switch 13 and a switch 14.

Station B likewise consists of a transmitter 15, an induction coil 16 associated therewith, a loud speaking receiver 17, a mechanical amplifier 18 associated therewith through the means of induction coil 19, a head receiver 20, a switch 21 and a switch 22. A transmitter 7 with its associated induction coil 8 is bridged to the leads 1 and 3, and the energizing winding of the mechanical amplifier 10 is likewise bridged to the leads 1 and 3. Similarly at station B, the transmitter 15 and the induction coil 16 are bridged to leads 1 and 3, and the energizing winding of the mechanical amplifier 18 is also bridged to the leads 1 and 3. The switch keys 13 and 21 are provided with two contacts 23 and 24, which contact when the keys are operated to connect the battery supply lead 4 with the battery feed lead 3. Thus, when key 13, or key 21, or keys corresponding thereto and at the other stations are operated, battery current is supplied to the transmitters and mechanical amplifiers of all the stations in the system. Keys 13 and 21 are provided with contacts, 25, 26, 27, 28, 29 and 30 whose functions will later become evident from the description of the operation of this circuit. Keys 14 and 22 are provided with contacts 31, 32, 33, 34 and 35, whose function will also be described hereinafter.

When a party at station A desires to communicate with a party at any other station, he operates key 13 which closes the contacts 23 and 24 to supply current to the entire system, as before described. Voice currents produced in the transmitter 7 are reproduced in the secondary winding of the induction coil 8 and take the following path: secondary of induction coil 8, contacts 28 and 29 of the key 13, contacts 33 and 31 of the key 14, lead 2, contacts 31 and 33 of the key 22, operating winding of mechanical amplifier 18, lead 1 to secondary winding of induction coil 8. The alternations in the operating winding of amplifier 18 cause oscillations in the armature and the current flowing from the lead 1 through the carbon button of amplifier 18, primary winding of the induction coil 19 to lead 3, contacts 23

and 24 of the key 13 to the lead 4 and battery supply 6, reproduces these voice currents in the secondary winding of the induction coil 19 and the loud speaking  
5 receiver 17.

In answering back at the transmitter 15, the voice currents reproduced in the secondary of the induction coil 16 take the following path: secondary winding of the induction coil 16, contacts 28 and 27 of key  
10 21, lead 5, receiver 12, contacts 26 and 25 of key 13, lead 1, through the secondary winding of the induction coil 16. The breaking of contacts 29 and 30 of key 13  
15 opens the short circuit around a resistance 38, placing resistance 38 in series with the operating winding of the mechanical amplifier 10 by cutting down the volume of tone through this amplifier.

Should it be desired to hold a private conversation between any two stations, A and B, of the system, keys 13, 14, 21 and 22 are operated. The head receivers are then used at both stations. The speech currents from  
25 transmitter 7 of station A follow the following path: secondary winding of the induction coil 8, contacts 28 and 29 of key 13, contacts 33 and 34 of key 14, lead 5, receiver 20, contacts 26 and 25 of key 21, lead  
30 1, through the secondary of induction coil 8. The resistance elements 36 and 37 are shunted across the leads 1 and 5 by the operation of the keys 14 and 22 respectively, in order to cut down excessive transmission  
35 when only the two stations A and B are carrying on a private conversation.

Contacts 32 and 31 operate to connect the leads 1 and 2 thereby short-circuiting the mechanical amplifiers and preventing their  
40 operation.

What is claimed is:

1. In a telephone system having a plurality of stations, switching means provided at each station, to simultaneously connect said  
45 station in intercommunicative relation with every other station, and additional switching means at each such station to exclude from intercommunicative relation all of such stations where the said additional switching  
50 means is not operated.

2. In a telephone system, a plurality of stations, a plurality of common conductors therefor, a source of current, switching means provided at each station to connect  
55 said station in intercommunicative relation with every other station, and additional switching means at each such station to exclude all of such stations where the said additional switching means is not operated.

3. In a telephone system, a plurality of stations, each station comprising a telephone transmitter, a loud speaking receiver, and a head receiver; a common source of current;  
60 a plurality of conductors common to all stations; and switching means provided at each

station to simultaneously connect said station in intercommunicative relation with all the other stations.

4. In a telephone system, a plurality of stations, each station comprising a telephone  
70 transmitter, a loud speaking receiver and a head receiver; a common source of current; a plurality of conductors common to all stations; switching means provided at each station to simultaneously connect said sta-  
75 tion in intercommunicative relation with all other stations; and additional switching means to exclude all of such stations where said additional switching means is not operated.

5. In a telephone system, a plurality of stations, each station comprising a telephone transmitter, a loud speaking receiver and a head receiver; a common source of current;  
80 a plurality of conductors connecting said stations; switching means provided at each station cooperating with the said conductors to connect simultaneously any one station in intercommunicative relation with all  
85 other stations.

6. In a telephone system, a plurality of stations, each comprising a telephone transmitter, a loud speaking receiver and a head receiver; a common source of current; a  
90 plurality of conductors connecting said stations; switching means provided at each station cooperating with the said conductors to connect simultaneously any one station in intercommunicative relation with all  
95 other stations; and additional switching means to exclude all of such stations where the additional switching means is not operated.

7. In a telephone system, a plurality of stations, each comprising a telephone trans-  
100 mitter, loud speaking receiver means and a head receiver; a common source of current; a pair of conductors therefor common to all such stations; a conductor common to all stations and adapted, when connected with  
110 such battery source, to supply such current to each of the said stations; switching means at each station to establish such connection; transmission conductors common to all such stations; and other switching means at each  
115 station to connect simultaneously any one station in intercommunicative relation with all other stations.

8. In a telephone system, a plurality of stations, each comprising a telephone trans-  
120 mitter, loud speaking receiver means and a head receiver; a common source of current, a pair of conductors therefor and common to all such stations; a conductor common to all said stations and adapted, when connected with such battery source, to supply  
125 such current to each of the said stations; switching means at each station to establish such connection; transmission means common to all said stations including a con-  
130

ductor; an additional conductor associated with the head receiver of each station; other switching means at each station to connect the transmitter of any one station in talking relation with the loud speaking means of the other stations and to connect the transmitters of the said other stations in talking relation with the head receiver of the said one station; and additional switching means to connect the head receivers and the transmitters of all stations in talking condition where all said switching means are operated.

stations each having a loud speaking receiver, a head receiver and a transmitter, and means at each station for connecting the loud speaking receivers at all other stations in communicative relation with the transmitter of the station where such means is operated, and to associate the head receiver of such station in communicative relation with the transmitters of all the other stations.

In witness whereof, I hereunto subscribe my name this 22nd day of May, A. D. 1920.

9. In a telephone system, a plurality of

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