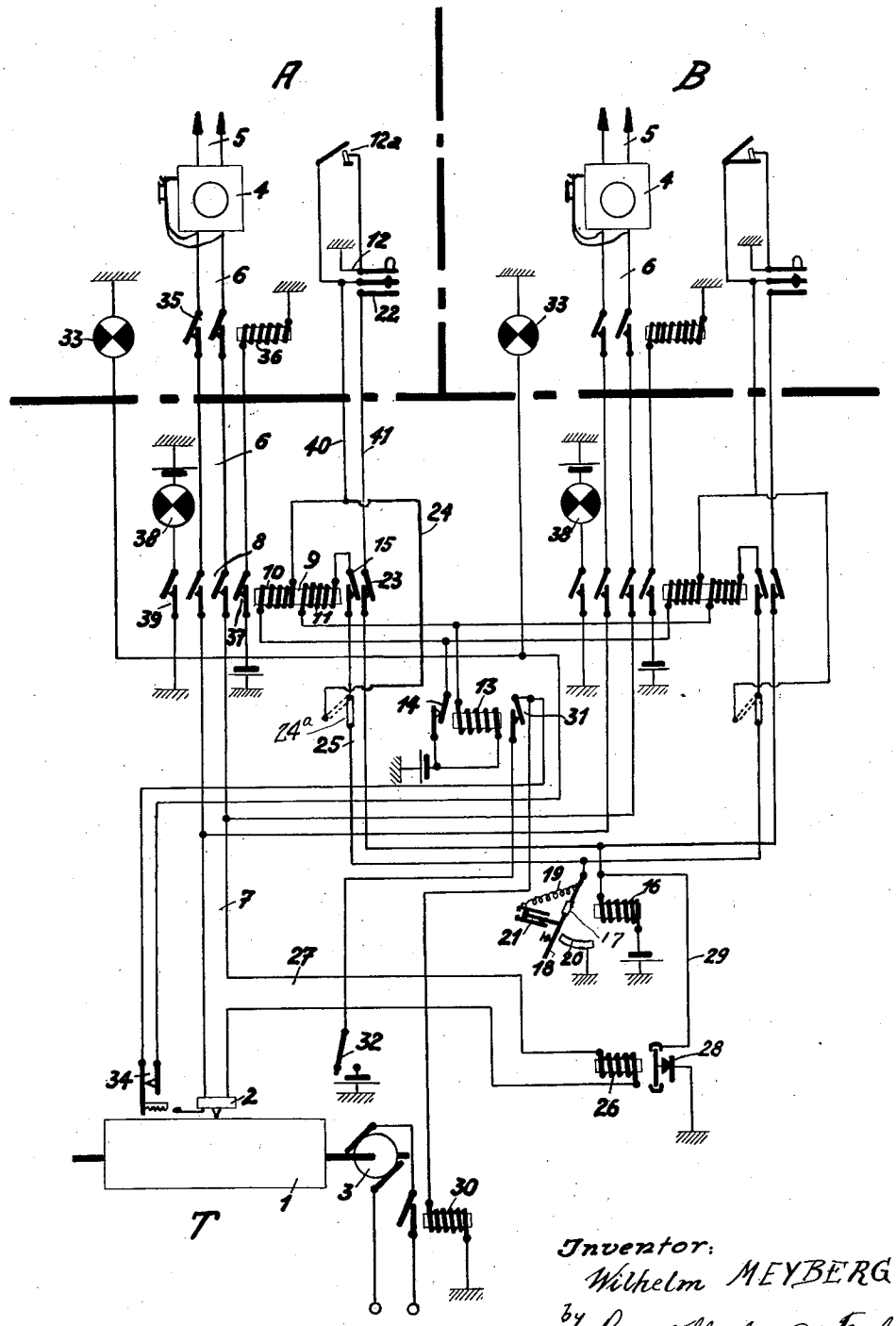
Aug. 25, 1925. 1,551,319

W. MEYBERG

TELEPHONIC WAVE RECORDER SYSTEM

Filed Dec. 19, 1924



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Patented Aug. 25, 1925. 1,551,319

UNITED STATES PATENT OFFICE.

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TELEPHONIC-WAVE-RECORDER SYSTEM.

Application filed December 19, 1924. Serial No. 756,878.

To all whom it may concern:

Be it known that I, WILHELM MEYBERG, a citizen of the German Empire, and residing at Berlin, Brucken Allee 30, Germany, have invented certain new and useful Improvements in Telephonic-Wave-Recorder Systems, of which the following is a specification.

This invention relates to a telephonic wave recorder system in which a telephonograph or telephonic wave recorder can be connected in circuit with any of a number of telephone stations or transmitting instruments and which is provided with means for preventing more than one station at a time from being connected to the telephonograph. A switching device such as a relay or step-by-step switch is provided with each telephone station and is controlled at the latter so as to effect the connection with the telephonograph. Another feature of the invention consists in a common relay which prevents a second telephone instrument from being connected to the telephonograph or from stopping the operation of the latter or from interfering in any way with a connection that is already established with another station. Other features of the invention by which the operation and manipulation of the system from the telephone instruments are facilitated will appear more fully hereinafter in the description of the drawing which shows an embodiment of the invention.

In this drawing two telephone stations or instruments A and B are shown which may be connected to the telephonograph T. The telephonograph is represented merely by a diagrammatic showing of a cylindrical record 1 and a sound box or voice wave impression maker 2. Any form of record 1 can of course be employed. The record of the telephonograph is driven by a motor 3. The telephone stations each comprise a telephone instrument 4 of any preferred kind. In cases in which the system is to be used merely for recording dictated messages, letters or the like, the telephone instrument 4 may consist of a telephonic transmitter only. In the case of telephone instruments that are used for telephone conversations each instrument has a telephone line 5 for ordinary telephonic conversations. A separate line 5 may be run from each station A, B etc. to an exchange but, if desired, each instrument may be provided with means for intercommunicating directly with other stations. The telephonograph line 6 of each station or instrument 4 is connected to the sound box or sound impression maker 2 of the telephonograph by contacts 8 of a switching device which may consist of a relay 9 or any other suitable form of switch such as a selector switch of the kind employed in automatic telephone systems. Generally speaking, any number of switching devices 8 may be provided for connection to the telephonograph T. The number of switching devices may, however, be reduced if selector switches or the like are employed for establishing the connections to the telephonograph. Each relay 9 has two windings 10 and 11, the winding 10 being energized by a switching function performed by the user of the telephone instrument 4 while the winding 11 acts as a holding or locking winding. The energizing winding is energized through a key switch 12 or the like. In addition to the hand-operated switch 12 a foot-operated switch 12^a may be provided, these two switches being connected in parallel, so that either of them may be used to close the circuit. When a relay 9 responds to the closure of its exciting circuit a relay 13 common to all of the relays 9 is actuated and opens a contact 14 which disconnects the battery current from the exciting circuit of all the relays 9. By this means only one relay at a time is enabled to effect a connection of its associated telephonograph line to the telephonograph. The circuit of the relay 13 is closed by a contact 15 on a relay 9, this circuit extending from earth through the switch 12, wire 40, wire 24, switch 24^a (the latter at this time being in the position indicated by a dotted line), contact 15, windings 11 and 13 to the battery.

With the arrangement described in the preceding paragraph the connection between the telephone instrument 4 and the telephonograph will only be maintained as long as the switch 12 is kept in its operated position. As this is rather inconvenient it is preferable to have an arrangement in which it is only necessary to depress the button 12 to bring about a condition in which the connection is maintained automatically, as by a relay that maintains the connection for a considerable period after it has been once actuated. This operation may be performed

by a time relay 16. When this relay is in its normal position its armature 17 rests against a stop 18. When the relay 16 is energized the armature 17 is attracted against the action of a spring 19 and closes a circuit through a contact strip 20. When the relay 16 is de-energized a dash-pot 21 prevents the armature 17 from being immediately restored by its spring 19 and the armature moves back slowly and in so doing maintains a connection through the long contact 20 for a considerable period. When the relay arrangement is to be used, the switch 24[a] is placed in the position indicated by a full line.

The circuit including the winding of the slow-acting relay 16 is prepared at the sub-station or telephone instrument by the closure of a contact 22 associated with the switch 12 and it is finally closed by a contact 23 of the relay 9. The object of this arrangement is to prevent the slow-acting relay 16 from being energized from any sub-station except the one connected to the telephonograph. When a slow-acting relay 16 as shown is provided the circuit of the relay 13 and of the locking winding 11 of the relay 9 does not extend to earth through the wire 24 but through the wire 25 and through the armature 17 and long contact 20 of the time relay 16.

As the slow-acting relay only keeps its armature attracted for a certain time after it is de-energized it is necessary to close the switch 12 at the sub-station repeatedly to maintain the connection. This drawback can, however, be removed by arranging the energizing circuit of the slow-acting relay 16 to be closed and opened by a relay that responds to the voice currents sent from the sub-station to the telephonograph. A relay of this kind is indicated at 26. The winding of this relay 26 is connected by wires 27 in the circuit of the sound wave impression maker or sound box 2. The voice currents passing through the relay 26 affect the contact 28 so that a current is caused to flow from the battery to the winding of the relay 16, wire 19, contact 28 to earth. When the line 7 is not being used and no voice currents flow through the winding of relay 26 the contact 28 will interrupt the energizing circuit of relay 16, or present a very high resistance therein. Relays of the kind illustrated at 26, which are sometimes called phonic relays, are well known, so that a detailed description of the same herein is unnecessary.

The motor 3 for driving the telephonograph T is switched on by a relay 30 that receives energizing current through a contact 31 of the relay 13. The contact 31 also closes the circuit of visual signals 33 arranged at the different sub-stations. These signals are intended to give an indication at the sub-stations that the telephonograph T is operating. In the common circuit of the signals 33 and the relay 30 there is provided a switch 32 for putting the telephonograph out of operation, as for example at times when the cylinder or record of the telephonograph has to be renewed. If at such a time a sub-station attempts to establish a connection with the telephonograph its signal 33 is prevented from operating, because the switch 32 is open and the user of the sub-station will then know that the telephonograph is inoperative. In the circuit of the signals 33 there is a contact 34 placed in the path of the sound box 2 and adapted to be transitorily opened by the latter and to thus cause the signals 33 to flutter shortly before the record 1 is used up. This arrangement is intended to advise the sub-station user of the fact that the record will soon be used up and that there is only a small amount of surface left for recording his speech on the cylinder.

Associated with each sub-station or line 6 is a double pole switch 35 which may be constructed in the form of a relay 36 that only extends the line 6 to the line 7 leading to the telephonograph when the user of the sub-station actually desires the conversation to be recorded on the telephonograph. By this means disturbances due to branch circuits are avoided in conversations through the central telephone exchange.

The relay 36 is energized by the closure of a contact 37 on relay 9. As this relay is energized when a sub-station is connected to the telephonograph it can be conveniently employed for the purpose of closing the circuit that extends back towards the sub-station to the relay 36 and that effects the extension of the line 6 to the telephonograph. When the switch 12 or the foot-operated contact 12[a] is arranged to be kept depressed for the purpose of connecting to the telephonograph the contacts 35 may be combined with the switch 12 or the foot-operated contact 12[a]. The position of the supervisor, one of whose duties is to replace the records of the telephonograph T when they are used up, is provided with visual signals 38 which indicate which of the sub-stations is connected to the telephonograph. The signals 38 are operated by the closure of contacts 39 of the relays 9. By the visual signals the supervisor can identify the section of the conversation record that has been produced by any certain sub-station and is thus enabled to make corresponding notes on the telephonograph or its cylinder. The mode of operation of the system is as follows:

When a record has been placed by the supervisor on the telephonograph T the latter can be made ready for operation by closing the switch 32. If now a sub-station, as A, is

being used for a conversation over line 5 with some other distant sub-station and a part of the conversation is to be recorded by the telephonograph T the switch 12 or 12^a is closed so as to establish a circuit from earth through 12, wire 40, energizing winding 10 of the relay 9 associated with the sub-station A, contact 14 of relay 13 to the battery. The relay 9 responds and at its contact 15 closes a locking circuit. If no slow-acting relay 16 is provided, the locking circuit extends from earth through switch 12, wires 40 and 24, contact 15, locking winding 11 of relay 9, relay 13 to the battery. The relay 13 responds and at contact 14 it opens the battery lead for all other relays 9 so that no other sub-station can cause its associated relay 9 to be energized. By this means a second sub-station user is prevented from connecting his telephone to the telephonograph or from stopping the telephonograph after it has been connected to a sub-station or from disturbing an existing connection in any other way.

In systems in which the slow-acting relay 16 is provided this relay is energized when the switch 12 is closed so that current flows from earth through switch 12, wire 41, contact 23 of relay 9 and the winding of the relay 16. The locking circuit of relay 9 will in this case extend from earth through the long contact 20 of the slow-acting relay 16, armature 17, wire 25, contact 15, locking winding of relay 9, winding of relay 13 to the battery. In other respects the operation is as already described above. If the arrangement is also equipped with a phonic relay 26 the slow-acting relay 16, after it has been preliminarily energized by the circuit through contact 23, is maintained by the phonic relay 26 which maintains an energizing current through the contact 28, wire 19 and the winding of the slow-acting relay 16. The actuating of the relay 13 results in the energization of the relay 30 that starts the telephonograph T. When the relay 9 is energized the sub-station line 6 is extended through contacts 8 to the telephonograph and by the closure of the contact 37 the relay 36 is energized which, by its contacts 35, completes the connection with the sub-station 4. The voice currents from the sub-station 4 then flow through the wave impression maker 2 of the telephonograph, whereby the conversation is recorded on the cylinder 1. This condition continues as long as voice currents flow through the phonic relay 26 so as to energize the latter. Short pauses in the conversation are permissible, because the slow-acting relay 16 prevents the telephonograph from being disconnected thereby.

When the telephonograph T is put into operation this is indicated by the visual signals 33 to the sub-stations, the visual signal 33 of the sub-station that has effected a connection giving indication that the telephonograph is in order, while the visual signals 33 of the other sub-stations indicate to them that the telephonograph is engaged.

When the conversation has been recorded as desired the switch 12 is released to de-energize the relays and restore the system to normal. If the arrangement is such as to maintain the connection by the action of a phonic relay 26, the cessation of voice currents in the same for a certain period results in the slow-acting relay 16 definitely opening its contact 20, which results in the system being restored to normal.

I claim:—

1. The combination with a telephonic wave recorder of a plurality of telephone circuits, a line relay associated with each telephone circuit for connecting it to the recorder, means for preventing more than one telephone circuit at a time from being connected to the recorder, a controlling circuit for maintaining the line relay in the condition in which it connects its associated line to the recorder, a slow-acting relay associated with said controlling circuit, and means for operating said slow-acting relay only from a telephone circuit that is in use.

2. The combination with a telephonic wave recorder of a plurality of telephone circuits, a line relay associated with each telephone circuit for connecting it to the recorder, means for preventing more than one telephone circuit at a time from being connected to the recorder, a controlling circuit for maintaining the line relay in the condition in which it connects its associated line to the recorder, a slow-acting relay associated with said controlling circuit, and a relay responsive to the voice currents in the telephone circuit in use for operating said slow-acting relay.

3. A telephonic wave recorder system, a voice wave record, a wave impression maker that moves relatively to the record, a contact that is operated when the impression maker reaches a certain position, telephone circuits, a signal circuit associated with each telephone circuit and controlled by said contact, a line relay associated with each telephone circuit for connecting it to the impression maker, means for preventing more than one telephone circuit at a time from being connected to the impression maker, a controlling circuit for maintaining the line relay in the condition in which it connects its associated line to the recorder, a slow-acting relay associated with said controlling circuit, and means for operating said slow-acting relay only from a telephone circuit that is in use.

4. The combination with a telephonic wave recorder of a plurality of telephone circuits, a line relay associated with each

telephone circuit for connecting it to the recorder, means for preventing more than one telephone circuit at a time from being connected to the recorder, a controlling circuit for maintaining the line relay in the condition in which it connects its associated line to the recorder, a slow-acting relay associated with said controlling circuit, means for operating said slow-acting relay only from a telephone circuit that is in use, and supervisory signals operatively connected to the line relays for indicating to a supervisor the particular telephone circuit that is connected to the wave recorder.

5. The combination with a telephonic wave recorder of a plurality of telephone circuits, a line relay associated with each telephone circuit for connecting it to the recorder, means for preventing more than one telephone circuit at a time from being connected to the recorder, a controlling circuit for maintaining the line relay in the condition in which it connects its associated line to the recorder, a slow-acting relay associated with said controlling circuit, means for operating said slow-acting relay only from a telephone circuit that is in use, and a hand-operated switch associated with each telephone circuit for operating its associated line relay circuit.

6. The combination with a telephonic wave recorder of a plurality of telephone circuits, a line relay associated with each telephone circuit for connecting it to the recorder, means for preventing more than one telephone circuit at a time from being connected to the recorder, a controlling circuit for maintaining the line relay in the condition in which it connects its associated line to the recorder, a slow-acting relay associated with said controlling circuit, means for operating said slow-acting relay only from a telephone circuit that is in use, a hand-operated and a foot-operated switch associated with each telephone circuit for operating the associated line relay circuit.

In testimony whereof I have affixed my signature.

WILHELM MEYBERG.