

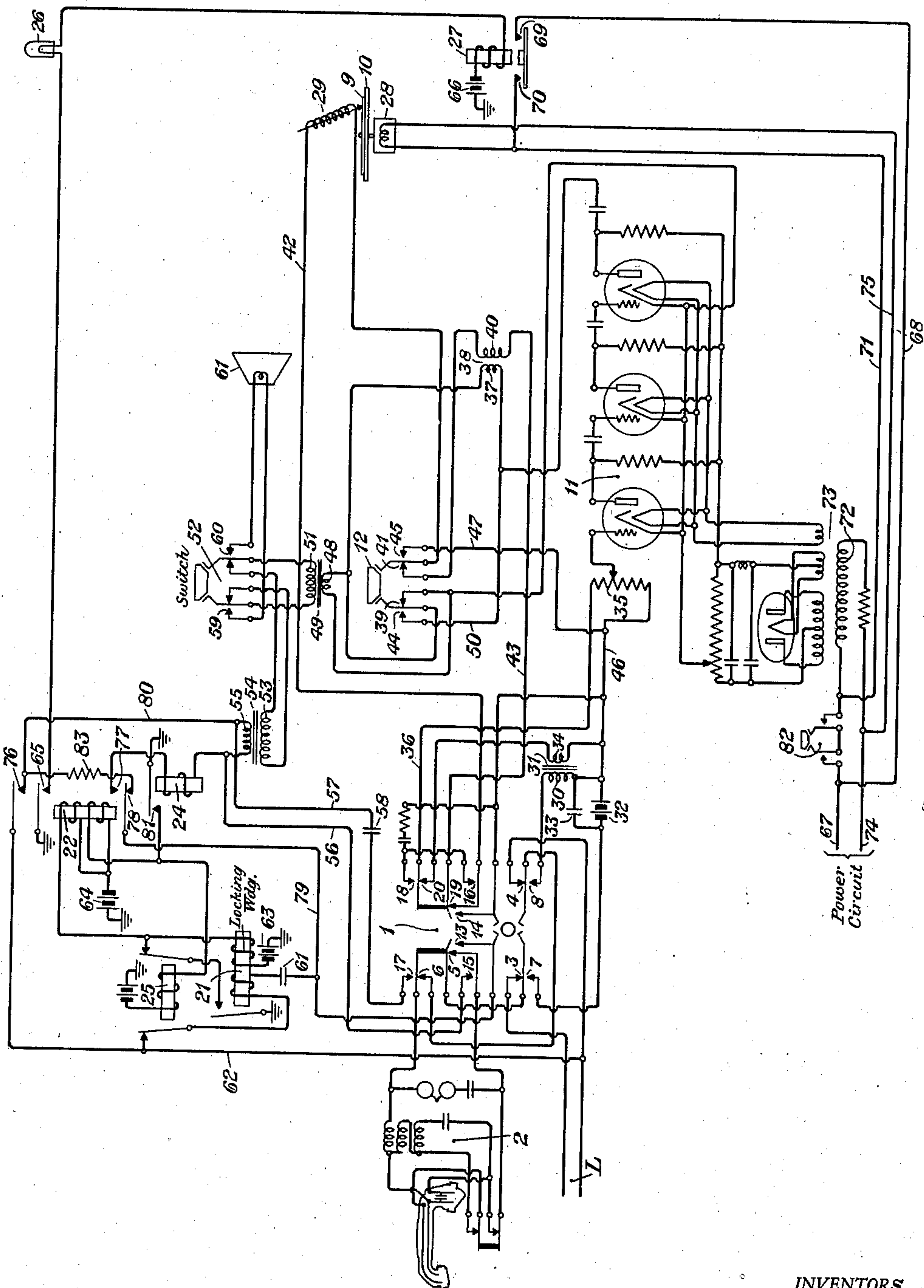
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AUTOMATIC TELEPHONE ANSWERING SYSTEM

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AUTOMATIC TELEPHONE ANSWERING SYSTEM

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This invention relates to a system for automatically giving a recorded answer to an incoming telephone call and particularly to means for automatically setting in operation the device that carries the recorded message and for connecting it to a line upon the receipt of an incoming call and for automatically disconnecting the said device from the line when the calling telephone is disconnected.

In the use of the present invention a telephone subscriber, who expects to be away from the premises on which his telephone set is located, may impress a message upon a record blank which will be automatically set in motion and the message will be picked up and transmitted to a calling party upon the receipt of the ringing signal from the said calling party's telephone. The system is further characterized by means by which the message may be repeated until the calling party's telephone is disconnected which will tend to ensure that the calling party hears the message. The record is made by the subscriber, who expects to be called during his absence, talking into the transmitter of his telephone set, with which the automatic answering device may be connected by manipulation of a switch. The record may then be played back to the subscriber in order that he may determine whether it is satisfactory.

Other and further objects of this invention will be apparent from the following description when read in connection with the attached drawing that shows schematically one form of embodiment of the invention.

In the drawing, L represents a line extending to the central office which may be of either the manual or automatic type through which connections may be established with other telephones. The line L is connected to the telephone 2 through the contacts 3, 4, 5 and 6 of the switch 1, when that switch is in its normal position. As shown in the drawing, switch 1 is designed to operate downwardly and upwardly to establish desired connections in the carrying out of the present invention. When operated downwardly it closes the contacts 7 and 8, which serve in part to connect the subscriber's telephone set 2 to the record blank 9 on the turntable 10 of the recording device for the purpose of recording the message intended to be given to calling subscribers. The connection for impressing the spoken message upon the record blank includes the amplifier 11 and also the switch 12 when the latter is in its normal, unoperated position. When the switch 1 is operated upwardly it closes its contacts 13

and 14, 15 and 16, 17 and 18, and opens the contacts 5 and 19, and 6 and 20, and with the switch 12 in that position the message recorded on the blank 9 will be transmitted either to the telephone set 2 or to the line L for transmission thereover to the distant subscriber, if an incoming call has, by the action of its ringing current, caused the operation of relay 21 and the subsequent operation of relays 22, 27 and 24, which, in combination, serve to connect the message device to the line and subsequently to disconnect it therefrom when the calling party's telephone is disconnected. The manner in which those broad objects are attained will be specifically described hereinafter.

For normal telephone operation between the telephone 2 and a distant telephone, the switch 1 is left in its normal unoperated position. The line L will then be connected to the subscriber's set through the contacts 3 and 5, and contacts 6 and 4. The mode of operation of that circuit does not involve in any way the other apparatus shown on the drawing.

Let it be assumed that a subscriber at telephone 2 desires to record upon the blank 9 a message to be given to all telephone callers during the absence of the subscriber from his premises where the telephone 2 is located. To record that message the switch 1 will be operated downwardly to close contacts 7 and 8 and the switch 12 will be left in its normal position as shown in the drawing. The cutting head 29 is lowered onto the blank 9 and the turntable is set in rotation by the operation of the switch 32 which connects the power circuit to the motor 28. A talking circuit will be established between the telephone 2 and the cutting head 29 which may be traced through contacts 6 and 8 of switch 1, the winding 30 of the transformer 31, through the battery 32, shunted by the condenser 33, thence through the contacts 7 and 5 to the other side of the telephone set. One side of the secondary winding 34 of transformer 31 is connected by conductor 46 to one side of the volume control resistance 35 of the amplifier 11 the other side of which is connected by conductor 36 through contact 20 of switch 1 to the other side of the winding 34 of the transformer 31. The output side of the amplifier 11 has its plate connected to one side of the winding 37 of the transformer 38 the other side of which is connected through contact 39 to the filament side of the output of the amplifier. The secondary winding 40 of the transformer 38 is connected to a circuit that includes contact 41 of the switch 12,

the cutting head 29, conductor 42, contact 19 of switch 1 and conductor 43 of the other side of the winding 40. The cutting head 29 will accordingly record the message upon the blank 9 that is put into the telephone 2.

After the recording of the message has been completed the subscriber may listen to it, in order to check its correctness, by operating the switch 1 upwardly and by operating the switch 12 downwardly so as to open its contacts 39 and 41 and to close the contacts 44 and 45. A circuit will thereupon be established that may be traced from the pick-up device 29, over conductor 42, through contacts 16 and 18 of switch 1, conductor 36 to one side of the volume control device of the amplifier 11, thence over conductors 46 and 47, contact 45 of switch 12 to the other end of the winding of the pick-up device 29. The message thus picked up from the record is applied to the input of the amplifier 11, the output of which has its plate side connected to a circuit that includes contact 44, winding 48 of transformer 49 and conductor 50 to the filament side of the output of the amplifier. The secondary winding 51 of the transformer 49 is connected through the contacts of the switch 52 to the primary winding 53 of transformer 54 across the secondary winding 55 of which is connected the circuit that includes conductors 56 and 57. Conductor 56 is connected through contact 15 with one side of telephone set 2 and conductor 57 is connected through contact 17 of switch 1 to the other side of said telephone set, the latter connection including the condenser 58. Thus the message recorded on the blank 9 will be amplified by the amplifier 11 and will be impressed upon the circuit that extends through the contacts of the switch 12, the switch 52, the transformer 54, and the contacts of switch 1 to the telephone set 2, and the subscriber will hear the recorded message. If it is desired to hear a reproduction of the message upon a loud speaker, the switch 52 may be operated to close its contacts 59 and 60 thereby connecting the output of the transformer 49 to the loud-speaker 61. That device, however, is not essential since the message can be clearly heard through the receiver of the telephone set 2, and the switch 52 and the loud-speaker may be omitted.

To provide for a repetition of the message a device made by the Repeato Graph Corporation is employed in connection with the mechanism for operating the turntable. By means of that device, recordings made upon a small portion of the record at a time, may be caused to be repeated simply by moving two small adjusting slides. Regardless of the position of the pick-up device 29 upon the record 9, when the calling party hangs up his receiver, the repeating device will always repeat the message from beginning to end as often as the calling party desires. This device does not have to be in place when making a record, but may be used as a means of preventing the slipping of the record due to a weight being placed on the recording pick-up head to assist in such recording.

Upon leaving the premises, the telephone subscriber will restore the receiver of his telephone set to its cradle and restore switch 32 to its normal position, and the automatic answering device will then be in a position to give to the calling parties the message recorded upon the record. This is accomplished in the following manner: When ringing current is transmitted over the line L from the central office it will flow through

a circuit that includes contacts 3 and 13 of switch 1, the condenser 61, the left-hand winding of relay 21, the left-hand contact of relay 25, and conductor 62 to the other side of the line. There-

upon relay 21 will be operated, and upon closing its contact, it will establish a circuit from the battery 63 through the right-hand winding of that relay, the right-hand contact of relay 25 and the contact of relay 21, thus locking the latter relay. The operation of relay 22 follows from the operation of relay 21 as the result of current flowing from the battery 64 through the upper winding of that relay and through the contacts of relays 25 and 21 to ground. The closing of contact 65 of relay 22 establishes a circuit from the battery 66 through the winding of relay 27 and the lamp 26 which will cause the operation of the said relay and the lamp. The operation of relay 27 will close a circuit to provide power for the motor 28 and also for the energization of the tubes of the amplifier 11. That circuit may be traced from one side of the power circuit 67, over conductor 68, contacts 69 and 70 of relay 27 and thence over conductor 71 through the primary winding 72 of the transformer 73 to the other side 74 of the power circuit. Current will also flow through the winding of the motor 28 and over conductor 75 to the said other side of the power circuit, and the motor and the amplifier will thereby be set in operation. Contacts 76 and 77 of relay 22 will also be closed but it is important to note that the contact 76 is closed before contact 78 of relay 22 is opened. By the closing of contact 76 before contact 78 opens, a circuit will be established from the lower side of line L over conductor 62, through contact 76, resistance 83, contact 78, conductor 79, contacts 13 and 3 of switch 1 to the other side of the said line. The effect of that is to trip the ringing device at the central office and thereby to stop the application of ringing current to the line. Thereafter contact 77 closes and that permits the flow of direct current from the central office battery through relay 24, the circuit for which may be traced from the lower conductor of line L through contact 76, conductor 80, winding 55 of transformer 54, the winding of relay 24, contact 77 of relay 22, conductor 79 and contacts 13 and 3 of switch 1 to the other side of the said line. Relay 24 will be operated and relay 22 will thereby be locked through its lower winding and contact 81 of relay 24. Relay 25 will also be operated, which will release relay 21.

The message picked up from the record by the device 29 will be impressed upon a circuit connected to the input of the amplifier, the said circuit including conductor 42, contacts 16 and 18 of switch 1, conductor 36, connected to one side of the volume control resistance 35 of the amplifier, thence over conductor 47 and contact 45 of switch 12 to the other side of the pick-up device 29. The message upon the record, as thus amplified, will be impressed by the output of the amplifier upon the circuit that extends from the plate of the last tube to contact 44 of switch 12, through the winding 48 to the filament side of the amplifier. The amplified message will be impressed by the transformer 49 upon the winding 53 of transformer 54, and, in turn, upon the circuit that extends from one side of the winding 55 over conductor 80, contact 76 and conductor 62 to the lower side of the line L and from the upper side of that line through contacts 3 and 13 of switch 1, conductor 79, contact 77 of relay 22, the winding of relay 24 to the other side of

the winding 55 of transformer 54. The voice currents, representing the recorded message, will thus be impressed upon the line L and will be transmitted thereover to the calling subscriber's telephone continuously until the calling subscriber hangs up his receiver and the connections between the lines of the calling and called parties are removed at the central office either automatically or manually.

The removal of the connection at the central office will automatically stop the flow of direct current over the line by which relay 24 was energized. That relay will accordingly be released and it will in turn release relay 22, which was locked through the contact 81 of relay 24. The breaking of contact 65 will open the circuit through the winding of relay 27 and the lamp 26 which will cause relay 27 to be released, and the light to be extinguished. In turn, the power circuit through the motor 28 and the amplifier 11 will be opened, thus causing both of those devices to cease to operate. Relay 25 will likewise be de-energized, thereby permitting its armatures to fall back and close their contacts. The system is therefore restored to its normal condition for the giving of the recorded message to the next telephone subscriber when ringing current is again transmitted over the line L.

While this invention has been disclosed as embodied in a particular form and arrangement of parts, it is capable of embodiment in other and different forms without departing from the spirit and scope of the appended claims.

What is claimed is:

1. In a system for automatically giving a recorded answer to an incoming telephone call, the combination with a telephone line of a recording device upon which a predetermined answer to be given to each incoming telephone call may be recorded, means operable by the receipt of an incoming call to automatically connect the said recording device to the said line and to cause it to impress the recorded answer upon the said line for transmission to the calling telephone, and means operable solely upon the disconnection of the calling telephone to stop the operation of the said recording device.

2. In a system for automatically giving a recorded answer to an incoming telephone call, the combination with a subscriber's telephone line extending from a central office to a subscriber's telephone set, of means at the central office to apply ringing current to the said line, a message reproducing device capable of having recorded thereon in reproducible form a message to be given to each incoming call, a switch arranged to disconnect the said telephone set from the said line and to connect to the said line the circuit of the said message reproducing device, means connected with the said circuit and responsive to the ringing current of an incoming telephone call to set in operation the said message reproducing device, means to effectively disconnect from the line the ringing current means at the central office and to impress upon the said line the said recorded message.

3. The system defined by claim 2 further characterized by the repetitive application of the said message to the said line until the disconnection of the calling telephone occurs.

4. The system defined by claim 2 further characterized by the inclusion of means to stop the operation of the message reproducing device and to disconnect that device from the said line upon the disconnection of the calling telephone.

5. In a telephone system for automatically giving a recorded answer to a calling party, the combination with a telephone line having a telephone set connected to the distant end thereof of another telephone set normally connected to the near end of the said line, a message reproducing device capable of having recorded thereon in reproducible form a message to be given to each incoming telephone call, a switch arranged to disconnect the said near end of the telephone from the said line and to connect thereto the circuit of the said message reproducing device, means connected with the said circuit and responsive to the ringing current of an incoming telephone call to start the operation of the said message reproducing device whereby the recorded message will be impressed upon the line for transmission to the calling telephone, and means controlled by the disconnection of the calling telephone to effectively disconnect the said message reproducing device from the said line whenever the calling telephone is also effectively disconnected from that line.

6. In a telephone system for automatically giving a recorded answer to a calling party, the combination comprising a telephone line having connected thereto the telephone set of the calling party, a source of ringing current and a central office battery to supply talking current, both connected to the said line, a telephone answering circuit connected to the said line at the called party's station, the said answering circuit including means responsive to the application of the ringing current to the said line to set in operation the answering device of the said circuit, the said responsive means being arranged to provide a shunt path of such resistance as to automatically effect the disconnection of the source of ringing current from the said line and also being arranged to automatically stop the operation of the answering device upon the disconnection of the source of talking current from the said line.

7. In a telephone system for automatically giving a recorded answer to a calling party, the combination with a telephone line having means connected therewith to generate a ringing current, of means connected to the said line and responsive to the said ringing current to transmit a recorded message to the said telephone line, the said means including an answering device upon which a message has been recorded for transmission to each calling party, a relay responsive to the said ringing current and thereupon adapted to be locked, a second relay responsive to the operation of the said first mentioned relay and having a plurality of contacts, one of which is adapted to close before a second contact opens to establish a shunt path for the ringing current of such resistance as to effect the disconnection of ringing current from said line, a source of power, a third relay adapted to be energized by the said second relay to connect the source of power to the said answering device whereby it will be set in operation to transmit the recorded message over the said telephone line to the calling party.

8. In a telephone system for automatically giving a recorded answer to a calling party, the combination with a telephone line to which the telephone set of the calling party may be connected, of a source of ringing current adapted to be connected to the said line to signal the called party, a relay responsive to the ringing current and adapted to be locked upon being energized by the said ringing current, a second

relay having a plurality of contacts and adapted to be energized by the operation of the first mentioned relay, the said second relay being arranged to close one of its contacts before the opening of another to provide a shunt path for the said ringing current of such resistance and of a limited duration as to effect the disconnection of the said source of ringing current from the said line, an answering circuit including a turn-table having thereon a record carrying an answer to be given to each calling party, a motor for operating the turn-table, an amplifier, a source of power to operate the said motor and the said amplifier, a third relay operable upon the operation of the said second relay to connect the power source to the said motor and the said amplifier, and a pick-up device connected to the inward side of the said amplifier to apply thereto the said answer, and means to connect the output of said amplifier to the said line.

9. The system defined by claim 8 further characterized by a fourth relay energized by the flow of current over the said line from the central office battery, and adapted to lock the said second relay, the said fourth relay being arranged to release the said second relay upon the cessation of the flow of current resulting from the disconnection of the calling party's telephone from the said line whereby the said answering circuit will be effectively connected from the said line.

10. In a telephone system for automatically giving a recorded answer to a calling party, the combination comprising a telephone line to which a calling party's telephone set may be connected, the connection including a source of ringing current and a source of talking current, a telephone answering circuit, the said answering circuit including switching means responsive to the said ringing current to connect to the said line an answering device including a record upon which an answering message has been recorded, means to set the said device in operation, and means to apply the recorded answer to the line, the said switching means in-

cluding means to provide a shunt path to appropriate resistance and of a limited duration across the said line to stop the application of ringing current to the line, and also including means responsive to the cessation of the flow of talking current over the line to effectively disconnect the answering circuit from the line.

11. In a telephone system for automatically giving a recorded answer to a calling party, the combination comprising a telephone line to which a calling party's telephone set is connected, the said line having connected thereto a source of ringing current and a battery to supply talking current to the line, and a telephone answering circuit at a called party's station, the said circuit including a relay responsive to the ringing current applied to the said line and adapted to be locked upon energization thereof, a second relay controlled by said first mentioned relay having a plurality of contacts, one of which is arranged to close before another opens to provide a shunt path across the said line of suitable resistance and for limited duration to effect the disconnection of the source of ringing current from the said line, an answering device connected to said answering circuit and having an amplifier associated therewith, a third relay controlled by the said second relay to apply power to the said answering device to set it in operation and also to energize the said amplifier, whereby a recorded answer may be given to the calling party, and a fourth relay energized by the flow of current from the said battery adapted to lock the said second mentioned relay, and a fifth relay energized by the operation of the fourth relay and adapted to release the said first relay whereby, upon disconnection of the battery supplying the talking current, the said fourth and the said second relays will be released and the answering device will be stopped and the answering circuit will be effectively disconnected from the said line.

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