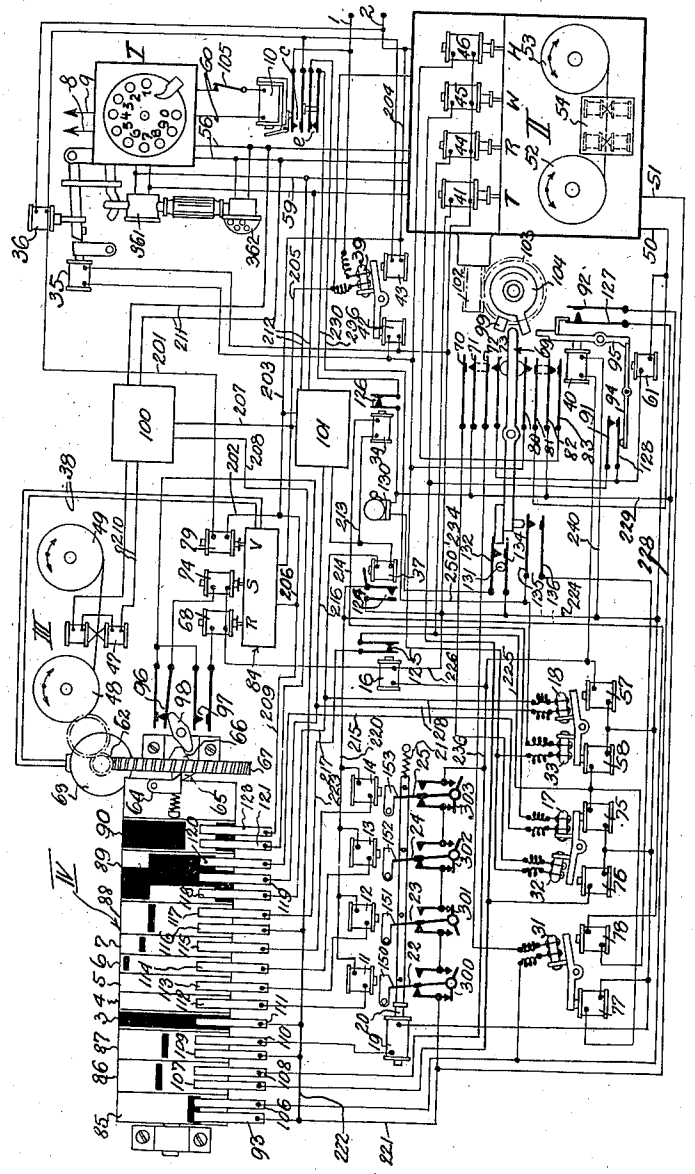
Aug. 29, 1939. H. HIPPLE 2,171,366

TELEPHONOGRAPH

Filed Aug. 11, 1936



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Patented Aug. 29, 1939 2,171,366

UNITED STATES PATENT OFFICE

2,171,366

TELEPHONOGRAPH

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Application August 11, 1936, Serial No. 95,337
In Germany August 15, 1935

13 Claims. (Cl. 179—6)

This invention relates to improvements in telephone systems.

It is particularly directed to a telephone system wherein at properly equipped substations, communications received during the subscriber's absence may be automatically recorded and may be taken from the record upon the subscriber's return.

The invention also has the object of providing a telephone system of this character in which at the properly equipped sub-station, hereinafter called the master station—the connections for recording incoming calls and communications are established by a connection controlling member which is actuated automatically upon a call reaching the master station in the subscriber's absence.

The invention also has the object of providing a system of this character wherein the master station is equipped with a signalling or message delivering apparatus informing the subscriber calling this master station during the master subscriber's absence, that the message to be delivered by the calling subscriber will be recorded.

Another object of the invention is to provide a system of this character in which the messages recorded at the master station may be listened to from the record made at the master station, so that the master subscriber may, prior to his return to the master station, learn what communications were made with the master station during his absence.

Another object of the invention is to render the reproduction of the messages recorded at the master station dependent upon the use of a code for the purpose of enabling solely the persons acquainted with this code, as for instance, the master or his agent or some controlling official of the system, to listen to these messages from any station in the system.

The invention, furthermore, has the object of providing a telephone system of this character wherein the code comprises the utterance of sounds or tones at predetermined intervals into that apparatus from which the master or his agent intends to receive the reproduced messages recorded during his absence at the master station.

The invention, furthermore, has the object of correlating the code in accordance with which the master or controlling official supervises the reproduction of the messages recorded during his absence with that message or signal which is delivered by the signalling apparatus forming a part of the equipment of the master station.

Another object of the invention is to equip the master station with a connection controlling member automatically actuated by a motor upon the receipt of a call during the master's absence and whereby the sequence of connections for reproducing the recorded messages is effected upon the use of the predetermined code.

The invention, furthermore, has the object of providing a system of this character, wherein the master or controlling official of the system has it in his power to selectively alter the code which controls the reproduction of the messages to the party listening from any sub-station of the system.

With these and numerous other objects in view, the invention is described in the following specification in which reference is made to the drawing showing a wiring diagram of the master station.

The equipment which is to be positioned at the master station or station of the controlling official or owner of the entire system comprises an ordinary telephone apparatus I which in this instance is combined with an electromagnet **36** adapted to raise the receiver **361** here rigidly combined with microphone **362** when an incoming call is received.

The telephone apparatus at this station is combined with the recording machine II. This recording machine operates under the well known Paulson principle for the purpose of making records of speech. The machine II is provided with four keys or magnetically operated switches. The key T serves for recording telephone speech, the key R for reversing, the key W for reproduction of the speech received, and the key H for stopping this recording machine. The rolls **52** and **53** in this machine support the steel wire or tape and pull this wire or tape through the magnetic control device **54**, which device carries the magnets for responding to the locally varied magnetized portions by induction or for altering the local magnetic conditions of the carrier to extinguish the local magnetizations for restoration purposes.

This recording machine II actuates a worm **102** driving a worm gear **103**. This worm gear **103** frictionally operates the disc **104** having a projection or nose adapted to engage upon rotation of said disc, one end of the lever **69**. Upon actuation of this lever, either one of two sets of contact springs **70—73** or **80—83** respectively is actuated, to be moved from normally open to

contact closing position. This actuation of these sets of contacts occurs upon setting the machine II for recording operation, and it also occurs upon termination of the reproduction.

The line conductors 8 and 9 lead to the master sub-station I from the telephone system of which this station forms a part. Conductors 56 connected with the microphone lead from the sub-station I to the recording machine II, and other conductors 59 extend from the receiver of this sub-station I also to the recording machine II. The conductors 60 also extend from this telephone to a relay 10. This relay may be connected up in the manner in which in an ordinary telephone sub-station extension signal bell or buzzer is connected, the signal bell or buzzer for calling sub-station I not being shown in the drawing. Relay 10 is a relay which releases its armature slowly when it is deenergized. Upon energization by the calling current (the switch 105 being closed), the relay 10 attracts its armature 363, thereby closing a contact *c* and opening the contact *e*. This operation establishes a circuit from a line 1 connected with the source of energy (not shown) through contact *c* to the electromagnet 36 and back to line 2 connected with the other pole of the source of energy. A shunt circuit is also established from electromagnet 36, wire 201 to electromagnet 79, wires 202, 203, electromagnet 43, wire 204 back to line 2.

The electromagnet 36, therefore, will raise the hook for the receiver (even though the latter remain on the hook) and thereby connect the telephone I into the system.

The electromagnet 79 in conjunction with the electromagnet 68 and 74 serves for servicing or controlling a switch assembly 84 by means of which through remote control a motor 63 may be supplied with current over wires 38 or whereby the the motor 63 may be cut off from the supply respectively. This motor 63 is a reversible motor: it operates the reels 48 and 49 forming part of a signal message apparatus III. The motor 63 also operates a contact roller or controller drum IV which is assembled of a plurality of several controller drum discs.

The electromagnet 43 tilts the mercury switch 39 to current closing (horizontal) position, whereby current is permitted to flow to the remote control switch 84, the recording machine II and the amplifier 101.

Current flows then from line 1 to switch 39 and through wire 205 to control switch 84 whose other lead 206 is connected with the electromagnet 79 and hence with line 2. This circuit renders the remote control switch operative.

The magnet 79 associated with the remote control switch 84 closes the circuit for the motor 63 at the point V of the remote control switch, thereby leading the current through the conductor cord 38 to the motor 63 to start the same in a predetermined direction, namely, forward.

The controller drum IV is imparted rotation through the motor 63 for which purpose gear transmission comprising the worm 62 and worm gear 67 are provided. The end disc 90 of the controller drum causes the current to flow to the amplifier 100.

The circuit extends from line 1 through the mercury switch 39, then closed, wires 205, 207, amplifier 100, wire 208, contact finger 121, contactor disc 90, contact finger 123, wire 209 to wires 206, 203 and to line 2.

The controller drum disc has a sector at which this current is interrupted, the closure of the current for the amplifier 100 being affected by the disc 90 solely after said disc has turned through a predetermined part of one revolution.

It is advisable to actuate the relays and magnets by means of direct current. In places where alternating current solely is available, the alternating current must be transformed and rectified. The device for transforming and rectifying the alternating current is not shown, but it may be assumed that it is enclosed in the housing of the recording machine II, the current after having been transformed to the necessary voltage and rectified, being conducted to and from the recording machine through the leads 50, 51 respectively.

The motor 63 not only drives the controller drum IV but it also drives through a transmission gearing the reels or drums 48, 49, each of which supports a steel wire or steel tape variably magnetized at different points in such manner as to reproduce some general message or communication. The currents which are induced by the variable localized magnetic alterations of this steel wire or tape in the reproducing head 47 flow through wires 210, the amplifier 100, and from there through wires 211 to the microphone conductors 56. The microphone therefore functions as if it were spoken into. The subscriber making the call from some sub-station of the system first hears solely that message which is delivered from the machine III. This message informs the calling subscriber of the number of the station with which he has been connected, and it will also convey to the calling subscriber the fact that his own communication will now be recorded.

The movement of the controller drum IV is effected from the worm gear 67 through a cam 65 on the gear which upon rotation enters into engagement with the pawl 64 of the drum to impart the movement to actuate from then on the controller drum.

The contact sector of disc 3 of the drum IV is conductively connected with the contact segments of the discs 4 and 5, which segments are not visible in the drawing, and this conductive disc 3 also is in conductive connection with the conductive sectors of the discs 6 and 7.

When the controller drum IV rotates, the end disc 85 moves its conductive segment away from the fingers 93, 106. Relay 10 had become deenergized since the calling current by this time ceased to flow. The release of its armature again closes the spring contacts at *e*, but although the contact *e* is in connection with finger 106, no current will flow through the closed contact as the finger 106 is now off the conductive segment of the disc 85.

The currents induced from the steel wire or tape in the message signalling machine III within the inductor device 47 are carried through cord 210 to the amplifier 100 and from there in amplified condition not only to the microphone conductor 56 but also through the telephone instrument to the telephone conductors 59. This pair of telephone conductors is connected by wires 212 with the amplifier 101. The "voice" currents from machine III and amplified as described, flow in the output circuit of the amplifier through the relays 37 and 34.

The circuit for relay 34 includes wire 213 extending from the amplifier, the relay 34, wire 214, mercury switch 17 (then closed), wire 215, contactors 120, 119, then connected through their disc segment, wire 216 to the amplifier. The circuit for relay 37 includes besides the serially

connected amplifier and relay 37 wire 217 extending to the contactor finger 118 of disc 89 which is then conductively connected through the contact sector of this disc with finger 119, wire 216 back to the amplifier.

The relay 34 is a relay which releases its armature slowly only, when it is disconnected from the energizing circuit owing to the contact finger 119, 120 ceasing to be conductively connected through the controller disc 89. The relay 34, however, is not energized from the amplifier through the mercury switch 17 since now the contact fingers 119, 120 of the controller drum disc 89 are not connected through the same conductive segment of the disc 89. Wires 219 connect contact fingers 118, 119 with the mercury switch 18, so that upon closure of this switch the relay 37 may be energized even though the contact fingers 118, 119 are not connected with each other at the drum 89.

The vibratory currents induced in the head 47 of the signalling machine III, therefore, will cause a vibratory movement to be imparted to the armature of the relay 37. The armature of this relay thereby rapidly opens and closes a spring contact 124 from which wire 220 extends jointly to the relays 11, 12, 13, 14.

The contact fingers 112, 113, 114, 115 associated with the controller drum discs 4, 5, 6 and 7 respectively are severally connected with the relays 11 to 14 inclusive. Now whenever any one of these contact fingers 112—115 happens to be conductively connected through the pertaining disc segment with the contact finger 111 of disc 3, the respective electromagnet 11, 12, 13 or 14 will be energized at each closure of contact 124, and its respective armature 150, 151, 152, 153 will be attracted. This armature in the form of a holding pawl for a switch would thereby be moved to release position.

This release, however, must not then take place and it is essential, therefore, that the contact fingers 112 to 115 must remain in current conductive position as long as there is no current induced in the head 47 of the signalling machine. This condition prevails whenever there is an interval between two words of the message to be transmitted by this machine III.

When the controller disc 88 associated with contact fingers 116, 117 has been rotated so far that the contact fingers 116, 117 are connected with each other through the conductive segment, current flows through the lead 51, wires 221, 222 to the contact fingers 116, and 117, wire 223, to a spring contact 125, then in closed condition, and to the electromagnet 41 of the recording machine II. It also flows through wire 225 to the electromagnets 58, 75 and 77 and back to the wire 50.

The electromagnet 41 being energized, actuates the recording machine II through the key T.

The electromagnet 58 being energized retains the mercury switch 33 in closed position, while the mercury switch 18 rigidly associated therewith is open.

The electromagnet 75 closes the mercury switch 17, but opens the current through the mercury switch 32 connected therewith.

The electromagnet 77 upon being energized tilts the mercury switch 31 to current interrupting position, as shown.

This is the position which these parts occupy when the message magnetically superimposed on the wire of the signalling machine III has been completely delivered to the calling party.

The calling party who had listened to this message now begins to speak into his telephone. His own conversation is now recorded in the recording machine II.

The controller drum IV continues to rotate until one revolution has been completed. At that time a cam 66 on the worm gear 67 strikes from below against the rocker arm 98, which is thereby turned at the opposite end towards the springs 97 to close them. The spring contact 97 now being closed, the current flows through wire 222 to the electromagnet 68, which upon energization acts on the key R of the remote control switch 84. This key serves for maintaining the motor 63 supplied with current adapted to reverse the direction of the motor. The worm gearing 62, 67 will then rotate the controller drum IV backwards, and the gearing actuated by the motor 63 also will move the magnetically influenced message wire in the opposite direction through the signalling machine III to rewind the reel. Upon completing the return movement of the controller drum, the cam 66 again strikes the rocker arm 98 to move the same into the position shown in the drawing, thereby establishing contact at the springs 96 in order to energize the electromagnet 74, the circuit including lead 51, wires 221, 222, contact springs 96, electromagnet 74, wire 226, wire 224 and lead 50. The electromagnet 74 operates the remote control switch 84 through the key S to stop the movement of the motor 63.

While the calling subscriber now delivers his message, the relay 34 associated with the amplifier 101 is continuously energized, and its armature, therefore, remains attracted. The circuit includes the amplifier 101, electromagnet 34, mercury switch 17 and contact fingers 119, 120. When, however, the calling party has completed his message, which message is being recorded in the recording machine II, the relay 34 becomes deenergized, and its armature 126 enters the position shown in the drawing, making a contact with a spring, which permits the current to flow from the conductor 51 to the contact finger 93 and 106 at the controller disc 85, wires 228, 229, contact 126, wire 230, contact *e*, wire 231, mercury switch 33, wire 232, electromagnet 42, wire 234, 224 to lead 50. The electromagnets 35 and 46 are placed parallel to electromagnet 42, so that they also are energized.

The electromagnet 46 operates through the key M to stop the recording machine II.

The electromagnet 35 withdraws the lever 129 which up to then had supported the receiver in raised position, so that the receiver again drops with its hook.

The electromagnet 42 tilts the mercury switch 39 to current interrupting position, thereby preventing the supply current flowing in the lines 1, 2 from continuing through the system. When no more current can flow into the system thru the line 1, 2, the recording operation is terminated.

An official acquainted with the requirements, the owner of the plant, or any party in supervision may now from any subscriber's station cause the recording machine II of station I to reproduce messages or messages previously recorded. To permit this remote control of reproduction to take place, a certain predetermined "sound code" must be observed. Tones reproduced at certain times, or sounds spoken into the telephone at certain intervals at the station from which the controlling official makes the

call will affect the electrical connections, to establish those circuits which are required for the reproduction of the message entered in machine II. This reproduction requires the operation of the signalling machine III, which is being operated whenever a call is made.

The "timing" feature of the sound code is correlated to the selectively changeable setting of the discs 4, 5, 6 and 7 on the controller drum IV. The segments of these discs are contacted by their respective fingers 112 to 115 at selectively determined times, depending on the setting of the discs. Switches 300, 301, 302, 303 also may be set for selectively timed operation. Hence, it is feasible to make any "code" combinations utilizing selectively determined intervals occurring in the delivery of the general signalling message of machine III, the "code" prescribing that certain of these intervals may be used, and that certain intervals may be observed without utilization.

In this manner it is only the owner or supervising or controlling official of the system or anybody who is thoroughly acquainted with the "code" who can influence the apparatus for reproducing the recorded speech of the former call in the proper way, or preventing the reproduction of the language in a manner which would be comprehensive to anybody.

Upon the origination of this "control" call which may be made from any subscriber's station in the system, the alterations which initially occur within the system are exactly the same as has been described above with respect to the call that was finally recorded in machine II.

Upon the calling signal reaching station I, the calling current energizes the relay 10. This relay as described above, again places the recording machine II, which now becomes a reproducing machine, into readiness for operation. The incoming call, furthermore, through the connections described above, supplies current to the motor 63 for turning the controller drum IV. The motor 63, however, at the same time also as described above, will actuate the signalling machine III.

When now the conductive segment of the controller disc 4 engages the contact finger 112, a path would be created for the current through the electromagnet 11, provided the two contact springs 124 at relay 37 were closed. It would include lead 51, wires 221, 222, contact fingers 111, 112, electromagnet 11, springs 124, wire 224, line 50.

Now, the closure of this contact at the springs 124 may be effected by an impulse flowing from the amplifier 101 into relay 37, and this impulse is produced by the calling subscriber speaking into the microphone of his apparatus at the very instant at which the controller drum disc 4 has reached a conductive connection with the contact finger 112. The path of this impulse extends from the amplifier 101 to the contact fingers 120, 119 then connected with each other, and to the relay 37. Upon producing this current impulse, a current flows from the line 51 through the contact fingers 111, 112 to the electromagnet 11, and from there to the springs 124 then in contact with each other, and through wire 224 to the line 50. The electromagnet 11 is energized by this current. It immediately attracts its armature 150 so that this locking pawl armature releases the spring 22 which has a biassing arm at its lower end to swing it upon release towards the opposite contact point pertaining to the set of contact springs 26. The path of a current would now be open from line 51 through the switch 300 to the right hand spring 26 and to the left hand spring of the set of springs 27 of the next adjacent switch 301. Here the path would end.

But when the contact finger 113 of the controller drum is in conductive engagement with the conductor segment on the drum disc 5, and if the controlling official again pronounces a sound, the current impulse produced will again close contact, and the magnet 12 will be energized in the same manner in which previously the electromagnet 11 had been energized through the contact finger 112, and pertaining conductor segment of the controller disc drum 4. The current would not continue from the left hand contact spring 27 and spring 23 since the spring 23 of switch 301 is biassed to remain even after release in the position shown in the drawing.

From the above it will be seen that various possibilities of combinations for the sound code are provided. In the first place, the location of the conductive segments on the discs 4 to 7 might be altered with respect to the pertaining contact fingers 112 to 115, and in the second place, the biassing attachments of the switches 300, 301, 302, 303 might be selected as desired. The controlling official, therefore, must know accurately at which intervals in the delivery of the message from the signalling apparatus III the relay 37 may be energized by the current impulse set up through a tone uttered by the official. He must know at which instants the contact fingers 112 to 115 will permit the current to pass and which switches 300 to 303 are set to permit the current to flow through. Whoever is not acquainted with the "code" could not induce the reproduction from the recording apparatus II.

When then the calling controlling official has actuated the magnets 11 to 14 in proper sequence in accordance with the intervals of the message delivered by the signalling apparatus III, the current flows from the conductor 51 to the locking springs 22 to 29 of the switches 300 to 303, wire 236, to the electromagnet 40, wire 240, 224, line 50. The current also flows from the last switch 303 to the electromagnet 57, back to line 50, and to the electromagnet 16, wire 224, to line 50.

The electromagnet 16 upon energization will open the contact between the springs 125, whereby interrupting that current which previously flowed through the closed contact whenever the segment on the controller drum disc 88 connected the contact fingers 116 and 117.

The energization of the electromagnet 57 causes the mercury switch 18 to be tilted to close the circuit through this switch 18 and to open the circuit through the companion mercury switch 33.

The energization of the electromagnet 40 causes the armature 95 thereof to be attracted: unless this armature is already in that position in which it is shown.

The controller drum 4 upon continuing its rotation will cause the contact fingers 107, 108 to be connected with each other, so that the current will find a path to the electromagnets 44 and 76 through the properly positioned switches 301 to 303.

The electromagnet 44 in the recording machine II sets this machine for reverse operation, thereby re-winding the wire or tape on that reel from which it had been unwound.

The electromagnet 76 upon being energized, tilts the mercury switch 32 to current closing position and tilts the companion switch 17 to current opening position.

In the continued rotation of the controller drum, the contact fingers 109, 110 are connected with each other through the disc 87, and the current will then flow from line 51 to wires 221, fingers 109, 110, to the electromagnet 19 which is associated with the switch assembly 300, 301, 302, 303 and to line 50. Upon energization, the electromagnet 19 pulls the bar 20 against the tension of spring 21 towards the left and thereby moves the switch springs 22 to 25 inclusive to the position illustrated in the drawing to contact the left hand companion springs 26 to 29 respectively. In this position the switch springs 22 to 25 are once more locked by the locking pawls 150 to 153.

The mercury switch 17 having been tilted (through the energization of electromagnet 76) to current opening position, will cause the electromagnet 34 to be deenergized, thereby closing the contact 126. But since the mercury switch 18 is now in circuit closing position, the circuit for relay 37 is closed for the current emanating from the amplifier 101, so that the voice currents in amplified condition flow through relay 37.

When the recording machine II completes the rewinding of the magnetized wire or tape to its initial position, the projection 99 on worm gear 103 strikes in the gear transmission of this machine, the right hand end of lever 69 from above, so that this lever moves the springs 80, 81, 82 and 83 to contact closing position.

The current now flows from the conductor 51 to the contact finger 93 of the controller drum and to the contact finger 106. It is continued through wire 228 to the spring contacts 82 and 83, and the electromagnet 45 of the recording machine II and wires 234, 224 to line 50. The electromagnet 45 of this machine now operates the key W which starts this recording machine for reproducing the recorded messages which are now transmitted to the telephone of the party making this control call.

The reproduction having been terminated, the cam disc 104 of the recording machine II will strike the right hand end of the lever 69 from below, whereby the contacts 80 to 83 beneath said lever are opened and the contacts 70 to 73 shown above said lever are closed. Before, however, this closure of these spring contacts 70 to 73 is completed, the lever has moved the insulated lug 133 at the opposite end away from the contact spring 132. This spring engages, therefore, the contact 134 closing a circuit for the buzzer or bell 130 from line 51 to contact fingers 93, 106, wire 228, wire 229, bell 130, springs 132, 134, wire 224 and line 50. This bell now renders a closing signal.

Immediately thereafter, the lever effects the closure of the contact between springs 135, 136 shown beneath the left hand end of lever 69, which closure also takes place before the set of contacts 70 to 73 at the other end of the lever is closed.

If upon hearing the closing signal rendered by the buzzer or bell 130, the party making the call utters a sound into his microphone, the electromagnet 37 is energized through the amplifier current from 101, flowing through the mercury switch 18 now in circuit closing position. The relay 37 closes the contact 124.

The current now flows from the conductor 51 to the fingers 93, 106 of the controller drum, wires 228, 229, contact 126, cord 236, to the set of springs *e*, wire 250 to the spring contacts 135, 136 which are closed, to the electromagnet 78, contact 124 and wire 50.

Energization of the electromagnet 78 tilts the mercury switch 31 to circuit closing position. During this movement of this mercury switch to circuit closing position, the reproducing machine II is still set for reproduction. The current continues to flow, therefore, from the conductor 51 to the contact fingers 93, 106 into the mercury switch 31, to the contact springs 72 and 73 which are closed, and to the electromagnet 61.

The electromagnet 61 attracts the right hand end of its armature lever 94. This releases the armature lever 95 of the electromagnet 40 and as a nose on said lever had engaged the spring 127, the spring is now free to move under its own resiliency into engagement with the companion spring 92. At the same time, the springs 91 and 128 at the left hand of the armature lever 94 are closed by this lever, permitting thereby the current from the contact spring 73 to continue through these closed springs contacts 91, 128 into the electromagnet 44 of the recording machine II. This electromagnet again operates the key R to reverse the movement of the recording machine.

In these last described steps, the contact springs 72, 73 are in conductive connection and are maintained in this connection by the lever 69. The contact springs 70 and 71 of the same set, however, are still open. The recording machine II, therefore, operates now in reverse, imparting a reverse movement to the worm gear 103 without, however, imparting this reverse movement to the cam disc 104, said last named cam disc engaging with its projection the right hand end of the lever 69 which prevents the disc 104 from following the movement of the worm gear.

The calling party now having received the reproduction of the message previously recorded in the machine II and also having received the closing signal, again restores the receiver to the hook. The recording machine II and the worm gear 103 has continued its movement in reverse until it arrived at the initial position. In this position, the lug 99 of the worm gear strikes from above against the lever 69 which now closes the contacts 80, 81.

This provides a path for the current from the line 51 to the contact fingers 93, 106, wire 228, contact springs 92, 127, contact springs 81 and 80, and to the electromagnets 46, 42 and 35, wires 234, 224 to line 50, as upon reproduction and recording. The machine is thereby again stopped and the receiver in the sub-station I drops onto its hook.

If the party making this control call after having noticed the signal rendered by the bell 130 does not desire to extinguish the record made in the recording machine II, he must not utter that sound which brought about the energization of the relay 37 through the amplifier current. The relay 37 will then not be energized. The contact 124 will remain in open condition, and the contact springs 135, 136 which had been closed by the contact lever 69 in the previously described sequence of operation cannot continue the path of this current. The contact springs 70 and 71, however, will subsequently be moved to closing position. The current then flows through this closed contact from the wire 51, contact fingers 93, 106, to the springs 71 and 70, and through the mercury switch 32 to the contacts 42, 35 and 46,

as described above, at the end of the recording. The machine, therefore, again is restored to its initial position and the receiver drops.

What I claim is:

1. In a telephone system having a line leading to a subscriber's station, a speech recording and reproducing machine at said station, a message delivery apparatus at the station, an automatic connection control means for successively placing said apparatus and said machine in connection with the line, a motor operatively associated with said connection control means and said message delivery apparatus, a relay conductively connected with the automatic connection control means when said last named means has been moved by the motor to a predetermined position, the connections between the message delivery apparatus and the line being under control of said relay and another relay conductively connected with said connection control means, means operable from any sub-station of the system for energizing said last named relay, and means under control of said last named relay for reproducing the message recorded in said machine when the latter had been placed in connection with the line.

2. In a telephone system having a line leading to a sub-station, the combination of a speech recording and reproducing machine, a message delivery apparatus, a connection control means for successively connecting said apparatus and said machine with the line, a motor operatively associated with said connection control means and said apparatus, a relay controlling the operation of the machine for recording, means dependent upon the position of the connection controlling means for energizing said relay subsequently to the operation of said message delivery apparatus and another relay conductively connected with said connection control means, means operable from any sub-station of the system for energizing said last named relay, and means under control of said last named relay for reproducing the message recorded in said machine when the latter had been placed in connection with the line.

3. In a telephone system having a line leading to a subscriber's station, the combination of a speech recording and reproducing machine, a message delivering apparatus, said machine and apparatus each comprising a traveling steel carrier for locally magnetically differentiated portions, an inductively operable element in opposition to said steel carrier, a connection control means, a motor operatively associated with said connection control means and said message delivery apparatus, an amplifier interposed between the inductively operable element of the message delivery apparatus and the line, means operable by the connection control means for energizing said amplifier, said amplifier being permanently connected with the sub-station, whereby the voice currents produced by the inductively operative element of the message delivery apparatus in the input circuit of the amplifier are transmitted in amplifier condition to the sub-station and another relay conductively connected with said connection control means, means operable from any sub-station of the system for energizing said last named relay, and means under control of said last named relay for reproducing the message reported in said machine when the latter had been placed in connection with the line.

4. In a telephone system a line leading to a subscriber's station, the combination of a speech recording and reproducing machine, a message delivery apparatus, a connection control means, a motor operatively associated with said apparatus and said connection control means, and circuit elements under the control of said means for rendering the speech recording machine adapted to successively record in-coming speech, reverse the machine to reproduce said incoming speech and stop the machine, a switch interposed between said connection control means and said machine, and means actuated by said machine for altering the position of the switch to render said machine adapted for the various operations in conjunction with the connection control means the means for altering the position of said switch to render the machine adapted for reproduction being actuatable from any sub-station of the system.

5. In a telephone system having a line leading to a sub-station, the combination of a speech recording machine, a message delivery apparatus, a connection control means, a motor jointly associated with said connection control means and said message delivery apparatus for successively establishing connection between said message delivery apparatus and the line, and the machine and the line, and selectively variable means operable from any substation of the system for connecting the machine for reproduction with the line, said selectively variable means being operable through an incoming call at the said substation, whereby the speech reproduced by the machine may be received at any sub-station of the system.

6. In a telephone system, having a line leading to a subscriber's station, the combination of a message delivery apparatus, a speech recording and reproducing machine, an automatic connection control means for successively connecting said apparatus with the line and said machine for recording with the line, and means operable from any sub-station of the system in accordance with a predetermined code for setting said machine for reproducing the speech recorded thereon on the line, whereby said speech on the record of the machine may be received at any sub-station of the line by a subscriber acquainted with the code.

7. In a telephone system having a line leading to a subscriber's station, a message delivery apparatus at the station, a speech recording and reproducing machine at the station, an automatic connection control means, said automatic connection control means being provided with a plurality of elements displaceable relatively to each other selectively, and means cooperating with said selectively displaceable elements and operable from any substation of the system for setting the reproducing machine to reproduction and connecting it with the line, whereby upon the operation of said selectively displaceable elements of the connection control means, the speech recorded on the recording machine may be reproduced and listened to at any station of the system.

8. In a telephone system having a line leading to a sub-station, a message delivery apparatus at said sub-station, a speech recording and reproducing machine at said sub-station, an automatic connection control means for successively connecting the apparatus with the line and the recording machine for speech recording purposes with the line, a relay, and means controllable from any sub-station of the system but operable through the connection control means and said

relay for setting the machine to reproducing condition and connecting it with the line when said relay is energized from the line by voice currents timed with respect to the message delivered into the line by the message delivery apparatus.

9. In a telephone system having a line leading to a subscriber's station, the combination of a message delivery apparatus, a speech recording and reproducing machine, automatic connection control means, a motor, means for starting said motor upon an incoming call, said motor being operatively associated with said connection control means and said message delivery apparatus, the connection control means being provided with a plurality of selectively movable elements, a plurality of switches, electromagnets controlling said switches, conductors connecting said electromagnets with the selectively placeable elements of the automatic connection control means, whereby said switches are moved in predetermined timely sequence dependent upon the selective setting of said displaceable elements of the connection control means, and means operable upon a predetermined setting of said switches for reproducing the speech recorded on the recording machine on the line, the connections between said relatively movable elements of the connection control means and of the electromagnets controlling the switches being dependent upon the timely sequence of voice currents arriving through the line, whereby the setting of the reproducing machine and the connection of said reproducing machine with the line is rendered dependent upon the relative displacement of said selectively settable elements of the connection control means and of the arrival of voice currents at selectively predetermined intervals over the line.

10. In a telephone system having a line leading to the subscriber's station, the combination of a message delivery apparatus adapted to deliver portions of a message at intervals from each other, a speech recording and reproducing machine, an automatic connection control means, a motor operatively associated with said connection control means and said message delivery apparatus, means for rendering said motor operative upon arrival of an incoming call at the substation, the connection control means being adapted to successively connect the message delivery apparatus with the line and the recording machine with the line, elements selectively settable to predetermined positions on the connection control means, electromagnets conductively connectible with said selectively settable elements of the connection control means during the motor induced movement of said means, a plurality of switches, each controlled by one of said electromagnets, means for normally holding all of said switches in a predetermined position, means biassing said switches selectively into different directions whereby upon release of said switches from the holding means controlled by said electromagnets, switches biassed in one direction will alter their position while other switches biassed in another direction will retain their position in spite of their release, circuit connections between said switches and the reproducing machine, means energizable by voice currents from the line for establishing circuits through said selectively settable elements and said electromagnets, and means under control of the connection control means for setting the recording and reproducing machine to reproduction on the line, whereby the reproduction of the speech recorded on the machine is rendered effective through the voice currents and through the setting of the selectively settable elements and through the selective biassing of said switches, the timing of the voice currents for completing the circuits energizing the electromagnets being determined by bringing the intervals in the message delivered from the message delivery apparatus in coincidence with the setting of the selectively settable elements of the connection control means.

11. In a telephone system having a line leading to a sub-station, a speech recording and reproducing machine at the sub-station, a message delivery apparatus at the sub-station, an automatic connection control means, a motor operatively associated with said message delivery apparatus and said connection control means, an amplifier connected with the line, connections extending from the amplifier to the recording machine, said connections being under the control of the automatic connection control means whereby upon the movement of said connection control means, the voice currents coming in from the line will be recorded in amplified condition on the recording machine, elements selectively settable on the automatic connection control means, switches operatively connected with said elements, said switches being selectively movable from circuit interrupting position to circuit closing position when said connections between said selectively settable elements and control means for said switches are completed, a relay, an amplifier in the output whereof said relay is located, the automatic connection control means establishing the connection between said relay and the control elements for the switches in selectively predetermined sequence, and means depending upon the arrival of voice currents at said amplifier at selectively timed intervals of the message delivered by the message delivery apparatus for intermittently energizing said relay, the connection control means and the recording machine cooperatively placing said recording machine into position for reproduction, whereby through incoming voice currents in a selectively timed sequence and at selectively predetermined intervals, the recording machine is set for reproducing the speech recorded thereon into the line.

12. In a telephone system having a sub-station connected with a line, the combination of a speech recording machine, a message delivery apparatus, an automatic connection control means, a motor operatively associated with said apparatus and said means, means under control of an incoming call for selectively energizing said motor, means interposed between the automatic connection control means and the line for setting the recording machine to reproduction, said interposed means becoming operative upon the arrival of voice currents in predetermined relation to intervals of the message delivered by the message delivery apparatus and in predetermined relation to selectively settable elements of the connection control means, whereby the recording machine is set and operated to reproduce the recorded speech into the line, and means automatically operative upon disconnection of the sub-station from the line for automatically restoring the message delivery apparatus, connection control means and recording and reproducing machine to its initial position.

13. In a telephone system having a line leading to a subscriber's station, the combination of a speech recording and reproducing machine, a

message delivery apparatus, an automatic connection control means for successively connecting said apparatus and the machine to the line, whereby the calling subscriber is informed that the message to be spoken by him will be recorded, means at the sub-station operable from any other sub-station on the line through voice currents uttered from said second named sub-station into the line in predetermined timely relation with respect to the message delivered by the apparatus of the first named sub-station for reproducing the speech recorded in the first named sub-station into the line to be received at the second named sub-station, and means for indicating at the second named sub-station that the reproduction is terminated.

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