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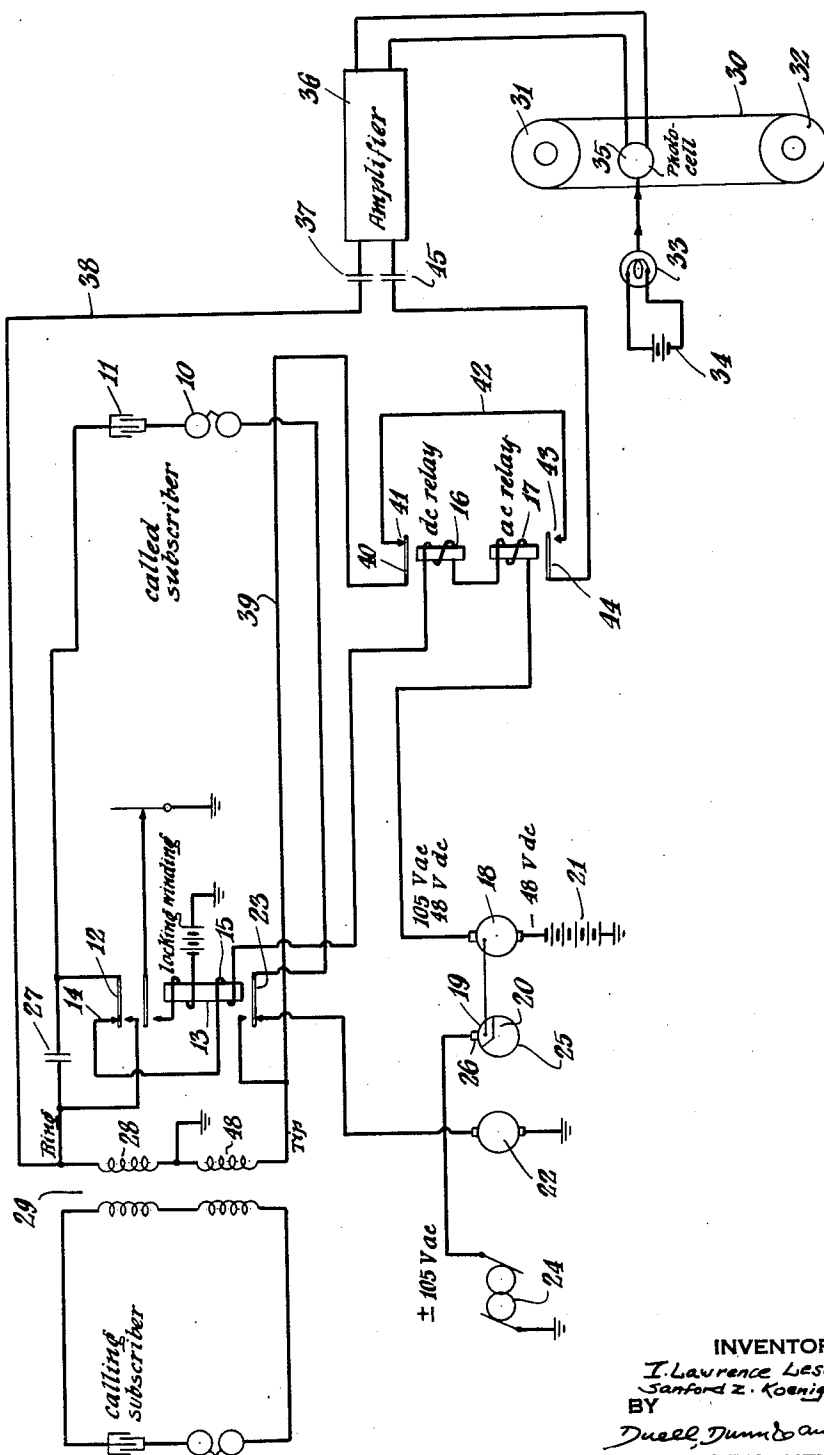
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TELEPHONE ADVERTISING METHOD AND APPARATUS

Filed March 31, 1932

3 Sheets-Sheet 1



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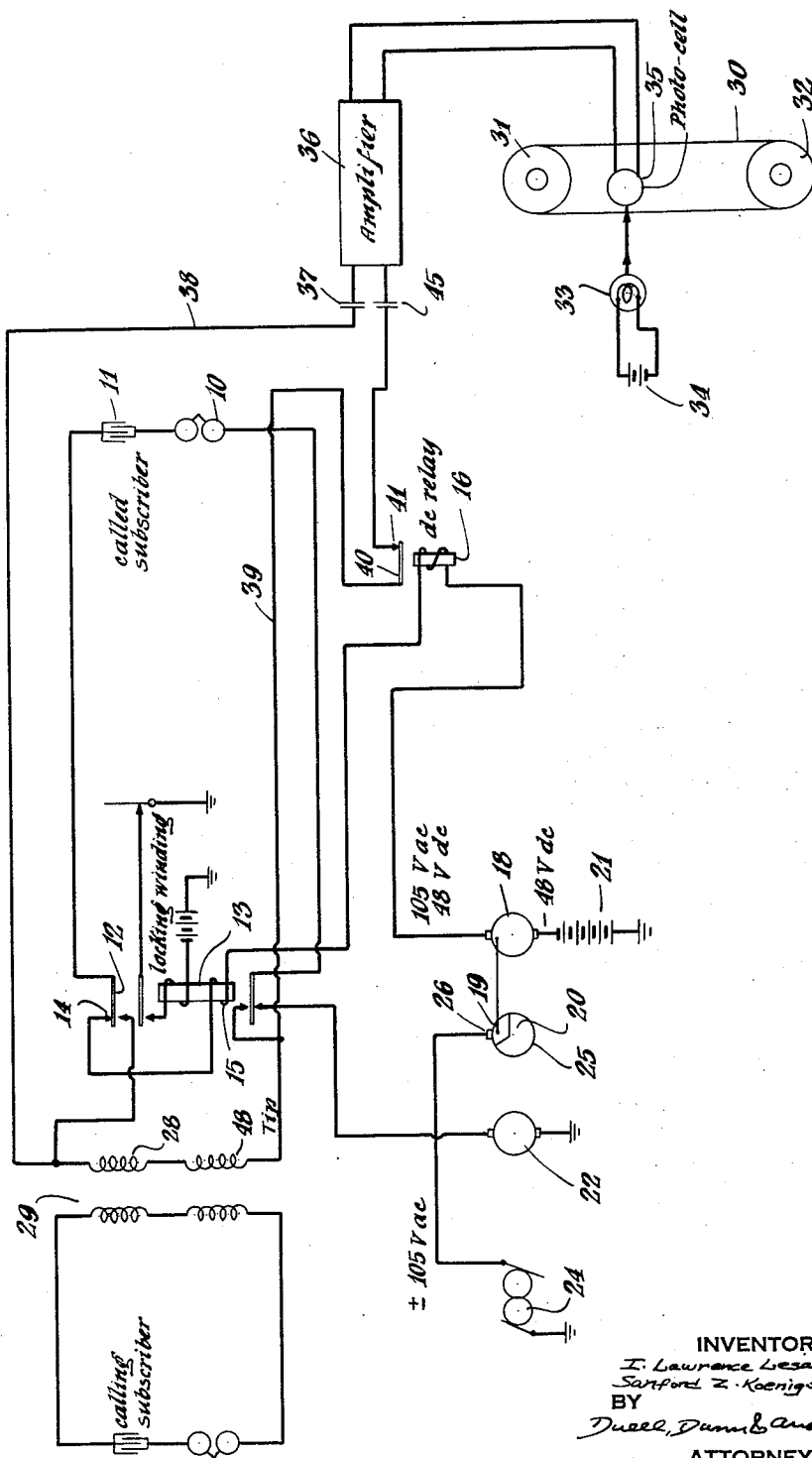
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Fig. 2



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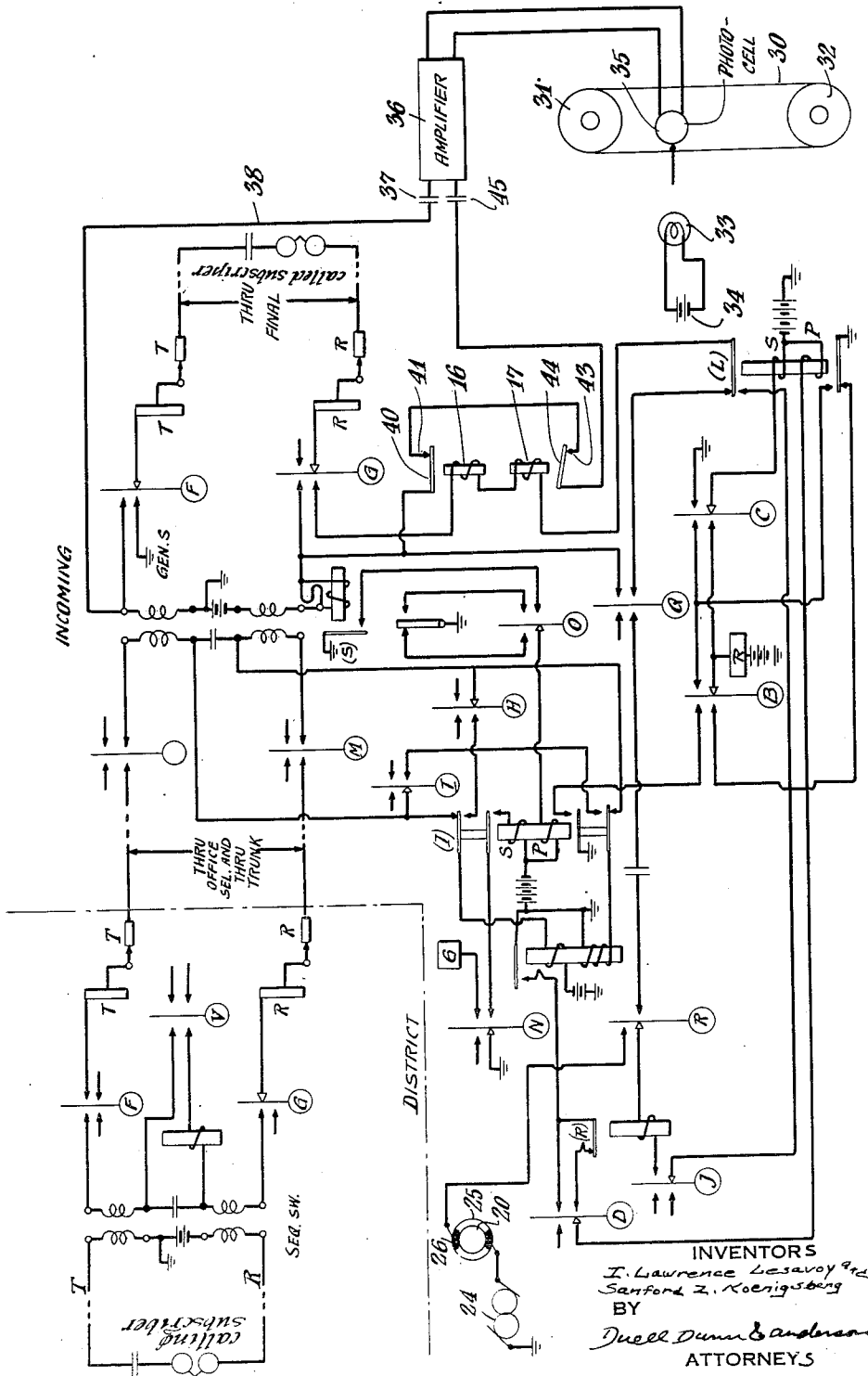
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TELEPHONE ADVERTISING METHOD AND APPARATUS

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Fig. 3



UNITED STATES PATENT OFFICE

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TELEPHONE ADVERTISING METHOD AND APPARATUS

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7 Claims. (Cl. 179-6)

This invention relates to telephone systems and relates more particularly to methods and apparatus for transmitting sound to a calling subscriber during the interval before the called subscriber responds.

In telephone systems, after the calling subscriber has made known the called subscriber to whom he wishes to be connected, the circuit of the called subscriber is supplied with ringing current which rings his bell to notify him that he is being called. When the called subscriber responds by lifting the receiver off the hook, the ringing current is discontinued and a talking circuit between the calling and called subscriber is completed. In some telephone systems a portion of the ringing current is inductively fed back into the calling subscriber's line to notify him through an audible ringing tone that ringing signals are being transmitted to the called subscriber. In the American telephone practice, the ringing machine in a telephone central office supplies ringing current for two seconds, then there is a silent period of four seconds, and then a ringing period of two seconds, and so on. There is usually an appreciable amount of time between the period when the ringing of the called subscriber starts, before he removes his receiver to respond to the call. The calling subscriber usually, while waiting for the called subscriber to respond, hears, therefore, if the exchanges in his location supply ringing tone, several two second ringing periods and several four second silent periods.

An object of this invention is to supply the calling subscriber with signals, other than ringing signals, during the time he is waiting for the called subscriber to respond.

Another object of the invention is to supply vocal messages to a calling subscriber while he is waiting for the called subscriber to respond.

Another object of the invention is to supply recorded sound to a calling subscriber while he is waiting for a called subscriber to respond.

According to this invention, suitable apparatus is provided in a telephone exchange to supply messages to a calling subscriber during the time between the period ringing current is first supplied to a called subscriber and his response thereto by lifting his receiver. In one embodiment of the invention a spoken message, such as advertising or any other message, is recorded on a film or other suitable medium and is reproduced continuously through a suitable pick-up and amplifier and superimposed under the control of the called subscriber on the calling sub-

scriber's line. Suitable mechanism is provided for opening the amplifier circuit to the calling subscriber when the called subscriber lifts his receiver. Suitable mechanism is also provided for discontinuing the message during the ringing periods and for supplying the message during the silent periods between the ringing periods.

In another embodiment of the invention, it is planned that the ringing tone to the calling subscriber be discontinued and that the supply of the message to him, according to this invention, be sufficient notice that the called subscriber's line is being supplied with ringing signals.

The invention will now be described with reference to the drawings, of which:

Fig. 1 is a simplified circuit showing a calling subscriber's and a called subscriber's line, the ringing machine, the tripping relay, the apparatus for supplying the recorded message, and its control apparatus;

Fig. 2 is a simplified circuit similar to Fig. 1, except that in the system shown by Fig. 2 no ringing tone is supplied to the calling subscriber, and

Fig. 3 is a simplified circuit showing the application of the invention to a panel type machine switching system.

Referring now to Fig. 1, when the calling subscriber has been connected through to the line of the called subscriber and ringing current is supplied to the called subscriber, a circuit is completed through the called subscriber's bells 10, the condenser 11, the armature 12 of the tripping relay 13, the contact 14, the D. C. winding 15 of the relay 13, the winding of the D. C. relay 16, the winding of the A. C. relay 17, the commutator and brushes of the interrupter 18, battery 21 to ground, through ground to interrupter 22, and switch 23. The battery 21 supplies 48 volts to the circuit to energize the D. C. relays and other associated apparatus (not shown). The ringing machine 24 supplies 105 volts alternating current to the interrupter 20, which is provided with the conducting segment 19 and the insulating segment 25. The conducting segment 19 is connected to the commutator of the interrupter 18. During a portion of the time that the segment 19 of the interrupter 20 is under the brush 26, 105 volts alternating current is superimposed on the 48 volts direct current and through the circuit above described. The 105 volt alternating current operates the bells 10 of the called subscriber. During a portion of the time that the insulated segment 25 is under the brush 26 of the interrupter 20, no

ringing current is supplied to the called subscriber's bells. The dimensions of the conducting segment to the insulating segment are such that two seconds ringing current is supplied, followed by a four second silent period.

In order that the calling subscriber may know that his number is being called, a portion of the ringing energy is supplied in the circuit including the condenser 27, the winding 28 of the repeat coil 29 to ground, the remainder of the circuit being through the condenser 11, the bells 10, and the other elements of the circuit as described above. The ringing energy is inductively transferred through the windings of the repeat coil 29 to the receiver of the calling subscriber. During the ringing period and before the called subscriber responds, the tripping relay 13 is de-energized—this due to the fact that the impedance of the called subscriber's bells 10 and the condenser 11 is too great for the relay to be energized.

When the called subscriber responds by lifting his receiver off the hook, apparatus in his telephone is operated by the lifting of the receiver to place the condenser 11 and bells 10 out of the circuit and to substitute the microphone and receiver for talking purposes therein. The talking circuit of the called subscriber has a relatively low impedance so that the tripping relay 13 becomes energized and opens the ringing circuit through the armature 12 being drawn down to release the contact 14. At the same time the armature 23 of the tripping relay is pulled up to connect the talking circuit of the called subscriber to the repeat coil 29 to complete the talking circuit.

The system described above is a standard telephone system except for the addition of the D. C. relay 16 and the A. C. relay 17. They are provided, according to this invention, to control the amplifier of the reproducing equipment. According to this invention, a film 30 on which there has been recorded a spoken message or entertainment, or any other matter which it is desired to transmit to the calling subscriber, is caused to circulate continuously over the end spools 31 and 32. The light source 33, energized by the battery 34, projects a light beam through that portion of the film on which the message is recorded, against the light sensitive cathode of the photo-electric cell 35. The output of the photo-electric cell 35 is fed into the amplifier 36 which may also contain means for applying polarizing and biasing potentials to the photo-electric cell. The circuit of the output side of the amplifier is as follows: through the condenser 37, the lead 38, the windings 28 and 48 of the repeat coil 29, the lead 39, the armature 40 of the D. C. relay 16, the contact 41, the lead 42, the contact 43, the armature 44 of the A. C. relay 17, and the condenser 45. The apparatus is arranged so that during the silent periods between the ringing periods, while the called subscriber's receiver remains down, the sound recorded on the film 30 interrupts the light beam between the light source 33 and the photo-electric cell 35 to variably energize the photo-electric cell 35 according to the shadings of the sound which has been photographically recorded on the film. The light variations set up electrical variations which are amplified in the amplifier 36 and superimposed on the windings of the repeat coil 29. During the two second ringing periods the A. C. relays 17, which is a marginal relay, operates to release the contact 43 and open the

output circuit of the amplifier so that none of the recorded sound is heard by the calling subscriber during the two second ringing periods. The D. C. relay 16 has characteristics similar to those of the tripping relay 13 and until the receiver of the called subscriber is lifted, it is not operated, due to the high impedance of the ringing circuit. Once the called subscriber's receiver is lifted, however, the relay 16 is energized due to the lowered impedance of the line and its armature 40 is pulled down to release the contact 41 to open the output circuit of the amplifier 36. When the talking circuit between the calling and the called subscriber is completed, as shown in Fig. 1, the amplifier circuit is open and the tripping relay 13 is energized.

The system shown by Fig. 1 is seen to comprise a standard system to which has been added the reproducing apparatus, according to this invention, and the relays 16 and 17. The recorded sound is transmitted to the calling subscriber only when his call has been completed and the called subscriber is being called. Furthermore, during the two second ringing periods, the recorded sound is discontinued so that the calling subscriber is able to hear the ringing tone to satisfy him that his number is being rung. Provision is also made for discontinuing the supply of the recorded sound when the called subscriber responds, thus preventing any possibility of the recorded sound interfering with the conversation between the two subscribers.

The embodiment of the invention illustrated by Fig. 1 is similar to that described above in connection with Fig. 2, except that in this embodiment of the invention no ringing impulses are supplied to the calling subscriber to satisfy him that his number is being called. This embodiment contemplates that the sound recorded on the film, according to this invention, may serve to notify the calling subscriber that his number is being called since the calling subscriber only hears the recorded sound when his call has been completed through to the line of the called subscriber. The system shown by Fig. 2 is exactly similar to that shown by Fig. 1 except that the condenser 27 of Fig. 1, which serves to transmit the ringing tone to the winding 28 of the repeat coil, is omitted, and the A. C. relay 17, its armature 44, and contact 43 are omitted. Otherwise, the apparatus shown in the two embodiments is exactly similar and their operation is similar. Accordingly, the same designation numbers have been given to the apparatus in both figures. In the embodiment shown by Fig. 2, the sound recorded on the film 30 is continuously transmitted to the calling subscriber while ringing current is being supplied to the called subscriber. The calling subscriber does not hear ringing tones. The sound supplied from the amplifier 36 serves to notify the calling subscriber that his call has been put through. In fact, the sound which is transmitted to him from the amplifier 36 may consist of language telling him that his number is being called. When the called subscriber lifts his receiver, the D. C. relay 16 is energized, as described in connection with Fig. 1, to open the output of the amplifier 36 so that no recorded sound is transmitted to the calling subscriber when the talking circuit between the two subscribers is completed.

This invention is applicable to manual telephone systems, to step by step machine telephone systems, and to panel type switching systems. The circuits described in Figs. 1 and 2 are appli-

cable to all three of the enumerated systems. For purposes of illustration, however, the additional apparatus, according to this invention, has been shown in Fig. 3 to be added to the mechanical ringing circuit of a panel type machine switching system as employed at the present time by the American Telephone & Telegraph Company. The apparatus shown by Fig. 3 is standard apparatus manufactured by the Western Electric Company for the American Telephone & Telegraph Company, and its operation is well known to those skilled in the art and will not be explained in detail in this specification since the machine switching operations are not part of this invention. It is believed to be sufficient for an understanding of the invention, therefore, to state that after the calling subscriber has dialed his number, connections are closed through the cams of sequence switches to complete the ringing circuit, and upon the called subscriber lifting his receiver to disconnect the ringing circuit and to complete the talking circuit. The cams of the sequence switches are indicated by the circles with the capital letters placed therein. The relays, switches, and other apparatus shown are well known to those skilled in the art and their operation, for the purpose of simplicity, will not be explained here. The relays 16 and 17 and their associated armatures and contacts, the amplifier 36, and the remaining reproducing apparatus shown in Fig. 3 is similar to that described above in connection with Fig. 1 and will not be explained again here since the operation of the apparatus shown by Fig. 3 is the same as that shown by Fig. 1, Fig. 1 being a simplified circuit with the various circuit closing mechanisms omitted.

The amplifier 36 may have its output circuit of such high impedance that its being bridged across the coils 28 and 38 of the repeat coil 29 will not affect to any substantial degree the characteristics of the telephone system, so that its addition will not interfere with existing telephone systems. Likewise, the relays 16 and 17 may have such low impedance and resistance that their arrangement in series relation with other apparatus will not interfere with the efficient operation of such other apparatus.

A single amplifier and its associated reproducing apparatus may be associated with a single telephone exchange, it not being necessary to supply a separate reproducing system for each subscriber. The amplifier 36 may be bridged across the distributing frame of an exchange and the recorded sound may be continuously supplied to the amplifier. The amplifier may supply sound to one or to a large number of called subscribers simultaneously, each subscriber circuit being supplied with separate relays 16 and 17 where the ringing tone is to be transmitted back to the calling subscriber, and with the single relay 16, where the calling sound notifies the calling subscriber that his number is being called. Any suitable automatic volume control may be associated with the output circuit of the amplifier to automatically vary the volume of its output proportional to the number of subscribers making up its load. Such volume controls are well known to those skilled in the art.

The sound recorded may be an advertising message, advertising any commercial product, and may be an advertising message from the telephone company; it may be instructions or confirmations from the telephone company, or may

be music or any other message that it may be desired to transmit.

While the sound to be transmitted back to the calling subscriber has been described as being recorded on a photographic film, as is used in talking pictures, it should be understood that it may be recorded on a wax record or any other suitable means, or it may be transmitted from its original source.

Whereas one or more embodiments of the invention have been described for the purpose of explanation, it should be understood that the invention is not limited to the exact arrangement described, but many modifications may be made by those skilled in the art without departing from the spirit of the invention.

What is claimed is:

1. A telephone system comprising a calling subscriber, a called subscriber, a circuit connecting said subscribers, transmitting means for sending calling signal impulses to said called subscriber, means for transmitting indications of said impulses to said calling subscriber, means for transmitting a separate signal to said calling subscriber while said called subscriber is being signalled, and means controlled by said first mentioned means for discontinuing said last mentioned means during said signal impulses.

2. A telephone system comprising a calling subscriber, a called subscriber, a circuit connecting said subscribers, transmitting means for sending calling signal impulses to said called subscriber, means for transmitting indications of said impulses to said calling subscriber, a medium carrying a recorded signal, means for converting said recorded signal into an electrical signal, means for transmitting said electrical signal to said calling subscriber while said called subscriber is being signalled, and means controlled by said first mentioned means for discontinuing said last mentioned means during the transmission of said signal impulses.

3. A telephone system comprising a calling subscriber, a called subscriber, a circuit connecting said subscribers, transmitting means for sending calling signals to said called subscriber, means for transmitting indications of said impulses to said calling subscriber, a medium carrying a recorded signal, means for converting said recorded signal into an electrical signal, means for transmitting said electrical signal to said calling subscriber while said called subscriber is being signalled, means controlled by said first mentioned means for discontinuing said last mentioned means during said calling signals, and means operated by the response of said called subscriber for discontinuing said signals.

4. A telephone system comprising a calling subscriber's station, a called subscriber's station, a circuit connecting said stations, a ringing generator for supplying ringing current to said called subscriber's station, a medium carrying a recorded signal, means for converting said recorded signal into an electrical signal, and means energized by the supply of ringing current from said generator for transmitting said electrical signal to said calling subscriber's station while said called subscriber's station is being signalled.

5. A telephone system comprising a calling subscriber's station, a called subscriber's station, a circuit connecting said stations, a ringing generator for supplying intermittent ringing currents to said called subscriber's station, a medium carrying a recorded signal, means for converting said recorded signal into an electrical

signal, means energized by the supply of ringing current from said generator for transmitting said electrical signal to said calling subscriber's station while said called subscriber's station is being signaled, and means energized by the supply of ringing current to said called subscriber's station for discontinuing said means during the transmission of ringing current to said called station, but connecting said means to said calling station in the intervals between the transmission of the intermittent ringing currents.

6. A machine-switching telephone system comprising a calling subscriber's station, a called subscriber's station, a central office, machine switching devices at said central office set into operation by the calling subscriber to complete a circuit through to the called subscriber, a medium at said central office carrying a recorded

signal, and means set into operation upon the completion of the circuit to said called subscriber's station for transmitting the recorded signal to the calling subscriber.

7. A machine-switching telephone system comprising a calling subscriber's station, a called subscriber's station, a central automatically operated office, machine-switching devices in said office, set into operation by the calling subscriber, for establishing a circuit to the called subscriber and supplying a ringing signal, a medium carrying a recorded signal in said central office, and means set into operation by said devices for transmitting the recorded signals on said medium to said calling subscriber's station, during the supply of the ringing signal.

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