

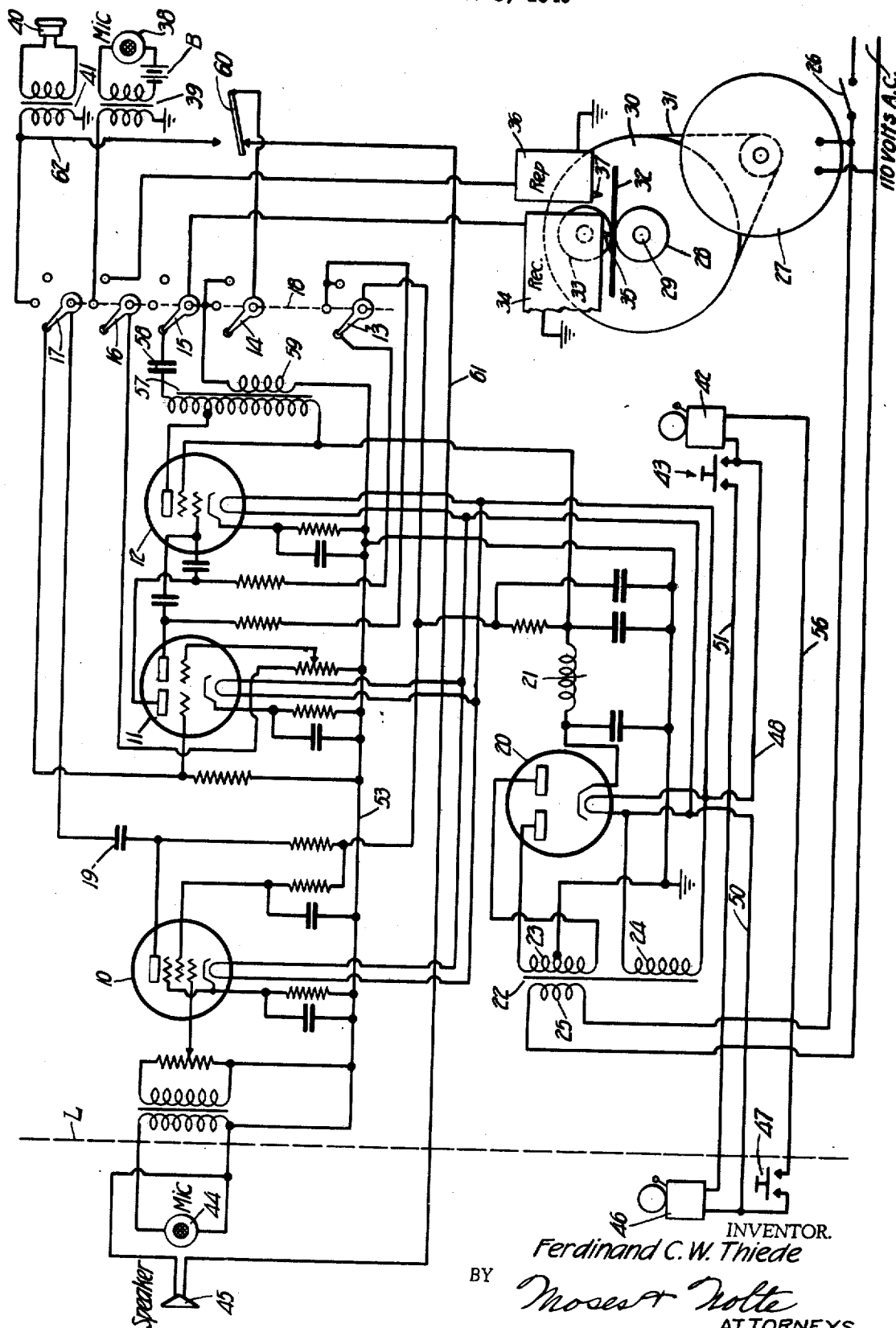
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SIGNAL RECORDING AND COMMUNICATION SYSTEM

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SIGNAL RECORDING AND COMMUNICATION SYSTEM

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4 Claims. (Cl. 179-100.4)

This invention relates to a system for recording sound on records and again reproducing the sound in which the dictator is located at a position remote from the record. The system is generally similar to that disclosed in patent application Serial No. 218,082, filed July 8, 1938, in the name of Barton A. Proctor, et al. In said application the recording machine is placed close to the dictator and the transcriber so that no communication system between the two persons is necessary. Where, however, it is desirable that the recording machine and the transcriber be located at substantial distances from the dictator, as, for example, in another room, it is desirable that a communication system be established between the parties so that the transcriber may operate the recording and reproducing machine in accordance with the wishes of the dictator.

It is accordingly an object of the present invention to provide such a communication system between the dictator and the operator of the machine. For recording dictation on a record, a multi-stage amplifying device is provided and it is the main feature of the present invention that this amplifying device is also used to amplify the voice currents comprising one way or two way conversation between the dictator and the machine operator.

Another object of the invention is to provide in connection with the amplifying device of a recording machine, a multi-position switch so arranged that in its first position dictation may be recorded on a record and in its second position a two way communication channel may be established between the dictator and the operator of the machine. In further pursuance of this object this switch is also provided with a third position in which the sound previously recorded on a record may be reproduced.

An auxiliary object of the invention is the provision of an additional switching device whereby the sound may be reproduced by means of a loud speaker located in the same room with the dictator or through a telephone receiver clamped to the operator's head so that both her hands may be free to transcribe the communication on a typewriter disposed near the recording machine.

For a better understanding of the invention, reference is made to the accompanying drawing in which the single figure is a schematic representation of certain parts of a recording and reproducing machine and a schematic circuit diagram embodying the invention.

The amplifying device for amplifying the sig-

nals to be recorded is generally similar to that disclosed in the aforementioned patent application and comprises the amplifying tubes 10, 11 and 12 which are connected together through the resistance coupling arrangements shown. The output circuits of the tubes are adapted to be connected to apparatus to be later described by means of a series of switch arms 13, 14, 15, 16 and 17. All these switch arms may be operated together by means of a common control shaft or other member as indicated in dotted lines by the reference numeral 18, it being understood that the shaft 18 will be made of insulation material or of metallic sections insulated from each other. With the switch shaft in the position shown, the output circuit of the tube 10 is connected to the grid circuit of tube 11 through the switch 17 and a condenser 19. The current is supplied through the circuits shown from a double rectifier 20 and a filter circuit 21. Current is supplied to the rectifier 20 through a transformer 22 having the secondary windings 23, 24 and the primary winding 25 which may be connected to an A. C. power supply source through the leads shown and the on-off switch 26. Secondary winding 24 supplies current through the circuit shown to the heater of the rectifier 20 and to the heaters of the amplifier tubes 10, 11 and 12.

The recording machine proper may be of the kind described in the aforementioned application and comprises an electric motor 27 which drives a lower feed roller 28 mounted on a shaft 29, which shaft also carries a pulley 30 which is driven by the belt 31. The record 32 is also driven by an upper feed roller 33 when the latter is lowered into engagement with the upper surface of the record, which is preferably curved and made of very thin, flexible material as fully described in the aforementioned application. For the purpose of recording, a recording unit 34 is provided which has a stylus 35 adapted to be brought into engagement with the surface of the record 32, and for the purpose of reproducing the recorded sound a reproducing unit 36 is provided having a stylus 37 adapted to be brought into engagement with the record. Also mounted near the recording machine are a microphone 38 which is adapted to be connected with an input circuit of the amplifier through circuit connections, including a transformer 39, and also a telephone receiver 40, which is adapted to be connected to the output circuit of the amplifier 10 by means of the switch 17 and a transformer 41. In order to secure a large output voltage, the microphone

38 is preferably of the carbon type and is provided with a bias battery B. Also disposed near the recording machine is an alarm bell 42 and the switch 43 which are provided for a purpose to be later described.

The apparatus described may be located at a point remote from the dictator as, for example, it may be located in one room of a building while the dictator is seated in another room thereof, as indicated by the division line L. Located in the room with and near the dictator are a microphone 44, a loud speaker 45, a bell 46 and a switch 47 which are connected to the circuit of the recording machine by the leads shown.

To use the device for recording, the dictator first closes the switch 47 for a short period. This closes a circuit comprising the secondary winding 24, lead 50, switch 47, lead 56, bell 42, and lead 48, the current through this circuit causing the bell 42 to ring once, thereby notifying the operator who is stationed at the machine that the dictator is ready to dictate. The operator then throws the switch shaft 18 into the recording position shown and simultaneously lowers the upper feed roller 33 into engagement with the surface of the record 32 causing the latter to rotate. The operator then closes the switch 43 for a brief interval, this action closing the circuit comprising the secondary winding 24, lead 48, switch 43, lead 51, bell 46, and lead 50, the current through this circuit causing the bell 46 to ring once, thereby notifying the dictator that the machine is ready for recording. It is not necessary for the practice of the invention that the operator at the machine move the recorder 34 from its neutral position and lower the feed roller 33 into engagement with the record to start its rotation as this operation may be performed by the dictator closing a switch mounted near him (not shown), this switch forming a part of a remote control device shown in patent application Serial No. 281,811 filed June 29, 1939, in the name of Barton A. Proctor.

The dictator then talks into the microphone 44, the amplified voice current in the plate circuit of tube 10 being transferred to the grid of tube 11 through the circuit shown, including condenser 19 and switch blade 17. The current amplified in tubes 11 and 12 is impressed on the recorder 34 through the winding of output transformer 57, condenser 58 and switch blade 15, causing the communication to be recorded on the record 32 by the stylus 35.

Should the dictator wish to hear what he has dictated, he may signal to the operator by means of a prearranged signal as, for example, by pressing the switch 47 twice thereby causing the bell 42 to ring twice. The operator then moves the record carriage back into its initial position and rotates the shaft 18 into its extreme right-hand position, which also elevates the recorder 34 above the record and lowers the stylus 37 of reproducer 36 into engagement with the record. The voltage generated by the reproducer is transferred to the grid at the right side of the second tube through the circuit shown, including the switch blade 16 and amplified in the tubes 11 and 12. The amplified speech currents appearing in the output circuit of tube 12 are transferred to the loud speaker 45 through the circuit shown including the transformer secondary winding 59, switch 14, switch 60, lead 61 and lead 53. The communication which has been recorded will be reproduced by the speaker 45 and may be heard by the dictator. Should, however, the

dictator not wish to hear the communication recorded, but wish to have it transcribed upon a typewriter, the machine operator will throw the switch blade 60 into its upper position whereupon the amplified currents corresponding to the recorded communication will be transferred to the primary winding of transformer 41 through the circuit shown including transformer secondary 59, switch 14, switch 60, and lead 62. An attendant will then hear the recorded communication in a telephone receiver 40 which may be clamped against her head and make it possible for her to transcribe the communication on a typewriter.

Should the dictator wish to speak to the machine operator who may also be his secretary, he may signal her by ringing the bell 42 a suitable number of times by closing the switch 47 a corresponding number of times. The operator will then move the switch shaft 18 into its middle position thereby establishing circuits which will permit two-way conversation between the dictator and his secretary.

Upon the dictator's talking into microphone 44, the speech currents are amplified in amplifier tube 10 only and are reproduced in the telephone receiver 40 through the circuit shown, including the condenser 19, switch blade 17 and the primary winding of transformer 41.

When his secretary wishes to speak to the dictator, she talks into the microphone 38, the speech currents being transferred to the grid at the right side of tube 11 through the circuit shown comprising a secondary winding of transformer 39 and switch blade 16. The speech currents are amplified in both the amplifying tubes 11 and 12 and cause the operation of the loud speaker 45 by means of currents passing through the circuit shown including a secondary winding 59, switch blade 60 and lead 61. His secretary may thus speak to the dictator while he is away from his desk and he may hear within the range of hearing of the loud speaker 45 as, for example, if he has moved into another communicating room. If the secretary, for any reason, should wish to hold conversation with a person in the room with her and not wish the executive to hear it, this may be done by throwing the switch 60 into its upper position, whereupon the aforescribed circuit to the loud speaker 45 is broken so that the conversation will not be reproduced thereby. It will be observed that the switch arrangement described permits the same amplifying device to be very conveniently used for recording a communication on a record, for reproducing such a recorded communication, and also for carrying on a two-way conversation between the two parties who are separated by a substantial distance.

I have described what I believe to be the best embodiments of my invention. I do not wish, however, to be confined to the embodiments shown, but what I desire to cover by Letters Patent is set forth in the appended claims.

1. A device for recording signals on a record and reproducing the signals comprising, in combination, an amplifying device having input and output circuits and comprising a plurality of amplifying stages, a microphone disposed at a point remote from the record and arranged to be connected to the amplifier input circuit, means for driving the record, a recorder for recording the signal on the record, a sound reproducer disposed adjacent to the record, and a switching device arranged in one position thereof to connect the recorder to the output circuit of the last stage

of the amplifier and to disconnect the sound reproducer from the amplifying device, and in another switch position to disconnect the recorder from the output circuit of the last stage and to connect the sound reproducer to the output of a stage preceding the last.

2. In a communication system for recording sound on a record which is disposed at a point remote from the source of sound, in combination, means for driving the record, a recorder for recording the sound on the record, an amplifier having input and output circuits, a microphone and a sound reproducer both disposed at the source of sound, a circuit connecting the microphone to the input circuit of the amplifier, a second sound reproducer and a second microphone both disposed adjacent to the record, a reproducer having a stylus adapted to engage the record and a switching device adjustable to at least three predetermined positions; said switching device in its first position being arranged to connect said recording device to an output circuit of the amplifier, in its second position to connect said first named sound reproducer and said second sound reproducer to output circuits of the amplifier and to also connect said second microphone to an input circuit of the amplifier, and in its third position to connect said reproducer to an input circuit of the amplifier and to simultaneously connect said second sound reproducer to an output circuit of the amplifier.

3. In a communication system for recording sound on a record which is disposed at a point remote from the source of sound, in combination, means for driving the record, a recorder for recording the sound on the record, an amplifying device having input and output circuits and comprising a plurality of amplifying stages, a

microphone and a sound reproducer both disposed at the source of sound, a circuit connecting the microphone to the input circuit of the amplifying device, a second sound reproducer disposed adjacent to the record, and a switching device having a single control member movable between two positions and arranged in one position thereof to connect the recorder to the output circuit of the last stage and to disconnect both the sound reproducers therefrom and in a second position thereof to disconnect the recorder from the output circuit of the last stage and to connect both the sound reproducers to the output circuits of different amplifying stages, said switching device being provided with means arranged to selectively connect the first named sound reproducer to the output of the last stage or to connect the second sound reproducer to the output of a stage preceding the last.

4. A communication system adapted to transmit sound to an operator located near a record on which the sound may be recorded, the source of sound being disposed at a point remote from the record, said system comprising, in combination, a vacuum tube amplifier having a plurality of amplifying stages connected in cascade, a microphone and a loud speaker disposed near the source of sound, a circuit connecting said microphone to the grid of the first stage, a second microphone and a sound reproducer both disposed near the operator, and a switching device located near the operator and arranged to connect the loud speaker to the output of the final stage and to simultaneously connect the sound reproducer to the output of only the first stage, and to also connect the second microphone to the grid of a stage preceding the final stage.

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