

June 18, 1946.

A. L. PATTERSON
VOICE AMPLIFYING DEVICE

2,402,341

Filed Oct. 6, 1944

3 Sheets-Sheet 1

FIG. 1

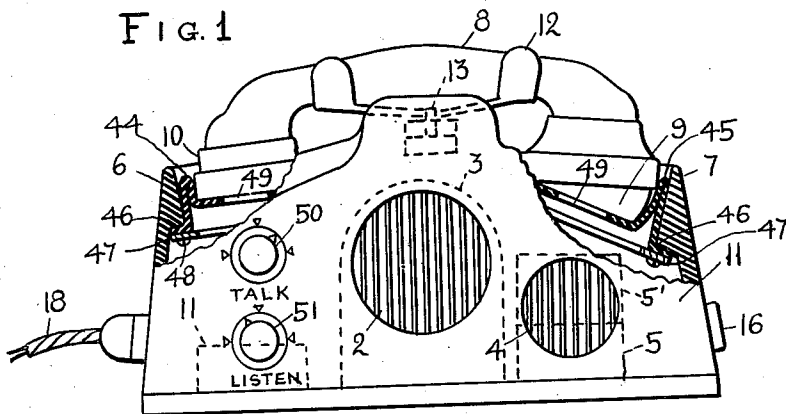


FIG. 2

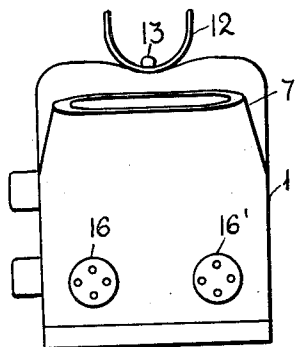


FIG. 3

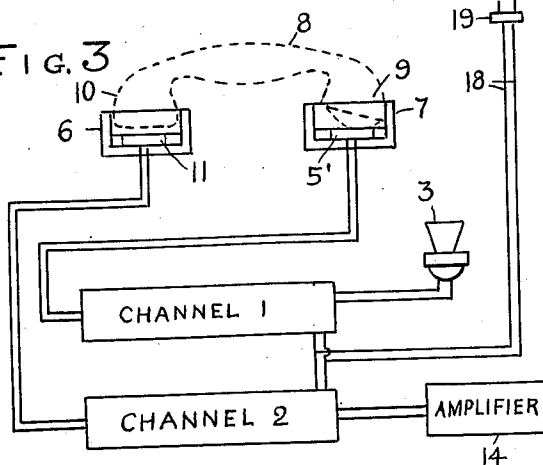
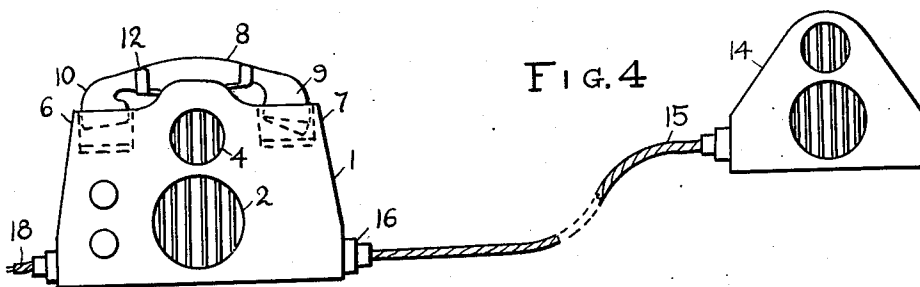


FIG. 4



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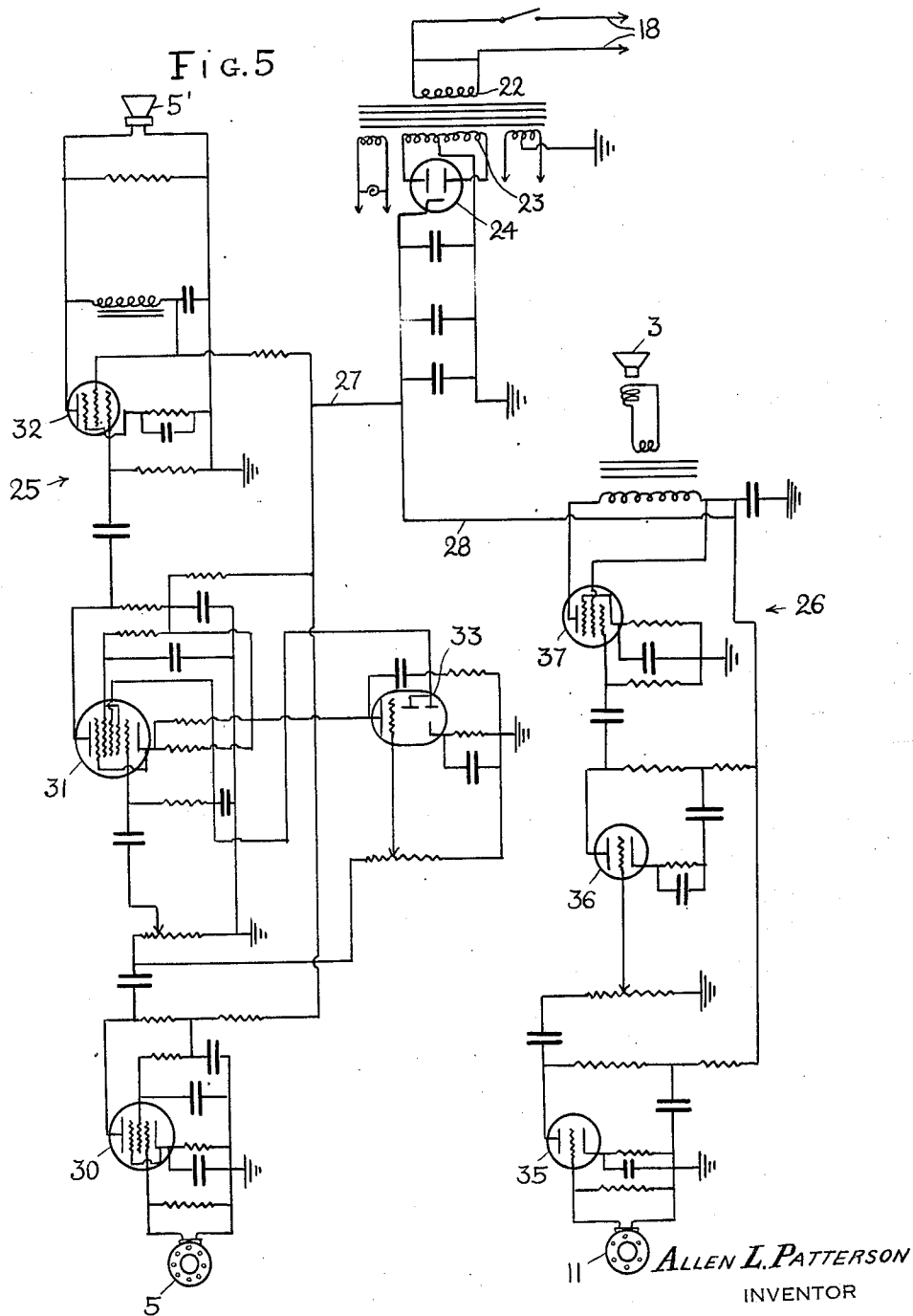
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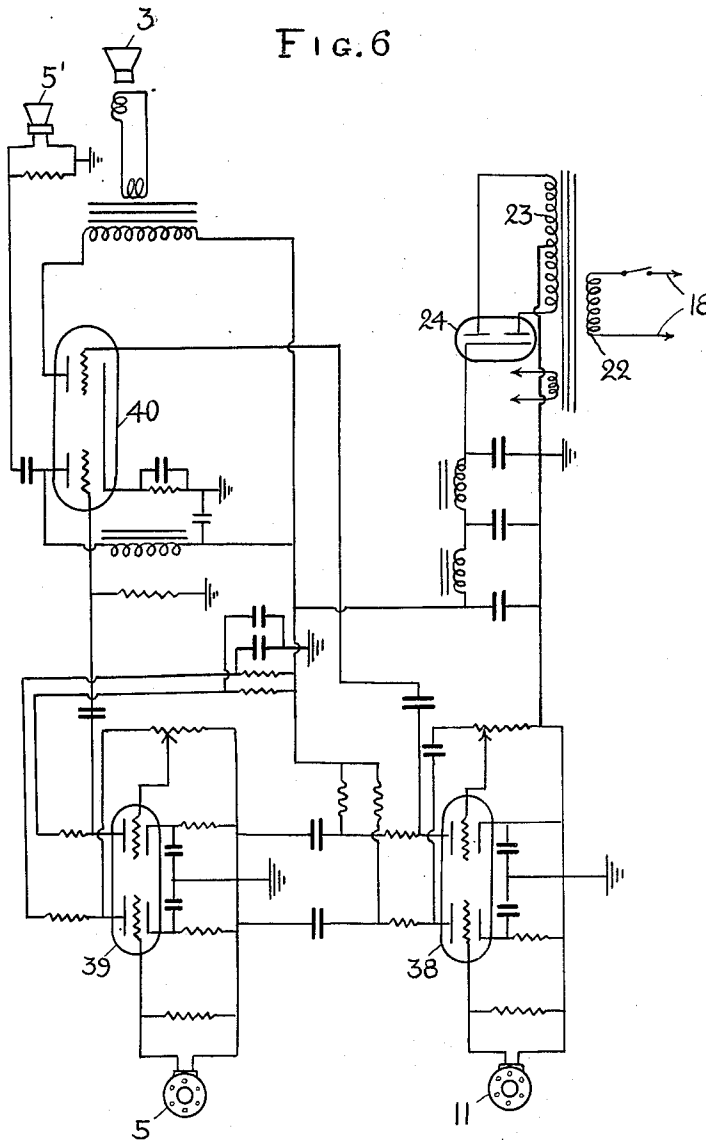
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FIG. 6



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VOICE AMPLIFYING DEVICE

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4 Claims. (Cl. 179—1)

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My invention relates to voice amplifying apparatus and has particular reference to apparatus for amplifying telephone transmission and reception sounds.

My invention has for its object to provide an apparatus in which sounds received from an ordinary telephone transmitter can be sufficiently magnified to be heard at a distance, and the voice of a speaker can be sufficiently magnified to be transmitted by a telephone transmitter when the speaker is at a distance from the transmitter.

I provide for this purpose an apparatus having a seat for an ordinary telephone receiver or hand set, having a voice transmitting and receiving unit at its ends, the device being provided with an amplifier or amplifiers, arranged to cooperate with the voice amplifying ends of the hand set, the device is therefore provided with a microphone and amplifier for transmitting amplified voices to the telephone receiving microphone, so that an ordinary conversation carried in a room, can be heard at the other end of the telephone line, similarly a microphone and a loud speaker with a suitable amplifier is provided for amplifying the voice heard in the telephone receiver, to render the sounds audible in a room where my device is located. My apparatus can be also provided with an attachment for recording the sounds by means of a suitable voice recording device of a known or other type, such as a "Dictaphone," "Ediphone," etc.

For convenience, the loud speaker and the microphone are placed in a special cabinet which also supports the telephone hand set.

Another object of my invention is to provide means to shield the receiving and transmitting units from a mutual interference, for which purpose I provide sound proof enclosures for the operating ends of the telephone hand set.

I also provide a special switch operated by the weight of the hand set when placed on my apparatus, for disconnecting my amplifying elements from the circuit when the hand set is removed and placed on its regular stand.

My invention is more fully described in the accompanying specification and drawings in which:

Fig. 1 is an elevational view of my voice amplifying apparatus, showing a telephone hand set in operative position;

Fig. 2 is an end view of the same;

Fig. 3 is a diagrammatic view of an arrangement of parts of my apparatus with two amplifying channels;

Fig. 4 is a diagrammatic view of the arrangement of my apparatus with an added voice amplifier;

Fig. 5 is a diagram of electrical connections of my apparatus; and

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Fig. 6 is a similar view of a modified diagram with two channel amplifiers.

My voice amplifier as shown in Figs. 1 and 2 comprises a hollow casing or cabinet 1 for amplifying radio tubes and their accessories and connections, the diagram of the electrical connections being shown in Figs. 5 and 6. The cabinet is provided with an opening 2 for a loud speaker 3 and a smaller opening 4 for a transmitting microphone-amplifier 5. Tubular sockets or receptacles 6, 7 are provided on top of the cabinet for a conventional telephone receiver or hand set 8. The receptacles 6, 7 are so arranged that the hand set can be placed in the operative position only in a certain way in which the speaking end 9 of the hand set will be opposite the microphone 5, and the receiver end 10 of the hand set will be opposite a microphone 11 of the loud speaker 3. The voice from the hand set is then amplified and reproduced by the loud speaker so that it can be heard by several persons in a room where the apparatus is located. Similarly, the voice of a speaker in the room can be received by the microphone 11 in the cabinet and retransmitted through the loud speaker 2. In this manner it will be only necessary to remove the telephone hand set from its cradle 12 and to place the set on my apparatus as shown in Fig. 1. The hand set will then transmit to a listener at the other end of the telephone line the words spoken in a normal voice at a moderate distance from the apparatus. Similarly the apparatus will loudly reproduce the speech from the receiving end of the hand set. An automatic switch 13 of a micro-switch type is provided on the base to deenergize the system when the hand set is slightly raised above the cradle (for instance by about $\frac{1}{8}$ "').

My device therefore can be conveniently used in connection with any ordinary telephone receiver or hand set, making it unnecessary to keep the hand set at the mouth and at the ear for conducting a telephone conversation, and it will be only necessary to place the hand set on top of my cabinet or apparatus, after which the telephone conversation can be conducted by persons in the room without even approaching the device.

An additional unit 14 may be connected to the device by plugging its wires 15 into a socket 16 at the side of the amplifying apparatus, the additional unit having a still more powerful loud speaker and microphone, for the use in conferences and for other purposes when several people may take part in the telephone conversation without leaving their places at the conference table, for instance.

My amplifying unit 1 is provided with a cable 18 and socket 19 (Fig. 3) for plugging into any suitable receptacle 20 to supply current for the amplifiers from a source 21. An additional socket

16' may be provided for connecting the system to a suitable sound recording device.

To avoid mutual interference between the sound reproducing and receiving parts of the apparatus, sound-proofing or sealing devices are provided in the form of flexible cups 44, 45, preferably made of rubber or similar elastic material, extending outwards in the openings or sockets 6, 7 and held by their flanges 46 clamped by metal rings 47 and screws 48. The cups have central openings 49 for admitting the sounds from the end 10 and to the end 9 of the receiver hand set 8. The cups are so made that they fit snugly over the portions 9 and 10 as shown in Fig. 1. Manually operable knobs 50, 51 are provided for controlling the volume of the sounds received and transmitted.

A preferred arrangement of the amplifying circuits is shown in Fig. 5. The supply line feeds current through the flexible cord 18 to a power transformer 22 whose secondary 23 is connected to a rectifier 24 for supplying current to main amplifying systems, generally designated 25 and 26, by leads 27 and 28 respectively. The system 25 comprises the microphone 5 which receives the speech or other sounds to be transmitted by the telephone. The output of the microphone is fed into the first amplifying stage comprising a tube 30, whose output in turn is fed into two more amplifying stages with tubes 31 and 32, the last stage being connected to a sound reproducing device 5', placed in a close proximity to the receiving end of the telephone hand set.

A portion of the output of the first speech amplified is applied to a compression or automatic vacuum control stage, comprising a tube 33. This feature is desirable for providing a more constant level at the mouthpiece and for compensating for variations in volume of the received speech.

The second system 26 comprises a pick-up microphone 11, placed in a close proximity to the receiving end of the telephone hand set. The output of the microphone is amplified in successive stages, comprising tubes 35, 36 and 37, to a desired volume for the loud speaker 3.

A modified system is shown in Fig. 6, corresponding to Fig. 3. In this system a two channel amplifier is used, with dual purpose tubes 38, 39, 40, for economizing space, the compressor stage being omitted.

Other parts and units of the amplifying systems are of standard types and arranged to produce satisfactory results in accordance with the standard practice of building amplifying circuits.

It will be understood that various features and principles of each of the embodiments of the invention above described or referred to may be utilized or substituted in the other embodiments.

While the invention has been described in detail with respect to certain particular preferred examples, it will be understood by those skilled in the art after understanding the invention, that various changes and further modifications may be made without departing from the spirit and scope of the invention, and it is intended therefore in the appended claims to cover all such changes and modifications.

What is claimed as new and desired to be secured by Letters Patent is:

1. A voice amplifying device for a telephone hand set, comprising a casing; means to removably support the telephone hand set on the casing; sockets on the casing for enclosing the receiving and transmitting ends of the hand set; 75

a first microphone in the socket for the receiving end of the hand set; a circuit with a plurality of amplification stages for the electric impulses from the microphone; a loud speaker connected with the last amplification stage; a second microphone for receiving sounds to be transmitted by the telephone; a second circuit with amplification stages for the second microphone; sound amplifying means connected with the last amplification stage of the second microphone and supported in the socket for the transmitting end of the hand set; and a current rectifying system connected to both of said amplification circuits.

2. A voice amplifying device for a telephone hand set, comprising a casing; means to removably support the telephone hand set on the casing; sockets on the casing for enclosing the receiving and transmitting ends of the hand set; a first microphone in the socket for the receiving end of the hand set; a circuit with a plurality of amplification stages for the electric impulses from the microphone; a loud speaker connected with the last amplification stage; a second microphone for receiving sounds to be transmitted by telephone; a second circuit with amplification stages for the second microphone; sound amplifying means connected with the last amplification stage of the second microphone and supported in the socket for the transmitting end of the hand set; a current rectifying system connected to both of said amplification circuits; and a radio tube connected in a circuit with the transmitting circuit for automatic vacuum control.

3. A voice amplifying device for a telephone hand set, comprising a casing; means to removably support the telephone hand set on the casing; sockets on the casing for enclosing the receiving and transmitting ends of the hand set; a first microphone in the socket for the receiving end of the hand set; a loud speaker for the first microphone; a second microphone for receiving sounds to be transmitted by the telephone; a loud speaker for the second microphone and supported in the socket for the transmitting end of the hand set; a second loud speaker for the second microphone; and a two-channel common amplifier for the two loud speakers employing dual purpose radio tubes.

4. A voice amplifying device for a telephone hand set, comprising a casing; means to removably support the telephone hand set on the casing; sockets on the casing for enclosing the receiving and transmitting ends of the hand set; a first microphone in the socket for the receiving end of the hand set; a plurality of amplification stages for the electric impulses from the microphone; a loud speaker connected with the last amplification stage; a second microphone for receiving sounds to be transmitted by the telephone; amplification stages for the second microphone; sound amplifying means connected with the last amplification stage of the second microphone and supported in the socket for the transmitting end of the hand set; tubular members made of an elastic material having outwards extending flanges at the inner end; rings securing the flange to the inner portions of the sockets, the outer portions of the members being folded inwards, presenting double thickness of the material for sealing the ends of the hand set, the inner portions of the tubular member having openings.

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