

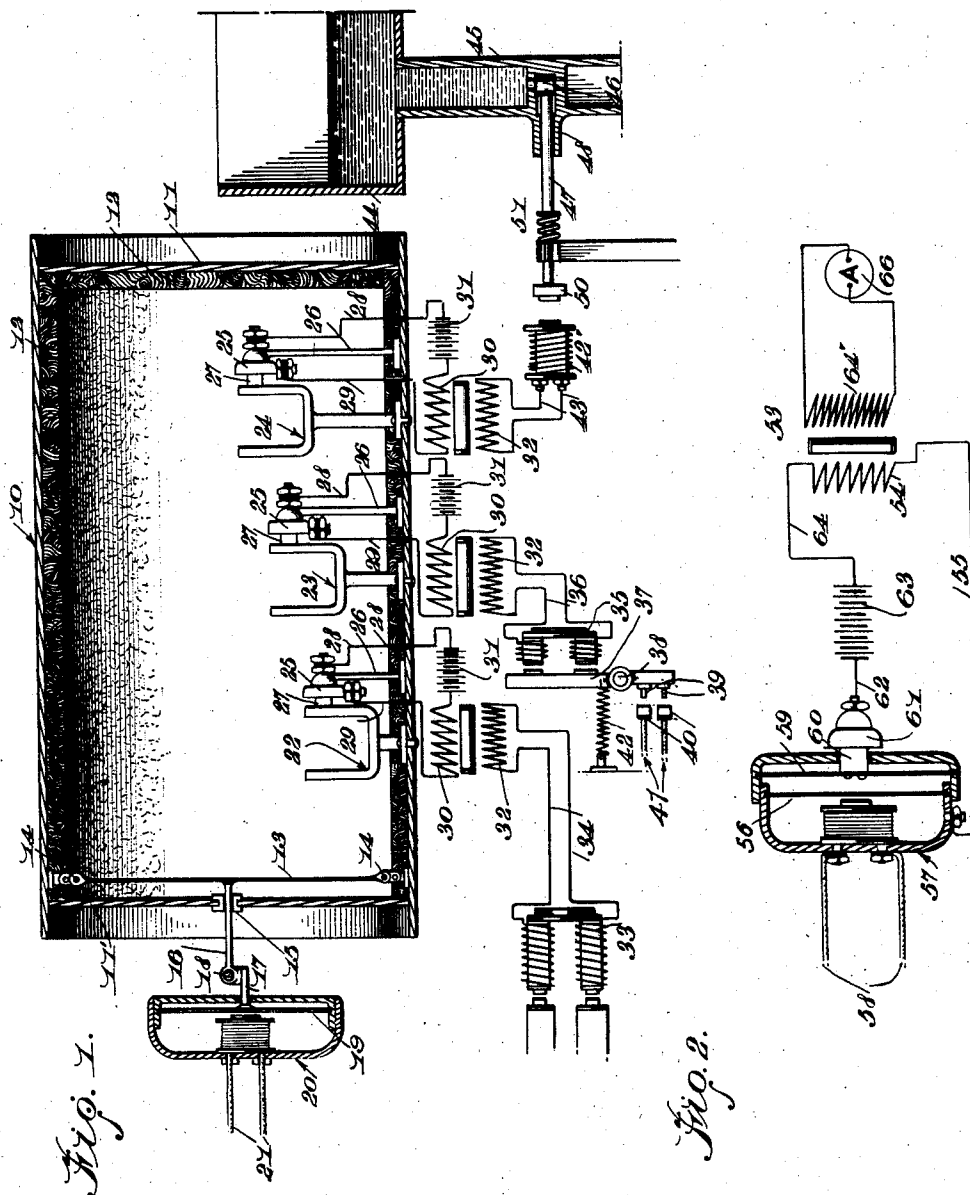
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ELECTRIC CONTROL APPARATUS

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ELECTRIC CONTROL APPARATUS.

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This invention relates to an electric control apparatus for wireless telephony.

The present invention more particularly relates to a control apparatus for receiving units employed in wireless telephony.

The object of the invention is to provide an apparatus of the above character whereby sounds of different pitch such as transmitted by wireless telephony may be segregated and employed to set into motion through cooperating devices and electric circuits definite mechanical motions.

It is also an object of the invention to provide means whereby electrical currents employed for operating mechanical devices of the present invention may be amplified a relatively high degree.

It is a still further object of the invention that the control apparatus is adapted to be connected with any standard type of receiving apparatus for wireless telephony.

A still further object of the invention is that means be provided whereby the overtones of the reproduced sounds may be eliminated.

Other objects, and objects relating to details of construction, combination, and arrangement of parts will hereinafter appear in the detailed description to follow.

The invention is illustrated by way of example in the accompanying drawings, in which:—

Figure 1 is a longitudinal sectional view taken through the apparatus of the present invention and also showing diagrammatically the different mechanical devices for which the present invention may be employed for operating,

Figure 2 is a diagrammatic view illustrating the means of the present invention whereby the feeble currents may be amplified.

Referring to the drawings specifically, and more particularly to Figure 1, 10 indicates generally a casing which may be of any desired shape and the walls of which may be made of any suitable material. The casing as shown is cylindrical and its ends closed by walls 11—11', respectively. The interior of the casing and also one wall 11 is covered with a lining 12 which is preferably of elastic felt or some similar absorbent material. Within the casing 10 there is positioned a diaphragm 13 which is preferably pivoted to the casing at points diametrically opposite to each other, as shown at 14. This

diaphragm is adjacent the inner side of the end wall 11'. The end wall 11' is provided with an opening in which there is positioned a packing gland 15, said packing gland having movable therethrough a link 16, said link having its end within the casing 10 engaging with the diaphragm 13 and its other end pivoted to a second link 17, as at 18. The second link 17 is attached to or engaged by the diaphragm 19 of a receiver 20. The receiver 20 has the usual wires 21 extending therefrom which may be connected with a wireless receiving apparatus in the customary manner.

With the construction heretofore set out, the currents received from a wireless receiving set will, of course, vibrate the diaphragm 19 which will in turn transmit its vibrations through the links 16 and 17 to the large diaphragm 13 within the casing 10, and the interior of the casing will then become filled with a reproduction of sounds received by the wireless set or apparatus. The lining 12 for the casing is provided to further obviate the outside noises or sounds with respect to the interior of this casing and thus enable a more efficient reproduction of sound waves from the diaphragm 13.

As is well known to set a tuning fork in vibration by means of sound waves, the sound waves must have exactly the same pitch as the pitch of the fork. However, these sound waves need not be generated by another tuning fork. The waves may come from a piano string, the human voice, a pipe organ or any other source. If a piano string is used it has been found that the sound waves from this piano string will set several forks of different pitches into vibration. On the other hand if the source of sound is an open diapason organ pipe only one fork will be found to vibrate. This is due to the fact that the sound of a piano string is compound or made up of a number of simple sounds, whereas, the sound of an open diapason organ pipe is pure. Practically all sounds are compound and their character is determined by their number and relative loudness of various simple sounds which they contain.

In order to reproduce and receive different sounds transmitted from the diaphragm 13 I provide a plurality of tuning forks which are disposed within the casing. In the present instance three tuning forks are shown, namely, 22, 23 and 24. These tuning forks

may be of any desired construction and preferably supported in the manner shown.

As seen in Figure 1 the tuning forks 22, 23 and 24 are of different relative sizes and these tuning forks are so constructed that each will respond to a certain sound pitch. Each tuning fork carries on one of its prongs a microphone 25, said microphone being of any desired construction and being supported by a suitable standard or the like, as at 26. Each microphone has its diaphragm connected to a prong of its associated tuning fork, as at 27. Also each microphone has extending therefrom a pair of wires 28 and 29, said wires in turn being connected to a primary coil 30 of an audio-transformer of the type employed for amplifying currents in receiving apparatus of wireless telephony. Also the wire 28 has interposed therein a battery 31 or some other source of E. M. F.

As before described the diaphragm 13 may be vibrated to reproduce sounds received from a wireless receiving set and sound waves from this diaphragm will be set up in the interior of the casing 10. If the sound waves were of a certain pitch and this pitch corresponded to the sound pitch at which the tuning fork 22 will operate this tuning fork will respond and set up a current flow of an alternating character in the electric circuit including the transformer primary winding 30. This current set up will correspond to the sound pitch given off by the vibrations of the diaphragm 13. The same will be true of the remaining tuning forks 23 and 24 that is these tuning forks will operate to sound waves of a certain pitch and operate to set up a current of an amplified character through the primary transformer coil 30 associated therewith. It becomes apparent from the description heretofore given that the present device might be utilized for causing different mechanical movements from a remote point with respect to the present apparatus, that is, a pipe organ of the type heretofore referred to, may be utilized for emitting sounds having pure tones and these sounds may be transmitted by a suitable wireless transmitting apparatus so that they may be received and reproduced by the diaphragm 13. The pipe organ may have different keys, as is customary, and the proper keys may be operated to set into vibration either of the tuning forks 22, 23 and 24. In this way definite electric circuits may be established by wireless telephony at some remote point with relation to the transmitting apparatus.

In Figure 1 I have shown a secondary coil 32 for each of the primary transformer coils 30 and for the transformer associated with the tuning fork 22 there is provided an electro-magnet 33 which is connected through suitable wires 34 with the secondary

transformer winding 31. This electro-magnet 33 may be employed for closing another electric circuit or for operating a diaphragm if desired.

Furthermore, with a sufficient number of these electro-magnets and tuning forks it is obvious that the keys of a typewriter might be operated, that is, each key of a typewriter might be associated with a tuning fork that would respond to a certain pitch of sound and in this way the different pipes of a pipe organ might be utilized for transmitting sounds for operating the different keys of the typewriter. It is believed that this arrangement is entirely obvious from the description and illustration given and further illustration would be unnecessary. With the secondary transformer coil associated with the tuning fork 23 there is connected an electro-magnet 35 through suitable wires 36. In this instance there is provided a switch lever 37 which is pivotally supported, as at 38, and which carries at its one end a pair of pins 39 which are electrically connected to each other. Forward to these pins there is disposed a pair of sockets 40, each socket being connected to a suitable wire 41. It may be assumed that upon the pins 39 being extended into the sockets 40 an electric circuit may be closed through the wires 41. The switch member 37 is normally held by a suitable spring 42', so that its pins 39 will not engage with the sockets 40. The switch lever 37 is adapted upon the electro-magnet 25 becoming energized to move under the influence of this magnet and enter the sockets 40, and thus establish the electric circuit heretofore referred to. It is apparent that this electric circuit established may be utilized for giving a signal or setting into motion some mechanical device if so desired.

With the secondary transformer coil 32 associated with the tuning fork 24 there is connected an electro-magnet 42 through suitable wires 43. Also there is shown a tank 44 which may have liquid therein or compressed air and which may have an outlet pipe 45. The piston head 46 is movable transversely of the outlet pipe 45 and adapted to serve for closing or opening the same. This piston has connected thereto a rod 47 which is slidable through a nipple 48 formed upon the pipe 45 and which carries at its outer end an armature 50. As is obvious upon the electro-magnet 42 being energized the piston 46 will be moved outwardly and thus to open the pipe 45. Also a spring 51 may be provided whereby to normally hold the piston member 46 in its position for closing the pipe 45.

Referring to Figure 2, at 53 there is shown a transformer which may be similar to an audio-transformer such as used in connection with wireless telephony receiving sets

and this transformer has its primary winding 54 connected at its one end through a wire 55 with a diaphragm 56 carried by a receiver 57. The receiver 57 has connected thereto wires 58 whereby the same may be connected with a wireless receiving apparatus in the customary manner. Also this receiver carries a second diaphragm 59 which is connected through suitable means, as at 60, to a microphone 61. This microphone is also connected through the wire 62 to one side of a battery or like source of electric current, as at 63, and the other side of this battery is connected through a wire 64 to the remaining end of the primary transformer coil 54. The secondary coil 64' of the transformer 53 may be connected to a volt meter or the like, as at 66.

In the use of the apparatus shown in Fig. 2, the currents received from the wireless receiving apparatus of course vibrate the diaphragm 56 and this diaphragm in turn will vibrate the diaphragm 59 which in turn communicates these vibrations to the diaphragm of the microphone 61 and thus cause an amplified current to flow through the primary transformer coil 54 having the same alternations or fluctuations as that received by the receiver 57. The last-named current will be transmitted to the volt meter 66 through the means of the secondary transformer winding 64' and wires connecting said winding to the volt meter, and in this way the currents will receive a higher voltage. By observing the volt meter the fluctuations of the sound waves set in motion by the diaphragm 46 may be observed. It is also apparent that instead of connecting the secondary transformer winding 64' to a volt meter it may be connected to another telephone receiver or the like and thereby reproduce the sound waves originally received at a louder tone. Also the second winding might be connected to operate an electromagnet for setting in motion a mechanical device if so desired.

While I have shown and described the preferred form of my invention, I wish it to

be understood that I am aware of the fact that the construction, combination and arrangement of parts may be changed by those skilled in the art without departing from the spirit of the invention, as indicated by the appended claims.

I claim:—

1. In an apparatus of the character described, a vibration and sound excluding container, a diaphragm within the container, means for hingedly connecting the diaphragm to the walls of the container, means whereby the diaphragm may be set into vibration for producing sound waves of different pitch values, a plurality of tuning forks within the container, each adapted to respond to sound waves of a different pitch, and means whereby different electrical circuits may be established with the vibration of said forks.

2. In an apparatus of the character described, a vibration and sound excluding container, a diaphragm within the container, means whereby the diaphragm may be vibrated without imparting vibration to the walls of the container, a plurality of tuning forks within the container adapted to respond to sound waves of different pitch, and means whereby different electrical circuits may be established with the vibration of said forks.

3. In an apparatus of the character described, a vibration and sound excluding enclosure, a diaphragm positioned therein, means for hingedly connecting the diaphragm to the walls of the enclosure to support the diaphragm transversely of the enclosure, means operable from the exterior of the enclosure whereby the diaphragm may be vibrated for producing sound waves of different pitch values, a plurality of tuning forks within the enclosure adapted to respond to sound waves of different pitch, and means whereby different electrical circuits may be established with the vibration of said tuning forks.

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