

W. O. C. ELLIS.
SOUND REPRODUCING APPARATUS.
APPLICATION FILED DEC. 23, 1908.

918,303.

Patented Apr. 13, 1909.

Fig. 1.

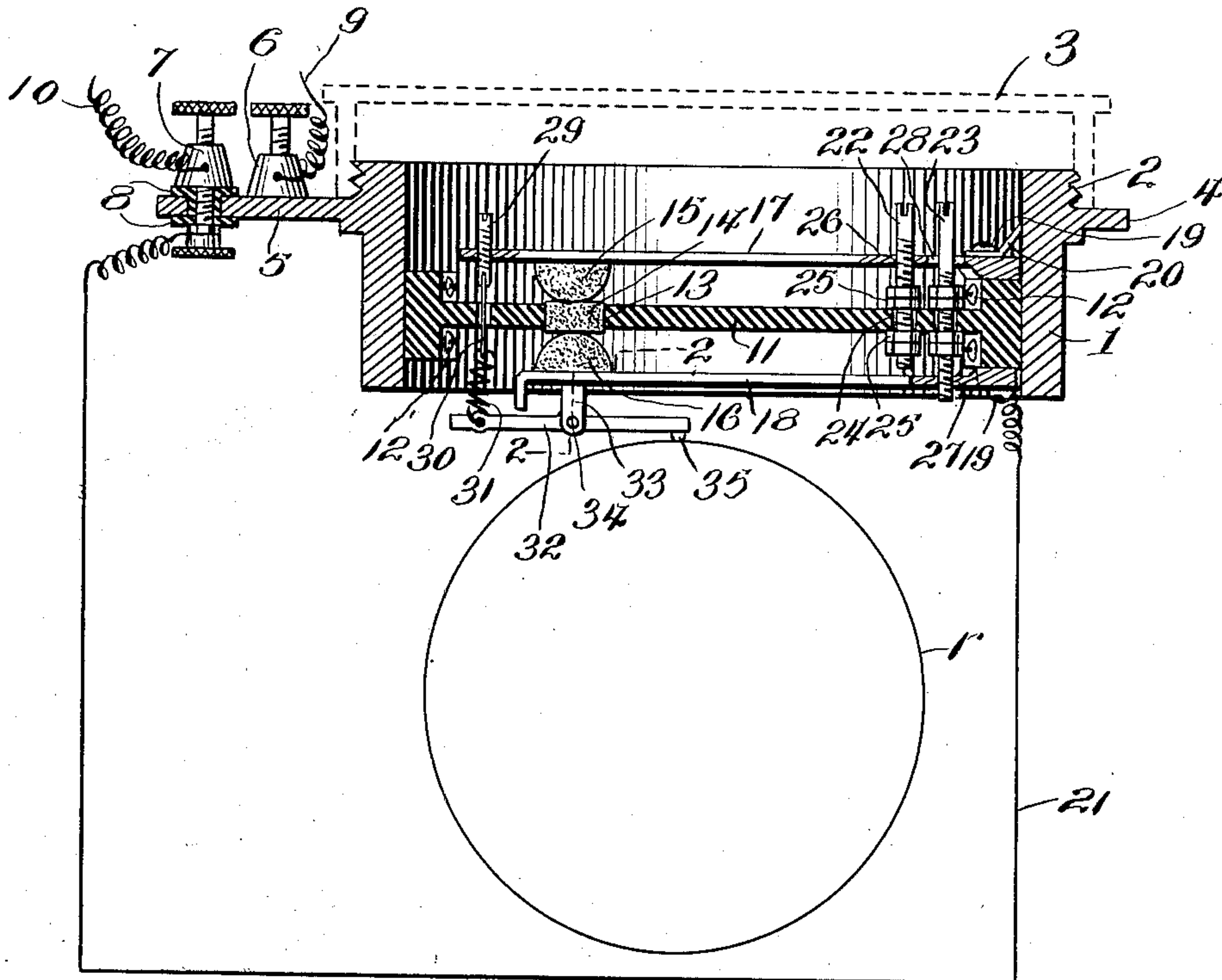


Fig. 3.

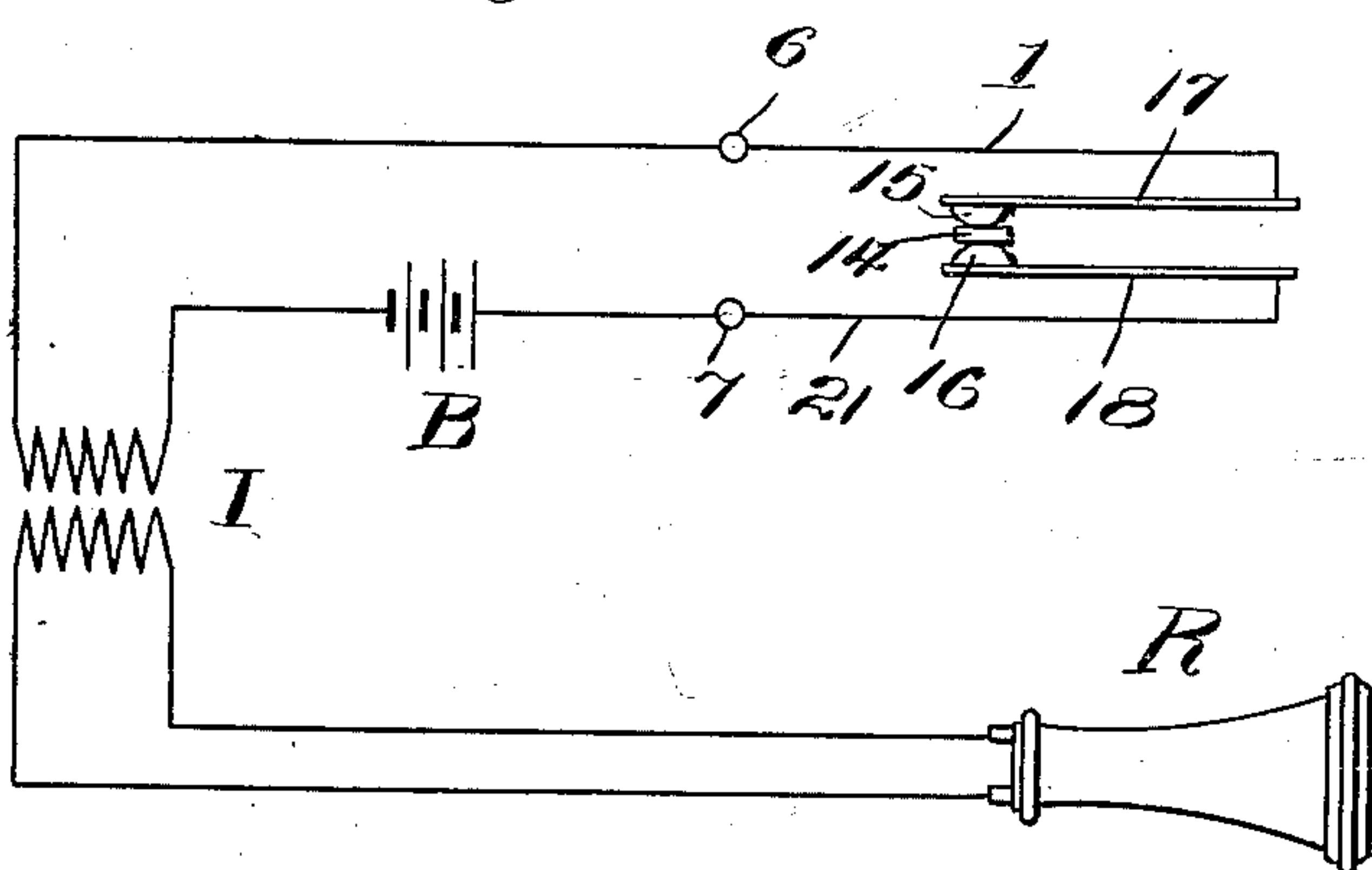
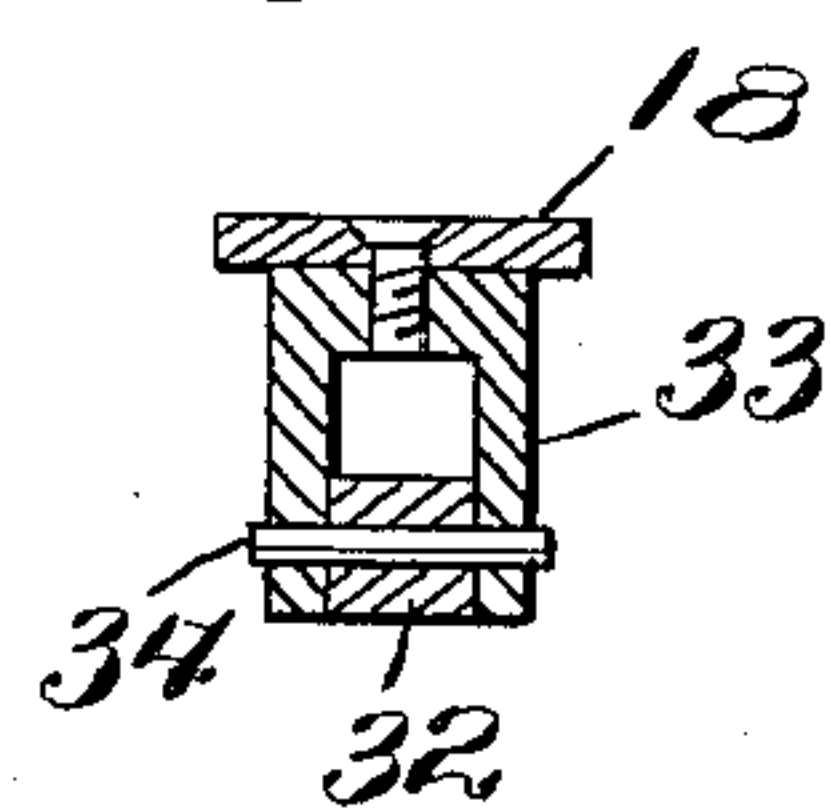


Fig. 2.



Witnesses

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SOUND-REPRODUCING APPARATUS

No. 918,303.

Specification of Letters Patent.

Patented April 13, 1909.

Application filed December 23, 1908. Serial No. 468,977.

To all whom it may concern:

Be it known that I, WILLIS O. C. ELLIS, a citizen of the United States, residing in the county of Fayette, near Greenfield, Highland county, and State of Ohio, have invented new and useful Improvements in Sound - Reproducing Apparatus, of which the following is a specification.

This invention relates to a sound-reproducing apparatus of that type whereby an undulatory current is transmitted through a telephonic receiver by a sound record whose undulatory surface acting on a stylus varies the tension of the contact between two or more current - conducting points or carbon buttons similar in some respects to the apparatus disclosed in my pending application Serial No. 413,711.

The invention has for one of its objects to improve and simplify the construction and operation of apparatus of this character so as to be comparatively simple and inexpensive to manufacture, reliable and efficient in use, and possessing superior transmitting qualities.

Another object of the invention is the provision of a plurality of contact points or buttons some of which are movable with respect to one or more stationary contacts or buttons, in combination with means for varying the tension or pressure of the contact between the buttons whereby a current of varying flow will be transmitted through a circuit containing a receiver or equipment device whereby the sounds that produce the original record will be substantially reproduced at the said receiver in an efficient and highly practical manner.

With these objects in view and others, as will appear as the description proceeds, the invention comprises the various novel features of construction and arrangement of parts which will be more fully described hereinafter and set forth with particularity in the claims appended hereto.

In the accompanying drawing, which illustrates one embodiment of the invention, Figure 1 is a sectional view of the sound reproducing apparatus. Fig. 2 is a sectional view on line 2—2, Fig. 1. Fig. 3 is a diagrammatic view showing the sound-transmitting circuit.

Similar reference characters are employed

to designate corresponding parts throughout the views.

Referring to the drawing, 1 designates the shell-like body of the transmitter which is preferably of annular form and threaded at its upper end at 2 for receiving a cap-shaped cover 3 which screws down upon a flange 4 on the said body. The flange 4 is enlarged at one side into a lug which carries two binding posts 6 and 7, one of which is electrically connected with the body 1 which is of metal, while the other is insulated by hard rubber or other suitable insulation 8 and these binding posts are connected by wires 9 and 10 with the receiver circuit of the apparatus.

Arranged within the body 1 is a diametrically-extending strip of insulation 11 which constitutes a support for the internal mechanism of the device and this support is secured at its ends to the body 1 by screws 12. The support 11 has an opening 13 in which is secured a fixed contact or carbon button 14 with which coöperates at least two contacts or carbon buttons 15 and 16 that bear respectively on the top and bottom faces of the central button 14. The buttons 15 and 16 are carried respectively by leaf springs 17 and 18 disposed parallel with the supporting member 11 and secured thereto at one end by screws 19. It will thus be seen that the springs are insulated from each other by the supporting member and one spring is grounded on the shell or body 1 of the device by a short spring finger 20 secured to the spring 17 by the screw 19 therefor. The spring 18 is connected with the binding post 7 by a wire 21, so that current will pass from the binding post 7 through the wire 21, spring 18, contacts 16, 14 and 15, spring 17, spring finger 20, metallic shell 1, binding post 6, and thence through the transmitting circuit to which the receiver is connected. The binding posts of the apparatus are directly connected with the receiver R or through an induction coil I, as shown in Fig. 3, there being a battery or other source of current B in the primary circuit, as shown.

The tension or pressure of the contact between the buttons 14, 15 and 16 is regulated by varying the set of the springs 17 and 18. For coarse regulation, separate adjusting

screws 22 and 23 are employed which have slotted upper ends for receiving a screw driver and these screws are accessible upon removal of the cap cover 3. The screws rotate freely in openings 24 of the supporting member 11 and are prevented from longitudinal movement in such member by nuts 25 that serve as collars on the screws, and the screw 22 engages in a threaded opening 26 in the spring 17, while the screw 23 engages in a threaded opening 27 in the spring 18. Thus, by turning either screw in one direction or the other, the spring in which such screw is threaded will be moved to increase or decrease the pressure between the carbon buttons. The spring 17 has an opening 28 through which the screw 23 extends so that it can be reached by a screw driver. For fine regulation of the pressure between the buttons, an adjusting screw 29 is arranged on the free end of the spring 17 and is connected by a strand 30 of silk or other non-conducting material with a spring 31 which is attached to one end of the stylus carrier or lever 32. This lever is disposed between depending lugs 33 on the spring 18 and is fulcrumed on a pivot 34 mounted on such lugs. The opposite end of the carrier 32 is provided with a stylus 35 that bears upon the undulatory surface of a record *r* or of any suitable character. By means of the adjusting screw 29, the tension between the carbon buttons can be varied with great precision. As the record *r* moves, the stylus carrier oscillates so that the carbon buttons 15 and 16 are simultaneously moved toward or away from the button 18 so as to thereby vary the pressure of the contact and change the resistance of the circuit so that a current of an undulatory character is transmitted, which undulatory current sets up in the receiver R of the apparatus vibrations, which are substantially an accurate reproduction of those sounds which created the record.

From the foregoing description, taken in connection with the accompanying drawing, the advantages of the construction and of the method of operation will be readily apparent to those skilled in the art to which the invention appertains, and while I have described the principle of operation of the invention, together with the device which I now consider to be the best embodiment thereof, I desire to have it understood that the device shown is merely illustrative, and that such changes may be made when desired as are within the scope of the claims appended hereto.

Having thus described the invention, what I claim is:—

1. A sound-reproducing apparatus comprising a plurality of relatively fixed and movable contacts, regulating means for the coarse adjustment of the contacts for vary-

ing the pressure of engagement between adjacent contacts, a second regulating means for the fine adjustment of the pressure of engagement between adjacent contacts, a record-actuated device for producing relative movement between the contacts, and a circuit connected with the contacts and including a telephonic receiver.

2. A sound-reproducing apparatus consisting of a fixed contact, a pair of movable contacts bearing against the same, means for insulating the movable contacts from each other, a regulating device for adjusting the pressure between each movable and the fixed contact, record-actuated means for moving the movable contacts toward and away from the fixed contact, and means for connecting the movable contacts in a transmitting circuit.

3. A sound-reproducing apparatus comprising a fixed contact, a pair of movable contacts insulated from the first and from each other, a regulating means for the coarse adjustment of the movable contacts, a second regulating means for the fine adjustment of the movable contacts, a record-actuated device for simultaneously moving the movable contacts toward and away from the fixed contact, and means for connecting the movable contacts in a transmitting circuit.

4. In a sound-reproducing apparatus, the combination of a supporting structure, a binding post electrically connected therewith, a binding post insulated from the said structure, a support of insulating material mounted on the said structure, a fixed contact carried by the support, a pair of springs mounted on the support and insulated from each other thereby, one spring being grounded on the said structure, contacts carried by the springs and bearing on opposite sides of the fixed contact, screws for adjusting the tension of the springs, a stylus carrier carried by one of the springs, and means between the other spring and the stylus carrier for effecting a fine adjustment of the pressure between the contacts.

5. The combination of a supporting structure, a member of insulation mounted therein, a fixed contact carried by the said member, contact springs on the member and insulated from each other, a separate screw for regulating the tension of each spring, a stylus carrier, and means controlled by the movement of the stylus carrier for changing the pressure between the contacts.

6. In a sound-reproducing apparatus, the combination of a metallic shell, an insulating support mounted therein, a fixed contact on the support, springs mounted on the support and insulated from each other, one spring being electrically connected with the shell, contacts on the springs both engaging the fixed contact, adjusting screws rotatably mounted on the support and having threaded

engagement with the springs respectively for
effecting a coarse adjustment of the tension
of the springs, a stylus carrier connected
with one of the springs, and a connection be-
5 tween the stylus carrier and the other spring
including means for a fine adjustment of the
pressure between adjacent contacts.

In testimony whereof I affix my signature
in presence of two witnesses.

WILLIS O. C. ELLIS.

Witnesses:

CONDE ELLIS,
W. E. KNEDLER.