March 10, 1925.

1,529,427

M. W. GISELMAN

TELEPHONE REPRODUCER

Filed Sept. 14, 1918

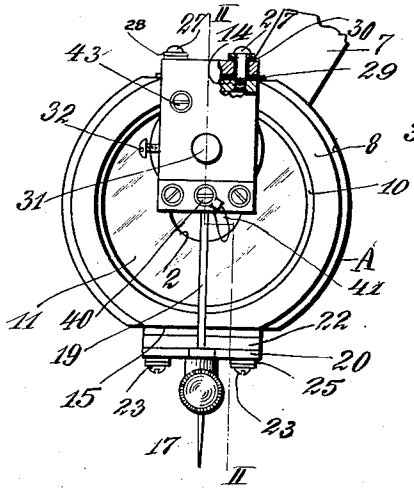


Fig. 1.

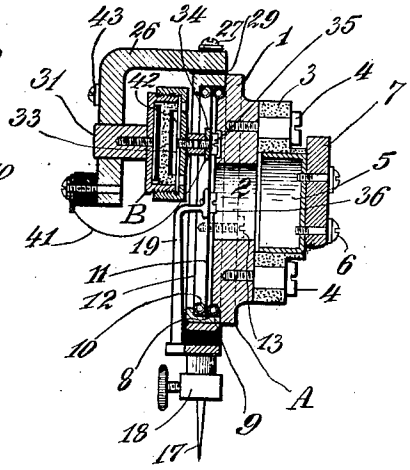


Fig. 2.

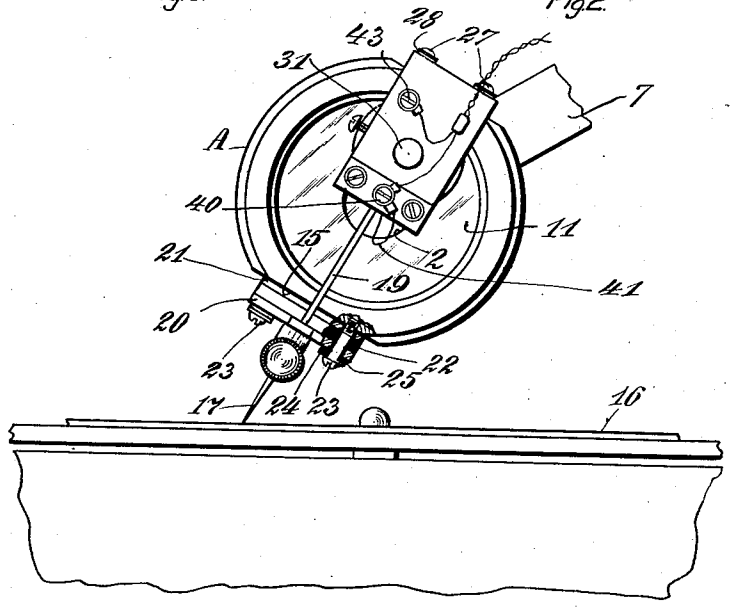


Fig. 3.

INVENTOR

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Patented Mar. 10, 1925.

1,529,427

UNITED STATES PATENT OFFICE.

MARSHALL W. GISELMAN, OF NEW YORK, N. Y., ASSIGNOR TO INTERNATIONAL CALLOPHONE CORPORATION, A CORPORATION OF DELAWARE.

TELEPHONE REPRODUCER.

Application filed September 14, 1918. Serial No. 254,066.

To all whom it may concern:

Be it known that I, MARSHALL W. GISELMAN, a citizen of the United States, and a resident of New York city, county and State of New York, have invented certain new and useful Improvements in Telephone Reproducers, set forth in the following specification.

My invention relates to the transmission and reproduction of sound and more particularly of recorded sound. The object of my invention is to simplify and to improve a telephonic reproducer more particularly of the type adapted for cooperation with phonograph records. A still further object is to combine a microphone transmitter with a standard phonograph reproducer or sound box in a simple, efficient manner and in such a manner so to relate such a transmitter and such a reproducer that the transmitter will be subjected to vibrations of an amplitude suitable for its proper operation and shall be insulated from undesirable vibrations. To this latter end it is an object to agitate the transmitter through the medium of vibrations of less amplitude than those commonly present in operating a standard sound box. It is also broadly an object to coordinate an electrical transmitting means with a sound functioning diaphragm so that said transmitting means shall be responsive to the desired sound vibrations and shall be insulated from undesired vibrations through the medium of vibration insulating or cushioning supporting means.

In detail it is an object of my invention to improve the general construction of a telephonic transmitter operable from phonograph records.

The above will better be understood by reference to the illustrative embodiment of my invention shown merely for purposes of illustration in the accompanying drawings which form a part hereof and in which like characters designate corresponding parts in the several figures.

In the drawings, Fig. 1 is an elevation of a preferred embodiment of my invention;

Fig. 2 is a staggered section through line II—II of Fig. 1, with parts shown in elevation; and

Fig. 3 is a front elevation of my apparatus in operative relation with a phonograph record.

The sound box A may, if desired, be of any standard construction. In the embodiment illustrated a ring-shaped metal block 1 provides the usual sound chamber 2 and is fitted at the rear with a ring-shaped rubber connection nipple 3, suitably secured in position as by screws 4, and which serves as a connector with the usual tone-arm or, in the embodiment illustrated, if it is desired to eliminate the tone-arm, as a metal cup 5 secured as by screws 6 with a carrying arm 7. This latter structure may be substituted for the usual tone-arm as the general functioning purpose for my apparatus is telephonic transmission instead of the direct amplification of the sound waves themselves.

The block 1 is provided with a rabbet 8 in which is fitted a suitable gasket, preferably a circular, tubular gasket 9 of soft rubber between which and a similar outer gasket 10 is clamped a vibratory diaphragm 11 by means of the clamp flange 12, clamped towards the block 1 in a suitable manner as by screws 13. Thus a suitable casing is formed. This clamp flange 12 is preferably flattened at top and bottom by the ledges 14 and 15.

The mechanism for operating the diaphragm 11 from a phonograph record 16 may, if desired, be any of the usual constructions in which a lever mechanism fulcrumed intermediate its ends has an operative attachment at approximately the center of the diaphragm and at its opposite end terminates in a stylus 17 for following the phonic line of the record. It is not unusual in such structure to form the fulcrum of such a lever mechanism in the form of pivoted trunnions. I prefer, however, a construction such as I have illustrated in which the stylus 17 is mounted in set screw mounting head 18, from which pin 18 an offset arm 19 extends into a central attachment upon the diaphragm 11. However, the head 18, instead of being swiveled upon the sound box, is preferably attached through the medium of an integral cross-plate 20, between which and a plate 21 a resilient filling or cushion 22, as of soft rubber, is clamped as by screws 23 passing through enlarged holes in the cross-plate 20 and threading into the flange member 12. The heads of the screws 23 are preferably provided with metal washers 24 and underlying rubber washers 25, which likewise embrace the

shanks of the screws 23 through the perforations in the cross plate 20. In this manner a somewhat deadened vibratory transmission may be imparted from the stylus 17 to the center of the diaphragm 11. This resilient hinge structure just described is more readily mountable by the provision of the ledge 15, previously described. It also, to a large degree, insulates the sound box casing and the structure carried thereby from vibrations due to non-phonetic irregularities in the phonic line.

The upper ledge 14 mounts a metal angle arm 26 directly upon the flange member 12 by means of screws 27 having metal washers 28 and a separating gasket 29 of soft rubber between the arm 26 and the ring 12 and a soft rubber washer 30 between the metal washer 28 and the outer face of the arm 26, and also extending between the shanks of the screws 27 and the enlarged perforations through the so attached end of the arm 26, all forming a vibration insulating or cushioning supporting means. This soft rubber packing serves to prevent the undesired transmission of any mechanical vibration from the sound box A to the arm 26, which arm itself serves as the fixed mounting means for the non-movable portions including the back unit of a standard microphone transmitter B, the mounting stem 31 of which may be adjustably fixed in a suitable perforation in the arm 26 by means of the set screw 32 which also insures a good electrical connection between these parts. It should be noted that the microphone B is thus eccentrically mounted relatively to the diaphragm 11 and directly in front of the diaphragm so that a direct connection between the microphone's diaphragm 33 its attached front electrode 42 and the sound box diaphragm 12 may be effected in a simple manner as by the washer 34 and the screw 35. The point of connection for the centrally operated microphone diaphragm 33 to the diaphragm 12 is preferably halfway between the center of the diaphragm 12 represented by the screw 36 and the fixed periphery between the gaskets 9 and 10.

On the lower end of the arm 26 is mounted a suitably insulated binding post 40 connected, preferably through the medium of a flexible jumper wire 41, with the electrode button 42 of the microphone. A second binding post 43, directly connected with the arm 26, is also provided to serve as the other terminal of the microphone, which is possible because the separating rubber 14, 28 and 29 serves to insulate the supporting arm 26 from the sound box structure electrically as well as sound conductively. Obviously, the terminals 40 and 43 may be connected into any usual telephone circuit to transmit electrical vibrations corresponding to sound waves.

Although I prefer to connect the microphone transmitter B directly to a locality on the diaphragm 11 midway between its center and its fixed periphery, I desire it to be understood broadly that I view the diaphragm 11 as a member centrally vibrating from a record and fixed against vibration on opposite sides of its center, and that the point of attachment for the microphone transmitter may be at other than mid-position between the center and a point of attachment, it being understood that the farther from the center the attachment is located, the smaller the amplitude of the vibrations imparted to the transmitter. This point of attachment may be selected as desired, so that the agitation of the transmitter is of an amplitude best adapted to cause the desired variation in an electrical circuit through the medium of the carbon granules indicated by stippling in the illustration of the transmitter.

It is also to be understood that I do not limit my invention to the form of transmitter illustrated herein in my preferred embodiment.

What I claim and what I desire to secure by United States Letters Patent is:—

1. An instrument for telephonically transmitting sounds from phonograph records comprising a diaphragm; means for operating said diaphragm from a phonograph record including an attachment to an approximately central part of said diaphragm; and a microphone transmitter having a direct connection with said diaphragm at a locality between its center and its periphery, the said diaphragm at said locality having a vibration amplitude accommodating the relatively small amplitude of said transmitter.

2. In combination, a phonograph reproducer having a diaphragm and a microphone transmitter eccentrically attached to the diaphragm of said reproducer, whereby reduced sound vibrations are directly imparted to said transmitter.

3. An instrument for telephonically transmitting sounds from phonograph records, comprising a member centrally vibrated from a record and fixed against vibration on opposite sides of its center and a microphone transmitter operatively attached to said member at a distance from its center.

4. An instrument for telephonically transmitting sounds from phonograph records comprising a vibratory diaphragm having a peripheral mounting; a stylus lever for operating said diaphragm at approximately its central point and fulcrumed to said mounting through the medium of a deadening resilient hinge; a microphone having a sound insulated supporting arm fixed to said mounting; and a direct eccentric connection between said microphone and said diaphragm.

5. In combination in an instrument for telephonically transmitting sound from a phonograph record, a sound box; a microphone; means for mounting said microphone upon said sound box; and an insulation against the transmission of sound vibration between said mounting and said sound box.

6. In an instrument for the telephonic transmission of sounds from a phonograph record in combination, a sound box and a telephone transmitter each having a vibratory diaphragm arranged parallel one to the other; a sound insulating mounting for said transmitter upon said sound box; and a connection eccentric relatively to one of said diaphragms and mechanically connecting the same one to the other.

7. In a telephonic transmitter two sound functioning diaphragms of relatively different size; a direct mechanical connection between the center of the smaller to an eccentric point of the larger having a vibration amplitude accommodating the said center of said smaller diaphragm; a granular electrical resistance medium under the control of the vibrations of said smaller diaphragm; casings for mounting said diaphragms respectively; and a sound insulating mechanical connection between said casings.

8. In a telephone transmitter, a casing, a diaphragm attached to the casing, a variable resistance combination connected to the diaphragm, cushion means, and a rigid support holding the said resistance combination and attached to the casing through the cushioning means independently of the diaphragm.

9. A telephone transmitter, provided with a casing, a vibrator held by the casing, cushions, a back unit elastically separated from the vibrator and yieldingly attached to the casing through the cushions, independently of the vibrator, and variable resistance material between the vibrator and the back unit.

10. In a telephone transmitter, the combination with a casing, vibratory and back units elastically connected together and having a variable resistance medium therebetween; of cushions disposed and separately held between the said units and the casing, so as to permit the units to move relatively to the casing, at least, in the direction in which the vibratory unit is destined to vibrate.

11. In a telephone transmitter, the combination of a casing having circular diaphragm mounting seats, a diaphragm, a peripheral cushion for said diaphragm having clamped circular line contact with one of said seats, a back unit, a support for the back unit, and a cushion mounting for the support, held therewith together under pressure by the casing and its attachments; with parts constituting therewith a variable resistance device.

12. In a telephone transmitter, the combination with a casing; of front and back electrodes bearing units, cushions between the casing and the said two units, the units being independently attached to the casing through the cushions, and parts constituting therewith a variable resistance device.

13. In a telephone transmitter, a yielding mounting for the working parts thereof, comprising a casing, a back support, and cushions separately held between the working parts and the casing, and between the back support and the casing, the working parts and the supports being independently attached to the casing.

14. In a variable resistance device, a casing, a diaphragm, a front padding through which the diaphragm is held by the casing, a back support, a back padding disposed on opposite sides of the support, screw means adapted to engage with the casing for holding the support and the last mentioned padding together separately from the diaphragm, and variable resistance mediums cooperatively related thereto.

In testimony whereof I have signed my name to this specification, this 7th day of August, 1918.

MARSHALL W. GISELMAN.