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K. M. TURNER & N. W. JOHNSTON

EAR MASSAGE APPARATUS.

APPLICATION FILED AUG. 25, 1905.

Fig. 1.

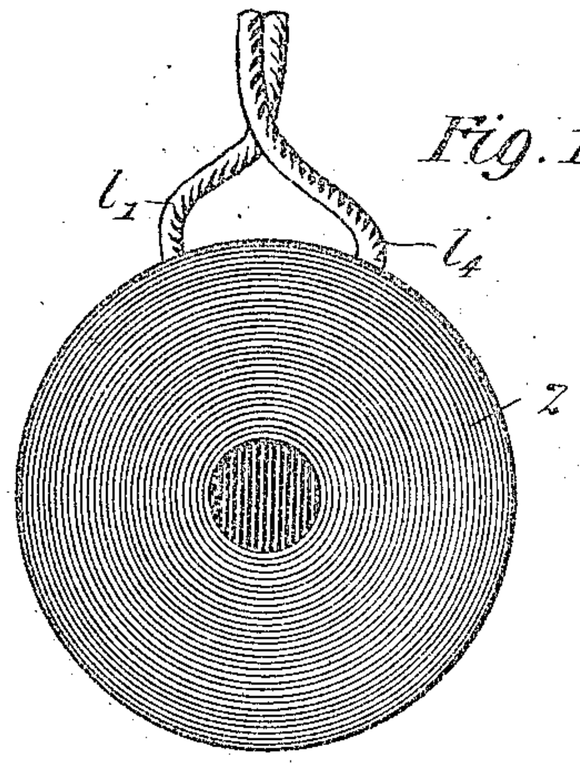


Fig. 2.

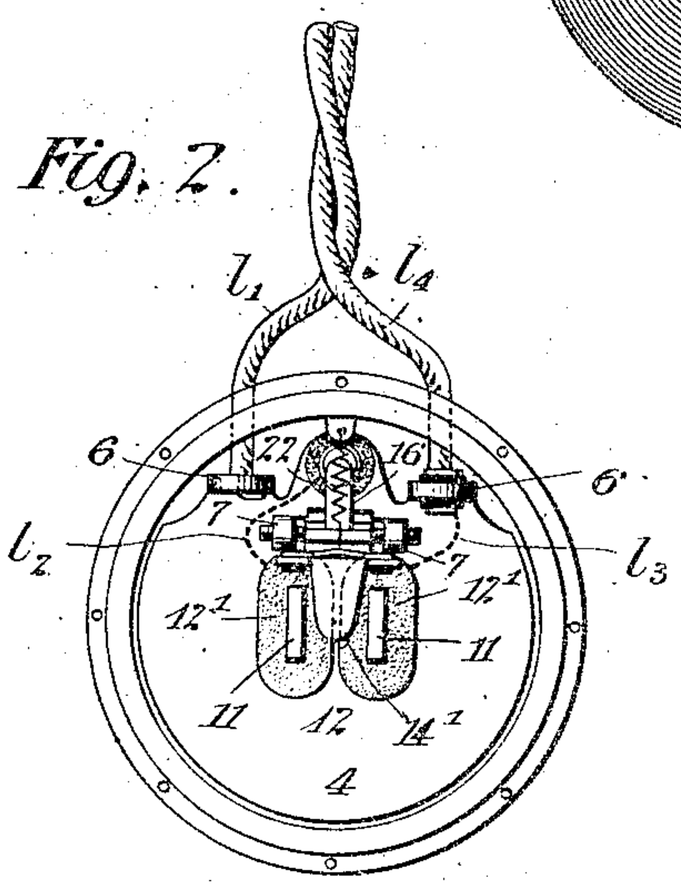


Fig. 3.

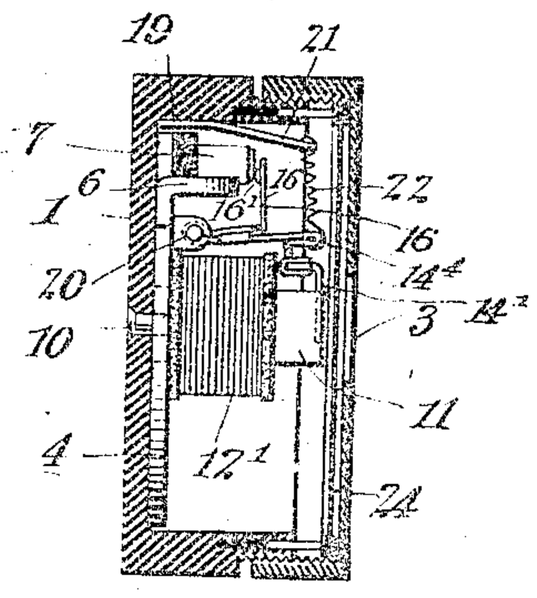


Fig. 4.

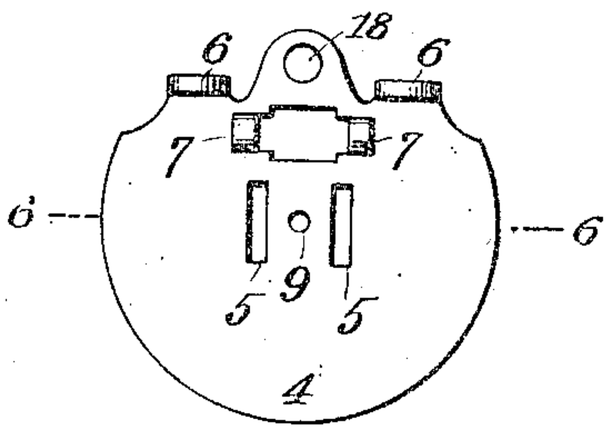


Fig. 5.

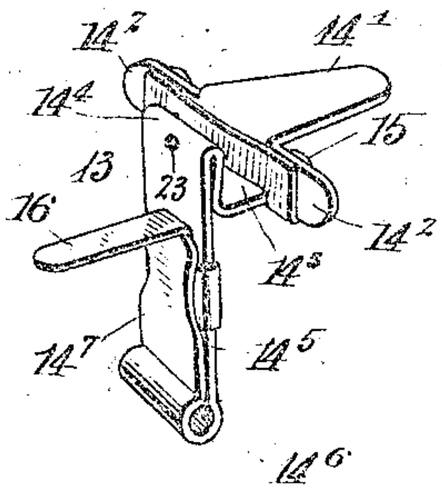
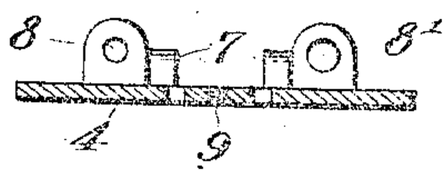


Fig. 6.



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UNITED STATES PATENT OFFICE.

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EAR-MASSAGE APPARATUS.

No. 845,383. Specification of Letters Patent. Patented Feb. 26, 1907.

Application filed August 25, 1905. Serial No. 275,761.

To all whom it may concern:

Be it known that we, KELLEY M. TURNER, of the city, county, and State of New York, and NORTON W. JOHNSTON, of Chappaqua, Westchester county, New York, have invented certain new and useful Improvements in Ear-Massage Apparatus, of which the following is a full, clear, and exact description.

Our invention relates to a telephonic apparatus.

The purpose of the invention is to provide a telephone-receiver in which a diaphragm is continuously vibrated and to devise a construction which can be made entirely by punch and die-press operations.

With these and other objects in view our invention consists in the construction, combination, location, and arrangement of parts, all as will be more fully hereinafter described, as shown in the accompanying drawings, and finally particularly pointed out in the appended claims.

In the drawings, Figure 1 is a front view of a telephone-receiver embodying the principles of our invention. Fig. 2 is a view of the same with the cover removed. Fig. 3 is a transverse sectional view of the same. Fig. 4 is a detail view showing the base-plate. Fig. 5 is a detail perspective view showing the vibratile armature of the instrument. Fig. 6 is a detail sectional view on the line 6 6 of Fig. 4.

Our appliance relates mainly to the treatment of deaf persons, and the purpose, broadly stated, is to massage the membranes of the ear by a regular and graduated vibration. For this purpose we employ a telephone-receiver having a magnet with an interrupter or circuit-breaker coöperating therewith, so that the magnet impresses regular and continuous vibrations upon the diaphragm.

Referring to the drawings and to the various views and reference-signs appearing thereon, in which like parts are designated by the same reference-sign wherever they occur, 1 denotes the frame or casing, and 2 indicates the cover, which is screwed or fastened to the casing 1 in any suitable way and has a central aperture 3 for the passage of sounds.

Within the casing 1 we arrange a metallic base-plate 4, and in the practical use of our invention we employ a sheet-iron plate which is blanked and drawn on a die-press, so as to provide rectilinear openings 5 and two pairs of projecting pins or lugs 6 and 7. Each of the ears 6 is conveniently punched with holes 8 and 8′, the hole 8′ being larger than the hole 8. In like manner the ears or lugs 7 7 are punched or drilled with holes, which are in alinement with one another when the device is completed.

9 indicates a central aperture or perforation which may be threaded to engage a screw 10, by which the base-plate is secured to the casing 1.

Within the openings 5 we firmly drive or otherwise fix projecting iron studs 11, which are of a length to constitute the cores of a small electromagnet, (broadly designated as 12.) 12′ indicates the coils of this electromagnet, which are conveniently wound upon fiber spools and slipped over the ends of the pole-pieces. The use of an iron base-plate 4 enables this to constitute the yoke of the electromagnet and to form a complete magnetic circuit.

13 indicates, broadly, the vibrating element or armature for the electromagnet 12, and we have shown a practical method of constructing this part by which it is formed entirely on a die-press. For this purpose a piece of metal is punched and formed into a substantially T-shaped part, as shown in Fig. 5. The part has an initial flat portion 14′, which is slightly tapering or wedge-shaped. The base or wedge-shaped portion 14′ is bent downward and broadened at 14², so as to constitute armature-faces for the electromagnet 12. The purpose of having the wedge or V-shaped portion 14′ is to produce an armature which has a considerable range of movement and yet which is always within an efficient attractive distance from the poles 11. On account of the fact that the poles 11 are quite small the magnetic intensity in the region thereof diminishes rapidly as the distance increases. By the provision of the V-shaped extension 14′ of the armature it is possible to have the armature move through quite wide limits without receding out of the zone of attraction of the electromagnet. We consider this arrangement by which a V-shaped extension is formed on the armature to extend between the pole-pieces 11 as an important feature of the invention.

14³ is a section of the armature which is

bent forwardly parallel to the portion 14′, and from thence the metal is looped upward at 14^4, finally passing downward at 14^5, where an eye 14^6 is provided. In practice the eye is made by bending the metal circularly around, so as to leave a central opening, and the material is finally bent upward at 14^7. Arranged to embrace and held in position by the pole-faces 14^2 is a sheet-metal clip 15 of non-magnetic metal, which prevents the pole-faces 14^3 from contacting with the electromagnet 12. 16 indicates a second sheet-metal clip, which should be made of springy copper and which is organized into the armature by being bent under the portion 14^7 thereof. It will be seen that the entire armature is composed of but three pieces and that all of them may be arranged and formed and finally organized together in an ordinary die-press.

17 indicates a stud which is inset into a hole 18 in the base-plate 4, an insulating-washer 19 being introduced to insulate the stud from the base.

20 indicates a pin which connects the ears or lugs 7, previously described, and forms a pivot bearing or support for the armature 13.

When the parts are organized, the spring-blade 16, which has a platinum or non-corrosive surface 16′ thereon, lies in close proximity to the metallic stud 17 and is adapted to make and break a slightly-sliding contact therewith when the armature is vibrated.

21 indicates a pin attached to the casing 1, which constitutes a support for the spiral spring 22, connected to an eye 23, provided in the armature for this purpose.

24 indicates the usual diaphragm, which may be of the usual ferrotype metal of any convenient or approved construction, which forms no part of our invention. The electrical circuits are generally indicated in Fig. 2, in which 1′ indicates a lead-wire which is grounded on the base 4. From this base the current enters the armature 13 and normally finds a path through the spring-blade 16 into the stud 17.

1^2 indicates a wire which leads from the stud 17 to the electromagnet 12, and 1^3 indicates a second wire or connection which completes the circuit to the return-lead 1^4.

In operation the circuit is completed in the manner above described, and the magnet 12 is energized. The energization of the magnet 12 attracts both the diaphragm 24 and the armature 13 through the wedge-shaped projection 14′. The attraction of the armature 13 breaks the circuit at 16 in the usual manner of interrupters or vibrators, so that the diaphragm continues to vibrate or buzz and produces a massage for the ear-membranes which is beneficial to deaf persons.

What we claim is—

1. In an ear-massage apparatus, a magnet, an armature formed of a single piece of iron bent or doubled upon itself and having a circuit-making clip engaged between adjacent portions so as to be held thereby.

2. In an ear-massage apparatus, a magnet, a T-shaped armature therefor having a pair of armature-faces and a wedge-shaped portion projecting therebetween, and a spring-metal clip secured to said armature and forming a circuit breaker or interrupter therefor.

3. In an ear-massage apparatus, a diaphragm, a magnet comprising a base-plate and projecting studs having coils, an armature comprising a piece of sheet iron-bent so as to form armature-faces with an intermediate V-shaped portion therebetween, said armature being also bent to form an eye constituting a pivot-bearing, and a circuit breaker or interrupter attached to said armature.

4. In an ear-massage apparatus, a base-plate having projecting iron studs thereon, coils surrounding said studs to form an electromagnet, an armature pivoted to said base-plate and having a pair of armature-faces and an intermediate V-shaped portion projecting between the poles of said electromagnet, and a circuit breaker or interrupter on said armature.

5. In an ear-massage apparatus, a base-plate having a pair of projecting iron cores thereon, coils surrounding said cores, an armature comprising a single piece of sheet metal pivoted to said base-plate and bent to form a pair of armature-faces having an intermediate projecting V-shaped portion, and an interrupter secured to said armature.

6. In an ear-massage apparatus, a base-plate having a pair of ears or lugs thereon, an electrical connection grounded on one of said lugs, and a second electrical connection bushed into the other lug, an electromagnet supported by said base-plate, a vibrating armature supported by said base-plate, an insulated stud projecting into proximity to said armature, and electrical lead-wires connecting said electromagnet to said stud and said bushed connection.

7. In an ear-massage apparatus, a base-plate having a pair of lugs thereon forming supports for a pair of electric terminals, a second pair of lugs arranged to constitute pivot-bearings, a vibratory armature supported by the said pivot-bearings and an electromagnet supported by said base.

In witness whereof we subscribe our signatures in the presence of two witnesses.

KELLEY M. TURNER.
NORTON W. JOHNSTON.

Witnesses:
FRANK S. OBER,
ALFRED W. PROCTOR.