

No. 878,760.

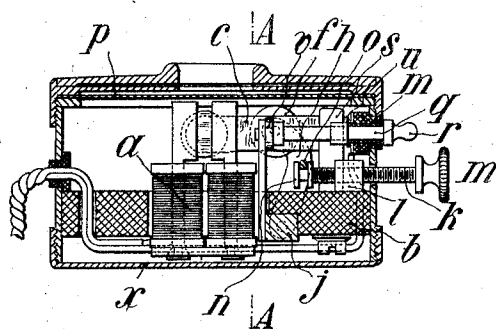
PATENTED FEB. 11, 1908.

A. ZÜND.

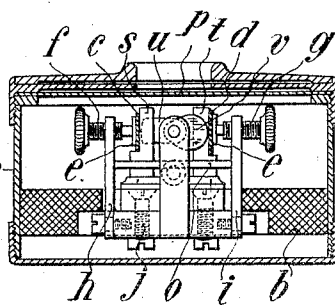
APPARATUS FOR MASSAGING THE HEARING ORGANS.

APPLICATION FILED MAR. 4, 1907.

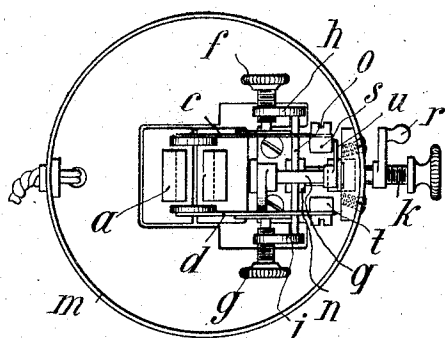
- FIG. 1 -



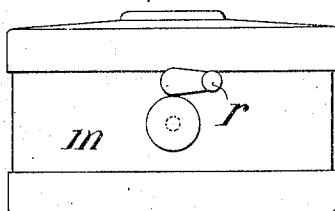
- FIG. 2 -



- FIG. 3 -



- FIG. 4 -



Witnesses:

L. M. Boulter.

[Signature]

Inventor:

Adolphe Zünd,
By *[Signature]* Boulter,
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UNITED STATES PATENT OFFICE.

ADOLPHE ZÜND, OF PARIS, FRANCE.

APPARATUS FOR MASSAGING THE HEARING ORGANS.

No. 878,760.

Specification of Letters Patent.

Patented Feb. 11, 1908.

Application filed March 4, 1907. Serial No. 360,435.

To all whom it may concern:

Be it known that I, ADOLPHE ZÜND, a citizen of the Republic of France, residing at Paris, in France, have invented a certain new and useful Apparatus for Massaging the Hearing Organs, of which the following is a specification.

This invention relates to an apparatus for the massage and physico-physiological treatment of the hearing organ by sonorous vibrations (phono-massage) and by tactile vibration.

One of the most practical constructions of the apparatus according to this invention is illustrated, by way of example, in the accompanying drawing.

In this drawing:—Figure 1 is a vertical section of the apparatus along the longitudinal axis of its sound regulating organs. Fig. 2 is another vertical section on the line A—A of Fig. 1. Fig. 3 is a plan of Fig. 1, the upper diaphragm holding cover being removed. Fig. 4 is an outside elevation.

This apparatus chiefly comprises an electro-magnet *a* which can be of the single pole, or of the bipolar kind, as shown in the drawing by way of example. Laterally of the soft iron core of the magnet *a* are arranged metal blades *c d* of different width and thickness, secured, at their ends remote from the said soft iron, to pillars *s t*, which, in their turn, are secured to a block *b* of insulating material.

The blades *c d* are provided along a portion of their length with platinum-tipped contacts *e*, against which rest the corresponding ends of platinum-tipped set screws *f* and *g* mounted in an adjustable manner on lever arms *h* and *i* pivoted to a cross bar *j* secured under the block *b*. These levers may be adjusted in the desired position by means of a suitable part which can be operated from the outside of the apparatus. In the example illustrated this part consists of a screw-threaded rod *k*, parallel to the blades *c d*, screwed into a sleeve-nut *l* secured to the insulating block *b* arranged in the casing *m*. The rod *k* is provided at its inner end with a double collar or grooved end *n* in which is mounted a rod *o* connecting the two levers *h* and *i*.

By turning the screw-threaded rod *k* by means of its outside button, the two levers *h* and *i* are simultaneously operated, in order to produce longitudinal movement of the platinum tipped set screws *f* and *g* on the plati-

num tipped contacts *e* of the blades *c d*. According to the direction in which the screw-threaded rod *k* is turned, the length of the blades comprised between the platinum tipped screws *f g*, and the free ends of the said blades, is increased or reduced, so that the number of vibrations which the said blades can give in a unit of time, is increased or reduced. Each blade can therefore produce a more or less great number of sounds or tones, according to its length. This longitudinal regulating device for the screws *f g* enables the vibrating and sonorous blade brought into action, to be compared to a violin string on which the player successively presses his fingers for varying the length of the vibrating portion.

The diaphragm or diaphragms have a double object. 1. To amplify the sonorous vibrations of the vibrating and sonorous blade or blades. 2. To act as vibro-massaging parts by transmitting to the part to be massaged (the center of the ear), while amplifying them, the sonorous vibrations of the blades (phonic massage) and the interruptions of the current.

In the construction illustrated, the two ends of the iron cores of the electro-magnet *a* are situated near a diaphragm *p* mounted in the wall or cover screwed to the cylindrical frame *m* so that the two poles of the said electromagnet simultaneously act on the diaphragm. By screwing or unscrewing the wall supporting the diaphragm *p*, the position of the latter can be regulated relatively to the poles of the magnets, so as to enable the intensity of the sounds produced by the vibrations of the blades *c d* to be at will increased or reduced.

When the electromagnet is a simple one, its pole magnetizes, by means of one of its ends, the vibrating and sonorous blade or blades, and with the other end acts on the diaphragm which is then arranged in the opposite position to that which it occupies in an apparatus with double magnet. The vibrating and sonorous blades *c d* act in either construction of the apparatus both as contact-breakers and as organs producing sonorous vibrations.

For the purpose of enabling only the blade which is to be operated, to be magnetized, the apparatus is provided with a commutator or switch which causes the current to pass either through one or the other of the blades. In the construction illustrated,

the switch is constituted by a spindle *q* connected to the circuit and operated from the outside by means of a handle *r*. To the spindle *q* is secured a metal finger *u* adapted 5 to contact with one or the other of the pillars *s* *t* carrying the blades *c* *d*, according to the direction in which the handle *r* is turned. To the spindle *q* is also secured a cam *v* of insulating material which rests against the 10 blade opposite to that on which the current is acting, so as to completely immobilize it. Any other device than that illustrated, acting in the same way as regards the switch and the insulation of the blades, can be used.

15 In operation the circuit is completed as follows:—The current on entering the apparatus proceeds to the switch finger *n* thence through either of the pillars *s* or *t* and the corresponding blade *c* or *d* to the contact 20 screw *f* or *g* connected to the cross bar *j* from which point the current flows around the windings of the electromagnet *a*, energizing the same, and is afterwards conducted from the apparatus.

25 What I claim as my invention and desire to secure by Letters Patent is:—

1. Apparatus for massaging the hearing organs consisting of an electric vibrator comprising an electro-magnet and non-adjustable 30 sonorous blades in combination with contact breaking means, contact points, an adjustable carrying device for said points by which device the length of the vibrating portion of said blades may be regulated for the purpose 35 specified.

2. Apparatus for massaging the hearing organs consisting of an electric vibrator comprising an electro-magnet and non-ad-

justable sonorous blades in combination with contact breaking means, contact points, an 40 adjustable carrying device for said points by which device the length of the vibrating portion of said blades may be regulated, and a diaphragm in proximity to said blades for reinforcing the sound produced thereby. 45

3. Apparatus for massaging the hearing organs consisting of an electric vibrator comprising an electro-magnet, vibratory blades having their free ends in proximity to the poles of said magnet, an adjustable lever in 50 proximity to each of said blades, an adjustable contact screw in each lever, means for varying the position of the contact screws on the vibratory blades, and means for rendering one blade inoperative when desired, sub- 55 stantially as set forth.

4. Apparatus for massaging the hearing organs consisting of an electric vibrator comprising an electro-magnet, vibratory blades having their free ends in proximity to the 60 poles of said magnet, an adjustable lever in proximity to each of said blades, an adjustable contact screw in each lever, means for varying the position of the contact screws on the vibratory blades, means for rendering 65 one blade inoperative when desired, and a microphonic diaphragm in proximity to the vibratory blades, substantially as set forth.

In testimony whereof I have signed my name to this specification in the presence of 70 two subscribing witnesses.

ADOLPHE ZÜND.

Witnesses:

HERNANDO DE SOTO,
GEORGES BONNEUIL.