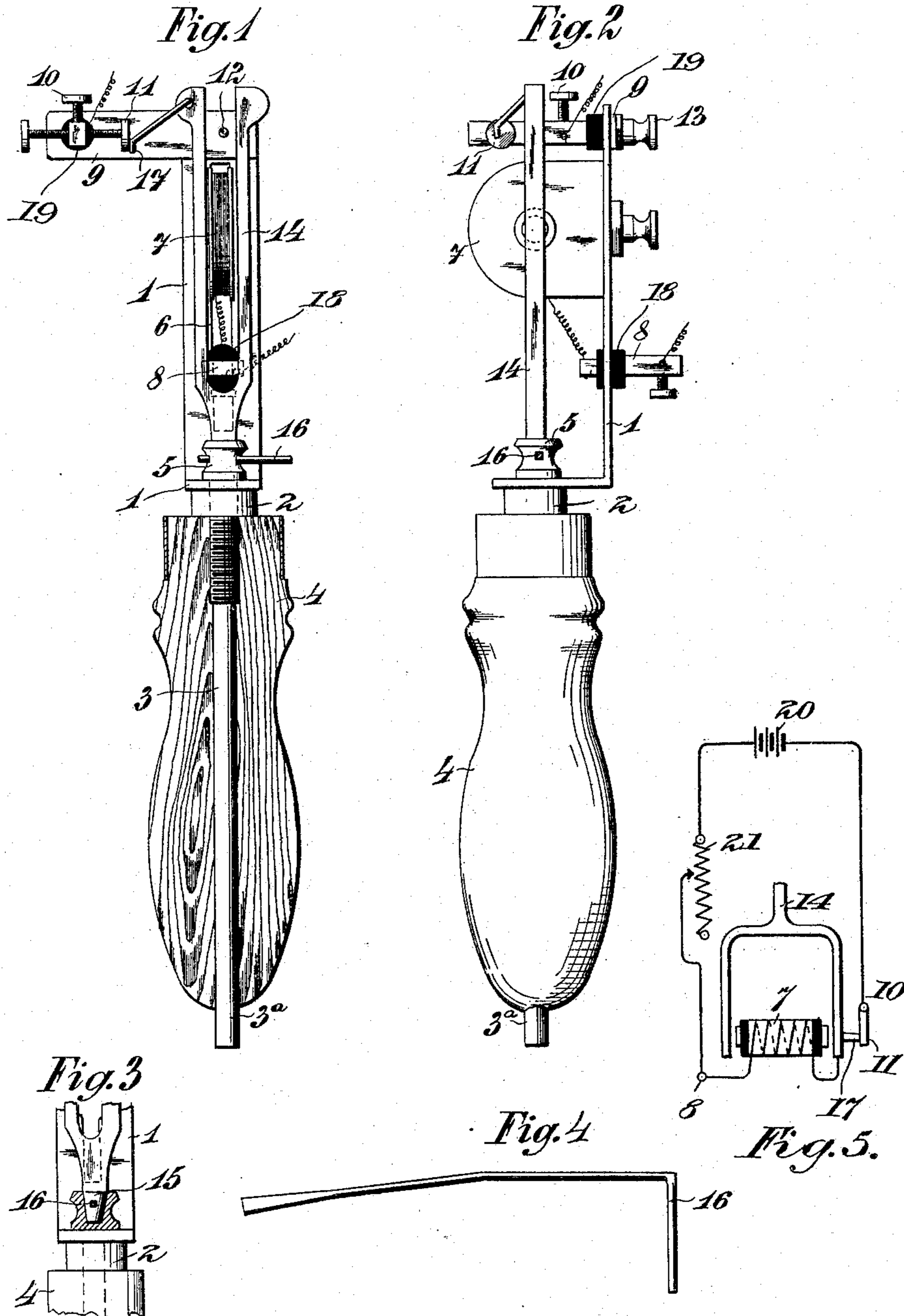


I. MÜLLER.
ELECTRICAL SOUNDING FORK VIBRATOR.
APPLICATION FILED OCT. 8, 1908.

947,251.

Patented Jan. 25, 1910.



Witnesses:-

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UNITED STATES PATENT OFFICE.

ISIDOR MÜLLER, OF VIENNA, AUSTRIA-HUNGARY.

ELECTRICAL SOUNDING-FORK VIBRATOR.

947,251.

Specification of Letters Patent.

Patented Jan. 25, 1910.

Application filed October 8, 1908. Serial No. 456,819.

To all whom it may concern:

Be it known that I, ISIDOR MÜLLER, doctor of medicine, of Guntherstrasse 3, Vienna, IX, Austria-Hungary, and a subject of the Emperor of Austria-Hungary, have invented new and useful Improvements in Electrical Sounding-Fork Vibrators, of which the following is a full and clear specification.

This invention relates to an electrical tuning fork by means of which acoustic vibrations can be produced during any desired length of time and communicated directly to the ear.

The appliance is provided with a handle so formed that the end thereof can easily be inserted into the outer auditory passages of the ear. It serves both for the purposes of clinical examination as also for the treatment of diseases of the ear, that is vibrating both the tympanum and the bones of the ear and even for the treatment of the nerve itself.

By means of the end of the tuning fork pushed tightly into the auditory passage the air in the outer auditory passage, the tympanum and the bones are caused to vibrate and these vibrations are communicated to the labyrinth, to the auditory nerves and the auditory centers of the brain. On the other hand the bone, as in the whole of the skull is set in vibration by the direct contact and these vibrations are again communicated to the nerves concerned with the sense of hearing so that the nerve of hearing is set vibrating both through the appliance for conducting the sound and also through its own independent acoustic function. This method of directly exciting the nerve of hearing by acoustic sound waves has up to now not been employed. It is moreover possible to exactly estimate the number of vibrations by the pitch of the sounding fork employed and the intensity of the vibrations can be regulated by means of a suitable rheostat.

By means of the tuning fork molecular vibrations are produced so that the sympathetic parts are set in corresponding acoustic and molecular vibration. These vibrations are enabled to influence the acoustic nerve fibers of the nerve of hearing corresponding to the ear more powerfully than all other kinds of vibration.

The drawing shows by way of example one method of carrying out the object of the invention.

Figure 1 is an elevation partly in section;

Fig. 2 is a side elevation; Figs. 3 and 4 show details; Fig. 5 is a diagram of the circuit.

The same numerals are employed to denote the same parts in all the views.

1 is a right angled frame clamped between a boss 5 and a ring 2 on the stem 3 which screws into the handle 4. In a slot 6 in the vertical portion of the frame 1 is adjustably mounted an electromagnet 7 as well as a terminal 8 connected with the windings of the magnet, said terminal being insulated from the frame 1 by means of the insulating bushing 18. A plate 9 which carries a terminal 10 and the adjustable contact piece 11 is movable about a pivot 12 and can be set or locked by means of a screw 13. The insulating bushing 19 insulates terminal 10 from the plate 9. The electro-magnet 7 is placed between the tines of the sounding fork 14 which are in metallic connection with its winding. A wire 17 connects the fork in the inoperative position with the contact piece 11. The fork is attached to the stem 3 in such a way as it can easily be changed. It has a conical end 15 which fits into the bush 5 and is secured therein by means of a bolt 16 (see Fig. 5). In the form of the appliance shown in the drawing this bolt 16 is formed into a sound with a thickened end. The sound (instrument) can be easily applied to any desired part of the auditory canal and of course vibrates in unison with the fork.

As may be seen from Fig. 5 the circuit comprises a source of current, 20 designating a battery, and a variable resistance 21, which serves for changing the intensity of the current. The wire of the electro-magnet 7 is with one end through terminal 8 connected to the resistance and with the other end it is either through frame 1 or some other suitable way in conducting connection with the fork 14. From there the current flows through the wire piece 17, contact piece 11 and terminal 10 back to the source of the current supply.

When the circuit is closed the electro-magnet 7 draws the tines of the fork 14 toward it and causes the wire 17 to come away from the contact piece 11 thereupon the circuit is broken and the tines return to their original positions in which the circuit is again closed so that the action is continuous.

On changing the sounding fork it is necessary to adjust correspondingly the magnet

and the contacts to suit the length of the fork.

By changing the sounding fork the pitch can be regulated and by altering the strength of the current the intensity of the sound can be altered.

The portion 3^a projecting from the handle which portion is a continuation of the fork stem is so shaped that it can be easily pushed tightly into the auditory canal. By this means the column of air closed in is set in acoustic vibration and also the bone is caused to vibrate directly. These vibrations are materially stronger than those caused by the sound (instrument).

Having now particularly described and ascertained my invention what I claim as new and desire to secure by Letters Patent is:

1. An electrical sounding vibrator comprising in combination a tuning-fork, an electro-magnet, and a sound attached to said fork.

2. An electrical sounding vibrator comprising in combination a tuning-fork, an

electro-magnet, a detachable element projecting longitudinally from the bight of said fork, a sound securing said element to said fork, the free end of said sound being thickened.

3. An electrical sounding vibrator comprising in combination, a tuning-fork, a frame, an electromagnet and terminals independently and adjustably mounted on said frame, a contact piece adjustably secured to one of said terminals, a conducting element secured to said fork and coacting with said contact piece for making and breaking contact, a handle, a longitudinal detachable projection on the bight of said fork, said projection passing through and extending beyond said handle, and a sound locking said projection to said fork.

Dated this 24th day of September, 1908.

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

ISIDOR MÜLLER.

Witnesses:

KARL TREUMER,

ROBERT W. HEINGARTNER.