A. E. HARTWELL.

VIBRATOR.

APPLICATION FILED OCT. 16, 1916.

1,259,396.

Patented Mar. 12, 1918.

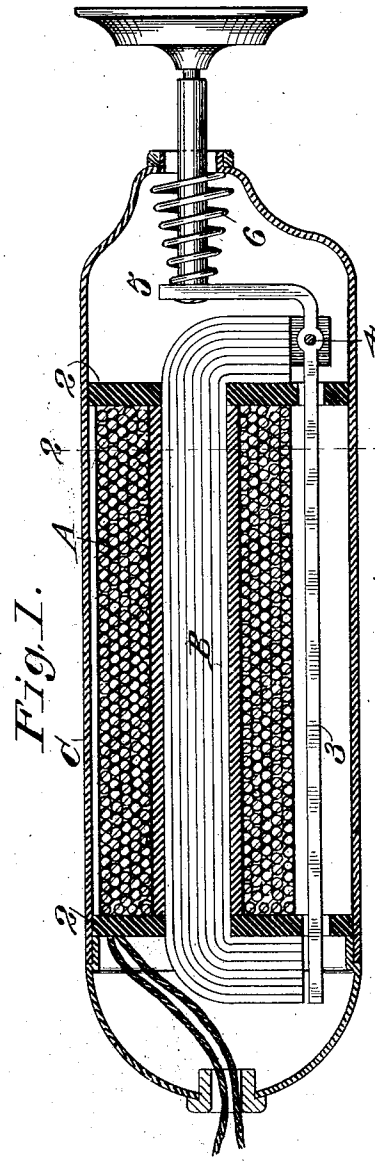

Fig. 1.

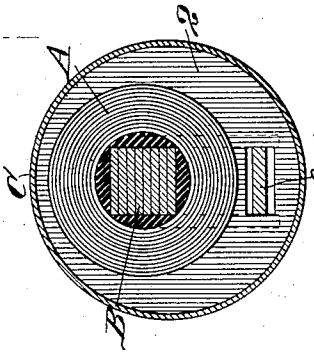

Fig. 2.

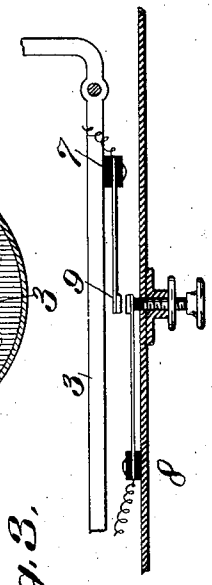

Fig. 3.

WITNESSES:

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UNITED STATES PATENT OFFICE.

ALBERT E. HARTWELL, OF SAN FRANCISCO, CALIFORNIA, ASSIGNOR TO E. N. TORMEY, OF SAN FRANCISCO, CALIFORNIA.

VIBRATOR.

1,259,396. Specification of Letters Patent. **Patented Mar. 12, 1918.**

Application filed October 16, 1916. Serial No. 125,826.

To all whom it may concern:

Be it known that I, ALBERT E. HARTWELL, a citizen of the United States, residing at the city and county of San Francisco and State of California, have invented new and useful Improvements in Vibrators, of which the following is a specification.

My invention relates to improvements in devices of that kind which are entitled vibrators, and in which a contact surface or pad is caused to have a rapid vibratory motion, such devices being used in medical and like apparatus, and in which a motor is generally employed to produce the vibrations.

It is the object of my invention to provide a device of this character in which the motor is eliminated, and the mechanism rendered more durable. It consists of an insulated coil having an armature core passing through it, an arm pivoted so as to be vibrated by the alternate energizing and deënergizing of the circuit, said arm having attached to it the pad or part to be vibrated.

It also consists of details of construction and the parts and combination of parts as hereinafter more fully described and claimed, having reference to the accompanying drawings in which:—

Figure 1 is a longitudinal section of the device.

Fig. 2 is a transverse section through 2—2 of Fig. 1.

Fig. 3 is a view showing the operation of the device where a direct current is used.

In the employment of vibrators of this class, a motor is generally needed to produce the proper action. These motors soon become worn out and useless and must be replaced. In my invention I have shown an electrical insulated coil A and a laminated core B surrounded by the coil. The whole may be conveniently inclosed in a case as at C and the coil is retained in position by means of insulating disks 2 within which the ends of the coil are fixed, and the disks themselves are fixed within the case C. The armature B is shown as bent at right angles so that its ends are substantially parallel with the sides of the coil. 3 is an arm pivoted within the case C as shown at 4 and capable of vibration upon this pivot. As here shown the arm is parallel with the exterior of the coil and the free end of the arm is in such relation with the co-acting end of the core that it may vibrate to and from said end with the alternate energizing and deënergizing of the coil. The opposite end of the arm 3 as here shown is bent at right angles just beyond the adjacent end of the core as shown at 5. It will thus be seen that with this construction, any vibration of the lever 3 caused by the action of the coil upon its core will be transmitted to the arm 5 with a compound movement about the pivot 4, the pad or attachment being moved both longitudinally and diagonally with relation to the case. 6 is a spring which is coiled within the end of the case and acts against the lever arm 5 so that when the coil is deenergized, this spring will force the arm 5 backward and withdraw the opposite end of the bar 3 from the core. With this construction it will be seen that with an alternating current, the oscillation may be kept up at high speed and for any length of time. If a direct current is used, one of the conducting wires may be connected with the arm, and insulated therefrom as shown at 7, and the other one may be connected as at 8. The contact being made and broken in the usual manner as at 9.

Having thus described my invention, what I claim and desire to secure by Letters Patent is:—

1. In a vibrator mechanism, a case, an electrically energized element, apertured insulating disks connected to the ends of said element and engaged with the case to support said element in spaced relation to the walls of said case, a substantially U-shaped core in said element having its end parts extending through the disk apertures and the free terminals of said ends spaced from the adjacent part of the case, said disks having openings in register with said free terminals of said ends, a bell-crank lever having one arm extending through said openings of the disks and pivoted to one end part of said core and having its other arm extending beyond said last named end part of the core, and means connected to said last named arm of the bell crank to operate a vibrator.

2. In a vibrator mechanism, an electrically energized element, a substantially U-shaped core in said element having its end parts extending beyond the ends of said element, a bell crank lever having one arm pivoted between its ends to one end of said core and having the free end of said arm arranged

opposite to the other end of said core, the other arm of said bell crank extending beyond said first named end of the core, and means connected to said other arm of the bell crank to operate a vibrator.

3. In a vibrator mechanism, an electrically energized element, a core therefor having one of its ends extending outwardly, a pivoted bell crank lever having one arm extending lengthwise of said core and the free end of said arm disposed adjacent to said end of the core so as to be attracted by said core, the other arm of said bell crank extending beyond the other end of the element, and means connected to the other arm of the bell crank to operate a vibrator.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

ALBERT E. HARTWELL.

Witnesses:
JOHN H. HERRING,
W. W. HEALEY.