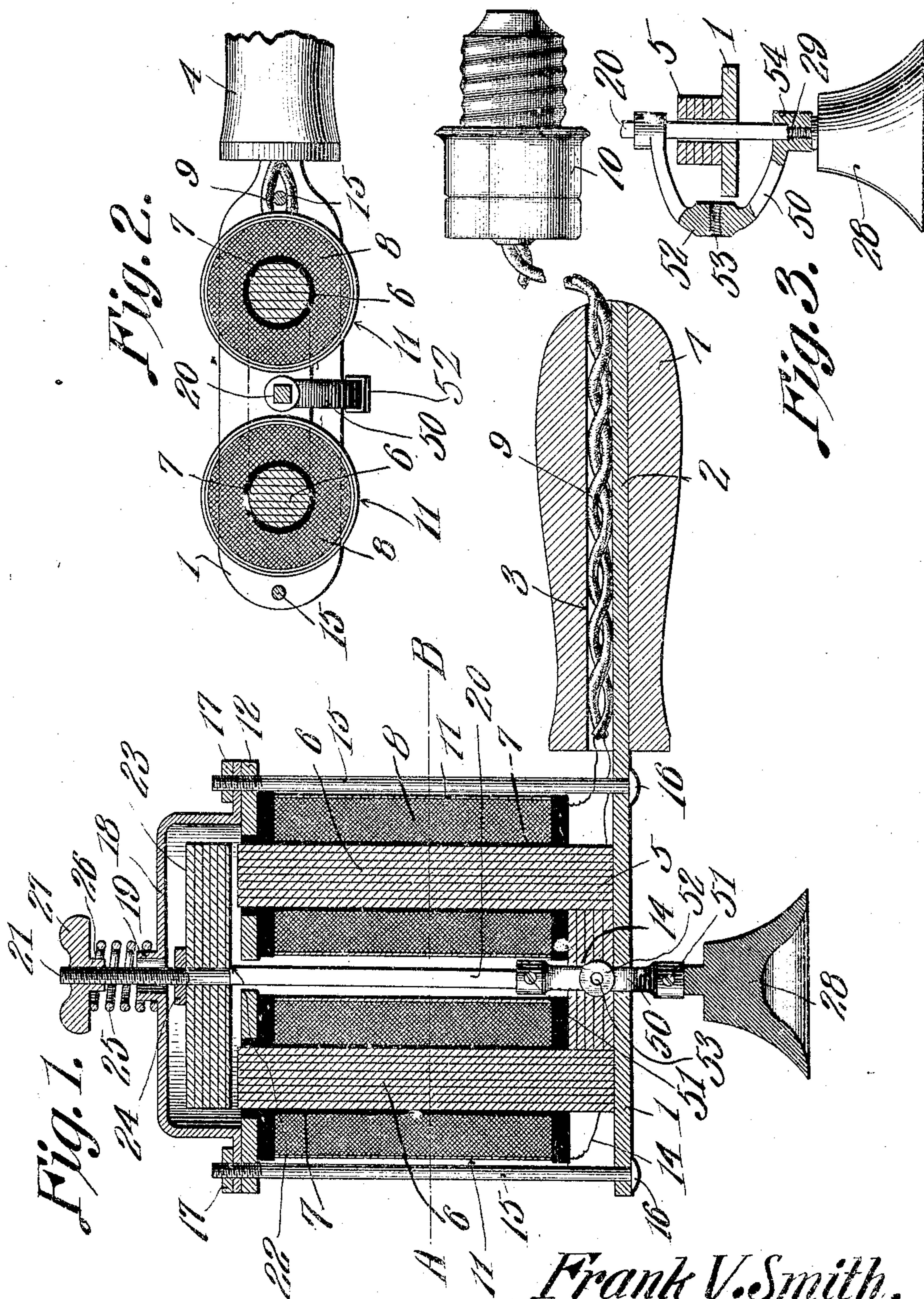


F. V. SMITH.
MAGNETIC VIBRATOR.
APPLICATION FILED DEC. 20, 1910.

994,957.

Patented June 13, 1911.



Witnesses

Mason B. Lawton

by

Frank V. Smith,

Inventor

C. A. Snow & Co.

Attorneys

UNITED STATES PATENT OFFICE.

FRANK V. SMITH. OF FLORISTON, CALIFORNIA.

MAGNETIC VIBRATOR.

994,957.

Specification of Letters Patent. Patented June 13, 1911.

Application filed December 20, 1910. Serial No. 598,291.

To all whom it may concern:

Be it known that I, FRANK V. SMITH, a citizen of the United States, residing at Floriston, in the county of Nevada and State of California, have invented a new and useful Magnetic Vibrator, of which the following is a specification.

The device forming the subject matter of this application, is adapted to be employed in an alternating current circuit, to secure the reciprocation of a movable element, the construction being adapted to be employed for massage, in dental operations, and elsewhere, where the rapid reciprocation of a tool-holding member is desirable.

It is the object of the invention to provide a movable member or holder, of novel and improved form, to provide novel means for housing and for actuating the holder, and to provide novel means for regulating and adjusting the movement of the holder.

In the drawings: Figure 1 is a longitudinal section; Fig. 2 is a transverse section upon the line A—B of Fig. 1; and Fig. 3 is a fragmental transverse section at right angles to the cutting plane of Fig. 1.

In carrying out the invention there is provided a base plate 1, having an extension 2, adapted to fit in the opening 3 of a handle 4. The electro-magnet rests upon the base plate 1, and comprises a laminated U-shaped core 5, the arms of which are denoted by the numeral 6. Upon these arms 6 spools 7 are disposed, and about the spools 7, a conductor 14 is wound, as shown at 8, the terminals of the conductor being carried through the opening 3 in the handle 4, as shown at 9 and united with a plug 10, of any desired form, whereby the device may be brought into an electric circuit. The coils 8 of the electro-magnet are covered, as shown at 11. The ends of the arms 6 of the core 5 extend through openings in the top plate 12, which rests upon the ends of the spools 7. Bolts 15 are extended through the base plate 1, the top plate 12, and through the periphery of a cover 18, which, in its central portion is spaced apart from the top plate 12. The bolts 15 are preferably headed, as shown at 16, to engage the base plate 1, the opposite extremities of the bolts 15 carrying nuts 17 which, engaging the periphery of the cover 18, serve to hold the cover and the plates in place upon the electro-magnet. The cover 18 is provided with an upstanding neck 19, disposed above and between

the arms 6 of the core 5. The plates 1 and 12, and the middle portion of the core 5 are provided with alined, polygonal openings, in which slides a rod or holder 20, this holder being provided with a threaded end 21, extended outwardly through the neck 19 of the cover 18. The threaded portion 21 of the holder is of less diameter than the body portion thereof, thus defining in the holder, a shoulder 22, upon which a laminated armature 23 rests, this armature 23 being disposed between the cover 18 and the top plate 12. The armature 23 is held in place by means of a nut 24, located upon the holder 20. The protruding, threaded end 21 of the holder 20 is surrounded by a compression spring 25, the lower end of which is fitted about the neck 19 of the cover 18. Threaded upon the extremity of the portion 21 of the holder, is a wing nut 27, provided with a projecting neck 26, adapted to fit in one end of the spring 25.

The invention further includes an arcuate bracket 50, extended laterally, as shown in Fig. 3, around the middle portion of the electro-magnet, the ends of the arcuate bracket 50 engaging the holder 20, above and below the middle portion of the core 5 to constitute a truss for the holder. The bracket 50 is held in place upon the holder 20 by means of set screws 51 or the like, threaded into the extremities of the bracket. The intermediate portion of the bracket 50 which is disposed laterally beyond the central portion of the core 5, is equipped with an enlarged head 52, provided with a threaded opening 53, the axis of which is positioned substantially at right angles to the axis of the holder 20. In the lower end 54 of the bracket 50 there is another threaded opening, of a common diameter with the opening 53, the axis of this last mentioned opening being alined with the axis of the holder 20. The holder 20 is adapted to secure a reciprocation of a tool of any sort. If desired, the tool may consist of a resilient cup-shaped head 28, of the sort ordinarily employed in massage, the head 28 being provided with threaded stem 29. This stem 29 may be mounted in the threaded opening in the end 54 of the bracket, or it may be mounted in the threaded opening 53. This construction permits the axis of the head 28 to be disposed in alinement with the axis of the holder 20, or at right angles to the axis of the holder.

The operation of the device is as follows. The head 28 or any other tool, being mounted in place, as hereinbefore described, in the bracket 50, the plug 10 is inserted into a
 5 socket, so as to bring the device into an alternating circuit. The current, passing through the conductor 14, will energize the electro-magnet, the armature 23 being drawn toward the core 5. This operation obviously,
 10 will cause the holder 20 and its head 28 to move in one direction. During the foregoing operation, the spring 25 will be compressed. When the potential of the alternating current falls, during the reversal of
 15 the current, so that the pulling effect of the electro-magnet upon the armature, is no longer greater than the thrusting effect of the spring 25, the spring 25 will, acting against the wing nut 27, move the holder 20
 20 in an opposite direction. When the potential of the current again rises, the electro-magnet will act, as hereinbefore stated, to move the holder 20, and to compress the spring 25, the reciprocation of the holder
 25 20, of course, taking place with great rapidity. By rotating the wing nut 27 upon the threaded end 21 of the holder, the spring 25 may be compressed, or permitted to expand,
 30 the stroke of the holder 20, in the one instance, being shortened, and the stroke of the holder 20, in the other instance, being lengthened.

Having thus described the invention, what is claimed is:—

35 1. In a device of the class described, an electro-magnet; plates applied to opposite ends of the magnet; a cover resting upon one of said plates; securing devices uniting
 40 the plates and the cover; a holder reciprocating in the plates and in the cover; an

armature upon the holder beneath the cover; a spring bearing at one end upon the cover; and a device upon the holder for engaging the other end of the spring to adjust the
 45 tension thereof.

2. In a device of the class described, an electro-magnet; plates applied to the ends of the electro-magnet, one of the plates being provided with an extension; a handle upon the extension; the terminals of the
 50 winding of the electro-magnet being extended through the handle; a holder reciprocating in the plates and in the magnet; a cover applied to one of said plates; means for holding the plates and the cover to-
 55 gether; an armature upon the holder, beneath the cover, one end of the holder being threaded and extended through the cover; a nut upon the threaded portion of the
 60 holder; and a spring positioned between the nut and the cover.

3. In a device of the class described, an electro-magnet; a holder slidable in the magnet; an armature secured to the holder;
 65 means for retracting the armature from the magnet; and an arcuate bracket, extended around the magnet and united with the holder upon both sides of the magnet, the bracket having elements for the reception
 70 of a tool, one of which elements is aligned with the axis of the holder, the other of which elements is disposed at an angle to the axis of the holder.

In testimony that I claim the foregoing as my own, I have hereto affixed my signature in the presence of two witnesses.

FRANK V. SMITH.

Witnesses:

W. W. GOODRICH,

J. D. WELLS.