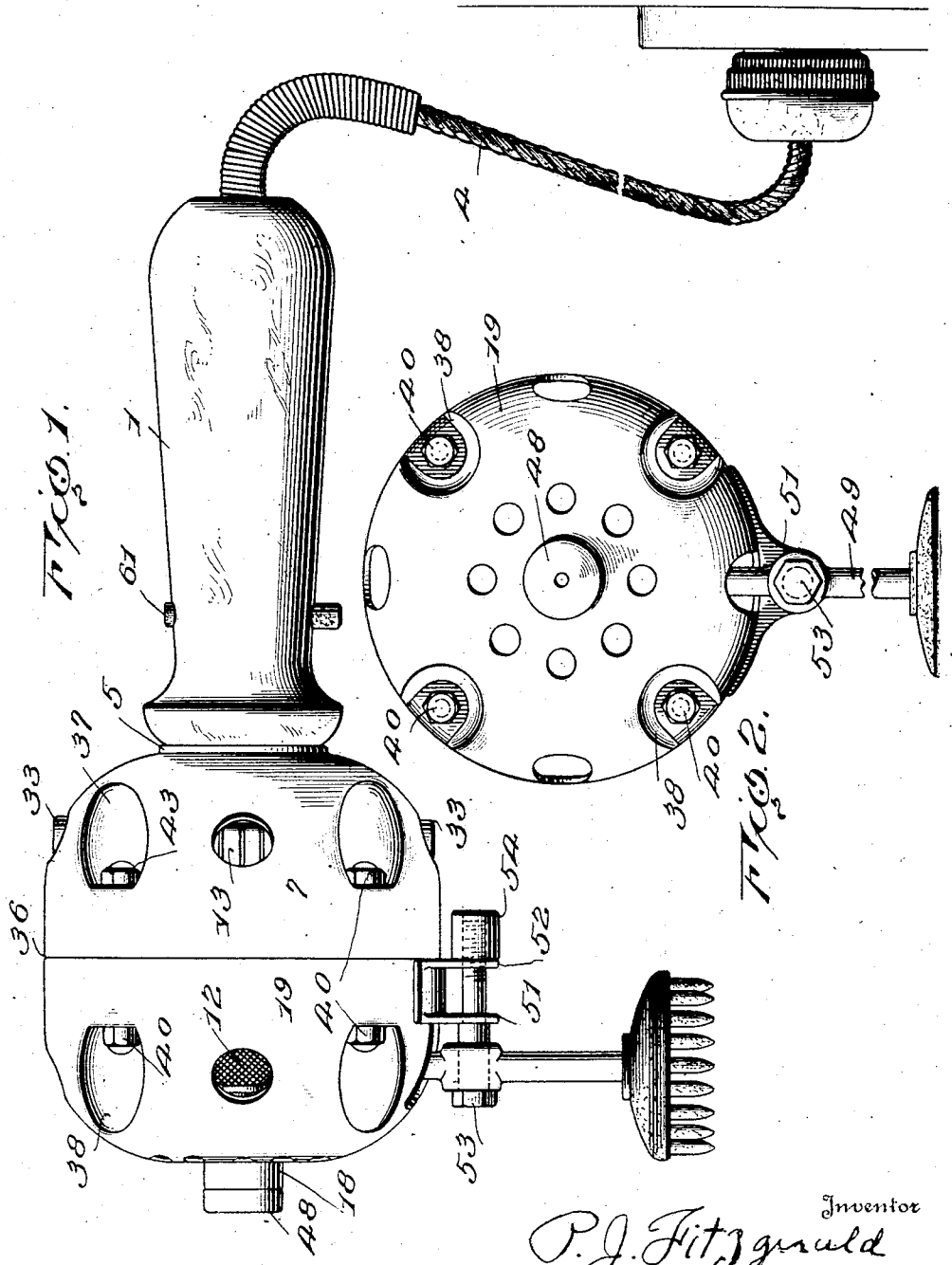
May 13, 1924. 1,494,162

P. J. FITZGERALD

VIBRATOR

Filed Jan. 7, 1921 3 Sheets-Sheet 1



Inventor

P. J. Fitzgerald

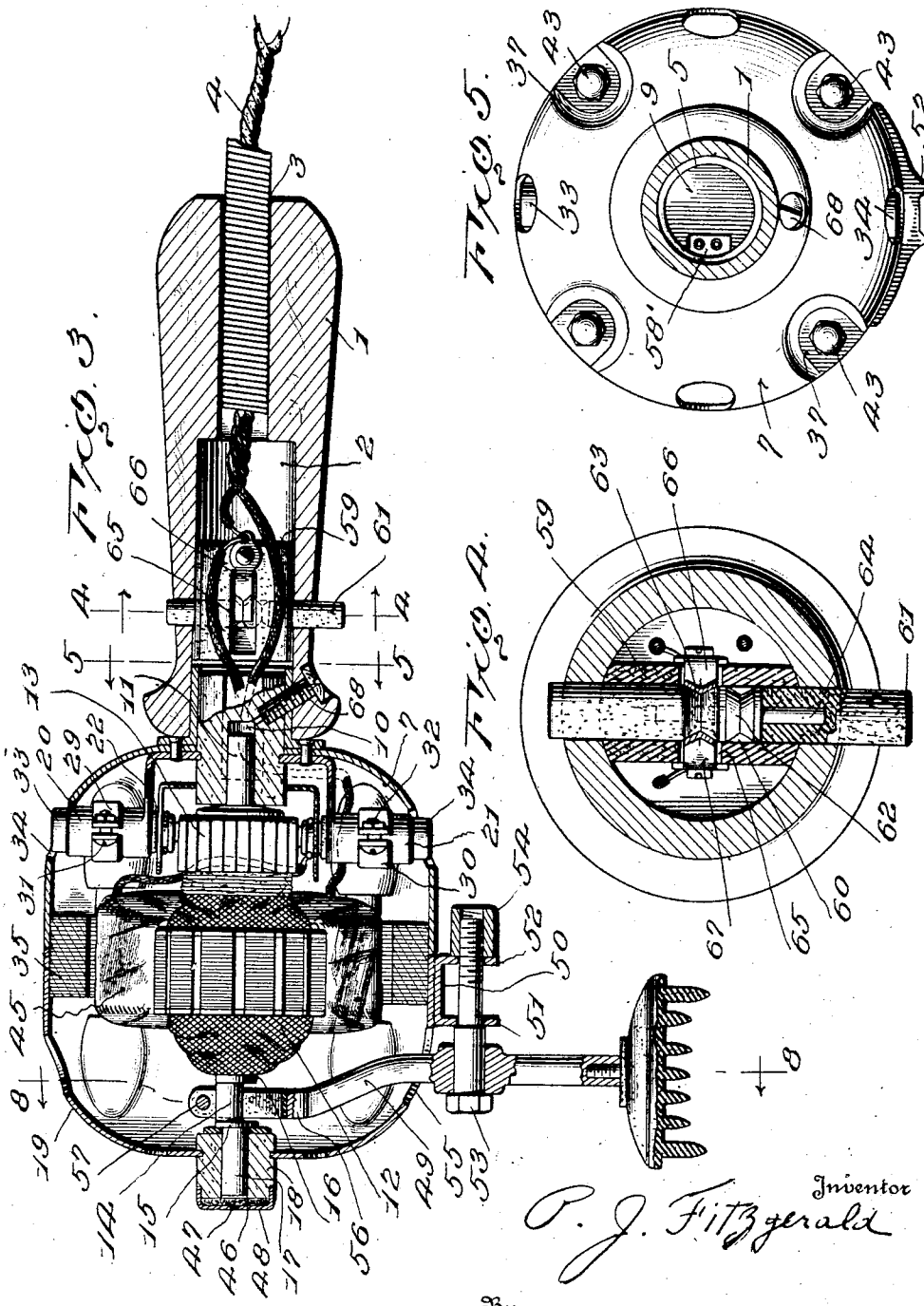
By Sturtevant & Mason Attorneys

May 13, 1924. 1,494,162

P. J. FITZGERALD

VIBRATOR

Filed Jan. 7, 1921 3 Sheets Sheet 2



Inventor
P. J. Fitzgerald

By
Sturtevant + Morson Attorneys

May 13, 1924. 1,494,162

P. J. FITZGERALD

VIBRATOR

Filed Jan. 7, 1921 3 Sheets-Sheet 3

Fig. 6.

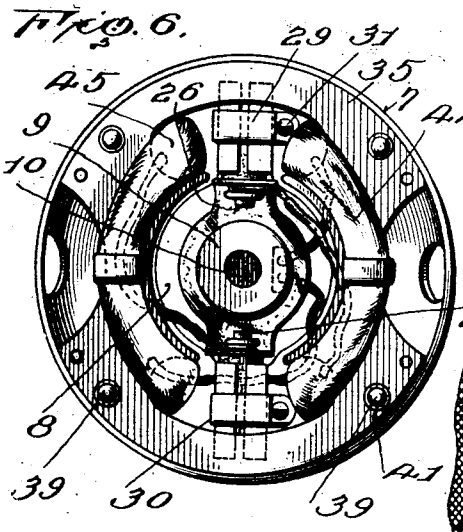


Fig. 7.

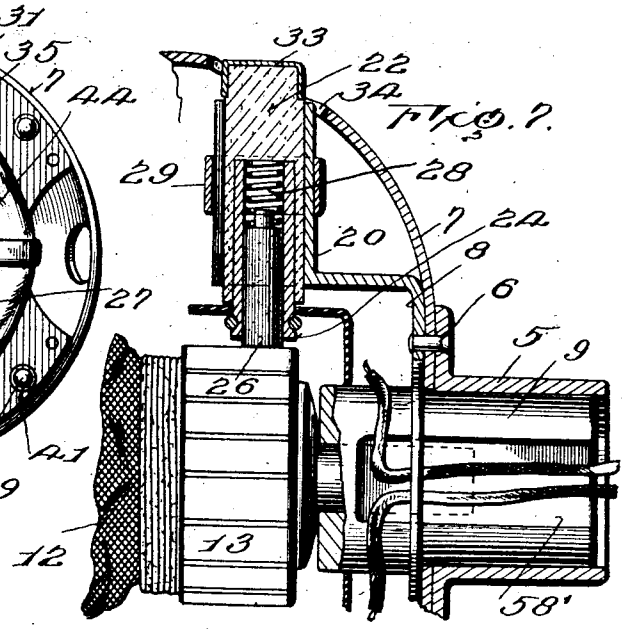


Fig. 8.

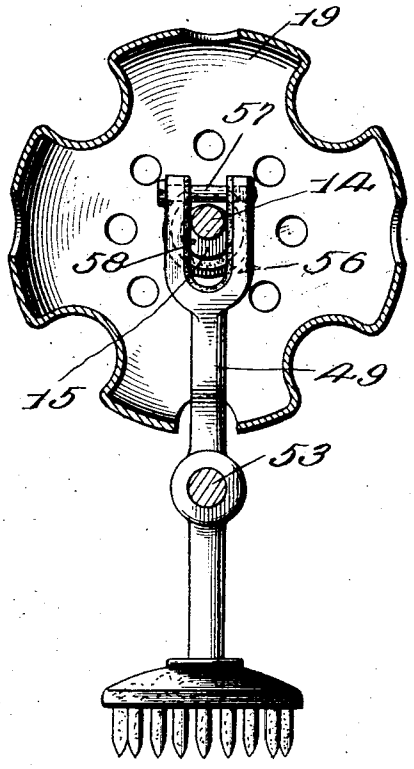


Fig. 9.

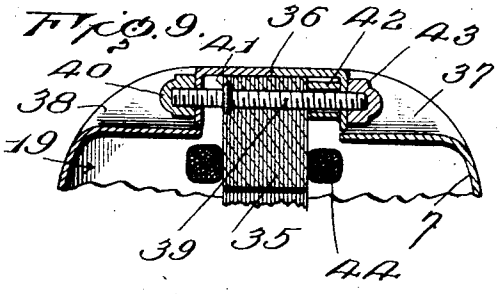
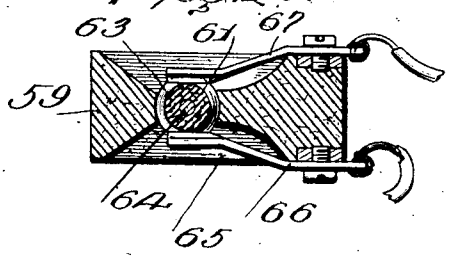


Fig. 10.



Inventor

P. J. Fitzgerald

By Sturtevant & Mason Attorneys

Patented May 13, 1924. 1,494,162

UNITED STATES PATENT OFFICE.

PATRICK J. FITZGERALD, OF TORRINGTON, CONNECTICUT, ASSIGNOR TO THE FITZGERALD MANUFACTURING COMPANY, OF TORRINGTON, CONNECTICUT, A CORPORATION OF CONNECTICUT.

VIBRATOR.

Application filed January 7, 1921. Serial No. 435,601.

To all whom it may concern:

Be it known that I, PATRICK J. FITZGERALD, a citizen of the United States, residing at Torrington, in the county of Litchfield, State of Connecticut, have invented certain new and useful Improvements in Vibrators, of which the following is a description, reference being had to the accompanying drawing and to the figures of reference marked thereon.

This invention relates to hand-held vibratory devices, and more particularly to massage vibrators, in which a massage effect is produced by the vibration of the member as distinguished from the usual rotation thereof.

One of the main objects of this invention is to produce a simple, durable and compactly built hand-held device in which the massage member or other actuated member is vibrated by an electric motor contained within the device.

Another feature of this device relates to the novel manner of constructing the casing, enclosing the motor, and of the manner in which the vibratable member is mounted on the casing for actuation by the motor.

A further object of the invention resides in the manner in which the vibration of the massage element is produced by the eccentric portion of the armature shaft, and particularly in the manner in which the armature shaft is locked in assembled position to one half of the casing shell so that the armature shaft can be removed bodily from its surrounding field when the casing sections are taken apart.

Still another feature of the invention resides in the forked construction of the inner end of the vibratable member and particularly with reference to the fiber lining adapted to engage the eccentric portion of the armature shaft for eliminating the noise of vibration.

Still another phase of the invention resides in the compact construction of the armature field about the armature shaft and the novel manner of utilizing the field laminations as a bearing between the two sections of the casing for the motor.

An ancillary object of this invention resides in the switch mechanism for making and breaking the motor circuit.

These and other objects will in part be obvious and will in part be hereinafter more fully disclosed.

Referring more particularly to the accompanying drawings:—

Figure 1 is a perspective view of the device;

Fig. 2 is an end view thereof;

Fig. 3 is a sectional view corresponding to Fig. 1;

Fig. 4 is a detail sectional view of the switch mechanism; taken on the line 4—4 of Fig. 3;

Fig. 5 is an end view of the casing taken on the line 5—5 of Fig. 3;

Fig. 6 is a sectional view through the commutator end of the casing clearly showing the electrical connections;

Fig. 7 is a side sectional view of one of the commutator brushes and the manner of mounting it within the casing;

Fig. 8 is a section on the line 8—8 of Fig. 3;

Fig. 9 is a detail sectional view showing the field laminations and their relation to the casing, and

Fig. 10 is a further detail sectional view of the switch mechanism.

In general, the hand-held vibrator includes a two-part casing having a handle connected to one part comprising the means through which the electrical conductors are connected to the usual motor within the casing. The casing is composed of two symmetrically shaped sections, each having a bearing for the armature shaft of the usual construction. One section of the casing has mounted thereon, the laminations of the field surrounding the armature shaft, which laminations are wide enough to project beyond the division line between the two casing sections when assembled, so that the laminations provide a bearing for insuring the accurate seating of one section with respect to the other. The shell parts are provided with opposed bolt recesses registering with perforations passing through the laminations whereby the laminations and casing sections are all held in assembled position by bolts passing through these parts and spaced circumferentially around the casing. The other section of the casing has mounted on the exterior thereof, a bracket forming a pivotal mounting for

the vibratable element which passes through an aperture in this casing member and at its inner end is formed with a forked connection straddling the eccentric on the rotable armature shaft, so that as the shaft rotates, the vibratable member is oscillated with great rapidity.

Referring more particularly to the accompanying drawing, the device comprises the usual wooden handle 1 provided with an enlarged recess 2 to receive the switch mechanism hereinafter described, and with a smaller registering recess 3 to receive the electrical connectors 4 leading to the source of current. The inner end of the handle is provided with a metal flange 5 to which is riveted as by the rivets 6, one section of the casing 7, and also a bracket 8 adapted to hold the commutator brushes.

Likewise fitting in the enlarged recess 2 of this handle and concentrically within the flange 5 is a Babbitt bearing 9 recessed as at 10 to receive one end 11 of the armature shaft which is shown as provided with the usual armature winding 12 and the commutator 13. The opposite end of the armature shaft is provided with an eccentric portion 14, and intermediate spaced collars 15 and 16. The extreme outer end 17 of the eccentric shaft is journaled in a Babbitt bearing 18 having a circumferential groove connection with the outer section of the casing 19.

The bracket 8 riveted to the section 7 of the casing is formed with opposed integral cylindrical portions 20 and 21 formed preferably by rolling the metal thereof to form such shell like portions which in turn receive insulating blocks 22 and 23 into the recesses of which fit insulation plugs 24 and 25 containing the usual brushes 26 and 27 held in outer position by coiled springs 28 fitting in recesses between the brushes and the recesses in the insulating blocks 22 and 23. The cylindrical portion 20 of each brush carrier is held in assembled position by means of the split members 29 and 30, which may be tightened by means of the screws 31 and 32. The outer ends of the insulating blocks 22 are provided with caps 33 of metal or other material, which project outwardly through apertures 34 in the section of the casing. Surrounding the armature winding 12 are arranged the field laminations 35 which are shown in Figures 3 and 9, and extend in thickness well beyond the end 36 of the casing 7 and provide a broad bearing surface or seating face extending across the inner circumference of the two shell sections when in assembled position, which construction permits the ready, accurate and firm seating of one shell section to the other as shown particularly in Fig. 9. Each section of the casing is provided with opposed circumferential spaced or inwardly formed portions 37 and 38 adapted to permit the insertion of fastening bolts 39 through registering perforations formed in the casing sections 7 and 19, and the laminations of the field 35. These fastening bolts 39 are secured to the casing section 19 by means of a nut 40 threading on one end thereof, and the bolts are provided with a flange 41 for holding the laminations assembled on this casing section 19. The other ends of the threaded bolts 39 pass through sleeves 42 on each of the other casing sections 7 to which they are secured by threaded nuts 43. By this construction, by loosening the nut 43, the casing section 7 may be removed from the casing section 19, and further, by loosening the nut 40, the laminations can be disassembled from the casing section 19. As clearly shown in Fig. 6, the laminations are of any desired shape, and are provided with the usual coils 44 and 45 having suitable electrical connections to the brushes, all as is well known in the art.

As above stated, the outer section 19 of the casing carries a recessed bearing block 18 which is provided with a felt pad 46 to which oil is admitted through an oil hole 47 in the end cap 48 of the casing. The outer end 17 of the armature shaft is removably journaled for rotation in the outer end of this bearing block 18. The vibratory member 49 has a pivotal mounting on the outside of the casing, and in the present construction, this mounting comprises a bracket 50 preferably welded to the exterior of the casing 19 and provided with spaced arms 51 and 52 for receiving the pivotal bolt 53 arranged in a plane parallel with the axis of rotation of the armature shaft. This pivotal bolt 53 is secured to the bracket by a securing nut 54. As shown, the vibratable member 49 has a pivotal mounting on the outer end of this bolt 53 and projects through an opening 55 in the casing 19 for connection with the eccentric portion 14 of the armature shaft. It will thus be seen that the shell has a welded support arranged on the outside of the shell for pivotally supporting the vibratory arm with the bolt passing through the center of the arm to hold the vibratable member 49 steady, but allowing it to revolve slightly in order to get the proper amount of vibration.

In order to convert the rotary motion of the armature shaft into vibratory motion for the vibratory member 49, the inner end thereof is provided with a forked portion 56 which straddles the eccentric portion 14 of the armature shaft between the two spaced ears 15 and 16. The forked portion 56 straddling the eccentric 14 is provided with a cross pin 57 to prevent accidental removal of the vibratable member 49, and the interior of the forked portion 56 is lined with fiber 58 to provide a noiseless and frictionless connection between the eccentric 14 and this forked connection. By means of this con-

struction, it will be apparent that upon rotation of the eccentric 14, the vibratable member 49 will be oscillated in a plane at right angles to the axis of rotation of the armature shaft. It will be further apparent that by means of this connection between the spaced ears 15 and 16, the armature shaft will be locked in assembled relation with respect to the section 19 of the casing so that when this section is removed from the opposite section 7 of the casing, the armature shaft will be removed with it, and from the surrounding field.

It will thus be apparent that the casing is composed of two sections, each forming a bearing for the armature shaft, the one section carrying the armature field and brush contacts, and the other section carrying the armature shaft and commutator, and likewise carrying the vibratable member, which in turn removably locks the armature shaft to its casing section. It will also be apparent that the field laminations which are secured to one of the casing sections are constructed and arranged to provide a broad seating surface for the two casing sections so that common securing bolts can hold the laminations and the two casing sections in assembled position.

The electrical connections for the field laminations as clearly shown, pass to the brushes and other connections pass back through a recess 58′ in the bearing block 9 where they connect with the switch mechanism comprising an insulating block 59 located in the recess 2 in the handle. As shown, this block 59 is provided with a recess 60 adapted to receive a two-part insulating plunger 61 provided with two V-shaped portions 62 and 63, the one composed of insulation and the other composed of electrical conducting material, which portions 62 and 63 may be secured to the plunger 61 by means of the pin 64. The insulating block 59 is further provided with a recess 65 arranged at right angles to the recess 60 through which pass from opposed sides the spring contact fingers 66 and 67 to which are connected the inner ends of the electrical connections from the field coils 44, and the source of current, 4, respectively, so that when the plunger 61 is in one position, the current is broken by means of the non-conducting block 62 being inserted between the spring fingers 66 and 67, and when the plunger is in another position, the conducting block 63 will be shifted between these fingers to establish a circuit from the source of current through the field windings.

As a means for holding the handle in fixed position relative to the flange 5, there is provided a screw 68 which passes through the wooden handle and the flange 5, into the Babbitt bearing 9. This screw 68 is provided with a bore passing therethrough, which bore communicates with the recess in the Babbitt bearing in which the journal 11 of the armature shaft rotates. This provides a very convenient manner of assembling these parts, while at the same time providing a means for supplying oil to this bearing. It will thus be seen that this device affords a very compact and durable hand-operated vibrator composed of few parts, which may be quickly assembled.

It will be obvious that minor changes in the details of construction and the arrangement of the parts may be made without departing from the spirit of the invention as set forth in the appended claims.

Having thus described the invention, what I claim as new and desire to secure by Letters-Patent, is—

1. A device of the class described comprising shell sections detachably united, a hollow sleeve connected to one of said sections and projecting therefrom, a bearing situated in said sleeve, a recessed handle seated on said projecting sleeve, a fastening means passing through said handle and sleeve to assemble the same, and a bearing in the other section and an armature shaft journaled in said bearings.

2. A device of the class described comprising shell sections detachably united, a hollow sleeve connected to one of said sections and projecting therefrom, a bearing situated in said sleeve, a recessed handle seated on said projecting sleeve, a fastening means passing through said handle and sleeve to assemble the same, a bearing in the other section, an armature shaft journaled in said bearings, electrical connections passing longitudinally through said handle, and a detachable switch block disposed in the recess of said handle.

3. A massage device comprising a divided shell enclosing an armature, an armature shaft having bearings in the respective sections of said shell, a field surrounding said armature and carried by one of said sections, a massage member oscillatably carried by the second section, means for oscillating said member from said shaft, said means being constructed and arranged to permit the quick detachability of said member from said shaft but normally holding said armature shaft in assembled relation to said second section on separation of said sections.

4. In a massage device, a shell enclosing an armature, a handle affixed thereto, an armature shaft rotatably journaled in said shell, a field surrounding said armature, a vibratable massage member mounted on said shell and oscillated by said armature shaft, electrical conductors for said field passing through said handle, and a switch for said conductors, said switch comprising spaced spring contact fingers, and an intermediate

slidable pin having conducting and non-conducting portions adapted to be reciprocably positioned between said fingers.

5. A device of the class described comprising substantially hemispherical sections detachably united to form an enclosing shell, a bearing carried by one of said sections, a handle surrounding said bearing and attached to said section, a second bearing carried by the other section and formed with a shaft receiving perforation extending therethrough, a metal cap for said bearing provided with an oil hole, an oil holding pad enclosed by said cap, a motor enclosed by said shell including a shaft freely journaled in said bearings, and a member extending through said casing and operatively connected to said motor shaft.

6. A massage device comprising a two-part sheet metal shell having an opening therein, a sheet metal bracket on the exterior of one of said shell parts comprising spaced perforated ears, a massage member extending through the opening in said shell and formed with a perforation, a motor including a drive shaft rotatably journaled in said shell portions, means for oscillating said vibratable member from said shaft, a headed pin extending through the perforations of said ears, said pin having a bearing passing through the perforation of said oscillatory member, and a threaded end, and a nut engaging said threaded end to hold said vibratable member assembled on said bracket.

In testimony whereof, I affix my signature

PATRICK J. FITZGERALD.