S. W. MOON.

ELECTRIC VIBRATOR.

APPLICATION FILED DEC. 24, 1906.

957,982. Patented May 17, 1910.

Fig. 1.

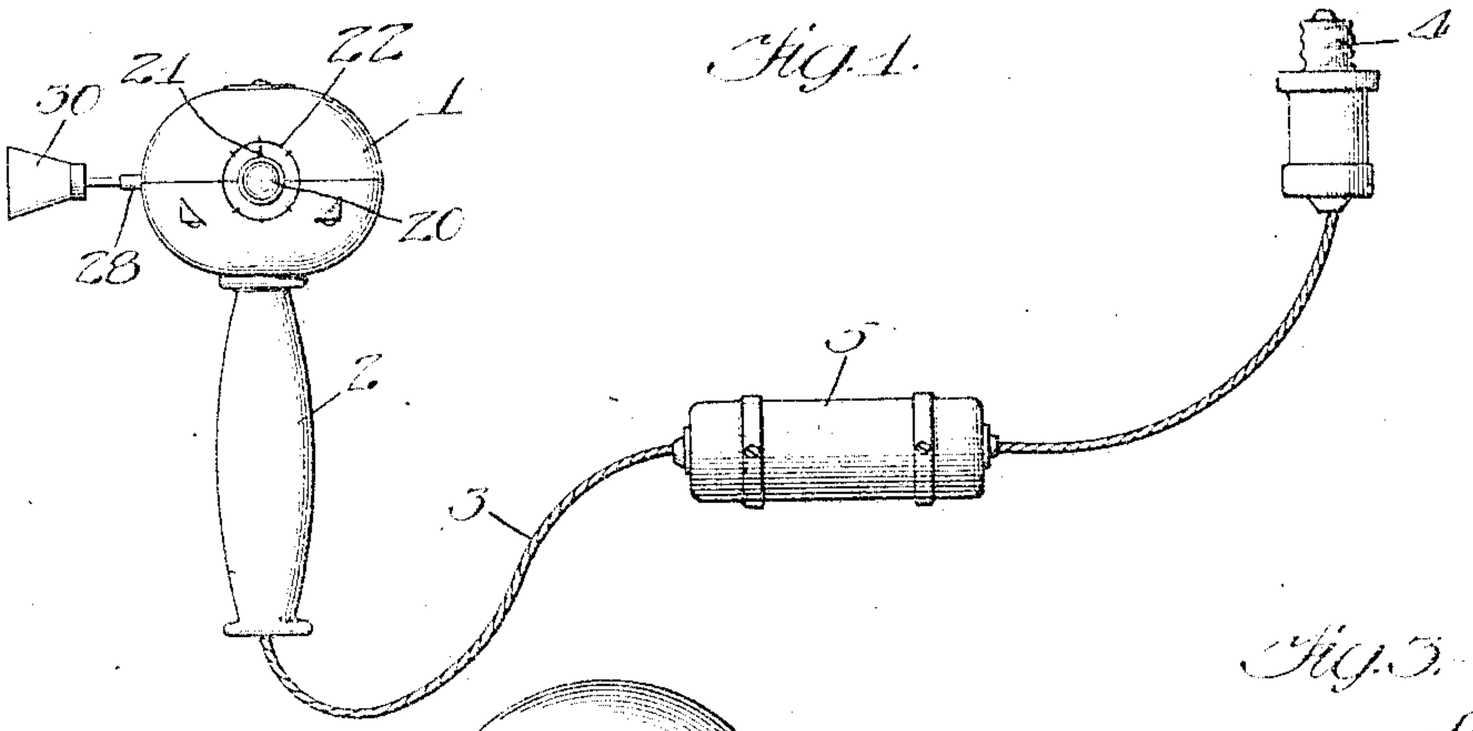

Fig. 3.

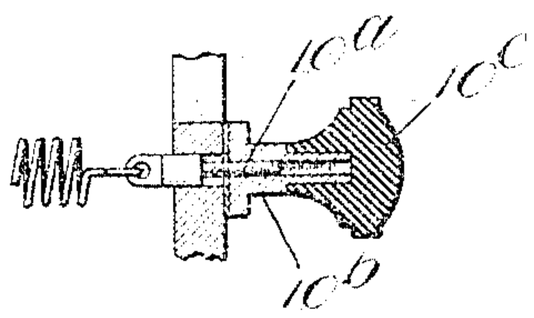

Fig. 2.

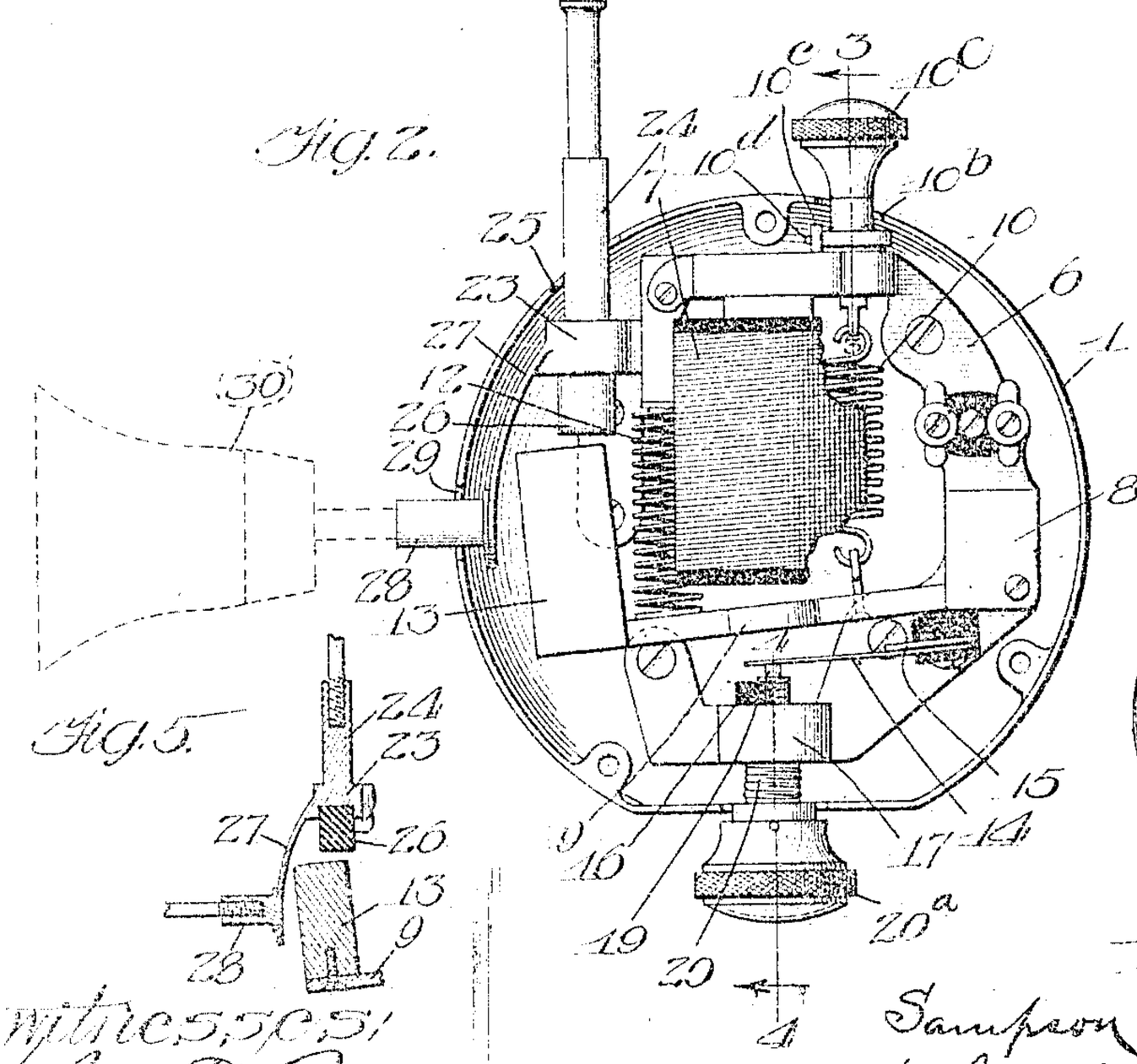

Fig. 4

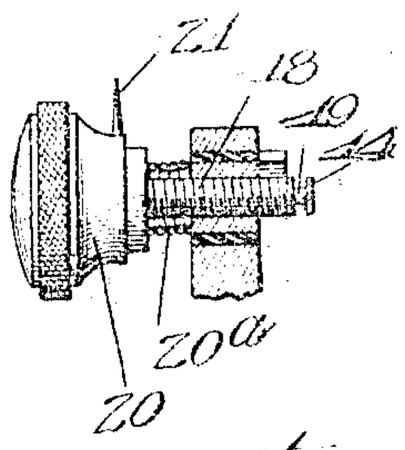

Fig. 5.

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UNITED STATES PATENT OFFICE.

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ELECTRIC VIBRATOR.

957,982. Specification of Letters Patent. **Patented May 17, 1910.**

Application filed December 24, 1906. Serial No. 349,313.

To all whom it may concern:

Be it known that I, SAMPSON W. MOON, a citizen of the United States of America, and resident of Chicago, Cook county, Illinois, have invented a certain new and useful Improvement in Electric Vibrators, of which the following is a specification.

My invention relates to improvements in electrical vibrators or massage machines.

The object of the invention is to provide a vibrator adapted to be operated without a motor and for use in connection with the direct, alternating or battery currents.

A further object is to provide a vibrator adapted to produce both percussion or hammer strokes and lateral strokes, and constructed in such a manner that the strokes of the armature will be but slightly affected by the hardest pressure of the applicators when running at either high or low speed.

A further object is to provide a device whereby larger and heavier tools, especially hammers, chisels, punches, surface grinders, cutters, etc., may be used if desired.

These and such other objects as may hereinafter appear are attained by my device, an embodiment of which is illustrated in the accompanying drawings, in which—

Figure 1 represents a perspective view showing my improved device with a condenser inserted between the apparatus and the plug. Fig. 2 is a plan view of my device with the top removed and parts of the instrument broken away. Fig. 3 is a sectional view on line 3—3 of Fig. 2, looking in the direction indicated by the arrows. Fig. 4 is a sectional view on line 4—4 of Fig. 2, looking in the direction indicated by the arrows. Fig. 5 is a sectional view on line 5—5 of Fig. 2, looking in the direction indicated by the arrows.

Like numerals of reference indicate like parts in the several figures of the drawing.

Referring more particularly to the drawings, 1 denotes the casing in which the operating parts of the machine are contained, the same being here shown, and is preferably of oblate spheroid shape. To the lower side of the same is removably connected a hollow handle 2 through which the end of the flexible conductor 3 passes to be connected to the operating parts of the device. On the opposite end of the conductor 3—which is preferably in the form of a silk covered wire—is arranged a contact plug 4 adapted to be screwed into an ordinary incandescent light socket. Arranged at a suitable point in the conductor 3 is a condenser 5, which is suspended by the conductor, thereby dispensing with the necessity of providing a separate support therefor, the condenser being constructed and arranged in a small compact form and covered by a casing to present an attractive appearance.

In the casing 1 is secured a suitable supporting frame 6 on which is mounted an electro-magnet 7, said magnet being connected to the inner end of the conductor 3 and energized by the current passing therethrough. Pivotally mounted in a bracket 8 of the frame 6 is an armature 9 adapted to be attracted by the electro-magnet 7. Connected to the armature 9 on one side of the magnet 7 and adjacent to the pivoted end of the armature is a coiled retracting spring 10, the opposite end of which is connected to a screw 10^a which is longitudinally mounted in an opening in the frame 6. An adjusting nut 10^b works on said screw and bears against the outer side of the frame, and has a button 10^c whereby it may be readily turned to vary the tension of the spring 10. (The said button has a pin 10^d which engages a stop 10^e on the casing to limit the adjustment of the spring 10 and hence of the armature.)

Although the device as previously in use would work properly on alternating currents as regards speed and power, there have been no ways devised to regulate said speed and power, as they were practically the same regardless of the adjustment of contact points—that is, they were the same when the contact was first made as when the contact points were almost closed. This is not the case when the direct current is used, as in this case the strokes are slow and short when contact is first made, and gradually increased in speed and length as the space is lessened between the contact points. To secure the various speeds and lengths and also power of strokes of armature on the alternating machine, I have attached the button above described to the retraction spring, which adjusts said spring so that the speed, power and size of strokes may be perfectly regulated. By the use of this adjustment button, the machine may be used for either an alternating current or a direct current without changing the windings of the magnet, provided the proper resistance is placed in the circuit. This is an important ad-

vantage, as the same machine can be used on different currents by simply furnishing a resistance plug to be used in connection with a machine originally designed for operation by direct current. The adjustment button also serves another very important purpose, in that it covers the variations in voltage and cycles in the alternating current,—that is, to the extent of a variation of ten cycles or ten volts either higher or lower than that for which the machine is originally intended. Arranged on the opposite side of the magnet 7, and bearing upon the inner side of the armature adjacent to its free end, is a push spring 12, said springs 10 and 12 serving to evenly balance the armature and to normally hold the same out of engagement with the magnet. Secured to the outer free end of the armature is a weight 13 which serves as a hammer head to impart the vibrations of the armature to the applicators of the machine. The outward push of the spring 12 on the armature is constant, but the pull of the spring 10 thereon may be varied by turning the button, as hereinafter described, and hence the spring 10 may be caused to counteract the spring 12 to any desired extent, and the force of the strokes of the hammer may be regulated accordingly.

Near the inner or pivoted end of the armature is secured the armature spring 14 which is in electrical engagement with an arm 15 to which one of the wires of the conductor 3 is connected. The opposite end of the spring 14 bears upon a hollow plug 16 formed of suitable non-conducting materia and arranged in a bracket 17 on the frame 6. In the inner end of the hollow plug 16 is arranged a threaded metallic sleeve 18 which is in electrical connection with the conducting wire from the magnet. Adapted to be screwed into the sleeve 18 is an adjustable contact screw 19, the inner end of which is adapted to be screwed in engagement with the inner end of the contact spring 14 to complete an electric circuit, thereby causing the magnet to attract and vibrate the armature. By adjusting the screw 19 in the sleeve 18, the speed, power and length of the vibrations of the armature may be regulated. On the outer end of the screw 19 is arranged a head 20^a, and on the screw between said head and the bracket 17 is arranged a coiled spring 20, the tension of which is exerted to hold the screw in its adjusted position. On the head 20^a is arranged a radially projecting pin or pointer 21 which is adapted to coact with a scale 22 arranged on the outer side of the casing 1 around the head 20^a to indicate the different adjustments.

Arranged in the casing 1 adjacent to one side of the magnet is a vibrator post 23, on the outer side of which, adjacent to its upper end, is formed an outwardly projecting socket 24 which projects through an aperture 25 in the casing 1, and is provided in its outer end with interior screw threads and into the threaded outer end of the socket 24 various forms of applicators are adapted to be screwed. On the inner side of the post 23 directly opposite to the socket 24 is formed a recess in which is secured an inwardly projecting rubber plug or bumper 26, which is adapted to be struck by the weight or hammer 13 on the free end of the armature, and through which the vibrations of the armature are imparted to the post. The plug or bumper 26 is employed to prevent the armature from striking the poles of the magnet. The rubber bumper also prevents the hammer or weight 13 from directly striking the post and thus deadening the noise which would be occasioned by such direct stroke. Formed on the outer edge of the post 23 adjacent to its upper end is an inwardly projecting vibrator arm or plate 27, to the end of which is secured a right-angularly projecting socket 28 which extends through an opening 29 in the side of the casing 1, and projects at substantially a right angle to the socket 24. The socket 28 is threaded inwardly and is adapted to receive the various forms of applicators 30, to which lateral strokes are imparted by the action of the hammer, direct or percussion strokes being imparted to the applicator 31 attached to the socket 24. Providing a vibrating post separate and apart, or structurally distinct, from the armature to receive the strokes or vibrations thereof, instead of connecting the armature directly with the applicators, leaves the armature entirely free, and the pressure of the applicators will not affect the speed or operation of the armature, whether the same be working at a high or low speed.

By arranging the machine to produce both a percussion or hammer stroke and a lateral stroke, the capacity and usefulness of the device will be greatly increased, the two kinds of strokes being produced without changes of the operating parts or providing switches and other complicated mechanism, both strokes being produced at the same time without interfering with each other.

In connection with the vibrator, I employ many different forms of applicators to be used on various parts of the body, besides those shown in the drawings. In Fig. 2, in dotted lines, is shown the form of applicator used for facial massage, the same being constructed of soft rubber and in cup shape. The construction and arrangement of the vibrator as herein shown and described enables the same to be practically operated by high or low voltage, direct currents, and high or low voltage, direct battery current without any change whatever except in the winding of the magnets. Another important point in the construction of the ma-

chine as herein shown is that the same may be operated by alternating currents of different voltages and cycles by employing the same in connection with a suitable resistance, and by properly adjusting the spring 10 by means of the screw 10^a and button 10^c. By providing a vibrator post arranged between the armature and the applicators, there is practically no pressure or resistance on the armature, allowing the same to swing freely, thus requiring but little current to operate the machine and producing but slight wear upon the contact members.

From the foregoing description, taken in connection with the accompanying drawings, the construction and operation of the invention will be readily understood without requiring a more extended explanation. Various changes in the form, proportion and the minor details of construction may be resorted to without departing from the principle or sacrificing any of the advantages of the invention, as defined by the appended claims.

In machines designed for use on direct current only, the button 10^c may be dispensed with, and the spring 10 secured rigidly to the frame, as all necessary regulation of current and vibration of the armature is taken care of by the button 20.

Having thus described my invention, what I claim as new is:

1. An electric vibrator comprising an electro-magnet, an armature and applicator, a vibrator post adapted to receive the strokes of said armature, and means for transmitting the same to said applicator, said receiving and transmitting means being structurally distinct from said armature and electromagnet.

2. An electric vibrator comprising an electro-magnet, an armature and applicator, a vibrator post adapted to receive the strokes of said armature and to transmit the same directly to the applicator in the form of percussion strokes, and means on said vibrator post for imparting a lateral stroke to the applicator.

3. An electric vibrator comprising an electro-magnet, an armature, an applicator, a vibrator post adapted to receive the strokes of the armature and transmit the same to the applicator in the form of percussion strokes, a socket on said post by which said applicator is connected directly thereto, and a vibrating arm on said post adapted to receive the applicator and impart thereto a lateral stroke.

4. An electric vibrator comprising a casing, an electro-magnet in said casing, a pivoted armature acted on by said magnet, a vibration post to receive the strokes or vibrations of said armature, a socket formed on said post to directly connect the applicator therewith, whereby they receive a percussion stroke from the armature through said post, a vibrator arm on said post and projecting rearwardly therefrom, and a socket on said arm to receive the applicator whereby a lateral stroke is imparted thereto through said post, substantially as described.

5. An electric vibrator comprising a casing, a handle thereon, an electro-magnet in said casing, a pivoted armature vibrated by said magnet, a weight to form a hammer on said armature, a resilient bumper on said post to receive the strokes or vibrations of the hammer, means to attach the applicator directly to said post to impart a percussion stroke thereto, and means to connect the applicator to the post to impart a lateral motion thereto, substantially as described.

6. An electric vibrator comprising a casing, a handle thereon, an electro-magnet in said casing, a pivoted armature vibrated by said magnet, a weight to form a hammer on said armature, a vibrator post adapted to be engaged by the hammer on said armature, a resilient bumper on said post to receive the strokes or vibrations of the hammer, a threaded socket formed on said post whereby the applicator may be attached directly thereto, an arm on said post projecting rearwardly therefrom at right angles, and a threaded socket on said arm whereby the applicator may be connected thereto and indirectly vibrated by said post to impart a lateral movement thereto, substantially as described.

7. An electric vibrator comprising a casing, a hollow handle on said casing, a flexible conductor adapted to be applied through said hollow handle, a supporting frame in said casing, an electro-magnet rigidly mounted in said frame, a pivotally mounted armature, a contact spring on said armature, an adjustable contact screw adapted to be engaged by said spring, balancing springs connected to said armature, a hammer on the free end of the same, a vibrator post adapted to be struck by said hammer, means to cushion the stroke of the latter against said post, and means for transmitting said stroke to the applicator, said means being separate and apart from said armature.

8. An electric vibrator comprising an applicator, a fixed electro-magnet, an armature, counteracting springs applied to said armature, and means for varying the tension of said springs, means adapted to receive the stroke of said armature, and means for transmitting the same to said applicators, said receiving and transmitting means being separate and apart from said armature.

9. An electric vibrator comprising an applicator, a fixed electro-magnet, an armature, counteracting springs applied to said

armature, and means including a screw and nut button to vary the tension of said springs, means adapted to receive the stroke of said armature, and means for transmitting the same to said applicators, said receiving and transmitting means being separate and apart from said armature.

10. An electric vibrator comprising an applicator, a fixed electro-magnet, an armature, a contact spring, means for varying the tension of said spring, and means for indicating the adjustment thereof, means adapted to receive the stroke of said armature, and means for transmitting the same to said applicators, said receiving and transmitting means being separate and apart from said armature.

11. An electric vibrator comprising an applicator, a fixed electro-magnet, an armature and a contact spring, a screw adapted to engage said spring, an adjusting nut for said screw and spring, a pointer movable with said nut, and a scale with which said pointer co-acts to indicate the adjustment of said spring, means adapted to receive the stroke of said armature, and means for transmitting the same to said applicators, said receiving and transmitting means being separate and apart from said armature.

12. In an electric vibrator, the combination with an electro-magnet, a fixed armature, vibrators, a flexible conductor for the transmission of electricity to said vibrator, and a condenser in circuit suspended by said conductor, means adapted to receive the strokes of said armature, and means for transmitting the same to said vibrator.

13. An electric vibrator comprising an electro-magnet, an armature and applicator, means adapted to receive the strokes of said armature, and means for transmitting said strokes to said applicator, said receiving and transmitting means being structurally distinct from said armature and electromagnet.

Signed by me at Chicago, Illinois, this 20th day of December, 1906.

SAMPSON W. MOON.

Witnesses:

SARAH LEWIS,

ALBERT JOHN SAUSER.