

C. F. BURGESS.
ELECTROMOTIVE DEVICE.
APPLICATION FILED FEB. 12, 1910.

1,031,038.

Patented July 2, 1912.

2 SHEETS—SHEET 1.

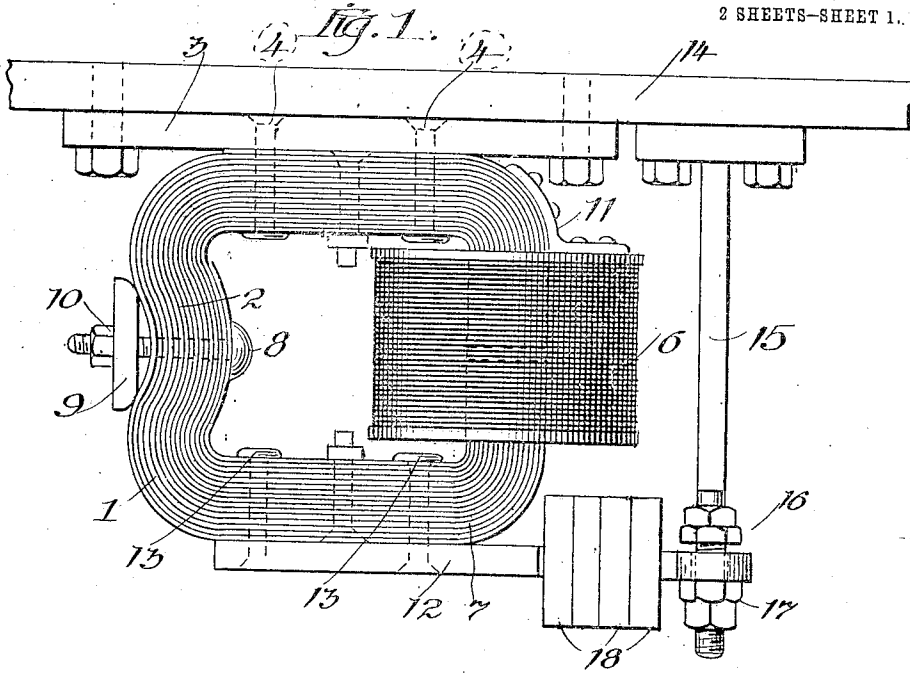
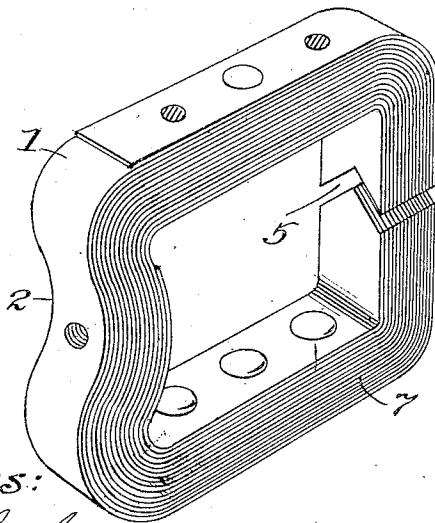


Fig. 2.



Witnesses:
Frank S. Blanchard
Daisy M. Eager

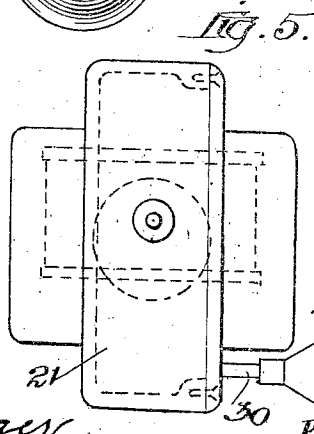
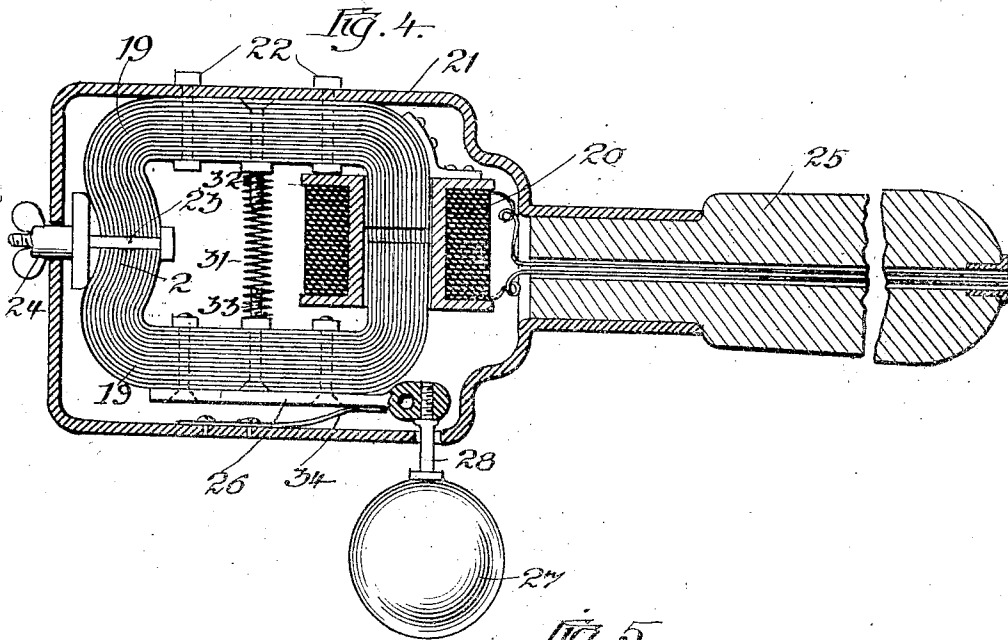
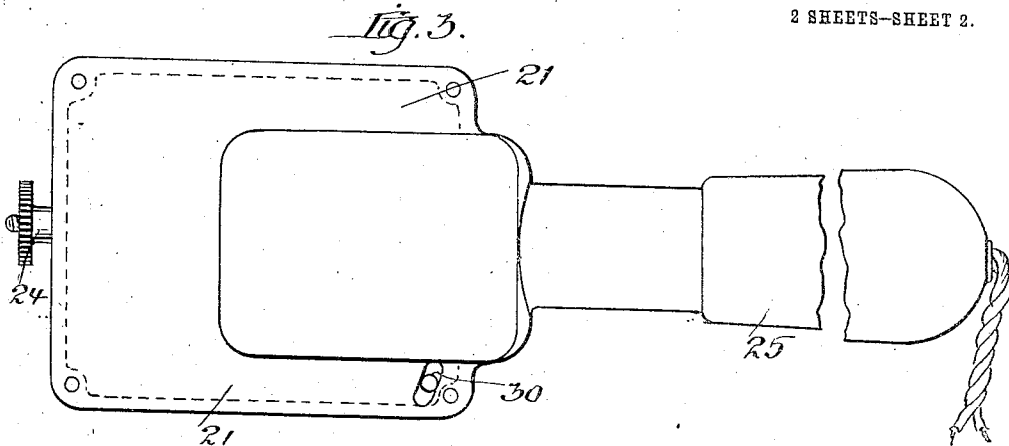
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UNITED STATES PATENT OFFICE.

CHARLES F. BURGESS, OF MADISON, WISCONSIN.

ELECTROMOTIVE DEVICE.

1,031,038.

Specification of Letters Patent.

Patented July 2, 1912.

Application filed February 12, 1910. Serial No. 543,528.

To all whom it may concern:

Be it known that I, CHARLES F. BURGESS, a citizen of the United States, residing at Madison, county of Dane, and State of Wisconsin, have invented certain new and useful Improvements in Electromotive Devices, of which the following is a specification.

The present invention relates to electromotive devices wherein the energy supplied to a magnetizing coil is used to set up movement in a member magnetized by said coil.

The main objects of the present invention are to provide an electro-motive device having a magnetizable member of special construction arranged advantageously with respect to the magnetizing coil; to provide a magnetizable core having a certain amount of flexibility and adapted to act as a spring; to provide a core and coil so arranged as to serve efficiently in setting up rapid vibrations in certain members operatively related therewith; to provide other details of construction and special arrangements of parts whereby the electro-motive device is rendered serviceable as an electrically operated vibrator.

A specific embodiment of my present invention is illustrated in the accompanying drawings in which—

Figure 1 is an elevation showing the electro-motive device in position for vibrating a table top. Fig. 2 is a perspective view of the magnetizable core. Fig. 3 is a side elevation of a modification, more particularly adapted for use as a massage instrument. Fig. 4 is a sectional elevation of the same, showing a round massage implement in position for hammering. Fig. 5 is an end elevation of the device shown in Fig. 4, but with the hammering ball removed from the bottom of the device, and a cupped implement attached at the side thereof.

In the construction shown in Figs. 1 and 2, the magnetizable core 1 is made up of a thin strip of resilient iron or steel of suitable quality, oxidized or coated with insulating material in usual manner, and then bent on itself, over a form, to produce a laminated core, preferably of rectangular outline, but having in one of its sides an, inwardly curved portion 2. It will be seen that when the core has thus been cut at the side, it comprises a plurality of separate laminations, each having an end located opposite an end of the next lamination. This core may be attached to a base plate

3 by means of suitable rivets 4, and the side of the core opposite the bent portion 2 can then be sawed through to form a V-shaped air gap 5. The magnetizing coil 6 is slipped into place by bending down the lower leg 7 of the core until the air gap is wide enough to admit the coil. The flexibility and resiliency of the entire core is of assistance in this operation, but the additional resilience afforded by the inwardly curved portion 2 is especially advantageous, not only in allowing the gap to open far enough, but also in restoring the gap to its normal width after the coil has been slipped into place. The curved portion 2 may be pierced by a bolt 8 carrying a bearing blade 9 and an adjusting nut 10 so arranged that when the nut is tightened, the bolt will tend to straighten out the curved portion 2, and thus will change the normal or effective width or setting of the air gap 5. The magnetizing coil 6 may be firmly connected to the upper leg of the core by means of a suspension plate 11 secured to the outer face of the core. The lower or movable leg 7 of the core carries a hammer member 12, securely attached to the core as by means of rivets 13. This hammer member projects beyond the end of the leg 7, and is the effective working member whereby the energy supplied to the magnetizing coil 6 may be made available for doing useful work of various kinds.

In Fig. 1, the electro-motive device is illustrated as applied to the under surface of a table top 14. This may be the top of a table such as is used by foundrymen when making molds for castings. When the device is so located, it can be used as a means for shaking or vibrating the table top to assist the molder in performing certain molding operations. In the construction shown in Fig. 1, the mechanical movement set up in the hammering member 12 is transmitted to the table top 14 by means of a standard 15, rigidly secured to the top and carrying suitable nuts 16 and 17, located to receive the impact of the hammer member 12, but adjustable along the standard 15 to govern the length of stroke and the force of the blow. If desired, weights 18 may be mounted on the hammer member to assist in securing the desired action. If alternating current is supplied to the magnetizing coil 6, the lower or movable leg 7 of the core will vibrate rapidly, and will

cause the hammer member 12 to pound on the nuts 16 and 17, thereby violently shaking the supporting table top. Vertical adjustment of the nuts 16 and 17 serves to
 5 change the width of the air gap 5, and also serves to change in very marked manner the force and character of the vibration transmitted. The adjusting bolt 8 is serviceable in controlling the resiliency of the core, and
 10 the effective width of the air gap 5.

The special form of air gap shown in Fig. 2 affords an advantageous distribution of the magnetic flux, allowing a relatively great movement of the movable leg 7 with
 15 a relatively small decrease in magnetic flux across the air gap, and tends to keep the movable leg of the core in proper alinement with the upper portion at all times.

In the modification shown in Figs. 3 to 5, inclusive, the magnetizable core 19 is similar to that of Fig. 2, and is inclosed, together with its coil 20, in a casing 21. The core may be suspended from the upper part of the casing by means of bolts 22. The ad-
 20 justing bolt 23, which passes through the curved portion of the core, passes out through the casing 21, and is equipped with a suitable thumb screw 24, whereby adjustments in the effective width of the air gap
 25 may be made. The terminals of coil 20 are connected to current supply wires which pass outward through a wooden handle 25 for attachment to a suitable source of electrical energy, as for instance, to an alter-
 30 nating current circuit of suitable voltage.

In the construction shown in Fig. 4, the hammer member 26 carries at its outer end a detachable massage implement, which may be in the form of a ball 27, having a stem 28,
 40 which passes freely through the casing 21, and is suitably secured to the hammer member 26. When alternating current is supplied to the magnetizing coil 20, the lower leg of the core 19 vibrates rapidly, and thus
 45 transmits a hammering movement to the massage ball 27.

If a sidewise movement of the massage implement is desired, it may be attached to the hammer member 26 at the side, as illustrated in Fig. 5. This figure shows an ordi-
 50 nary cupped implement 29, having its stem 30 passing through the side wall of the casing 21 for attachment to the hammer member. It will be seen that when the hammer
 55 member moves up and down, the cupped implement will move sidewise. If desired, the natural resiliency of the core may be supplemented by springs, as for instance, by a
 60 coiled compression spring 31 carried on projections from the rivets 32 and 33. A leaf spring 34 may also be inserted between the vibrating leg of the core and the inclosing casing 21.

Although but one specific embodiment of
 65 this invention is herein shown, it will be

understood that numerous details of the construction shown may be altered or omitted within the scope of the appended claims without departing from the spirit of this invention.

What I claim as new, and desire to secure by Letters Patent of the United States is:

1. In a vibrator, the combination of a core consisting of a flat strip wound on itself and having a transverse cut forming an air gap, a magnetizing coil inclosing said core and adapted to vibrate a portion of said core, and adjustable means acting on said core to control the width of said air gap.

2. In a vibrator, the combination of a core comprising a flat strip wound on itself to form a core of rectangular outline, a bend in one side of said core and a transverse cut forming an air gap in another side of said core, a magnetizing coil inclosing said air gap, and means for adjusting the bent portion of said core to change the normal setting of said air gap.

3. In a vibrator, the combination of a flat strip bent to form a magnetizable core and having a cut forming an air gap in said core, an alternating current magnetizing coil inclosing said air gap and adapted to vibrate a portion of said core, a hammer member carried by said vibrating portion, means for transmitting the blow of said hammer member to the object to be vibrated, and adjusting means acting on said core to change the normal width of said air gap.

4. In a vibrator, the combination of a flat strip bent on itself to form a laminated core of rectangular outline with an inward bend in one side and a transverse cut forming an air gap in the other side, an alternating current magnetizing coil for flexing said core, a hammer member movable with a portion of said flexing core, and means acting on said inward bend to control the distance through which said hammer member normally moves.

5. In a vibrator, the combination of a flat strip bent to form a magnetizable core, a V-shaped cut forming an air gap in said core, an alternating current magnetizing coil inclosing said air gap and adapted to vibrate a portion of said core, a hammer member carried by said vibrating portion, means for transmitting the blow of said hammer member to the object to be vibrated, and adjusting means acting on said core to change the normal width of said air gap.

6. In a vibrator, the combination of a flat strip bent on itself to form a rectangular core having an inward bend in one of its sides, and having a V-shaped cut forming an air gap in the side opposite said bent side, and an alternating current magnetizing coil inclosing said air gap, means for changing the curvature of said bent portion to change the effective length of said air gap, and a

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hammer member movable with a portion of said core.

5 7. In a vibrator, the combination of a flat strip bent on itself to form a rectangular core having an inward bend in one of its sides, and having a cut forming an air gap in the side opposite said bent side, and an alternating current magnetizing coil inclosing said air gap, means for changing the curvature of said bent portion to change the effective length of said air gap, and a hammer member movable with a portion of said core.

10 8. In an electro-motive device, the combination of a laminated core having a flexible side, and having a transverse cut opposite said flexible side, forming an air gap, a magnetizing coil inclosing said gap and adapted to move the severed ends with re-

spect to one another, and mechanical means for flexing said core to change the effective width of said air gap. 20

9. In an electromotive device, a flat strip of electro-magnetic material wound on itself in a plurality of turns to form a core with an inward curve on one side, said core having a cut opposite said inward curve forming an air gap, and means for compressing said curved portion to govern the width of said air gap. 25

In witness whereof, I have hereunto set my hand this 4th day of February, A. D. 1910. 30

CHARLES F. BURGESS.

Witnesses:

DAISY M. EAGER,

CHAS. J. MONAHAN.