

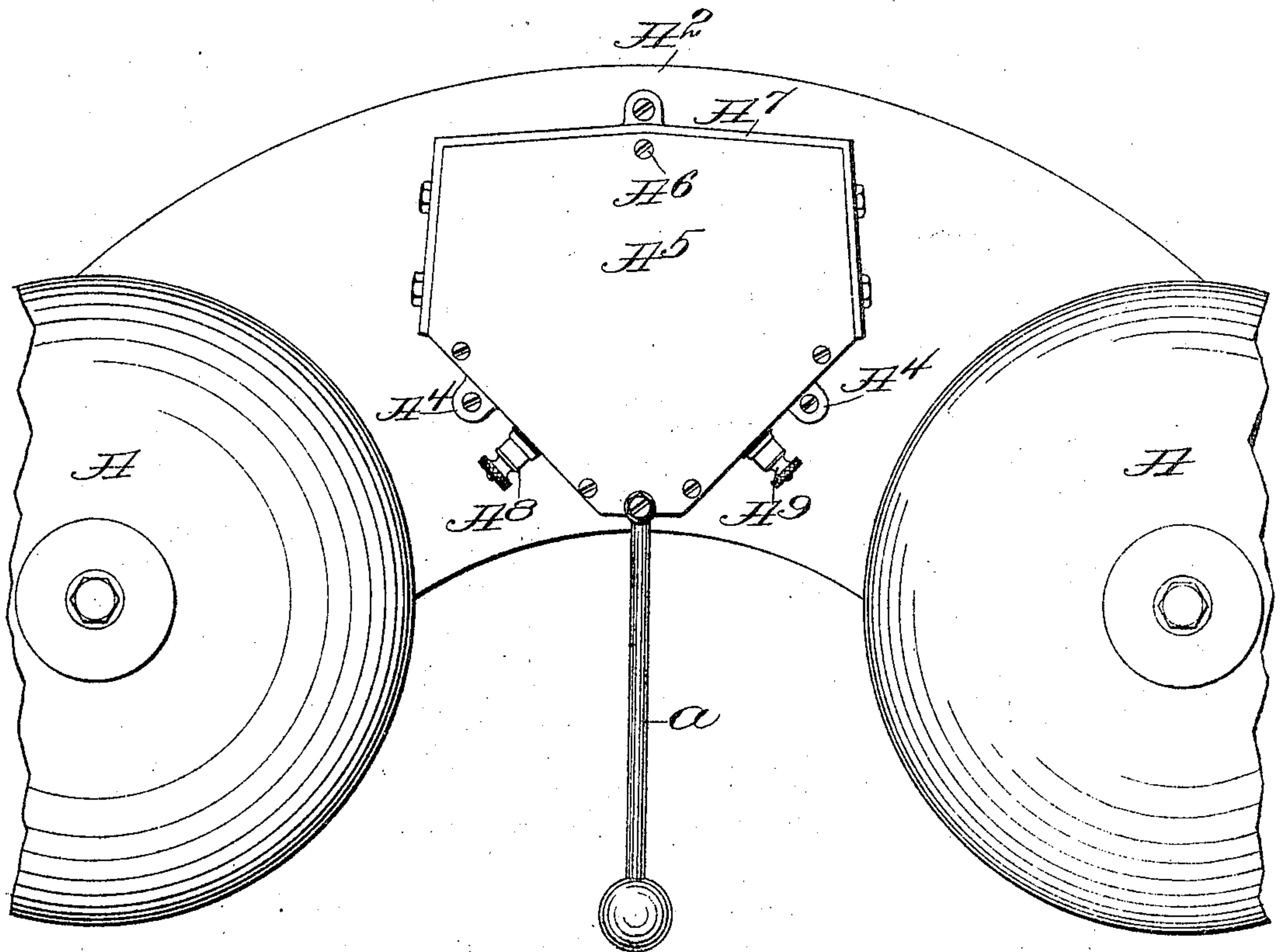
No. 798,339.

PATENTED AUG. 29, 1905.

H. J. HEENEY.
ELECTRIC VIBRATOR.
APPLICATION FILED NOV. 22, 1904.

3 SHEETS—SHEET 1.

Fig. 1.



Witnesses:
Margaret Heeney,
James Maloney

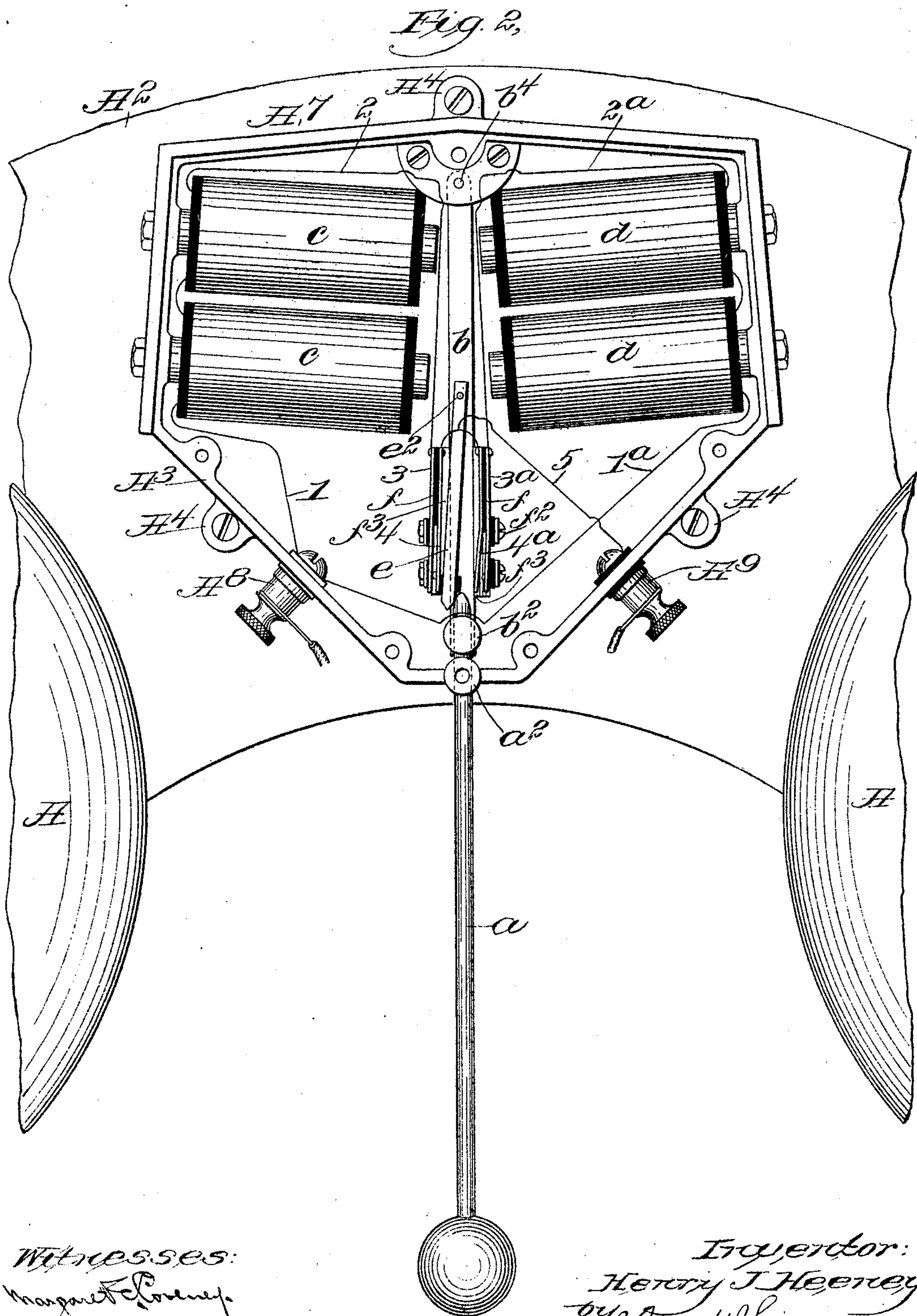
Inventor:
Henry J. Heeney,
by J. P. and H. Swernore
Attys.

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3 SHEETS—SHEET 2.



Witnesses:
Margaret Heeneey,
Jas. J. Maloney.

Inventor:
Henry J. Heeneey,
by J. P. and H. J. Livermore
Attys.

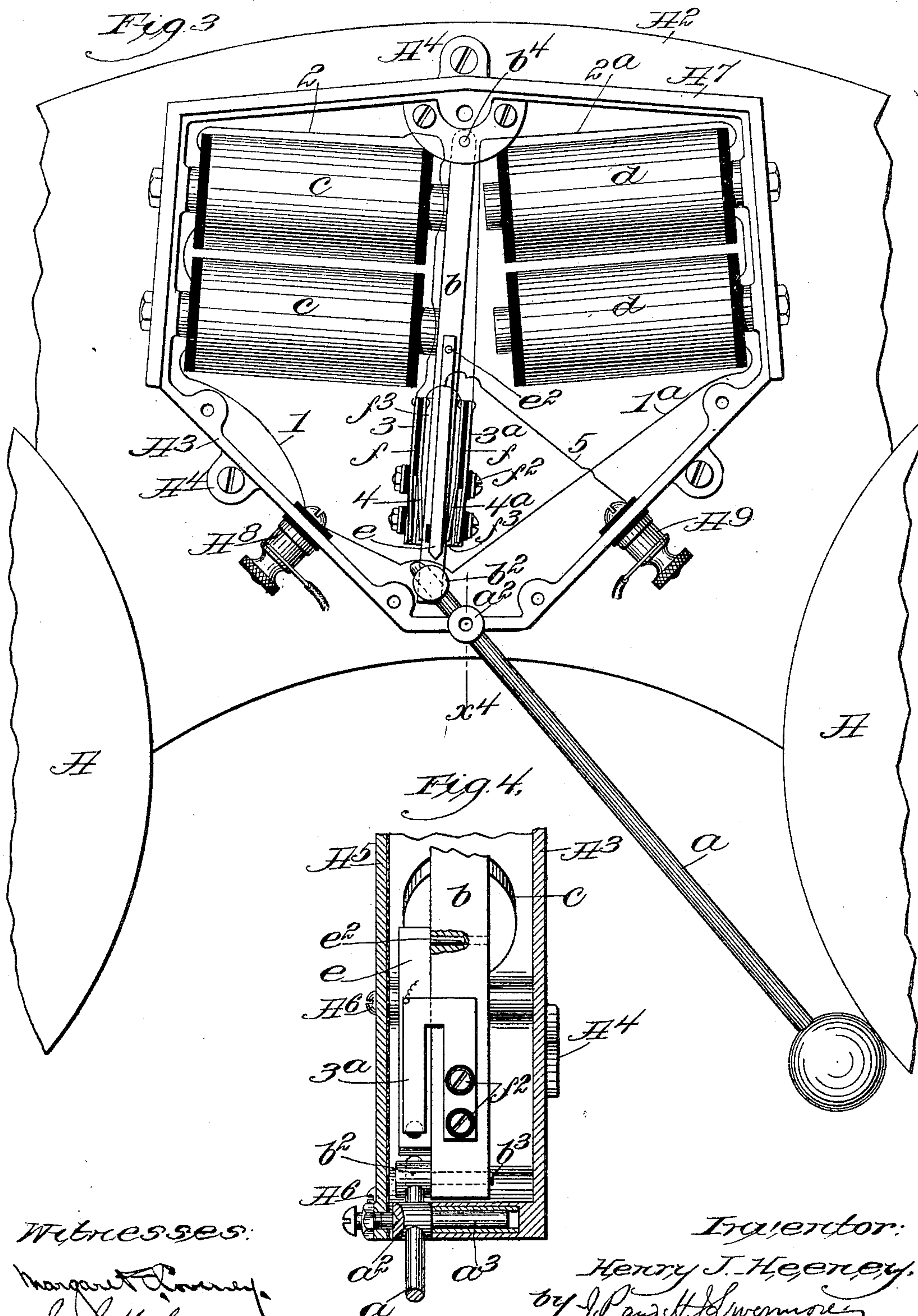
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3 SHEETS—SHEET 3.



Witnesses:
Margaret D. Conner
Jacob J. Maloney

Inventor:
Henry J. Heeney
by J. P. and H. J. Swannell
Attys.

UNITED STATES PATENT OFFICE.

HENRY J. HEENEY, OF BOSTON, MASSACHUSETTS, ASSIGNOR TO HOLTZER CABOT ELECTRIC COMPANY, A CORPORATION OF MASSACHUSETTS.

ELECTRIC VIBRATOR.

No. 798,339.

Specification of Letters Patent.

Patented Aug. 29, 1905.

Application filed November 22, 1904. Serial No. 233,859.

To all whom it may concern:

Be it known that I, HENRY J. HEENEY, a citizen of the United States, residing in Boston, county of Suffolk, and State of Massachusetts, have invented an Improvement in Electric Vibrators, of which the following description, in connection with the accompanying drawings, is a specification, like letters and numerals on the drawings representing like parts.

The present invention relates to an electric vibrator, and is embodied in a vibrator to be operated by direct currents, the invention being especially applicable to large gongs, where considerable power is required to strike the necessary blows and a comparatively slow rate of vibration is desirable.

The invention is further embodied in novel details of construction and arrangement whereby the operative parts may be thoroughly incased and protected, the construction, furthermore, being simple and inexpensive.

In the construction embodying the invention two sets of electromagnets are used, with an armature movable between the polar extremities of the said electromagnets, the said armature being connected with a bell-striker, which in turn controls the circuit-closers which cause the two sets of electromagnets to be alternately energized while current is flowing through the instrument. The construction is such that the armature normally stands midway between the pole-pieces of the two sets of electromagnets, so as to be well within the magnetic field of either, and when the said armature is in such intermediate position a circuit is closed through one or the other of said sets of electromagnets, but not through both. When, therefore, current flows through the instrument, one set of electromagnets will be energized, so as to attract the armature in one direction, the movement of the armature producing a corresponding movement of the bell-striker, which movement in turn results in the operation of a circuit-controller which breaks the circuit through the electromagnets which have been energized after the said bell-striker has acquired sufficient momentum to strike the bell. At this period the circuit through the entire instrument is open; but the bell-striker, which is arranged to return to an intermediate position, preferably by

the force of gravity, will swing back and in so doing will cooperate with the other circuit-controller, so as to energize the other electromagnet and cause a movement of the bell-striker in the opposite direction in order to strike another gong, if two gongs are used. This operation will continue so long as the current is turned on, and after the current ceases and the parts return to their normal position the circuit will remain closed through one or the other set of electromagnets, so that the device is ready to operate as soon as the current is turned on again.

Figure 1 is a plan view, on a small scale, showing the general arrangement of the gongs and striking mechanism. Fig. 2 is a plan view, on a larger scale, with the cover of the casing removed and the parts shown in their normal position. Fig. 3 is a similar view with the parts shown in the position in which they stand after the impulse of current has passed through one set of electromagnets and the circuit broken by the action of the bell-striker, and Fig. 4 is a partially vertical section on the line x^x of Fig. 3 looking toward the left.

The invention is herein shown as embodied in a two-gong vibrator, the gongs A being mounted at the ends of a curved base or support A^2 , the striking mechanism being inclosed in a case A^3 , mounted on the base-plate between the gongs. As herein shown, the case is provided with lugs A^4 to receive screws which hold the case upon the base, the case being further wholly incased by a cover A^5 , secured to the face of the case by means of screws A^6 . At the top and sides the case is provided with a flange A^7 , projecting beyond the face of the cover, and thereby affording further protection from moisture, &c. The bell-striker a is pivotally supported in the lower wall of the case and is connected with the armature b by means of a swivel connection, the upper end of the bell-striker a being shown as passing through a boss b^2 , which has a stem b^3 , bearing in an opening or bore through the lower end of the armature b . Through this connection, therefore, the movement of the armature b in one direction will cause a corresponding multiplied movement of the bell-striker a in the opposite direction sufficient to cause the said striker to ring the gong. As herein shown, the bell-striker a is provided with a

hub or enlargement a^2 , which fits in an opening through the lower wall of the case, there being a stem a^3 projecting rearward from said hub and having a bearing in a bore or socket formed in the lower wall of the case. The parts are held in position by the case-cover, and by the construction described the opening through the wall of the case is substantially closed, so that the case is practically sealed when the apparatus is in operation. The armature b is pivotally supported at b^4 near the top of the case and extends from said pivotal support between the polar extremities of electromagnets c and d , which are arranged to be alternately energized by current entering the instrument from terminals connected with binding-posts A^8 and A^9 . From the binding-post A^8 the circuit extends through the conductors 1 and 1^a to the electromagnets c and d , respectively, and thence through the conductors 2 and 2^a , respectively, to switch-terminals 3 and 3^a , which terminals cooperate with other terminals 4 and 4^a , both of which are connected with a conductor 5, which leads to the binding-post A^9 . If, therefore, the switch-contacts 3 and 4 are in electrical engagement with each other, the current will pass through the electromagnets c , while if the contacts 3^a and 4^a are in engagement the current will pass through the electromagnets d . As herein shown, the switch-terminals 4 and 4^a consist of light springs which are arranged to be acted upon by a tongue or actuating member e , pivoted at e^2 upon the armature b , the said tongue extending down between the springs 4 and 4^a and into the path of the bell-striker a , the upper end of which engages said tongue, holding the same in contact with one or the other of the switch-terminals, as best shown in Fig. 2. In the construction shown the bell-striker is in a vertical position, so that normally it will hang in the position shown in Fig. 2 midway between the two gongs and will close the circuit through one or the other of the sets of electromagnets, according to the side of the bell-striker against which the tongue e rests.

With the parts in the position shown in Fig. 2 if the current is turned on the armature b will be attracted toward the electromagnets c , moving to the position shown in Fig. 3 and carrying the striker into contact with the right-hand gong. In this movement of the bell-striker, however, the end of said striker will travel past the end of the tongue, permitting the same to reach an intermediate position between the contacts 4 and 4^a , thereby breaking the circuit entirely. As the bell-striker returns, however, through force of gravity or otherwise, toward the intermediate position it will engage the tongue e upon the opposite side, thus closing the circuit through the contacts 4^a and 3^a , thereby energizing the electromagnets d and produc-

ing a movement of the striker a in the opposite direction. This operation will continue so long as the current is turned on, causing the gongs to be struck alternately and at a relatively slow speed. The spring-contacts are separated from each other at their upper ends by insulating-strips f and are secured to the armature by means of screws f^2 , Fig. 4, there being a strip of insulating material f^3 between the inner spring of each pair and said armature. As shown in Fig. 4, the springs are U-shaped, the movable ends thereof projecting forward beyond the face of the armature, so as to be acted upon by the tongue e . The tongue e is also insulated, as shown, so that none of the metallic parts of the instrument frame or casing are influenced by current, and there is therefore no chance of grounding if the vibrator is placed where there is liability of getting a metallic circuit through the frame to the ground. The multiplying connection between the armature and the bell-striker insures distinct and powerful blows of the striker with material intervals of time between.

What I claim is—

1. In a two-gong vibrator, a base or support; a gong mounted at each end thereof; a casing mounted on said support midway between said gongs; a striker pivotally supported in the lower wall of said casing; an armature contained in said casing and connected with said striker; electromagnets to act upon said armature; and circuit-controllers also contained within said casing and operated by said striker, substantially as described.

2. In a vibrator, an inclosing casing; a vibrating member pivoted in the lower wall of said casing and having a hub or enlargement fitting an opening in said wall; oppositely-disposed electromagnets within said casing; an armature pivotally supported between said electromagnets; a swivel connecting member connecting said armature with said striker; circuit-controllers carried by said armature; and an actuating member for said circuit-controllers operated by said bell-striker in the movement thereof, substantially as described.

3. In a vibrator, the combination with oppositely-disposed electromagnets; of a pivotally-supported armature between the poles of said electromagnets; spring-contacts mounted on the opposite sides of said armature to control, respectively, the circuits through said electromagnets; a striker-arm pivotally supported near one end, and having a swivel connection near said support with said armature; and a tongue pivotally connected with said armature and projecting between said contacts into the path of the striker; the length of said tongue being such that the striker will pass out of contact there-with during the movement of the armature in either direction, substantially as described.

4. In a vibrator, electromagnets; an arma-
ture pivotally supported between said elec-
tromagnets; a circuit-controller for said elec-
tromagnets mounted on the said armature; a
5 bell-striker connected with said armature
and coöperating with said circuit-controller;
and an independent pivotal support for said
bell-striker.

In testimony whereof I have signed my
name to this specification in the presence of 10
two subscribing witnesses.

HENRY J. HEENEY.

Witnesses:

HENRY J. LIVERMORE,
MARGARET E. COVENEY.