

Improvements in electro-magnetic apparatus adapted to the generation of electric currents for exercising and other hygienic purposes.

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A.D. 1884, 28th APRIL. N° 6908.  
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**Improvements in Electro-magnetic Apparatus Adapted to the
Generation of Electric Currents for Exercising and other
Hygienic Purposes.**

*[Communicated from abroad by James Henry Shaw, of the City, County, and
State of New York, in the United States of America, Mechanic.]*

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**PROVISIONAL SPECIFICATION.**

I, HERBERT JOHN ALLISON, of the firm of Allison Brothers, of 52 Chancery Lane, London, in the county of Middlesex, Patent Agents, do hereby declare the nature of my invention for "IMPROVEMENTS IN ELECTRO-MAGNETIC APPARATUS ADAPTED TO THE GENERATION OF ELECTRIC CURRENTS FOR EXERCISING AND OTHER  
5 HYGIENIC PURPOSES," a communication to me from abroad by James Henry Shaw, of the City, County and State of New York, in the United States of America, Mechanic, to be as follows:—

This invention relates to electrical dumb-bells and other forms of exercising apparatus enclosing an electrical battery, an induction coil and a rheotome for the  
10 generation of electrical currents; and has for its object a more simple and perfect adaptation of the apparatus to the production of either the primary; the secondary; or the primary and secondary currents combined; to the adjustment of the power or intensity of said currents; and to their application to the body through suitable electrodes.

15 It consists in the combination with the rheophore dumb-bell or device which encloses the electro-magnetic battery and inductorium, and which is provided with suitable external manual contact and conducting plates and binding-screws or connections for electrode wires, of a separate electrode in the form of a dumb-bell or other manual exercising device also provided with external manual contact-  
20 plates and binding-screws or connections for a conducting wire, and of a conducting wire adapted to connect the rheophore dumb-bell with said electrode dumb-bell and to close an electrical circuit from the former through the latter and through the hands and body of the person holding in either hand the rheophore and the electrode.

25 It consists furthermore in the construction of the rheophore dumb-bell with an enclosed metallic cylinder or damper fitted to encircle the coil and insulated therefrom and which is adapted to be moved back and forth longitudinally over

[Price 6d.]



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the coil within its casing by means of an outwardly projecting device; an insulated arm pivoted to swing transversely over the vibrating armature of the rheotome to and from its outer free end so as to adjust its vibrations; a suitable switch adapted to make or break the connections between the rheophore and battery, to open and close the electric circuit; and a fixed metallic band encircling each end of the dumb-bell and adapted to form a seat for the cap covering and completing the end of the device, said band being notched to form a bayonet joint locked by one or more pins on the cap and adapted by means of suitable conducting wires or plates connected to the band and to said pin, to produce an electrical connection between a binding-screw or contact-point on the cap, and the battery and induction coil enclosed in the body of the dumb-bell. 5 10

In the use of this electrical apparatus, the electrode dumb-bell is connected with the rheophore dumb-bell by means of a suitable conducting cord secured to a binding-screw on the former and to either of the binding-screws on the latter, according to the nature of the current desired. The connecting rod is of such length as to permit a free use of the dumb-bells and at the same time a free electric current is made to pass through the arms and body of the person exercising therewith, which may be graduated in its intensity by an adjustment of the movable damper cylinder covering the coil, and in its quality by an adjustment of the arm swinging transversely over the armature of the rheotome; and which may be changed from a primary to a secondary current or be made to include them both, by changing the point of connection of the conducting wire with the rheophore dumb-bell. 15 20

Apart from its adaptation as an exercising device, the rheophore dumb-bell may be used as an efficient, portable electro-magnetic machine, in connection with two separate electrodes to be connected therewith by separate conducting wires for all purposes for which the ordinary forms of electro-magnetic machines are employed. 25

The electrode dumb-bell is recessed interiorly to adapt it as a convenient receptacle wherein to pack the connecting wires; extra electrodes; vial of battery chemicals, etc., used in connection with the apparatus, this internal chamber or receptacle being closed by a suitable detachable cap or plug at the end of the dumb-bell. 30

Dated this 28th day of April 1884.

HERBERT J. ALLISON



*Allison's Improvements in Electro-magnetic Apparatus, &c.***Improvements in Electro-magnetic Apparatus Adapted to the Generation of Electric Currents for Exercising and other Hygienic Purposes.****COMPLETE SPECIFICATION.**

I, HERBERT JOHN ALLISON, of the firm of Allison Brothers, of 52 Chancery Lane, London, in the County of Middlesex, Patent Agents, do hereby declare the nature of my invention for "IMPROVEMENTS IN ELECTRO-MAGNETIC APPARATUS ADAPTED TO THE GENERATION OF ELECTRIC CURRENTS FOR EXERCISING AND  
5 OTHER HYGIENIC PURPOSES," a communication to me from abroad by James Henry Shaw, of the City, County and State of New York, in the United States of America, Mechanic, and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to electrical dumb-bells and other forms of exercising  
10 apparatus enclosing an electrical battery, an induction coil and a rheotome for the generation of electrical currents; and has for its object a more simple and perfect adaptation of the apparatus to the production of either the primary, the secondary, or the primary and secondary currents combined; to the adjustment of the power or intensity of said currents; and to their application to the body through suitable  
15 electrodes.

It consists in the combination with the rheophore dumb-bell, containing the battery and inductorium of the apparatus and provided with suitable manual contact plates, of an electrode dumb-bell also provided with manual contact plates, and a conducting wire adapted to connect the two and close an electrical circuit  
20 through the same to include the body of the person holding the two dumb-bells; it consists furthermore, in improved devices for adjusting and varying the quality and intensity of the electric current in the apparatus and for facilitating the use thereof, as is hereinafter fully described.

In the accompanying drawings—

25 Figure 1 is an elevation of the electrode dumb-bell.

Figure 2, an elevation of the rheophore dumb-bell adapted to be connected therewith by an insulated conducting cord as shown.

Figure 3, a longitudinal section of the rheophore in the line  $x, x$ , of Figure 5.

Figure 4, a detached view in perspective, of the open end of the rheophore dumb-  
30 bell with its cap removed, illustrating the bayonet-joint by which the cap is made fast and electrical connections effected through the same, and

Figure 5, a top view of the rheotome at one end of the rheophore dumb-bell, the cap being removed.

A, is an electrode constructed in the form of a dumb-bell, preferably of wood or  
35 rubber, and which is fitted exteriorly with metallic contact plates, B B, for the hand. These plates, secured on opposite sides of the central portion of the electrode dumb-bell are connected by concealed metallic wires or strips with a binding screw, C, in the end or side of the device, adapted to engage and secure the end of a suitable conducting cord D, whose opposite end is to be secured to a similar  
40 binding screw, C<sup>1</sup>, in the end or side of a rheophore dumb-bell, A<sup>1</sup>.



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Within a central, longitudinal, cylindrical chamber formed in the dumb-bell, A<sup>1</sup>, is fitted an induction coil, E, constructed in the customary manner, of a primary coil of insulated wire, *b*, wound about a central core and overlapped by an outer, secondary coil of finer insulated wire, *c*. An insulating coating or envelope is laid upon the outer coil, and upon this is fitted a cylindrical metallic case or damper, F, 5 of about the same length as the coil and which is adapted to be slid off and on the same within the cylindrical chamber by means of a pin or button, F<sup>1</sup>, projecting from the slide outward through an extended slot in the casing, its too free movement being prevented by a lateral spring, *e*, interposed between it and the inner side of the containing chamber. The slide or damper is supported, as it moves off 10 from the coil, by means of a cylindrical block, *f*, whose diameter coincides with that of the coil so as to serve, when fitted end to end thereto, as an extension thereof, as illustrated in Figure 3. The outer end of this block, *f*, rests against a partition which separates the central chamber in which the induction coil, E, and its slide or damper are thus fitted from a semi-spherical recess in the end of the 15 dumb-bell adapted to contain the battery-cell, G. A flat, helical spring, *g*, is fitted in the bottom of the recess, and the bottom of the cell, G, carrying the metallic contact plate of one of its poles, is made to rest upon the spring, which is connected with the inner end of the primary coil, *b*, of the inductorium by means of conducting wire, *b*<sup>1</sup>, led through a slot cut in the interposed block, *f*. The opposite 20 end of the chamber containing the inductorium is closed by a metallic plate, H, fixed over the same and made fast to the end-block, *h*, of the induction coil, through which the outer end of the primary coil, *b*, together with the inner end of the secondary coil, *c*, are led into contact with said plate, H.

The end of the central core, *a*, of the induction coil is extended out through the 25 plate, H, to attract a vibrating armature opposed thereto and consisting of a spring-plate, J, made fast at one end to the plate, H, so that its opposite, free end, carrying a suitable platina contact point, may vibrate in and out of contact with the end of said core, *a*. The vibrations of the spring armature, J, are limited and regulated at pleasure by means of an arm or lever, K, pivoted to an insulated 30 block, K<sup>1</sup>, on the plate, H, so as to swing transversely over the armature to bear thereon, more or less closely to its outer end. Manual contact plates, B<sup>1</sup> B<sup>2</sup>, are fitted and secured upon opposite sides of the body of the dumb-bell and are both connected by conducting wires with its battery-cell, one of them, B<sup>1</sup>, being also connected with the lever, K, over the vibrating armature, J, by means of a pin or 35 screw led through the insulating block, K<sup>1</sup>, and to the end of which the conducting wire, *i*, is connected. A simple, sliding, circuit-closing device L, is interposed between the end of the wire, *i*, and the manual contact plate, B<sup>1</sup>. The outer end of the secondary coil, *c*, is connected by a fine wire with an outer binding screw, C<sup>2</sup>. 40

The ends of the dumb-bell are closed by semi-spherical, hollow caps, M M<sup>1</sup>, each fitted thereto by a bayonet-joint which is constructed of a metallic ring, N, fitted as a band upon the end of the body of the dumb-bell and which is formed with suitable slots, *k*, *k*, at opposite points, to receive and interlock with pins on the inner face or rim of each cap, M. The cap is made to fit snugly over and upon 45 said band and to make a neat close joint with the body of the dumb-bell, as illustrated in Figure 2.

The battery-cell, G, is preferably of a spherical bottle-shape to fit snugly within the spherical end of the dumb-bell. One element of the cell is made to connect through the bottom thereof with the spring-plate, *g*, and the primary coil; the 50 other element is made to connect outwardly through the stopper of the cell with a binding screw, C<sup>3</sup>, in the cap, M<sup>1</sup>, governing and closing that end of the dumb-bell.

The screw, C<sup>3</sup>, is connected by a concealed conducting wire, with the pin engaging the metallic rim, N, and said rim is in turn connected by concealed conducting wires, *n* *n*, with the manual contact plates, B<sup>1</sup> and B<sup>2</sup>. 55



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The cap, M, covering the opposite end of the dumb-bell is also provided with a central, outer binding-screw, C<sup>1</sup>, which is connected by an outer metallic strip, O, with the pins which engage the metallic rim, N, to lock the bayonet-joint.

The primary circuit is closed in the rheophore dumb-bell by moving the slide, L, so as to produce a contact of the wire, i, with the plate, B<sup>1</sup>, whereupon the current will pass from the positive pole of the battery through the primary coil, b, the rheotome wire, i, the plate, B<sup>1</sup>, the rim, N, of the cap, M<sup>1</sup>, and the concealed wire, to the negative pole.

In the use of this electrical apparatus the electrode dumb-bell, A, is connected with the rheophore dumb-bell, A<sup>1</sup>, by means of the conducting cord, D, secured to the one binding screw in the first, and to either one of the binding screws in the latter, according to the nature of the current desired, and one of the dumb-bells is held in each hand. If now, the connection of the cord, D, be made with the end-screw, C<sup>1</sup>, both the primary and secondary currents from the induction coil will be received by the person holding the apparatus. If the conducting cord, D, be connected to the binding screw, C<sup>2</sup>, the primary current alone will be obtained. The strength or intensity of both currents may be modified at pleasure by a movement of the damper, F, off or on the induction coil, and the quality of the current is varied by a movement of the lever, K, which determines the length and rapidity of the vibrations of the armature, J, in the rheotome.

By using a second electrode, A<sup>2</sup>, (see dotted lines Figure 2) to be held in the hand, instead of the rheophore dumb-bell, A<sup>1</sup>, the latter may be used simply as a convenient electro-magnetic machine. In such case by connecting this electrode, A<sup>2</sup>, with the binding screw, C<sup>1</sup>, and a second electrode with the binding screw, C<sup>1</sup>, the combined primary and secondary currents are obtained.

By connecting one electrode with the binding screw, C<sup>1</sup>, and the other with the binding screw, C<sup>2</sup>, the secondary current is obtained; whilst by connecting one electrode with the binding screw, C<sup>2</sup>, and the other with the binding screw, C<sup>3</sup>, the primary or extra induced current is obtained.

Having now particularly described and ascertained the nature of my said invention, and in what manner the same is to be performed, I declare that what I claim is

1<sup>st</sup> The combination in an electrical exercising apparatus, with a rheophore dumb-bell enclosing a battery, an induction coil and rheotome, and which is fitted with suitable manual contact plates, of a separate electrode dumb-bell fitted with manual contact plates, and a detachable, insulated conducting cord, adapted to close a circuit from the battery or inductorium, through said contact plates and the body of the person grasping the two devices, all substantially in the manner and for the purpose herein set forth.

2<sup>nd</sup> The combination in a rheophore dumb-bell or exercising device, and with its induction coil, of a metallic cylinder encircling the coil and insulated therefrom, and which is adapted to be moved back and forth longitudinally thereon within the body of the dumb-bell, by means of an outwardly projecting pin, substantially in the manner and for the purpose herein set forth.

3<sup>rd</sup> The combination with the end of a rheophore dumb-bell or exercising device, and with a cap fitting thereon and a battery-cell and inductorium enclosed therein, of a fixed metallic band encircling the seat of the cap and notched to form a bayonet-joint with one or more pins on the cap, and adapted, by means of suitable conducting wires or plates connected thereto and to said pins, to produce an electrical connection between a binding screw or contact point on the cap, and the cell and induction coil of the rheophore, substantially in the manner and for the purpose herein set forth.

4<sup>th</sup> The combination with an external, manual, contact-plate upon a rheophore dumb-bell or exercising device, and with the wires and conducting strips arranged



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to close the primary circuit from the battery to the inductorium and through said contact plate, of an external slide included in said circuit and adapted by its movement to open and close the same, substantially in the manner and for the purpose herein set forth.

Dated this 22nd day of January 1885.

ALLISON BROS,  
Agents for the Applicant.

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1885.

FIG. 1.

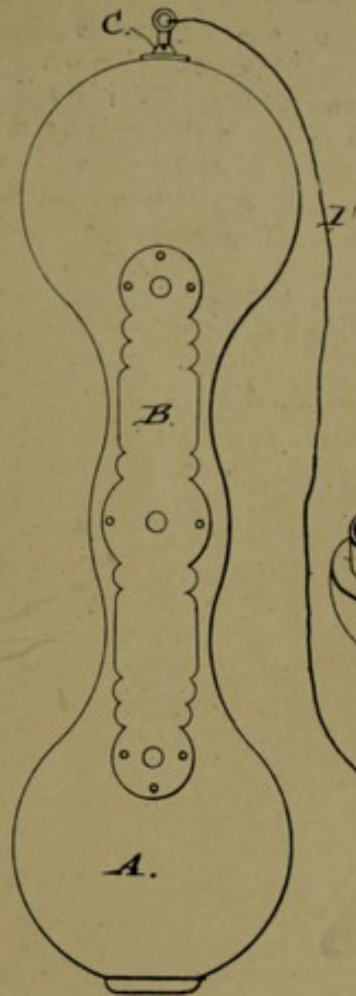


FIG. 2.

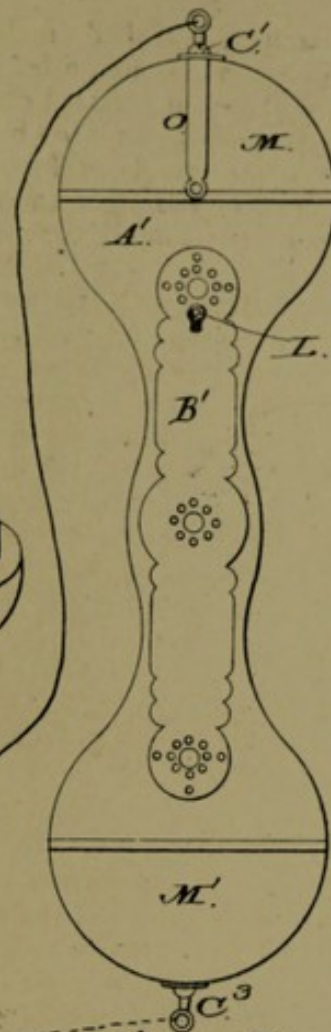
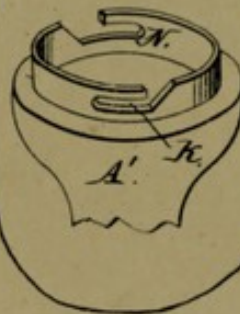


FIG. 4.



A<sup>2</sup>

FIG. 3.

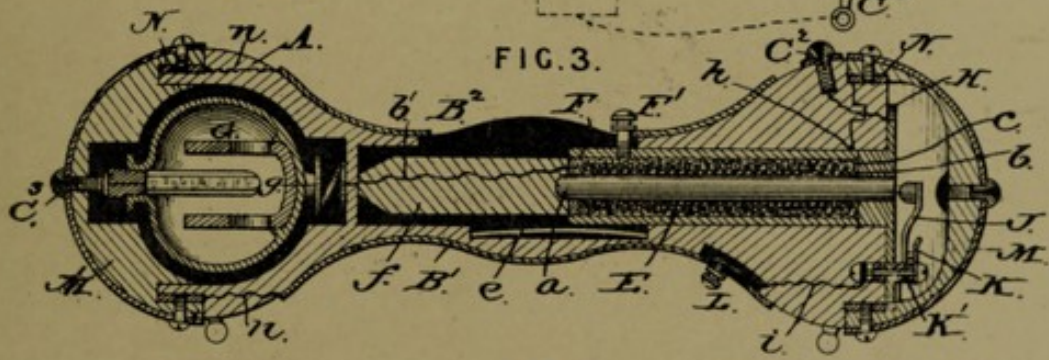
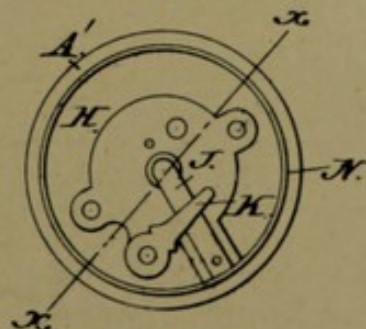


FIG. 5.





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