(No Model.)

W. STANLEY, Jr.

SELF INDUCTION DEVICE.

No. 485,336. Patented Nov. 1, 1892.

Fig. 1

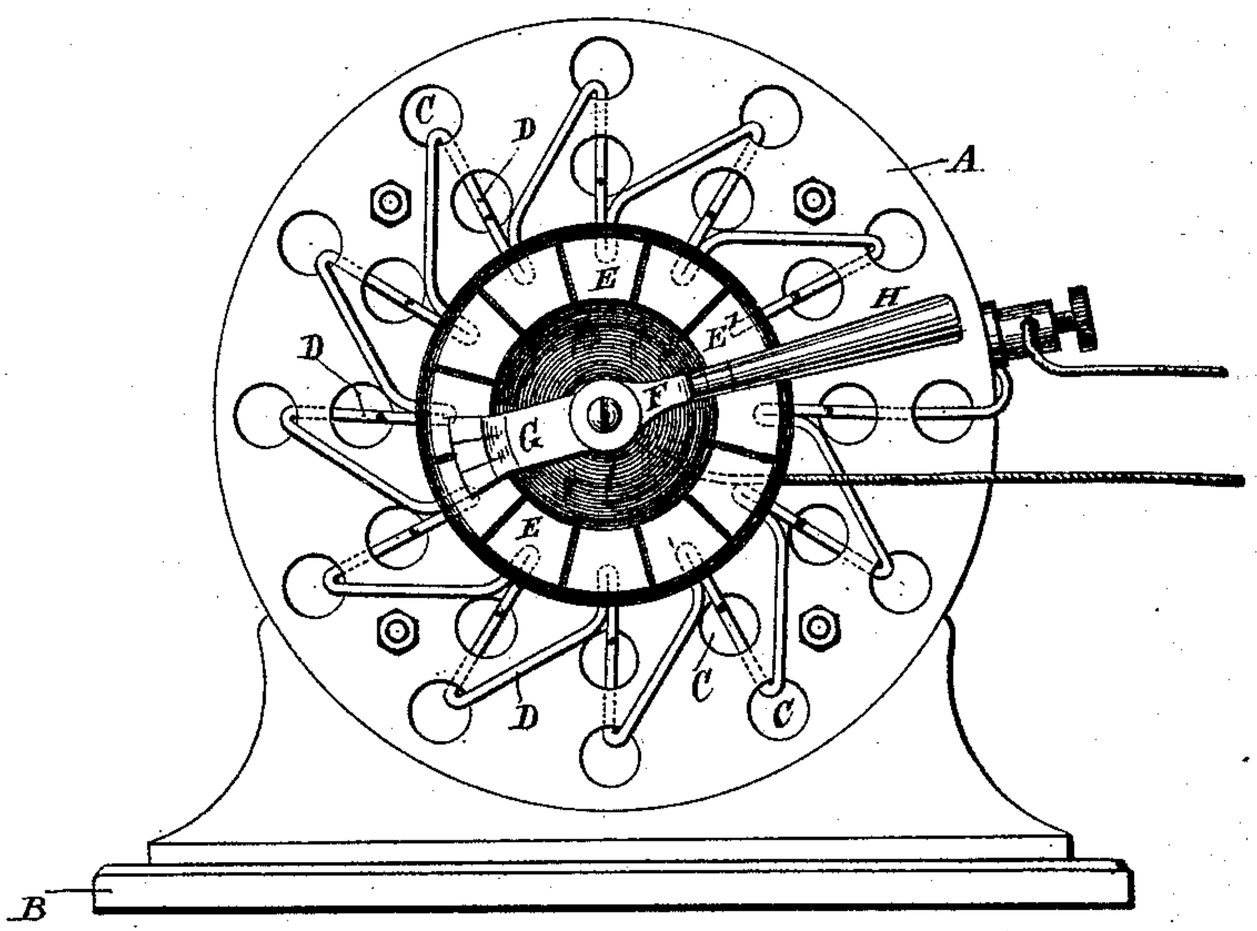


Fig. 2

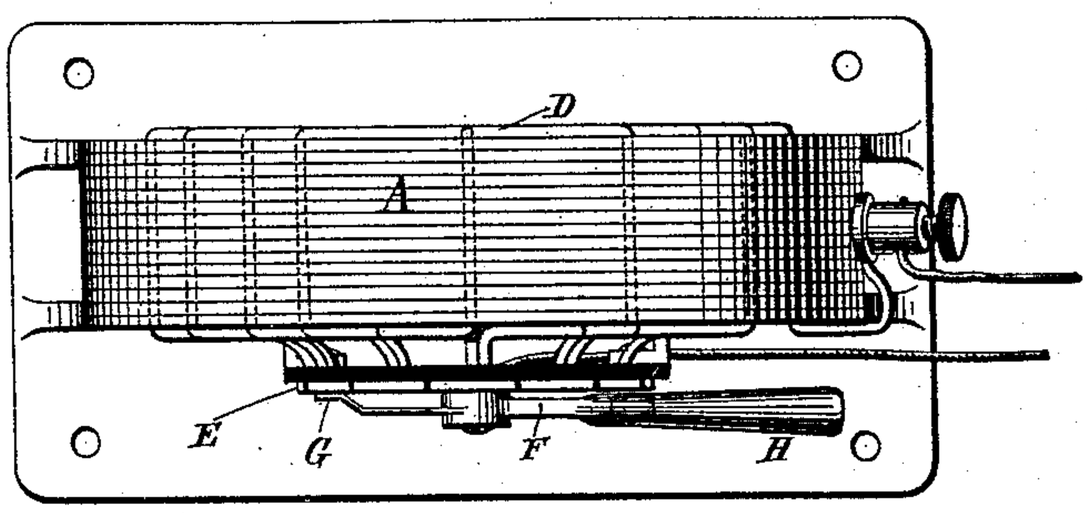
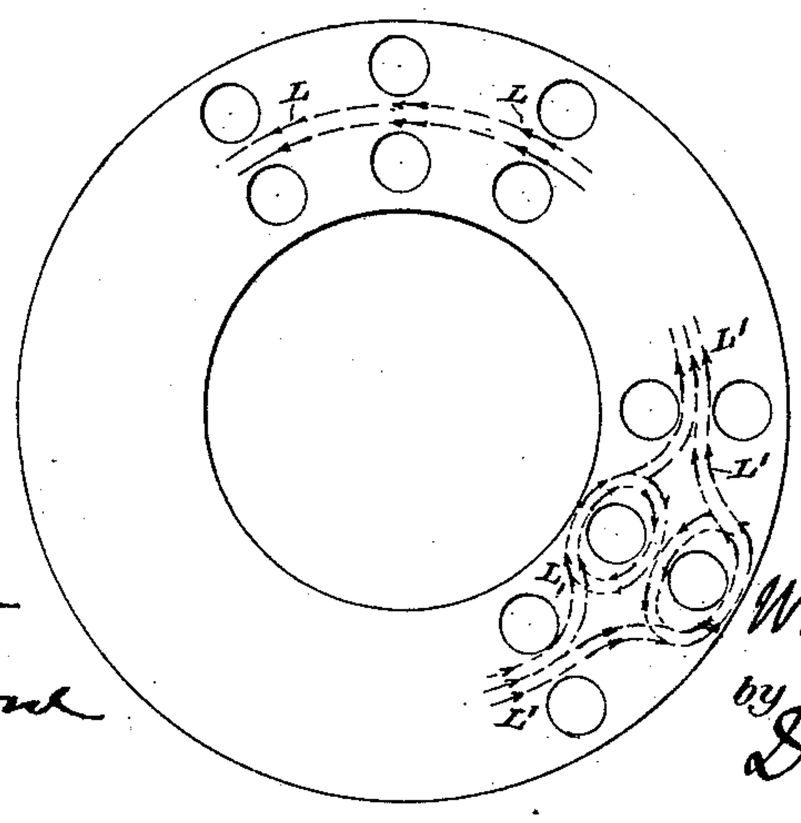


Fig. 3



Witnesses:
Raphael Netter
Robt. F. Gaylord

Inventor
William Stanley Jr.
by Duncan & Sage
Attorneys.

UNITED STATES PATENT OFFICE.

WILLIAM STANLEY, JR., OF PITTSFIELD, MASSACHUSETTS, ASSIGNOR TO THE STANLEY LABORATORY COMPANY, OF SAME PLACE.

SELF-INDUCTION DEVICE.

SPECIFICATION forming part of Letters Patent No. 485,336, dated November 1, 1892.

Application filed April 10, 1891. Serial No. 388,434. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM STANLEY, Jr., a citizen of the United States, residing at Pittsfield, in the county of Berkshire and State of Massachusetts, have invented certain new and useful Improvements in Self-Induction Devices, of which the following is a specification, reference being had to the drawings accompanying and forming a part of the same.

The subject of my present invention is an improvement in that class of apparatus known as "inductive resistance devices" or "self-induction coils." These devices, composed, essentially, of a coil or series of coils wound on an iron core, have heretofore been made with the capability of adjustment for varying inductive capacity, generally by forming from each convolution or section of the coil a loop connection to one of a series of insulated contact-plates, over which a contact connected with one part of the circuit is arranged to be moved, whereby the number of such convolutions or coil-sections in circuit may be varied at will. A serious difficulty has been met with in the practical use of apparatus of this kind, as heretofore constructed, due to the fact that when the contact arm or lever passes from one contact-plate of a series to another a short-circuiting of one of the convolutions or coil-sections is produced. This sets up an extraordinary rush of current in such coil-section, which, being short-circuited and under the inductive influence of the remaining coils or convolutions, exhibits the same action as the secondary circuit of a transformer. The object of my invention is to avoid this difficulty, and to this end I have devised a self-induction apparatus in which a core or magnetic circuit is common to all the convolutions or sections of the coil and in which each individual convolution or coil-section is surrounded by the core or magnetic circuit. To render this device variable or adjustable, I provide a series of contact-plates to which the convolutions or sections are respectively looped and a contact-lever that is mounted or adapted to be moved over the surfaces of such plates, whereby the number of convolutions in circuit may be varied according to the position of the lever.

The specific construction of the best form of apparatus of this kind of which I am aware is illustrated in the accompanying drawings, in which—

Figure 1 is a front elevation of an apparatus embodying my invention. Fig. 2 is a top plan view, and Fig. 3 a diagrammatic illustration of the operative conditions or action of the same.

The core A is made up of a number of insulated iron plates laid upon one another and secured together in any proper and well-known way, forming an annular magnetic core with proper feet or supports for mounting it on a base B. Through the annular laminated core A extend two concentric lines of perforations C, through which the conductors or coils D are threaded, all being connected up to form a continuous winding similar to that on the ordinary annular armature of a dynamo-electric machine.

E is a circular series of contact-plates suitably secured to the core and equal in number to that of the coil-sections.

F is a lever with a metallic contact end G and an insulated handle H, which is mounted so that the contact end may be turned over the whole series of plates E.

The conductors joining adjacent coil-sections or convolutions are looped to the contact-plates E except that between two adjacent sections arbitrarily selected as the first and last, and the free ends of this are connected to a circuit of alternating currents and to one of the plates, respectively. The metallic end G of the lever F is connected with the other part of the alternating-current circuit. If the lever F be turned so that its metallic end rests upon the last plate of the series only, or that marked E′, all of the convolutions or coil-sections will be included in the circuit and the maximum self-induction effect of the apparatus is exerted. So, also, if the said lever rests on any single plate, the full self-inductive effect of all the coil-sections included thereby in circuit will be produced, and the magnetization circulates through all of the turns of wire around the entire ring, as may be illustrated by the arrows marked L in the upper part of Fig. 3. When the lever is moved so that its metallic end spans and connects two plates, a short circuit is formed in one of

the coil-sections, which becomes a secondary circuit with respect to the rest of the coil. A secondary current is caused to flow in said coil-section, which will produce a magnetization of opposite but practically equal value to that threading the remaining coil-sections. The current requisite for producing this degree of magnetization depends upon the length of the magnetic circuit around the short-circuited coil or coil-section, or, in other words, it is dependent upon the magnetic resistance about such coil; but it will be observed from the described construction of the apparatus that while the magnetic core is common to all the coil-sections it surrounds each one individually, and that in consequence this magnetic resistance is extremely small. Very little current can therefore flow in the short-circuited coil and no troublesome effects will be produced. The direction of the magnetic flow with respect to a short-circuited coil may be represented by the arrows marked L′ in the lower right-hand part of Fig. 3.

In the device constructed as herein described the short-circuited coil acts to produce what may be compared to an eddy caused by a stone in a swiftly-flowing stream of water and has the effect of simply diverting the magnetism from itself.

The apparatus is applicable to all cases where it is desirable to vary the active potential of a circuit and is highly efficient, not being subject to the losses that have rendered instruments of this kind heretofore impracticable.

What I claim as my invention is—

1. The combination, with a laminated magnetic core, of a continuous magnetizing-coil the sections of which are wound through perforations in said core, a series of contact-plates to which the said sections are looped, and a contact-lever for including more or less of said sections in a circuit of alternating currents, as set forth.

2. The combination of an annular laminated magnetic core, a continuous magnetizing-coil the sections of which are wound through perforations in the core, a circular series of contact-plates to which the said sections are looped, a contact arm or lever mounted to sweep over said plates, and a handle for turning the same, as set forth.

3. In a self-induction device, the combination of a series of convolutions or coil-sections and means, substantially as described, for including more or less of the same in a circuit of alternating current with a magnetic core common to all of said convolutions or coil-sections and surrounding each individually, as herein set forth.

WILLIAM STANLEY, JR.

Witnesses:
HENRY J. RYAN,
PARKER M. PAGE.