No. 870,938. PATENTED NOV. 12, 1907.

G. H. COVE.

ALTERNATING CURRENT GENERATOR.

APPLICATION FILED MAY 7, 1906

Fig. 4.

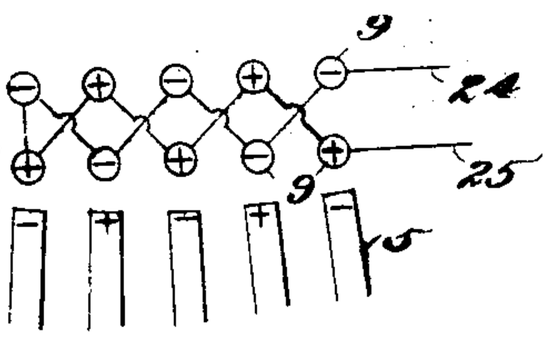


Fig. 2.

Fig. 1.

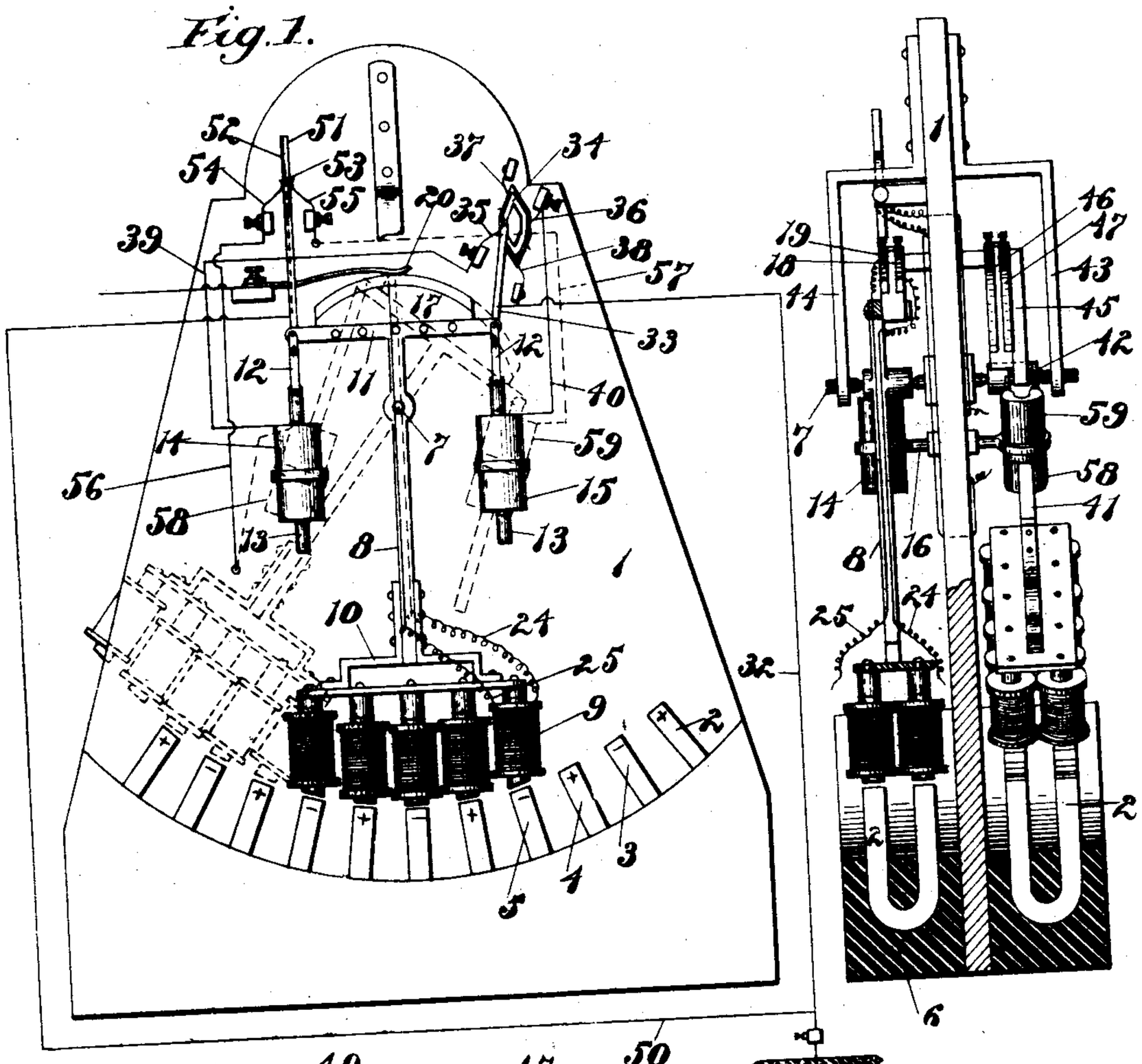
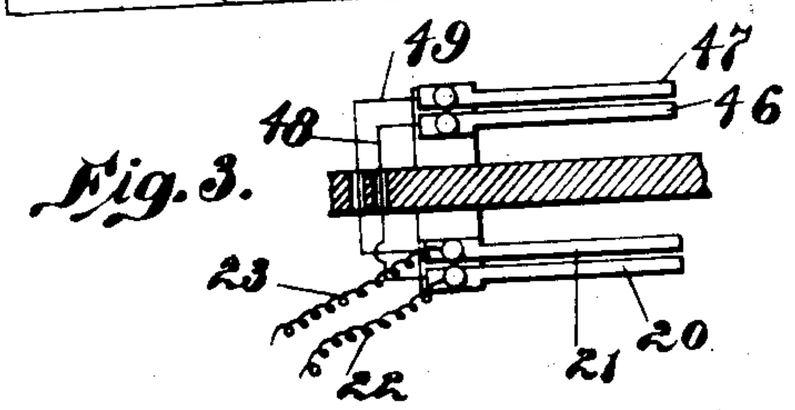
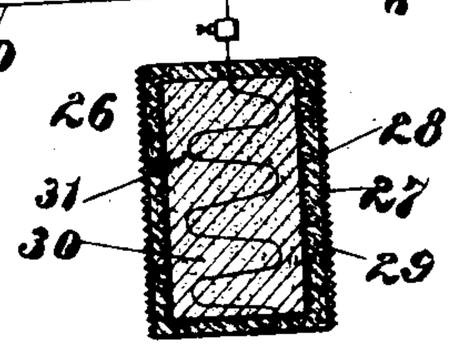


Fig. 3.





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UNITED STATES PATENT OFFICE.

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ALTERNATING-CURRENT GENERATOR.

No. 870,938. Specification of Letters Patent. Patented Nov. 12, 1907.

Application filed May 7, 1906. Serial No. 315,676.

To all whom it may concern:

Be it known that I, GEORGE H. COVE, a citizen of the Dominion of Canada, residing at Roxbury, in the county of Suffolk and State of Massachusetts, have invented an Improvement in Alternating-Current Generators, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

My invention is a pendulum-like magneto generator of alternating electric current.

I provide a series of fixed magnets having their poles set alternately of opposite polarity, arranged in an arc to coöperate with a set of electro magnets maintained in regular oscillation, preferably by electro magnetic means, so that thereby regular alternations of current are produced.

Further details of my invention will be pointed out in the course of the following description, reference being had to the accompanying drawings, in which I have shown a preferred embodiment of my invention.

In the drawings, Figure 1 is a view in front elevation of an apparatus constructed according to my invention; Fig. 2 is an edge view or side elevation thereof, parts being broken away for clearness of illustration; Fig. 3 is a fragmentary cross sectional view of a detail to be referred to. Fig. 4 is a diagrammatic view illustrating the winding of the electro magnets.

On a suitable base or frame 1 are mounted a series of permanent magnets 2, 3, 4, 5, etc., held rigidly in any suitable manner, as by being embedded in a base block 6. A similar set of magnets is provided at both sides of the base 1. At 7 I have pivoted a pendulum, whose stem 8 carries a plurality of electro magnets 9 suspended therefrom by a supporting frame 10, said electro magnets being arranged in an arc corresponding to their arc of movement and spaced apart and wound as indicated in Fig. 4 to coöperate with the fixed magnets 2, 3, etc. The upper end of the stem 8 above the pivot 7 is provided with a cross bar 11 connected by links 12 at its opposite ends to the movable cores 13 of opposite electro magnets 14, 15, pivotally supported at 16 on the base board 1. The cross bar 11 is provided with a segmental contact block 17 having opposite contacts 18, 19, on which rest brushes 20, 21, see Figs. 2 and 3, for delivering alternating current to the conductor wires 22 and 23. The contacts 18, 19, connect respectively with wires 24, 25, of the windings of the electro magnets 9, so that as the pendulum swings back and forth and cuts the lines of force of the fixed magnet, whose poles are arranged alternately, as shown in Fig. 1, the result is that an alternating current is induced in the electro magnet 9 and transmitted to the feed wires 22, 23.

To cause the pendulum to swing automatically I supply current to the electro magnets 14, 15, from a battery 26 set into the ground and having an outer inclosure 27 of zinc provided with points, as shown, and an inner inclosure 28 of copper also similarly provided, an intervening absorbent layer 29 of asbestos wool or the like being interposed and the inner can or receptacle 28 containing a filling 30 of fine coke or the like, in which is embedded a conductor wire 31 of copper. I have found that this battery when embedded in the earth is very efficient and enduring. A wire 32 leads from this battery to a contact maker 33 pivoted at the right-hand end of the cross bar 11 and arranged to travel in an endless path 34, engaging a spring contact 35 as it moves up on one side, and a similar contact 36 as it moves down on the other side, being shifted at the end of its upward movement by a spring 37 and at the end of its downward movement by a spring 38. The contact 35 connects with a wire 39 to the electro magnet 14 and the contact 36 by a wire 40 to the electro magnet 15, the circuit being completed in any suitable manner, as by grounding the opposite terminals of the windings of said electro magnets. It will thus be seen that as the pendulum swings back and forth, the electro magnets 14, 15 are alternately energized to pull downwardly upon the respective cores 13 with sufficient force and at the proper time to keep the pendulum going.

In order to keep the current regular and prevent an interruption of the alternations at each end of the movement of the pendulum I provide a second pendulum 41, constructed in all respects the same as the pendulum just described, and therefore not needing specific description, said pendulum 41 being pivotally mounted at 42 at the back of the base board 1 and supported by a hanger 43 similar to the hanger 44 which supports the front pendulum. The cross bar 45 of the rear pendulum carries contacts 46, 47, similar to the contacts 18, 19, of the front pendulum, see Fig. 3, which are connected respectively by wires 48, 49, to said front contacts, in proper manner to convey the current to the wires 22, 23, as clearly shown in said Fig. 3. The back pendulum is caused to oscillate in the same manner as the front pendulum, and current therefor being transmitted by a wire 50 from the battery 26 to a rod 51 pivoted to the cross bar 11 at the left-hand end, Fig. 1, said rod being provided with contact plates 52, 53, coöperating with spring contacts 54, 55 connected by wires 56, 57, to the electro magnets 58, 59, of the back pendulum, as best shown in dotted lines

Fig. 1, said contacts 52, 53, being of such length that when the front pendulum is in an intermediate position and swinging toward the right, the contact plate 52 will begin to engage the spring contact 54 and will maintain said engagement while the front pendulum is completing its swing toward the right and has swung back toward the left to an intermediate position again, whereupon the plate 52 and spring 54 will cease to contact and the plate 53 and spring 55 will begin their contact and remain in contact with each other while the pendulum is completing its swing to the left and back again to its intermediate position. The front pendulum and back pendulum are set with relation to each other as shown in full lines and in dotted lines Fig. 1, the dotted lines indicating the rear pendulum, so that when one pendulum is in an intermediate position the other pendulum is always at its extreme swing at one side or the other of the center, said pendulums always passing the center in opposite directions.

The means which I have shown for causing the swinging of the pendulum, including the forms of switches or automatic contact makers, is a preferable construction, as it is comparatively simple, although I do not intend to limit myself to either of these constructions nor to the various constructional details and arrangements shown in the machine of the drawings, as my invention is capable of a wide variety of embodiments.

I have already explained the operation of my machine in connection with the description of its construction, the swinging back and forth of the pendulum setting up in the windings of the electro magnets 9 alternating current, as they pass through the fields of magnetic force of the alternately arranged fixed-magnets 2, 3, 4, 5, etc., and this alternating current is transmitted to the feed wires 22, 23, being maintained regular by the arrangement of a plurality of pendulums, as explained, set so that one pendulum is always at its maximum movement when the other pendulum is coming to rest, both pendulums being kept in proper regular oscillation by their electro magnetic impulse givers or propelling means, which are caused to act in unison and at the proper rate by reason of the switches provided at the opposite ends of the cross piece 11.

Having described my invention, what I claim as new and desire to secure by Letters Patent is,

1. An alternating current generator, comprising a series of fixed magnets having their poles arranged alternately and set in an arc, and a pendulum arranged to oscillate over said alternately arranged magnet poles and provided adjacent said magnets with an electro magnet, the opposite terminals of whose windings are connected in the circuit on which said alternating current is to be impressed.

2. An alternating current generator, comprising a pendulum provided at its swinging end with an electro magnet, circuit wires leading from the terminals of said magnet, a series of fixed magnets set in an arc and arranged successively with opposite polarity to lie in the path of said pendulum, independent electro magnetic means for oscillating said pendulum, and a source of current supply for said electro magnetic means.

3. An alternating current generator, comprising a pendulum provided at its swinging end with an electro magnet, circuit wires leading from the terminals of said magnet, a series of fixed magnets set in an arc and arranged successively with opposite polarity to lie in the path of said pendulum, electro magnets and their movable cores, connected to said pendulum at the opposite sides of the latter, a source of current supply therefor, and an automatic switch operated by the swinging of the pendulum, to shift the current from one of said sides to the other.

4. An alternating current generator, comprising two series of fixed magnets arranged in the arc of a circle, each series having successive magnets arranged with reverse polarity, a swinging electro magnet for each of said series, electro magnetic means for oscillating said swinging electro magnets, and automatic switching mechanism for cutting off the current from the electro magnetic actuating means of one of said swinging magnets at the end of its swing, when the other swinging magnet is at the center of its swing.

5. An alternating current generator, comprising a series of fixed magnets set in the arc of a circle and having successive opposite polarity, a pendulum provided with electro magnetic means for cutting the magnetic fields of said fixed magnets, means for automatically swinging said pendulum, and means including a second set of fixed magnets and a second pendulum provided with similar electro magnetic means, for producing alternations of current during the interval when said first-mentioned pendulum is at rest at the end of its oscillation.

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

GEORGE H. COVE.

Witnesses:
GEO. H. MAXWELL,
WM. J. PIKE.