(No Model.)

C. E. BUELL.

ELECTRIC GENERATOR.

No. 407,327. Patented July 23, 1889.

Fig. 3.

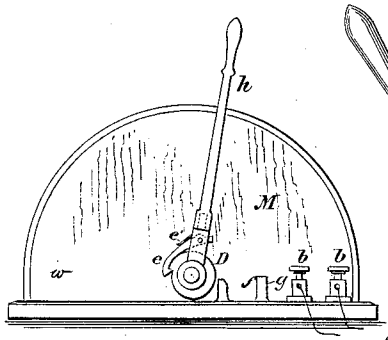
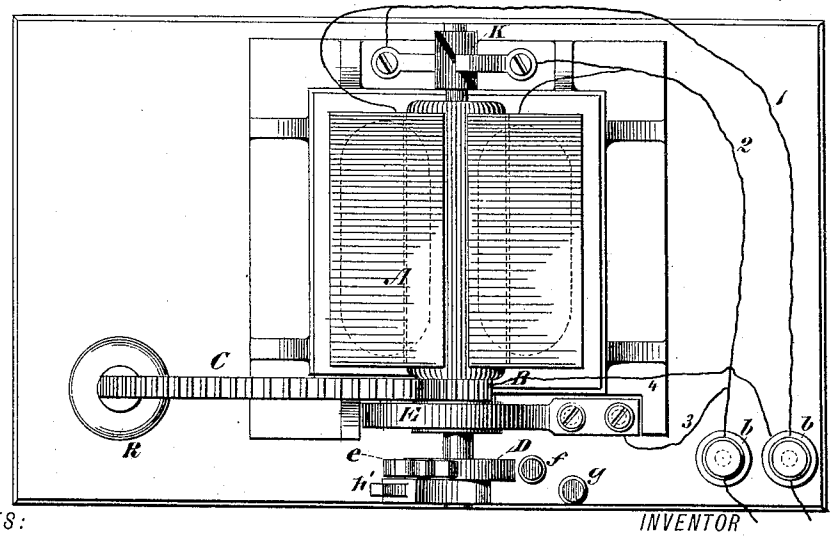


Fig. 1.

Fig. 4.

Fig. 2.



WITNESSES:

Gustave Retenich.

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CHARLES E. BUELL, OF NEWARK, NEW JERSEY.

ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 407,327, dated July 23, 1889.

Application filed February 18, 1889. Serial No. 300,266. (No model.)

To all whom it may concern:

Be it known that I, CHARLES E. BUELL, of Newark, Essex county, State of New Jersey, have invented Improvements in Electrical Generators, of which the following is a specification.

My invention relates to the class of dynamo-electric machines that accumulate a charge to be sent to a circuit as a deflagrating-charge for firing fuses, in blasting, and for other purposes where a quantity-discharge of brief duration is desired.

My invention consists of a generator comprising a spring-actuated armature and a condensing-circuit formed by the movable parts of the apparatus, that are in such relation to each other as to be electrically connected during the time of accumulation and to become electrically separated at the desired moment in the process of accumulation, substantially as hereinafter described.

My invention further consists in the combination, with a dynamo or magneto electric machine, of a spring-actuated armature that comprises a releasing device that in its normal operation will trip the armature-actuating mechanism at a predetermined point in the process of winding, substantially as hereinafter described.

My invention further consists in sub-combinations to be hereinafter described.

In the accompanying drawings, Figure 1 is a view in side elevation of an apparatus embodying my invention. Fig. 2 is a plan view of the same, and Figs. 3 and 4 show details of my invention.

Referring to these drawings, the letter A represents a dynamo-electric machine insulated upon a base at I.

C is a toothed rack-bar in the form of a sector, that is rigidly secured upon an arbor mounted in the base of the dynamo below the insulation I. On the same arbor with sector C is a notched wheel D and a handle *h*, the said wheel D being rigid upon the sector-arbor and the handle *h* being mounted loose thereon. A spring E is secured to the wheel D and to the board or plate upon which the apparatus is placed. A latch or hook *e* upon the handle *h* catches into the notch in wheel D when the lever or handle *h* is in the position shown, being pressed down by the small spring *e'*, the said latch *e* being pivoted on the side of the lever *h*.

The sector C when in the position shown is not electrically connected to the dynamo, but when the lever *h* is thrown to the right it moves with it the wheel D and sector C, and the teeth of the sector interlock with the teeth of the small pinion B on the armature-shaft, and while said sector and said pinion B are interlocked they electrically connect the dynamo with its insulated base.

The circuit of the dynamo is over wires 1 and 2 to the binding-posts *b b*, and from them to the fuses to be fired, or to other devices to be operated on by the discharge. From wires 1 and 2 branch 4 leads to or is electrically connected with pinion B, and branch 3 is electrically connected to the sector C, so that when said pinion and sector are interlocked they complete a condensing-circuit, and as they separate when the sector is in the position shown the condensing-circuit thus formed is ruptured, so that by insulating the parts named the condensing-circuit can be composed of the moving parts of the apparatus and the greatest durability reached as compared with those dynamos heretofore used that depend upon the opening of a circuit-controlling key by the impingement of a rack-bar that is descending with great force, or upon a spring that is in contact with the moving parts of the apparatus, and requires to be a light spring to prevent its retarding the moving of the parts, and is therefore easily displaced, worn, and broken.

The sector C is provided with a plate *r*, that comes in contact with a rubber block R, and as the spring E is under tension even when the sector is in the position shown the rebound of the sector is prevented, while the moving part is brought to rest without shock.

The spring E should be a spring that does not create friction in unwinding by having its convolutions touch each other when wound up, as the unwinding will be irregular and of varying force and the discharge unreliable.

The open form of coiled spring shown is satisfactory; but a spring coiled upon the

sector-arbor will do; or the sector-arbor may be the spring by securing one of its ends from turning.

The lever *h* is preferably detachable for convenience in carrying and to prevent unauthorized persons from using the apparatus. For this purpose the lever *h* is removably connected at *h'*.

A post *f* is rigidly attached to the support or base of the apparatus and in such relation to the latch *e* that when the lever *h* is moved to the right that portion of the latch *e* between the lever *h* and the notch in the wheel D comes in contact with said post *f* in a manner to lift the latch *e* and raise the hook out of the notch.

The operation of the apparatus is as follows: The lever or handle *h* is moved from the position shown to the right until the hook *e*, coming in contact with the post *f*, is lifted out of the notch in wheel D, when the sector, which has been carried over with handle *h*, is released, and by the wound-up spring E is quickly returned to the position shown in the drawings, and in returning rapidly revolves the armature by interlocking with the pinion B. The lever *h* is prevented from going beyond a desired point after the hook *e* is disconnected from wheel D by the post *g*, which intercepts it. When the sector C is being moved to the right and the spring E is being wound, the armature is turned in an opposite direction from that in which it turns in the process of an accumulation of charge; but the turning of the armature in the operation of winding is so slow that no current is developed to change or disturb the normal polarity of the dynamo.

In Fig. 3 the apparatus is shown covered to exclude dirt and drip from the moving parts. A strap or handle (not shown) is provided for carrying the apparatus.

In Fig. 4 there is shown a lamp in a loop or branch and a switch for connecting the dynamo alternately to the lamp and to the exterior or firing circuit, for the purpose of first testing the apparatus before use by discharging through the lamp L, and then turning the switch to contact with the terminal of wire 2 connect the dynamo in the firing circuit. The addition of a switch *w* for testing is novel and of practical consequence, as the knowledge of the fact that the apparatus has become out of order in shipping is of great importance and before discharging it into a line of fuses, for a failure of a part of the fuses on account of an insufficient discharge of electricity is followed by danger and an apprehension of danger by those who are required to work around the loaded holes after such a failure.

The advantages of a spring-actuated armature, when comprising a spring that has no friction between its convolutions and, at the completion of its motion, is under tension, are that the discharges produced are every time alike in their light-giving and deflagrating force—a result never before reached by any hand-operated or spring-actuated generator for sending an accumulated charge for firing fuses or other purposes where a discharge of brief duration is desired. Besides the regularity of the discharges, the maximum product is reached by the employment of the moving parts to form the condensing-circuit, as the contact is firm and the conductivity of the parts great, while the separation of the parts is accomplished in an instant of time at the proper moment, and they are widely separated, all of which results favorably.

The form of apparatus shown is cheaply constructed and is the preferred arrangement; but details may vary without departing from my invention.

What I claim is—

1. An electrical generator comprising an exterior circuit and a condensing-circuit, gears for actuating the same, and electrical connections with said gears, the said gears being adapted to first complete the condensing-circuit and then break said circuit, whereby said generator is caused to discharge into the said exterior circuit.

2. An electrical generator comprising a spring-actuated armature and a condensing-circuit, a spring and gears for actuating said generator, and electrical connections with said gears, the said gears being adapted to first complete the condensing-circuit and afterward break said circuit, whereby the generator is caused to discharge into the exterior circuit.

3. The combination, with a generator, of a spring-actuated armature and a winding-up handle or device that is provided with an automatic releasing contact or device, whereby the wound-up armature-actuating mechanism is tripped at a predetermined point in the process of winding.

4. The combination, with a dynamo or magneto electric machine that is provided with a firing-circuit and a condensing-circuit that is completed by the movable parts of the apparatus, as described, of a spring-actuated armature that is provided with an automatic releasing device that in its normal operation trips the armature-actuating mechanism at a predetermined point in the winding, the whole arranged and operating substantially as described.

5. An electric generator that comprises an exterior circuit, a condensing-circuit, a spring-actuated armature, gears for actuating said armature, electrical connections with said gears, and a winding handle or device that is provided with a releasing-contact, whereby the wound-up mechanism can be released in the process of winding and the condensing-circuit opened at the desired moment by the moving parts of the apparatus.

6. In an electrical generator the combination, with a spring-actuated armature that is automatically released at a predetermined point in the winding, of a condensing-circuit that is opened at the desired moment in the process of accumulation by the moving parts of the apparatus.

Signed before witnesses this 15th day of February, 1889.

CHARLES E. BUELL.

Witnesses:
A. C. BUELL,
A. H. CRUMP.