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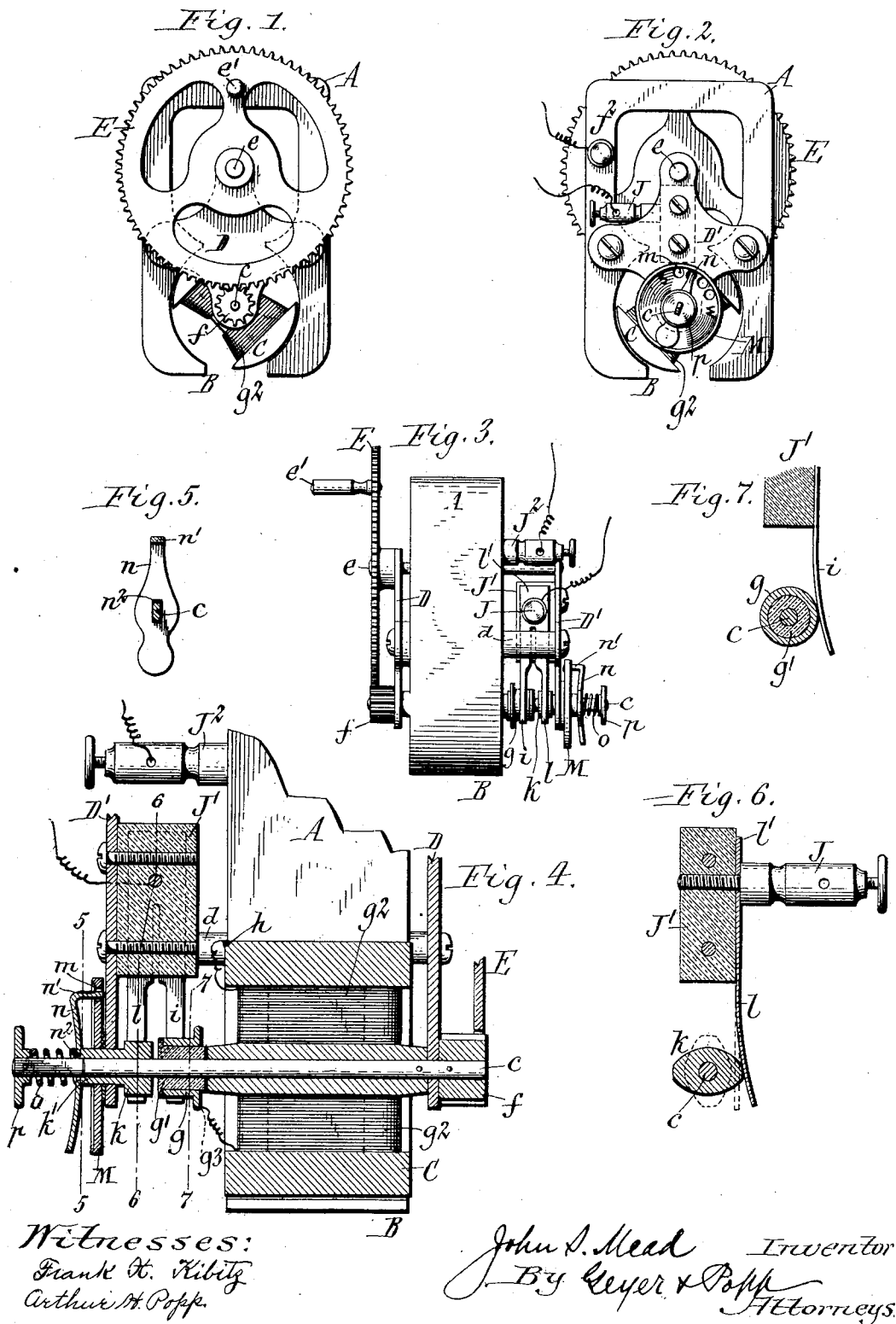
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J. S. MEAD.

MAGNETO ELECTRIC GENERATOR.

(Application filed Mar. 18, 1901.)

(No Model.)



UNITED STATES PATENT OFFICE.

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MAGNETO-ELECTRIC GENERATOR.

SPECIFICATION forming part of Letters Patent No. 685,286, dated October 29, 1901.

Application filed March 18, 1901. Serial No. 51,776. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. MEAD, a citizen of the United States, residing at the city of Buffalo, in the county of Erie and State of New York, have invented a new and useful Improvement in Magneto-Electric Generators, of which the following is a specification.

This invention relates to a magneto-electric generator, and more particularly to hand-generators of this class which are employed for curative purposes and which are provided with a current-interrupter or make-and-break device which is adjustable in such manner that the point in the rotation of the armature at which the break occurs can be varied within certain limits for regulating the strength or intensity of the current. It is well known that if the break occurs when the poles of the armature are about reversing a current of comparatively high electromotive force is developed and that in a position of ninety degrees from this point the intensity of the current is slight, while its strength gradually increases as the point in the rotation of the armature at which the break occurs approaches the first-named position of the armature.

It is the object of my invention to provide the circuit-interrupter of the generator with an adjustable device of simple construction which can be cheaply produced, which can be conveniently manipulated and understood by laymen, and which is not liable to get out of order.

In the accompanying drawings, Figure 1 is a front view of the generator. Fig. 2 is a rear view thereof. Fig. 3 is a side elevation of the same. Fig. 4 is a fragmentary central section of the generator, on an enlarged scale, taken lengthwise of the armature. Figs. 5, 6, and 7 are transverse vertical sections on the correspondingly-numbered lines in Fig. 4.

Like letters of reference refer to like parts in the several figures.

A is the stationary metallic frame of the generator, which is substantially rectangular and preferably forms the field B.

C is the rotary armature, mounted on the transverse armature-shaft *c*. This shaft turns in bearings arranged in the lower portions of a pair of vertical bracket-plates D D', ar-

ranged on opposite sides of the frame A. The front plate D may be secured directly to the adjacent side of the frame, as shown, while the other plate D' is supported at a distance from the frame by horizontal rods or sleeves *d*.

e is a transverse driving-shaft arranged above the armature-shaft *c* and journaled in the upper portions of the bracket-plates D D' and provided at its outer end with a comparatively large driving-gear E, having a crank *e'* for turning it. The gear-wheel E meshes with a gear-pinion *f*, secured to the armature-shaft.

g is a metallic commutator or collecting-ring mounted on the armature-shaft and insulated therefrom by a bushing *g'* and connected with one end of the armature-coil *g²*, as shown at *g³*. The other end of this coil is connected with the metallic body of the armature, as shown at *h* in Fig. 4.

i is a contact-brush bearing against the collecting-ring *g* and connected with a binding-post J, which forms one terminal of the generator and which is secured by said post to an insulating-block J'. This block is in turn fastened to the inner side of the bracket-plate D', as shown in Figs. 3 and 4.

J² is a binding-post secured to the frame A and forming the other terminal of the generator and connected with the end *h* of the armature-coil through the frame A, the bracket-plate D, and the body of the armature.

k is a metallic interrupting-cam or make-and-break device mounted on the rear portion of the armature-shaft and electrically connected therewith, and *l* is a metallic spring or contact-brush bearing against the cam *k* and connected with the binding-post J. The cam *k* and the brush *l* constitute the make-and-break device of the generator. The brushes *i* and *l* are both connected with the binding-post J and with each other and are preferably formed in one piece with a shank *l'*, which is secured to the block J' by said binding-post, as shown in Fig. 3. The interrupting-cam *k* is formed on or secured to a sleeve *k'*, capable of turning on the armature-shaft, so that the cam can be adjusted circumferentially on the shaft for changing the position of its high portions relatively to the

armature-poles. The sleeve k' is provided with a setting wheel or disk M , which is secured thereto on the outer side of the bracket-plate D' and provided with a milled or roughened edge. This setting-wheel is provided near its edge with a segmental row of locking recesses or openings m .

n is a locking or coupling catch for the disk M , arranged on the outer side of the latter and consisting, preferably, of a lever mounted on the armature-shaft to turn therewith and provided at one end with an inwardly-turned lip n' , which interlocks with one of the openings m of the setting-disk, as shown in Figs. 2, 3, and 4, thereby locking the disk to the armature-shaft and compelling it and the interrupting-cam k to turn with the armature-shaft. In the preferred construction shown in the drawings the locking-lever n is interlocked with the armature-shaft by providing the lever with a rectangular opening n^2 for the passage of the shaft and making the adjacent portion of the shaft of corresponding cross-section, this opening being large enough to permit the necessary rocking movement of the lever. The lever is fulcrumed against the outer end of the cam-sleeve k' and held against the same preferably by a spring o , which surrounds the armature-shaft and bears at its inner end against the lever and at its outer end against a collar p , secured to the rear end of the armature-shaft and serving both as an abutment for the spring and as a knob for turning the armature-shaft or holding it against turning with reference to the interrupting-cam k in adjusting the latter. In the construction shown in the drawings this cam is elliptical in form, and it is made of such a size that when one of its low portions faces its companion brush l the latter is relaxed and clears the cam, breaking the circuit, while when one of the high portions of the cam arrives opposite said brush it touches and deflects the same, thus establishing the circuit.

As shown in Fig. 4, the cam-sleeve k' is journaled in the bracket-plate D' and forms a bearing for the rear portion of the armature-shaft.

The terminals of the instrument or apparatus through which the current is to be passed or a suitable pair of body-electrodes are connected with the binding-posts $J J^2$.

In the use of the generator when the armature is turned and the interrupting-cam k touches its companion brush l the armature is short-circuited through the collecting-ring g , the corresponding brush i the other brush l , cam k , armature-shaft c , and armature-body. During the interval that a break occurs between the cam k and its brush l the short or shunt circuit is interrupted and the main circuit is established through the armature-coil, the collecting-ring g , brush i , binding-posts $J J^2$, generator-frame A , bracket-plate D , and the armature-body. The circuits are rapidly opened and closed by the make-and-break

cam k , producing a comparatively strong current in a manner common to this class of generators.

When it is desired to increase or diminish the intensity of the current, the setting-disk M is unlocked by pressing the thumb upon the tail end of the locking-lever n to disengage its lipped end from the disk, and the latter is then turned in one or the other direction relatively to the armature-shaft for changing the position of the interrupting-cam k with reference to the armature-poles. The locking-lever is then released and allowed to engage in the opposing opening of the setting-disk for again locking the disk and the interrupting-cam to the armature-shaft. To facilitate the adjustment of the interrupting-cam, the letters "S" and "W" may be stamped on the setting-disk at opposite ends of its series of locking-openings, as shown in Fig. 2, to indicate the direction in which the disk must be turned to obtain a strong or a weak current. These locking-openings also serve as graduations for indicating current graduations between the maximum and the minimum.

The simplicity of my improved adjusting device enables it to be produced at small expense and lessens its liability of getting out of order, while the convenience with which it can be manipulated renders it especially desirable for small hand-generators, which are employed in the treatment of nervous and other disorders and intended for the use of persons unfamiliar with the construction and operation of such devices.

I claim as my invention—

1. In a magneto-electric generator, the combination with the armature, and a main and a shunt circuit, of a make-and-break device capable of rotary adjustment on the armature-shaft and forming one of the terminals of the shunt-circuit, and a locking-catch for said make-and-break device connected with the armature-shaft to turn therewith, substantially as set forth.

2. In a magneto-electric generator, the combination with the armature, and a main and a shunt circuit, of a make-and-break device capable of rotary adjustment on the armature-shaft and forming one of the terminals of the shunt-circuit, a setting-wheel connected with said make-and-break device, and a locking-catch connected with the armature-shaft to turn therewith and constructed to interlock with said setting-wheel, substantially as set forth.

3. In a magneto-electric generator, the combination with the armature, and a main and a shunt circuit, of a make-and-break cam capable of rotary adjustment on the armature-shaft and forming one of the terminals of the shunt-circuit, a brush arranged to bear against said cam and forming the other terminal of the shunt-circuit, a setting-wheel connected with said cam and provided with a series of locking-recesses, and a locking-

catch connected with the armature-shaft to turn therewith and interlocking with one of the recesses of the setting-wheel, substantially as set forth.

5 4. In a magneto-electric generator, the combination with the armature, and a main and a shunt circuit, of an interrupting-cam capable of rotary adjustment on the armature-shaft and forming one of the terminals of the
10 shunt-circuit, a setting-wheel connected with said cam and provided with a series of locking-recesses, a locking-lever provided with a flat-sided opening which receives a corresponding portion of the armature-shaft and
15 having a lip which interlocks with one of the recesses of the setting-wheel, and a spring arranged to hold the lever in engagement with the setting-wheel, substantially as set forth.

20 5. In a magneto-electric generator, the combination with the armature and its shaft provided at one end with a knob or projection, of a main and a shunt circuit, a sleeve capable of rotary adjustment on the armature-shaft and carrying an interrupting-cam which
25 forms one of the terminals of the shunt-circuit, a setting-wheel provided with a row of locking-recesses, a locking-lever bearing against the end of said sleeve and having a flat-sided opening which receives a corresponding portion of the armature-shaft, and
30 a lip which interlocks with a recess of the setting-wheel, and a spring surrounding the armature-shaft between said lever and knob of the armature-shaft, substantially as set
35 forth.

6. In a magneto-electric generator, the combination with the armature and its shaft, and a main and a shunt circuit, of an insulated collecting-ring mounted on said shaft and connected with one end of the armature-coil, 40 a make-and-break cam capable of rotary adjustment on the armature-shaft and electrically connected therewith, a setting-wheel connected with said cam, a locking-catch connected with the armature-shaft to turn there- 45 with and interlocking with said setting-wheel, a pair of electrically-connected brushes bearing against said collecting-ring and said cam, respectively, and a binding-post connected with both of said brushes, substantially as 50 set forth.

7. In a magneto-electric generator, the combination with the armature and its shaft, and a main and a shunt circuit, of an insulated collecting-ring mounted on said shaft and 55 connected with one end of the armature-coil, a make-and-break cam electrically connected with the armature-shaft and turning therewith, a pair of contact-brushes bearing against said cam and said collecting-ring, respec- 60 tively, and arranged on the same side of the armature-shaft, and a binding-post or terminal connected with said brushes, substantially as set forth.

Witness my hand this 15th day of March, 65 1901.

JOHN S. MEAD.

Witnesses:

CARL F. GEYER,
ARTHUR H. POPP.