(No Model.) 2 Sheets—Sheet 1.

W. W. GARY.

MAGNETO GENERATOR FOR RAILROAD SIGNALS.

No. 262,396. Patented Aug. 8, 1882.

Fig. 1

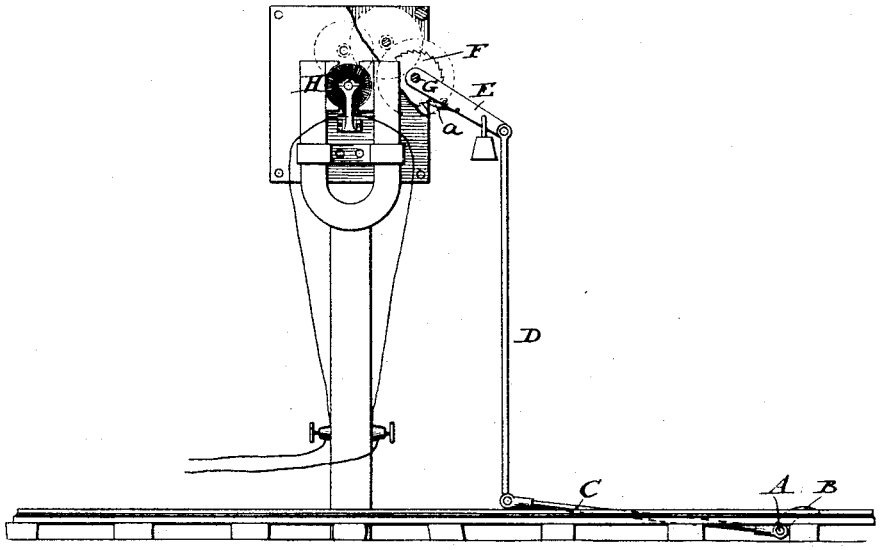


Fig. 2

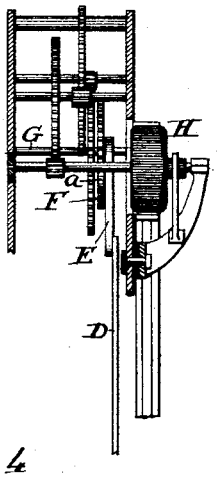


Fig. 3.

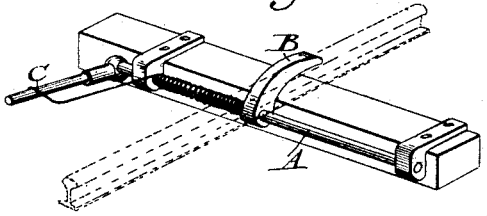
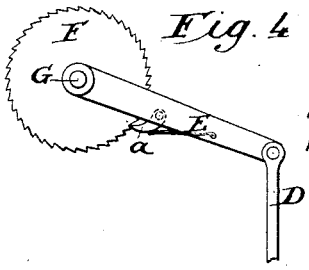


Fig. 4



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(No Model.) 2 Sheets—Sheet 2.

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MAGNETO GENERATOR FOR RAILROAD SIGNALS.

No. 262,396. Patented Aug. 8, 1882.

Fig. 5.

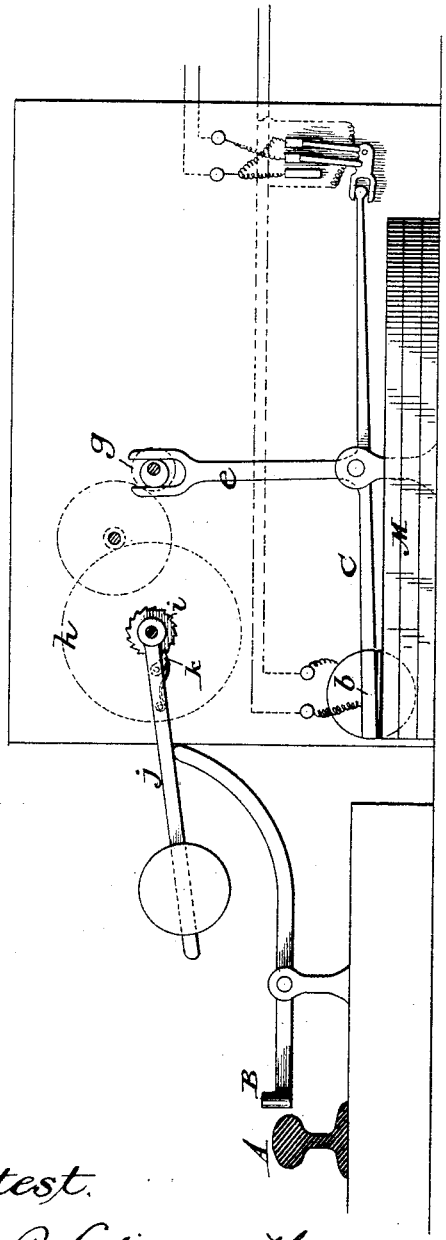
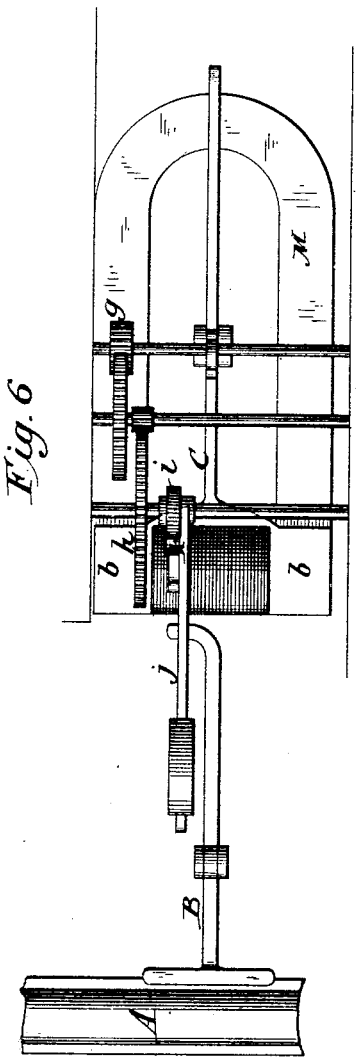


Fig. 6



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UNITED STATES PATENT OFFICE.

WESLEY W. GARY, OF BOSTON, MASSACHUSETTS.

MAGNETO-GENERATOR FOR RAILROAD-SIGNALS.

SPECIFICATION forming part of Letters Patent No. 262,396, dated August 8, 1882.

Application filed May 9, 1882. (No model.)

To all whom it may concern:

Be it known that I, WESLEY WARD GARY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Magneto-Generators for Railroad-Signals, of which the following is a specification.

The object of this invention is to produce a magneto-electric generator which may be operated through the instrumentality of passing railway-trains, and which will produce a long-continued electrical current or succession of electrical impulses. The objects aimed at are, first, to produce a generator which may be operated by rapidly-passing trains without danger of breakage or disarrangement of the working parts; second, to produce a generator which, being operated by passing railway-trains, will produce a long-continued current, as contradistinguished from those generators which, being operated by a car-wheel, produce a single impulse; third, to produce a generator which, being set for action by a passing railway-train, will continue in action after the passage of the train.

With these ends in view the invention consists mainly in combining with a magneto-electric generator of any suitable type a gear-train or equivalent means for operating the same, and appliances whereby the operating devices are set for action by passing railway-trains. The generator may be of any ordinary or approved construction, either of the rotary that it shall by its motion generate or develop or vibratory type, the only requirement being a current of electricity. Generators of this character are well known in the art in a great variety of forms, and are familiar to all persons skilled in electrical matters. The driving mechanism may be of any suitable construction; but it is preferred to employ the construction shown, which consists of a train of gear, in combination with a weight and a track-lever or equivalent appliances, to be operated by passing trains in such manner as to elevate the weight. Under this arrangement the passing train merely elevates the weight without applying any direct strain or shock to the gear-train, and after the train has passed the weight, descending automatically, causes the operation of the generator and the production of the electric current thereby, the operation continuing for a greater or less length of time, according to the number of wheels in the machine and the distance to which the weight is elevated.

I am aware that vibratory magneto-generators which produce at each vibration a single current or impulse of electricity have been produced with track arms or levers operating directly thereon, so that at each vibration of the track-arm the generator produced a single impulse of electricity. This arrangement caused the production of but two or more momentary feeble, widely-separated impulses or currents of electricity, and this during instead of after the passage of the train.

Referring to the accompanying drawings, Figure 1 represents a face view of my improved apparatus, embodying a rotary armature, a portion being broken away to expose other parts to view. Fig. 2 is a vertical central section of the driving-gear from front to back; Figs. 3 and 4, enlarged views of details. Fig. 5 is a side elevation of the apparatus, embodying the vibratory form of armature. Fig. 6 is a top plan view of the same.

Referring to Figs. 1, 2, 3, and 4, A represents a rock-shaft arranged horizontally at right angles to the track, provided with a curved arm or tappet, B, which is located by the side of one of the track-rails in position to be acted upon by the wheels of a passing train, and with a second arm, C, the outer or free end of which is jointed to an upright rod or stem, D, which is in turn jointed to an arm or lever, E, turning or swinging loosely upon a spindle or shaft in the frame which contains the gearing. The vibrating arm E is furnished with a pawl, *a*, weighted or provided with a spring, by which it is caused to engage with the teeth of a ratchet-wheel, F, secured to the shaft G, upon which the arm or lever E is journaled. The teeth of the ratchet-wheel are so inclined that as the arm or lever rises the pawl shall slip past them. Upon the same shaft with the wheel F is secured a first wheel of a train of gearing, through which motion is transmitted to the shaft of the rotating or vibrating magneto-generator H, of any suitable construction.

The arm E, rod D, and arm C may be weighted and provided with a spring or equivalent device by which the storage of power may be obtained, or they may themselves be made of sufficient weight to actuate the gearing.

The apparatus being thus constructed and arranged, it will be seen that upon the passing of a train over the tappet B the latter will

be depressed, and through the arm C and rod D the lever or arm E will be elevated. As the train leaves the generator the lever or arm E will fall, its pawl engaging with the teeth of the ratchet-wheel and rotating the shaft G and its wheel, which latter will transmit motion through the intermediate gearing to the armature of the generator, imparting thereto a rapid rotation. This action may be repeated with the passage of each wheel, the lever E falling a greater or less distance, according to the interval occurring between them, until the last wheel has passed, whereupon the arm or lever falls to its lowest position, imparting a steady rotation of considerable duration to the shaft of the generator.

Referring to Figs. 5 and 6, A represents the track-rail, and B the horizontal arm or tappet, pivoted near its middle, with one end arranged in position beside the rail to be depressed by the passage of the train over it. The opposite end of this lever acts beneath a weighted lever, *j*, armed with a pawl, *k*, which engages in a ratchet-wheel, *i*, mounted on a horizontal shaft. The shaft of the ratchet-wheel carries a gear-wheel, *h*, which, through intermediate gearing, drives a pinion, *g*, the shaft of which is provided with an eccentric operating to vibrate the upper end of an arm, *e*. This arm is attached rigidly to a bar or lever, C, one end of which is provided with a soft-metal armature, *b*, coiled with insulated wire, to form what is commonly known in the art as an "electro-magnet" or "induction-coil." This coil, which is vibrated by the movement of the lever, is arranged within the field of force of a permanent magnet, M, the effect being to induce a current of electricity within the coil of the armature as it is vibrated to and from the magnet by the movement of the lever C. The vibrating armature *b* and the magnet M jointly form a magneto-electric generator of the well-known type. When the lever B is acted upon by the passing train it elevates the weighted lever or arm *j*, which, after the passage of the train, gradually descends, imparting motion through the intermediate gear to the eccentric *g*, causing the latter to produce a rapid vibration of the armature, thereby developing a long electric impulse or rapid succession of impulses. This generator, as well as that shown in Figs. 1 and 2, may be used without a commutator, in which case they will develop currents of alternating polarity, or they may be provided with commutators of any approved form, in order to produce a current of continuing or unchanging polarity.

The commutator represented in Fig. 5, as well as the generator itself, are substantially the same as that described in Letters Patent of Great Britain, granted to me, numbered 805 of the year 1879.

As regards the details of the generators and the commutators, they are matters well understood to all persons skilled in the art, and it is deemed unnecessary to enter more fully into them.

While I have represented and described herein the two forms of generators which are preferred for general use, it is obvious that they may be modified in their details, and that the track-levers and other appliances acted upon by the trains may be modified as desired, provided no substantial change is made in their mode of action.

The currents developed by my generators may be employed for operating signals, and for various other purposes forming no part of the present invention.

I do not claim herein the combination of the apparatus represented in Fig. 1 with a railway-signal and operating-magnet, as said claim is embodied in another application. The present invention relates to the generating apparatus broadly, irrespective of the peculiar combination in which it may be employed.

I do not claim herein the details of construction represented in Figs. 5 and 6, as the combination of the vibratory armature, the cam or eccentric, the driving-gear, and the arm or lever will be made the subject of a separate application. The apparatus shown in said figures is presented herein as an illustration of one of the numerous forms in which the broader invention herein claimed may be embodied.

The right is reserved to make any features or combinations which may be shown and described herein, but which are not specifically claimed, the subject-matter of a separate patent.

Having thus described my invention, what I claim is—

1. In combination with a magneto-electric generator, mechanism, substantially as described, for operating said generator, adapted and arranged to be set for action by a passing train, and to be automatically put in action as the train ceases to act upon it.

2. In combination with a magneto-electric generator and gearing for transmitting motion thereto, mechanism, substantially such as described and shown, for operating the gearing, adapted and arranged to be thrown into an operative position by a passing railway-train without affecting the gearing, and subsequently to act upon said gearing.

3. The combination of a magneto-electric generator, a device, substantially as shown, to be operated by passing trains, and intermediate mechanism, substantially as described, whereby a single movement of the operating device will cause prolonged or continuing motion to be imparted to the magneto-generator.

4. The combination of a magneto-electric generator, a train of driving-gear connected therewith, and an operating-lever connected at one end with the driving-gear, and arranged with its opposite end in position to be moved by passing railway-trains.

WESLEY W. GARY.

Witnesses:
W. CLARENCE DUVALL,
PHILIP T. DODGE.