(Model.)

W. W. GARY.

MAGNETO ELECTRIC RAILWAY SIGNAL.

No. 303,567. Patented Aug. 12, 1884.

Fig. 1.

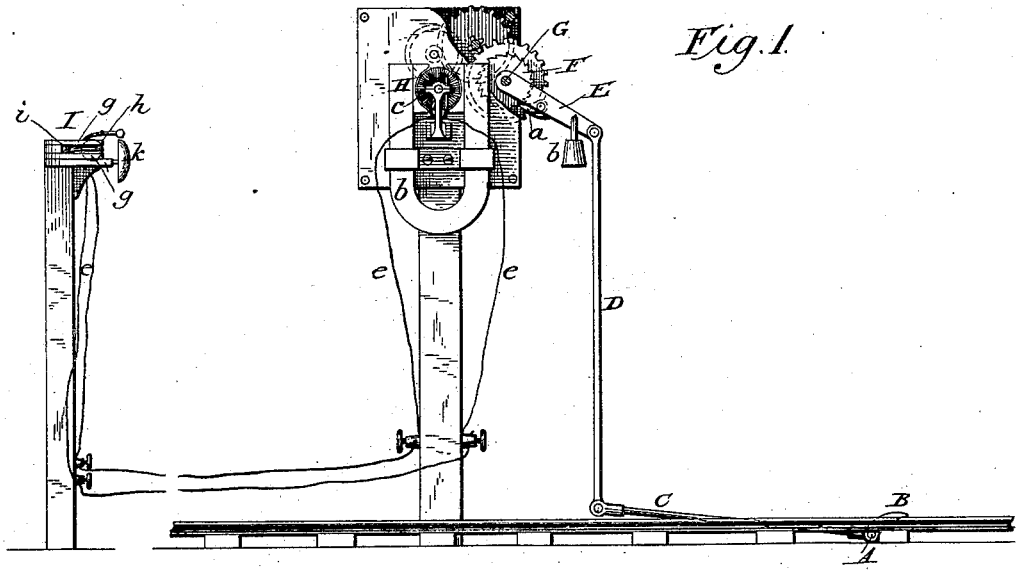


Fig. 2.

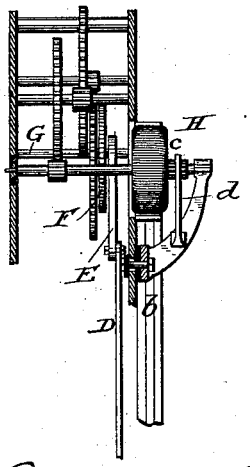


Fig. 3.

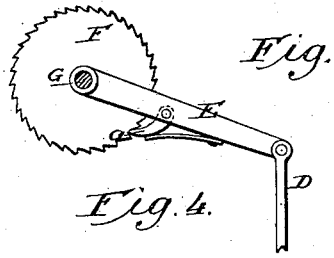
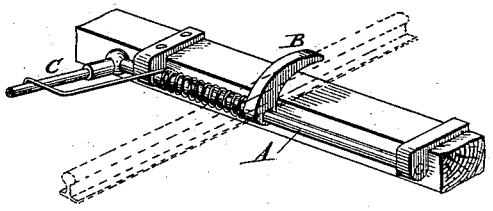


Fig. 4.



Attest

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MAGNETO-ELECTRIC RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 303,567, dated August 12, 1884.

Application filed July 29, 1880. Renewed July 21, 1884. (Model.)

To all whom it may concern:

Be it known that I, WESLEY W. GARY, of Boston, in the county of Suffolk and State of Massachusetts, have invented certain Improvements in Apparatus for Operating Electric Railway-Signals, of which the following is a specification.

My invention relates to the operation of magneto-electric generators through the agency of passing railway-trains for producing an electric current to operate railway-signals, &c., and in the combination of said generator with signals provided with an operating-magnet.

The invention consists in the combination, with a railway-signal and operating-magnet, of a rotary magneto-machine and appliances, substantially as hereinafter described, to effect the rotation of the armature by the movement of a passing train of cars to secure a prolonged current of electricity; in the combination of a rotary magneto-generator with mechanism 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 operate upon it; also, in the combination, with a rotary magneto-generator, of appliances to effect the rotation of the armature by the movement of a passing train of cars.

It also consists in minor features and combinations, hereinafter specified.

In my apparatus the direct force or action of the train is applied for the accumulation or storage of power which, after the action of the train has ceased, is utilized to actuate the generator.

Referring to the accompanying drawings, Figure 1 represents a face view of my improved apparatus, the parts being broken away to show the mechanism more clearly. Fig. 2 is a vertical section through the driving-gear from front to rear. Figs. 3 and 4 are enlarged views of parts.

Various attempts have hitherto been made to operate magneto-electric generators through the agency of passing trains to secure momentary or instantaneous impulses, and, in connection with vibratory generators, producing currents of the character indicated, good results have in some cases been attained. It is to overcome the difficulties incident to the employment of the vibratory generators that the present invention is mainly directed. Where a steady, continuous, or prolonged current is desired to control a signal, a rotary generator of any of the various approved forms known in the art will give the best results. The driving of such generators at very high speeds through intermediate gearing and clutches by the direct action of the railway-train is attended with objections and dangers which are not encountered when the motion of the train is applied to accumulate or store up the necessary power, which is subsequently applied to operate the generator.

The details of my apparatus may be modified in various ways without departing from the spirit of my invention, the construction represented in the drawings producing highly satisfactory results.

The apparatus shown consists simply of a rock-shaft, A, arranged at right angles to the track, and provided with a curved arm or tappet, B, which is located by the side of one of the rails in position to be acted upon by the wheels of a passing train, and with a second arm, C, extending in the opposite direction, and having its outer or upper end 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 shaft in the frame which contains the gearing. The swinging or 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 a shaft, G, upon which the arm or lever E is pivoted. The teeth of the ratchet-wheel are inclined, so that as the arm or lever rises the pawl will slip past them. Upon the same shaft with the ratchet-wheel is secured the first wheel of a train of gearing, through which motion is transmitted to the armature of a rotary magneto-electric generator, H, of any desired form or construction.

The arm E, rod D, or arm C may be weighted or 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 constructed and ar-

ranged as described, it will be seen that upon the passing of a wheel 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 car-wheel moves over the tappet or lever, the arm E will fall and its pawl will engage with the teeth of the ratchet-wheel, rotating the shaft G with its wheel, and through the latter the train of gearing, and finally the armature of the generator. This action is repeated to a greater or less extent after the passage of each wheel, the lever E falling a greater or less distance, according to the interval occurring between the wheels, until the last one 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.

As before stated, the rotary generator may be of any suitable type. The generator represented in the drawings is of the well-known Gramme pattern, consisting of the circular armature *c*, arranged to revolve between the poles of the field-of-force magnets *b*, and of commutators or conducting fingers *d*, by which the current generated is transmitted to the conducting-wires *e*. In machines of this type, as is well understood by all persons skilled in the art, the successive currents or impulses generated by this machine are of a constant polarity, so that when the machine is driven at a sufficiently high speed a practically continuous and prolonged current is transmitted to the conductors. When the machine is driven at a sufficiently slow speed, the intervals occurring between the successive impulses will impart to the current an intermittent or pulsatory action.

The signal with which the generator is connected is provided with a controlling-magnet to be actuated by the current from the generator. The signal I, represented in the drawings, is constructed as follows: Two polarized armatures, *g*, separated at a suitable distance, having reverse poles arranged opposite to each other, are arranged at a short distance apart. Between these poles a vibrating electro-magnet, *h*, is arranged, its poles being extended between the permanent magnets, as shown. The coil of this electro-magnet forms a portion of the circuit through the conductors *e*. The magnet is suspended, as shown, by an arm, *i*, which admits of its vibrating freely, and is provided with a hammer or striker to act upon the bell *k*. If the gearing is of such character as to drive the generator at slow speeds, no devices other than those above described are necessary, as the intermittent current will cause the electro-magnet to attract the upper magnet and be lifted so as to raise the hammer and then be released so as to fall and effect the striking of the bell, this vibratory action continuing as long as the generator continues to rotate.

Having thus described my invention, what I claim is—

1. The combination, with a railway-signal and operating-magnet, of a rotary magneto-generator and appliances, substantially as described, to effect the rotation of the armature by the movement of passing trains of cars to secure a prolonged current of electricity, substantially as described and shown.

2. The combination, substantially as described, of a rotary magneto-generator, a train of gear for imparting motion thereto, a weight or its described equivalent for operating said gear, and appliances, substantially as described, for elevating said weight from passing railway-trains.

WESLEY W. GARY.

Witnesses:
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