

(Model.)

W. W. GARY.

MAGNETO ELECTRIC RAILWAY SIGNAL.

No. 303,567.

Patented Aug. 12, 1884.

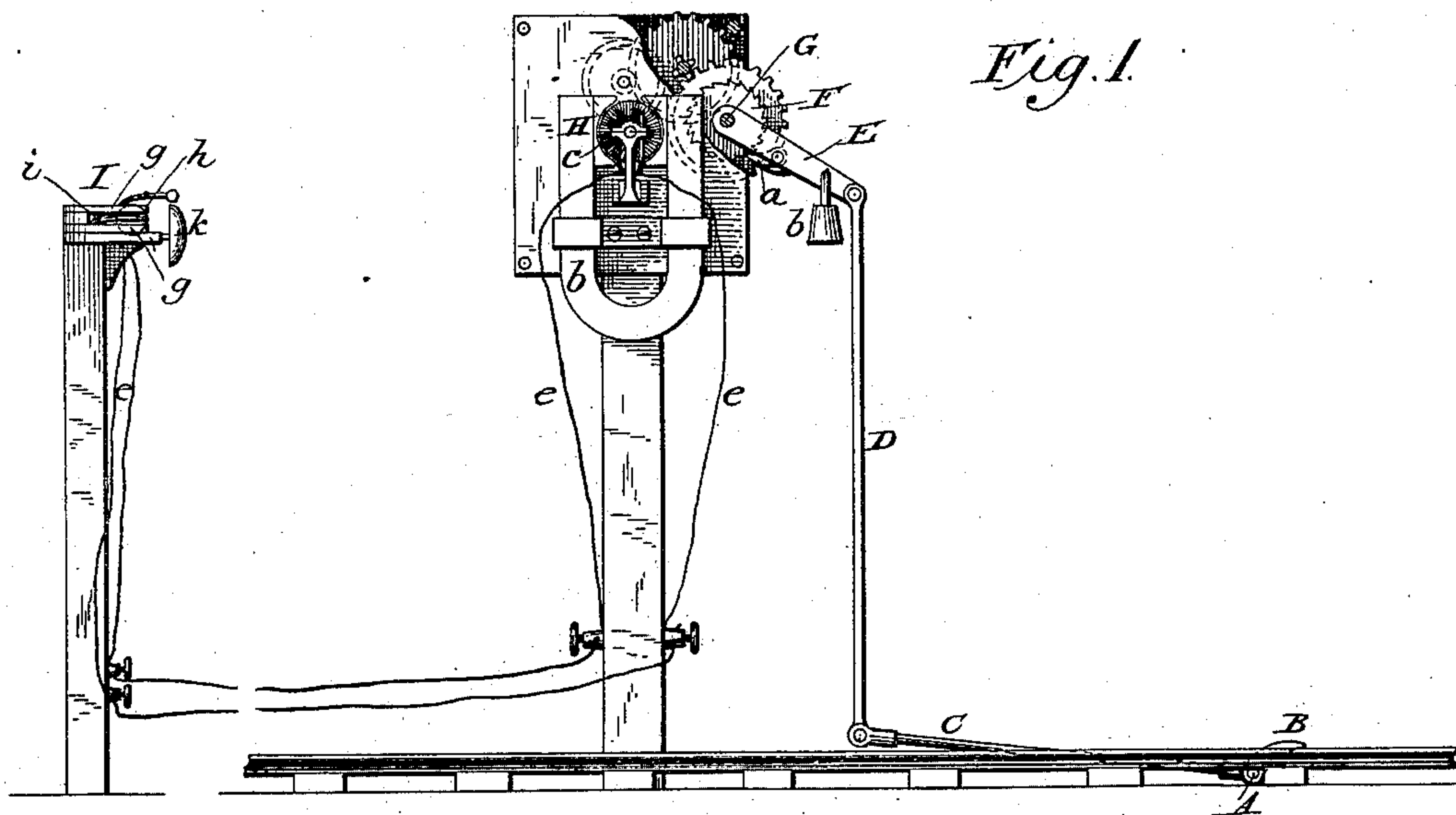


Fig. 2

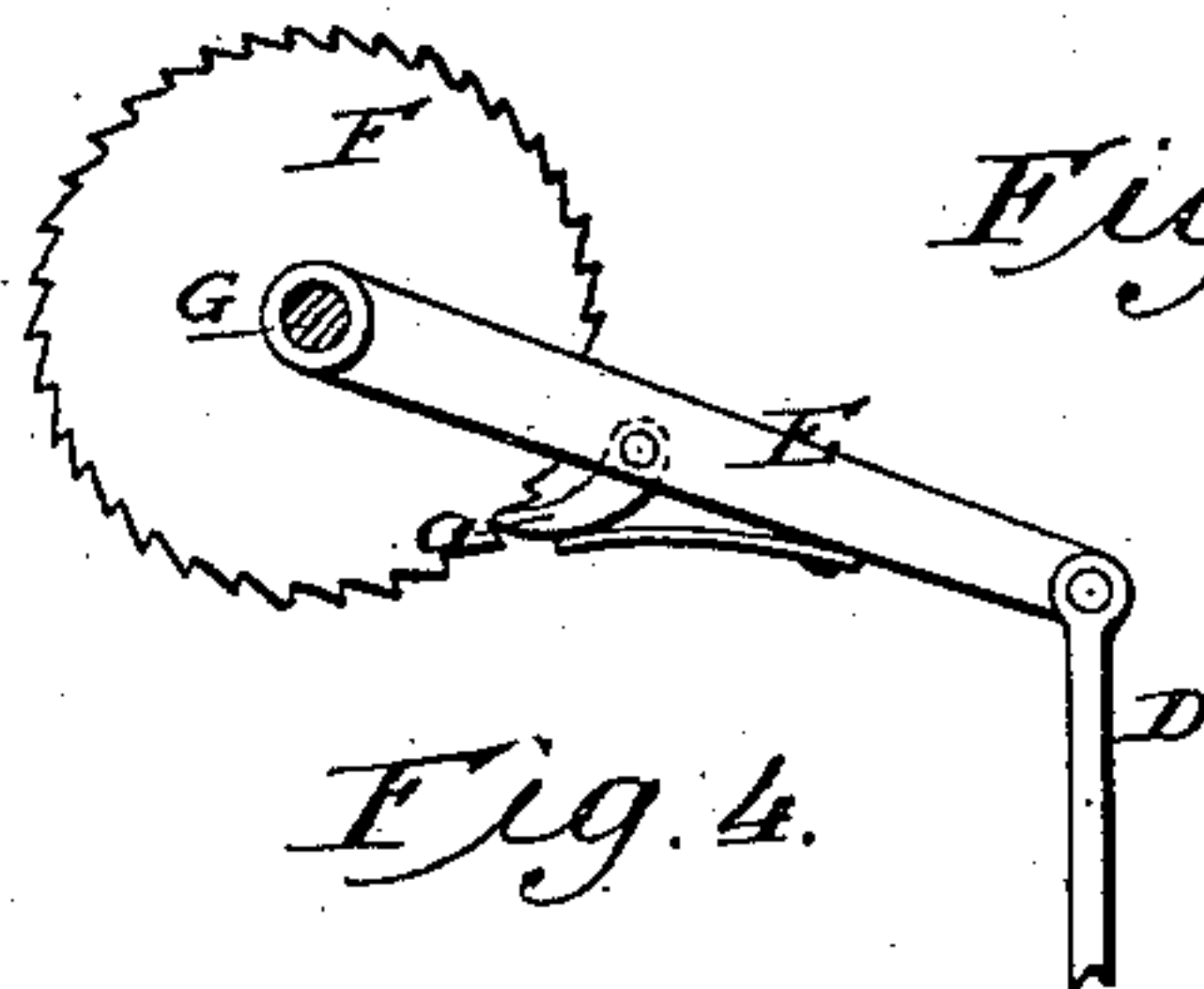
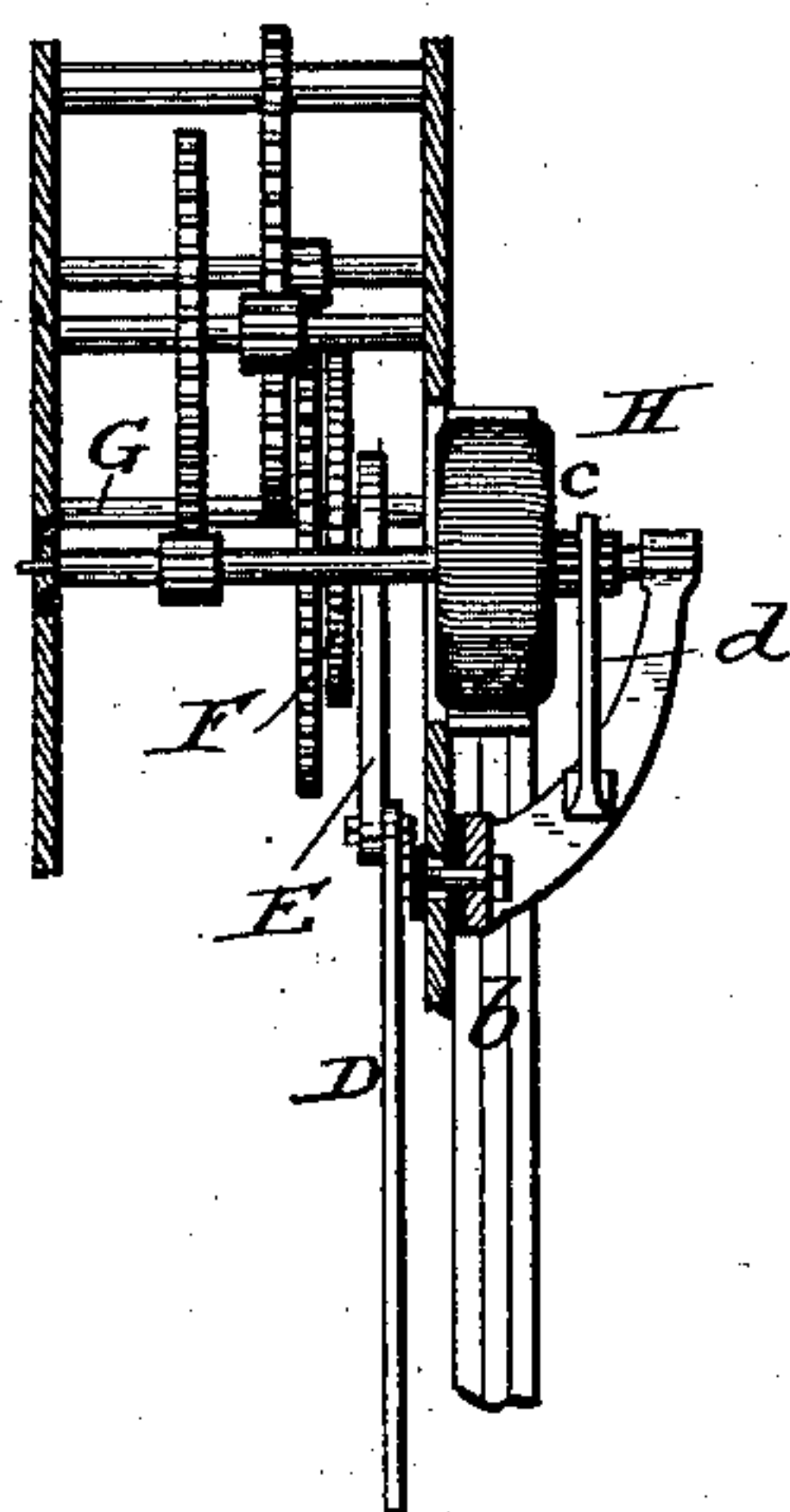
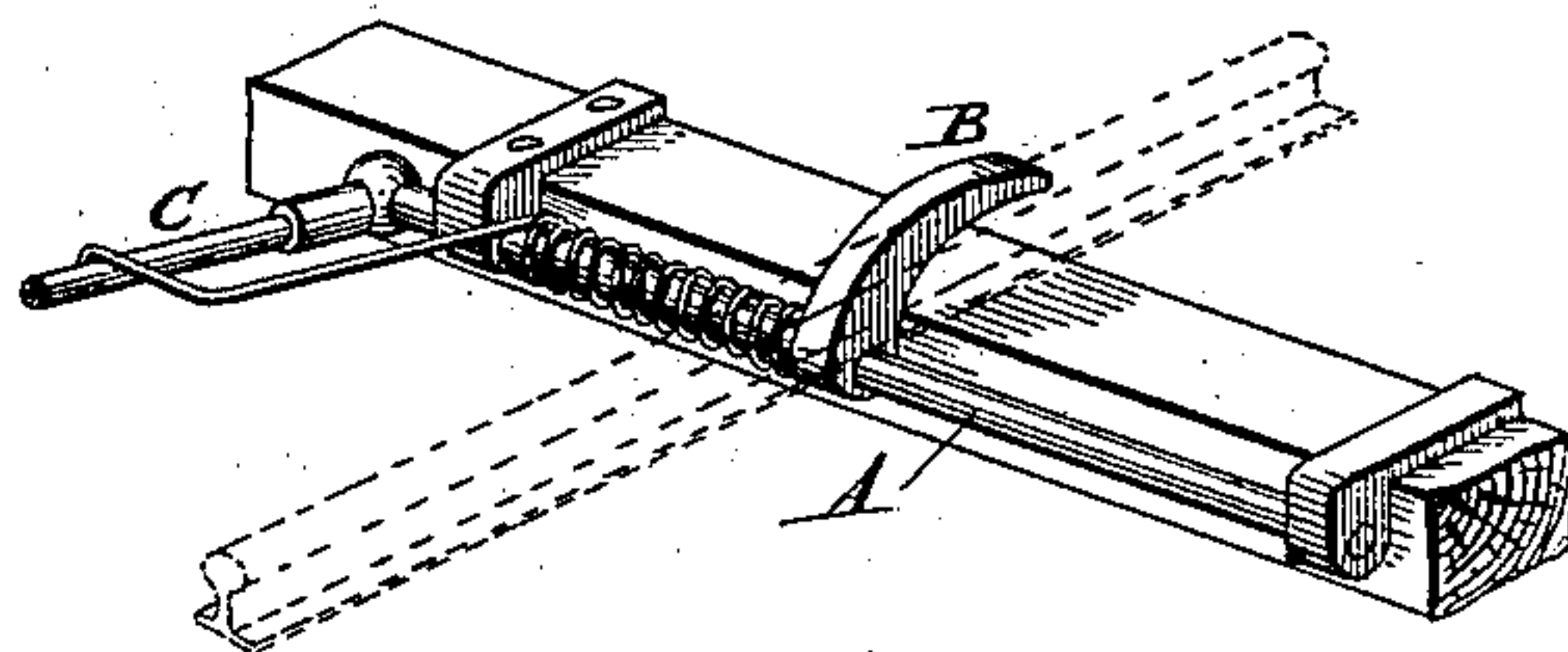


Fig. 3.

Fig. 4.



Attest

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UNITED STATES PATENT OFFICE.

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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 ele-
 5 vated. As the car-wheel moves over the tap-
 pet 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
 10 armature of the generator. This action is re-
 peated to a greater or less extent after the
 passage of each wheel, the lever E falling a
 greater or less distance, according to the in-
 terval occurring between the wheels, until the
 15 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
 20 be of any suitable type. The generator rep-
 resented 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
 25 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
 30 generated by this machine are of a constant
 polarity, so that when the machine is driven
 at a sufficiently high speed a practically con-
 tinuous and prolonged current is transmitted
 to the conductors. When the machine is
 35 driven at a sufficiently slow speed, the inter-
 vals occurring between the successive impulses
 will impart to the current an intermittent or
 pulsatory action.

The signal with which the generator is con-
 40 nected is provided with a controlling-magnet
 to be actuated by the current from the gener-
 ator. The signal I, represented in the draw-

ings, is constructed as follows: Two polarized
 armatures, *g*, separated at a suitable distance,
 having reverse poles arranged opposite to 45
 each other, are arranged at a short distance
 apart. Between these poles a vibrating elec-
 tro-magnet, *h*, is arranged, its poles being ex-
 tended between the permanent magnets, as
 shown. The coil of this electro-magnet forms 50
 a portion of the circuit through the conduct-
 ors *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 55
 is of such character as to drive the generator
 at slow speeds, no devices other than those
 above described are necessary, as the intermit-
 tent current will cause the electro-magnet to
 attract the upper magnet and be lifted so as 60
 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 65
 claim is—

1. The combination, with a railway-signal
 and operating-magnet, of a rotary magneto-
 generator and appliances, substantially as de-
 scribed, to effect the rotation of the armature 70
 by the movement of passing trains of cars to
 secure a prolonged current of electricity, sub-
 stantially as described and shown.

2. The combination, substantially as de-
 scribed, of a rotary magneto-generator, a train 75
 of gear for imparting motion thereto, a weight
 or its described equivalent for operating said
 gear, and appliances, substantially as de-
 scribed, for elevating said weight from pass-
 ing railway-trains.

WESLEY W. GARY.

Witnesses:

WILLIAM W. DODGE,
 GEO. F. GRAHAM.