(No Model.)

W. G. ROOME.

RAILWAY GATE.

No. 567,657. Patented Sept. 15, 1896.

Fig. 1

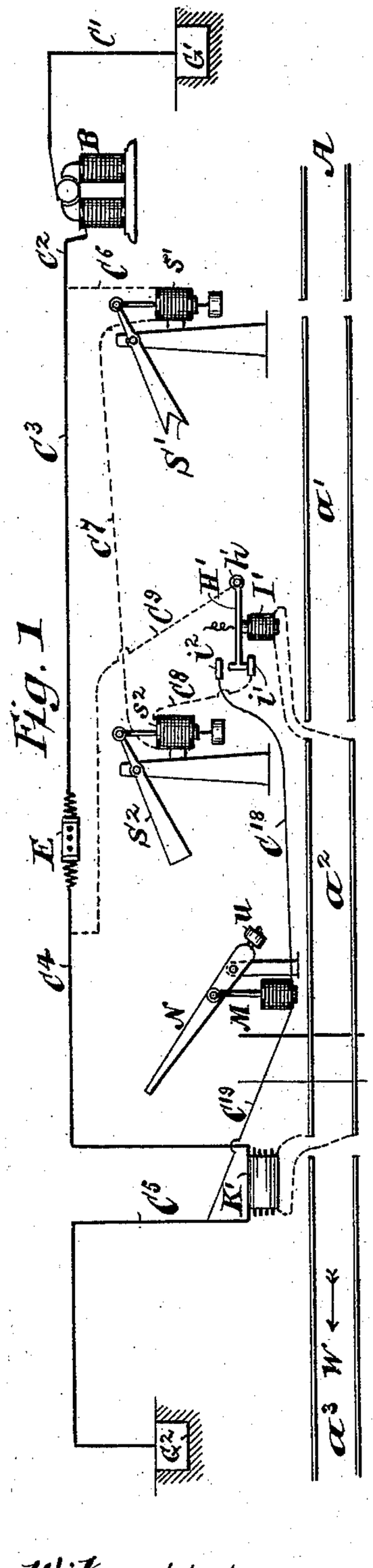


Fig. 2

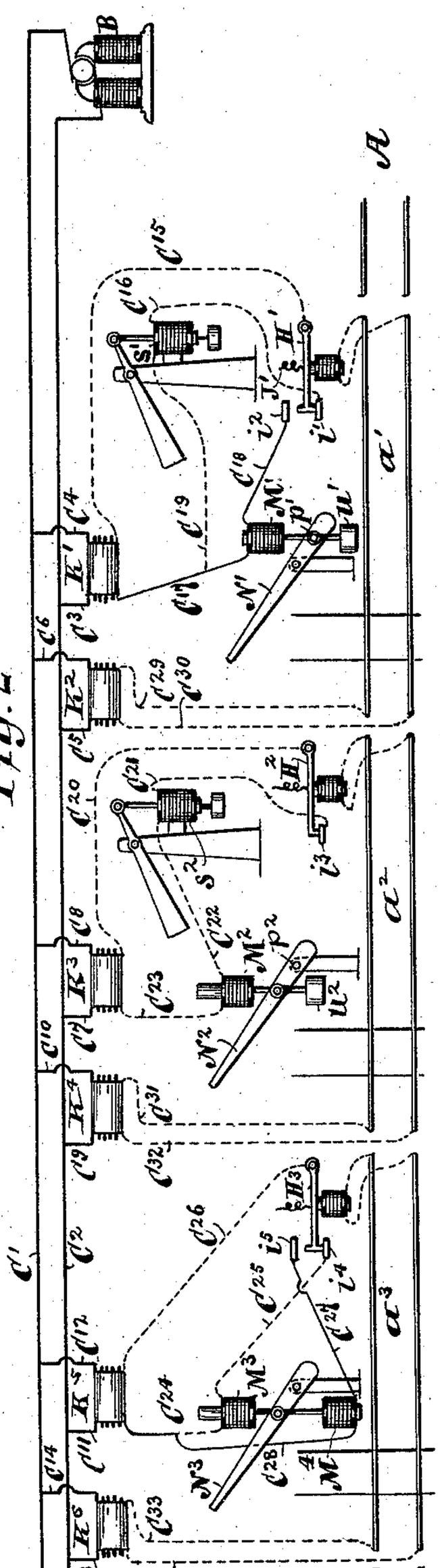
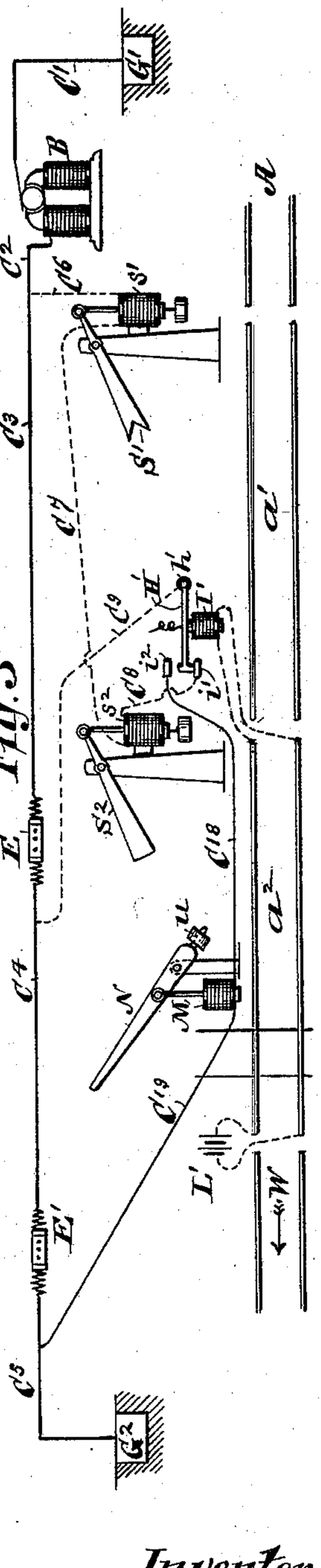


Fig. 3



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RAILWAY-GATE.

SPECIFICATION forming part of Letters Patent No. 567,657, dated September 15, 1896.

Application filed November 17, 1893. Serial No. 491,256. (No model.)

To all whom it may concern:

Be it known that I, WILLIAM G. ROOME, of the city of Jersey City, in the county of Hudson and State of New Jersey, have invented a certain new and useful Improvement in Railway-Gates, of which the following is a specification.

The construction which forms the subject-matter of this application is specially adapted for use in connection with such a construction as is shown in Patent No. 558,565, granted to me April 21, 1896.

I will describe my improvement in detail, and then point out the novel features in the claims.

In the accompanying drawings, Figure 1 is a diagrammatic view of a portion of a railway track and appurtenances embodying my improvement. Fig. 2 is a diagrammatic view illustrating other modified means for operating my improvement. Fig. 3 illustrates other modified means for operating my improvement.

Similar letters of reference designate corresponding parts in all the figures.

Referring first to Fig. 1, A designates a railway-track of ordinary or any suitable construction. It may be regarded as one of the tracks of a double-track railroad on which trains may travel in the direction indicated by the arrow *w*.

B designates an arbitrary representation of a dynamo-electric machine. The machine I use may be of any desired type. This dynamo is intended to supply current for certain gates or signaling devices employed in the system.

The track A comprises a number of sections a' a^2. The section a' may be regarded as a section extending from a depot or station. The rails comprised in each track-section are intended to be made electrically continuous. This may be done by means of fish-plates, chairs, or other devices made of metal and electrically connecting the ends of abutting rail-sections. A simple way of connecting adjacent rail-sections comprised in the track-section is to fasten the ends of a wire between each pair of adjacent rail-sections. The rails comprised in each track-section are, in this example of my invention, electrically independent of those comprised in every other track-section. Their electrical independence may be secured by employing chairs or fish-plates of insulating material, such as wood, between the rails comprised in one track-section and those comprised in each adjacent track-section.

In this example of my improvement I use what may be regarded as a main circuit comprising all the signals and protecting devices, and I also use a track circuit or circuits. In each track-circuit the rails of one of the track-sections is comprised.

I will first describe the main circuit and its appurtenances. C' designates a wire leading from one pole or electrode of the dynamo-electric machine B to the ground. As here shown it is represented as connecting with a ground-plate G'. C^2 designates another wire extending from the other pole or electrode of the dynamo-electric machine. This wire extends to a point where the main circuit branches, one branch C^3 extending to one terminal or contact point of a resistance device E and the other branch C^6 extending to one end of the coil of an electromagnet s' belonging to a cautionary signal S'.

From the other end of the coil of the electromagnet s' a wire C^7 extends to one end of the coil of an electromagnet s^2 belonging to a danger-signal S^2. From the other end of the coil of this magnet a wire C^8 extends to a contact-piece i' belonging to the circuit-changer H', here shown as consisting of a lever fulcrumed at one end to a pin h' and having at the other end a contact-piece which is adapted to coact with the contact-pieces i' i^2.

From the circuit-changer H' a wire C^9 extends and connects with the wire C^4, extending from the resistance device E.

The resistance device E in that branch of the main circuit comprising the wires C^3 C^4 is employed to make this circuit branch approximately correspond in resistance with the other branch of the main circuit comprising the wires C^6 C^7 C^8 C^9, and comprising the coils of the magnets s' s^2 belonging to the signals S' S^2 and the circuit-changer H'.

The main-circuit wire C^4 extends to one extremity of one of the coils of a transformer K'. This transformer may be of any suitable construction comprising low and high potential coils. If a direct-current dynamo be

used, a dynamotor (sometimes called a "motor-dynamo") or direct-current transformer would be preferable. In other cases the ordinary alternating-current transformer or any other kind would suffice. This transformer K′ is employed to furnish current of low potential to the track-circuit, comprising the rails of the track-section a^2, the wire C^4 being connected with one extremity of the high-potential coil of the transformer. From the other extremity of the high-potential coil of the transformer a wire C^5 extends to the ground, represented here by a ground-plate G^2.

From the extremities of the low-potential coil of this transformer wires are extended to the ends of the rails comprised in the track-section a^2. From the ends of the rails at the other end of the section a^2 wires are connected with the magnet I′ of the circuit-changer H′, thus completing this track-circuit and energizing the magnet I′ when there is no train on the track-section a^2.

When the magnet I′ controlling the circuit-changer H′ is deënergized and the circuit-changer leaves the contact-piece i', it will in this example of my improvement impinge against the contact-piece i^2 and establish another branch circuit comprising a wire C^{18} and a wire C^{19}. The wires C^{18} and C^{19} connect with the ends of the coils of an electromagnetic device M, which may consist of a solenoid or of an electromagnetic motor capable of producing even a greater movement. The wire C^{19} connects with the wire C^5. The electromagnetic motor M is intended to operate a gate N, located at a crossing, to lower the gate. Normally the gate will be maintained by a weight u in an elevated position. It is understood that when any track-section is short-circuited out by the passage of a train, car, or locomotive over it the gate controlled by the circuit comprising that section will be lowered.

In Fig. 2 I have shown three different blocks or sections of track, each of which is operated independently of every other block or section. In the track-sections a' a^2 of the track A, I have shown signals connected with the gates, but as this is not necessary I show the section a^3 of the track A without any signal in connection with the gate controlled by that section. It will also be noticed that each section of the track A has locally-independent circuits energized from transformers K′ K^2 K^3 K^4 K^5 K^6, these transformers being energized from the dynamo B, but in this example of my invention being connected with the dynamo B in multiple arc. In its wiring each of the local circuits of the several track-sections a' a^2 a^3 of the track A is shown slightly different from the rest. I have done this simply to show different means of operating my gates.

The magnet, solenoid, or electromagnetic motor M′ operating the gate controlled by the track-section a' is normally out of circuit, the gate N′ being normally raised by a weight u'. When a train enters the track-section a', the magnet of the circuit-changer H′ is shunted out of circuit and the circuit-changer is shifted by means of the spring J′ so as to impinge against the contact-piece i^2 of this circuit-changer, energizing the magnet, solenoid, or electromagnetic motor M′, raising the back part of the gate N′, which is pivoted at a point p', and raising the weight u' and lowering the front end of the gate over the crossing.

The wires C^{15} C^{16} C^{17}, circuit-changer H′, contact-piece i', signal-magnet s', and the ends of the coil of the transformer K′ which are not connected to the wires C^3 C^4 form the normal local circuit for the track-section a', and the wires C^{15} C^{18} C^{19} C^{17} form with the coil of the magnet M′ of the gate N′ and contact-piece i^2, together with the same coil of the transformer as in the other local circuit, another circuit through the gate-magnet, lowering the same.

Coming now to the track-section a^2, a transformer supplies energy for a local circuit in this track-section a^2 from one of its coils, the other coil being connected by wires C^7 C^8 to the wires C′ C^2. This is transformer K^3 and from the terminals of the coil supplying energy to the local circuit wires C^{20} and C^{23} extend. The wire C^{20} leads to a circuit-changer H^2, and from a contact-piece i^3 the circuit is continued by wire C^{21} to one end of the coil of an electromagnet s^2 belonging to a signal. From the other end of this coil a wire C^{22} extends to the gate-magnet or electromagnetic motor M^2 belonging to the gate N^2. This gate has combined with it a weight and is pivoted at a point p^2. From the other end of the coil of the magnet M^2 the wire C^{23} returns the circuit to the transformer.

The gate N^2, controlled by the second track-section a^2, is connected with its magnet M^2 on the reverse side of the pivot p^2 to that of the gate N′ of track-section a'. The magnet of the gate N^2 tends to hold the gate open and upon this magnet becoming deënergized by its circuit being interrupted by the circuit-changer H^2 the weight u^2 will pull the gate down and close it over the crossing.

The gate N′ of the track-section a' has its magnet connected to the reverse side of the pivot p' to that of the gate N^2, and here the magnet M′ is normally out of circuit and the gate is held open by the weight u'. When the circuit-changer H′ shifts its contact-piece from the normal position against the contact-piece i', so as to connect with the contact-piece i^2, the magnet M′ is energized, and by lifting the back end of the gate lowers the other end across the crossing.

In the track-section a^3 the gate N^3 has two magnets combined with it, one for lowering and one for raising. The magnet M^3 is normally in circuit through the wires C^{26} C^{25} C^{24}, contact-piece i^4, and one of the coils of the

transformer K^5, the other coil of this transformer being connected to the wires $C' C^2$ by wires $C^{11} C^{12}$.

The magnet M^3 tends to keep the gate N^3 open. A magnet M^4 is connected to the lower side of the gate and tends to close the same whenever the circuit-changer H^3 shifts its contact from the contact-piece i^4 to the contact-piece i^5 through the wires $C^{27} C^{28}$.

The dynamo B has leading from it wires $C' C^2$. From these wires the transformers $K' K^2 K^3 K^4 K^5 K^6$ are supplied with energy by means of the wires C^3 and C^4, C^5 and C^6, C^7 and C^8, C^9 and C^{10}, C^{11} and C^{12}, C^{13} and C^{14}, respectively.

The transformers K^2, K^4, and K^6 are intended to energize the track-circuits $a' a^2 a^3$, respectively. They are connected from their low-potential coils to their respective track-circuits by wires $C^{29} C^{30} C^{31} C^{32} C^{33} C^{34}$, respectively, the other end of these track-circuits being connected to the coils of the circuit-changers $H' H^2 H^3$, respectively.

Fig. 3 is similar to Fig. 1, with the exception that the transformer K is dispensed with and a track-battery L' takes its place and supplies the track-circuit a^2 with a low-potential current.

A resistance device E' has been also added to compensate for the removal of the transformer K. This resistance device E' should be proportioned so as to be as near the resistance of the magnet M of the signal N as possible.

What I claim as my invention, and desire to secure by Letters Patent, is—

1. A common source of electrical energy supplying power to a number of sections of a block system, a gate operated from said common source, a transformer energized by power from the common source, and a track circuit or circuits comprised in the low-potential circuit of said transformer and serving to control the operation of the gate, substantially as specified.

2. A common source of electrical energy supplying power to a number of sections of a block system, a gate operated from said common source, a transformer energized by a power from the common source and serving to control the operation of the gate, and a track circuit or circuits governing the action of the transformer, substantially as specified.

3. In a block system the combination of a number of sections, a common source of power, one or more transformers for the sections energized from the common source of power, a track-circuit comprising the rails of a section included in the low-potential circuit of the transformer and a gate operated from the common source of power and controlled in its operation by a track-circuit, substantially as specified.

4. In a block system comprising a series of gates and a series of signals, the combination of a number of sections, a common source of power, one or more transformers for the sections energized from the common source of power, a track-circuit comprising the rails of a section included in the low-potential circuit of the transformer, said series of gates and signals being operated from the common source of power and controlled in their operation by a track-circuit, substantially as specified.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

WILLIAM G. ROOME.

Witnesses:

ANTHONY GREF,

WILLIAM M. ILIFF.