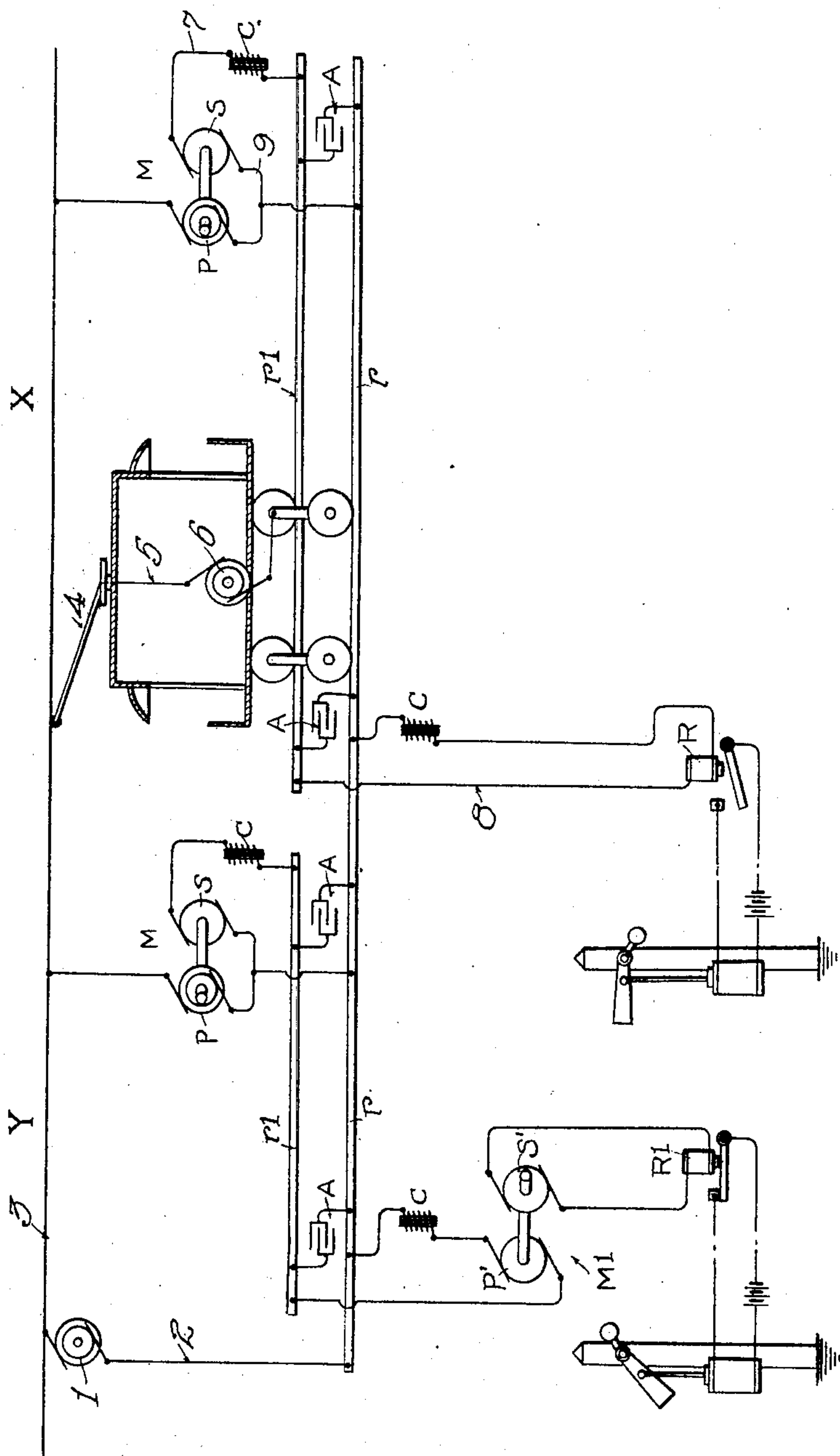


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PATENTED APR. 4, 1905.

W. G. ROOME.
SIGNAL SYSTEM FOR RAILWAYS.
APPLICATION FILED DEC. 19, 1904.



Witnesses

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UNITED STATES PATENT OFFICE.

WILLIAM G. ROOME, OF LOS ANGELES, CALIFORNIA.

SIGNAL SYSTEM FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 786,316, dated April 4, 1905.

Application filed December 19, 1904. Serial No. 237,420.

To all whom it may concern:

Be it known that I, WILLIAM G. ROOME, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented a new and useful Signal System for Railways, of which the following is a specification.

My invention consists, broadly, in providing means for operating an electric-railway system by an alternating current and signaling or other devices by a direct current and utilizing the movement of the cars actuated by the alternating current to control the movements of the devices actuated by the direct current.

My improved signaling system may also be used for other purposes, and I wish it understood that I consider myself to be the first to suggest and show how a direct current may be impressed upon an alternating current and transmitted through the conductors upon which the alternating current is flowing and utilized through devices actuated by the alternating current to actuate mechanism for signaling or otherwise.

The accompanying diagram will serve to illustrate my invention.

Referring to the diagram, 1 indicates a source of alternating current, here shown as an ordinary alternating-current dynamo, for generating the operating-current for the cars. One of the dynamo-terminals is connected by a wire 2 to one of the main conductors of the system, here shown as the lower or continuous rail r and which may be one of the ordinary rails on which the cars run. The opposite terminal of the dynamo is connected to the main or feeder conductor 3. The operating-circuit to the car is completed through trolley 4, car-wiring 5, motor 6, thence to the car-axles and to rail r in the usual manner.

The block-sections are formed by dividing one of the running-rails, such as r' , shown in the drawing as the upper rail, into sections corresponding to the length of block required. These track-sections have impressed upon them a direct current from the motor-generators m . The primary coils p would preferably consist of alternating-cur-

rent motors whose circuit is connected across from the feeder 3 to the lower or return feeder rail r and may be considered as rotating continuously normally. The secondary coils s may consist of a direct-current generator one of the terminals of which is connected by the wire 7 to the choking-coil or reactance device C, thence to the rail r' , wire 8, coil of track-relay R, choking-coil or reactance device C, rail r , and wire 9 to the other terminal of the generator. The choking-coils or reactance devices C are for the purpose of preventing the alternating current that would escape to the rail r' from passing through the direct-current apparatus sufficiently to interfere with its operation. As an extra protection to these direct-current apparatus the condensers A may be connected to the rails r and r' in multiple with the generator or track-relay, so as to provide a shunt around them for the escaping alternating currents. The wheels and axle of the car crossing the rails r and r' in section X would act to shunt the direct current from the relay R, and the signal would be set to "danger" in the usual manner. The combined action of the choking-coil or reactive device C and the condenser A would prevent any interference by the alternating current flowing through either or both of the rails r and r' . A further protection may be added by inserting a motor-generator, such as M' , in section Y in circuit between the rails and the track-relay R' . The primary coil p' may consist of a direct-current motor arranged so as not to rotate with alternating current. The secondary coil would consist of a generator for energizing the track-relay R' . If there be no car on this block or section, the motor-generator M at the other end of the section would be impressing a direct current upon this section, and this direct current would operate the direct-current motor or primary coil p' of M' , and the secondary coil s' would generate current to close the circuit of relay R' , and its signal would be set to "safety" in the usual manner. A pair of wheels and axles shunting the rails of this section would deprive primary coil p' of sufficient direct current to rotate it, and the

secondary coil s' would not generate the current to energize magnet of R' , and this signal would be then set to "danger" in the ordinary manner.

5 It is quite a common occurrence to have the contacts of track-relays fused together by lightning or heavy escaping foreign currents, and the arrangements of circuits here shown will provide an effective remedy for
10 overcoming this.

What I claim is—

1. A signaling system comprising a source of alternating current, a source of direct current, a common return for both currents,
15 motor-vehicles actuated by the alternating current, signaling devices actuated by the direct current, and means controlled by the movement of the motor-vehicle for controlling the movement of the signaling devices.

20 2. A signaling system comprising a source of alternating current, a source of direct current, a common return for both currents, motor-vehicles actuated from the source of alternating current, signaling devices actuated from the source of direct current, and
25 means carried by the moving vehicles and adapted to shunt the direct current around the signaling devices.

3. A signaling system comprising a source
30 of alternating current, a source of direct current, a common return for both currents, a choking-coil in series with the source of direct current, signaling devices operated from said source and connected to one of the rails
35 and to the common return, cars actuated by the alternating current, and carrying means that will shunt the direct current around the signaling devices.

4. A signaling system comprising a source
40 of alternating current, a source of direct current, a common return for both currents, a choking-coil in series with the source of direct current, signaling devices operated from said source and connected in series with a
45 choking-coil to one of the rails and the common return, cars actuated by the alternating current, and carrying means that will shunt the direct current around the signaling devices.

50 5. A signaling system comprising a source of alternating current, a source of direct current, a common return for both currents, a choking-coil in series with the source of direct current, signaling devices operated from
55 said source and connected in series with a

choking-coil to one of the rails and the common return, cars actuated by the alternating current, and carrying means that will shunt the direct current around the signaling devices, and a condenser connected to the direct-current circuit so as to form a by-path for the alternating current around the direct-current apparatus.

6. A signaling system comprising a source of alternating-current energy, a source of direct-current energy, a working circuit, a series of branch circuits connected to said working circuit, signaling devices in said branch circuits, a motor-vehicle in said working circuit, means for transmitting the alternating-current energy to the motor-vehicle, means for transmitting the direct-current energy to the signaling devices, and the interposed means whereby the direct and alternating currents will be limited to certain defined
75 paths.

7. A signaling system comprising a source of alternating-current energy, a working circuit, a motor-vehicle in said working circuit and arranged to operate from said alternating-current energy, a series of electrically-operated and electrically-controlled signals, a series of motor-generators, one at each block for transforming the alternating current to one of direct current for the track-circuits,
85 the track-circuit formed of the secondary winding of the motor-generator, the track-rail, and either the wheels and axles of the train or the relay at block, and electrical connections substantially as shown and described.

8. A signaling system comprising a source of alternating-current agency, a working circuit, a motor-vehicle in said working circuit and arranged to operate from said alternating-current energy, a series of electrically-operated and electrically-controlled signals, a series of direct-current track-circuits, one at each block comprising the track-rails and circuit to signaling apparatus, and a motor-generator in said circuit arranged to rotate only with the direct current.

In testimony whereof I have hereunto set my hand, at Los Angeles, California, this 10th day of December, 1904.

WILLIAM G. ROOME.

In presence of—

ARTHUR P. KNIGHT,
JULIA TOWNSEND.