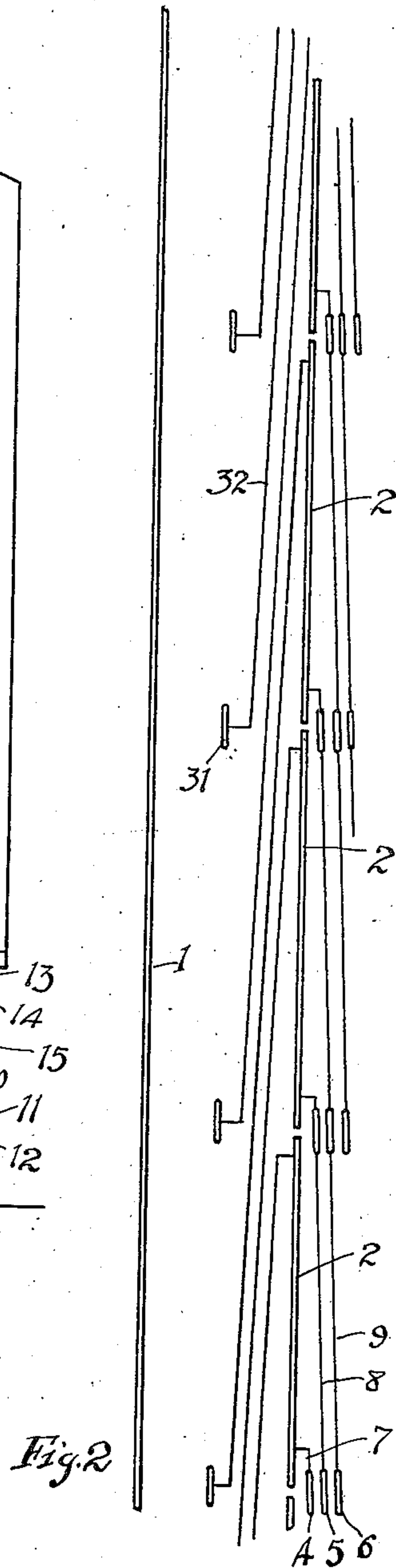
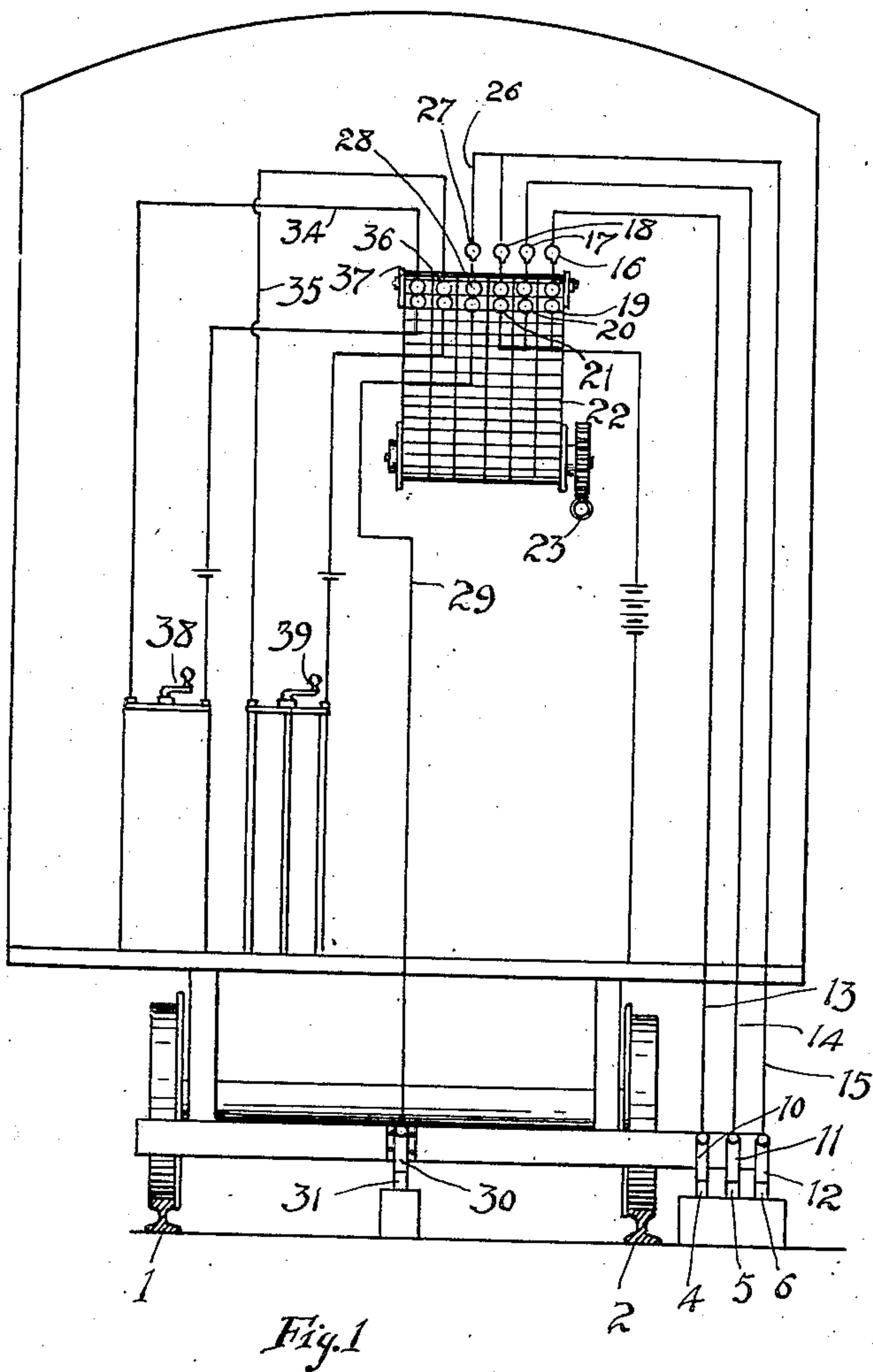


P. J. SIMMEN.
ELECTRIC BLOCK SIGNAL SYSTEM.
APPLICATION FILED APR. 22, 1908.

910,593.

Patented Jan. 26, 1909.



WITNESSES:

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ELECTRIC BLOCK-SIGNAL SYSTEM.

No. 910,593.

Specification of Letters Patent.

Patented Jan. 26, 1909.

Application filed April 22, 1908. Serial No. 428,570.

To all whom it may concern:

Be it known that I, PAUL J. SIMMEN, a citizen of the United States, residing at Los Angeles, in the county of Los Angeles and State of California, have invented new and useful Improvements in Electric Block-Signal Systems; of which the following is a specification.

The present invention is an improvement upon that for which U. S. Letters Patent were granted to me May 1st, 1906, No. 819,677, and its objects are, first, to provide means whereby a record may be kept of the signals furnished by the block system there shown, thus fixing the responsibility on the engineer in case of accident caused by neglect of said signals, second, to provide means for indicating to the engineer of a moving train or car any fault or break in the system, thus preparing him for a failure of the system to give the proper signal, and third, to provide means for recording the operations of the controller and air brake of the train or car, and thus furnish a check upon careless and wasteful driving of the same.

In the accompanying drawing, Figure 1 is a diagram of the circuits in the cab; Fig. 2 of those on the track.

Referring to the drawing, 1. indicates an electrically-continuous rail of a track, the other rail being divided into sections 2, electrically separated from each other. At the side of the track, and opposite to the end of each such section 2, are arranged parallel contact rails 4, 5, 6, three being here shown, although there may be any desired number in each group. These rails 4, 5, 6, are connected by wires 7, 8, 9, respectively, with the successive sections 2 in advance. With said rails 4, 5, 6, respectively, contact, as the train passes, shoes or other contact makers 10, 11, 12, connected respectively by wires 13, 14, 15, with signaling devices 16, 17, 18, which, in the manner described in said Letters Patent, are actuated when a train is on the track one, two, or three blocks ahead.

In the present invention, in addition to the signaling devices, the circuits pass through electromagnets 19, 20, 21, which, when energized, mark, by mechanism common for this purpose, a recording sheet 22, on a roller revolved by a time-controlled mechanism 23. Thus, should at any time a train be on the track one, two or three blocks ahead, the fact is permanently recorded, and in case of the en-

gineer or motorman neglecting the signal said record fixes the responsibility upon him.

With the construction disclosed in said Letters Patent, should a wire from one of the contact rails to the track section become broken, or should the electric circuit be accidentally disconnected in any way, the signaling devices would not act when a train was on the proper sections of the track to cause them to act. To provide for this contingency, I now connect a wire 26, preferably with the wire 15 corresponding with the section in the system farthest ahead, which wire 26 passes through a signaling device 27 and electromagnets 28, similar to those already provided, and thence by a wire 29 to a shoe or other contact maker 30 adapted to contact with a test contact rail 31 between the rails of the track, same rail being connected by a wire 32 with that section 2, which is also connected with the rail 6. The circuit is then closed when the shoe 30 arrives at the rail 31 and gives a signal, providing that the main signaling connections, including wires 7, 8, 9, are all intact. If the engineer receives no signal at the device 27, he knows that the system is out of order, and must there take proper precautions to prevent collisions without the assistance of the block system.

In city and suburban electric lines great waste of power occurs through careless operation of the motors and air brakes by reason of the motorman using his brake to check the car instead of reducing the current. To furnish a check upon the actions of the motorman in this respect, there are provided circuits 34, 35, which pass through electromagnets 36, 37, which, in like manner with those already described, mark on the recording sheet when these circuits are closed, the operations of the controller 38 and the air brake handle 39 respectively, thus furnishing a permanent record of the manner in which the car is driven at each trip.

I have herein shown the system as installed for trains running in one direction only on a pair of rails. It will readily be seen that the system needs only to be duplicated, that is, each contact rail and wire repeated for the other rail and the conductors connected across the track to the blocks or sections of the divided rail in order to extend the system for trains running in both directions. Such a duplication is seen by com-

parison of Figs. 1 and 2 of U. S. Patent granted to me May 1st, 1906, No. 819,677.

As in my prior patent referred to, the word "rail" in the claims is to be understood in its broad sense.

I claim:—

1. In an apparatus of the character described, the combination with a moving train or car, of a series of signaling devices, and a series of recording devices, corresponding to the respective signaling devices, all carried by said train or car, and a series of mechanisms, arranged at successive points in the track, for individually actuating simultaneously said signaling and recording devices, substantially as described.

2. In an electrical block signal system for railways, the combination of an electrically continuous rail of a track, electrically insulated sections of the other rail of a contact rail arranged adjacent to each such section at a convenient point therefor, an electrical connection between said contact rail and a section in advance of the adjacent section, a contact maker, a signaling device, and a circuit through the signaling device, and the wheel axle, all carried by the moving train or car, means for supplying electricity to said circuit, a test signaling device carried by the moving train or car, and means for actuating said test signaling device, automatically operated by the passage of the train or car only when the circuit from the main contact rail to the main signaling device is intact, substantially as described.

3. In an electrical block signal system for railways, the combination of an electrically continuous rail, of a track, electrically insulated sections of the other rail, a group of contact rails arranged adjacent to each such section at a convenient point therefor, electrical connections between the members of the group and successive sections in advance of the adjacent section, corresponding contact makers, signaling devices, and circuits through the signaling devices and the wheel axle, all carried by the moving train or car, and means for actuating said test signaling device, automatically operated by the passage of the train or car only when the circuit from the main contact rail and one of the main signaling devices is intact, substantially as described.

4. In an electrical block signal system for railways, the combination of an electrically continuous rail of a track, electrically insulated sections of the other rail a group of contact rails arranged adjacent to each such section at a convenient point therefor, an electrical connection between said contact rail and a section in advance of the adjacent section, a contact maker, a signaling device and a circuit through the signaling device to the wheel axle, all carried by the

moving train or car, means for supplying electricity to said circuit, a test contact rail adjacent to the rear section, a wire leading therefrom to the section in advance, a test contact maker carried by the train or car and adapted to contact with said test contact rail, a wire from said contact maker to the circuit of the signaling device, and a test signaling device in said wire, substantially as described.

5. In an electrical block-signal system for railways, the combination of an electrically continuous rail of a track, electrically insulated sections of the other rail, a group of contact rails arranged adjacent to each such section at a convenient point therefor, electrical connections between the members of said groups and the successive sections in advance of the adjacent section, corresponding contact makers, signaling devices, and circuits through the signaling devices to the wheel axle, all carried by the moving train or car, means for supplying electricity to said circuits, a test contact rail adjacent to the rear section, a wire leading therefrom to a section in advance, a contact maker carried by the train or car, and adapted to contact with said test contact rail, a wire from said contact maker to the corresponding circuit to the signaling device, and a test signaling device in said wire, substantially as described.

6. In an apparatus of the character described, in combination with a movable train or car, mechanism adapted to be actuated by an operator on the train or car for controlling the movement thereof, a signaling device, mechanism for controlling said signaling device, a unitary recording device, and means for automatically recording thereon the actuation of each of said mechanisms, substantially as described.

7. In an apparatus of the character described, in combination with a movable train or car, mechanism adapted to be actuated by an operator on the train or car for controlling the movement thereof, a signaling device, stationary mechanism for controlling said signaling device, a unitary recording device, and means for automatically recording thereon the actuation of each of said mechanisms, substantially as described.

8. In an apparatus of the character described, in combination with a movable train or car, mechanism adapted to be actuated by an operator on the train or car for controlling the movement thereof, a signaling device, mechanism for controlling said signaling device, a unitary recording device carried by the train or car, and means for automatically recording thereon the actuation of each of said mechanisms, substantially as described.

9. In an apparatus of the character described, in combination with a movable train or car, mechanism adapted to be actuated by an operator on the train or car for controlling the movement thereof, a signaling device, stationary mechanism for controlling said signaling device, a unitary recording device carried by the train or car, and means for automatically recording thereon

the actuation of each of said mechanisms, 10 substantially as described.

In testimony whereof I have hereunto set my hand in the presence of two subscribing witnesses.

PAUL J. SIMMEN.

Witnesses:

H. C. HOUGHTON,
J. J. HURLEY.