No. 785,294. PATENTED MAR. 21, 1905.

P. S. DORLON.

RAILWAY SIGNAL.

APPLICATION FILED APR. 23, 1904.

3 SHEETS—SHEET 1.

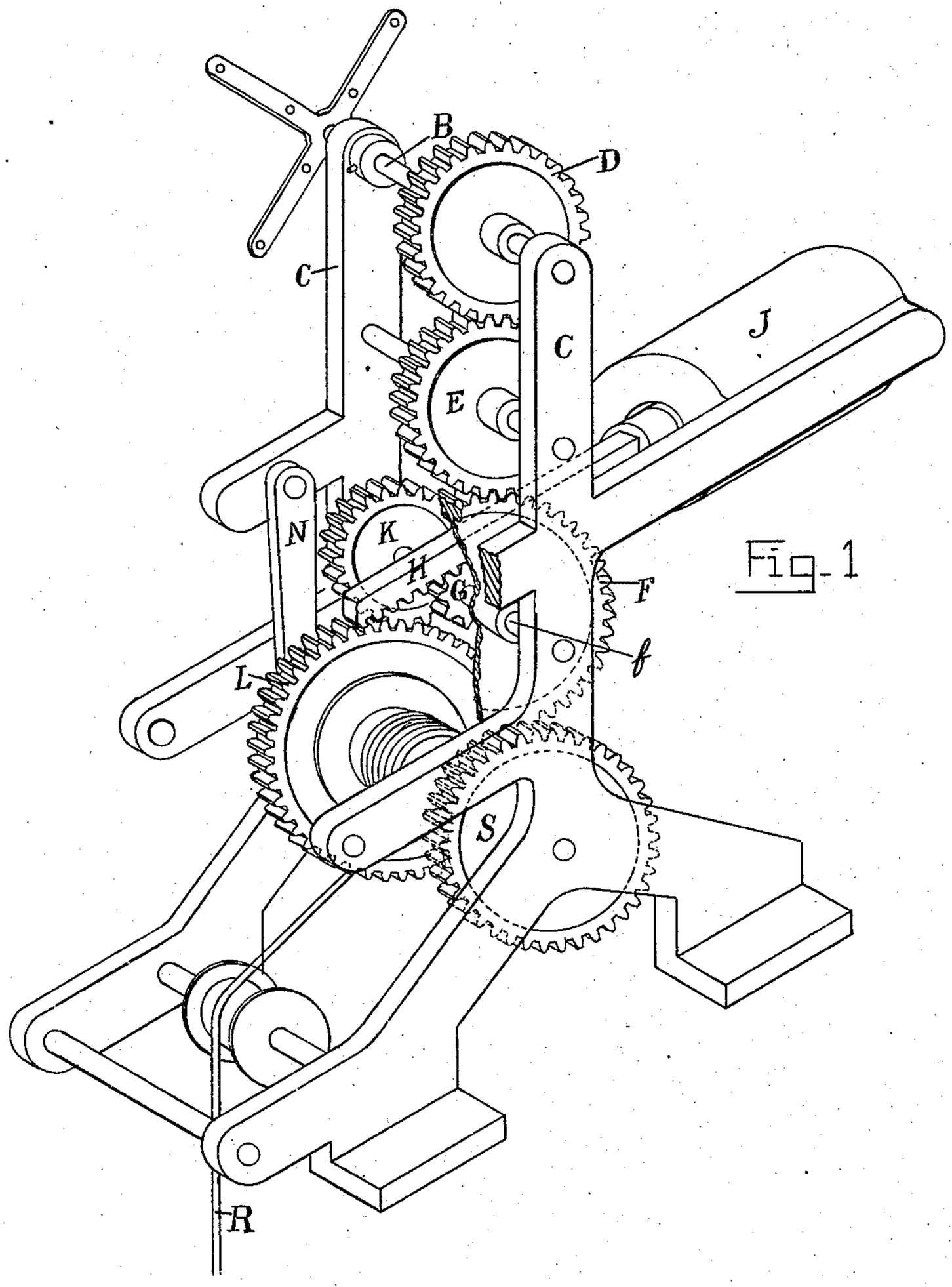

Fig. 1

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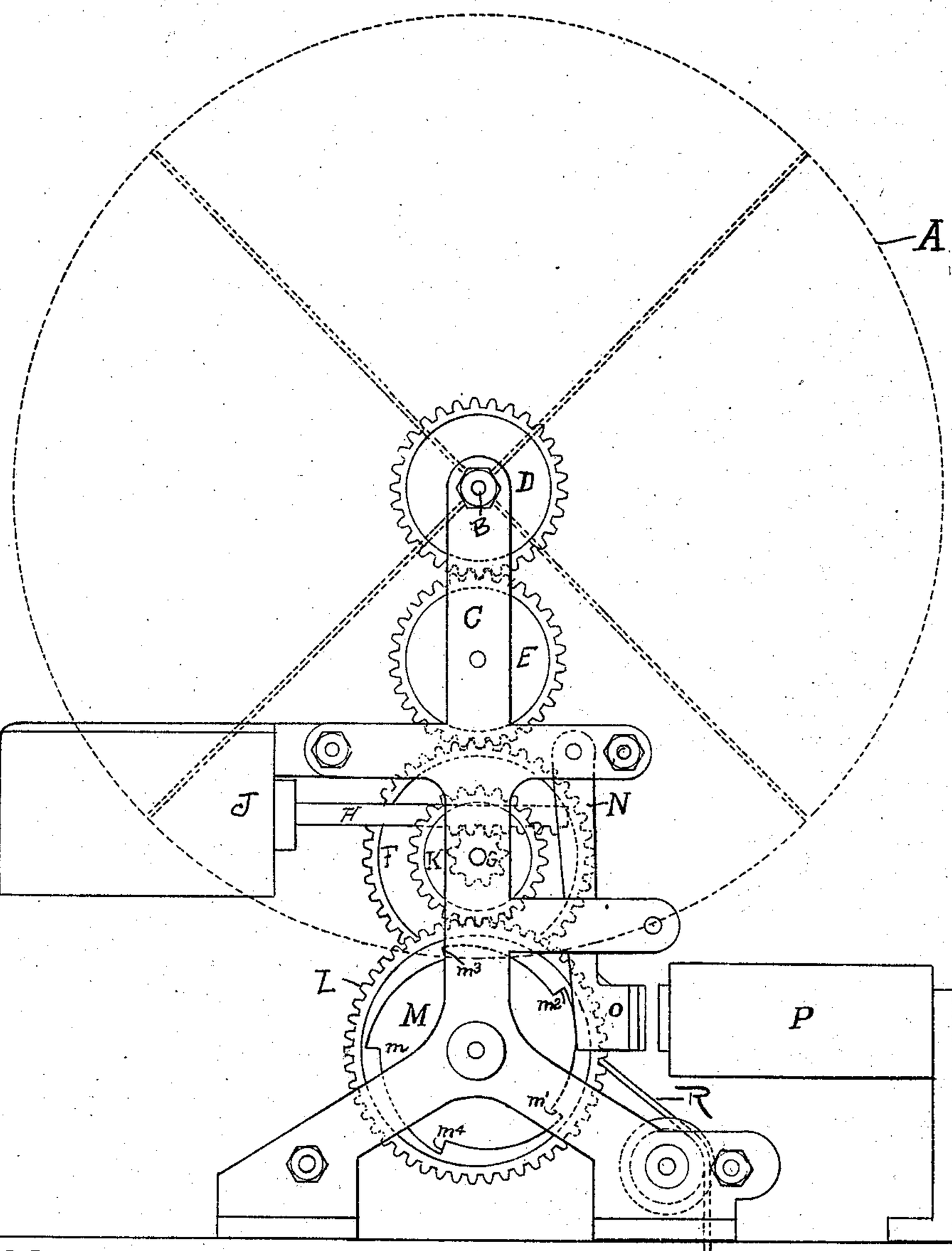
3 SHEETS—SHEET 2.

Fig 2



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3 SHEETS—SHEET 3.

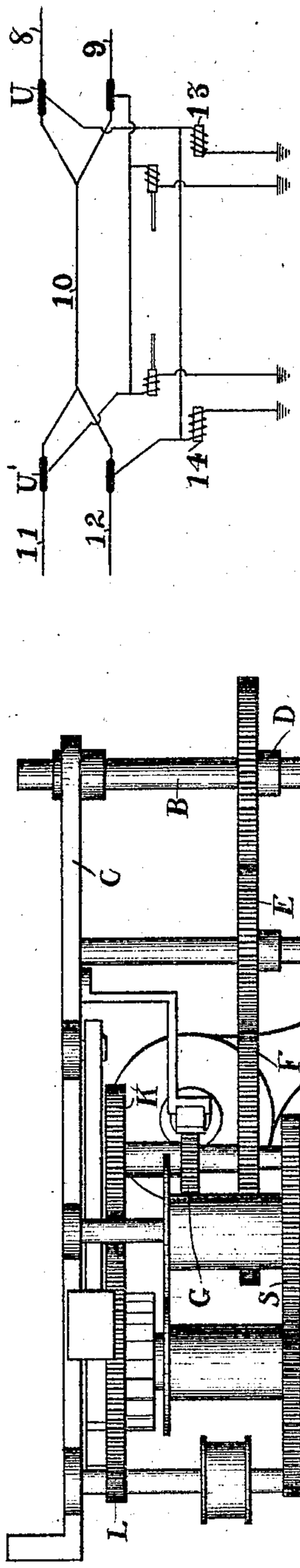

Fig. 7.

Fig. 3.

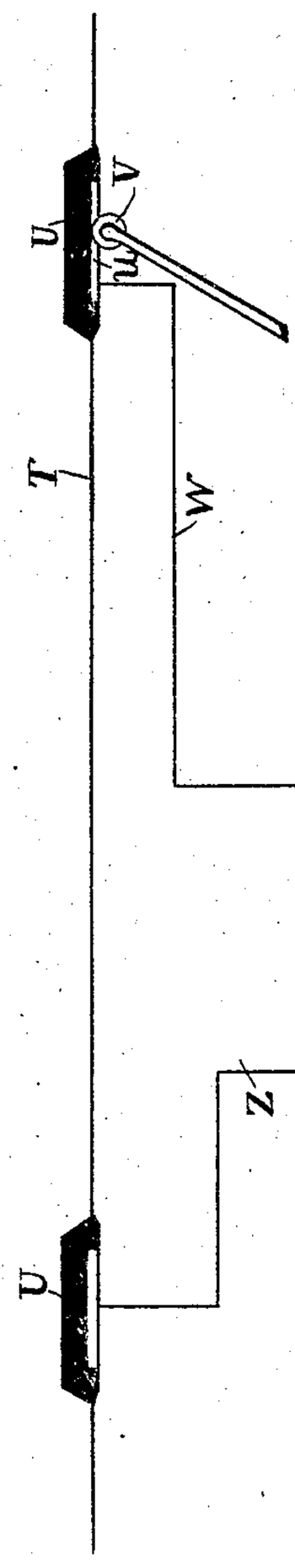

Fig. 4.

Fig. 5.

Fig. 6.

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No. 785,294. Patented March 21, 1905.

UNITED STATES PATENT OFFICE.

PHILIP S. DORLON, OF TROY, NEW YORK, ASSIGNOR OF ONE-HALF TO CHARLES B. McMURRAY, OF TROY, NEW YORK.

RAILWAY-SIGNAL.

SPECIFICATION forming part of Letters Patent No. 785,294, dated March 21, 1905.

Application filed April 23, 1904. Serial No. 204,574.

To all whom it may concern:

Be it known that I, PHILIP S. DORLON, a citizen of the United States of America, and a resident of the city of Troy, county of Rensselaer, and State of New York, have invented certain new and useful Improvements in Railway-Signals, of which the following is a specification.

My invention relates to devices for operating a railway semaphore or signal; and the object of my invention is to provide a signal which may be automatically set by a trolley-car when it approaches a predetermined place of danger and which will automatically return the signal when the car has passed the danger-point, together with the elements and combinations hereinafter more particularly described and claimed. I accomplish this object by means of the mechanism illustrated in the accompanying drawings, in which—

Figure 1 is a perspective; Fig. 2, an elevation; Fig. 3, an end elevation; Fig. 4, an elevation of the trolley connection, together with a diagram showing the wiring; Fig. 5, a plan of the trolley connection; Fig. 6, a side elevation of the trolley connection; Fig. 7, a plan of trolley connection with diagram of wiring where double and single trolley-sections unite.

Similar letters refer to similar parts throughout the several views.

It is often desirable in the operation of an electric-railway system to raise a signal showing when a car is about to pass from a double to a single track in order that a car coming in the opposite direction may not enter upon the single track at the time when the first-mentioned car is on the said track in order to prevent a collision. There are many other occasions when it is desirable to show by signal the approach of a car, and I simply refer to the foregoing as an example of one important use of my invention.

I preferably use a wheel A, having alternate sections of different colors, as white and red, dividing the wheel A preferably into four equal sections, as shown in Fig. 2. I secure the wheel on a spindle B, which spindle is mounted in frame C of my machine and which spindle carries a gear-wheel D, meshing with the gear-wheel E, which gear-wheel E is also mounted in the frame C. The gear-wheel E meshes with a gear-wheel F on the spindle *f*. Spindle *f* also carries a pinion G, with which the rack H engages, said rack being connected with the plunger of the solenoid J. As thus arranged, the movement of the rack will operate the signal-wheel A.

On the spindle *f* I mount the gear-wheel K, engaging with the gear-wheel L, and on one face of the gear-wheel L, I arrange a cam-wheel M, preferably with five shoulders *m*, m', m^2, m^3, and m^4. On one side of the cam-wheel M, I arrange for engaging the said cam-wheel the arm N, said arm being pivoted to the frame C and having an armature O attached thereto or constructed thereon near the end of the arm which is adapted to engage the cam-wheel M. The magnet P is placed within operative distance of the armature O in order that when it is energized it will attract the armature O and draw it away from contact with the cam-wheel M, which will permit the revolution of the spindle *f*, and therefore of the gear-wheel F and of the signal A. The magnet will remain energized but an instant, when gravity will cause the arm N to engage the cam-wheel M and come in contact with the next shoulder of the cam-wheel and prevent further movement of said cam-wheel. For the purpose of energizing the magnets and operating my mechanism I arrange in connection with the trolley-wire T an insulating contact-plate U, (see Fig. 4,) placing on one side of the insulating contact-plate a wire *t*, connecting with the trolley-wire T, (see Fig. 5,) and on the opposite side of said contact-plate a wire *u*, insulated from the trolley-wire. Thus when the trolley-wheel V comes to the contact-plate U one portion of the wheel will engage with the wire *t* and the other with the wire *u*, and a current will pass from the wire *t* through the trolley-wheel V to the wire *u*, to the wire W, which leads to the magnet P and which will energize

the magnet and attact the armature O, removing it from contact with the projection on the cam-wheel M.

The signal is rotated by means of a weight, which may be secured to the rope R, wound about the axle carrying the wheel L. The force of gravity will tend to rotate the wheel L and the pinion G, with which the rack engages. The signal will then be set at "danger," displaying, preferably, the red portion of the wheel A. The arm N engaging the next adjacent shoulder m' will stop the revolution or rotation of the cam-wheel M and prevent gravity from moving the signal past the danger-displayed portion. When the trolley reaches the contact-plate U', which is constructed and connected up in connection with the trolley T, as is the contact-plate U, the current will pass through the wire Z to the solenoid J, which will operate the rack H and rotate the wheel L, carrying the cam-wheel M in the direction opposite to that which the weight moved it, and when the shoulder m^2 has passed the arm N the signal will be rotated, so as to display the clear or white portion thereof, and the arm N engaging with the shoulder m^2 of the cam-wheel will prevent the return of the danger-signal until the magnet P has again been energized. It will be noted that when the magnet is energized and the arm N drawn therefrom the cam-wheel and the wheel are rotated by the action of gravity on the weight and the rack H is drawn out of the solenoid J.

I usually arrange the signals in pairs, as is shown in diagram in Fig. 7, thus arranging for the block-signal. I have shown two trolley-wires 8 and 9, arranged for a two-track road, and a single trolley 10, and, again, two trolleys 11 and 12. If we suppose the car to approach from along the trolley-wire 8, when it reaches the contact-plate U it will energize the magnet at the signal-station 13 and also the magnet at the signal-station 14, in each case relieving the cam-wheel and causing the weight to drop, setting the danger-signal. There will then be displayed at each end of the single track a signal which shows that the car is now on the single track 10. When the car passes off the track 10 onto the track 11, it comes in contact with the contact-plate U'. It will energize the solenoid at station 13 and also at station 14, and the racks at each station will rotate the wheel A and set the clear signal. A car passing along the wires 12 and 9 would perform a like result.

It will be noticed that should there by any chance any accident occur to prevent the solenoid from working or to prevent the successful operation of the apparatus the danger-signal would be the one that would be displayed, as it is the weight which sets that signal. The automatic movement of the weight is only interfered with by the also automatic gravity impelling movement of the arm N, and thus the danger-signal is the one that would be displayed in case of cutting or breaking the wire or other interference with the electric machinery.

I do not limit myself to the number of gears shown nor to the particular adjustment of the weight to the spindle carrying the wheel R. I might arrange the signal-wheel A so that one side should be heavier than the other, and thus cause rotation of the signal when the arm is brought out of contact with the cam-wheel by the energizing of the magnet.

It is understood that I house my whole signal apparatus, arranging for the display of but one "portion" or "section," as I have termed it, of the signal-wheel A. I also intend to arrange for placing a light behind the portion of the signal-wheel displayed in order that it may be distinctly seen at night. The signal-disk I preferably make of silk; but I do not limit myself to any particular material.

My apparatus is automatic, and it is so simple in its construction and operation that there is little or no danger of it becoming out of order.

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

1. In a signal device adapted for use in electric-railway systems; a signal-wheel having its face divided into sections differing in color; a number of gears adapted to rotate said signal; a cam-wheel connected with one of said gears; an arm arranged to engage said cam-wheel; an armature on said arm; a magnet in position to attract said armature, when said magnet is energized; a means for rotating said signal when said magnet is energized; a solenoid; a rack connected with the plunger of said solenoid; a pinion with which said rack engages, substantially as described.

2. In a signal device adapted for use in electric-railway systems; two contact-plates placed a distance apart; each of said contact-plates connected at each end with a trolley-wire of a railway system; each of said contact-plates containing a wire connecting a trolley-wire at the ends of said contact-plates; each of said contact-plates containing a wire insulated from the trolley-wire; one of said insulated wires connected with two magnets, arranged in parallel; the other of said insulated wires connected with two solenoids in parallel; a railway-signal adapted in rotation to display different colors; a means for rotating said signal; a means for holding said signal in position when said magnets are demagnetized; said magnets and solenoid and apparatus operating said signal so connected up that when said magnets are energized the "danger-signal" is shown and when the solenoid is energized the "clear-signal" is displayed.

3. In a signal device adapted for use in elec-

tric-railway systems; a means for conveying through the trolley-wheel of an electrically-propelled car a current to a wire insulated from the trolley-wire; with a means for carrying the current from said insulated wire to a magnet; an armature; a cam-wheel; an arm carrying said armature and engaging with the cam-wheel; a signal-wheel, having sections of different colors; gear-wheels connected with said signal-wheel; a weight secured to a rope wound about the axle of said cam-wheel; a solenoid; a means for energizing said solenoid, by a current passing through said trolley, substantially as described.

Signed at Albany, New York, this 11th day of April, 1904.

PHILIP S. DORLON.

Witnesses:

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FREDERICK W. CAMERON.