No. 890,942. PATENTED JUNE 16, 1908.

W. H. TURNER.

ELECTRIC SWITCH THROWING MECHANISM.

APPLICATION FILED APR. 18, 1907.

FIG. 1.

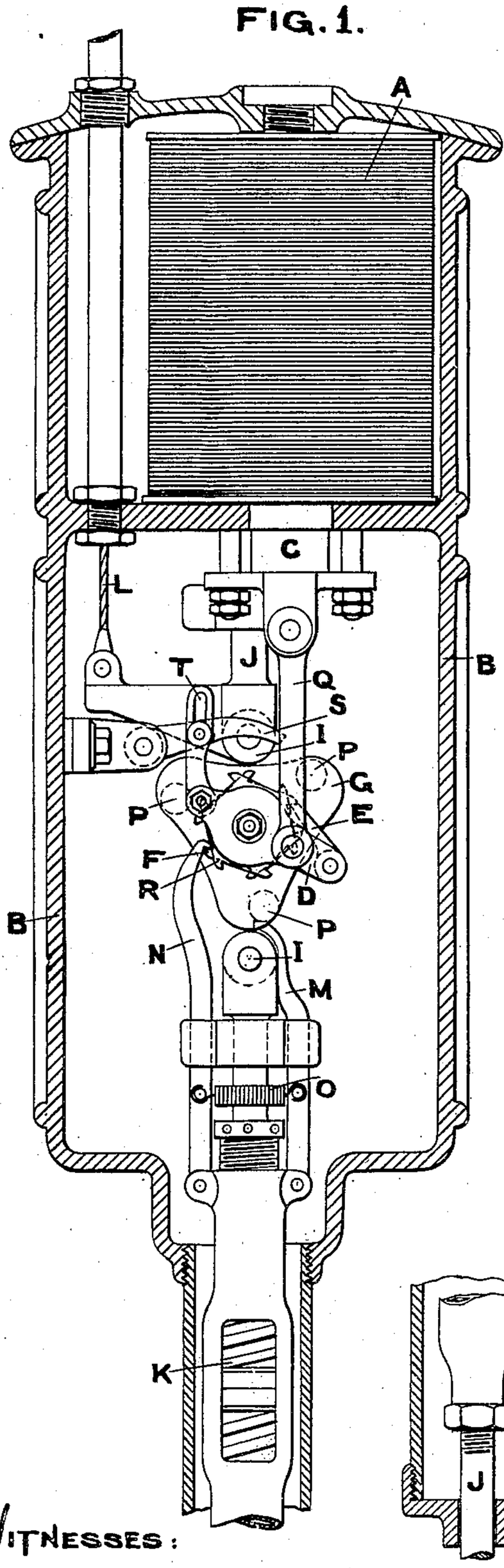
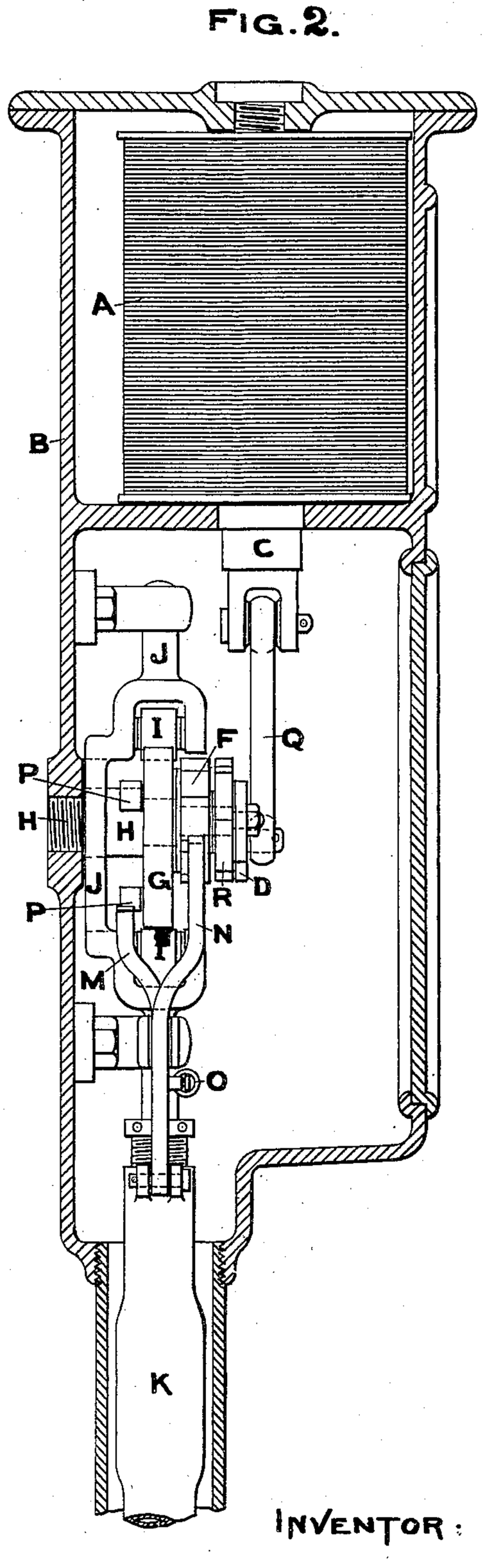


FIG. 2.



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ELECTRIC SWITCH-THROWING MECHANISM.

No. 890,942. Specification of Letters Patent. Patented June 16, 1908.

Application filed April 18, 1907. Serial No. 368,901.

To all whom it may concern:

Be it known that I, WILLIAM HERBERT TURNER, a subject of the King of Great Britain and Ireland, residing at Leeds, in the county of York, England, have invented certain Improvements in Electric Switch-Throwing Mechanism, of which the following is a specification.

This invention relates to apparatus for automatically controlling and operating the points of overhead cable electric railways and tramways.

Description of Drawings.

Figure 1 is a front elevation, and Fig. 2 a side elevation, of my improved apparatus, the inclosing box being in each case shown in section, and similar letters of reference being employed throughout to indicate corresponding parts.

According to my present invention a single electro-magnet or solenoid A is employed, and the whole of the actuating mechanism is inclosed within a small box or casing B which is fixed in any convenient position near the points, preferably in a vertical position upon the nearest street standard. The core C of the solenoid, which is held in its normal or outer position either by its own weight or under the influence of a suitable spring, is arranged in connection (by rod Q) with a small pawl lever D and pawl E, which in turn is arranged in gear with a six-toothed ratchet wheel F, upon the opposite face of which is carried a three-throw cam G, the said pawl lever, ratchet wheel, and cam being all mounted on a small pin or stud H which is fixed into the back of the casing B. The said three-throw cam G is adapted to work between a pair of runners or rollers I I carried by the rod J which actuates the rail points, this rod J being slotted over the stud H and being provided with the usual compensating spring K and with suitable lever and wire connections L to the overhead frog.

Any approved overhead mechanism can be used to control the energizing of the solenoid A, such as that shown in Patent No. 792,741, dated June 20, 1904, issued to myself and others.

The action of the apparatus is as follows:—A motorman wishing to enter the branch route and finding the points closed would, on approaching the overhead actuating switch, keep his motor controller on, so that the solenoid A would be energized and its core C drawn in. This movement turns the ratchet wheel F and three-throw cam G (by means of the aforesaid pawl lever D and pawl E) through one-switch of a revolution, drawing in the rod J and thereby opening the points and holding them firmly in that position. On the car having passed the overhead actuating switch, the solenoid circuit is broken and the core C automatically withdraws, the pawl E slipping back into the next notch of the ratchet wheel F in readiness for the next movement of the cam G. The points may be reversed by a similar forward movement of the three-throw cam G, this movement being effected either by the first car by means of a second overhead insulated contact plate placed in the branch cable, or by means of the aforesaid first actuating switch on the approach of the next succeeding car.

Provision is made for setting the cam G in its correct position in case the points are actuated by means of a hand lever or bar in the ordinary manner. For this purpose the point rod J is provided with a pair of extended fingers M, N, having connecting spring O, the finger M terminating in an incline engaging with a series of three small runners P on the cam G, and the other finger N terminating in a hook engaging with the teeth of the ratchet wheel F, so that a movement of the point rod J in either direction turns the cam G forward through one-sixth of a revolution. These fingers M and N insure the setting of the cam fittings in their correct positions at each movement of the points, no matter whether such movement be effected automatically or by hand.

To check the movement of the cam G when rotated under the action of the solenoid, and prevent it turning through more than one-sixth of a revolution, a second ratchet wheel R may be provided, this ratchet wheel being adapted to engage at the proper time with a second pawl S actuated from the lever D by means of a slotted rod T. When the points are moved by hand this second pawl S remains out of action.

If desired a suitable signal light or lights may be employed in connection with the apparatus, such light being controlled by any convenient mechanical means.

I claim:

1. The combination, with a solenoid, and its core; of a stationary shaft, a cam and a ratchet-toothed wheel secured together and

journaled on the said shaft, a lever mounted on the said shaft, a connecting-rod between the said lever and core, a driving-pawl pivoted to the said lever and engaging with the said ratchet-toothed wheel, and a rod for operating the points provided with rollers which bear on opposite sides of the said cam.

2. The combination, with a solenoid, and its core; of a stationary shaft, a cam and a ratchet-toothed wheel secured together and journaled on the said shaft, a lever mounted on the said shaft, a connecting-rod between the said lever and core, a driving-pawl pivoted to the said lever and engaging with the said ratchet-toothed wheel, a second ratchet-toothed wheel secured to the said cam, a pivoted check-pawl engaging with the last said ratchet-toothed wheel, a rod connected to the said lever and provided with a longitudinal slot for operating the said check-pawl, and a rod for operating the points provided with rollers which bear on opposite sides of the said cam.

3. The combination, with a solenoid, and its core; of a stationary shaft, a ratchet-toothed wheel and a cam provided with lateral projections secured together and journaled on the said shaft, a lever mounted on the said shaft, a connecting-rod between the said lever and core, a driving-pawl pivoted to the said lever and engaging with the said ratchet-toothed wheel, a rod for operating the points provided with rollers which bear on the opposite sides of the said cam, and two spring-controlled fingers carried by the said rod and engaging with the projections of the said cam and with the teeth of the said ratchet wheel respectively.

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Witnesses:

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