

(No Model.)

C. M. FITCH.
ELECTRIC RAILWAY SWITCH.

No. 516,731.

Patented Mar. 20, 1894.

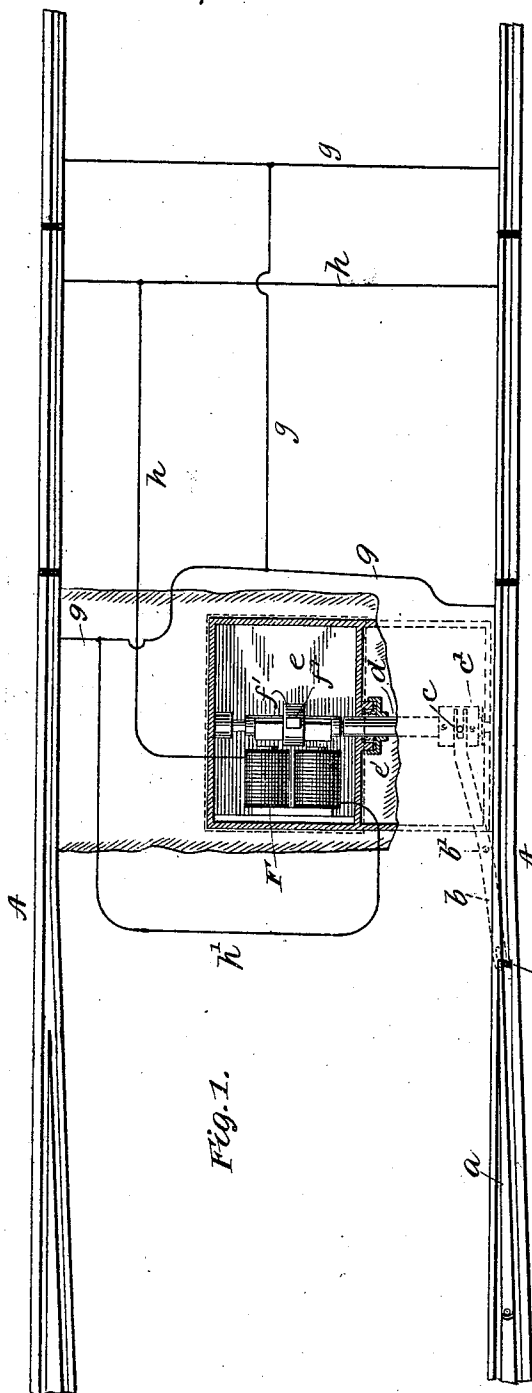


Fig. 1.

Fig. 2.

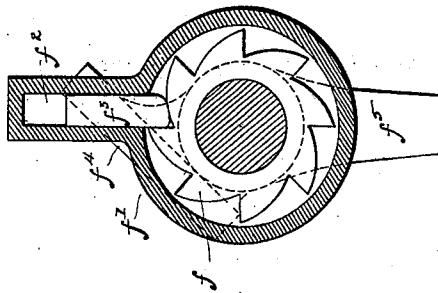


Fig. 3.

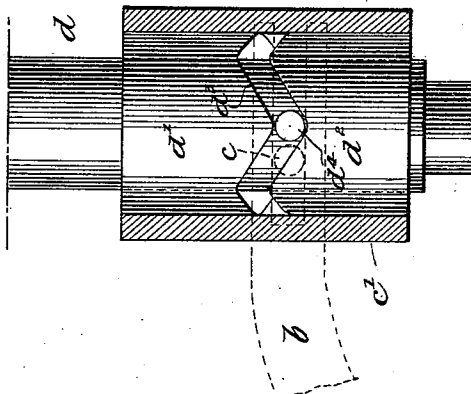
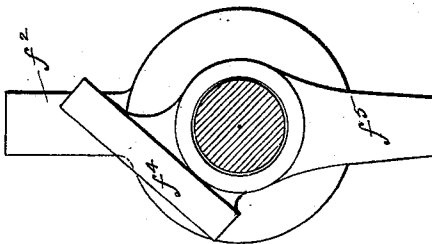


Fig. 4.



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UNITED STATES PATENT OFFICE.

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FITCH EXCELSIOR SWITCH COMPANY, OF NEW JERSEY.

ELECTRIC RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 516,731, dated March 20, 1894.

Application filed June 17, 1893. Serial No. 477,899. (No model.)

To all whom it may concern:

Be it known that I, CHARLES M. FITCH, a citizen of the United States, residing at South Norwalk, in the county of Fairfield and State of Connecticut, have invented certain new and useful Improvements in Electric Railway-Switches, of which the following is a full, clear, and exact description.

My invention relates to mechanism for automatically throwing the switch point of a railway track upon the approach of a car or train.

The invention is a modification of the apparatus shown in my Patent No. 493,991, dated March 21, 1893, consisting in substituting an electro-magnet to operate the switch in place of the mechanical device and arrangement described in said patent.

In the accompanying drawings, Figure 1 represents a plan of a roadway equipped with my improved apparatus. Fig. 2 is a transverse section of the main shaft taken through the ratchet wheel case. Fig. 3 is a section of sleeve surrounding the operating shaft showing the operating cams in elevation; and Fig. 4 is a transverse section of the main shaft showing the armature and ratchet case in elevation.

Referring to the drawings by letter, A represents the two rails of a track in one of which there is a pivoted switch point *a*. The tip of this point is provided with a downwardly projecting pin working in a transverse slot *a'* and passing through the track on the under side of which it is pivotally connected with the end of a lever *b* which is pivoted to swing in a horizontal plane upon an axis *b'*. The opposite end of said lever is provided with a slot which embraces a pin *c* fixed in a sleeve *c'*. *d* represents a shaft mounted in a suitable box or casing buried in the roadway. The shaft carries loosely upon it two cams *d'*, *d''* which face each other and form a zigzag annular groove *d'''*; into this groove a pin *d'''* rigidly connected with the shaft extends. The cams are surrounded by the sleeve *c'* before referred to and are connected therewith by screws or in any other manner. One end of the shaft *d* projects through a stuffing box *e'* into a tight chamber *e*. A ratchet wheel *f* is tightly fitted on the shaft and is housed in by

a casing *f'* fixed loosely upon the shaft. This casing has an upwardly extending pocket *f''* in which is freely placed a bolt *f'''* adapted to engage with the teeth of the ratchet wheel. The casing also carries lateral projections from each side which consist of iron plates *f''''* and the counterbalances therefor *f'''''*. The faces of these plates stand at an oblique angle normally and are directly opposite the respective poles of an electro-magnet F. The plates constitute the armatures for this magnet and their inclination is for the purpose of imparting a long rotary movement to the armatures when they are operated upon by the magnet. The electro-magnet may be energized by current taken from the main conductors, if the railway is operated by electricity, or it may be energized by a galvanic battery located at a convenient point in the roadway, the circuit of which is closed by the moving vehicle. I have, however, shown electric connections for energizing the magnet by current after it has passed through the electric motor propelling the vehicle. The rails through which the return current passes to the generator have a short insulated section *a'''* just preceding the switch point. This section is bridged by a conductor *g* which carries the current at all times when the car is not on the insulated section. The insulated section is connected with a wire *h* passing around the electro-magnet F and thence to the continuous rail A, by wires *h'* and *g*.

The operation is as follows: When a car whose return current passes through the rail reaches and passes on to the insulated section *a'''*, the current flows over wire *h* and through the electro-magnet F energizing it and causing it to swing the armatures *f''''* through an arc of about sixty degrees. The armatures carry the ratchet case with them and the bolt engaging with the ratchet wheel causes the shaft to rotate. This rotation of the shaft carries the pin thereon against one of the inclined sides of the zigzag groove between the cams and causes the cams and the surrounding sleeve to move in a longitudinal direction upon the shaft. This movement is imparted to the lever *b* through the pin *c* and it in turn moves the switch point. As soon as the car has passed the insulated section of

rail, the magnet becomes de-energized and the counterbalances f^5 return the armatures to their normal position. The next car approaching will ordinarily throw the switch in the opposite direction because the groove in the cam next presented to the pin is reversed, but if it is not desired that the switch shall be thrown, the current may be cut off momentarily while the car is passing over the insulated section of rail, by inertia.

If desired, the car may carry a mechanical device which shall strike and operate an electric switch to close the battery circuit including the magnet.

Having thus described my invention, I claim—

1. In a switch operating mechanism, a movable switch point connected to a reciprocating sleeve, said sleeve having cam portions making contact with an outwardly projecting pin carried by a shaft, and electro-magnetic means for actuating said shaft, substantially as described.

2. The combination of a switch point, a pivoted lever connected therewith, sliding cams operating said lever a rotary shaft operating said cams, a rotating armature centered upon the shaft, and an electro-magnet permanently fixed within attractive distance of the armature, substantially as described and for the purpose set forth.

3. In a switch operating mechanism, the rotary shaft d carrying the ratchet wheel f , the magnet armatures f^4 loosely mounted upon said shaft and carrying a bolt adapted to engage with said ratchet wheel, and an electro-magnet acting upon the armatures to rotate the shaft in one direction, in the manner and for the purpose set forth.

In testimony whereof I subscribe my signature in presence of two witnesses.

CHARLES M. FITCH.

Witnesses:

FRANK S. OBER,
WM. A. ROSENBAUM.