

No. 709,676.

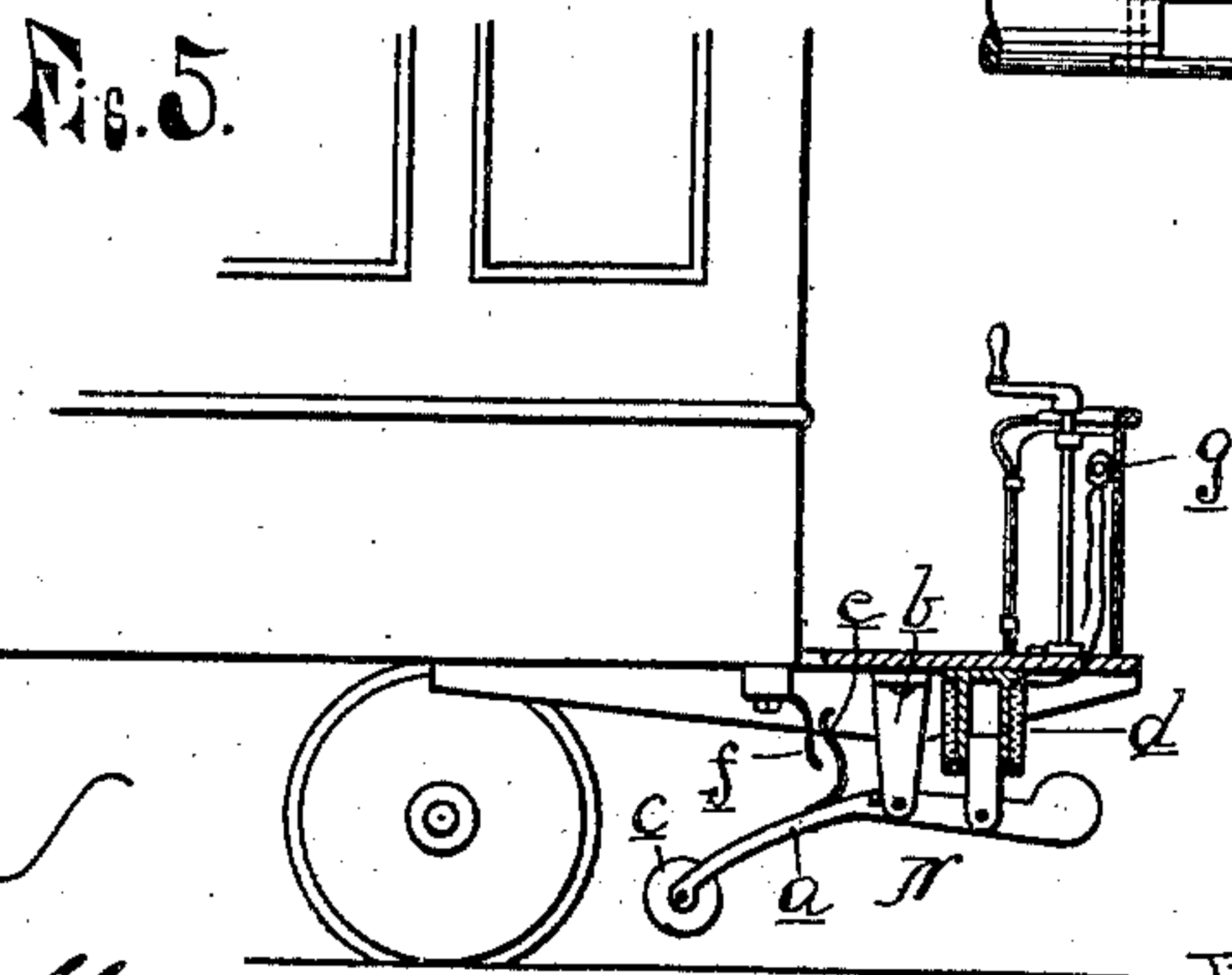
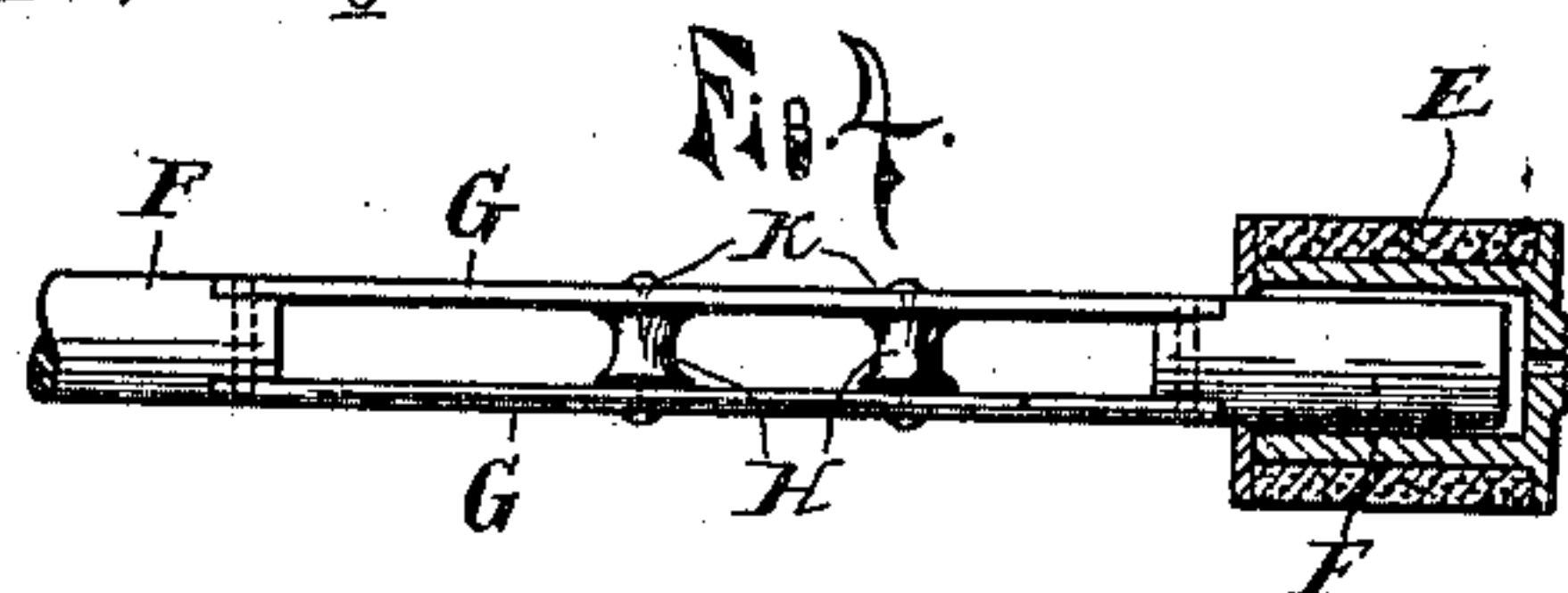
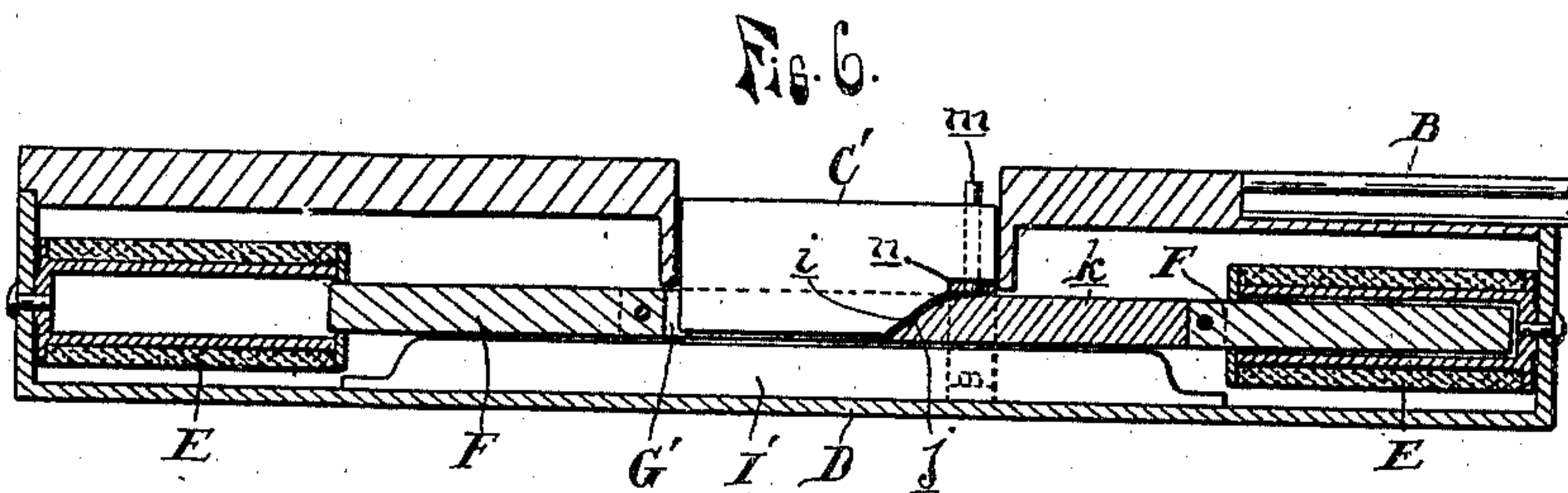
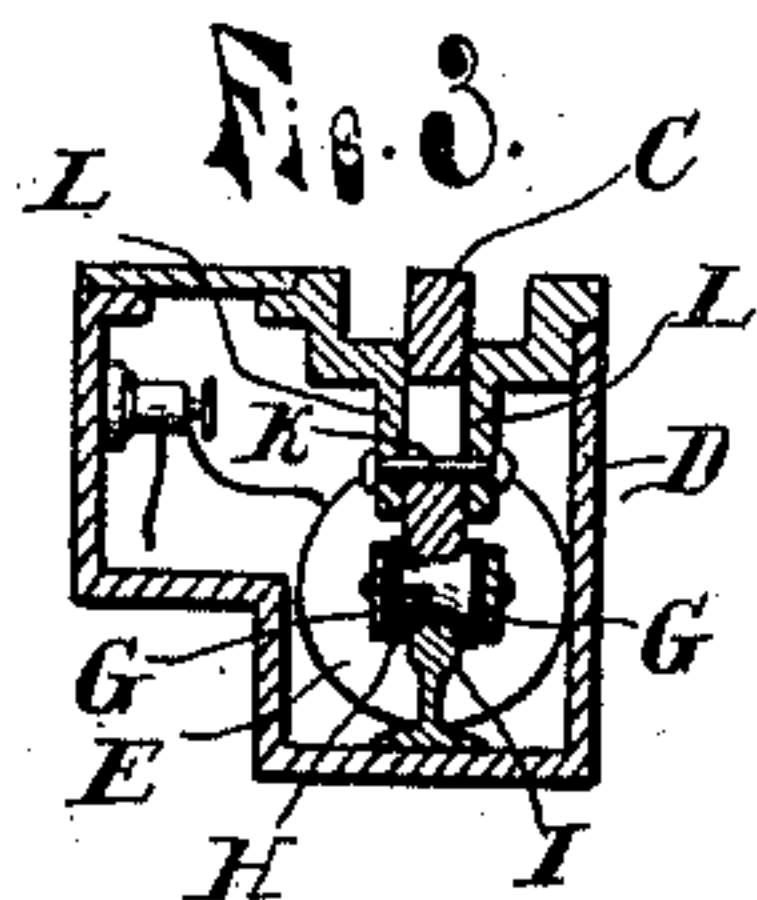
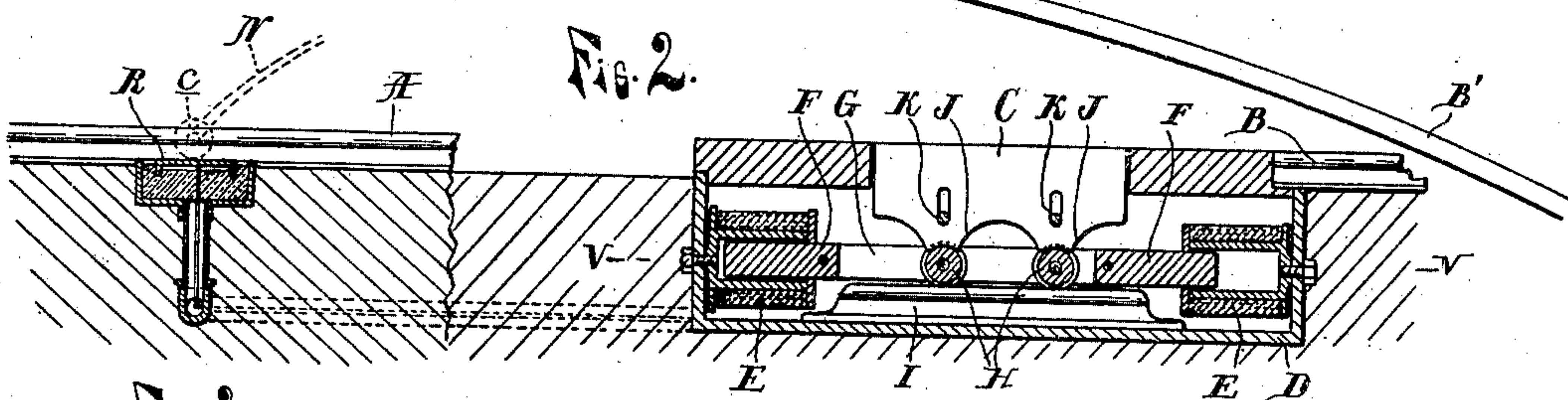
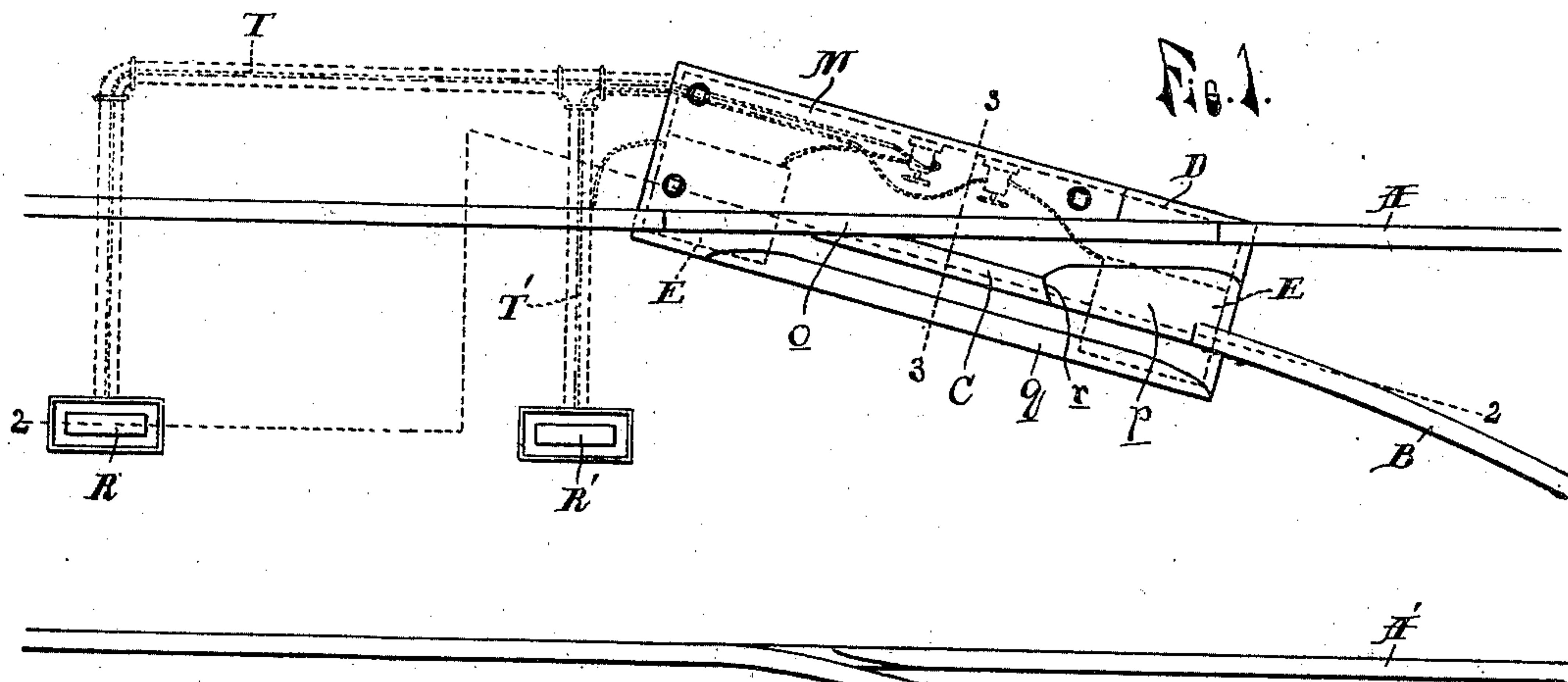
Patented Sept. 23, 1902.

J. LONEY.

ELECTRICALLY OPERATED RAILWAY SWITCH.

(Application filed June 21, 1902.)

(No Model.)



WITNESSES.

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UNITED STATES PATENT OFFICE.

JAMES LONEY, OF DETROIT, MICHIGAN.

ELECTRICALLY-OPERATED RAILWAY-SWITCH.

SPECIFICATION forming part of Letters Patent No. 709,676, dated September 23, 1902.

Application filed June 21, 1902. Serial No. 112,580. (No model.)

To all whom it may concern:

Be it known that I, JAMES LONEY, a citizen of the United States of America, residing at Detroit, in the county of Wayne and State of Michigan, have invented certain new and useful Improvements in Electrically-Operated Railway-Switches, of which the following is a specification, reference being had therein to the accompanying drawings.

The object of this invention is to provide a simple and effective device whereby the switch-point of a railway-switch may be moved by means of electricity under the control of a passing car. While my improvement is designed principally for application to electric cars, it admits of being applied to cars propelled by other power, in which case a generator of electricity is carried on the car, which may be driven by suitable connection with a car-axle; but in lieu of such generator a storage battery may be substituted.

The invention consists in a switch-point structure comprising a box in the road-bed, a switch-tongue projecting into said box and vertically guided therein in line with the inner rail at its junction with the outer rail, an incline or inclines formed on the under side of the switch-point, a horizontal sliding bar or carriage beneath the switch-point and adapted to coöperate with the inclines to raise the switch-point in position, and a pair of electromagnets adapted to operate said carriage in opposite directions, all as more fully hereinafter described.

In the drawings, Figure 1 is a plan view of the switch. Fig. 2 is a vertical longitudinal section on line 2 2, Fig. 1. Fig. 3 is a vertical cross-section on line 3 3, Fig. 1; and Fig. 4 is a horizontal section on line *vv*, Fig. 2. Fig. 5 is an elevation of the traveling contact device; and Fig. 6 is a similar section as Fig. 2, showing a simplified construction.

A A' are the main-line rails, and B B' are the rails of the side track.

C is a vertically-movable switch-point in line with the inner rail of the side track and forming a junction between said inner rail and the corresponding main-line rail. D is a box placed beneath said switch-point and substantially in line with it. F represents two electromagnets secured in said box in

line with the switch-point. E represents the movable cores of said magnets.

G represents parallel bars rigidly uniting the cores together into a single structure or bar. H represents two grooved rollers journaled between said parallel bars.

I is a support or rail on the bottom of the box for the rollers to run on.

J J are two inclines at the under side of the switch-point coöperating with the rollers.

K represents transverse bolts passing through vertical slots in the switch-point.

L represents vertically-depending guide-flanges for the switch-point and in which the bolts are secured.

M is a removable portion of the top of the box for permitting easy access into the box.

N is a traveling contact device carried by the car and adapted to be placed in electrical connection with the trolley-wire or other source of electricity under control of the motorman in the car. As shown in the drawings, it consists of lever *a*, pivoted to a hanger *b* and weighted at one end, the other end carrying a contact-wheel *c*. In suitable proximity to this lever is secured an electromagnet *d*, the movable core of which is carried by the lever in such manner that on energizing the magnet the lever is actuated to press the contact-wheel against the ground, while normally the weight of the lever holds it above ground. The lever carries a contact *e*, adapted to make electrical connection with a fixed contact *f* when the lever is depressed. The contact *f* is connected with the source of electricity on the car, and the magnet *d* is in a normally open circuit between said source and the return conductor or rail, which circuit is adapted to be closed by a suitable switch or push-button *g* under control of the motorman.

R R' are two electrically-insulated contact-plates secured upon the ground in position to coöperate with the traveling contact on the car, and T T' are the circuits of the electromagnets E, one terminal of which is respectively connected to the plates R R' and the other to the return conductor or rail.

In the construction shown in Fig. 6, which is the preferred construction on account of its simplicity and the cheapness with which

it can be constructed, the switch-point C' is provided with an incline *i* at one end, and a corresponding incline *j*, adapted to cooperate therewith, is formed on the end of the bar *k*,
 5 secured between the parallel bars G', connecting the movable cores of the electromagnets, said bar being supported upon a suitable track or rail I', the switch-point being vertically guided upon the pin *m*, mounted on
 10 the stirrup *n*, straddling said bar and track.

The parts being constructed and arranged as shown and described, they are intended to operate as follows: By closing the electric circuit T by means of the traveling contact
 15 on the car, the core of the electromagnet in said circuit will be drawn into the magnet, and thereby move the sliding bar or carriage into the position shown in Fig. 2, in which the switch-point is level with the rails, thus
 20 closing the switch. In the same manner by closing the circuit through the other electromagnet the sliding bar or carriage will be drawn in the opposite direction, and the switch-point is free to drop a sufficient distance to open the switch. Where certain
 25 cars follow always over a prescribed route, as is usually the case, the contact-plates R R' need not be in line with each other; but where cars should be able to take either track
 30 they are placed in line with each other, so that the motorman may close the circuit through either electromagnet. It is also obvious that other contacts may be provided upon the other side of the switch.

35 As shown in the drawings, a portion *o* of the main rail and a portion *p* of the side rail may be formed as an integral part of the top of the box, which has obvious advantages; but these portions may be integral parts of
 40 the track-rails without departing from my invention. I also preferably provide a guard-rail *q*, which may also be an integral part of the box.

The rear face *r* of the switch-point I preferably form obliquely, as shown, and in that
 45 way the switch-point when in position is firmly supported at its rear against lateral pressure, while the front end has a broad bearing against the main rail. A switch-point of this
 50 character is thus not likely to be damaged by lateral pressure.

It will be seen that the switch-point both in its elevated and in its depressed positions rests upon the sliding bar or rollers, which
 55 are preferably of steel, and these in turn rest upon the rail below, and thus a strong support is provided for the switch-point.

All the parts in the box are made accessible by removing the cover of the box, and the
 60 switch-point can be taken out without dismounting it.

What I claim as my invention is—

1. The combination with the movable contact on the car adapted to be connected with
 65 the source of electricity on the car and fixed contacts in the road-bed, of a switch-point structure comprising a vertically-movable

switch-point in line with the inner rail of the side track at the junction therewith with the corresponding main rail and formed with an
 70 incline or inclines upon the lower face, a box in the road-bed into which the lower portion of the switch-point projects, vertical guide-bearing for said switch-point and operating
 75 mechanism inclosed in said box and comprising two electromagnets in line with the switch-point and adapted to be connected in circuit with the source of electricity on the car, and
 80 a bar or carriage slidingly supported in the box beneath the switch-point in line therewith and forming with its opposite ends cores for said electromagnets and means carried by
 85 said bar or carriage intermediate said cores and adapted to cooperate with the incline or inclines on the switch-point to raise or lower the same.

2. The combination with the movable contact on the car adapted to be connected to a source of electricity and fixed contacts on the
 90 ground adapted to electrically connect therewith in the travel of the car, of a switch-point structure comprising a vertically-movable switch-point in line with the inner rail
 95 of the side track at the junction with the corresponding main rail and formed with an incline or inclines upon its lower face, a box in the road-bed formed with an opening in
 100 its top through which the switch-point projects into the box and with flanges depending from the top forming vertical guides for said switch-point, two electromagnets arranged
 105 oppositely each other in line with the switch-point and having movable cores, parallel guide-bars rigidly uniting said cores together in line with each other and means secured
 110 between said guide-bars adapted to cooperate with the incline or inclines on the switch-point to raise or lower the same by the movement of the guide-bars in opposite directions.

3. The combination with the electric car carrying a movable contact adapted to be
 115 lowered in contact with the ground and fixed contacts in the road-bed in line with the movable contact and adapted to be electrically connected therewith in the travel of the car,
 120 of a switch structure comprising a box in the road-bed at the junction of the inner rail of the side track with the corresponding main-line rail and carrying integral portions of said rails, a switch-point vertically movably
 125 supported in line with the inner rail in an opening in the top of the box and forming a junction of said inner rail with the main rail at the elevated position of said switch-point, an incline or inclines formed upon the lower
 130 face of the switch-point, a sliding bar or carriage beneath the switch-point in line therewith and provided with means cooperating with the inclines on the switch-point to raise and lower the same by the endwise movement of the sliding bar, and a pair of electromagnets arranged oppositely each other in line with the sliding bar or carriage and in-

dependently connected in circuits between the fixed contacts and the return-rail, the ends of the sliding bar or carriage forming cores for said magnets.

- 5 4. The combination with the movable contact on the car adapted to be connected to a source of electricity and fixed contacts on the ground adapted to electrically connect therewith in the travel of the car, of a switch-
10 point structure comprising a vertically-movable switch-point in line with the inner rail of the side track at the junction with the corresponding main rail and formed with an incline upon its lower face, a box in the road-
15 bed formed with an opening in its top through which the switch-point projects into the box, two electromagnets arranged oppositely each

other in line with the switch-point and having movable cores, parallel guide-bars rigidly uniting said cores in line with each other, 20
a bar having an inclined shoulder carried by said guide-bars and adapted to cooperate with the incline on the switch-point to raise or lower the same by the movement of the guide-bars in opposite directions, a stirrup 25
straddling said bars and a pin carried by said stirrup upon which the switch-point is free to have a limited vertical movement.

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

JAMES LONEY.

Witnesses:

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LEWIS E. FLANDERS.