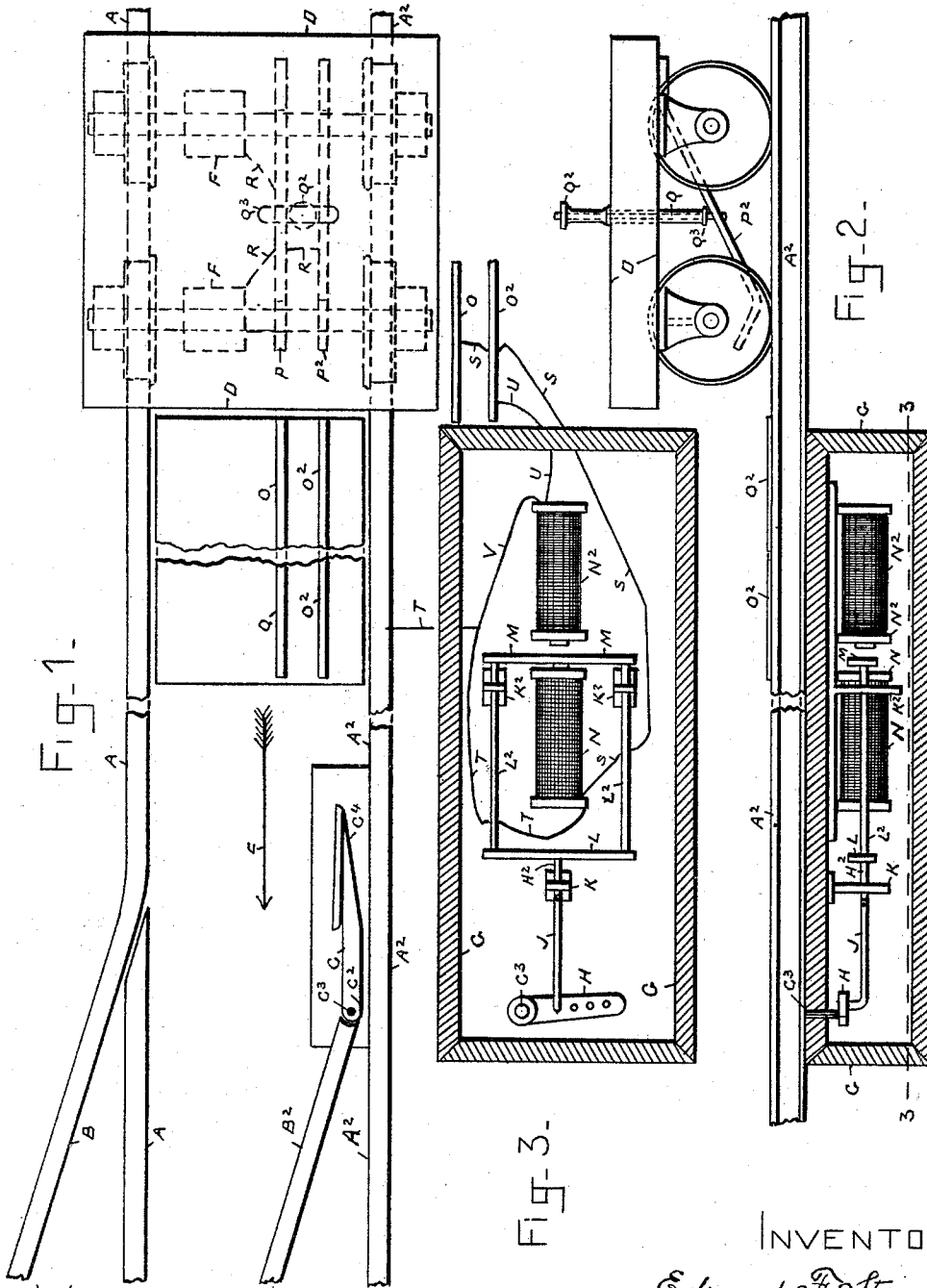


(No Model.)

E. F. STONE.
ELECTRIC RAILWAY SWITCH.

No. 497,061.

Patented May 9, 1893.



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UNITED STATES PATENT OFFICE.

EDWARD F. STONE, OF HYDE PARK, MASSACHUSETTS.

ELECTRIC-RAILWAY SWITCH.

SPECIFICATION forming part of Letters Patent No. 497,061, dated May 9, 1893.

Application filed February 1, 1890. Serial No. 338,945. (No model.)

To all whom it may concern:

Be it known that I, EDWARD F. STONE, a citizen of the United States of America, and a resident of the town of Hyde Park, in the county of Norfolk and State of Massachusetts, have invented certain new and useful Improvements in Electric-Railway Switches, of which the following is a full, clear, and exact description.

10 This invention relates to railway-switches for tracks over which cars are run by electric power, and its object is to adapt the switches and the cars so that the switches may be moved and placed as desired directly from the
15 car and by the use of an electric current.

This invention, for the object stated, in substance, consists in the combination with the railway switch and car, of separate and elongated electric contacts located, side by side
20 and along the road-bed of the railway, separate electric contacts on the car, one for each of said electric contacts of the road-bed and each adapted for direct contact with an electric contact of the road-bed and to be placed
25 into and out of such position of contact, and all of said electric contacts in suitable electric connection with the electric power of the car, separate electro-magnets located in the road-bed and each in electric connection with
30 one of said electric contacts of the road-bed and severally in electric connection with the electric power of the car, means held on and adapted relative to and in co-operation with said electric contacts of the car to place either
35 of said electric contacts into and out of position for its direct contact with an electric contact of the road-bed and thus to close and to open the electric circuit of the electro-magnet electrically connected to said electric
40 contact of the road-bed and contrivances located in relation to said electro-magnets, and connected to the railway-switch and adapted on the closing of an electric circuit through either electro-magnet to be operated thereby
45 and in a manner to move and thus to place the switch in position as may be desired and there hold it for the farther run of the car in accordance with the then position of the switch so long as said electric circuit is closed.

50 In the drawings forming part of this specification, the combination of this invention is

illustrated in connection with the overhead or trolley system of electric railways.

Figure 1 is a plan view, on a reduced scale, of portions of the main and the side or branch-
55 tracks of a railway, a switch-tongue and an electric-motor car. Fig. 2 is a side elevation of the car and railway, Fig. 1, and of the armature, electro-magnets and mechanism connecting armature and switch-tongue, and a
60 vertical sectional view of the box encasing said magnets, armature and mechanism. Fig. 3 is a horizontal section, line 3—3, Fig. 2 and a plan view of the parts above said line overturned and of the electric contacts of the
65 railway or road-bed and also showing the electric connection between the electro-magnets, said electric contacts and a rail of the railway, Fig. 1.

In the drawings, A, A² represent the two
70 rails of a section of main-track and B, B² the two rails of a section of a side or branch-track of a railway and C is the tongue of a railway switch. This tongue, at its heel C², is arranged to swing on a pivot C³ and otherwise so
75 that properly placed at its toe C⁴, a car D moving in the direction of the arrow E over the main-track toward the switch will be guided either along the main-track or switched therefrom onto the side or branch-track all and in
80 each respect the same and as well known and therefore needing no particular description herein.

The car D is to be of any suitable construction and is provided with electric-motors F,
85 one at its opposite ends for running it in either direction along said rails of the railway also in suitable electric connection with said motors all as well known.

The electric motors F, shown in blank, form
90 of themselves no part of this invention and they may be of any of the well known or other suitable construction and again each is to have electric connection, in any well known or otherwise suitable manner, for being driven
95 by the operation of an electric current and otherwise handled and controlled, the same constituting of themselves separately or together no part of this invention.

The pivot C³ is fixed on the switch-tongue
100 C and it is extended downward into a closed box or casing G located below the road-bed

and within said casing it has a horizontal arm H fixed on it. J is a horizontal rod at one end hung on said arm H and at its opposite end pivoted to one end of a horizontal rod that is in continuation of it and passes through a fixed pendant and guide-bracket K of the casing and is held on a horizontal cross-piece L of a horizontal rectangular frame, consisting of said cross-piece L, horizontal parallel side-rods L³, to one end of which said cross-piece L is fixed and that pass through fixed pendant and guide-brackets K² of the box and of a cross-piece M beyond said brackets K² and there fixed to the side-rods L³ at their ends opposite to the cross-piece L. The cross-piece M, in fact, is an armature common to two horizontal electro-magnets N, N² located in line with each other and one N on one side and the other N² on the opposite side of said armature and all so that with a closed electric circuit through either electro-magnet said armature M will be attracted and thus, as is plain, said frame will be horizontally moved either in one or the other direction and the switch-tongue C thereby correspondingly swung and placed as the case may be either for the main-track A, A² or for the side or branch-track B, B².

O, O² are separate elongated electric contacts, side by side and along the road-bed and between the rails of the main track and thus in the pathway of a car running on said track toward the toe C⁴ of the switch-tongue C.

The road electric-contacts O, O² are located for electric-contacts P, P² held on the car to be placed into or out of contact with them as the car moves along the main track toward the toe of the switch-tongue and as hereinafter more particularly appears. The electric contacts P, P² of the car D as particularly shown consists of two similar spring-arms or fingers each at one end rigidly fixed to the car and at the other end free and all otherwise so that either of said electric contacts P, P² by being pressed down or toward the road-bed can be placed in position for and held in direct contact with its appropriate electric contact O or O² of the road-bed, it being of course understood that the car is at the time in suitable position relative to the electric contacts O, O² of the road-bed.

For placing either electric contact P or P² of the car into position for contact with its appropriate electric contact O or O² of the road-bed, the car is provided with a vertical windlass-rod Q that at its upper end has a handle Q² for convenience in operating it and at its lower end a cross-arm or cam Q³ adapted at its opposite end-positions when the rod is turned in one direction to press down one of the electric contacts of the car, and when it is turned in the other direction to press down the other of said electric contacts and thus in each case to make direct contact between an electric-contact of the car and its approximate electric contact of the road-bed. Otherwise than above, by turning the rod Q to

press down as stated an electric contact of the car its pressure on the other of said electric contacts is released and with said rod in its normal position its said cam or arm Q³ is out of contact with both of said electric contacts. Obviously by the means described either electric contact of the car can be placed in position for and held in contact with its appropriate electric contact of the road-bed and so placed, all else being suitable and as hereinafter appears, an electric circuit is closed through the magnet of the electro-magnets N, N² which is in electric connection with said electric contact of the road-bed.

R is an electric wire connecting the electric contacts of the car and said contacts with the electric motors F.

S is an electric wire connecting the electric contact O of the road-bed with the electro-magnet N and T is an electric wire connecting said magnet to a rail of the railway which is in the electric circuit of the motors.

U is an electric wire connecting the electric contact O² of the road-bed to the electro-magnet N² and V is a wire connecting said magnet to the electric wire T of the magnet N and therethrough with the rail of the railway having said electric wire T connected to it as above stated.

The wire connections above explained are all such as to secure a closed circuit as has been referred to through either of the electro-magnets N, N² according as either the electric contact P or P² of the car has been placed in contact with the electric contact O, or O² of the road-bed and thus the armature is attracted toward the one of said magnets N, N² which is in the closed circuit established as aforesaid. The breaking of either of the electric contacts above described opens the electric circuit through the electro-magnet N or N² as the case may be, and thus the armature is set free of the magnet. According as the armature M is attracted toward the electro-magnet N or N², the switch-tongue C is moved either from the main-track to the branch-track or vice versa, thus establishing the line of track along which the car shall move. As particularly shown the movement of the armature under the attraction of the magnet N places the switch-tongue for the main-track and under the attraction of the magnet N² for the branch-track.

This invention broadly considered is not to be limited to any kind of electro-magnets, or mechanism connecting the armature thereof with the switch-tongue of the railway, nor to any especial means of placing the electric contacts of the car into and out of position for contact with the electric contacts of the road-bed, as each and all may be varied in many obvious ways without substantially changing the main feature of this invention as has been particularly set forth. But, however, all of the devices shown and described are capable of practically accomplishing the result aimed at.

Having thus described my invention, what I claim, and desire to secure by Letters Patent, is—

1. The combination with the main and side
5 or branch-tracks of a railway, a car to be run
by electric power, a railway switch, and mechanism embracing an armature and connected
with and adapted to move the switch in opposite
10 directions, of electro-magnets arranged
and adapted to attract said armature in opposite
directions, elongated electric contacts
of and placed side by side and along the road-
bed, an electric contact of the car, for each of
15 said electric contacts of the road-bed and arranged
to be moved into and out of contact
with its electric contact of the railway-bed
and all of said contacts in suitable electric connection
with the electric power of the car and
20 said electro-magnets, and means held on and
adapted relative to and in cooperation with
said electric contacts of the car for either one
or the other of said electric contacts to be
placed into and out of position for direct contact
25 with its said electric contact of the road-bed
substantially as described, for the purposes specified.

2. The combination with the main and side
or branch-tracks of a railway, a car to be run
by electric power, a railway-switch and mechanism

consisting of a horizontal sliding frame 30
at one end connected to the switch and at the
other end having an armature and adapted to
move the switch in opposite directions, of
electro-magnets to attract said armature in
opposite directions, elongated electric con- 35
tacts of and placed side by side and along the
road-bed, an electric contact of the car, for
each of said electric contacts of the road-bed
and arranged to be moved into and out of contact
with its electric contact of the railway- 40
bed and all of said contacts in suitable electric
connection with the electric power of the
car and said electro-magnets, and means held
on and adapted relative to and in cooperation
with said electric contacts of the car, for 45
either one or the other of said electric contacts
to be placed into and out of position for
direct contact with its said electric contact of
the road-bed, substantially as described, for
50 the purposes specified.

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

EDWARD F. STONE.

Witnesses:

ALBERT W. BROWN,
FRANCES M. BROWN.