(No Model.)

2 Sheets—Sheet 1.

E. JULIEN.

ELECTRIC RAILWAY CAR.

No. 384,581. Patented June 12, 1888.

FIG. I.

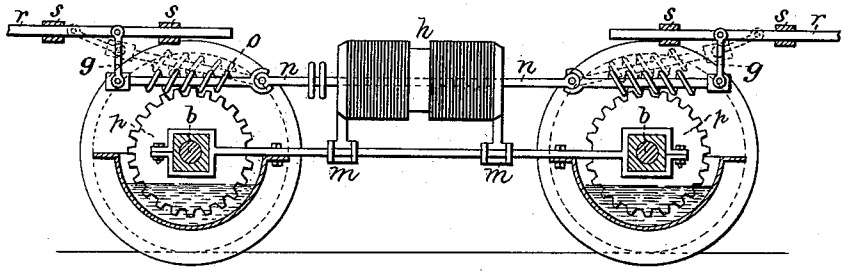
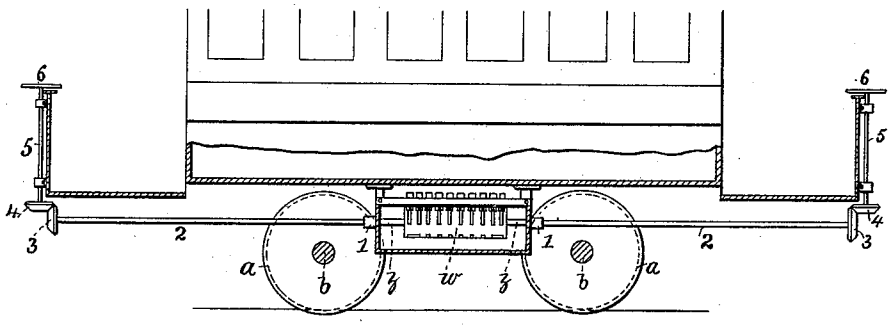


FIG. II.



Attest:
Geo. T. Smallwood
H. S. Knight

Inventor:
Edmond Julien.
By Knight Bros. Attys.

N. PETERS, Photo-Lithographer, Washington, D. C.

(No Model.)

2 Sheets—Sheet 2.

E. JULIEN.

ELECTRIC RAILWAY CAR.

No. 384,581. Patented June 12, 1888.

FIG. III.

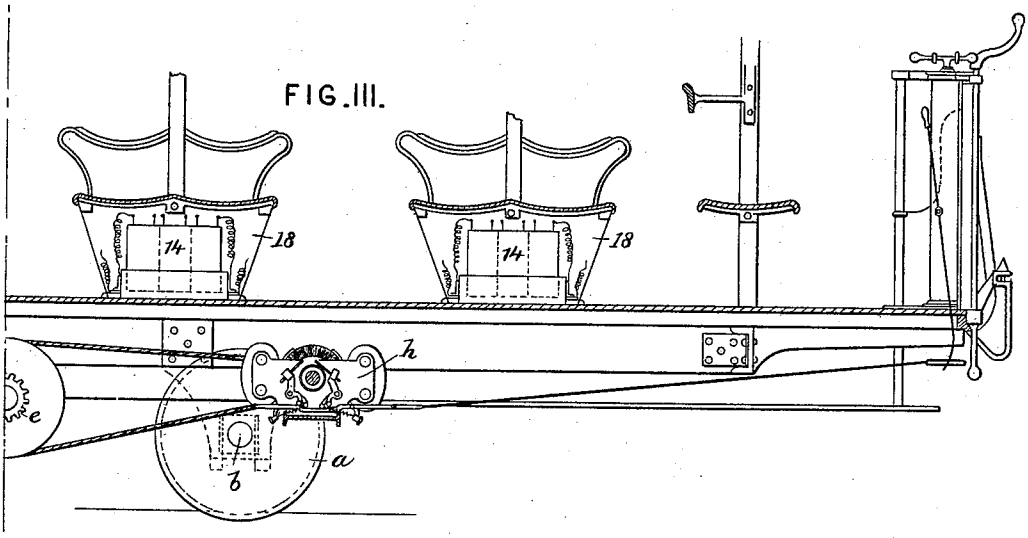
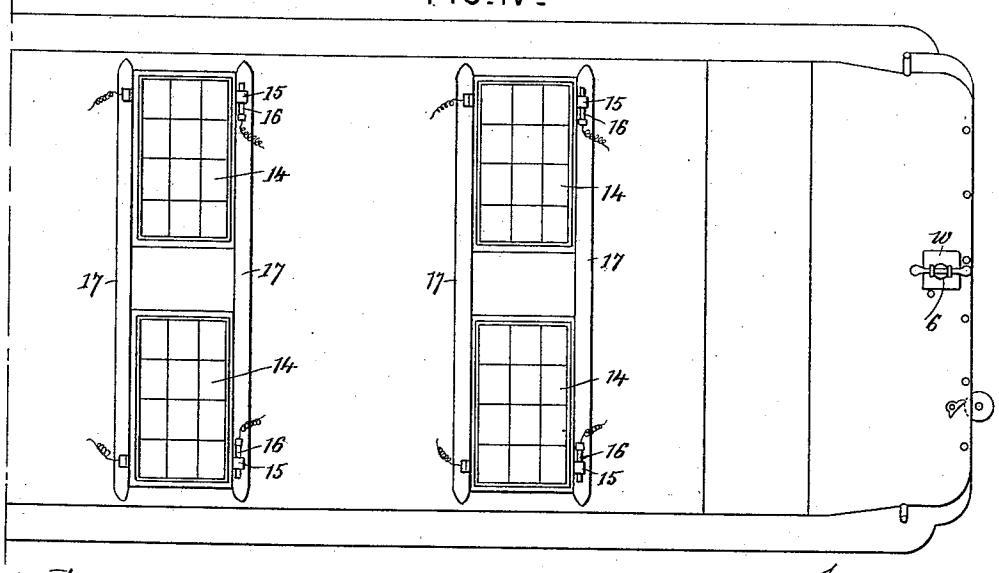


FIG. IV.



Attest.

Geo. T. Smallwood.

F. A. Hopkins

Inventor:

Edmond Julien.

By Knight Bros.

atty's.

N. PETERS, Photo-Lithographer, Washington, D. C.

UNITED STATES PATENT OFFICE.

EDMOND JULIEN, OF BRUSSELS, BELGIUM.

ELECTRIC RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 384,581, dated June 12, 1888.

Application filed March 16, 1887. Serial No 231,164. (No model.) Patented in Belgium November 19, 1886, No. 75,288.

To all whom it may concern:

Be it known that I, EDMOND JULIEN, a subject of the King of Belgium, residing at Brussels, in the Kingdom of Belgium, have invented certain new and useful Improvements in Electric Railway-Cars, of which the following is a specification.

This invention is embodied in Belgian Patent No. 75,288, granted to me under date of November 19, A. D. 1886.

My present improvements consist in certain modifications in the invention described in my application for patent dated February 17, 1886, and serially numbered 192,249, and they will first be fully described with reference to the accompanying drawings, and then pointed out in the claims.

In said drawings, Figure I is a sectional side elevation of the truck of a street-car to which my invention is applied. Fig. II is a side elevation of the car with the casing of the regulating-commutator in section. Fig. III is a sectional side elevation of an open car, showing the preferred method of fixing the batteries thereon. Fig. IV is a plan view of the same with the seats and superstructure of the car removed.

The invention relates particularly to cars which are adapted to be propelled by batteries, preferably accumulators 14, which, when the car is made with transverse seats 18, as shown in Figs. III and IV, are placed under the seats, being guided to their places by guides 17, Fig. IV. When in place under the seats, contact-terminals 15 of the batteries rest upon metallic springs 16 on the guides 17. These springs 16 are included in the circuit on the car which embraces the motor *h* and the commutator, hereinafter described. The end panels of the seats are movable, to allow the batteries to be inserted and removed.

The preferred arrangement of the motor is shown in Fig. I. Here the motor is shown carried by a frame, *m*, which is hung by boxes from the axles *b* of the car-wheels *a*. The frame *m* also supports at its ends receptacles for the liquid lubricant for oiling the pinions *p* on the axles. These pinons are engaged by worms *o*, jointed to the armature-shaft *n*. Rods *r*, sliding in guides *s*, are connected by links *q* to said worms. By operating either of the rods from any position on the car, either of the worms may be brought in contact with its pinion for determining the direction of movement of the car, the worms being oppositely pitched, as shown.

In my before-mentioned application I have described the arrangement of the commutator employed for grouping the batteries in various manners according to the electro-motive force required in propelling a car at any desired speed. It is not necessary, therefore, to again describe the peculiar form of the commutator-cylinder and the arrangement of the brushes against the same.

The object of the present application, so far as this portion of my invention is concerned, is to indicate that such commutator *w* may, as shown in Fig. II, be placed in horizontal position under the body *y* of the car and have its shaft *z* engaging with sleeves on the two operating-shafts 2 2, which may be actuated from either end of the vehicle by hand wheels or levers 6, vertical shafts 5, and pinions 3 4. By this arrangement a single regulating-commutator in the circuit can be made to perform the function of two commutators placed on the two ends of the car, as heretofore proposed by me.

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

1. The combination of the motor *h*, having armature-shaft *n*, worms *o*, jointed to said shaft, axles having pinions *p*, and rods for elevating one or other of said worms, substantially as and for the purpose set forth.

2. The combination of a car carrying a number of batteries, and a motor in circuit therewith, a regulating-commutator in the circuit for arranging said batteries in various groups, a shaft extending from end to end of the car, and hand-shafts connected therewith for operating said commutator, substantially as and for the purpose set forth.

EDMOND JULIEN.

Witnesses:
HARRY E. KNIGHT,
H. S. KNIGHT.