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E. VON PLANTA.

ELECTROMECHANICAL EMERGENCY BRAKE FOR TRAM CARS.

(Application filed Jan. 10, 1901.)

(No Model.)

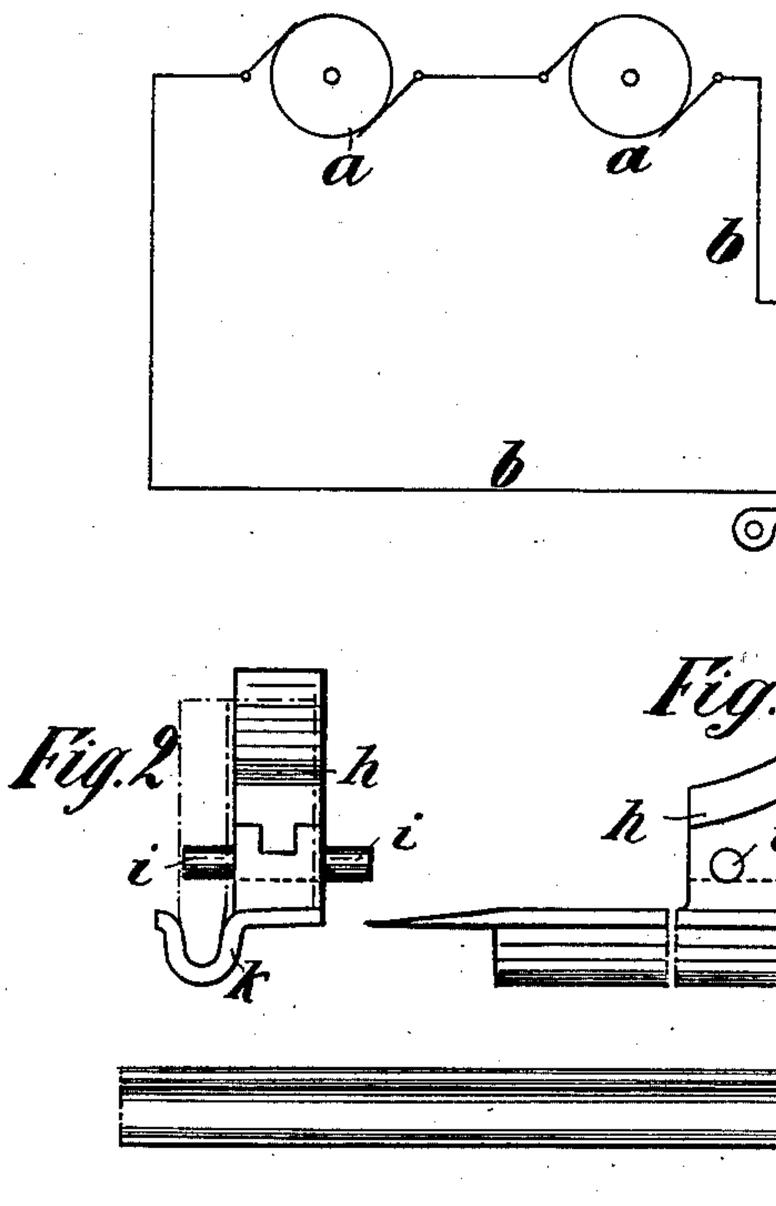

Fig. 1

Fig. 2

Fig. 3

Fig. 4

Witnesses.

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UNITED STATES PATENT OFFICE.

EMANUEL VON PLANTA, OF LUCERNE, SWITZERLAND, ASSIGNOR TO THE GESELLSCHAFT FÜR PATENTVERWERTUNG DER ELEKTRO-MECHANISCHEN NOTBREMSE, (SYSTEM PLANTA,) OF BASLE, SWITZERLAND.

ELECTROMECHANICAL EMERGENCY-BRAKE FOR TRAM-CARS.

SPECIFICATION forming part of Letters Patent No. 673,286, dated April 30, 1901.

Application filed January 10, 1901. Serial No. 42,712. (No model.)

To all whom it may concern:

Be it known that I, EMANUEL VON PLANTA, a citizen of Switzerland, residing at Lucerne, in the canton of Lucerne, Republic of Switzerland, (whose post-office address is Morgartenstrasse 11,) have invented certain new and useful Improvements in Electromechanical Emergency-Brakes for Tram-Cars Driven by Electricity; and I do declare the following to be a full, clear, and exact description of the same, reference being had to the accompanying drawings, which form a part of this specification.

I have applied for patents in the following countries: Switzerland on June 23, 1900; Austria, September 13, 1900; Belgium, September 14, 1900, and Germany, September 15, 1900.

The invention relates to an electromechanical emergency-brake for electrically-driven tram-cars. Usually in such cars the motors may act as generators when the external current is cut off while the velocity of the car is considerable, and on the completion of a short circuit the energy stored should, theoretically, bring the car to a sudden stop, since the motors are geared with the wheel-axles by cog-wheels. It is upon this principle that the well-known "short-circuit" brake is based; but owing to the momentum of the car the latter may, if no mechanical brake is provided, slide several meters on the rails, although the wheels are prevented from turning. In order, therefore, to enable the car to be brought to a standstill within a very short distance, the short-circuit brake alone is not sufficient, and it is necessary to combine with it a mechanical brake.

According to this invention the above-mentioned object is attained by causing skid-shoes to be released by means of electromagnets on the short circuit and to drop upon the rails in front of the wheels, so that the latter will run onto the skid-shoes, whereby the instantaneous stoppage of the car will be effected.

The invention is illustrated, by way of example, in the accompanying drawings, wherein—

Figure 1 is a diagrammatical illustration of the arrangement. Figs. 2 and 3 show detail views of the skids, and Fig. 4 is a diagrammatic illustration of the arrangement with a sanding device attached.

In connection with the two motors *a* of the car is an electric circuit *b*, in which there may be several electromagnets *c*, only one electromagnet *c* being indicated in the drawings for the sake of simplicity. The armature *d* of each electromagnet *c* is adapted to act as a detent to retain the system of the levers *e f g*, supporting the skid-block *h* and shoe *k*, in the position shown. The said skid-block rests freely by pins *i* upon the carrier *g*, and the shoe or bottom piece *k* is adapted to fit the groove of the rail. If now immediately after cutting off the supply of current to the motors the short circuit *b* be completed, the electric current generated in the motors by the momentum of the car causes the electric brake to act, and simultaneously therewith the electromagnets *c* attract their armatures, whereby the system of levers *e f g* is released and the skids are caused to drop upon the rails, so that the wheels of the car, not yet being completely stopped by the completion of the short circuit, run onto the skids, whereby the car is brought to an absolute standstill. The braking of the car is therefore effected in two very short periods of time following one another immediately and allowing the car to drag only for a very short distance. In the short circuit *b* there may be another electromagnet *l*, Fig. 4, whose armature *m* may be adapted to actuate a slide *n* of a sand-box *p* against the tension of the spring *o* in normally tending to close said slide, so as to cause a sufficient quantity of sand to be discharged at the moment when the short circuit is completed in order to thereby increase the adhesion of the skids upon the rails.

Having now particularly described and ascertained the nature of the said invention and in what manner the same is to be performed, I declare that what I claim is—

The combination, with an electric circuit and with a source of electrical energy and an electromagnet contained in said circuit, of an

armature disposed in operative proximity to said electromagnet, a skid adapted to be engaged by one of the wheels of a vehicle to stop the latter, resting on one of the rails, and a train of mechanism carrying said skid and normally engaged by the armature to maintain the skid elevated, said source of electrical energy being adapted, through said circuit, as a means for braking the vehicle and simultaneously actuating said armature, substantially as described.

In testimony that I claim the foregoing as my invention I have signed my name in presence of two subscribing witnesses.

EMANUEL VON PLANTA.

Witnesses:

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