(No Model.) 2 Sheets—Sheet 1.

W. FELDMANN.

APPARATUS FOR INCREASING ADHESION OF DRIVING WHEELS OF MOTOR VEHICLES FOR RAILWAYS.

No. 573,772. Patented Dec. 22, 1896.

Fig. 3.

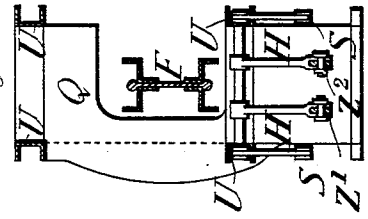


Fig. 6.

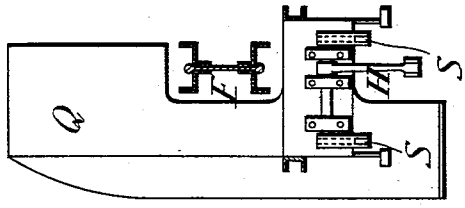


Fig. 2.

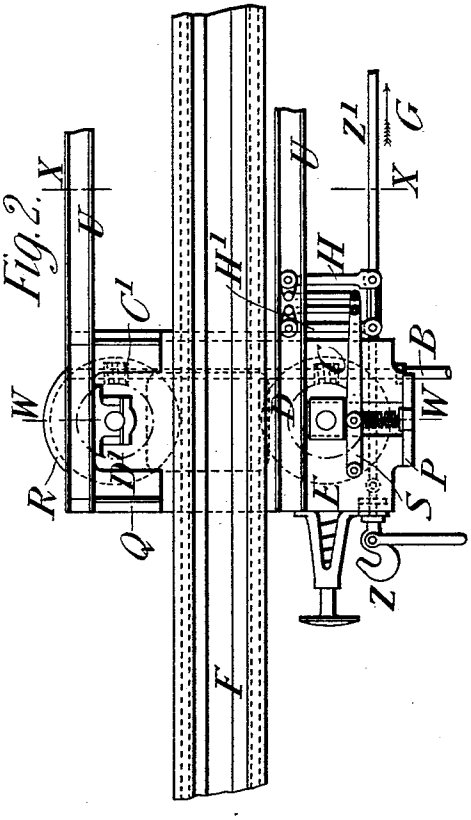


Fig. 5.

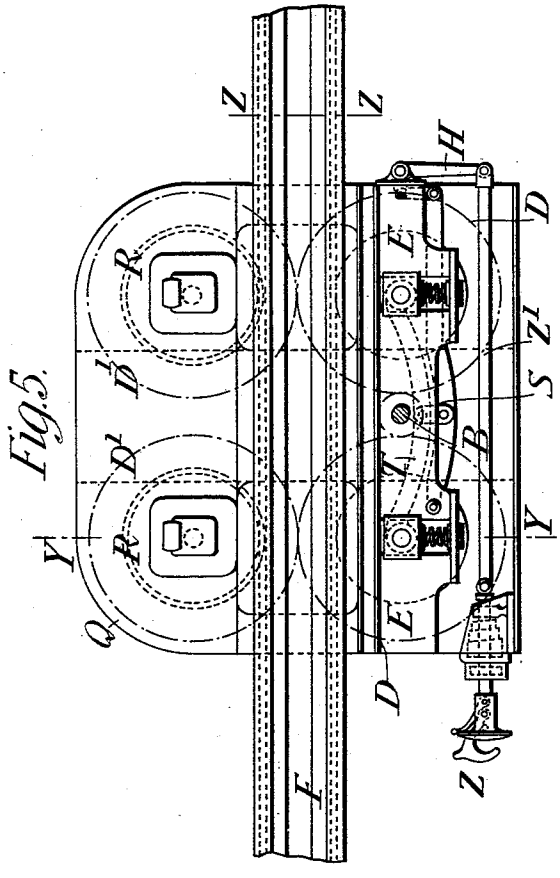
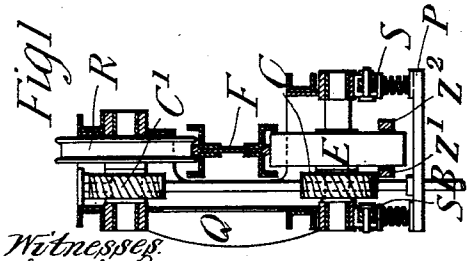
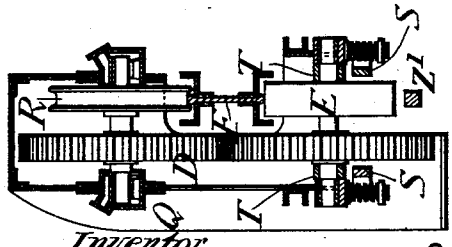


Fig. 1



Witnesses.
Jas. W. Rea,
Robert Everett

Fig. 4.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

(No Model.) 2 Sheets—Sheet 2.

W. FELDMANN.

APPARATUS FOR INCREASING ADHESION OF DRIVING WHEELS OF MOTOR VEHICLES FOR RAILWAYS.

No. 573,772. Patented Dec. 22, 1896.

Fig. 2a.

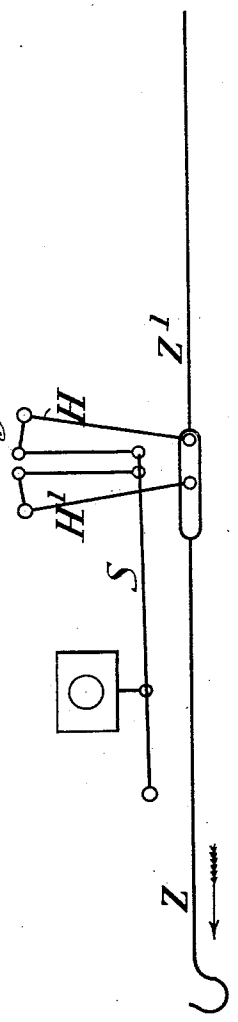
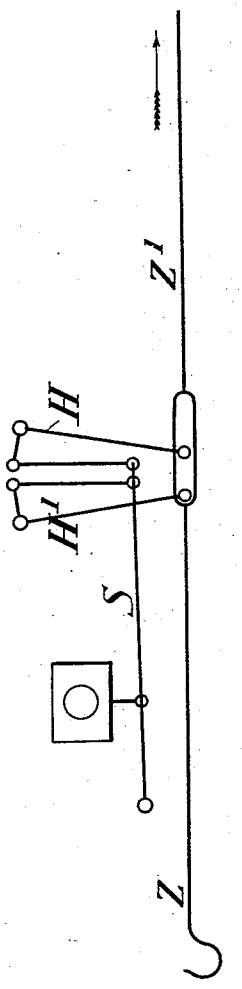


Fig. 2b.



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THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

UNITED STATES PATENT OFFICE.

WILHELM FELDMANN, OF NUREMBERG, GERMANY, ASSIGNOR TO EUGEN LANGEN'S ERBEN, OF COLOGNE, GERMANY.

APPARATUS FOR INCREASING ADHESION OF DRIVING-WHEELS OF MOTOR-VEHICLES FOR RAILWAYS.

SPECIFICATION forming part of Letters Patent No. 573,772, dated December 22, 1896.

Application filed August 17, 1896. Serial No. 603,034. (No model.)

To all whom it may concern:

Be it known that I, WILHELM FELDMANN, a citizen of Germany, residing at Nuremberg, in the Empire of Germany, have invented certain new and useful Improved Means or Appliances for Increasing the Adhesion of the Driving-Wheels of Motor-Vehicles for Railways with Suspended Vehicles, of which the following is a specification.

This invention relates to motor-vehicles of that description of railways in which the vehicles are suspended from the rail or rails, more particularly such as were described in the specifications to Langen's patents, Nos. 546,928 and 550,513. It consists in increasing the adhesion of the driving-wheels of such motor-vehicles to the rail or rails by causing the guard-rollers or wheels arranged on the under side of the rail to be pressed with more or less force against the latter. By means of such pressure the pressure of the driving-wheels is correspondingly increased, resulting in a proportionately increased tractional force. This arrangement is in particular effective when not only the ordinary driving-wheels above the rails but also the guard-rails below are driven by the motor-engine.

Figures 1 to 6 of the accompanying drawings show two arrangements for the application of this invention to a single-rail railway. Fig. 1 shows a vertical cross-section at W W, Fig. 2. Fig. 2 shows a part side view. Figs. 2^a and 2^b are diagrams illustrating the operation of the draw-bars in both directions; Fig. 3, a cross-section at X X, Fig. 2, of one arrangement. Fig. 4 shows a cross-section at Y Y, Fig. 5. Fig. 5 shows a side view; and Fig. 6 a cross-section at Z Z, Fig. 5, of the second arrangement.

In Figs. 1 to 3 not only the driving-wheel R but also the guard-wheel E receives direct rotary motion from the motor-engine by means of the worms C C′ and the worm-wheels D D′. The shaft B of the worms passes down to the motor carried by the body of the vehicle, (not shown,) which is suspended by a suitable pivotal connection from the plate P. The shaft B may be the motor-shaft itself or a shaft driven thereby. The arrangement is such that the pressure of the guard-roller E against the under side of the rail F is rendered proportional to the amount of the tractional force exercised by the motor-vehicle upon the other vehicles of the train through the draw-hook Z. For this purpose the draw-bars Z′ Z^2 are pivotally connected to elbow-levers H H′, which in their turn are connected by links to levers S, having their pivot on the framing Q and connected to the axle-boxes of the roller E. Thus the greater the tractional force exerted upon the hook Z the more forcibly will the guard-roller E be pressed upward against the rail through the medium of the elbow-levers H H. In like manner when a pull is exerted in the contrary direction (indicated by the arrow G) upon the draw-rods Z′ Z^2 such pull will exert a pressure on the roller through the elbow-levers H′ H′. The draw-hook Z is connected to two draw-bars Z′ Z^2, and the elbow-levers H H H′ H′ are connected to slotted parts of these, so that only one set of levers is acted upon when the traction is in the one direction.

As shown in the diagrams Figs. 2^a and 2^b, wherein, as shown in the former figure, if the draw-bar Z Z′ is drawn to the left hand, as indicated by the arrow, only the lever H will be actuated by its loop, so as to raise the lever S, whereas in Fig. 2^b, when the draw-bar is drawn to the right hand, only the lever H′ is operated, so as to raise the lever S.

In the arrangement shown at Figs. 4 to 6 a pinion on the motor-shaft B gears with two spur-wheels D D on the axles of the guard-rollers E E, which spur-wheels gear with spur-wheels D′ D′ on the axles of the driving-wheels R R, so that all four wheels are thus driven simultaneously by the motor, which is carried in any suitable manner by the frame Q, carried by the wheels, and being of any suitable known construction is not shown on the drawings. The guard-rollers E are in this case also pressed against the under side of the line of rail F in proportion to the tractional force exerted by the motor-carriage through the medium of the draw-hook Z, the pull of the latter being transmitted through the elbow-lever H, pivoted to the draw-bar Z′, to levers S, which are made to press the rollers upward against the rail, such levers S being connected by a link to beams T, the ends of

which embrace the two axles, so that the two rollers E are pressed with equal force against the rail.

In the arrangement at Figs. 4, 5, and 6 the framing Q, with the wheels, motor, &c., comprises the entire motor-vehicle or locomotive. In the arrangement at Figs. 1, 2, and 3 there are two frames, such as Q, connected together by beams U U, and which with the body (not shown) suspended from them constitutes the motor-vehicle. This construction is more particularly suitable for locomotives of light field-railways and the like, while the construction at Figs. 4 to 6 is very suitable for mountain-railways. The guard-rollers E are made without flanges, so that if the locomotive should assume a somewhat inclined position the rail-girder F would not be jammed or twisted thereby. The system of freely-suspended vehicles can therefore be maintained with these constructions.

Having thus described the nature of my said invention and the best means I know for carrying the same into practical effect, I claim—

In a motor-vehicle or locomotive for railways with suspended vehicles having driving-wheels acting on the upper side of the line of rails and guard-rollers bearing against the under side of the rail an arrangement for automatically increasing the pressure of the driving-wheels upon the rail, wherein the guard-rollers E are pressed against the rail by means of elbow-levers connected to the draw-bar, so that such pressure is directly proportional to the tractional force applied to the draw-bar substantially as described.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 30th day of July, A. D. 1896.

WILHELM FELDMANN.

Witnesses:
JOSEPH MEAR,
WALTER DIETZ.