No. 749,142. PATENTED JAN. 12, 1904.

R. ABT.

RACK RAILWAY.

APPLICATION FILED MAY 2, 1902.

NO MODEL.

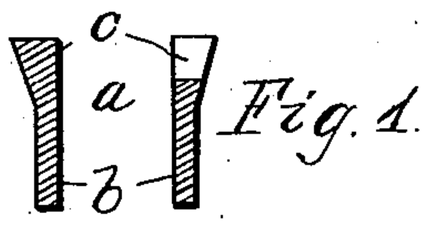


Fig. 1.

Fig. 2.

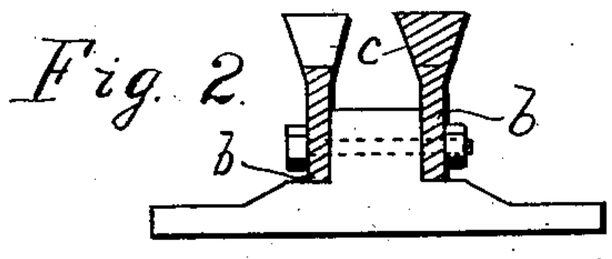


Fig. 3.

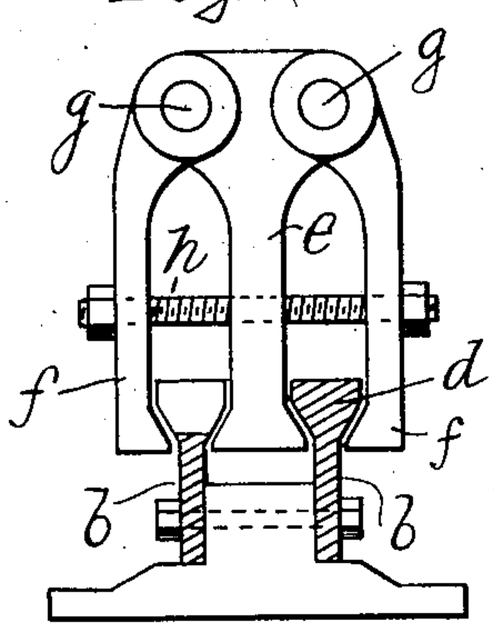


Fig. 4.

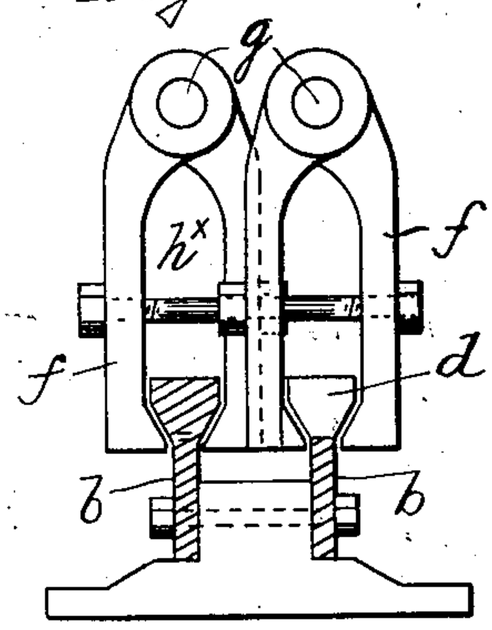
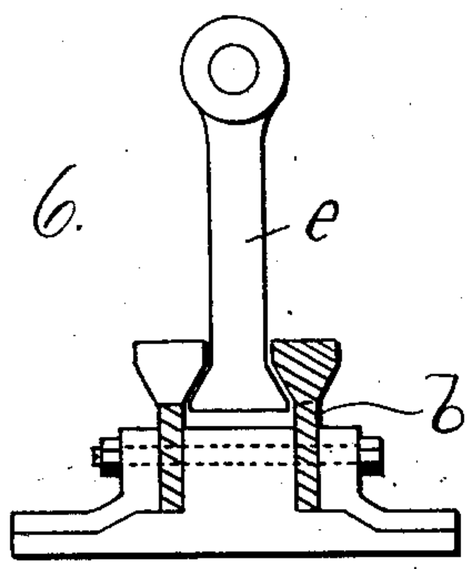


Fig. 6.



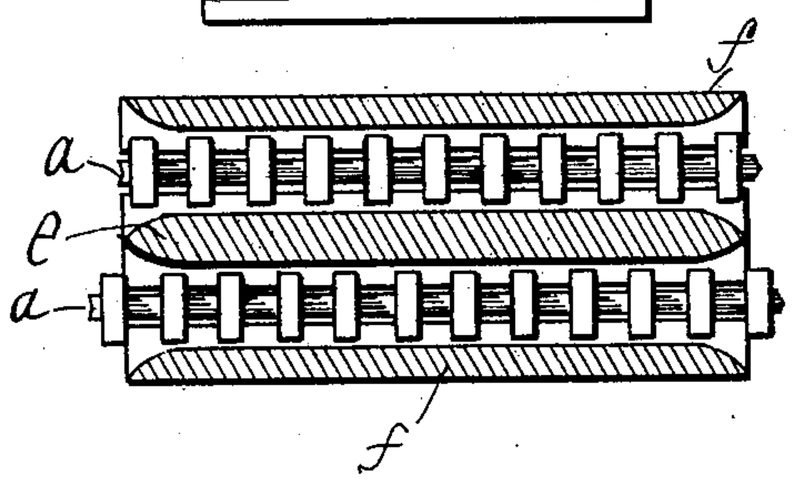


Fig. 5.

Witnesses
Geo. C. Hemming
E. J. Rector

Inventor
Roman Abt,
By his Attorney
Richard W. Barkley.

No. 749,142. Patented January 12, 1904.

UNITED STATES PATENT OFFICE.

ROMAN ABT, OF LUCERNE, SWITZERLAND, ASSIGNOR OF ONE-HALF TO WILHELM HILDENBRAND, OF NEW YORK, N. Y.

RACK-RAILWAY.

SPECIFICATION forming part of Letters Patent No. 749,142, dated January 12, 1904.

Application filed May 2, 1902. Serial No. 105,584. (No model.)

To all whom it may concern:

Be it known that I, ROMAN ABT, a citizen of the Swiss Republic, and a resident of Lucerne, in the canton of Lucerne, Switzerland, have invented certain new and useful Improvements in Rack-Railways, of which the following is a specification.

The present invention relates to railways of the class to which relate prior Letters Patent of mine in the United States and elsewhere, and has for its object the provision of a rack-rail provided with an overhanging part or parts whereby the motor may obtain a grip both for moving along and for preventing it from being lifted from the track and so lifting its cog-wheel out of gear with the rack-rail on steep inclines, thus contributing to the efficiency and safety of the line as a whole.

The invention is illustrated in the accompanying drawings, forming part hereof, in which—

Figure 1 is a cross-section of a pair of rack and guard rails in which the invention is embodied. Fig. 2 is a cross-section of a modified form of the invention. Fig. 3 shows a section of another modification in combination with catch devices for preventing the lifting of the motor. (Not shown.) Fig. 4 illustrates the same with a modified form of the catch devices. Fig. 5 is a plan view of the rails and catches, the view being partly in section; and Fig. 6 is a section of a modification.

In the drawings the reference *a* indicates generally the new rail, whose foot may be of any suitable section or form.

b designates the vertical web of the rail, which is of less thickness than that part *c* of the rail in which the rack-teeth are cut or formed. The part *c* may overhang the web *b* on one or both sides thereof, and the angle between the under surface of the overhang and the side of the web may vary, as desired.

In the form shown in Fig. 1 the part *c* is wedge-shaped or has one surface inclined to the horizontal, the overhang of one rail *a* being disposed reversely to that of the other rail *a*, as both on the outside of the rails, as shown.

In the form shown in Fig. 2 the part *c* is wedge-shaped or overhangs on both sides of the web *b* of the rails.

In the form shown in Fig. 3 and in Fig. 4 the parts *c* are formed with a head *d*, which is joined with the webs *b* by inclined or wedge-shaped parts.

The rack-teeth are cut or otherwise formed in these parts *c* of the rails, and the teeth of the adjacent rails are staggered with respect to each other, as usual.

The cog-wheel used on the motor meshes with said rails *a*, as usual, its teeth being wide enough to extend all the way across the widest part of the said rack-teeth, thus giving large wearing-surfaces, while the smaller thickness of the webs *b* keeps down the weight and cost of the rails, whereby economy and efficiency are promoted.

The improved rail affords a ready means for applying a clamp or catch for connecting the motor with the railway, so that it cannot be lifted, and thereby cause the disengagement of its cog-wheel and the rack-rail on the steepest inclines employed in such railways. Two forms of catch for this purpose are shown in the drawings.

The reference *e* designates a stout vertical double jaw to go between the rails *a* and underrun the inside overhangs thereof, as shown in Fig. 3, while *f* indicates pivoted or movable jaws connected at *g* to the jaws *e* and hooking under the outside overhangs of the rails *a*, and *h* designates threaded rods and nuts for regulating the positions of the jaws with respect to the heads *c* of the rack-rails.

In the form shown in Fig. 4 the two catches are quite independent of each other, both jaws of each catch being movable on the pivot-rods *g* and the jaws of each catch being held in juxtaposition to the overhangs by threaded rods and nuts $h^{\times}$. It will be observed that in this instance the catches may move on their pivots *g* independently of each other.

The rails *a* are built into the road-bed, as heretofore, or in some other suitable manner, while the catches are mounted in appropriate ways upon the motor to be carried along thereby and serve to prevent it from jump-

ing its cog out of the rack-rails. It will also be noted that the catches do not interfere with the progress of the motor, for the jaws thereof are so shaped at each end as not to catch on the rack-teeth even on the shortest curves and are of such lengths as to overlap several teeth of the rack-rails with which they coact to hold down the motor.

The invention may also be embodied in forms other than those shown in the drawings and described above.

What I claim is—

1. In a rack-railway, parallel rack-rails provided with overhangs, combined with a catch-bar between said rails, and with independent catch-bars outside said rails.

2. In a rack-railway, parallel rack-rails provided with overhangs at each side thereof, combined with an independent catch on the motor for each rail and underrunning the outside overhanging parts of the same, and catch devices inside or between said rails coacting with the outside catches, substantially as described.

Signed at Lucerne, in the canton of Lucerne, in the Republic of Switzerland, this 16th day of April, A. D. 1902.

ROMAN ABT.

Witnesses:
JOH. FLUOLER,
F. HEGGLI.