(No Model.)

A. HUBER.

SUSPENSION TROLLEY AND RAILWAY.

No. 588,714. Patented Aug. 24, 1897.

Fig. 1

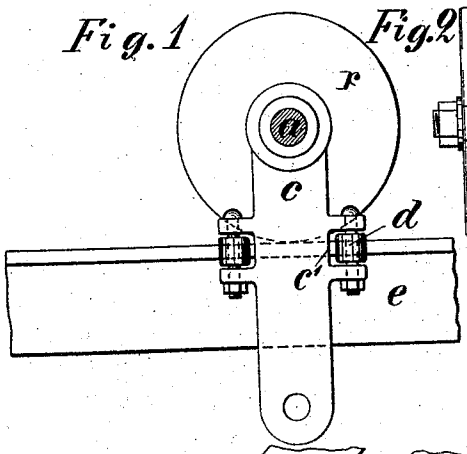


Fig. 2

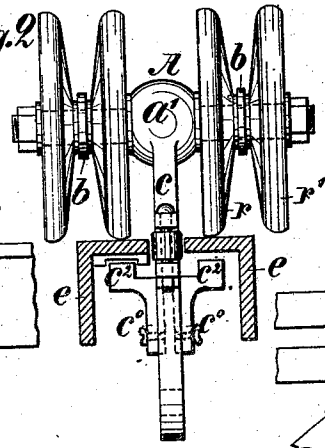


Fig. 4

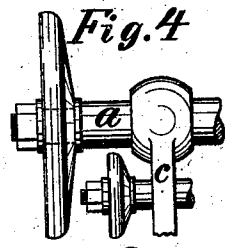


Fig. 6

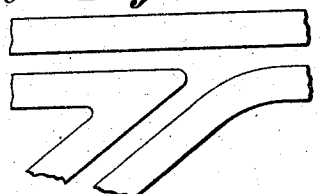


Fig. 3

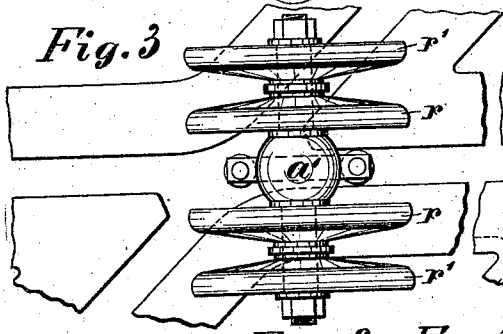


Fig. 5

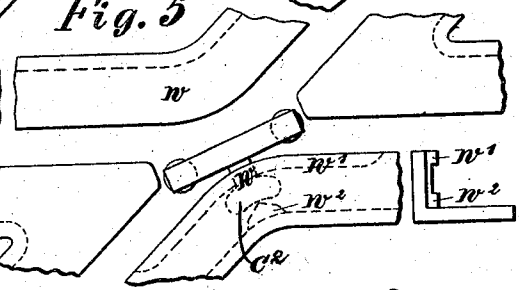


Fig. 7

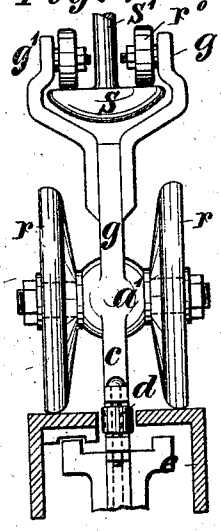


Fig. 8

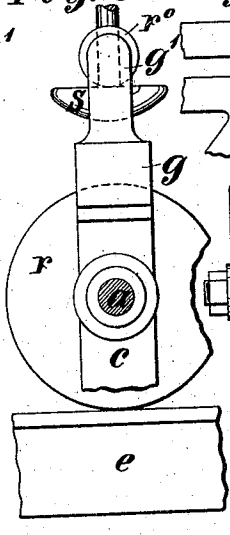


Fig. 11

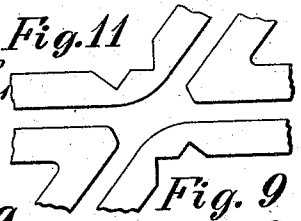


Fig. 12

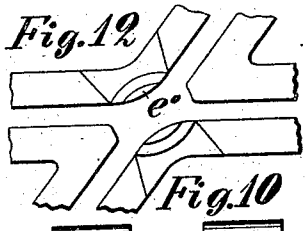


Fig. 9

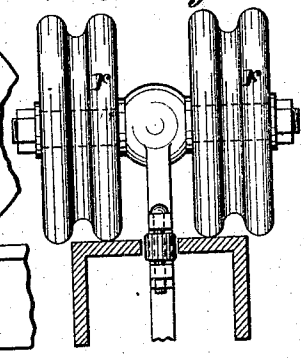
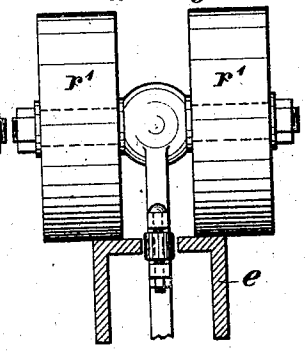


Fig. 10



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UNITED STATES PATENT OFFICE.

ALEXANDER HUBER, OF COLOGNE, GERMANY.

SUSPENSION-TROLLEY AND RAILWAY.

SPECIFICATION forming part of Letters Patent No. 588,714, dated August 24, 1897.

Application filed May 5, 1896. Serial No. 590,292. (No model.) Patented in Germany March 17, 1894, No. 78,459, and in England January 4, 1895, No. 293.

To all whom it may concern:

Be it known that I, ALEXANDER HUBER, a subject of the King of Prussia, Emperor of Germany, residing at Cologne, Rhenish Prussia, Germany, have invented certain new and useful Improvements in and Relating to Suspension-Trolleys and Railways Therefor, (for which I have obtained a patent in Germany, No. 78,459, dated March 17, 1894, and in Great Britain, No. 293, dated January 4, 1895,) of which the following is a specification.

This invention relates to improvements in suspension-trolleys and in railways therefor; and the special object of this invention is that in railway-crossings and switches of suspended railways the passage of the running trolley from one line of rails onto the other may be effected by simple means by the trolley itself, and that such crossings, points, or switches may be traversed without the wheels losing their support on the line or receiving concussions when crossing.

These improvements are shown in different views in Figures 1 to 12 of the annexed drawings, in which—

Fig. 1 is a sectional side elevation of the improved trolley with part of the rail on which it runs. Fig. 2 is an elevation of the trolley at right angles to Fig. 1, showing the rails in section. Fig. 3 is a plan view thereof, showing a crossing-place in the rails. Fig. 4 is a detailed view of part of the trolley, showing a modified construction. Fig. 5 illustrates in plan a crossing-place in the rails and means for automatically turning the trolley from the one to the other track. Fig. 6 is a plan view of a single point or branch. Figs. 7 and 8 are elevations of the trolley and of means for supporting the same when passing crossings at right angles. Figs. 9 and 10 illustrate modified forms of trolley-wheels. Figs. 11 and 12 show in plan modified constructions of the rails to avoid friction at crossing-places between the wheels and the rails when the trolley is diverted from the one to the other track.

The invention comprises a running trolley A, the axle *a* of which is at each end provided with two wheels *r r'*. These wheels are loosely mounted on the axle and are capable of rotating independently of each other, for which purpose separating-washers *b* may be arranged between them. This axle *a* is in its center—that is to say, between the two pairs of wheels—enlarged in diameter at *a'*, from which enlargement or boss the downward supporting or bearing web *c* projects. The latter is provided on its fore and aft edges with a recess *c'*, in each of which a rotary guiding-roller *d* is journaled.

It is not necessary that each pair of wheels *r r'*, as illustrated in Figs. 1 to 3, be composed of two equally-large wheels. Wheels of different sizes and also a larger number of wheels than two may be employed for attaining the same effect—namely, to impart to the axle *a* in direction of its vertical axial plane a support on passing over branches or points in the line. (See Fig. 3.)

The auxiliary wheels *r' r'* may run free from contact with the rails when the inner wheels are running on the railway-line, since the former are required and act only on traversing crossing or branch lines.

For carrying the running trolleys rails made of angle-iron, bars, (see Fig. 2,) or the like may be used, two of which are arranged parallel at a suitable distance apart in such a manner that the web *c*, with its guide-rollers *d*, has sufficient play in the slot thus made between the rails. These rails *e* are fixed on the suspension-bearings, cantalivers, posts, or the like in such a manner that the trolleys and their cages or the like are enabled to freely pass.

At those places where two railway-lines cross each other the rails are suitably widened. At crossings which do not intersect at right angles, but at an angle of, say, fifty degrees, first the outer wheel *r'* passes the slot of the crossing while the load rests on the inner wheel *r*. The inner wheel *r* then passes over the slot when the outer wheel *r'* has already passed again onto the rail and carries the load. With the opposite pair of wheels on the other side an inverse process takes place—namely, first the inner wheel traverses the slot, leaving the load on the outer wheel, while subsequently the outer wheel crosses the slot, leaving the load again supported on the inner wheel. Thus out of the four wheels indicated in the drawings each passes singly

over the slot at a different time, so that at least always one wheel on each side carries the load. Consequently uninterrupted and uniform support of the load on passing the railway-crossings is completely secured. The same description applies to the passing of a single switch or siding, but only upon one side of the trolley.

In order to pass the trolley out of one line onto the other cutting or branching from the former, the trolley is brought up to the crossing-point, where the rails at their acute angle are shortened to such extent that the web *c* with its two guide-rollers *d* can be turned in the space, and said trolley is then simply turned in the direction of the other line, into which it can then be shunted in either direction. The turning or switching of the trolley may be executed on all the wheels or on but two, so that when the turning is to be made on two wheels only then in arranging the lines those parts of the rails on which the outer wheels usually turn should be cut away at the respective places, as is shown in Figs. 11 and 12. In Fig. 4 a modification is shown in which the wheels of each pair are of different diameters and are mounted on different axles, the larger wheels of each pair being mounted on the main axle *a*, while the smaller ones are mounted on an axle connected with the web *c*, which depends from a boss or sleeve through which the main axle passes, all of the said wheels simultaneously engaging the track.

When the trolley is to be passed out of the one line into the other crossing the first without stoppage being made, as described above, at the point of crossing, this may be effected by means of the arrangement hereinafter described, and shown in Fig. 5. On the crossing of two rails, (one set of tracks,) namely, at the obtuse and suitably rounded-off angles W, there is at the edge of the bottom side of the rail a downwardly-projecting counter-rail W', and rearward therefrom an abutment W^2 is arranged. On the web *c* of each trolley is an arm c^0, Fig. 2, which at its outer end is provided with a suitably-shaped nose c^2. The arm c^0 may be adjustably secured in any suitable manner to the web *c*, as in guides, so that, if desired, they may be placed in such a position as to come in proper contact with the aforesaid counter-rail W' and abutment W^2.

To pass or switch a trolley from one line to another without stopping, the arm c^0 is first suitably secured to the web so that the noses c^2 will come in proper contact behind the counter-rails W'. Owing to the particular shape of this nose, as illustrated in Fig. 5, it is not allowed to freely pass through the space between the counter-rail and the abutment W^2, but is, on the contrary, held back by the latter, on which it turns until the trolley has been so far turned that it will run on the other line, whereupon the nose arrives into such a position as to allow of its passing in front of the abutment. Thus the trolley freely continues its passage onto the other line without having come to a standstill.

Fig. 6 shows the construction of a single branch.

The arrangement shown in Figs. 7 and 8 enables the trolley where the tracks cross at right angles to be simply turned to pass from the one line into that running at right angles thereto. For this purpose there is placed vertically above the crossing-point a horizontal disk *s* or the like, vertically suspended. The main axle *a* of the trolley carries above its boss *a'* a forked arm *g*, the two arms *g'* of which carry each on its inner side a rotary wheel r^0. These wheels r^0 ride onto the upper face of the disk *s* as soon as the trolley arrives at the crossing-point of the line, so that the trolley with its load is now suspended from these auxiliary wheels r^0 upon the disk *s*. The trolley may then be turned, when the wheels r^0 will describe arcs of a circle upon the disk *s*. The rails at the crossing-point must be suitably cut away to afford space for the web with its guide-rollers to turn.

In the trolley hereinbefore described the axle *a* is at each side provided with at least two wheels *r r'*, moving independently from one another, to insure a continuous and uniform support for the load. By the arrangement which will now be described these wheels provided at each end of the axle may be brought into a firm connection with each other or be replaced, respectively, by one suitably-shaped wheel by which, owing to its construction alone or together with a particular form of the rails at the crossing-points, uniform support of the load on passing any crossing of the line or the like may also be secured. This latter improvement is illustrated in Figs. 9 to 12 of the annexed drawings. The wheel *r'* is of such a width or two wheels *r'* are firmly connected so that this composite wheel on passing over a branch or a non-rectangular crossing finds uninterrupted support on at least one of the two edges of the wheel. In order to reduce the friction to a minimum, either the wheels may be provided each with two running-surfaces, as in Fig. 9, or otherwise the friction-face may be decreased by reducing the width of the rail, as in Fig. 10.

Especially at such crossings or branches of the line where the trolley by simply turning on its vertical axis is passed out of the one line into the other that part of the rail-surface which lies at the crossing-point may, as illustrated in Fig. 12, be cut down to an extent of a few millimeters in depth, so that the turning motion may be only executed on the annular part e^0 of the rail-surface, which is left at the normal height. In this respect the same result is attained with the wheel *r'* shown in Fig. 10 as with the wheel shown in Fig. 9, for which latter the rails at the crossing-points, Fig. 11, are provided with notches, so that always only one of the running-flanges

will be in contact with the rail-surface at any given time.

Having now described my invention, what I claim is—

1. In a suspension-trolley, an axle, wheels mounted on either end thereof, a boss in the center of said axle, a web connected with said boss and extending downwardly therefrom, tracks suitably supported and having a passage-way in which said web travels a counter-rail secured to said track, an abutment also secured to said track, and near said rail, an arm secured to said web having noses adapted to engage said counter-rail, said parts being combined substantially as described.

2. In a suspension-trolley an axle with wheels freely mounted thereon, a web secured to said axle rotary guiding-rollers mounted thereon, rails supported at a suitable distance apart and adapted to have passed between them said web, an arm provided with noses adjustably secured to said web, a counter-rail and abutment secured to said rail and adapted to engage said noses and an upwardly-projecting forked arm also secured above said axle, having wheels mounted thereon, all of said parts being combined substantially as described.

3. In a suspension-trolley an axle with wheels mounted on either end thereof, a boss in the middle of said axle an upwardly-projecting forked arm secured to said boss, wheels journaled on said forks, a disk suitably supported and adapted to engage on its upper surface said latter wheels, a web also secured to said boss and projecting downwardly, rails adapted to have said web pass between them, an arm mounted on said web, a nose on the end of said arm, a counter-rail secured to said rail, and an abutment also fastened to said rail and being adapted to engage said nose, all of said parts being combined substantially as described.

4. In a suspension-trolley switching device an axle with wheels suitably mounted thereon, a downwardly-projecting web secured to said axle, recesses in said web having journaled therein vertical rotating guides, rails secured in any suitable manner, said web passing between said rails, an arm having a nose adjustably mounted on said web, a counter-rail and abutment firmly secured to said rail and adapted to engage said nose, an upwardly-projecting arm also secured to said axle having forked arms, wheels journaled in said arms, a horizontal disk suitably supported and adapted to engage said wheels on its upper face, all of said parts being combined, substantially as described.

In testimony whereof I have signed this specification in the presence of two subscribing witnesses.

ALEXANDER HUBER.

Witnesses:

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WILLIAM H. MADDEN.