(No Model.)

A. M. LEINWATHER.

RAILWAY CAR.

No. 393,709. Patented Nov. 27, 1888.

Fig. 3

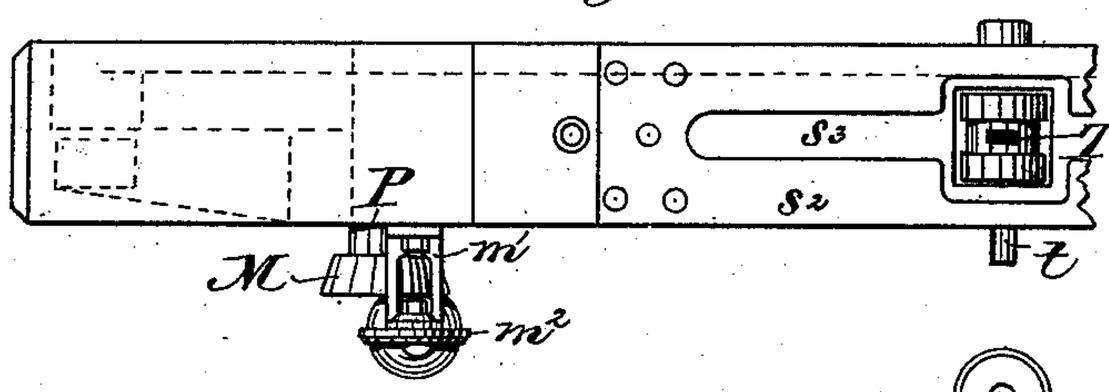


Fig. 4.

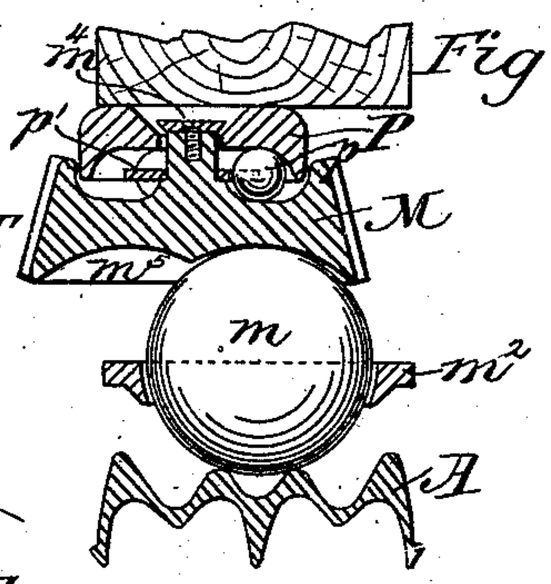
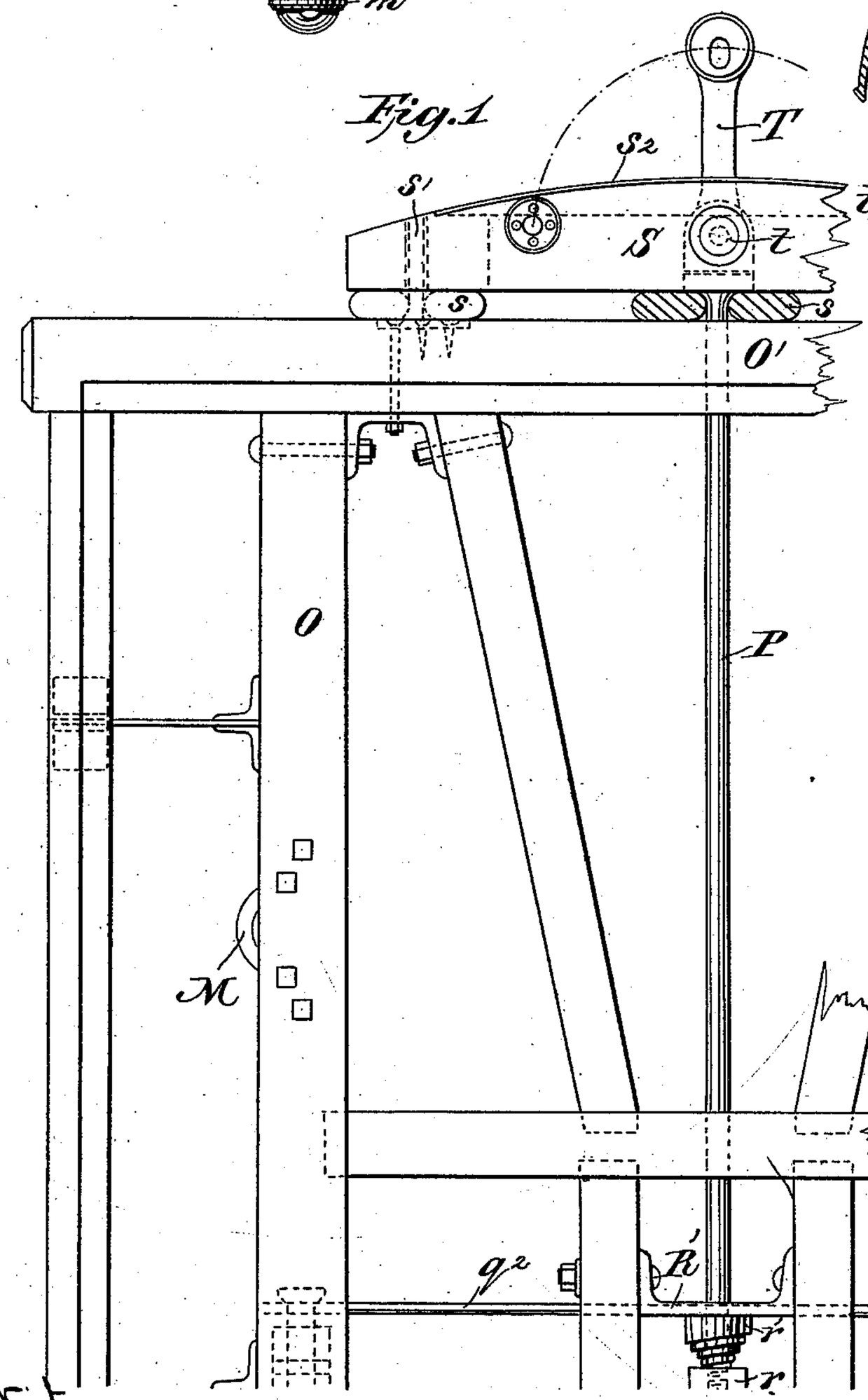


Fig. 1



T Fig. 2

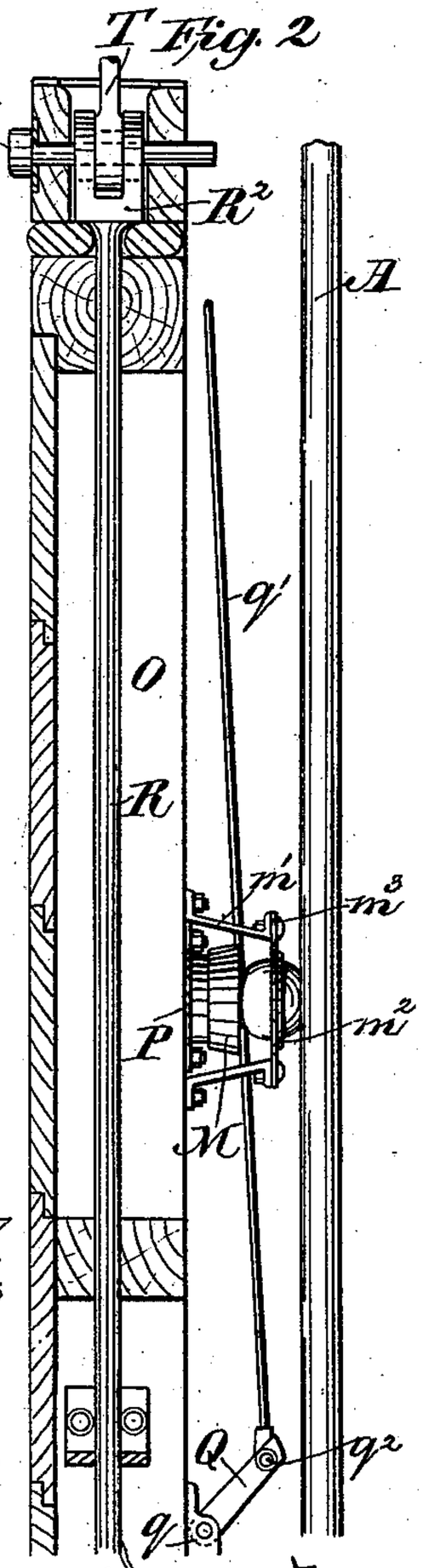
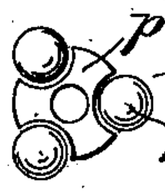


Fig. 5



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UNITED STATES PATENT OFFICE.

ALOYS MARIA LEINWATHER, OF VIENNA, AUSTRIA-HUNGARY, ASSIGNOR OF ONE-HALF TO HEINRICH GLASER, OF SAME PLACE.

RAILWAY-CAR.

SPECIFICATION forming part of Letters Patent No. 393,709, dated November 27, 1888.

Application filed February 17, 1888. Serial No. 264,377. (No model.) Patented in Germany June 14, 1887, No. 43,683; in France January 28, 1888, No. 188,411; in Belgium January 28, 1888, No. 80,438; in Italy March 17, 1888, XXI, 22,912, and XLV 244, and in Austria-Hungary June 4, 1888, No. 51 and No. 28,566.

To all whom it may concern:

Be it known that I, ALOYS MARIA LEINWATHER, engineer, a subject of the Emperor of Austria, residing at Vienna, in the Province of Lower Austria, in the Empire of Austria-Hungary, have invented certain new and useful Improvements in Railway-Cars, (for which I have obtained Letters Patent in Germany, dated June 14, 1887, No. 43,683; in France, dated January 28, 1888, No. 188,411; in Belgium, dated January 28, 1888, No. 80,438; in Italy, dated March 17, 1888, Vol. XXI, No. 22,912, and Vol. XLV, No. 244, and in Austria-Hungary, dated June 4, 1888, No. 51 and No. 28,566;) and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, and to letters or figures of reference marked thereon, which form a part of this specification.

Referring to the drawings, Figure 1 is a top plan view, partly in section, of a portion of the main frame of a car, showing certain parts of my invention. Fig. 2 is a vertical longitudinal section thereof, showing other parts of my invention. Fig. 3 is a partial end elevation of the car-frame; Fig. 4, a transverse vertical section of one of the longitudinal girts and the means for propelling the car, and Fig. 5 is a detail view.

This invention relates to the propulsion of vehicles or other heavy bodies by means of or upon spheres instead of the usual propelling and supporting wheels.

The object of the invention is to provide a simple means for supporting and propelling vehicles or other heavy bodies either upon a track or a road-bed; and it consists in structural features and combinations of parts, substantially as hereinafter described, and as set forth in the claims.

In the drawings, O indicates one of the longitudinal girts of the floor-timbers of a car adapted to be supported on and propelled by spheres *m*, that are held against lateral displacement in openings formed in guide-plates m^2, bolted to hangers m', secured to the longitudinal girts O of the frame.

As shown in Fig. 4, the opening in the guide-rings m^2 is such as to allow the sphere *m* free play therein, yet holding said sphere against lateral displacement.

M indicates a disk in whose under side is formed a circular groove, m^5, of such concavity as to fit onto the sphere *m*. This disk M is pivoted eccentrically to the vertical axis of the guide m^2, and is pivotally connected with the longitudinal girt O of the car-frame through the medium of a collar, P, in which is formed a bearing for the journal or pivot-pin m^4 of said disk M. The collar P is bolted to the under side of the longitudinal girt O, and has in its under face an annular groove, the inner face of which is flat, the edges of the collar projecting inside of a like groove formed in the upper face of the disk M, the bottom of which groove is also flat, while the inner face around the journal or pivot m^4 has the form of a segment of a sphere. On this journal is loosely fitted a disk, p', in which are formed semi-cylindrical recesses that serve as bearings for small spheres *p*, as shown in Fig. 4, to form an anti-friction bearing for the body of the car and the disk M, the sphere *m* forming a like bearing between it and the said disk M.

It is obvious that if traction is applied to a vehicle mounted as described a gyratory or revolving motion will be imparted to the disk M, while the sphere M will revolve on its own axis in a plane at right angles to the plane of rotation of the disk, and thus propel the car whether the spheres rest upon a road-bed or upon a grooved rail, H, as shown in Fig. 4. It will also be observed that the resistance of inertia is readily overcome in a vehicle mounted as described, and that the frictional resistance to its motion is reduced to a minimum.

To check the motion of a vehicle of the character referred to, brakes may be applied to the spheres; but in such case the guide and retaining-disks would have to be made of sufficient strength to resist the strain brought upon them. To avoid this I prefer to employ brake-

levers arranged to coact either with the road-bed or with the rails. In the drawings I have shown a brake-lever acting upon the road-bed, and which is adapted to be raised clear of such road-bed when not in use, so that the motion of the vehicle may be either suddenly or gradually stopped.

In Figs. 1 and 2, Q indicates a brake-lever pivoted to the under side of the longitudinal girts O in bearings q, the brake-levers being arranged in pairs—one on each side of the truck-frame—and connected by connecting-rods q^2; and q' is the operating-rod by means of which the brake-levers may be raised or lowered, the rod being connected in any desired or well-known manner to an operating-lever (not shown) fulcrumed to any convenient part of the car. Two pairs of such levers are arranged between the spherical supports at the end of the vehicle, the levers Q extending in reverse directions, so that a vehicle moving in the direction of the arrow, Fig. 2, may be suddenly stopped by lowering the levers Q, while such vehicle may be more gradually stopped by lowering the levers, (not shown in the drawings,) and located to the left of said levers Q, which then act more like brake-shoes upon the road-bed.

The draft devices consist of two rods, R, of which one only is shown in the drawings, extending from the end to the center of the vehicle or truck, said rods having their inner ends screw-threaded, and are connected by a nut, r, by means of which they may be tightened up. The inner ends of the rods have their bearings in brackets R', which latter and the nut r serve as abutments for the springs r', that support the strain upon the frame and form a yielding bearing.

In front of each truck is arranged a buffer consisting of a cross-head, S, capped with sheet-steel, as shown at s^2, Figs. 1, 2, and 3, said cross-head resting on rubber cushions or buffers, the whole being secured by bolts to the end cross-girt, O', of the truck-frame. The cross-head has a suitable opening, into which projects the draw-head R^2 of the draw-bar R, to which is connected the coupling-link T by means of a coupling-bolt, t, so that when such a vehicle is to be drawn by animals the draft-bar may be removed and the whiffletree connected with said draw-bar. The buffer S has in its front face a transverse slot to afford the necessary lateral motion to the draft-bar T.

In locomotives the periphery of the bearings M is beveled, as shown in Fig. 4, and provided with teeth, thus forming bevel-wheels, which are properly geared with like wheels mounted on the crank-shafts driven by the engine.

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

1. In a vehicle, a loose spherical support, in combination with a bearing for said support, consisting of a disk in the under side of which is formed an annular groove, into which said spherical support projects, said bearing being revoluble on a vertical axis eccentric to the like axis of the sphere, substantially as and for the purposes specified.

2. In a vehicle, a loose spherical support, in combination with a bearing for said support, consisting of a disk in whose under face is formed an annular groove, into which said spherical support projects, said bearing being revoluble on a vertical axis eccentric to the like axis of the support, and with a retaining-ring rigidly connected with the vehicle-frame and loosely encompassing the spherical support, substantially as and for the purposes specified.

3. In a vehicle, a loose spherical support, in combination with a bearing for said support, consisting of a disk in whose under face is formed an annular groove, into which the spherical support projects, said bearing being revoluble on a vertical axis eccentric to the like axis of the spherical support, and with a rolling bearing interposed between the vehicle-body and the disk-bearing for the spherical support, substantially as and for the purposes specified.

4. In a vehicle, the loose sphere m and its bearing M, having an annular groove in both of its faces and an axial journal projecting vertically therefrom, in combination with the collar P, of less diameter than the groove in the upper face of said bearing, said collar being rigidly secured to the vehicle-body and provided with an axial seat for the journal of the bearing M, the spheres p, interposed between the bearing M and collar P, and the retaining-disk p' for said spheres, said parts being arranged for co-operation substantially as and for the purposes specified.

5. In a vehicle, a loose spherical support therefor and a bearing consisting of a disk having its perimeter beveled or inclined and toothed to form a bevel-wheel, and having in its under side an annular groove, into which the spherical support projects, said bearing being revoluble on a vertical axis eccentric to the like axis of the spherical support, substantially as and for the purposes specified.

In testimony whereof I affix my signature in presence of two witnesses.

ALOYS MARIA LEINWATHER.

Witnesses:
OTTO SCHIEFER,
OTTO MAASS.