(No Model.)

J. P. HARPER.

ANTIFRICTION TRUCK FOR CARS, &c.

No. 536,873. Patented Apr. 2, 1895.

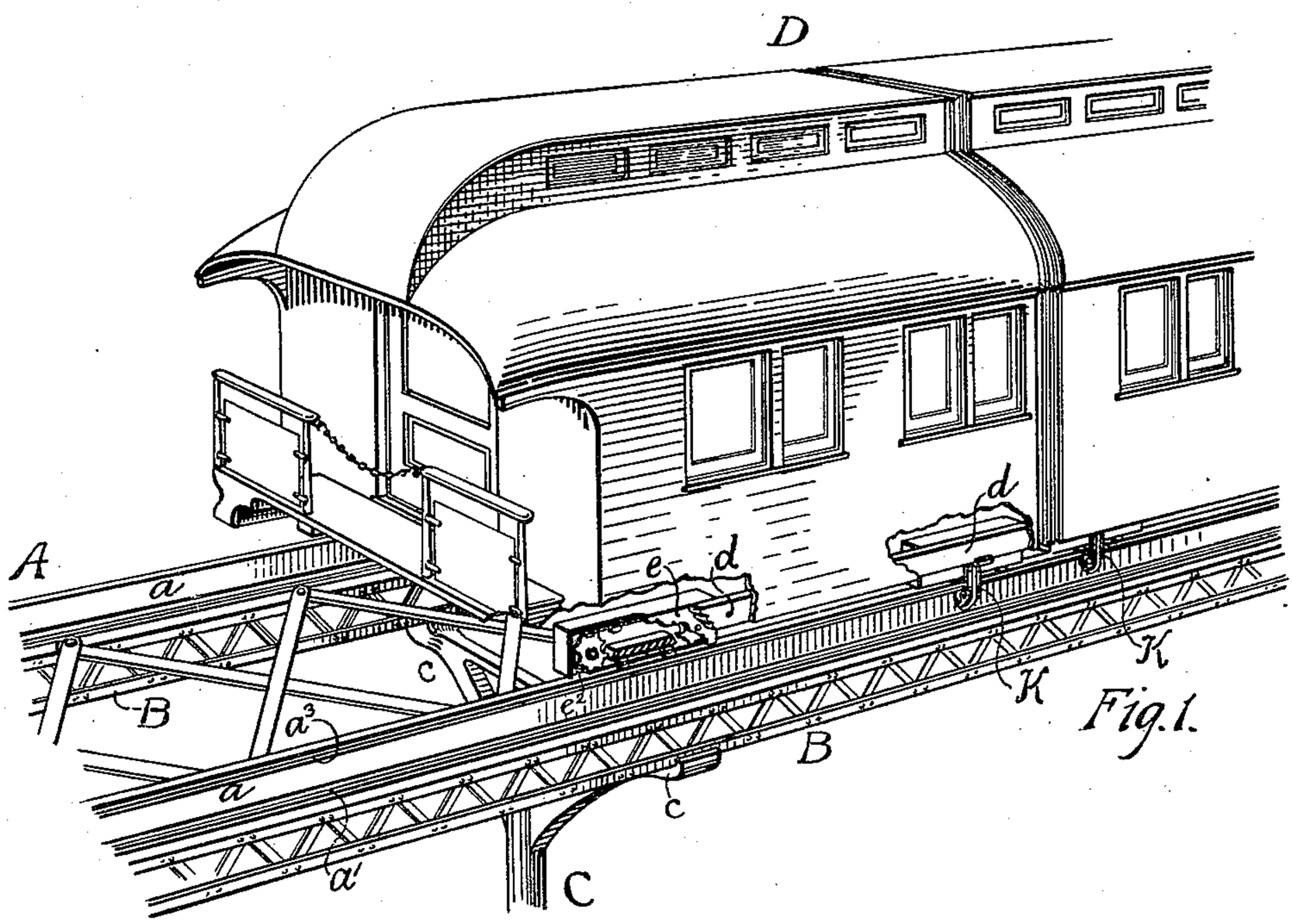

Fig. 1.

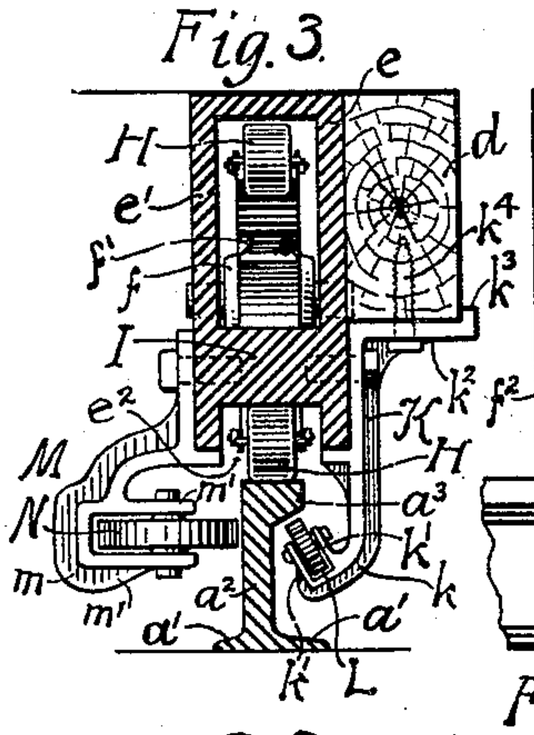

Fig. 3.

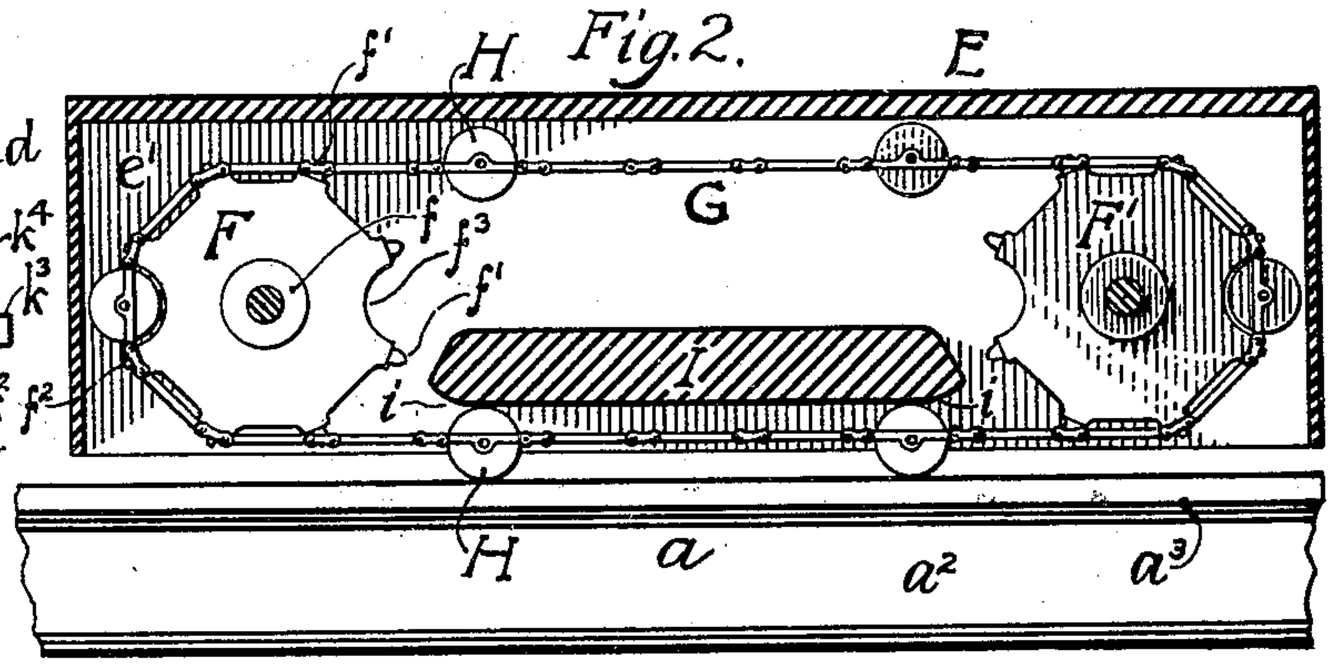

Fig. 2.

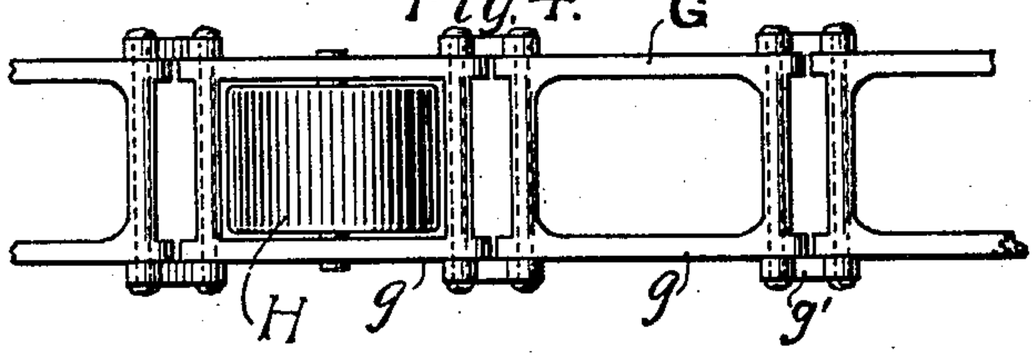

Fig. 4.

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ANTIFRICTION-TRUCK FOR CARS, &c.

SPECIFICATION forming part of Letters Patent No. 536,873, dated April 2, 1895.

Application filed October 26, 1894. Serial No. 527,596. (No model.)

To all whom it may concern:

Be it known that I, JAMES P. HARPER, a citizen of the United States, residing at Westport, in the county of Jackson and State of Missouri, have invented certain new and useful Improvements in Antifriction-Trucks for Cars, &c.; and I do hereby declare that the following is a full, clear, and exact description of the invention, such as will enable others to make and use the same, reference being had to the accompanying drawings, forming a part of this specification.

The object of my invention primarily is to obtain the highest degree of speed in a railway car with the minimum degree of friction, and also to enable said rate of speed to be maintained with a light vehicle or coach, with absolute freedom from danger of derailment; and which will afford an anti friction device applicable to various uses.

My invention consists in the novel construction and combination of parts, such as will first be fully described, and specifically pointed out in the claims.

Referring to the drawings:—Figure 1,— is a view in perspective of a single track elevated railway with the car thereon shown in sections, short in length, and raised slightly above the plane of the track, also showing the forward section of the car at each end and the truck frame, carrying the anti friction devices broken away, also showing the means for retaining and guiding the car upon the track rails. Fig. 2,— is a longitudinal vertical sectional view of the truck shown mounted upon the track rails. Fig. 3,— is a cross sectional view of the truck and the track rail taken upon a vertical line drawn through opposite rollers in the position as seen in Figs. 1 and 2. Fig. 4,— is a detail view of the sprocket chain and roller.

Similar letters of reference indicate corresponding parts in all the figures.

Referring to the drawings:—A, represents an elevated railway track of which *a*, *a*, are the track rails.

B, B are trussed beams extending in the longitudinal direction of and supporting the respective rails *a*, *a*.

Beneath the track A is a single column C, upon each side of which are brackets *c*, *c*, which extend laterally therefrom and support the respective beams B, B. Similar columns with brackets are provided and placed at proper distances apart beneath the trussed beams, as may be required to support the structure.

The track rails *a*, *a*, each consist of the usual lateral flanges a' a' at the base, from which the web a^2 extends upwardly a considerable distance, for the purpose hereinafter described. Upon the outer side of the web and from the tread of the rail is extended in a longitudinal direction the flange a^3, the portion of which beneath the tread is inclined obliquely in the direction of the web a^2. Upon the track rails *a*, *a*, is the railway car D, which is made preferably in short sections, and of a minimum height.

In the construction of the car, materials having the least weight combined with strength are employed, and dead weight is thus avoided. The floor beams *d* which extend along the side of the car and a short distance past the line of the track rail are therefore proportionately light in weight. To the inner side of the beam *d*, and near one end of the forward section of the car D, is attached in the manner hereinafter described my improved antifriction truck E. The frame of said truck consists of a hollow casting or box the side plates *e*, *e'* of which are comparatively short in length and which extends from the line of the upper side of the beam *d*, downwardly to a position a short distance above the tread of the track rail *a*, and in the under side of which box is a longitudinal opening e^2. Near one end of the box or casting and in the side plates *e e'* is journaled a sprocket wheel, F. Said sprocket wheel in diameter extends from a position beneath the inner side of the top of the box or casting A, for the clearance of the rollers hereinafter described to a position nearly in line with the lower edge of the plates *e e'*. Upon each side of the wheel F is a boss *f* extending around the journal thus preventing lateral movement of the said wheel. The number and distance apart of the sprocket teeth f', are in proportion to the diameter of the sprocket wheel. Between two adjacent sprocket teeth f' f' and in a transverse direction to the periphery of the sprocket wheel is a semi-circular depression f^2. Upon the portion of the periphery opposite to the de-

pression f^2 and upon a line drawn through said depression f^2 and the journal of the said wheel is a depression f^3 which is similar to the depression f^2. At the other end of the box or casting A is a sprocket wheel F', which is precisely the same in construction and arrangement and journaled in the side plates $e\,e'$ as described of the sprocket wheel F. Over the sprocket wheel F is placed one end of a sprocket chain G, the other end of which chain is extended over the sprocket wheel F', and the two ends of the said chain linked together in the usual manner. Said sprocket chain G, consists of rectangular shaped links or frames, g, g, to the side and end of one of which is pivoted one end of a flat bar or link g', the other end of which bar is pivoted to the outer side and end of an adjacent frame g, the length of each link being sufficient to admit the sprocket tooth f' on the sprocket wheel between the cross bars of the respective frames g, g, and the pivots of the links extending through said cross bars.

Within one of the frames g, of the sprocket chain G, is a small roller, H, which is journaled in the sides of said frame g, and rotates in the direction of the sprocket wheel, the periphery of the said roller being permitted to enter the depressions f^2, f^3, in the sprocket wheels F F'. Within another frame g, of the sprocket chain at the distance from the heretofore described roller H equal to that described by the semi-circumference of the sprocket wheel is journaled in precisely the same manner a similar roller H and continuously in the entire length of the sprocket chain at the same described distance apart are journaled a series of like rollers.

Extending from the inner side of plate e to the inner side of plate e' and from a position adjacent to the sprocket wheel F, without contact, to the sprocket wheel, F', is a single longitudinal track plate I, the under side of which plate extends in a horizontal plane, nearly its entire length, and downwardly to a position in line horizontally with the periphery and in the path of the rollers H, H, which are beneath the said track rail. At one end of the track rail I' the surface upon the under side is inclined at i in a curved line in an upwardly direction in a slight degree, and at the other end of the said rail the same degree of inclination is given to the track rail at a corresponding point.

To the side plate e, of the truck and at a suitable point between the ends of said truck plate is bolted one end of a guide roller bracket K, which extends from a point corresponding to the upper side of the track plate I upon said plate e, downwardly to a point opposite the web a^2 of the track rail a, and the lower end k of said bracket is bent in an upwardly curved line in the direction of said web. Upon the inner side of the lower curved end k of said bracket are lugs k' k' in which is journaled a small guide roller L, the periphery of which is adapted to bear upon the obliquely inclined portion of the flange a^3 of the web. The upper end of the bracket K is provided with a seat k^2 which extends outwardly beneath the under side of the beam d of the floor of the car and the extreme outer end k^3 of said seat is bent at right angles in an upward direction a short distance.

The seat k^2 is secured to the beam d, by means of the screw k^4.

To the outer side portion of the plate e' at a point opposite in position to the bracket K is bolted a bracket M, which extends from a point similar to that described by the bracket K, and its lower end m, is extended downwardly to a position on the inner side opposite the web a^2, of the track rail and bent from the plate e' in an outwardly curved line.

Upon the inner side portion of the lower end m, of the bracket M, are the horizontally extended lugs m' m', in which is journaled the horizontal guide roller N, which is adapted to bear against the adjacent side of the web a^2. At the other end of the forward section of the car D, and secured to the beam d is a similar truck, and also upon the other side and at both ends of the said section of the car and also upon the other section of the car are trucks which are precisely the same as described at the one end of said section of the car and are secured to the corresponding beam upon the car in like manner.

In the propulsion of the car or cars provided with my improved truck, it is at once evident that the bearing of the under surface of the track plate I which comes in contact with the bearing rollers H, H, is moving with the car and at the same rate of speed, and glides over the said rollers at a rate of speed double that described by said rollers, and with the minimum degree of friction. The sprocket wheel F F' described the same revolutions within the same space of time and consequently there is a continuous roller support under the track plate I, and simultaneously with the released bearing of the track upon one roller H, another passes under said track plate.

By the observance of the rules of speed, I may enlarge the diameter of the sprocket wheels and increase or decrease the length of the sprocket chain in this manner, enabling rapidity of the car to be increased with decreased movements of the sprocket wheels and chain. As the rollers pass over the sprocket wheels they are received within the depressions f^2 f^3 and thence between the movable track plate I and the stationary track rail a, the length of the track plate, together with the inclined surface at each end of the track plate enabling all jar to be avoided in transit.

The truck frame instead of being cast in one piece may be made of separate plates and bolted together in the usual manner. The guide roller L, counteracts all tendency of the car to rise upward from any cause and is only in active operation when said tendency

is manifested. The guide rollers N, which are upon the inner side of the track rails *a*, *a*, prevent lateral swaying, maintain steadiness of the car, and of the anti friction truck upon the bearing surface of the rail, thus preventing derailment of the car. Instead of elevating the track rails, the said rails may be placed upon the surface of the ground and the truck will have the same capability of operation. The means of propulsion of the cars is not deemed necessary to illustrate in this application as they may be drawn by any well known application of power. I may employ pulley wheels and belts in lieu of the sprocket wheels and chain, whenever it may be found convenient to substitute the one for the other.

It will be observed that weight as a factor in maintaining steadiness upon the track rails is dispensed with, thereby lessening the cost of the train and the wear and tear incident to operation. I am also enabled to lessen the cost of the motive power which propels the train as well as the substructure which supports it.

The improved device is applicable to other uses wherever an anti friction support is required.

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

1. In a truck for cars &c. consisting of vertical side plates and a longitudinal bearing plate uniting said plates the combination of sprocket wheels journaled in said side plates at each end of said bearing plate, an endless sprocket chain extending over said sprocket wheels having links, and bearing rollers journaled in the said links, said sprocket wheels having depressions in their periphery adapted to receive the bearing rollers as shown and described.

2. A truck for cars &c. consisting of vertical side plates having journal bearings and a longitudinal roller bearing plate uniting said side plates in combination with wheels at each end of said bearing plate having depressions in the periphery of each wheel, an endless chain extending over said wheels composed of frames linked together and bearing rollers journaled in the said link frames adapted to enter the depressions in said wheels, said wheels being in alignment with said bearing rollers and having their journals extended within the journal bearings in said side plates, substantially as shown and described.

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