(No Model.) 2 Sheets—Sheet 1.

L. C. SHARP & J. A. GUTSCHE.

CAR TRUCK.

No. 421,111. Patented Feb. 11, 1890.

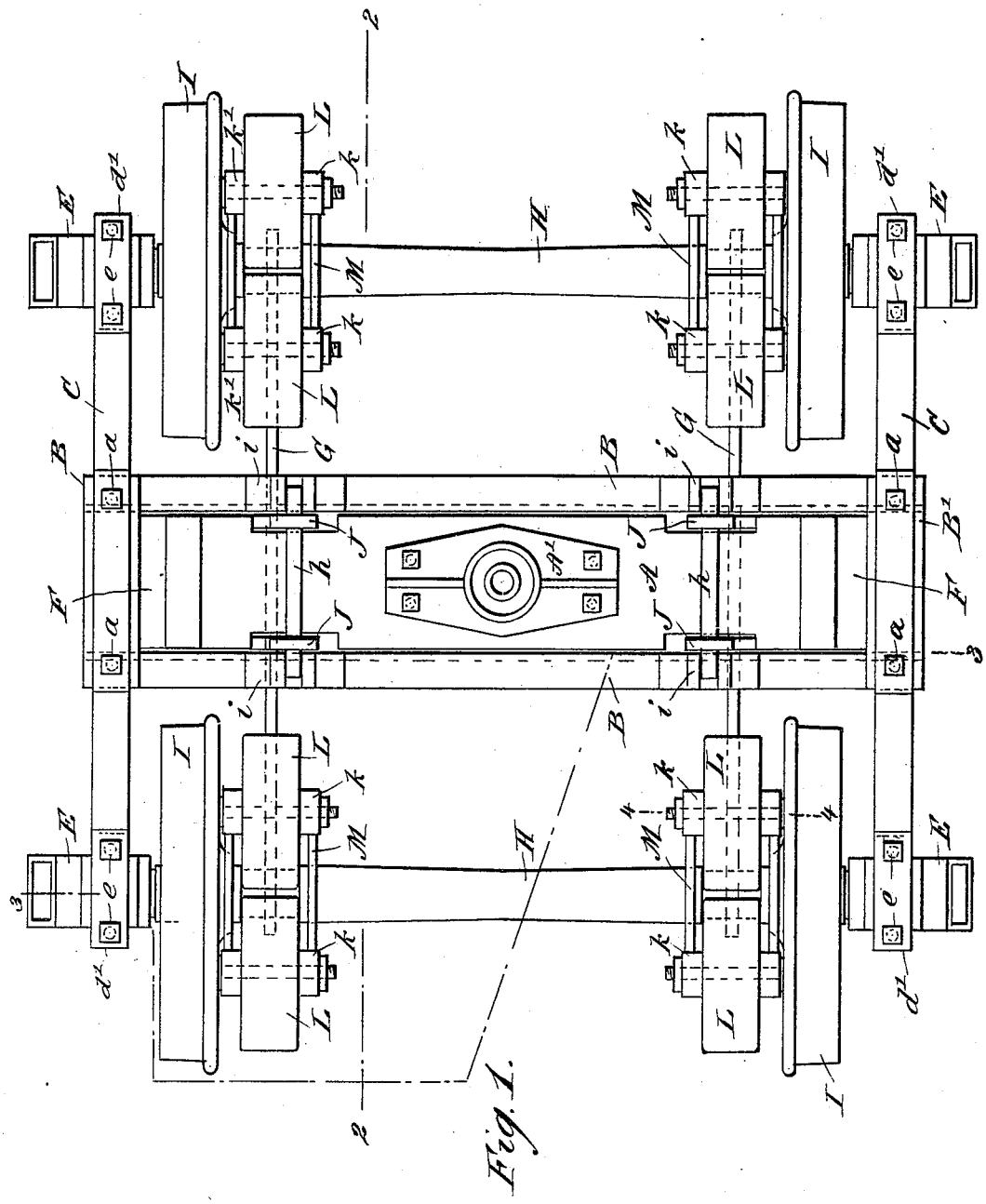

Fig. 1.

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Fig. 2.

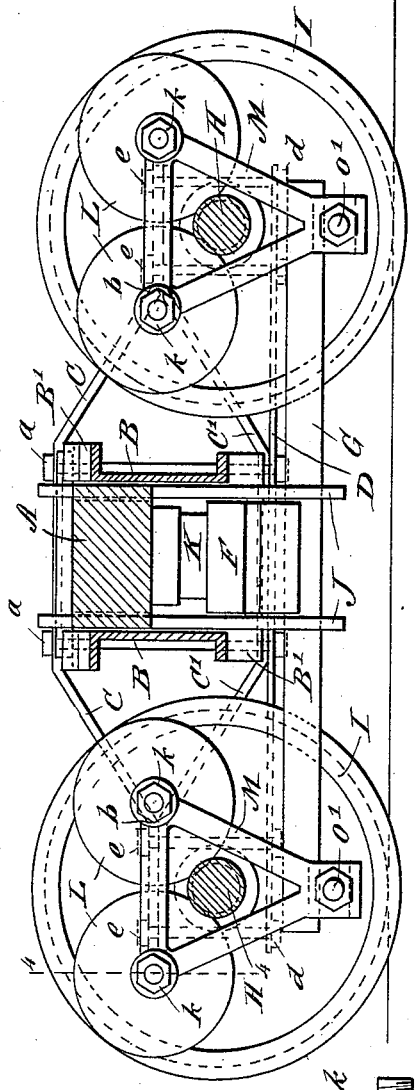


Fig. 3.

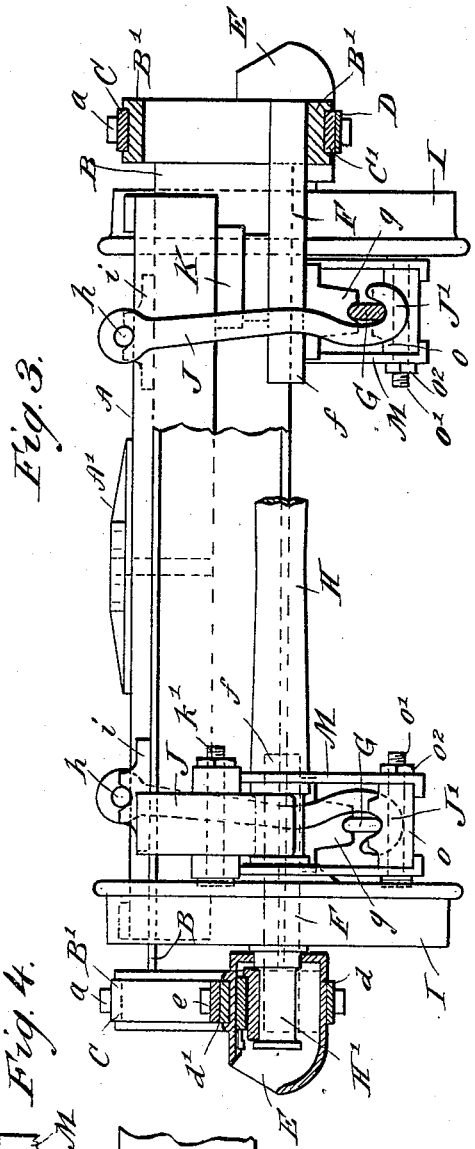
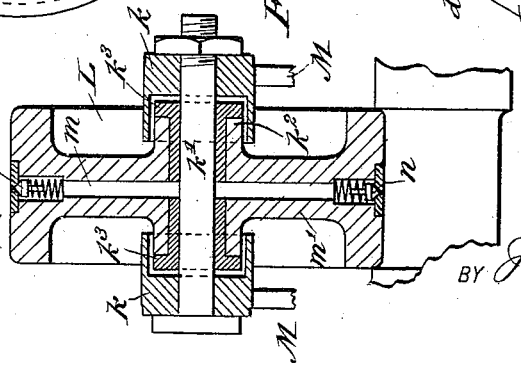


Fig. 4.



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UNITED STATES PATENT OFFICE.

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CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 421,111, dated February 11, 1890.

Application filed November 5, 1889. Serial No. 329,310. (No model.)

To all whom it may concern:

Be it known that we, LEE C. SHARP and JOHN A. GUTSCHE, of Plattsmouth, in Cass county, and State of Nebraska, have invented a new and useful Improvement in Car-Trucks, of which the following is a full, clear, and exact description.

The objects of our invention are to provide a car-truck of special or ordinary form with an improved means for distribution of load-strain upon the axles, whereby frictional resistance to revoluble movement of the axles is greatly reduced, heating of the bearings obviated, the load-sustaining capacity of the truck-axles increased, and wear on them reduced to a minimum.

With these ends in view our invention consists in certain features of construction, and combinations of parts, which will be hereinafter described, and indicated in the claims.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar letters of reference indicate corresponding parts in all the figures.

Figure 1 is a top plan view of a car-truck embodying the improvement. Fig. 2 is a side elevation, in section, of a car-truck having the improved features thereon, taken on the line 2 2 in Fig. 1. Fig. 3 is a partly sectional end elevation of the car-truck and improvements thereon, taken on the broken line 3 3 in Fig. 1; and Fig. 4 is an enlarged detached transverse sectional elevation of one of the anti-friction load-bearing wheels, which constitute an important feature of our invention, and a portion of an axle engaged by the same, the line of section being indicated at 4 4 in Fig. 2.

The car-truck herein represented in its general construction is of the usual improved form of trussed car-trucks, important features being embodied therewith, as will be explained.

A represents a transverse wooden bolster on which the center plate A′ is fastened. Said bolster is designed to have limited vertical movement within a skeleton frame comprised of the similar channel-plates B, the ends of which are secured to the spacing-bars B′, which are preferably made integral with the channel-plates. Grooves are formed across the four spacing-bars B′ in which the truss-plates C C′ are seated and secured by vertical bolts *a* that also penetrate the tie-bars D, which are extended in vertical alignment with and below the lower truss-plates C′. The ends of the truss-plates are inclined toward each other in pairs oppositely from the sides of the channel-plates B, and at *b* engage their adjacent faces, from which points on said truss-plates their ends are extended in contact horizontally, the upper and lower plates C C′ on each side of the truck producing a skeleton frame whereon the axle-boxes E are attached. Said boxes E are located at the same distance from the center of width of the bolster A between the tie-bar ends *d*, and lapped truss-plate ends *d′* parallel and aligning perforations being produced in the plate and bar ends, which register with vertical holes formed in ears on the boxes E, through all of which the pedestal-bolts *e* are inserted, which serve to clamp the boxes rigidly in place.

Aligning with the bolster A two similar spring carrier-beams F are located below it, one at each end of the same. These beams are made of wood, are equal in width to that of the bolster, and project from points *f* outwardly to engage the lower spacing-bars B′, on which their outer terminals rest.

Upon the lower surface of the carrier-beams F the saddle-plates *g* are transversely seated and secured, these being grooved suitably on their lower faces to receive the upper rounded edges of the equalizing-bars G, which latter are preferably made straight and of a length to extend below the axles H, that have their journaled ends H′ revolubly supported by the boxes E. The office performed by this connection of parts will be more fully explained.

Across the upper faces of the bolster A the hanger-shafts *h* are extended. The ends of said shafts are seated upon grooved saddle-plates *i*, that are mounted securely on the upper edges of the channel-plates B. The preferred position of the saddle-plates *g* and engaged shafts *h* is at points opposite to the axle-bodies, near to the inner hub-faces of the truck-wheels I, which latter are affixed upon the axles H in the usual manner, inside of their journal ends H′.

On the transverse hanger-shafts *h*, between

the sides of the bolster A and channel-plates B, the depending safety-hooks J are placed, these being furnished with integral perforated enlargements at their upper ends to provide means for their loose connection with the shafts *h*. On the lower ends of the pieces J hooks J′ are formed, which from the relative length of the safety-hooks considered as an entirety are adapted to engage the lower rounded edges of the equalizing-bars G, and thus be in position to upbear the latter if accident should detach them from other supports, which will be described.

Between the bolster A and the carrier-beams F the springs K are adjustably located, said springs being capable of affording elastic support to the load placed upon the bolster A, and from their manner of interposition between these pieces they may be adjusted toward or from the ends of the bolster, and thus shift the load-strain correspondingly, as will be more particularly mentioned.

In Figs. 1 and 2 are shown the load-supports, that form an important feature of the invention, which supports consist, essentially, of four anti-friction wheels L, pivoted in pairs and oppositely upon or between the upper portions of pendent triangular skeleton bracket-frames M.

Referring to the details shown in Fig. 4, it will be seen that the frames M consist of opposite mating-sections provided with bosses *k*, that are spaced apart, as shown in Fig. 2, to receive steel supporting-shafts *k′*, which revolubly sustain the wheels L, said shafts being so spaced apart that the peripheral surfaces of the anti-friction wheels placed thereon will nearly approach but not impinge upon each other.

To reduce friction upon the shafts *k′*, suitable provision must be made for lubrication of the points of bearing of the wheels. A preferred method of effecting this is shown in Fig. 4, the wheel therein shown being provided with an enlarged hub k^2, which is longitudinally and centrally perforated of a diametrical size to receive two flanged thimbles or bushings k^3, that are inserted from each side of the hub until their flanges bear upon the hub ends, thus affording a center revoluble bearing. The bushings k^3 should be formed of gun-metal, hard brass, phosphor-bronze, or other suitable material which will afford a proper wearing-surface for the wheels to revolve upon.

A median oilway *m* is produced in each of the central webs *m′* of the wheels L, which oilway intersects a recess afforded by the diminished length of the bushings k^3. Spring-actuated valves *n* are adapted to close the oilways *m* at the peripheries of the wheels L, which valves may be depressed by the nozzle of an oil-can and oil introduced when it is required.

It is to be understood that the construction of the wheels L may be changed as to the details of revoluble support upon the shafts *k′*, as anti-friction ball-bearings or cylindrical rollers may be adopted instead of the metal bearings described, and in an evident manner provide anti-friction revoluble supports for the wheels L. Each axle is suitably formed at proper points adjacent to the inner hub-faces of the truck-wheels I for the revoluble contact of the wheels L, the rims of which are rendered concentric with the shafts that sustain them, and are preferably rounded at their corners, as shown in Fig. 4, said wheels in pairs resting oppositely against these bearings on the axles, as shown in Fig. 2. As the bracket-frames M are triangular and the bosses *k* thereon, which carry the wheels L, lie in the same horizontal plane, such a construction provides depending supports for the transverse blocks *o*, that are secured to these lower ends of the frames by bolts and nuts *o′* o^2. The blocks *o* are grooved across their upper surfaces for the reception of the lower edges of the equalizing-bars G, that rest thereon. These points of contact, being vertically aligned with the truck-axles, are near the ends of the bars.

Safety-chains (not shown) may be readily secured to the bracket-frames and be therefrom extended to be attached by their other ends to the car-body above the trucks, which will prevent injury to the train which might result from any accidental breakage of the wheels or bracket-frames of the truck. The safety-hooks J herein described perform a similar function with regard to the equalizing-bars G, being provided as a guard against accidents to a train which could occur if a bar should drop on the track from accidental causes.

In operation the weight thrown on the center of the bolster A will preferably be mainly imposed upon the wheels L and by them transmitted to the bodies of the axles H, through the hanging equalizing-bars G, carrier-beams F, and springs K, and as the contact of the wheels with the axles is at their peripheries, the diameters of the wheels being considerably greater than the axle-bodies, the speed of the wheels will be proportionately less than said axles, and frictional contact with their revoluble supports largely diminished over that which would result if the entire weight of the load were imposed upon the outer journal ends H′.

The arrangement of the springs K upon the carrier-beams F so that a longitudinal adjustment thereon may be effected affords means for a graduation of load-strain between the points of contact of the wheels L and the journal ends H′. If the springs K are located as shown on the drawings in Fig. 3, the load will be principally sustained by the wheels L, in which case the office of the journals H′ will largely consist in their counteracting improper lateral and longitudinal motion of the axles, due to several causes, which produce side strain and end-thrusts of the same. Advantages claimed for this plan of construc-

tion consist, essentially, of the increased durability of the axles and time of efficient service of the same, due to the reduction of wear on their journal ends.

Lighter draft of the loaded car results, owing to the low percentage of frictional resistance induced at points of support of the load on the axles, which reduction is provided by the slow-running anti-friction load-carrying wheels L.

Obviation of journal heating is another advantage afforded. Car-trucks constructed as herein described may be safely reduced in weight of material employed, as there is a direct transfer of the load-strain to the axle-bodies, removing it from the frames to a large extent.

Having thus fully described our invention, we claim as new and desire to secure by Letters Patent—

1. In a car-truck, the combination, with a truck-frame, journal-boxes thereon, axles journaled and engaging these boxes at their ends, and truck-wheels secured to the axles inside of the truck-boxes, of a bolster, revoluble anti-friction wheels which rest on the axle-bodies, bracket-frames on which these wheels are supported, equalizing-bars extending between the axles and engaging the depending ends of the bracket-frames, vertically-acting springs which support the bolster, and a device which upbears the springs and is supported by the equalizing-bars, substantially as set forth.

2. In a car-truck, the combination, with a frame, two axles, truck-wheels secured on the axles, and a bolster, of two pairs of anti-friction wheels supported on bracket-frames and engaging the upper surface of the axles, equalizing-bars hung from the bracket-frames, springs on which the bolster rests, which springs are upheld by the equalizing-bars, substantially as set forth.

3. In a car-truck, the combination, with a truck-frame, two axles, truck-wheels thereon, and a bolster, of two pairs of revolubly-sustained anti-friction wheels for each axle, which engage the upper surfaces of the axle near the inner truck-wheel faces, four depending safety-hooks, two equalizing-bars, a set of vertically-acting springs, and means by which to connect the equalizing-bars with the wheel-supports and also upbear the springs on which the bolster is seated, substantially as set forth.

4. In a car-truck, the combination, with a skeleton truck-frame, two axles, wheels secured on the axles, and a bolster located between the transverse plates of the skeleton frame, of journal-boxes which engage the journal ends of the axles, four depending bracket-frames, four pairs of anti-friction wheels spaced apart and revolubly supported on the bracket-frames, and two equalizing-bars upheld by the bracket-frames and affording support to springs which engage the bolster, substantially as set forth.

5. In a car-truck, the combination, with a car-frame, a bolster located transversely between channel-plates of the frame, four journal-boxes secured at spaced distances to the frame, two axles having journal ends which engage these journal-boxes, and two truck-wheels secured to each axle, of four bracket-frames, a pair of spaced and revolubly-supported anti-friction wheels for each bracket-frame, two equalizing-bars hung on the bracket-frames near the ends of the bars, carrier-beams resting on the equalizing-bars and also on the side portions of the frame, and springs seated adjustably on the carrier-plates and engaging the lower surfaces of the bolster, substantially as set forth.

6. In a car-truck, the combination, with a truck-frame, a bolster, two axles, truck-wheels affixed to the axles, and journals formed on the ends of the axles which engage boxes secured to the truck-frame, of other journals produced on the axles near the inner faces of the truck-wheels, anti-friction wheels which rest on these inner journals, bracket-frames which revolubly support the anti-friction wheels and hold them spaced apart in the same plane horizontally to engage the axle-bodies, two equalizing-bars which are hung near their ends on lower ends of the bracket-frames, carrier-beams which engage the equalizing-bars with their inner ends and the truck-frame with their outer ends, and vertically-acting springs which rest upon the carrier-beams, uphold the bolster ends, and are adapted to be moved longitudinally of the bolster and carrier-beams to shift the load imposed on the bolster between the anti-friction-wheels and the outer journal-supports of the axles, substantially as set forth.

7. In a car-truck, the combination, with a truck-frame, a transverse bolster thereon, two axles having journal ends engaging boxes secured on the frame, and wheels secured on the axles inside of the journal ends, of four bracket-frames, two anti-friction wheels mounted to revolve on each of these frames and engage inner journals produced on the axle-bodies, two straight equalizing-bars that rest with their ends on blocks attached to the lower portions of the bracket-frames, two carrier-beams which lie on the equalizing-bars and side portions of the truck-frame, vertically-acting springs which may be moved longitudinally upon the carrier-beams, and four depending safety-hooks which loosely engage the lower edges of the equalizing-bars and depend from transverse hanger-shafts that rest on the top edge of transverse plates of the car-frame, substantially as set forth.

8. In a car-truck, the combination, with a skeleton frame attached to the truss-plates

which carry the axle-boxes and the axles, of a bolster, equalizing-bars which carry said bolster, and skeleton frames supported from the axles and carrying said equalizing-bars, substantially as set forth.

9. In a car-truck, the combination, with a skeleton frame attached to the truss-plates which carry the axle-boxes, and the axles, of a bolster, equalizing-bars which carry said bolster, springs interposed between the equalizing-bars and the bolster, bracket-frames supported from the axles and carrying said equalizing-bars, and anti-friction wheels journaled on the bracket-frames and bearing on the axles, substantially as set forth.

10. In a car-truck, the combination, with a skeleton frame attached to the truss-plates which carry the axle-boxes and the axles, of a bolster, carrier-beams engaging the ends of the skeleton frames, springs interposed between the carrier-beams and the bolster, equalizing-bars which support the inner ends of the carrier-beams, pendent bracket-frames supported from the axles and carrying the equalizing-bars, and anti-friction wheels revolubly connected to the pendent bracket-frames and bearing peripherally on the axles, substantially as set forth.

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JOHN A. GUTSCHE.

Witnesses:
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SAMUEL RAMSDEN.