No. 629,050. Patented July 18, 1899.

# G. L. STUEBNER.

## FLEXIBLE CAR TRUCK.

(Application filed Sept. 14, 1898.)

(No Model.) 2 Sheets—Sheet 1.

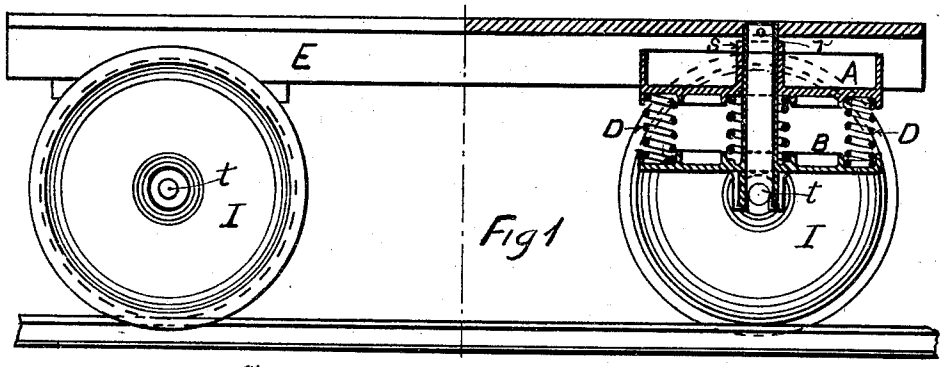



Fig 1

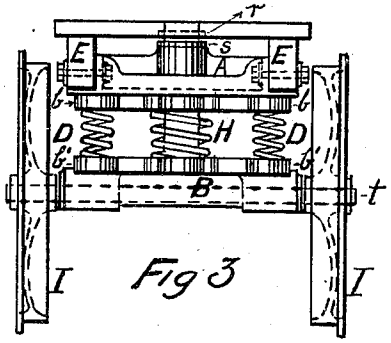



Fig 3

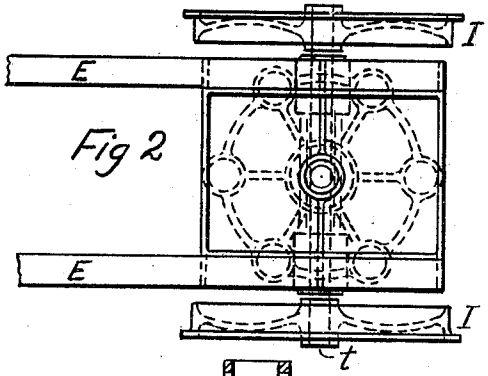



Fig 2

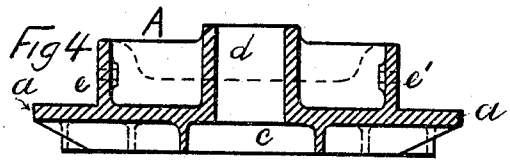



Fig 4

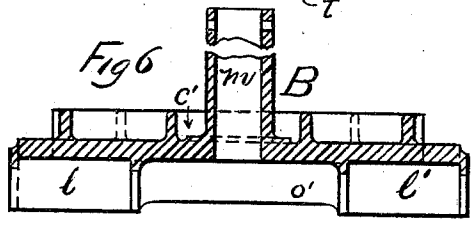



Fig 6

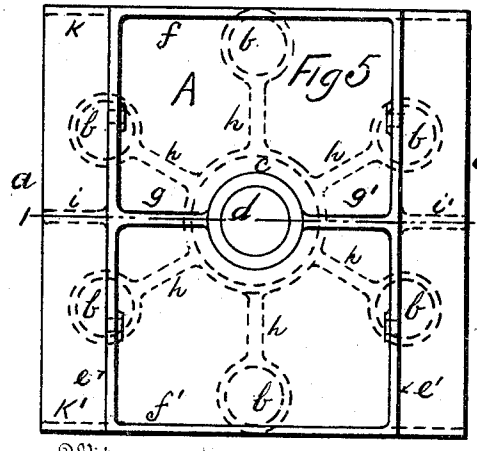



Fig 5

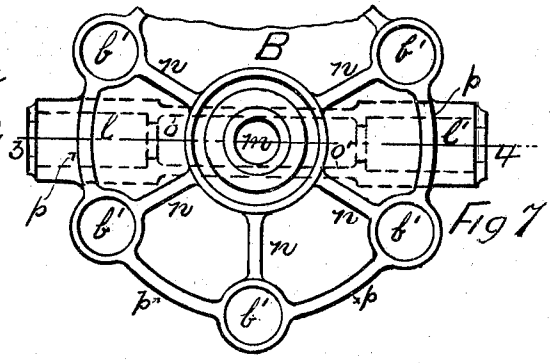



Fig 7

Witnesses
Chas. F. Pope
George A. Wardell

Inventor
Gustavus L. Stuebner
By his Attorney
A. A. de Bonneville

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

No. 629,050. Patented July 18, 1899.

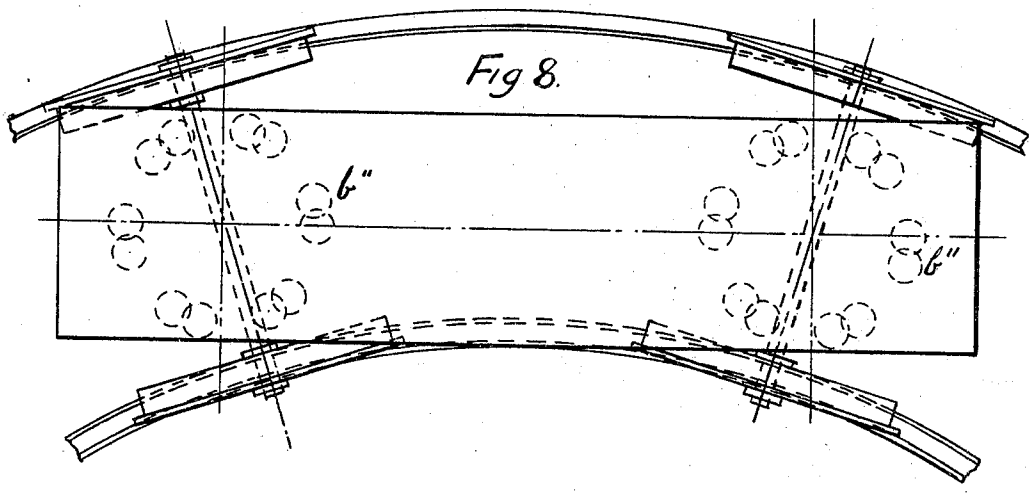
# G. L. STUEBNER.

## FLEXIBLE CAR TRUCK.

(Application filed Sept. 14, 1898.)

(No Model.) 2 Sheets—Sheet 2.

Fig 8.



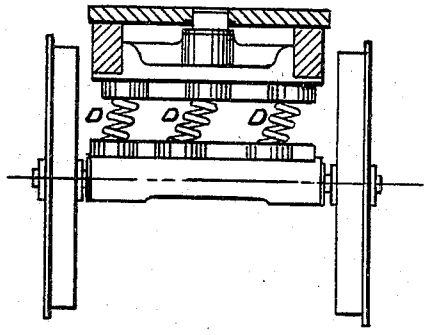



Fig 9.

Witnesses
Charles J. Rae
George A. Wardell

Inventor
Gustavus L. Stuebner
By his Attorney
A. A. de Bomeville

THE NORRIS PETERS CO., PHOTO-LITHO., WASHINGTON, D. C.

# UNITED STATES PATENT OFFICE.

GUSTAVUS L. STUEBNER, OF NEW YORK, N. Y.

## FLEXIBLE CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 629,050, dated July 18, 1899.

Application filed September 14, 1898. Serial No. 690,972. (No model.)

*To all whom it may concern:*

Be it known that I, GUSTAVUS L. STUEBNER, residing at the borough of Queens, New York city, in the county of Queens, State of New York, have invented an Improvement in Flexible Car-Trucks, of which the following is a specification.

This invention relates to certain new and useful improvements in flexible car-trucks, and has for its object the production of cars which can easily run on sharp curves or straight track. To obtain these results, the trucks allow the axles of the cars to assume radial positions when passing over curves, the center lines of the axles approximately taking the directions of the radii of the curved track at the points of contact between the track and truck-wheels.

It has been endeavored to construct the trucks with the least possible number of parts, thereby avoiding the use of complicated mechanism and avoiding wear and breakage.

To these ends, therefore, my said invention consists in the novel arrangement and construction of parts, all as hereinafter fully described, and pointed out in the claims.

In the accompanying drawings, in the several views of which like parts are designated by similar letters of reference, Figure 1 is an elevation, partly in section. Fig. 2 is a plan view showing one end of a car with floor-planking removed. Fig. 3 is an end elevation of car on straight track, some of the springs being omitted to avoid confusion. Figs. 4 and 5 show, respectively, a vertical section and plan of top portion of truck-axle bearing with center guide. Figs. 6 and 7 show, respectively, vertical section and plan of lower portion of truck-axle bearing with center pin. Fig. 8 is a plan showing outline of car when on a curved track. Fig. 9 is an end view of Fig. 8, partly in section, with center spring omitted to avoid confusion.

To secure the flexible feature to the car-truck, it consists, essentially, of a top portion A and lower portion B, which are kept in their normal positions by the springs D engaging the opposite pockets $b$ and $b'$ and at the same time by virtue of the elasticity of the springs allow the lower portion B, which rides on the axle, to rotate relatively to the upper portion A, which is secured to the girders or side plates E of the car-body. When the car is running on straight track, there is no tendency to deviate the springs from their normal vertical positions; but when a curve is reached the axles are forced to take radial positions, as shown in Fig. 8, and the springs are subjected to bending moments, as shown in Fig. 9. The relative positions of the spring-pockets when the car is on a curved track are shown at $b''$, Fig. 8. When the car again reaches the straight track, the springs assume the normal positions, as shown in Fig. 3, and the axles are maintained at right angles to the longitudinal axis of the car.

Referring to Fig. 4, which is a section on the line 1 2 of Fig. 5 and represents the top portion A of truck-axle bearing, consists, essentially, of the plate $a\ a$, spring-pockets $b$ and $c$, center guide $d$, and flanges $e$ and $e'$. The ribs $f\ f'$, $g\ g'$, $i\ i'$, and $k\ k'$ combine to secure the strength and stability of the casting.

Fig. 6 shows a section of lower portion B of truck-axle bearing on line 3 4 of Fig. 7. It consists, essentially, of the journal-boxes $l\ l'$, spring-pockets $b'$ and $c'$, and hollow center pin $m$. The ribs $n$, $o$, $o'$, and $p$ combine to secure the strength and stability of the casting.

The journal-bearings are fitted to the truck-axles or are babbitted or roller-bushed.

The lower portion B of truck-axle bearing is held in place by its hollow center pin $m$, which is guided in the opening $d$ of the top portion A. The pin $r$ and washer $s$ are provided to prevent the separation of the top and lower portions of the truck-bearings.

Wheels are shown at I I, pressed on the axles $t\ t$.

When the car is running on straight track, the longitudinal axis of the car and center lines of the axles are maintained at right angles by the tension of the springs D keeping the spring-pockets of the top and bottom portions A and B of the truck-bearing opposite each other.

When the car is running over a curve, the axles assume radial position, as shown in Fig. 8, the center lines of the axles meeting in a point coincident with the center from which the curves of the track are generated. The axles are forced to take these radial positions by the curvature of the track and are permitted to assume these positions by virtue of

the pliability of the springs D. These springs are principally subjected to bending moments, a slight depression being present. The main weight of the car is carried by the center springs H. The tipping of the car is avoided by the hollow center pin *m* working in the long bearing *d*.

The pockets *b* and *b'* are distributed centrally about the hollow center pin *m*; but of course this distribution need not be adhered to.

When the car leaves the curved track, the bending moments of the springs D disappear and they again assume their normal vertical positions, as shown in Fig. 3, and at the same time force the axles to take position at right angles to the longitudinal axis of the car.

The springs D, &c., serve the double purpose of allowing the axles to take radial positions and to form elastic mediums for the easy running of the car.

It is evident that springs made of rubber or other pliable material could be substituted for the springs H and D and that the springs H might be eliminated, using only the springs D.

What I claim, and desire to secure by Letters Patent, is—

1. In a car, flexible car-trucks, consisting of upper portion of truck-axle bearing A, with center bearing *d*, flanges *e*, *e'*, spring-pockets *b*, *c*, ribs *g*, *g'*, *h*, *i*, *i'*, *f*, *f'*, and *k*, *k'*; operating with lower portion of truck-axle bearing B, with similar spring-pockets *b'*, *c'*, journal-boxes *l*, *l'*, ribs *n*, *o*, *o'*, *p*, hollow center pin *m*, cross-pin *r*, and washer *s*, in combination with springs H and D D, &c., substantially as described.

2. In a car flexible car-trucks, consisting essentially, for each axle with a pair of wheels, of one top and one bottom casting, connected by main center-bearing compression-spring; in combination with vertically-distributed helical springs to control the relative positions of top and bottom castings, when car-truck is running over curves or straight track.

3. In a car, flexible car-trucks, consisting of cast top portion of truck-axle bearing with long central guide, and suitable flanges for securing girders or side plates of a car-body, also arranged with a central pocket for main bearing-spring, and numerous other pockets for springs, in combination with lower portion of truck-axle bearing having hollow center piece and spring-pockets corresponding to top portion, substantially as described.

4. In a car, flexible car-trucks, consisting of upper portion of truck-axle bearing A, with center bearing *d*, flanges *e*, *e'*, spring-pockets *b*, ribs *g g'*, *h*, *i*, *i'*, *f*, *f'* and *k k'*; operating with lower portion of truck-axle bearing B, with similar spring-pockets *b'*, *c'*, journal-boxes *l' l'*, ribs *n*, *o*, *o' p*, hollow center pin *m*, cross-pin *r*, and washer *s*, in combination with springs H and D D, &c., substantially as described.

GUSTAVUS L. STUEBNER.

Witnesses:
EPHRAIM SMITH,
HECTOR MATHISON.