(No Model.)

# E. CLIFF.

## CAR TRUCK.

No. 539,977. Patented May 28, 1895.

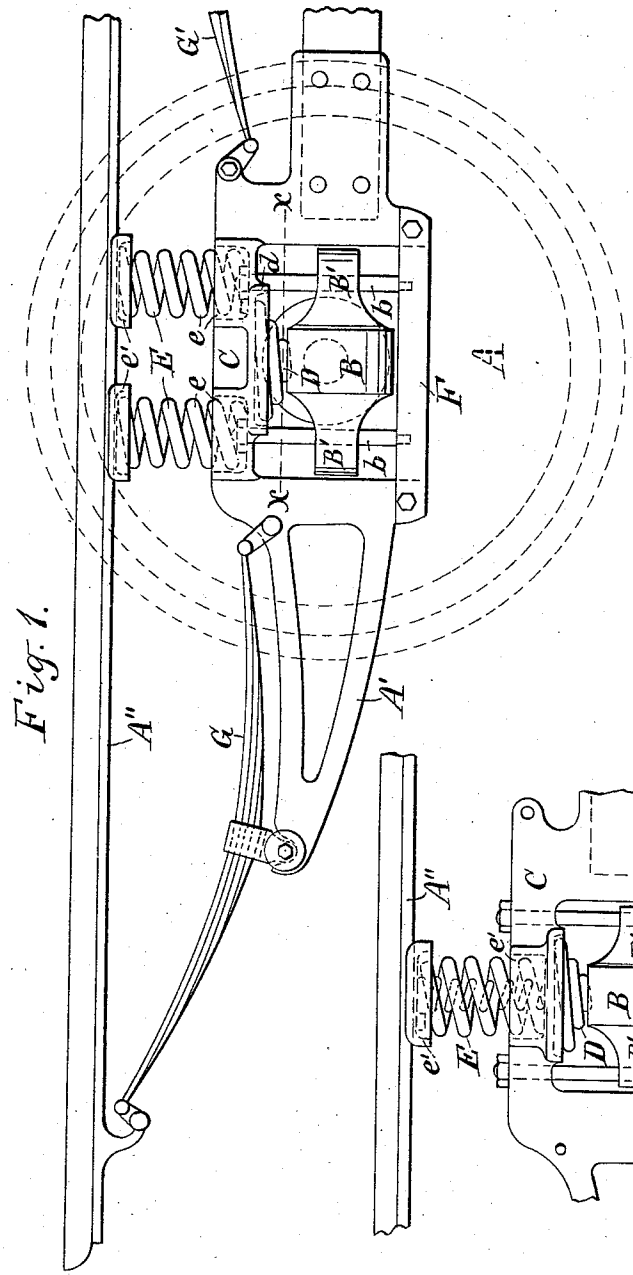


Fig. 1.

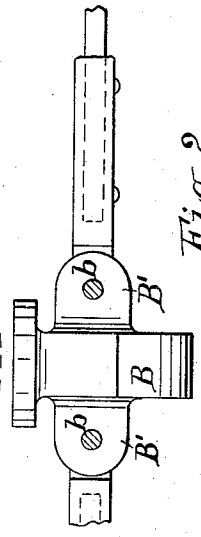


Fig. 2.




Fig. 3.

Witnesses:
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# UNITED STATES PATENT OFFICE.

EDWARD CLIFF, OF NEWARK, NEW JERSEY.

## CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 539,977, dated May 28, 1895.

Application filed May 7, 1894. Serial No. 510,299. (No model.)

*To all whom it may concern:*

Be it known that I, EDWARD CLIFF, of Newark, in the county of Essex, in the State of New Jersey, have invented new and useful Improvements in Car-Trucks, of which the following, taken in connection with the accompanying drawings, is a full, clear, and exact description.

My invention relates to improvements in street railway car trucks, and particularly to the improved arrangement of the spiral springs to provide an easier riding car and to prevent undue vibrations of the upper frame.

To this end my invention consists in the combination with the axle-box, lower frame, pedestal or yoke in the frame and the upper frame of the truck, of projections on each side of the axle-box, vertical guide-posts held in the yoke and passing through said projections, a spiral spring between the box and the yoke, and one or more springs between the yoke and the said upper frame; and my invention consists in certain other combinations of parts hereinafter described and specifically set forth in the claims.

In the drawings accompanying this specification and forming a part hereof, Figure 1 is a side elevation of my improved pedestal or yoke, together with the neighboring parts. Fig. 2 is a top plan view of the axle-box, taken on line *x x* of Fig. 1; and Fig. 3 is a modified form and arrangement of the parts shown in Fig. 1.

Referring specifically to the drawings, A represents one of the car wheels; B, the axle-box; C, the pedestal or yoke which is integral with the end portion of the lower truck frame A′, and A″ is the upper frame of the truck.

Heretofore the axle-box worked directly on the vertical sides of the yoke, but in my invention said vertical sides are separated widely to receive projections B′, B′ on the sides of the axle-box. Vertical bolts or guide posts, *b*, *b*, pass through said projections, B′, B′, one on each side of the axle-box and are held in place in the yoke and between the latter and the detachable retaining bar, F, extending horizontally between the sides of the yoke and below the axle-box, and which can be detached for the purpose of removing the said box from the yoke or frame. The axle-box with its projections slide on said guide-posts, *b*, *b*.

Directly above the axle-box, B, and between the latter and the lower side of the upper horizontal portion of the yoke is a spiral spring, D, preferably a graduated spiral spring having its smallest end bearing upon the axle-box. The upper end of said spring is held in a socket, *d*, secured to or formed on the yoke C. In the top side of the upper horizontal portion of the yoke are formed one or more sockets, *e*, *e*, for the lower ends of spiral springs, E, E, extending upward to the lower side of the upper frame, A″, of the truck. Spring sockets *e′*, *e′*, are secured to the upper frame to receive the upper ends of the springs, E, E.

In Fig. 1 the springs, E, E, are shown side by side above the projections, B′, B′, on the axle-box but in Fig. 3 said springs are shown one within the other.

I do not wish to limit myself to a plurality of springs between each yoke and the upper frame, as a single heavy spring may be used alone, or, the inner spiral spring shown in Fig. 3 may be dispensed with, if desired.

This construction of yoke and axle-box together with the arrangement of spiral springs is designed more especially for use with my improved form of car truck having semi-elliptic springs, G, hung at each end between the two frames, with or without a central semi-elliptic spring, G′, partly shown in the drawings.

The end elliptic springs are pivoted or fulcrumed at their center upon the end of the lower frame A′ of the truck, the inner end being shackled to the lower frame and the outer end shackled to the upper frame.

Any matters shown or described herein, but not claimed are not dedicated to the public, but form the subject matter of an application filed September 8, 1893, Serial No. 485,121, and another application filed herewith.

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

1. The combination with the axle-box, lower frame, yoke in the frame, and the upper frame of a truck, of projections on each side of the axle-box, vertical guide posts held stationary

in the yoke and passing through said projections, a spiral spring between the said box and the yoke, and a spiral spring between the yoke and the said upper frame, as set forth.

2. The combination with the axle-box, lower frame, yoke in the frame, and the upper frame of a truck, of projections on each side of the axle-box, vertical guide posts held stationary in the yoke and passing through said projections, a graduated spiral spring between the said box and the yoke, and a spiral spring between the yoke and the said upper frame, as set forth.

3. The combination with the axle-box, lower frame, yoke in the frame, and the upper frame of a truck, of projections on each side of the axle-box, vertical guide posts held stationary in the yoke and passing through said projections, a graduated spiral spring between the said box and the yoke, and a plurality of spiral springs between the yoke and the said upper frame, as set forth.

4. The combination with the axle-box, lower frame, yoke in the frame, and the upper frame of a truck, of projections on each side of the axle-box, vertical guide posts held stationary in the yoke and passing through said projections, a spiral spring between the said box and the yoke, a socket on the yoke to receive the upper end of said spring, a pair of spiral springs between the yoke and the upper frame, and spring sockets formed on the yoke and upper frame to receive the ends of the latter springs, as set forth.

5. The combination with the axle-box, lower frame, yoke in the frame and the upper frame of a truck, of a semi-elliptic spring fulcrumed at its center upon the end of the lower frame and shackled at one end to the lower frame and at the opposite end to the upper frame, projections on each side of the axle-box, vertical guide posts held stationary in the yoke and passing through said projections, a spiral spring between the said box and the yoke, and a spiral spring between the yoke and the said upper frame, as set forth.

In testimony whereof I have hereunto signed my name.

EDWARD CLIFF. [L. S.]

Witnesses:

E. L. TODD,

GEO. H. GRAHAM.