(No Model.) 4 Sheets—Sheet 1.

W. S. ADAMS.

CAR TRUCK.

No. 547,472. Patented Oct. 8, 1895.

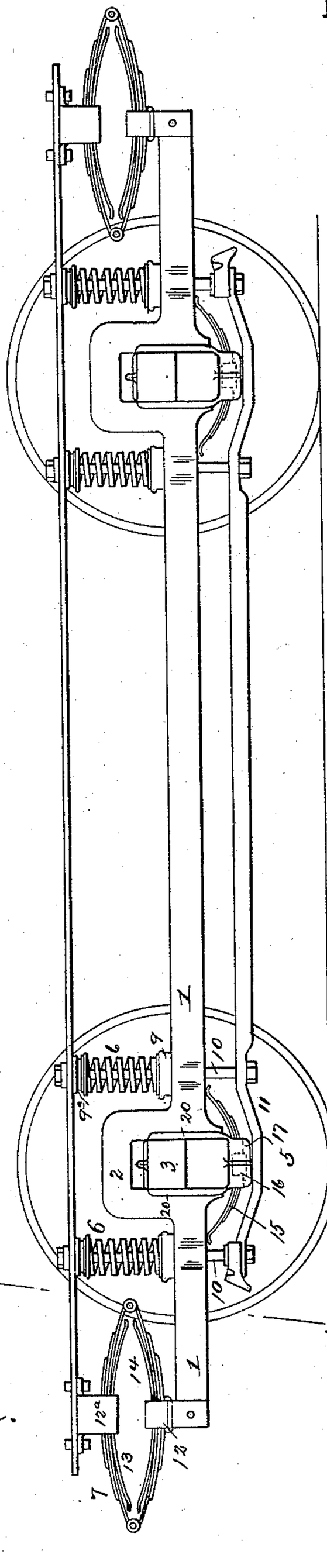


Fig. 1.

WITNESSES:
C. M. Benjamin
Otto Jacobsen.

INVENTOR
Walter S. Adams
BY Joseph L. Lilley
ATTORNEY

(No Model.)

4 Sheets—Sheet 2.

W. S. ADAMS.

CAR TRUCK.

No. 547,472. Patented Oct. 8, 1895.

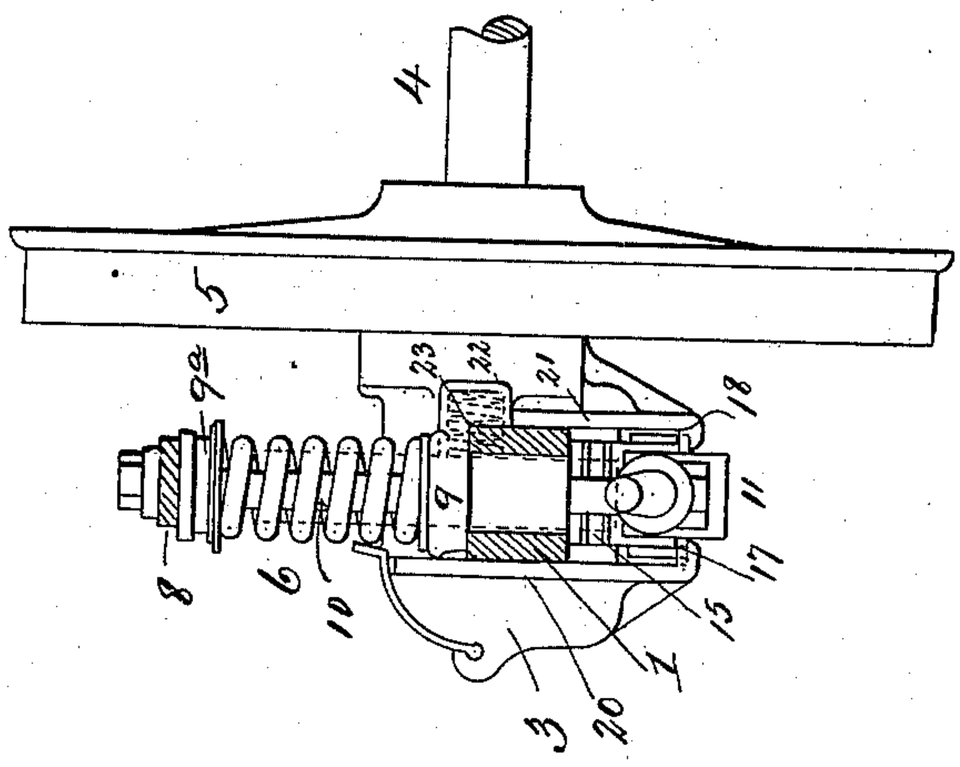


Fig. 3.

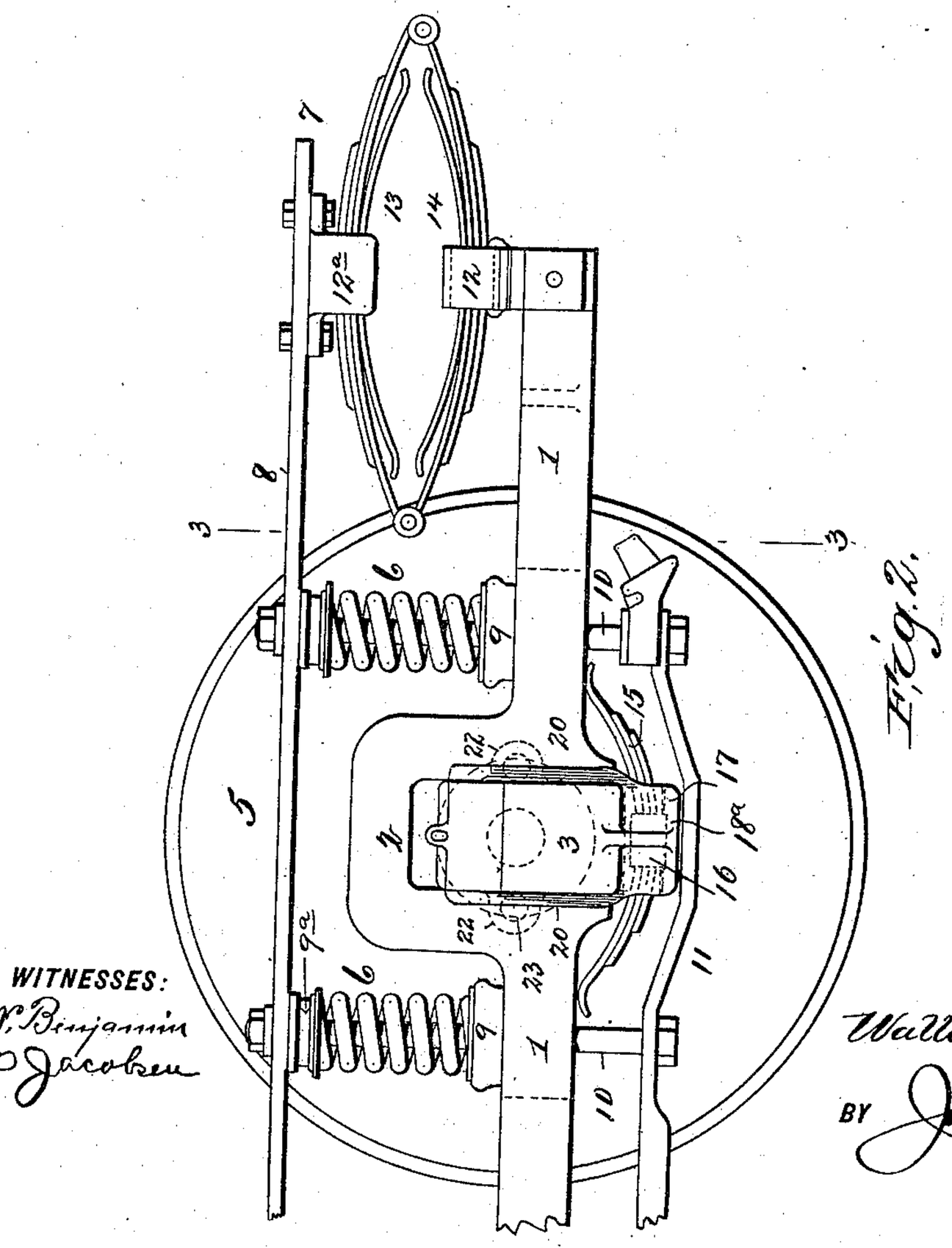


Fig. 2.

WITNESSES:
C. W. Benjamin
Otto Jacobsen

INVENTOR
Walter S. Adams.
BY Joseph L. Levy
ATTORNEY

(No Model.)

4 Sheets—Sheet 3.

W. S. ADAMS.

CAR TRUCK.

No. 547,472. Patented Oct. 8, 1895.

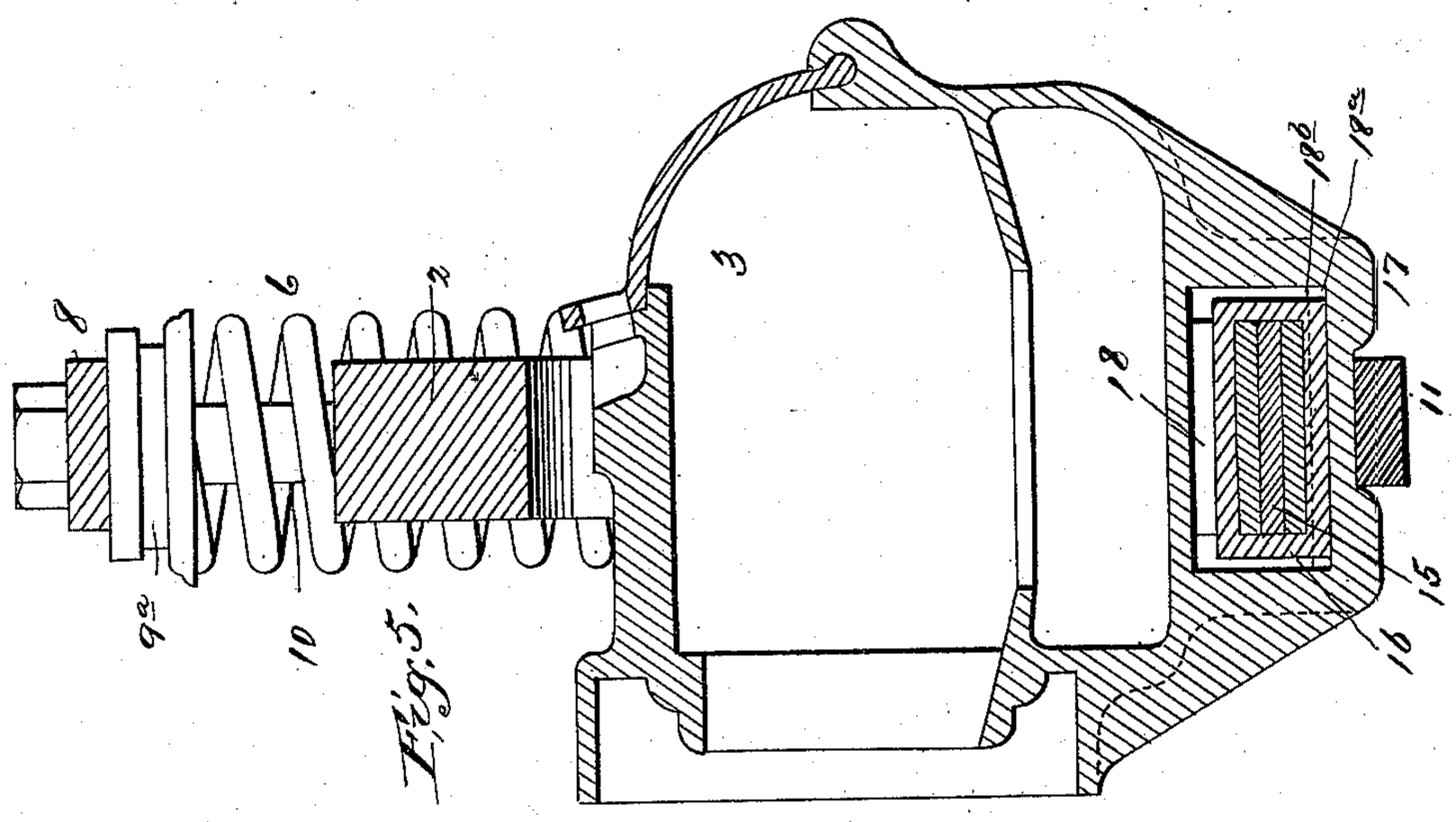


Fig. 3.

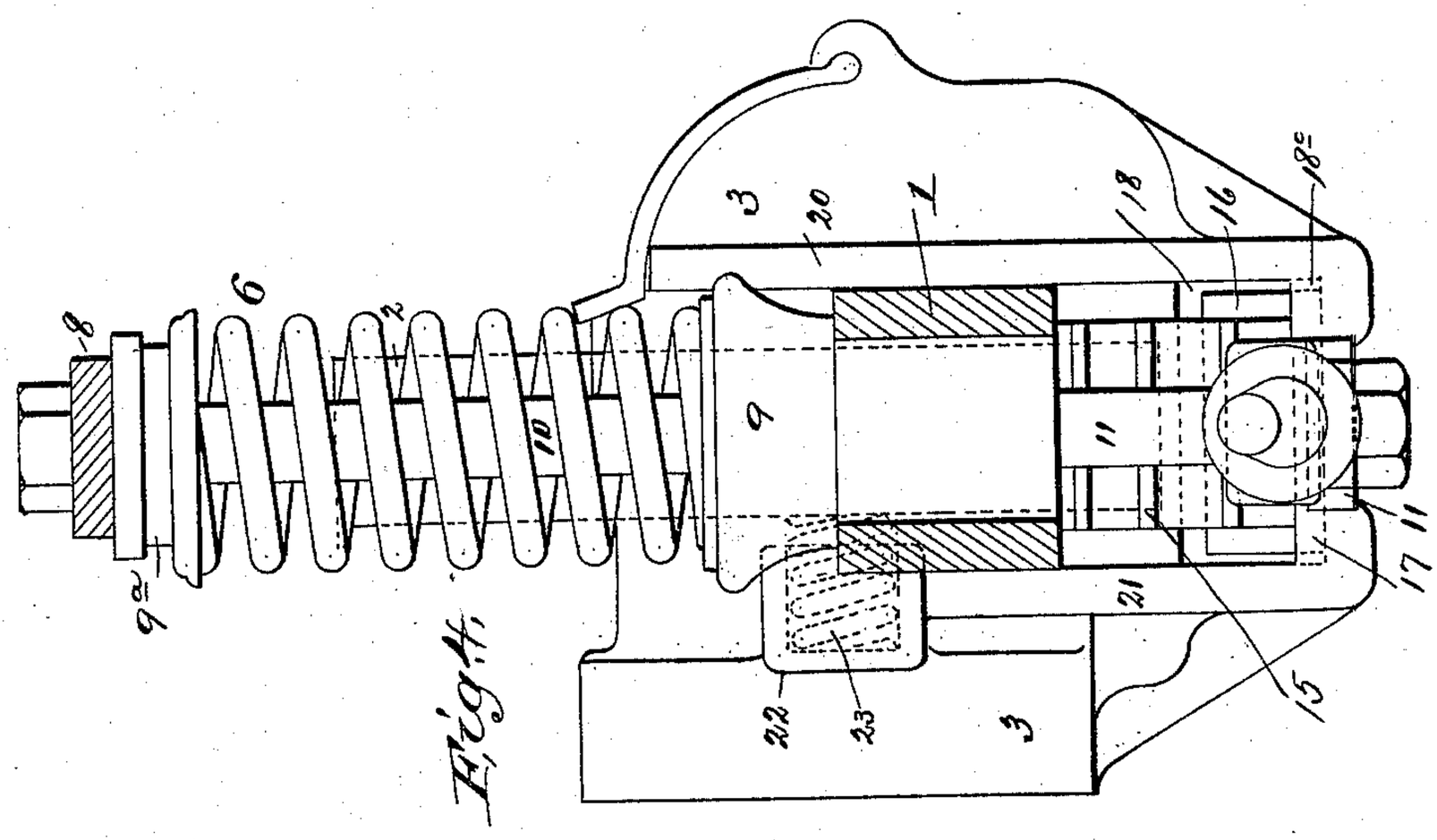


Fig. 4.

WITNESSES:

C. W. Benjamin

Thos Jacobus.

INVENTOR

Waller S. Adams.

BY Joseph L. Levy

ATTORNEY

(No Model.) 4 Sheets—Sheet 4.

W. S. ADAMS.

CAR TRUCK.

No. 547,472. Patented Oct. 8, 1895.

Fig. 6.

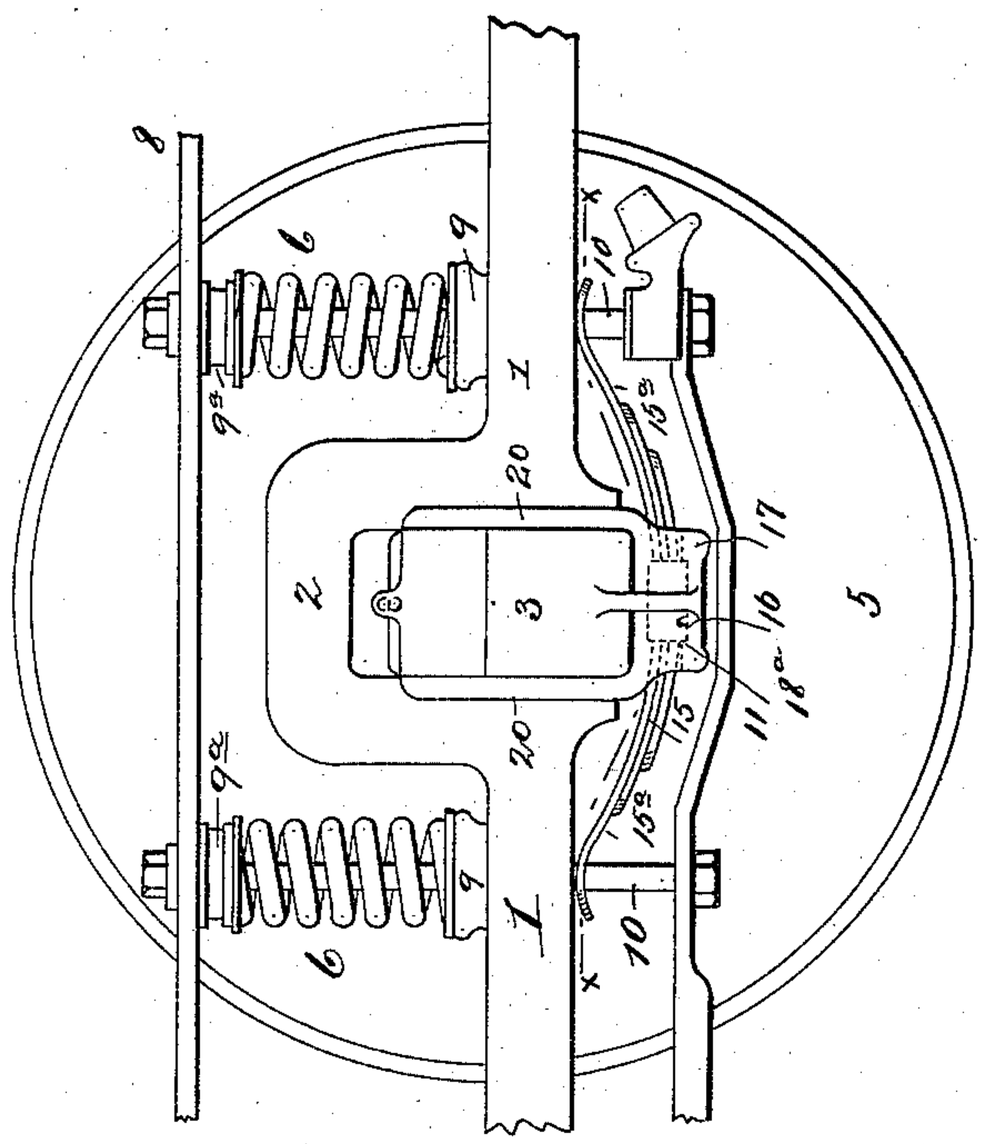
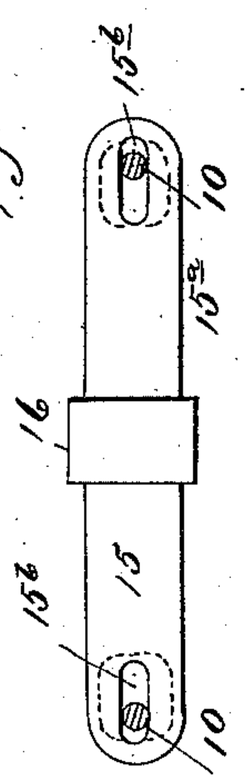


Fig. 7.



WITNESSES:
B. S. Wise
Wm. Jacobsen.

INVENTOR
Walter S. Adams
BY Joseph L. Levy
ATTORNEY

UNITED STATES PATENT OFFICE.

WALTER S. ADAMS, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO JOHN A. BRILL, OF SAME PLACE.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 547,472, dated October 8, 1895.

Application filed October 9, 1894. Serial No. 525,331. (No model.)

To all whom it may concern:

Be it known that I, WALTER S. ADAMS, a citizen of the United States, residing at Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Car-Trucks, of which the following is a specification.

My invention pertains to the class of car-trucks wherein an axle-box frame is supported by axle-boxes and the car-body is resiliently supported on said frame; and one of the objects of this invention is to provide a resilient support or connection between the axle-boxes and the axle-box frame. This is accomplished by means of springs carried by the axle-boxes, upon which the side bars of the axle-box frame rest. By this means the weight and strain of a superposed car-body are largely removed from direct action on the axle-box yokes of the axle-box frame, the weight of the car-body being more evenly distributed between the axle-box frame and the axle-boxes. For this purpose, by preference, I use upwardly-bent leaf or semielliptic springs that are centrally suspended from the axle-boxes, the side bars of the axle-box frame resting upon the free ends of said springs, the springs thereby bearing on opposite sides of the yokes. In connection with this arrangement suitable car-body supporting-springs are used, which receive and take up the primary weight and motion of the car-body, the first-mentioned springs acting to resist extra downward movements of the car-body.

Another object of the invention is to permit the axle-boxes to have a certain amount of lateral movement relatively to the axle-box frame, so as to ease the wheels in rounding curves and to remove strain from the axle-boxes and axle-box frame. In order to resiliently restrain the axle-boxes from side movement, springs may be interposed between the axle-boxes and the axle-box frame or its yokes, which will permit said boxes to have the lateral movement mentioned without too much freedom of action.

The invention further consists in the novel details of improvement and the combinations of parts, that will be more fully hereinafter set forth, and then pointed out in the claims.

Reference is to be had to the accompanying drawings, forming part hereof, wherein—

Figure 1 is a side elevation of a car-truck embodying my invention. Fig. 2 is an enlarged detail side view of a portion of the truck. Fig. 3 is a cross-section on the line 3 3 in Fig. 2. Fig. 4 is an enlarged detail section on the line 4 4 in Fig. 1. Fig. 5 is an enlarged cross-section through the axle-box, yoke, and my improved axle-box-frame supporting-spring. Fig. 6 is a detail side view of a portion of the truck, showing means for holding the axle-box-frame supporting-spring in its support; and Fig. 7 is a horizontal section on the line x x in Fig. 6.

In the accompanying drawings, in which similar numerals of reference indicate corresponding parts in the several views, 1 indicates the side bars of an axle-box frame, which are to be connected at the ends by cross-bars, all of which may be formed in a single forging, if desired, in well-known manner. 2 represents the axle-box yokes suitably formed or connected with the side bars 1. 3 represents the axle-boxes, 4 the axles, and 5 the wheels, all of which parts, with the exceptions hereinafter noted, may be of suitable construction.

The car-body supporting-springs 6 7 are shown interposed between the side bars 1 and the upper chord or car-sill 8, upon which a car-body can rest. The springs 6 are shown in the form of spiral springs resting in seats or risers 9 9^a on the side bars 1 and chord 8, and pedestals or spring-posts 10 are shown passing through said springs and connected by a pedestal tie-bar 11 in well-known manner, the pedestals passing freely through apertures in the side bars. The springs 6 6 are shown in pairs, located on opposite sides of the yokes 2. The springs 7 are elliptical and located at the ends of the side bars 1 and chord 8, being secured in position by yokes or clamps 12 12^a, all arranged substantially as shown in the patent to G. M. Brill, No. 478,218, dated July 5, 1892. In addition to the usual lamina of the elliptical springs 7, I have shown leaf-springs 13 14, located within the springs 7, but entirely out of contact therewith at their ends, so that the springs 13 14 are normally not under tension. The ar-

rangement is such that when the springs 7 are sufficiently compressed the ends of springs 13 14 will abut and thereupon act with additional spring-force to resist the down thrust of the car-body on the supporting-springs. I do not in this application claim the springs 13 14 in conjunction with an elliptical spring, but reserve the right to cover the same in a separate application.

The foregoing description will serve the purpose of explaining the construction of a suitable truck to be used in connection with my improvements now to be described.

In Figs. 1, 2, 5, and 6 it will be observed that there are no rubber cushions between the tops of the axle-boxes and the yokes, as has heretofore been customary, to sustain the weight of the truck upon the axle-boxes. To resiliently support the axle-box frame and sequently the other parts of the truck and the car upon the axle-boxes, I have provided a spring 15, preferably a leaf-spring, of suitable shape, which is shown suspended below the axle-box frames and upon which the side bars 1 rest. In the drawings the spring 15 is shown composed of three leaves clamped centrally by a strap 16. The spring 15 is shown centrally supported by a depending lug or housing 17 on the axle-box 3, which lug has a longitudinal aperture 18, in which the spring 15 is located and which is deeper than the strap 16. To restrain longitudinal movement of the spring 15, the aperture 18 has a depressed portion 18^a, forming shoulders 18^b, against which the strap 16 abuts, said strap normally lying in the depressed portion 18^a of the aperture 18; but of course the spring 15 may be otherwise supported and held in the lug 17, if desired. The spring 15 is shown bent upwardly into such shape and position that the side bars 1 of the axle-box frame can conveniently rest upon said springs, as clearly shown in the drawings. It will be seen that the points of contact between the side bars 1 and the ends of the springs 15 are outside of the yoke 2, whereby the side bars 1 are supported independently of the yokes 2, and yet are supported by the axle-boxes. This arrangement relieves the yokes 2 from a great amount of strain and reduces the danger of breakage of said yokes. The springs 15 are preferably of such a strength as to normally resist the weight of the truck and superposed car-body, and yet so arranged and proportioned as to suitably bend when extra weight is applied to them, such as when a car oscillates or when the wheels run over rough places—such as switches, frogs, &c. This increased spring action between the truck and its supporting axle-boxes causes the car to run much smoother than with the arrangements heretofore used and known to use, as the jarring incident to travel is greatly relieved. When the car oscillates greatly and the springs 6 7 are firmly compressed, the springs 15 will bend and thus overcome the sudden shock that occurs when rubber cushions are located between the axle-boxes and the yokes 2. It will be observed that the ends of the springs 15 are practically in line with the springs 6, so that the weight borne by said springs is substantially transmitted directly to the springs 15, thus relieving the yokes 2 from the necessity of sustaining the full load, as is customary where the yokes bear upon the axle-boxes or on cushions located between said parts.

To reduce strain on the axle-box frame when rounding curves and when the car swings laterally, it is desirable to allow the axle-boxes 3 to have a limited lateral movement relatively to the yokes 2. For this purpose I have shown the boxes 3 as provided on opposite sides with vertical webs or flanges 20 21, wider apart than the width of the yokes, which may bear against the yokes when the truck or boxes 3 move laterally, as shown. These webs or flanges 20 21 may be cast integral with the boxes 3, as also may the lugs 17.

To resiliently resist the lateral movement of the boxes 3, they are each shown provided with a hollow lug or projection 22, in which is located a spiral spring 23, that bears against the yokes. By this means the axle-boxes are normally held in proper position and yet allowed free lateral movement. The springs 23, both pressing in opposite directions, readily resist the lateral movement and cushion the parts.

To more positively retain the spring 15 in the aperture 18 in the lug 17 on the axle-box, I have shown in Figs. 6 and 7 the upper leaf 15^a of said spring as provided near its ends with apertures or slots 15^b, through which pass the pedestal-posts 10, which limit the longitudinal movement of the springs 15 and prevent it from leaving its seat. To permit the springs 15 to move laterally with the boxes 3 when the pedestal-posts 10 pass through said springs, the apertures 15^b may be enlarged, as in dotted lines in Fig. 7. The springs 15 are thus confined by the posts 10, while still having the necessary movements to permit freedom of lateral play of the parts.

It is apparent that my invention can be embodied in structures differing from that described without departing from the spirit of my invention.

Having now described my invention, what I claim is—

1. In a car truck, an axle box frame, combined with axle boxes, an integral lug depending from said box, said lug having a transverse aperture, and a recess at the bottom of said aperture forming shoulders, a spring located in said aperture, and a strap for said spring, said strap being located in said recess, the spring extending from opposite sides of the lug to sustain the frame, as and for the purposes specified.

2. The combination, with a top chord, of a car truck, an axle box frame having yokes, car springs adjacent the yokes to movably support the chord on the frame, spring posts

passing through the frame and springs to the chord, axle boxes having depending lugs, leaf springs supported by said lugs and bearing against the frame adjacent the yokes, said springs having slots or apertures in their ends for the passage of the posts, substantially as described.

3. In a car truck, the combination of an axle box frame having the yokes, with axle boxes located in and disconnected from said yokes and adapted to have lateral motion bodily thereon, said boxes having vertical webs or flanges on their front sides to bear against the yokes of the frame to limit the lateral movement of the boxes, recessed lugs on the rear sides of the boxes, coiled springs in the lugs bearing against the rear of the yokes, and leaf springs secured to the bottom of said boxes and bearing against said frame at each side of the yokes, substantially as described.

4. In a car truck, the combination of an axle box frame having yokes, with axle boxes adapted to permit of lateral movement of the yokes thereon, integral vertical webs or flanges on the front sides of said boxes as deep as the bearing faces of the yokes, integral recessed lugs on the rear sides of the boxes, and coiled springs in the lugs bearing against the rear faces of the yokes, substantially as described.

Signed at Philadelphia, in the county of Philadelphia and State of Pennsylvania, this 31st day of August, 1894.

WALTER S. ADAMS.

Witnesses:
WM. H. HEULING, Jr.,
HENRY C. ESLING.