(No Model.) 2 Sheets—Sheet 1.

J. A. BRILL.

CAR TRUCK.

No. 571,824. Patented Nov. 24, 1896.

Fig. 1.

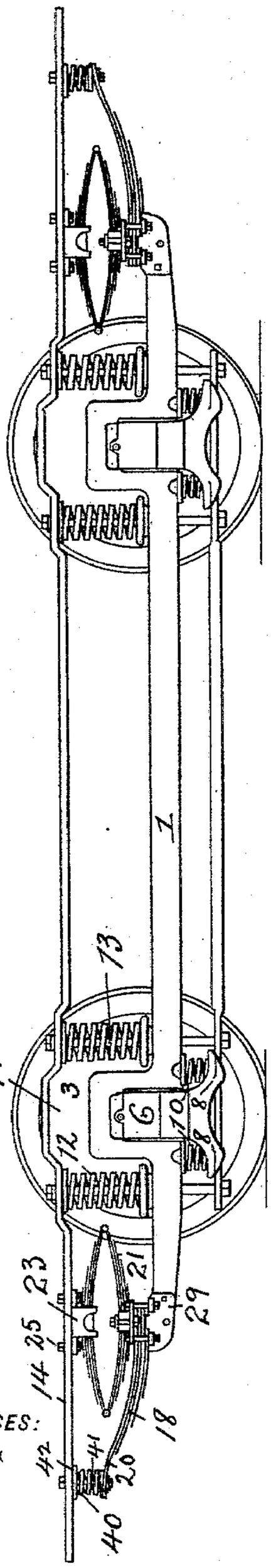


Fig. 2.

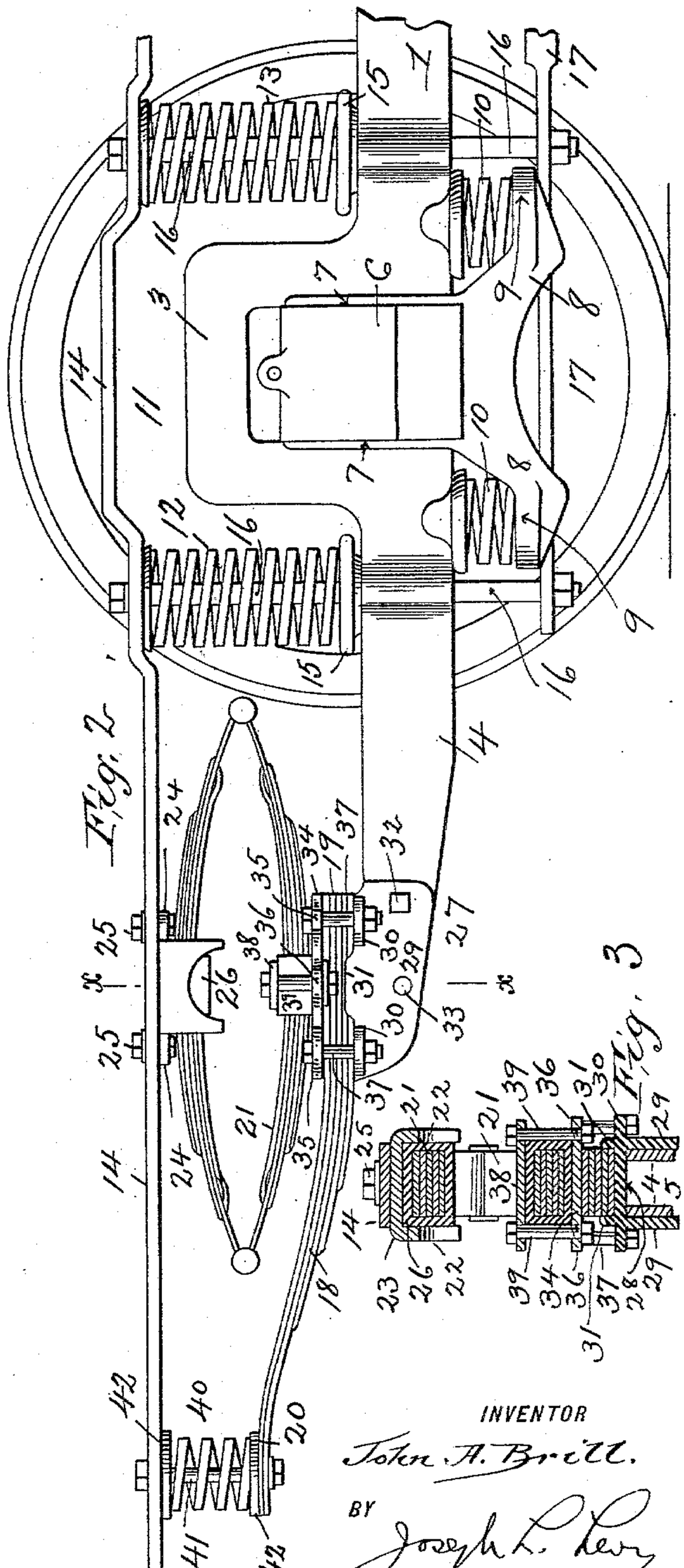


Fig. 3.

WITNESSES:

C. W. Benjamin

B. S. Wiel

INVENTOR

John A. Brill.

BY

Joseph L. Levy

ATTORNEY

(No Model.) 2 Sheets—Sheet 2.

J. A. BRILL.

CAR TRUCK.

No. 571,824. Patented Nov. 24, 1896.

Fig. 4

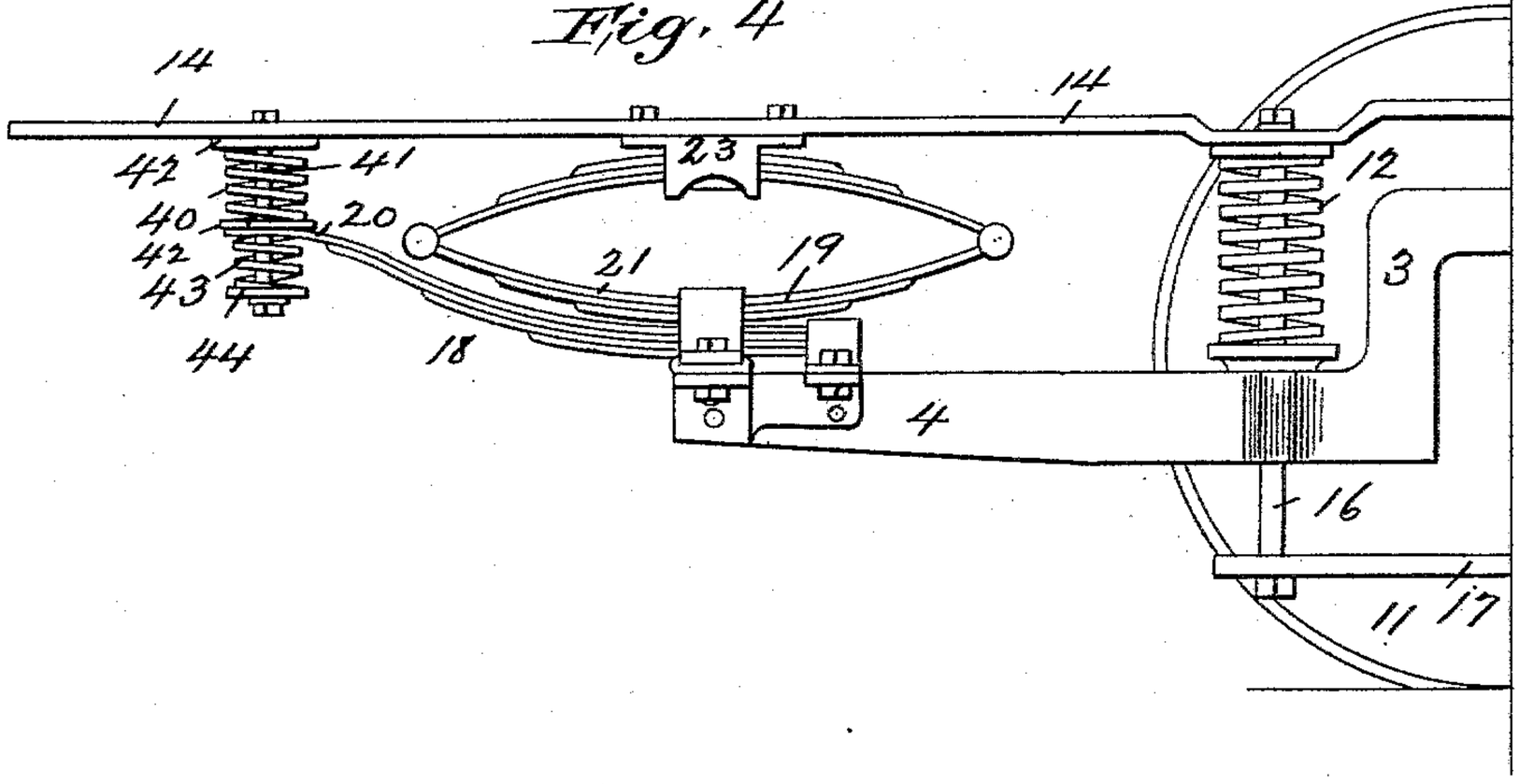


Fig. 5.

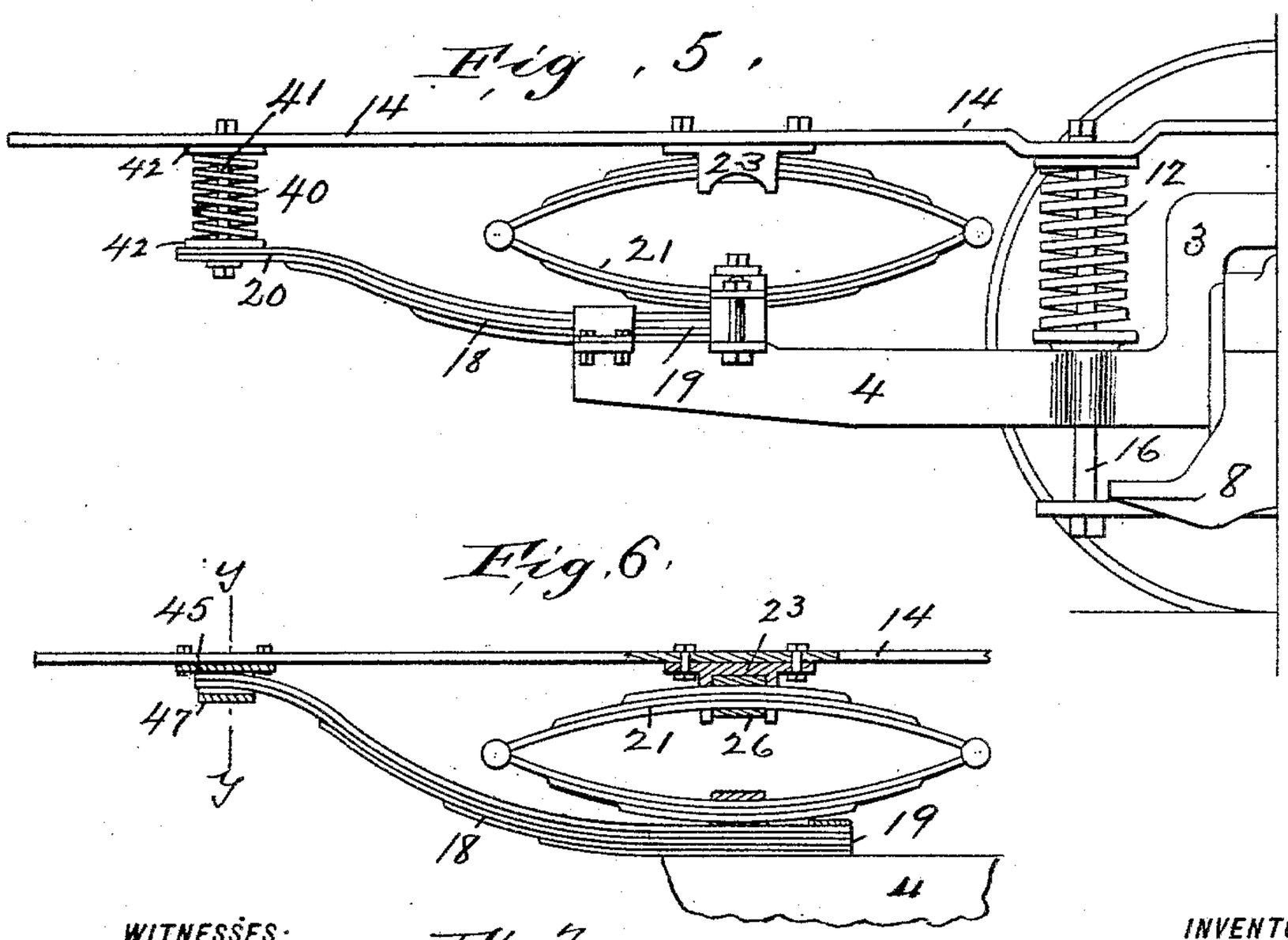
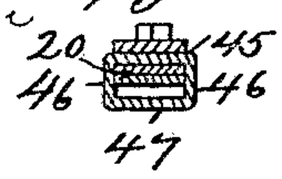


Fig. 6.

Fig. 7.



WITNESSES:

C. W. Benjamin

B. A. Wise

INVENTOR

John A. Brill.

BY Joseph L. Lowry

ATTORNEY

UNITED STATES PATENT OFFICE.

JOHN A. BRILL, OF PHILADELPHIA, PENNSYLVANIA.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 571,824, dated November 24, 1896.

Application filed April 11, 1896. Serial No. 587,110. (No model.)

To all whom it may concern:

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

My invention relates to improved means for resiliently resisting the oscillations of a car-body upon its truck; and one of the objects of the invention is to carry the connections between the springs of the axle-box frame and the car-body well forward of the axles without increasing the length of the truck; that is, the object of my invention is to increase the extent of what is known as the "spring-base" of the truck without increasing the length or the wheel-base of the truck itself; and my invention in this regard consists in certain improvements upon that disclosed in an application filed by me on the 3d day of April, 1895, Serial No. 544,256.

In the before-mentioned application I substituted for the elliptic spring carried upon the extensions of the axle-box frame and at each corner of the truck a three-quarter or portional elliptic spring, the upper end of which was connected to the car-sill or upper chord of the truck at two points, the lower bow of the spring being secured to the extensions of the truck-frame below the connection of the upper bow with the sill or chord, the lower bow being provided with an extension, the extension being connected to the upper chord of the truck or car-sill by means of springs instead of being directly connected therewith.

In my present construction I retain the usual full-elliptic spring at the end of the axle-box frame and at the four corners of the truck and increase the spring-base of the truck by securing a semibow or quarter-elliptic leaf-spring to the axle-box frame under or adjacent the full elliptic, and extend the end of the semibow spring out beyond the end of the axle-box frame to the required distance and connect its end with the sill of the car-body or top chord of the truck, as the case may be, either by springs or provide a direct and sliding connection therefor.

My invention further includes means whereby the length of the spring-base can be increased or shortened at will.

My invention therefore resides in the construction and combination of parts hereinafter described, and further pointed out in the claims.

In the drawings forming part of this specification, Figure 1 is a side elevation of a truck embodying my invention. Fig. 2 is a side elevation of one end of the truck enlarged, provided with one of the particular embodiments of my improvements; Fig. 3, a sectional elevation, enlarged, on the line x x, Fig. 2; Fig. 4, a side elevation showing a modified form of connection of the elliptic and semibow springs to the axle-box extension and chord or sill; Fig. 5, a side elevation showing further modifications; Fig. 6, a like view of a further modification in this regard. Fig. 7 is a sectional elevation on the line y y, 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 may be connected by cross-bars in any desired manner.

At 3 are the axle-box yokes, suitably formed or connected with the side bars 1, and at 4 are the extensions of the side bars, bifurcated, if desired, as at 5, Fig. 3.

At 6 are the axle-boxes, having lips 7 bearing on the sides of the yokes, and downwardly-extending lugs or ears 8, having seats 9 for springs or cushions 10, which support the axle-box frame of the axle-boxes; but the cushions must not be confounded with the car-springs hereinafter described.

The means above described for supporting the axle-box frame on the axle-boxes forms part of the subject-matter of an application filed by Walter S. Adams on April 16, 1896, Serial No. 587,783, to which cross reference is made.

The axles and wheels 11 may be of any desired construction.

The springs forming the "spring-base" of the truck comprise the springs 12 and 13, which are shown interposed between the side bars 1 and the top chord or car-sill 14, upon which a car-body can rest, or if the top chord is displaced with these and other parts can be secured directly to the car-sill, although I prefer the use of the chord. These springs are shown in the form of spiral springs rest-

ing in seats or risers 15 on the side bars, and pedestals or spring-posts 16 are shown passing through said springs, side bars, and extensions, and are connected at the bottom by a pedestal tie-bar 17 in the usual manner, the posts passing freely through apertures in the side bars and secured at the top to the chord 14.

The construction of the truck forms no part of my present invention and the present one may be modified or varied without departing from the spirit of my invention.

My improvements may be described as follows, reference being had to Figs. 1, 2, and 3: In addition to the spiral springs 12 13 adjacent the axle-boxes I have provided a semibow or leaf spring 18, preferably formed of a number of leaves or laminæ and suitably secured upon the extensions 4 of the side bar 1, there being one of such springs at the ends of each side-bar extension. The inner ends 19 of the spring 18 are substantially flat, and the upper leaf or leaves are bowed upwardly from where they leave the end of this side bar and form the end or extension 20, the extension being directly connected with the top chord 14 of the truck, or car-sill, or by springs, as hereinafter described, which latter amplify the action of the elliptic springs. Between the end 19 of the semibow spring 18 and the top chord or car-sill extends a full elliptic spring 21, the lower of which is secured directly over the extreme inner end of the semibow spring or otherwise, as hereinafter described, the upper bow of which engages or is engaged by the depending lips 22 of a saddle or housing 23, having flanges 24, which are secured by bolts 25 to the top chord 14 of the truck or directly to the car-sill, as the case may be. The laminæ of both bows of this spring are incased within the usual straps 26, the upper strap lying within the depending lips of the saddle or housing, its upper surface engaging the top of the saddle. In other words, the saddle rests directly on the top straps 26 of the spring.

If desired, the upper bow of the elliptic spring can be so arranged or adjusted in relation to the springs 12 and 13 that it will not come into play or be compressed by the normal downward movement of the car until subsequent to the initial compression of said springs 12 and 13, but as this arrangement does not materially enter into the present invention I prefer that the elliptic springs 21 should be so arranged as to come into compression simultaneous with the compression of the springs 12 and 13 for the reasons hereinafter expressed. In either case the depending lips of the saddle act as guides for the top bow of the elliptic spring and restrain it from transverse movement, the lower bow and the end 19 of the spring 18 being rigidly secured to the side bar in the manner now to be described.

At 27 is a casting or saddle having a top plate 28, resting on the top of the extension 4, depending flanges 29, embracing the sides of the extension, ears 30, extending outwardly on the same plane as the top plate, and the lips 31, extending upwardly on the same plane as the flanges 29, all the parts being preferably cast in one piece, the saddle being secured to the extension having a hole 33, through which a bolt for securing life-guard hangers may be passed, if desired.

The laminæ of the spring 18 rest upon the saddle and between the lips 31, and upon the top of the spring rests a plate 34, having ears 35 and 36, and through the ears 30 pass bolts 37, which forcibly secure the plate 34 down on the end 19 of the spring 18, retaining it in place, and upon the lower straps 26 of the spring 21 rests a cross-bar 38, the strap resting on the plate 34, and through the ends of the cross-bar 38 and ears 36 pass bolts 39, by means of which the spring 21 is firmly held in place at this point, the plate 34 and bolts 37 firmly securing the spring 18 to the extension 4.

In Figs. 1 and 2 the sill or chord 14 is shown extending considerably beyond the extensions 4 of the axle-box frame, and at or near the outer end of the chord connection is made with the extreme end or extension 20 of the semibow spring 18. This may be accomplished by either interposing a further spring or springs between the end of the spring 18 and a sill or chord or by connecting the spring directly with the sill or chord.

In Figs. 1 and 2 a spiral spring 40 is held in place between the sill or chord and the end of the spring by a post 41, passing loosely through the end of the spring and secured to the sill or chord, as the case may be, the spring 40 surrounding the post, which latter serves to retain the chord and springs together, suitable caps 42 being placed at the top and bottom of the spring 40 for its proper support.

In Fig. 4 a further spiral spring 43, preferably of less strength than 40, is combined with the end 20 of the spring 18, said spring 43 being disposed below the end 20, surrounding the post 41, which in this case is larger than in Figs. 1 and 2, the spring 43 resting on a cap 44, supported by the nut of the bolt.

In Figs. 6 and 7 the end 20 of the spring 18 is directly and movably connected with the sill or chord 14 by means of a cap or saddle 45, secured to the chord or sill in the usual way, the top of the spring having a movable bearing against the saddle. The sides 46 restrain sidewise movement, a cross-plate 47 preventing displacement of the spring. In this way a sliding engagement of the end of the spring is made directly with the sill-chord. When connected to the car in either of these ways, the outer ends of the spring 18 serve with increased leverage to resist the downward thrust of the car-body derived from its oscillatory movements, the spring acting as an auxiliary spring to supplement elliptics and spiral or other car-supporting springs about

the axle-boxes, and when the elliptic springs 21 are arranged, as hereinbefore set forth, to be compressed simultaneously with the compression of the spirals 12 13, the springs 18 will come into play and assist the other car-supporting springs in resisting the load and reduce the oscillation of the car at a point nearer to its extremes of movement before the elliptics 21 come into play, and then they serve the purpose of buffers to annihilate, check, or arrest such oscillation, and when the car is abnormally loaded, either evenly or at one end, the springs 18 will assist the spiral springs 12 and 13 in resisting the load, they being then supplemented by the elliptics, and should the elliptic springs 21 be not so arranged to come into compression simultaneously with the spiral springs 12 and 13 and the springs 18 they will work subsequently, and with a reserve of resistance, with all the other springs to resist the load.

It is not necessary for the purposes of my present invention to resiliently connect the outer ends of the springs 18 with the sill or top chord of the truck, but I prefer that such a connection be made, and, furthermore, that it should be made by a spring arrangement, consisting either of a single spiral or two springs, one above and below the end 20, which latter arrangement embodies the use of "oppositely-acting" springs, which are so called by reason of the fact that they act in opposite directions to each other, and, further, that these springs should be of varying capacity, that is, one stronger than the other.

The spring 40 at the end of the spring 18 assists the springs 12, 13, and 21 in resisting the load in either of the manners before set forth, and during load movement or oscillation the ends of the springs 18 are bent until they offer sufficient resistance to force the compression of the spiral springs 40 at their ends, at which time this action is assisted by the elliptic springs simultaneously or subsequently, as before described.

During oscillation the action of the spring 18 is emphasized, and when the end of the car rises the ends of the springs 18 are strained, offering resistance to further upward oscillatory movement. When the oppositely-acting springs 40 43 are employed, and when during oscillation or undue load motions, the lower and smaller springs 41 will come into play and act as cushions to check the further upward movement of the car, and thus the car is not only provided with a spring-base of a great length, but additional means are provided for checking and resisting the oscillations and load movements of the car.

From the foregoing it will be understood that my improvements give a gentle yet forcible resistance to the oscillations of the car-body, which are thereby restrained within reasonable limits without giving shocks when the resistance is encountered. By this easy riding of the car is effected with few parts and the resistance is placed at the proper point to quickly and easily check the oscillations of the car-body.

Should it be desired to increase or diminish the spring-base of the truck, that is, the longitudinal distance between the operative centers or points of contact of the end spring or springs, it is only necessary, as in Figs. 1 and 2, to loosen the bolts 37 and detach the posts 41, move the springs 18 in or out until the desired spread is obtained, secure the spring end 19 in position, and replace the post either in holes in the chord specifically provided for this adjustment or in any other way.

In Figs. 4, 5, and 6 are shown modified forms of means for securing the elliptic and semibow springs to the extensions of the side bars.

In Figs. 4 and 6 instead of the end 19 of the spring 18 being secured to the extensions 4, adjacent the latter's ends, as in Figs. 1 and 2, it is secured more to the rear, reducing the spring-base without altering the position of the spring 21, suitable saddles being employed to secure both springs in place.

In Fig. 5 the position of the spring 18 is the same as in Figs. 1 and 2, and the spring 21 is moved back to the end of the spring 18 and there fixed in position.

The same form of saddle as in Figs. 1 and 2 can be used, or detached ones, as in the other figures.

Instead of connecting the springs 12, 21, and 40, the posts 16 and 41, and saddles 23 to the top chord 14 they or either of them may be directly connected to the car-sill and the chord or parts of the same omitted, as is occasionally done; and where the words "top or truck chord" are used in the claims I intend to include the car body or sill.

I do not, as before stated, limit myself to the particular construction of truck herein illustrated, as my improvements may be applied to trucks of varying construction, and I furthermore do not limit myself to such an arrangement of the springs as will permit of the compression of the full-elliptic springs simultaneously with the compression of springs 12 and 13 or the other springs, as all may be arranged to come into compression during the downward movement of the car-body at different times, and thus it will be apparent that changes and modifications can be made in the embodiment of my present invention without departing from the spirit of the same.

I claim—

1. In a car-truck, a compound spring located at each corner, said spring being composed of two unequal parts, a lower part attached to the truck-frame, extending out beyond the truck-frame, and engaging with the car-body, and an upper part comprising two connected bow-springs extending between the proximate frame end of said lower part and the truck-chord, substantially as described.

2. In a car-truck, a compound spring lo-

cated at each corner, said spring being composed of two unequal parts, a lower part attached to the truck-frame, extending out beyond the truck-frame, and engaging with the car-body, and an upper part comprising two connected bow-springs extending between the proximate frame end of said lower part and the truck-chord, combined with other springs for supporting the car-body, substantially as described.

3. In a car-truck, a compound spring located at each corner, said springs being composed of two unequal parts, a lower part attached to the truck-frame, extending out beyond the truck-frame, and engaging with the car-body, and an upper part comprising two connected bow-springs extending between the proximate frame end of said lower part and the truck-chord, combined with spiral springs on the truck-frame for supporting the car-body, substantially as described.

4. In a car-truck, a compound spring located at each corner, said spring being composed of two unequal parts, a lower part attached to the truck-frame, and extending out beyond the truck-frame, a compressible resilient element between the end of the lower part and the car-body and engaging therewith, and an upper part comprising two connected bow-springs extending between the proximate frame end of the said lower part and the truck-chord, substantially as described.

5. In a car-truck, a compound spring located at each corner, said spring being composed of two unequal parts, a lower part attached to the truck-frame and extending out beyond the said frame, oppositely-acting springs above and below the outer end of the said lower part engaging the car-body, and an upper part comprising two connected bow-springs extending between the proximate frame end of the said lower part and the truck-chord, substantially as described.

6. In a car-truck, a compound spring located at each corner, said springs being composed of two unequal parts, the lower part attached to the truck-frame and extending out beyond the truck-frame, the outer end of said lower part carrying a spiral spring engaging with the car-body, and an upper part comprising two connected bow-springs extending between the proximate frame end and the said lower part and the truck-chord, substantially as described.

7. In a car-truck, a compound spring located at each corner, said spring being composed of two unequal parts, a lower part attached to the truck-frame and extending out beyond the truck-frame, the outer end of said lower part carrying a spiral spring engaging the car-body, a post extending between said outer end and the said chord or sill, and an upper part comprising two connected bow-springs extending between the proximate frame end of said lower part and the car-sill or truck-chord, substantially as described.

8. In a car-truck, the combination with a truck-frame, of the leaf-spring extending therefrom, and a compressible resilient element interposed between the outer end of said spring and the truck-chord, each of the corners of the truck being so provided with said leaf-spring and compressible element, substantially as described.

9. In a car-truck, the combination with a truck-frame, a full-elliptic spring extending between the extremes of said frame and the truck-chord, and a leaf-spring extending from said frame, its outer end engaging the truck-chord, substantially as described.

10. In a car-truck, the combination with a truck-frame, of the full-elliptic spring extending between the extremes of said frame and the truck-chord, a leaf-spring extending outwardly from said truck end, and a compressible resilient element interposing between the outer end of said leaf-spring and said truck-chord, substantially as described.

11. In a car-truck, the combination with a truck-frame, of the truck-chord, an extension of said frame formed at its four corners comprising a leaf-spring, and a full-elliptic spring interposed between said extension and said chord, substantially as described.

12. In a car-truck, the combination with a truck-frame, of the truck-chord, an extension of said frame formed at its four corners comprising a leaf-spring, and a full-elliptic spring interposed between said extension and the said chord, and other springs interposed between the frame and said chord, substantially as described.

13. In a car-truck, the combination with a truck-frame, of the truck-chord, an extension of said frame formed at its four corners comprising a leaf-spring, and a full-elliptic spring interposed between said extension and said chord, and spiral springs interposed between said frame and the chord, substantially as described.

14. In a car-truck, the combination with a truck-frame of the upper chord, an extension of said frame formed at its four corners comprising a leaf-spring, a compressible resilient connection between the end of said leaf-spring and said chord, and a full-elliptic spring interposed between said extension and said chord, substantially as described.

15. In a car-truck, the combination with a truck-frame, of the truck-chord, an extension of said frame formed at its four corners comprising a leaf-spring, oppositely-acting springs above and below the outer end of said leaf-spring and engaging said chord, and a full-elliptic spring interposed between said extension and said chord, substantially as described.

16. In a car-truck, the combination with a truck-frame, of the truck-chord, and an extension of said frame formed at its four corners comprising a leaf-spring, a spiral spring interposed between the outer end of said leaf-

spring, a truck-chord, and a full-elliptic spring interposed between said extension and said chord, substantially as described.

17. In a car-truck, the combination with a truck-frame, and a truck-chord, a leaf-spring on said frame extending beyond its ends, a coil-spring interposed between the ends of the leaf-spring and the chord, and a full-elliptic spring extending between said frame and chord, substantially as described.

18. In a car-truck, the combination of an axle-box frame and an upper chord which extends beyond the end of said frame, with a spring extending from said frame to the extended portion of said chord, oppositely-acting springs interposed between the end of said spring and said chord, and a full-elliptic spring extending between said frame extension and said chord, substantially as described.

19. In a car-truck, the combination of an axle-box frame and an upper chord which extends beyond the end of said frame, with a spring extending from said frame to the extended portion of said chord, and springs of varying capacity secured to the end of said spring and to said chord, and a full-elliptic spring extending between said frame extension and said chord, substantially as described.

20. In a car-truck, the combination of an axle-box frame and an upper chord, which extends beyond the end of said frame, with a spring extending from said frame to the extended portion of said chord, an elastic connection between the extended portion of said spring and said chord or spring, and a full-elliptic spring extending between the end of said frame and chord, substantially as described.

21. In a car-truck, the combination of an axle-box frame and a top chord, with a full-elliptic spring carried by said frame, and having a connection with said chord above its connection with said frame, and a leaf-spring extending from the frame connection of the full-elliptic spring to said chord forward of said full-elliptic spring, substantially as described.

22. The combination of the top chord, a full-elliptic spring secured by a detachable saddle to the ends of said frame, a saddle movably connecting the top of said full-elliptic spring with said chord, and a leaf-spring confined on the end of said truck-frame below said full-elliptic, and extending out beyond the frame and engaging said chord, substantially as described.

23. The combination with a truck-frame, of a saddle having the lips 29 and top plate 28, ears 30, the leaf-spring 18, a plate 35 resting on top of the ends of said leaf-spring, bolts 37 connecting the plate 35 to the ears 30, and confining the ends of said leaf-spring to the truck-frame, the end 20 of said leaf-spring engaging the car-body, substantially as described.

24. The combination with the frame extension 4, of the leaf-spring 18 secured on said extension by a detachable saddle, the top chord 14, a full-elliptic spring secured on the inner end of leaf-spring by a detachable saddle, its upper portion engaging the top chord, the outer end of the leaf-spring engaging said top chord, substantially as described.

Signed at the city and county of Philadelphia, State of Pennsylvania, the 3d day of March, 1896.

JNO. A. BRILL.

Witnesses:
HENRY C. ESLING,
CHARLES MCQUILKIN.