(No Model.) 2 Sheets—Sheet 1.

J. A. BRILL.

CAR TRUCK.

No. 586,987. Patented July 27, 1897.

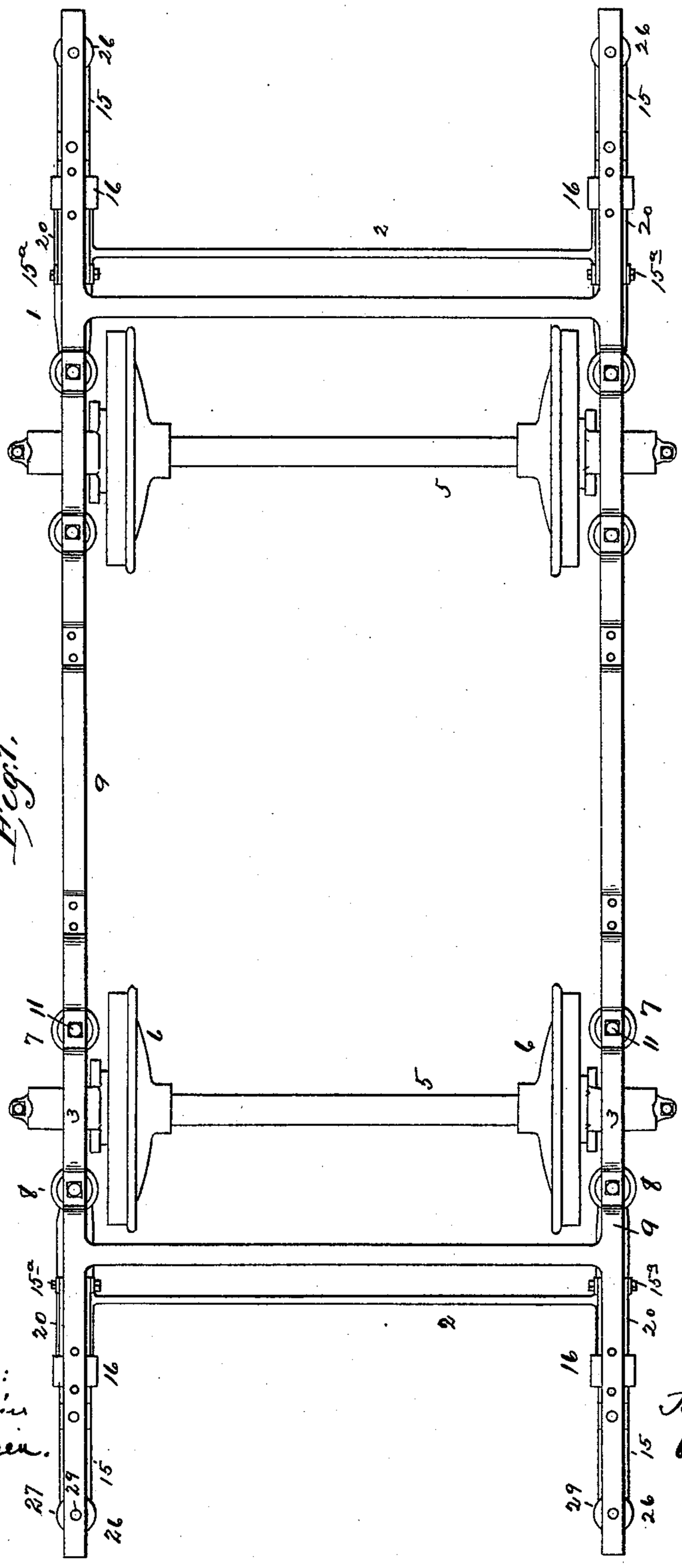

Fig. 1.

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(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

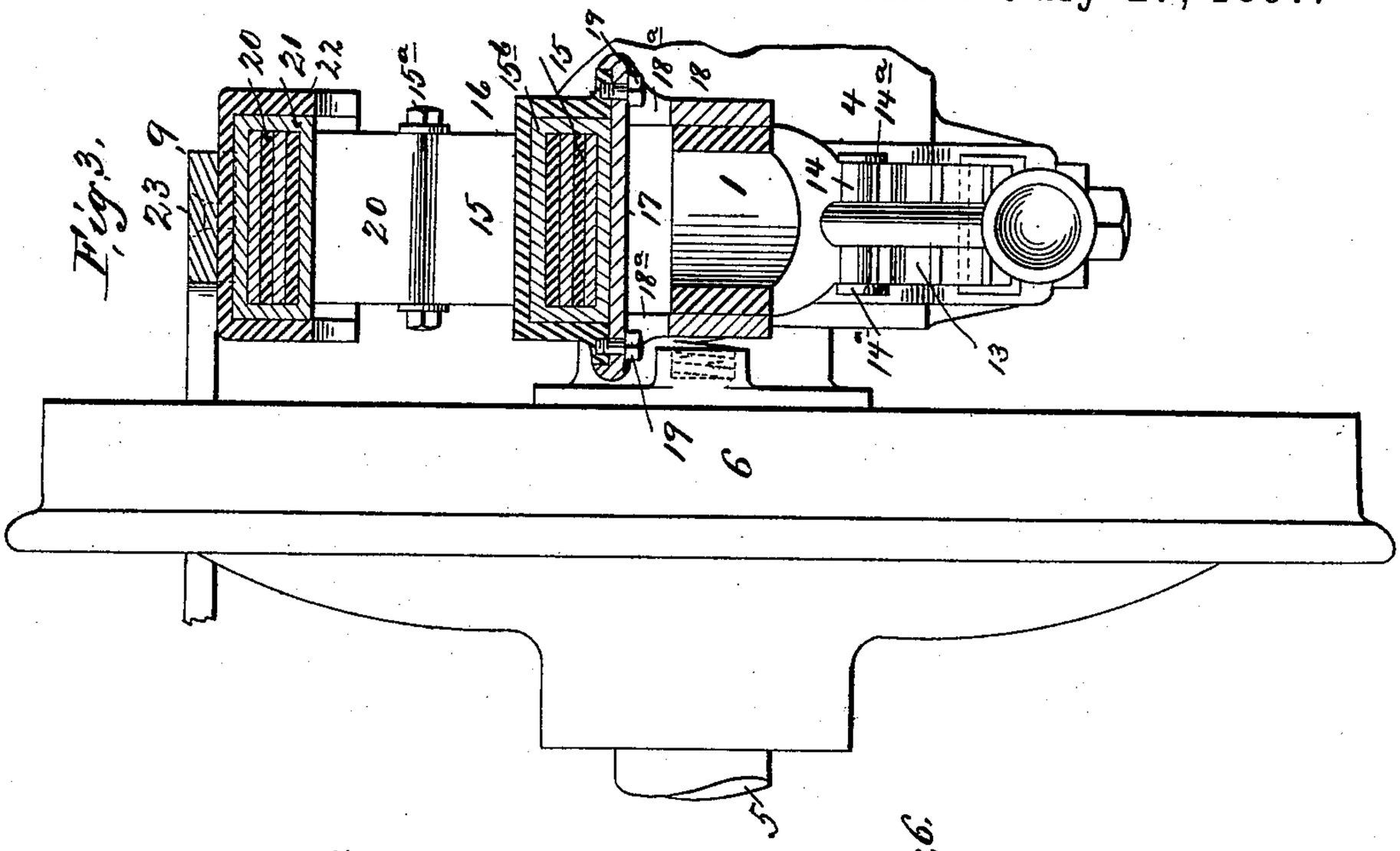


Fig. 2.

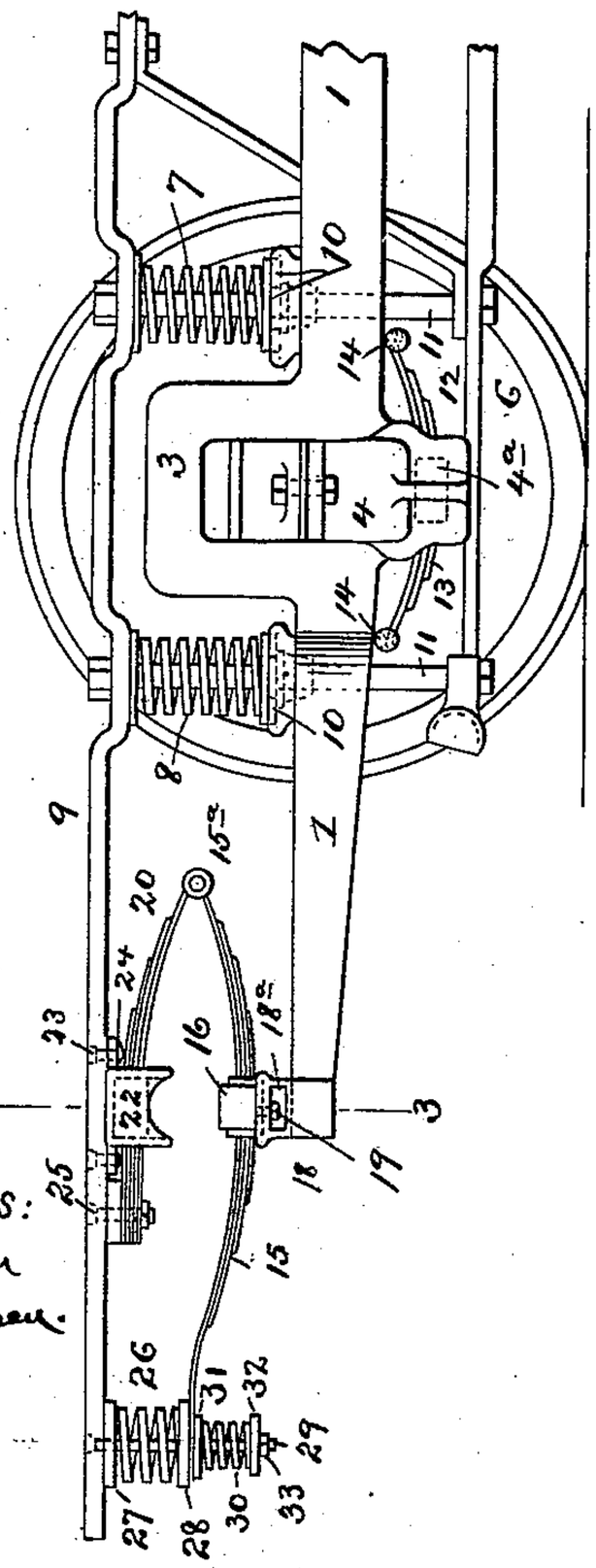


Fig. 6.

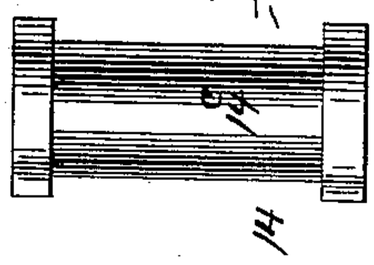


Fig. 5.

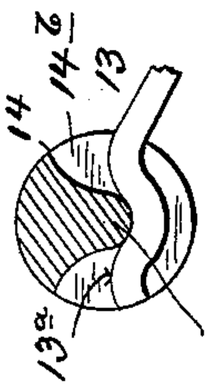
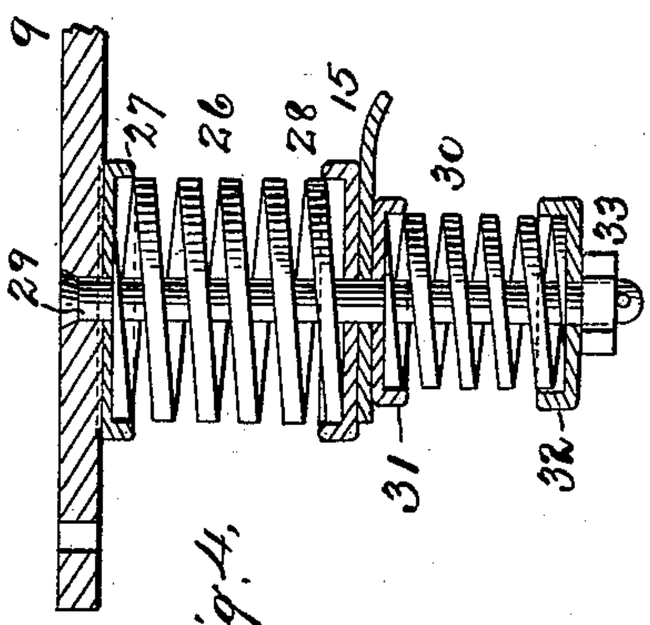


Fig. 4.



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UNITED STATES PATENT OFFICE.

JOHN A. BRILL, OF PHILADELPHIA, PENNSYLVANIA.

CAR-TRUCK.

SPECIFICATION forming part of Letters Patent No. 586,987, dated July 27, 1897.

Application filed April 3, 1895. Serial No. 544,256. (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, 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 relates more particularly 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. In carrying out this feature of my invention I provide a peculiar and novel portional-elliptical or bow spring which is carried by the axle-box frame at its end, one end of this spring being connected with the car-body sill or top chord of the truck above the corresponding end of the axle-box frame by a bow or leaf spring, the other end of said portional-elliptical spring being connected with the car-body sill or top chord of the axle-box frame at a point well forward of the axle-box frame by means of other springs, and by this means I provide further resiliency by locating the outer end of said portional-elliptical or bow spring between the said springs which are carried by the car-body sill or top chord of the truck, so that if undue oscillations of the car-body take place extra spring resistance will be encountered.

The invention also 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 plan view of a car-truck embodying my improvements. Fig. 2 is an enlarged side elevation of a portion of the truck, illustrating the application of my improvements. Fig. 3 is a cross-section, enlarged, on the plane of the line 3 3 in Fig. 2, looking from the left. Fig. 4 is an enlarged detail view, partly in section, showing the double spiral springs at the outer end of the sill or top chord of the car-truck and their connection with the portional-elliptical or bow spring. Fig. 5 is a sectional detail view of connection between the axle-box spring and the axle-box frame, and Fig. 6 is a plan view thereof.

In the accompanying drawings, in which similar numerals and letters of reference indicate corresponding parts in the several views, 1 indicates the side bars of an axle-box frame, which are connected by cross-bars 2 in any desired manner.

3 are the axle-box yokes, suitably formed or connected with the side bars 1.

4 are the axle-boxes, 5 the axles, and 6 the wheels, all of which parts may be of any desired construction. The car-body-supporting springs 7 8 are shown interposed between the side bars 1 and the upper chord or car-sill 9, upon which a car-body can rest. These springs are shown in the form of spiral springs resting in seats or risers 10 on the side bars, and pedestals or spring-posts 11 are shown passing through said springs and connected by a pedestal tie-bar 12 in well-known manner, the pedestals passing freely through apertures in the side bars. The axle-boxes 4 are shown with depending housings 4^a, carrying leaf-springs 13 of suitable shape, the outer ends of which extend upwardly and serve to receive and sustain the side bars 1 of the axle-box frame.

My improvement may be described as follows:

15 is a portional-elliptical or bow spring, preferably formed of a number of leaves or laminæ and suitably secured at the end of the side bar 1, there being one of such springs at the ends of each side bar of the axle-box frame. The leaves of the spring 15 are shown bound together by a band 15^b, over which passes a strap 16, and said spring rests on a cross plate or bar 17 of a yoke 18. The strap 16 and plate or bar 17 are shown secured together by screws or bolts 19, the yoke 18 having recesses 18^a to receive the heads of said screws or bolts and to allow them to be operated. The yoke 18 is shown as straddling the side bar 1, to which it may be secured by any suitable means, the outer ends of said side bars being shown bifurcated or forked to receive a brace-bar. (Not shown.)

The inner end of the spring 15 is pivotally connected, as at 15^a, with a plate or bow spring 20, preferably composed of several

leaves or laminæ, the spring 20 being secured to the sill or chord 9, as shown. The leaves of the spring 20 are shown bound together by a strap or band 21, which is held in a yoke 22, which projects downwardly and is secured to the sill or chord 9 by bolts or screws 23, which pass through ears 24 on said yoke. (See Fig. 2.) The yoke 22 keeps the spring 20 from side movements, while allowing it to have the necessary vertical play. The spring 20 is shown further secured to the sill or chord 9 by a bolt 25, as in Fig. 2, whereby it is positively retained in position.

In Figs. 1 and 2 the sill or chord 9 is shown extending considerably beyond the ends of the axle-box frame or its side bars 1, and near their outer ends the sill or chord 9 is connected with the outer ends of the portional-elliptical or bow spring 15. The outer ends of the springs 15 thereby serve, with increased leverage, to resist the downward thrust of the car-body derived from its oscillatory movements, the entire spring acting as an auxiliary spring to assist the spiral or other car-body-supporting springs. The outer ends of the springs 15 are preferably resiliently connected with the sills or chords 9, and for this purpose a spring 26 is interposed between the sill or chord 9 and the end of the spring 15. (See Figs. 2 and 4.) The spring 26 is shown located in seats 27 28, the seat 27 resting against the sill or chord 9 and the seat 28 resting on the spring 15. (See Fig. 4.)

29 is a guide-post carried by the sill or chord 9 and passing freely through the seats 27 28, spring 26, and spring 15, so as to have sliding movement through said parts, or they about it.

At 30 is a smaller spiral spring, located at the under side of the outer end of the spring 15 and surrounding the post 29, the spring 30 having seats or risers 31 32, through which the post 29 passes, a nut 33 on said post sustaining the seat 32, as shown clearly in Fig. 4.

The portional-elliptic spring 15 20 is peculiar in construction in that the lower half is semielliptic and has a continuation or extension *a* of one of its leaves which is connected with the part 29 and spring 26 30, as shown, while the upper half is segmental or bowed for a portion of its length, as at *b*, the other end *c* being substantially horizontal and entirely disconnected from the lower half, which extends out beyond it.

The power-arm *c b* is substantially equal to the power-arm *a*—that is, that portion between the strap 16 and end of the extension *a*—and when the truck is riding the part *b c* and connected end *d* act as an elliptic spring with the power of a little more than a semielliptic spring of the same spread, while a combination of spring resistances or actions is had at the end *a* by reason of the presence of the spirals.

With the construction heretofore described the ordinary weight of a superposed car-body is resisted by the springs 7 and 8 and an extra weight is partially sustained by the springs 15 and 20. When the car-body oscillates slightly, its outer end, which has the greater movement, bears against the outer end of the spring 15, which acts to resist the downward thrust of the car-body with increased leverage. Should the downward movement of the end of the car-body be large, the tension of the several leaves of the spring 15 increases and offers greater resistance to the thrust of the car-body, whereupon the springs 26 will be compressed between the sill or chord 9 and the spring 15, thereby further resisting the movement of the car-body until it is checked. As the car-body rises at one end the spring 15 resists the upward movement thereof, and if said upward movement becomes great the spring 30 will become compressed and relieve the strain on the spring 15.

From what has been stated it will be understood that my improved spring-acting devices 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.

Reference may now be had to the connections between the spring 13 and the side bars 1 of the axle-box frame. As shown, the spring 13 depends from the axle-box 4 and its free ends extend upwardly to sustain the axle-box frame. At the ends of the spring 13 are cylindrical blocks 14, which may have flanges 14^a at the ends to embrace the lower edges of the side bars 1, (see Fig. 3,) the side bars 1 resting on these blocks. The under surfaces of the blocks 14 are cut away at 14^b, forming curved bearings 14^c, that receive the curved ends 13^a of the springs 13. (See Fig. 5.) The curved bearings 14^c permit a slight oscillatory motion of the blocks 14 on the springs 13, and the curved ends 13^a of the springs 13 keep the blocks 14 in position. As the weight or movement of the car-body increases the blocks 14 may slide slightly or vibrate under the side bars 1, while said blocks remove any wear that might occur on the ends of the springs. The construction shown forms a substantial support for the ends of the springs, and the blocks 14 can be readily replaced without removing the springs 13 from the axle-boxes.

The connection between the spring under the axle-boxes and the side bar is not claimed herein.

I do not limit my invention to the precise details of construction shown, as they may be varied without departing from the spirit of my invention.

I claim—

1. In a car-truck, a portional-elliptical spring located at each corner, said springs being composed of two unequal parts, a lower part attached to the truck-frame having one

long end extending out beyond the truck-frame, a compressible resilient connection interposed between the extreme of the long end and the car-body, and a short end extending toward the truck-axle, and an upper part attached at one end to the car-body and extending toward the truck-axle and engaging with the short end of said lower part, combined with a spiral spring for supporting the car-body, substantially as described.

2. In a car-truck, the combination with a car-body, of three-quarter elliptic springs, each having its single end longer than its double end, and also having two bearings on the car-body, neither of which is inside the bearing of said spring upon the truck-frame, and a longer and single end projected out and beyond the truck-frame, a compressible resilient connection interposed between the long end and the car-body, acting directly against an overhanging portion of the car-body, and a spiral spring arranged upon the car-truck and supporting the car-body, substantially as described.

3. In a car-truck, a portional-elliptical spring located at each corner, said springs being composed of two unequal parts, a lower part attached to the truck-frame having one long end extending out beyond the truck-frame, oppositely-acting springs interposed between the extreme of the long end and the car-body, and a short end extending toward the truck-axle, and an upper part attached at one end to the car-body and extending toward the truck-axle and engaging the short end of said lower part, combined with a spiral spring for supporting the car-body, substantially as described.

4. In a car-truck, a portional-elliptical spring located at each corner, said springs being composed of two unequal parts, a lower part attached to the truck-frame having one long end extending out beyond the truck-frame, the spiral springs 26 30 above and below the extreme of the long end, the post 29 tying the springs together, the spring 26 engaging the car-body, and a short end extending toward the truck-axle, and an upper part attached at one end to the car-body and extending toward the truck-axle and engaging the short end of said lower part, combined with a spiral spring for supporting the car-body, substantially as described.

5. In a car-truck, the combination with the truck-frame, of an upper chord or car-sill, an extension of said frame formed at its four corners comprising a leaf-spring and a compressible resilient connection between said leaf-spring and said chord or sill, and other springs interposed between the frame and chord or sill, substantially as described.

6. In a car-truck, the combination of a truck-frame, and an upper chord or car-sill, a leaf-spring on said frame and extending beyond its ends, and a coil-spring interposed between the end of the leaf-spring and the sill or chord, substantially as described.

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

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

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

10. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a spring carried by said frame and having one connection with said sill or chord above its connection with said frame, and an elastic connection with said sill or chord forward of said frame, substantially as described.

11. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a spring carried by said frame and having connections at its ends extending to different points on said sill or chord, and a further spring interposed between one of its ends and the sill or chord, substantially as described.

12. The combination with the car sill or truck upper chord, and an axle-box frame, of a spring having bowed elements connected at one end and entirely disconnected at the other, and oppositely-acting springs connecting the disconnected end with the sill or chord, substantially as described.

13. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a spring carried by said frame, a spring connecting its inner end with said sill or chord, and elastic connections between the outer end of said first-mentioned spring and the outer part of said sill or chord, substantially as described.

14. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a portional-elliptical or bow spring having its opposite ends connected to separate points on said sill or chord, the longer arm of said spring having a resilient connection with said sill or chord, substantially as described.

15. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a bow-spring carried by said frame, a bow-spring connected with one end of said spring, and a coiled spring connecting the other end of the first-mentioned spring with said sill or chord, substantially as described.

16. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a bow-spring carried by said frame, a bow-spring connecting the inner end of said spring with said sill or chord, a spring located between the outer end of said first-mentioned spring and said sill or chord, and a spring beneath the outer end of the first-mentioned spring, and a bar extending from said sill or chord to regulate the position of the third-mentioned spring, substantially as described.

17. In a car-truck, the combination of an axle-box frame and a sill or upper chord which extends forwardly beyond said frame, with a spring carried by said frame, and means for elastically connecting the outer end of said spring with the outer portion of said chord beyond the plane of the axle-box frame, substantially as described.

18. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a bow-spring centrally connected with said frame, another bow-spring carried by said sill or chord and extending rearwardly and pivotally connected with said first-mentioned spring, and a spring located between the outer end of said first-mentioned spring and said sill or chord, substantially as described.

19. In a car-truck, the combination of an axle-box frame and a sill or upper chord, with a bow-spring 15, connections between the inner end of said spring and said sill or chord, a spring 26 between the sill and the outer end of the spring 15, a spring 30 located on the under side of the spring 15 beneath the spring 26, a rod 29 passing freely through the springs 26, 15 and 30 and connected with said sill or chord, a seat 32 beneath the spring 30, and a nut on the rod 29 to sustain said seat, substantially as described.

20. A spring comprising a semielliptic lower half, and a portional-semielliptic upper half, the opposing segments of the two halves being connected, and the other ends of the halves disconnected, an oppositely-acting element at the end of the lower half, combined with a truck-frame and sill or chord, substantially as described.

21. A portional-elliptic spring, comprising a lower full-semielliptic element, having an extension at one end, and an upper portional-semielliptic element, the extremes of the upper and lower elements at one end being connected, the other being disconnected, the lower element having a longer spread on one side than on the other, this end carrying an additional spring, combined with a truck-frame, and chord or sill, substantially as described.

Signed at New York, in the county of New York and State of New York, this 1st day of April, 1895.

JOHN A. BRILL.

Witnesses:
JOSEPH L. LEVY,
WILLIAM JACOBSEN.