No. 844,150. PATENTED FEB. 12, 1907.

G. LINDENTHAL.

CAR TRUCK.

APPLICATION FILED APR. 4, 1905.

5 SHEETS—SHEET 1.

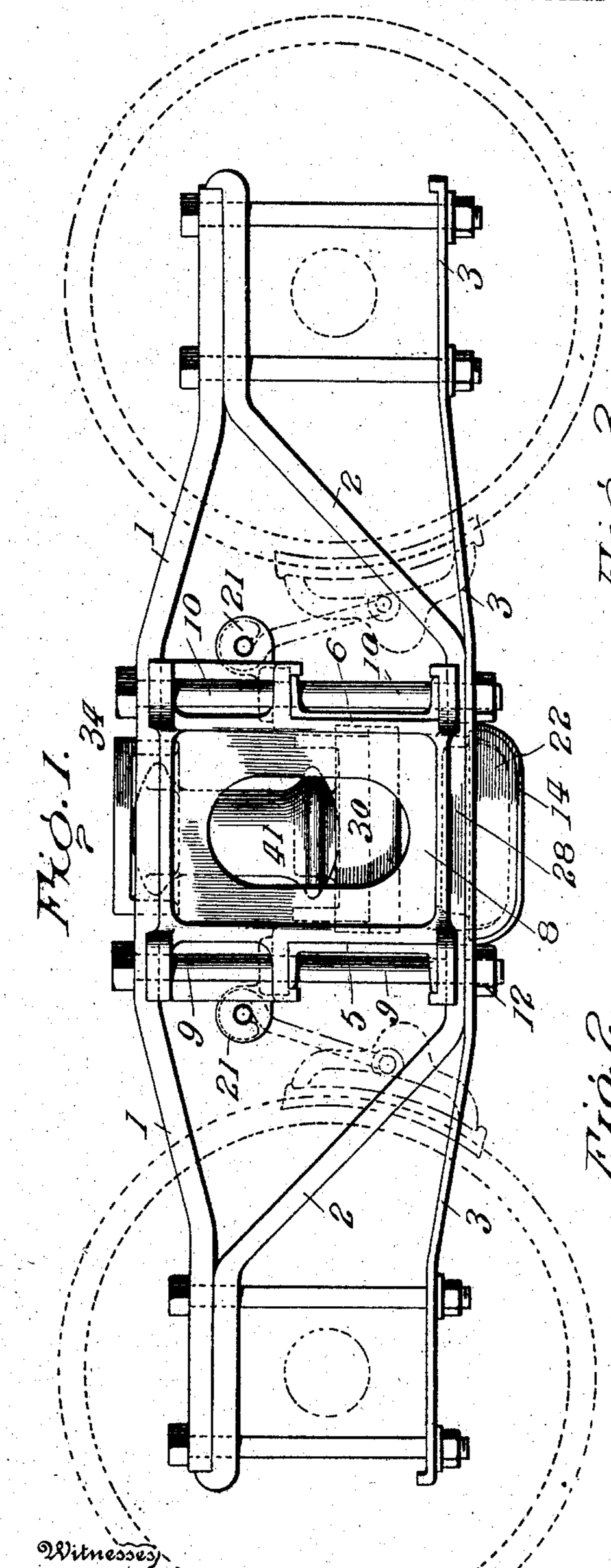

FIG. 1.

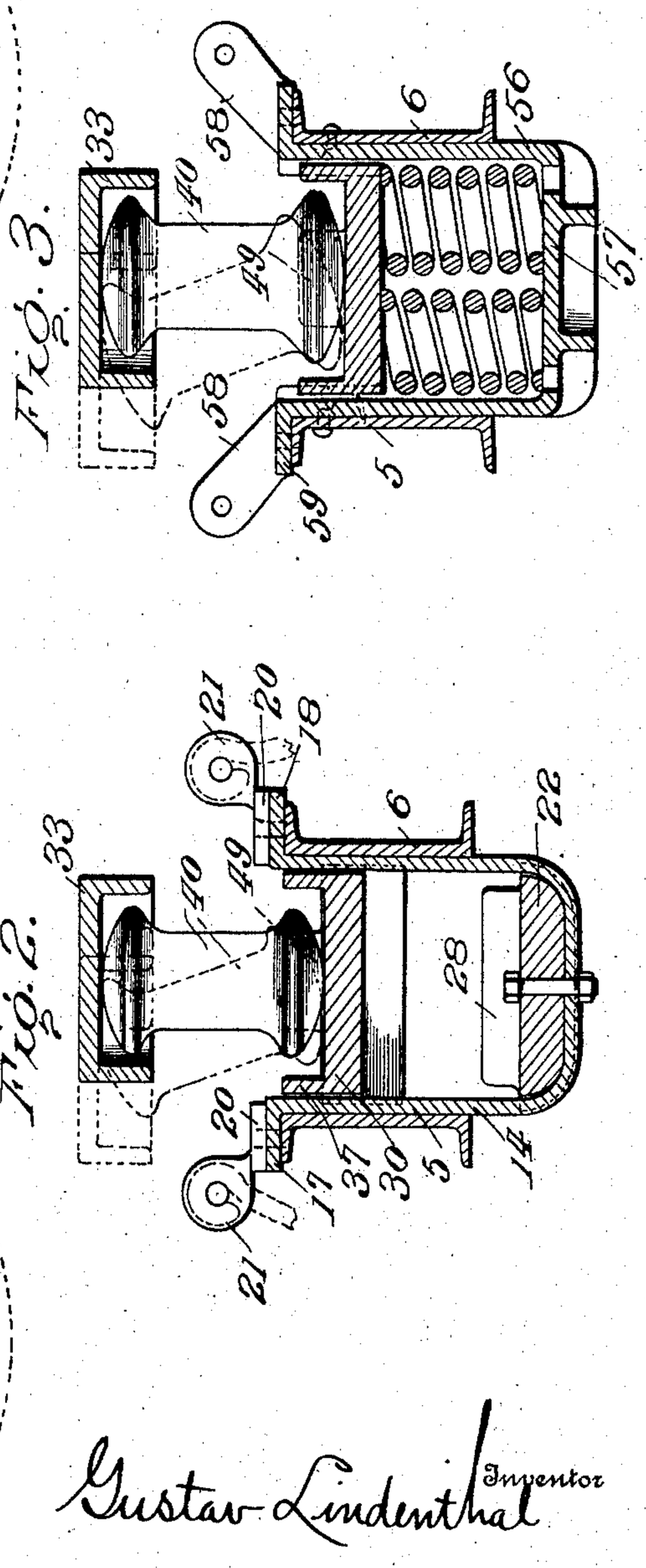

FIG. 3.

FIG. 2.

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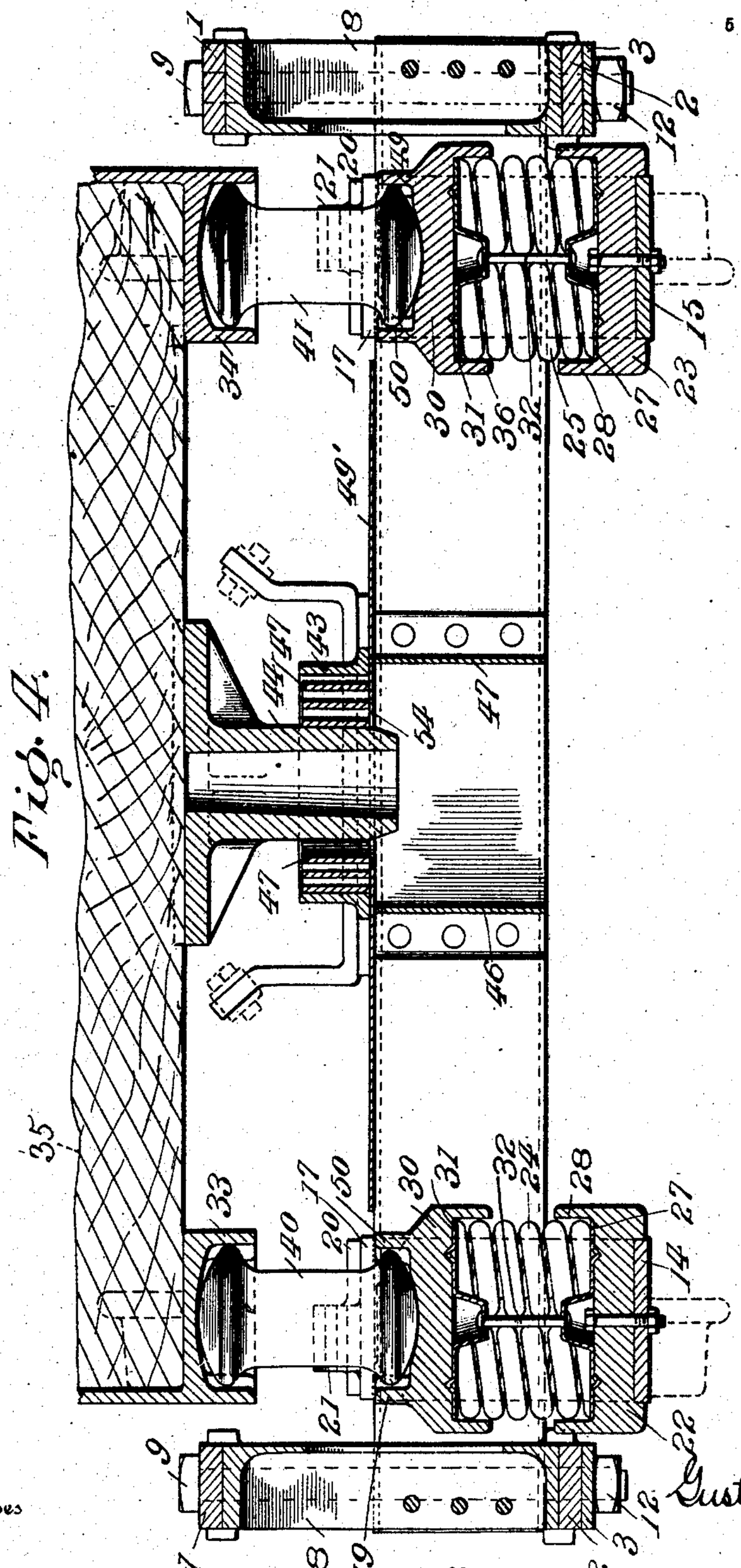
5 SHEETS—SHEET 2.

Fig. 4.



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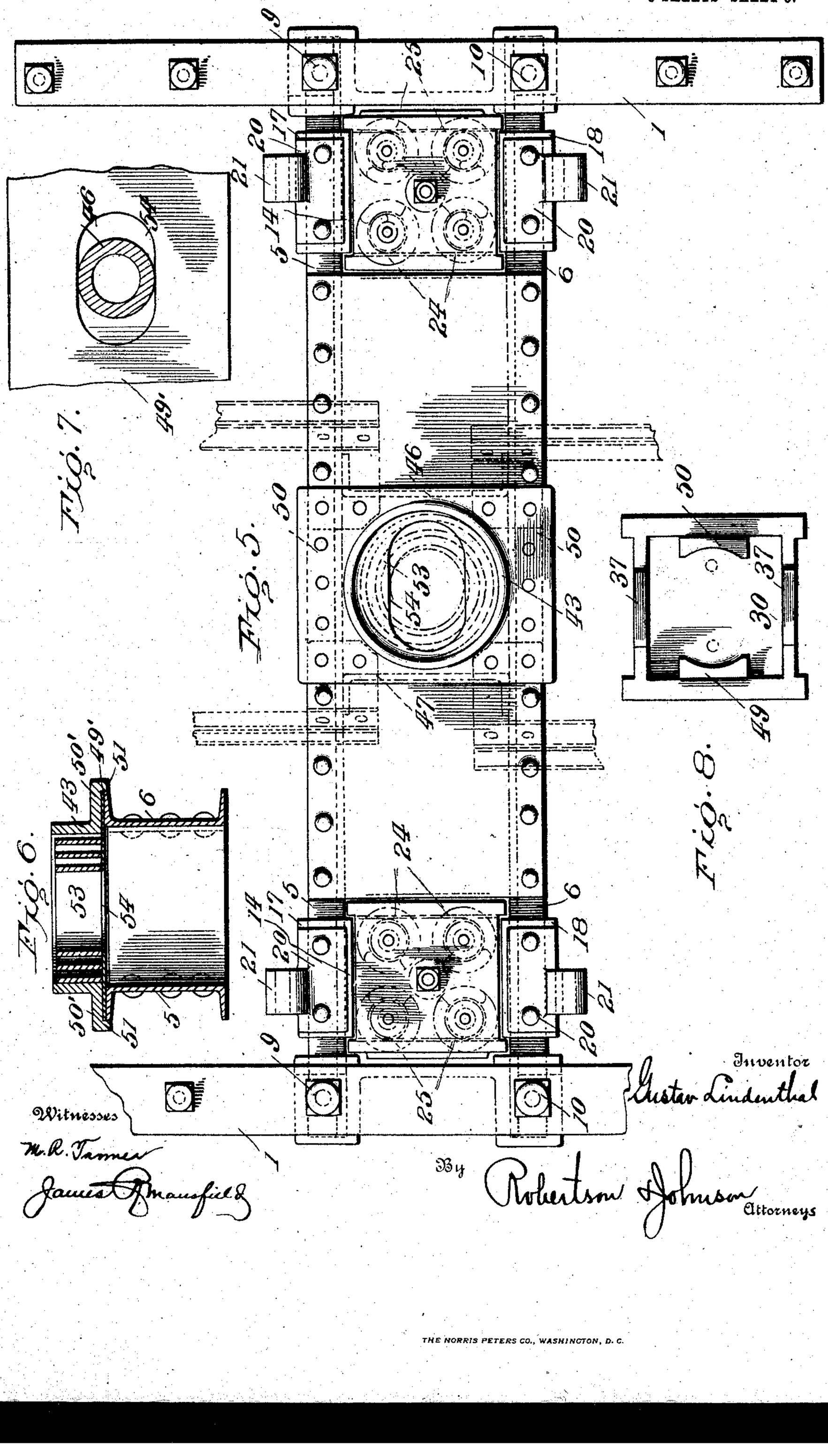

Fig. 7.

Fig. 5.

Fig. 8.

Fig. 6.

Witnesses

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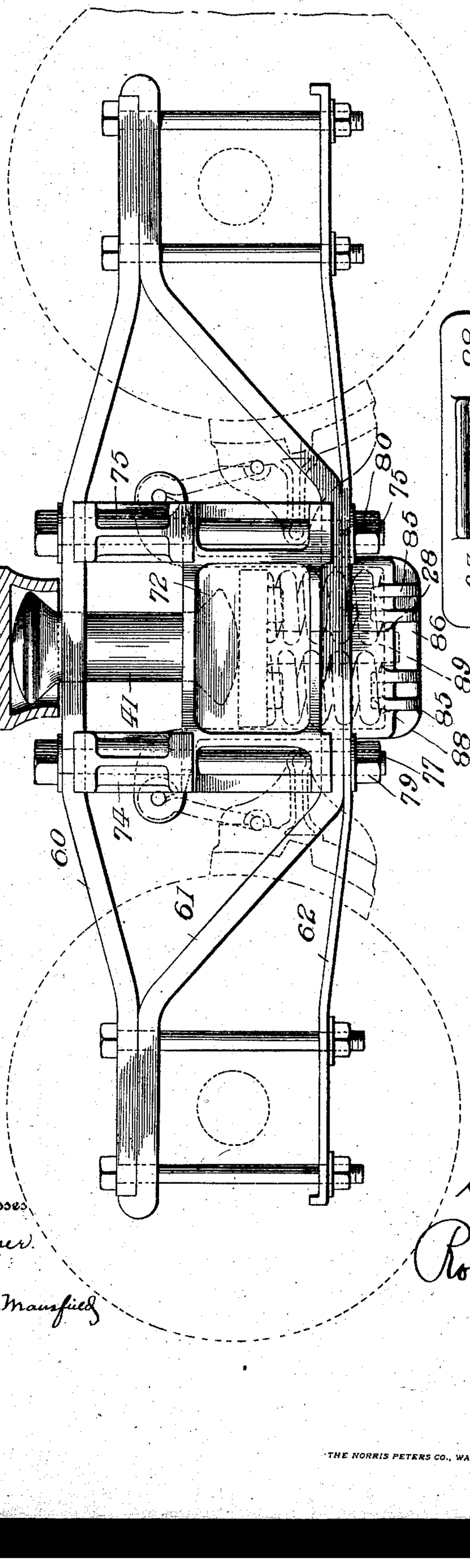

Fig. 9.

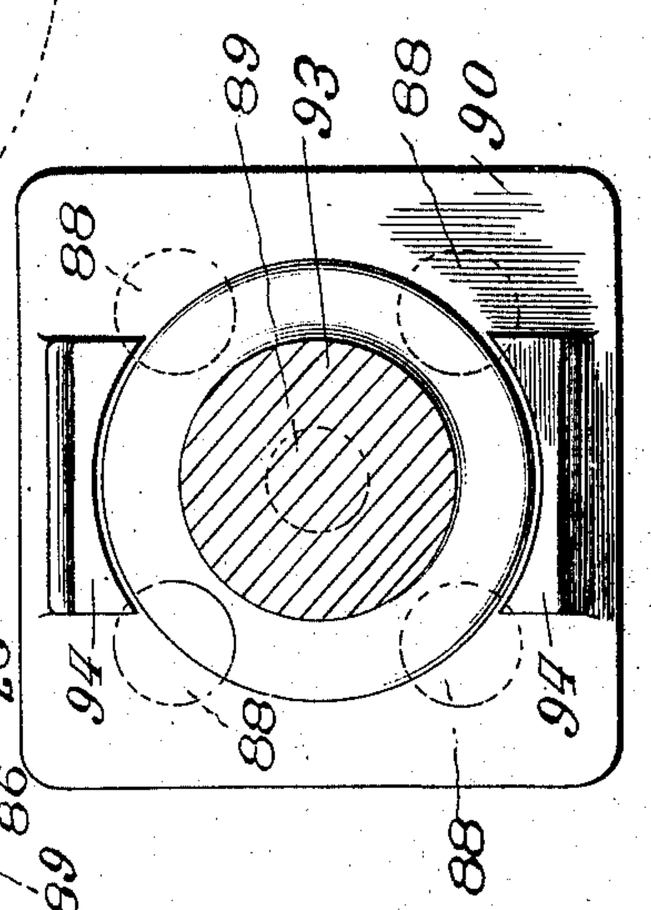

Fig. 10.

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5 SHEETS—SHEET 5.

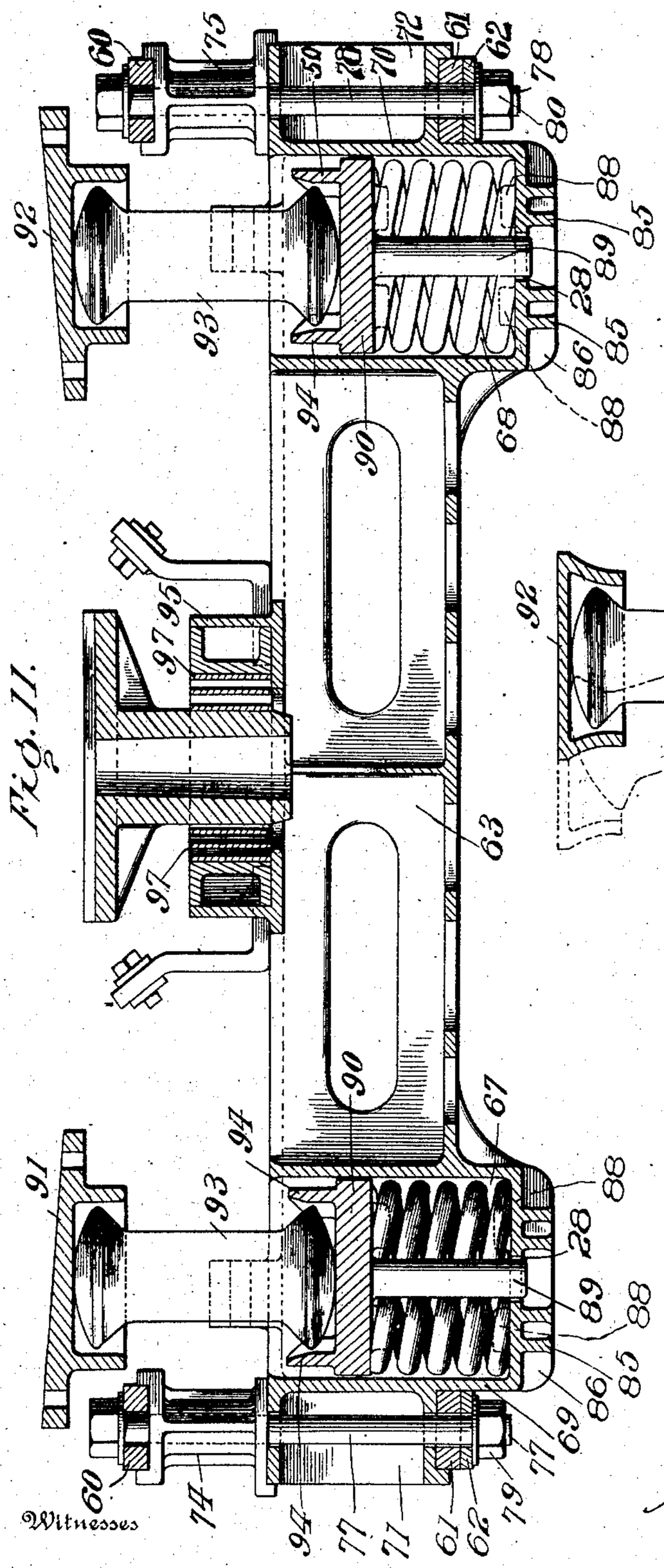

Fig. 11.

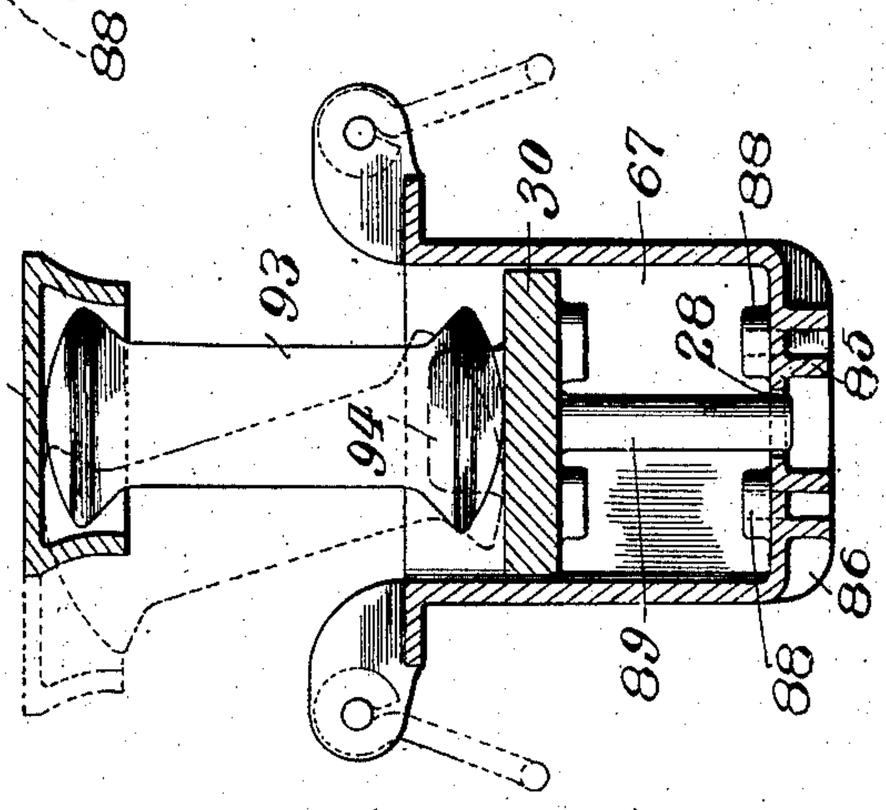

Fig. 12.

Witnesses

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UNITED STATES PATENT OFFICE.

GUSTAV LINDENTHAL, OF NEW YORK, N. Y.

CAR-TRUCK.

No. 844,150. Specification of Letters Patent. Patented Feb. 12, 1907.

Application filed April 4, 1905. Serial No. 253,784.

To all whom it may concern:

Be it known that I, GUSTAV LINDENTHAL, a citizen of the United States of America, and resident of New York, in the county of New York, State of New York, have invented certain new and useful Improvements in Car-Trucks, of which the following is a specification.

This invention relates to new and useful improvements in car-trucks, and more particularly to that class of trucks described and claimed in my United States Patent No. 799,606, granted September 12, 1905, and my application filed January 16, 1905, Serial No. 241,252. In said patent and application I have shown and broadly claimed certain novel forms of side rockers or bearing-columns which are preferably formed with spherical ends and are, in fact, nothing more than sections of a large ball or sphere with all useless parts cut away, leaving two elongated rockers with spherical ends. In my said patent these elongated rockers or side supports are shown as solid, and in connection therewith springs may be employed in the side frames, preferably over the journal-boxes. In my said application the rockers are formed both solid and sectional, the latter having springs acting between the sections. In this latter form springs may or may not be employed in the side frames.

My present invention is an improvement on these trucks, and while it includes the rockers or side bearing-columns broadly covered therein it is the object of this invention to provide a truck in which the rockers and springs coact with each other and are in juxtaposition, so that they work together. Other desirable features will also be hereinafter described.

The present invention therefore consists of a truck of the character shown, in its preferable embodiments, in the accompanying drawings and as will be definitely set forth by the claims at the end hereof.

Referring now to said drawings, Figure 1 is a side elevation of my improved truck, which is, as stated, merely the embodiment I now prefer and is to be understood as being illustrative of one of the forms my claims are intended to cover. Fig. 2 is a sectional detail of one of the dropped pockets containing a rocker-seat and one of the rockers, said pocket being formed of structural iron. Fig. 3 is a similar view of similar parts, but in which the dropped pocket is a casting. Fig. 4 is a transverse vertical section of the entire truck through the king-pin and rocker-supports. Fig. 5 is a top plan view of the bolster, its spring-socket, and the side frames. Fig. 6 is a sectional detail of the pocket for the king-pin. Fig. 7 is a top plan of the plate under the pocket for the king-pin for limiting the movement of the latter. Fig. 8 is a plan of one of the rocker-seats. Fig. 9 is a side elevation of a modified form of truck in which an integral cast bolster is employed. Fig. 10 is a plan view of one of the rocker-seats. Fig. 11 is a transverse section of the entire truck. Fig. 12 is a sectional detail showing one of the dropped pockets with a rocker and its seat thereon.

Referring now by numerals to the details of the aforesaid drawings, and particularly to Figs. 1 to 8, inclusive, 1 and 2 designate, respectively, the upper compression member and the diagonal tension member of a so-called "diamond-frame" truck, and 3 the lower member or tie-bar, and between the two upper members and the lower member 3 may be secured the journal-boxes. (Not shown.) Inasmuch as my invention has nothing to do with the special construction of these parts, it will not be necessary to further describe them unless it be to add that I may substitute for them any side frame capable of use with my invention. These side frames, one on each side of the truck, are connected together by a truck-bolster, which I prefer to make as illustrated in my drawings, one form of which may be described as follows: The truck-bolster is built up principally of structural iron and comprises two channel-irons 5 and 6, extending transversely of the car from one side frame to the other. These channel-irons 5 and 6 rest within similarly-shaped openings, facing in opposite directions, formed in transom end frames 8, one of which is illustrated in Fig. 1. (See also Fig. 4.) Bolts 9 and 10 pass through the compression member 1, the transom end frames 8, the transoms 5 and 6, the tension member 2, and tie-bar 3, nuts 12 being employed to secure these parts as one rigid structure. The transoms 5 and 6 support dropped pockets 14 and 15, which are formed of structural iron bent into substantially U shape, as illustrated in Fig. 2. These dropped pockets 14 and 15 are formed with right-angled flanges 17 and 18 at their upper ends, which are riveted to the upper flanges of the channel-iron transoms 5 and 6. The

same rivets also secure in position brackets 20, having lugs 21 for supporting the brake-gear and brake-beam, part of which are shown in dotted lines. These dropped pockets are for the purpose of containing or partially containing the means for supporting the car-body, and to this end the bottoms of said dropped pockets support cast seats 22 and 23, on which rest springs 24 and 25, a plate 27 of ordinary construction being employed to center the springs. The cast seats 22 and 23 also have flanges 28 to assist in retaining the springs in position.

The pockets may contain any desired number of springs; but I prefer to place four springs in each pocket, and on top of the springs is supported a "rocker-seat" 30, provided with a centering-plate 31, similar to plate 27, connected by the usual pin 32.

The car-bolster 35 (shown in Fig. 4) is provided with two cup-shaped bearing-plates 33 and 34, which are located immediately over the dropped pockets. Between these cup-shaped bearing-plates 33 and 34 and the seats 30 are located my spherical-ended columns or rockers 40 and 41. These columns or rockers are made on the principle disclosed in my aforesaid applications and are therefore properly designated "elongated" or "spherical ended" rockers. As a matter of fact, they are nothing more or less than large spheres or balls with the surplus parts cut away, leaving two stems of somewhat considerable length with respect to their diameters and whose ends are formed of such a curvature that they are both described by the same circle. In actual practice I prefer that all the load be carried by these columns or elongated rockers and the springs beneath them and that none of the weight shall rest on any center-bearing. The idea of these rockers is to maintain substantially the same distance between the upper bearing formed on the car-bolster and the bearing formed on the truck-bolster, so that as the truck moves with respect to the car there will be a rolling movement of the rockers 40 and 41 without any vertical movement of the car, the springs absorbing only any extraordinary shock. I therefore, preferably, provide a center socket 43 for the king-pin 44, which is formed substantially on the same lines illustrated in my aforesaid applications, and hence there is no "center-bearing," as this expression is commonly used, but merely a swivel, and the construction I now prefer to use may be described as follows: The channel-iron transoms 5 and 6 are connected together by two flanged irons 46 and 47, Figs. 4 and 5, and riveted to said transoms and to said flanged irons 46 and 47 is a top plate 49′, as clearly illustrated in Figs. 4 and 6. The socket 43 for the king-pin 44 rests upon the top plate 49′, and this socket or pocket has horizontal flanges 50′, which project out over the flanges of the transoms 5 and 6, and these horizontal flanges are preferably, but not necessarily, flanged slightly, as illustrated at 51 in Fig. 6. This makes a very rigid construction, and the socket or pocket affords room for a ribbon 53, of spring-steel with tapering ends, (see dotted lines in Fig. 5,) which rests upon the top plate 49′ and surrounds the king-pin 44, and is thus well adapted to absorb the shocks ordinarily received by the center-bearing of the car. The top plate 49′ is provided with an elongated opening 54, as illustrated in Fig. 7, and this opening runs transversely of the car to enable the spring to permit a greater yielding movement laterally or transversely when the car enters a curve on the track. It is obvious that a simple swivel may be used in lieu of the spring or yielding swivel.

Instead of making the dropped pockets of structural iron, as designated at 14 in Fig. 2, I may employ a pocket formed of a casting, as illustrated in Fig. 3, in which case the dropped pocket 56 and the seat 57 for the springs is formed integral and the brackets 58 for the brake-beams are formed integral with the top flanges 59, bolted to the channel-iron transoms 5 and 6. I of course regard this structure as equivalent to that shown in Fig. 2.

In the practical operation of my truck the truck-bolster can turn around the king-pin, this movement being afforded by the rolling of the side bearing columns or elongated rockers 40 and 41. In one of my previous applications I have shown pins to center these rockers; but I now prefer to form on top of each of the rocker-seats 30 two flanges 49 and 50, (see Fig. 8,) whose inner surfaces are concaved and are of substantially the same curvature as the bottom of the rockers 40 and 41. The flanges on these rocker-seats thus tend to prevent lateral motion of the rockers transversely of the car; but, as seen in dotted lines in Fig. 2, the rockers are permitted ample and free movement longitudinally of the car. I am thus enabled to center the rockers without using any centering-pins. These rocker-seats 30 are also provided with downwardly-projecting flanges 36, which assist in centering the springs, and with upwardly-projecting flanges 37, (see Fig. 2,) which afford wider sides for the rocker-seats 30, which coact with the sides of the dropped pockets 14, and thus tend to prevent the rocker-seat from any undue tilting.

Referring now particularly to Figs. 9 to 12, inclusive, 60, 61, and 62 represent, respectively, the upper compression member, the diagonal tension member, and the lower tie-bar, which may all be as shown in Fig. 1. Instead of connecting the side frames onto these members 60, 61, and 62 by means of a bolster formed of structural material, as illustrated in Figs. 1 to 8, inclusive, I employ a

truck-bolster which is formed of an integral casting. (Shown best in Fig. 11.) This integral casting comprises a central portion 63, running transversely of the car and having at its ends dropped pockets 67 and 68. Projecting from the outer walls 69 and 70 of these dropped pockets are integral rectangular portions 71 and 72, which project through the opening formed between the upper compression member 60 and the depressed part of the diagonal or tension member 62. In order to secure the side frames to the rectangular portions 71 and 72 of the cast transom and to make one substantially rigid structure comprising the two side frames and the bolster, I prefer to insert fillers 74 and 75 immediately over each end of each of the rectangular portions 71 and 72, as clearly seen in Figs. 9 and 11. These fillers occupy the space between the upper compression member 60 and the top of the rectangular portions 71 and 72, and bolts 77 and 78 are then passed through openings in said compression member, the fillers, the rectangular portions, and the horizontal portions of the tension member 61 and tie-bar 62, which are then securely held together by nuts 79 and 80. It will thus be seen that these parts are rigidly bolted together, and the bolster and its side frames thus practically become one rigid structure, as in Figs. 1 to 8, inclusive. The dropped pockets are intended to support springs and rocker-seats, as in the first form illustrated, and in order to make said pockets of the maximum strength they are formed with projecting ribs 85 and 86. The upper surfaces of the bottom of the dropped pockets are also provided with upwardly-projecting lugs 88, which correspond in number to the number of springs to be contained in said pockets, and the bottoms of the pockets are also provided with a central aperture 88′, formed to receive a stem 89, projecting from the rocker-seats 90, the object of this stem being to prevent any tilting of the rocker-seat in the pocket in the event of any uneven pressure on top of the rocker-seat during the rolling of the rockers. Of course the car-bolster is provided with bearing-plates 91 and 92, which are located immediately over the dropped pockets and between which and the rocker-seats 90 are located spherical-ended or elongated rockers 93, identical with those shown in the other figures. The rocker-seats 90, in addition to having the central stems 89, are also provided with flanges 94, whose inner surfaces are concaved and are somewhat like similar parts shown in Fig. 8. In the form of bolster shown in these Figs. 9 to 12 the socket 95 for the king-pin is formed integral with the bolster and contains the spring 97, (see Fig. 11,) similar to the spring shown in Fig. 4 and which is designed to permit lateral movement to absorb excessive shocks.

In view of the fact that the operation of my truck is described at some length in the description of its construction it is unnecessary to further state the operation, and as I have already shown two different ways of carrying out my invention it will be obvious that other changes and modifications may be made.

What I claim as new is—

1. In a car-truck, the combination with a truck-bolster, of elongated side bearing columns or rockers carried by said bolster and adapted to support the load, and springs exterior to said columns or rockers and coacting therewith; said columns or elongated rockers having spherical ends permitting rolling movement.

2. In a car-truck, the combination with a truck-bolster, of a center pivot or king-pin having a yielding connection, elongated side bearing columns or rockers carried by said bolster and adapted to support the entire load, and springs exterior to said columns or elongated rockers and coacting therewith.

3. In a car-truck, the combination with a truck-bolster, of elongated side bearing columns or rockers carried by said bolster and supporting the load, and springs located between said bolster and said columns or rockers; said columns or rockers having spherical ends permitting rolling movement.

4. In a car-truck, the combination with a truck-bolster, of a center pivot or king-pin having a yielding connection, elongated side bearing columns or rockers carried by said bolster and supporting the entire load, and springs located between said bolster and said columns or rockers.

5. In a car-truck, the combination with a truck-bolster, of a center pivot or king-pin, elongated side bearing columns or rockers carried by said bolster and supporting the load, and springs located between said bolster and said columns or rockers; said columns or rockers having spherical ends permitting rolling movement.

6. In a car-truck, the combination with a truck-bolster, of a center pivot or king-pin having a yielding connection, elongated side bearing columns or rockers carried by said bolster and supporting the entire load, and springs located between said bolster and said columns or rockers; said columns or rockers having spherical ends permitting rolling movement.

7. In a car-truck, the combination with truck and car bolsters, of elongated side bearing columns or rockers carried by said truck-bolster and supporting said car-bolster, and springs located between said columns or elongated rockers and one of said bolsters; said columns or elongated rockers having spherical ends permitting rolling movement.

8. In a car-truck, the combination of

truck and car bolsters, elongated side bearing columns or rockers carried by said truck-bolster and entirely supporting said car-bolster, springs located between said columns or elongated rockers and one of said bolsters; and a center pivot or king-pin supporting no part of the load; said columns or elongated rockers having spherical ends permitting rolling movement.

9. In a car-truck, the combination with truck and car bolsters, of a center pivot or king-pin having a yielding connection, elongated side bearing columns or rockers carried by said truck-bolster and entirely supporting said car-bolster, and springs located between said columns or elongated rockers and one of said bolsters.

10. In a car-truck, the combination with truck and car bolsters, of a center pivot or king-pin having a yielding connection, elongated side bearing columns or rockers carried by said truck-bolster and entirely supporting said car-bolster, and springs located between said columns or elongated rockers and one of said bolsters; said columns or elongated rockers having spherical ends permitting rolling movement.

11. In a car-truck, the combination of a car-bolster and a truck-bolster having dropped or depending pockets, elongated side bearing columns or rockers carried by said pockets and supporting said car-bolster; and springs between said columns or elongated rockers and one of said bolsters; the said rockers having spherical ends permitting rolling movement.

12. In a car-truck, the combination of a car-bolster, a truck-bolster and a center pivot or king-pin carrying none of the load, dropped pockets depending from said truck-bolster, elongated side bearing columns or rockers carried by said dropped pockets and entirely supporting said car-bolster; and springs located between said columns or elongated rockers and one of the bolsters; said columns or elongated rockers having spherical ends permitting rolling movement.

13. In a car-truck, the combination with a truck-bolster having dropped pockets, of springs carried by said dropped pockets, rocker-seats resting upon said springs, and elongated side bearing columns or rockers resting upon said seats and supporting the load; said columns or rockers having spherical ends permitting rolling movement.

14. In a car-truck, the combination of a bolster, springs supported near the opposite ends thereof, rocker-seats resting upon said springs; and elongated side bearing columns or rockers resting upon said rocker-seats and supporting the load, said columns or rockers having spherical ends permitting rolling movement.

15. The combination of a bolster, springs supported near the opposite ends thereof, a center pivot or king-pin carrying none of the load, rocker-seats resting upon said springs; and elongated side bearing columns or rockers resting upon said rocker-seats and carrying all of the load; said columns or rockers having spherical ends permitting rolling movement as the truck turns on the center pivot or king-pin.

16. In a car-truck, the combination of a bolster having rocker-seats, elongated side bearing columns or rockers resting on said seats and supporting the load; said seats having flanges coacting with said columns or rockers, and said columns or rockers having spherical ends permitting rolling movement.

17. In a car-truck, the combination of a bolster having seats for rockers, and elongated side bearing columns or rockers resting upon said seats and supporting the load; said columns or rockers having spherical ends permitting rolling movement, and said seats having flanges coacting with said columns or rockers.

18. In a car-truck, the combination of elongated side bearing columns or rockers, seats under and bearing plates over said rockers having flanges; said columns or rockers having spherical ends permitting rolling movement; and said flanges limiting this rolling movement in one direction.

19. In a car-truck, the combination of a truck-bolster having dropped pockets, springs within said pockets, seats supported in said pockets by said springs; and side bearing-rockers resting on said seats and having spherical ends permitting rolling movement; said seats having means for preventing tilting movement.

20. In a car-truck, the combination of a truck-bolster having dropped pockets, springs within said pockets, seats supported in said pockets by said springs; and side bearing-rockers resting on said seats and having spherical ends permitting rolling movement; said seats having flanges coacting with said rockers.

21. In a car-truck, the combination of a truck-bolster having dropped pockets, springs within said pockets, seats supported in said pockets by said springs, and side bearing-rockers resting on said seats and having spherical ends permitting rolling movement; said seats having means preventing tilting movement in the pockets and flanges coacting with the rockers.

22. In a car-truck, the combination with centering means and a truck-bolster having dropped pockets, of spring-supported elongated side bearing columns or rockers supported in said dropped pockets and supporting the car-body, said rockers or columns having spherical ends designed to rock as the bolster turns on the centering means.

23. In a car-truck, the combination of a center pivot or king-pin, a truck-bolster hav-

ing a yielding connection with said pin and having dropped pockets, spring-supported columns or elongated rockers supported in said pockets and carrying the load and rocking upon their ends as the bolster turns on said king-pin.

24. In a car-truck, the combination of a truck-bolster formed of channel-iron and having dropped pockets secured near the ends thereof, spring-supported spherical-ended rockers seated in said pockets, a top plate secured to said channel-irons and bracing the same, and a socket for the king-pin secured to said top plate and the flanges of said channel-irons.

25. In a car-truck, the combination of a truck-bolster formed of structural iron, dropped pockets formed of substantially U shape fitting between the members of said bolster, and spherical-ended rockers resting in said U-shaped pockets.

26. In a car-truck, the combination of a truck-bolster formed of structural iron and having dropped pockets formed of substantially U shape secured near the ends thereof, said pockets having flanges at the upper extremities of the U secured to said bolster, and spherical-ended rockers resting in said pockets.

27. In a car-truck, the combination with a car-bolster and a truck-bolster, a center or king-pin, one of said bolsters having a center or king-pin and the other bolster a pivot-opening for said pin, and spring-supported side bearing spherical-ended columns or rockers resting on said truck-bolster and designed to rock upon their spherical ends as the bolsters turn with respect to the axis of said king-pin.

Signed by me at New York city this 1st day of April, 1905.

GUSTAV LINDENTHAL.

Witnesses:

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M. B. SANFORD.