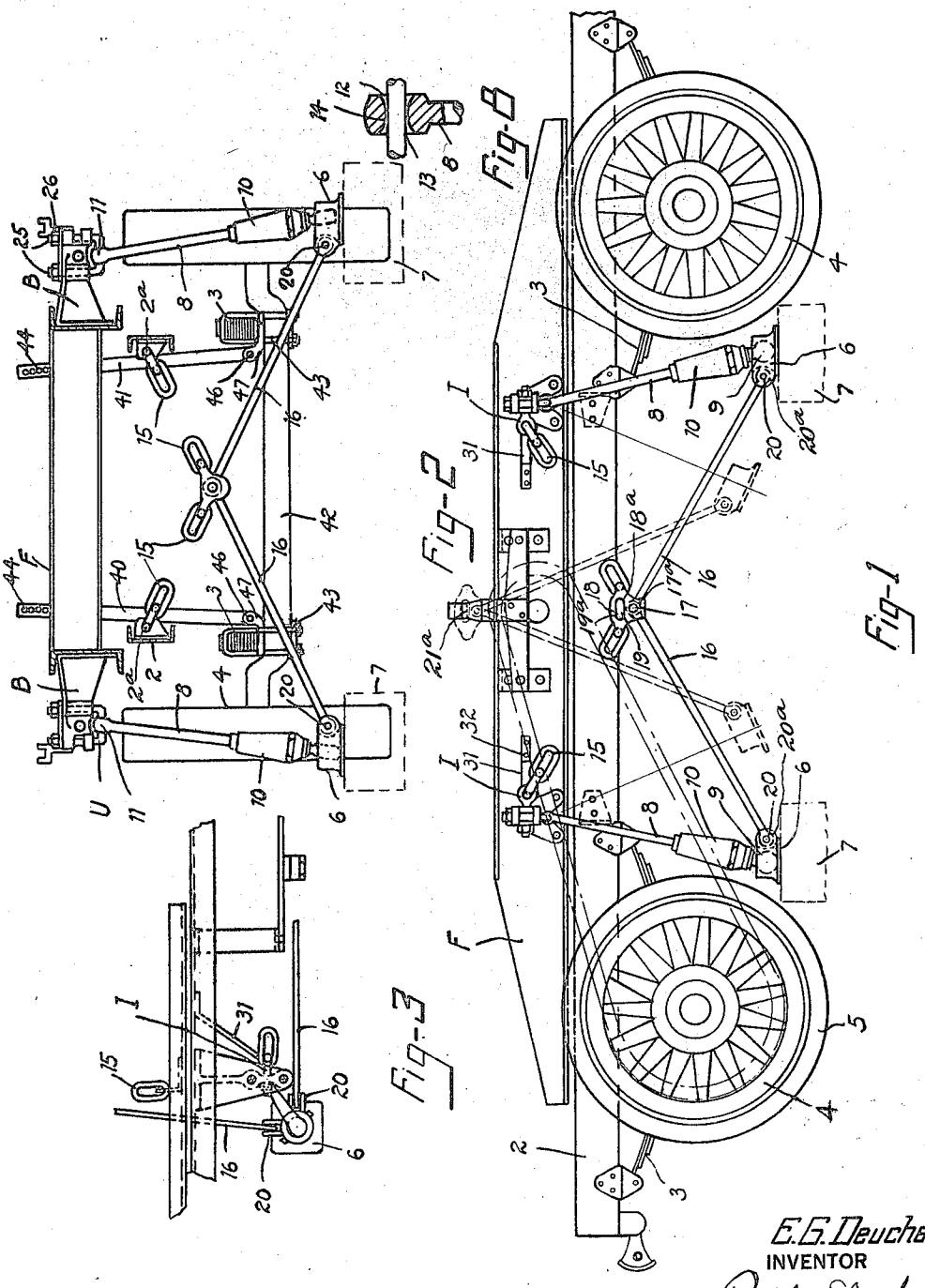
June 5, 1923. 1,457,897

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VEHICLE OUTRIGGER

Filed March 11, 1921 2 Sheets-Sheet 1



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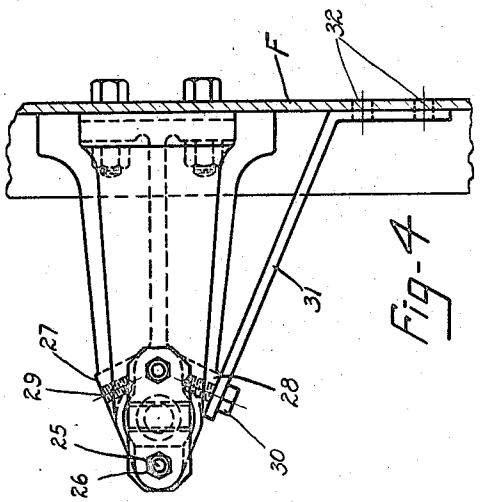


Fig-4

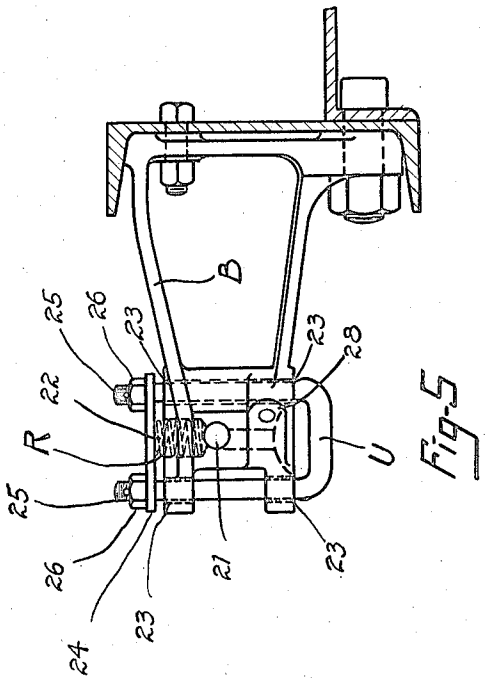


Fig-5

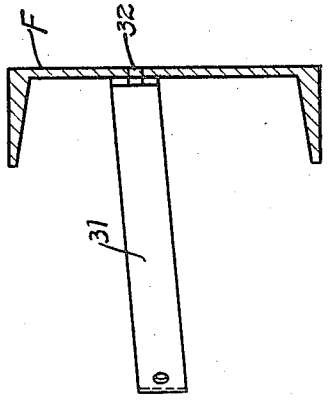


Fig-7

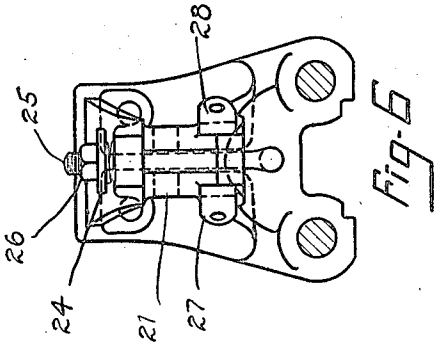


Fig-6

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Patented June 5, 1923. 1,457,897

UNITED STATES PATENT OFFICE.

EUGENE G. DEUCHER, OF CLEVELAND, OHIO, ASSIGNOR TO THE UNIVERSAL CRANE COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

VEHICLE OUTRIGGER.

Application filed March 11, 1921. Serial No. 451,599.

To all whom it may concern:

Be it known that I, EUGENE G. DEUCHER, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented certain new and useful Improvements in Vehicle Outriggers; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it appertains to make and use the same.

My invention relates to vehicle outriggers, and more particularly to outrigger mechanisms wherein the load of a springed vehicle supported crane mechanism, or the like, may be carried on adjustable pier legs independently of the springs and wheels of the vehicle when desired, as, for example, when the crane mechanism is in operation.

It is an object of my invention to provide an outrigger mechanism normally carried by the crane bed of a crane mechanism, and which when the vehicle supporting the crane bed is adapted to move may be adjusted to such a position that the pier legs may be withdrawn from the level which they would occupy when the crane is in operation and when the pier legs would support the load of the crane. When so adjusted for traveling, it is an object of my invention to provide a system of struts and ties which will, with the use of a minimum of weight, comprise a structure which will support the maximum of supported crane weight most efficiently for the purpose specified, and like purposes.

It is a further object of my invention to provide such pier legs whereby they may be supported by the bed of the crane mechanism, or the like, in line with the line of travel of the vehicle wheels adjacent to which they will depend, although lifted until points about the level of the ground upon which the wheels rest is of a solid enough character, whereby said pier legs may be adjusted so as to rest upon said ground.

Further objects of my invention and the invention itself will become apparent during the description thereof which follows, and in which description references will be had to the drawings forming part of this specification.

Referring now to the drawings:

Fig. 1 shows a side elevation of a spring vehicle employing an embodiment of my invention, illustrated as attached to the bed frame of a crane or like mechanism, and which mechanism is not shown, as it may be of any desired type.

Fig. 2 shows an end view of portions of the outrigger mechanism illustrated in Fig. 1, other portions being omitted for the sake of clearness, and the vehicle frame and crane bed embodiment being shown partly in section.

Fig. 3 shows a top view of a pier leg bracket mechanism, which supports one of the four pier legs of my improved outrigger mechanism, as applied to the frame of a crane bed.

Fig. 4 shows a top view of the pier leg bracket, and in this view the method of attaching a reinforcing bar to the bracket is illustrated.

Fig. 5 shows a side view of the bracket illustrated in Fig. 4.

Fig. 6 shows an end view of the bracket of Figs. 3, 4 and 5.

Fig. 7 shows a view of the reinforcing bar in position to connect with a channel beam of the crane bed frame, which latter is shown in section.

Fig. 8 shows a section of a portion of the pier leg.

Referring now to the drawings, in all of which like parts are denoted by like reference characters, at 2 is shown the frame of a vehicle, such as an automobile truck trailer, which is supported by springs 3 upon the front and rear axles (not shown) of the vehicle, which in turn, are carried by the wheels 4. The springs 3 and the tires 5 for the wheels are quite resilient, so as to enable the vehicle to travel over ordinary roads at a relatively high rate of speed, and which is an advantage, in that the idle time of the vehicle may be minimized. Whereas it is quite possible to make the tires and springs of such a vehicle of considerable resiliency and still enable the vehicle to transport a crane mechanism of considerable weight, still if the crane were put in operation and the same were only supported by these springs and the wheels, whenever the boom of the crane was called upon to support loads at any distance from the space enclosed by the wheels, the property of resiliency as possessed by the said tires and springs would cause the frame of the vehicle to be deflected, inclining toward the

load, with consequent apparent disadvantages.

By the use of the outrigger mechanism of my invention I am enabled, when the vehicle has been moved to the desirable position, wherein it is proposed to operate the crane mechanism, to adjust the pier legs to their crane supporting position, wherein the shoes 6 are brought into a position approaching the ground or resting upon the ground when the ground is of a solid enough character, and the load is then carried by the pier legs, reinforced by a system of ties, as will be later more specifically described.

When the ground is soft, the pier leg shoes 6 will not rest directly upon the ground, but blocks, as indicated at 7, will be placed under the shoes, so as to increase the area of contact over the ground. In the embodiment illustrated, the pier legs 8 are united with the shoes 6 by a ball and socket swivel joint 9 and the pier legs are capable of being elongated by means of a jack-screw connection 10, which is capable of being adjusted so as to alter the length of the legs. The other end of the pier legs is jointed to U-bolts U at 11. The U-bolts U are carried in bracket B, the connection between the pier leg end and the U-bolt being so made as to provide for swinging motion by the pier leg in any desired direction. This is secured by providing an opening 12 through the pier leg 8, the said opening being widest at the outside at 13, and being narrowest at the center 14.

The frame F of the crane structure carries four brackets B, two on either side of the vehicle, and these brackets, besides carrying the pier legs which form the struts of a truss structure, also are adapted to connect with the other ends of the pier legs at the shoes 6 through tie rods 16, said tie rods being connected together with chains 15 at an intermediate point 17 to a junction member 18 containing an opening 19.

When the vehicle is arranged to travel, the pier legs are withdrawn from their operative to their traveling position by raising the junction member 18 up to a higher level, where it may have its opening 19 hooked over a supporting hook 20^a. The ties comprising the chains and tie rods are subject only to forces placing them in tension, whereas the pier legs 8 form struts of a truss structure, which are subject to stress in the direction of their length,—that is to a tensile or compressive stress.

The tie rods 16 are connected at their lower ends by swivel joints 17^a, 18^a, 19^a, and 20^a to the pier leg shoes 6, there being a pair of tie rods 16 connected to each shoe, the tie rods connected to a given shoe extending at right angles one to the other. This is shown in Fig. 3, where the two tie rods 16 are shown as connecting at points 20, which are points of swivel joint connection, to a shoe 6. The chains 15, Fig. 2, are secured to the frame 2, by means of bolts 2^a. The chains 15, Fig. 1, located at the sides of the vehicle, connect with the pier leg brackets B by means of I-bolts I, which pass through an opening 21 in the pier leg bracket B.

The pier leg bracket is recessed at R, and a heavy coil spring 22 is placed in the recess, the pier leg opening 12 being then threaded by the U-bolt U, and the U-bolt then is inserted through openings 23 in the pier leg bracket B. The plate 24 is then placed over the ends of the U-bolt and which ends have a threaded portion 25. The plate 24 then rests upon the top of the coil spring 22 and the plate 24 is clamped tightly in position against the said spring by turning the nuts 26 down on the threaded portions 25 of the U-bolt ends.

The spring 22 in the embodiment illustrated rests partly upon the I-bolt I, which extends through the opening 21 in the bracket. Bosses 27 and 28 are provided on the bracket B, whereby by means of an internal thread 29 a bolt, such as 30, may secure a reinforcing bar 31 to the bracket, and which reinforcing bar may be bolted at points 32 to the frame F of the crane mechanism.

Relative movement of the frame F and the axle of the vehicle in an upward direction on either side of the said vehicle is limited by means of the bars 40 and 41, which are secured to the axle 42 near either end thereof and adjacent the wheels 4 by the U-bolts 43, which also secure the springs 3 to the said axle. These bars 40 and 41 have an upwardly extending portion having perforations 44 at their ends for the purpose of clamping these ends to the frame F by means of a pin which may pass through a desired one of the said perforations and extend over the frame F, so as to prevent upward movement of the said frame F relative to the axle 42. These upwardly extending portions are pivoted at 46 to base members 47 secured under the springs 3 and held by the bolts 43.

It will be seen that the operator can, by selecting a given perforation 44 and inserting a pin therein, which passes over the frame F, limit to a predetermined amount any motion of the frame F relative to the axle 42, which would tend to separate the frame and axle. This provision is of distinct value. When heavy loads are supported from the end of a boom carried on the frame F, the end of the boom as occurs in practice, extending at quite a distance from the vehicle, is sometimes subjected to considerable loads, and loads suddenly applied. If the restraining members 40 and 41 were absent, the tendency to tilt or tip the

frame would be increased, since the springs 3, are not well adapted to restrain the movement of the frame in an upward direction, such as would be caused by such heavy loads applied, as above described. The members 40 and 41 form, in effect, a relatively rigid connection between the end of the axle opposite the applied load and the adjacent portion of the frame, whereby the weight of the adjacent wheel is added to the counter-active force tending to prevent tilting or tipping by the applied load and tends to keep the center of mass of the vehicle and load within the prescribed area, bounded by the wheels or the outrigger pier leg shoes.

When the outrigger mechanism of my invention is applied to a vehicle carrying a crane mechanism, or the like, I am enabled to use a vehicle of the ordinary truck or truck trailer type, which is highly springed, and which may have rubber tires, and which is, therefore, capable of traveling over ordinary roads at a considerable rate of speed, even when the crane mechanism is very heavy, since when the vehicle reaches the end of its journey and the crane mechanism is to be worked, the weight of the crane mechanism will not be carried by the vehicle springs and tires, but by the outrigger mechanism provided, as illustrated and described, and which is adapted to carry weights far in excess of the weights which might be carried by the springs and tires.

Having thus described my invention in a specific embodiment, I am aware that numerous and extensive departures may be made from the embodiment of my invention herein illustrated and described, without departing from the spirit of the invention.

What I claim as my invention is defined in the following claims:

1. In an outrigger mechanism for springed vehicles, the combination with a hoisting mechanism bed, a vehicle frame, said bed being normally carried on the said frame, wheels for the said vehicle, resilient spring means connecting the said frame and the said wheels, a plurality of brackets on the bed, a plurality of pier legs adapted to be secured each at one end to one of the said brackets, shoes for the lower ends of the pier legs, and tie means connecting each bracket to shoes of next adjacent pier legs.

2. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, and eight tie members, each tie member uniting opposite ends of adjacent legs, said truss structure being adjustable to lift the legs from a lower operating position to a higher vehicle traveling position.

3. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, eight tie members, each tie member uniting opposite ends of adjacent legs, said truss structure being adjustable to lift the legs from a lower operating position to a higher vehicle traveling position, and shoes for the lower ends of the said legs, said shoes making a universal joint connection with the said tie members.

4. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, and eight tie members, each tie member uniting opposite ends of adjacent legs, a hoisting mechanism bed frame, and means to secure the said pier legs to the said bed frame, said truss structure being adapted to usurp the weight supporting function of the said springs.

5. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, and eight tie members, each tie member uniting opposite ends of adjacent legs, said truss structure being adjustable to lift the legs from a lower operating position to a higher vehicle traveling position, a hoisting mechanism bed frame, and means to secure the said pier legs to the said bed frame, said truss structure being adapted to usurp the weight supporting function of the said springs.

6. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, and eight tie members, each tie member uniting opposite ends of adjacent legs, a hoisting mechanism bed frame, means to secure the said pier legs to the said bed frame, said truss structure being adapted to usurp the weight supporting function of the said springs and said pier legs being adapted to position to depend from the said bed frame in the line of travel of the wheels.

7. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, and eight tie members, each tie member uniting opposite ends of adjacent

legs, and a universal joint mechanism to attach said pier legs, being attached at their upper ends to the said bed frame, said truss structure being adapted to usurp the weight suporting function of the said springs.

8. In an outrigger mechanism for spring vehicles, the combination with a hoisting mechanism bed, a vehicle frame, said bed being normally carried on the said frame, wheels for the said vehicle, resilient spring means connecting the said frame and the said wheels, a plurality of brackets on the bed, a plurality of pier legs adapted to be secured each at one end to one of the said brackets, shoes for the lower ends of the pier legs, and tie means connecting each bracket to shoes of next adjacent pier legs, and restraining means adjacent each spring means for preventing expansion of the said spring means beyond a predetermined maximum.

9. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, and eight tie members, each tie member uniting opposite ends of adjacent legs, said truss structure being adjustable to lift the legs from a lower operating position to a higher vehicle traveling position, and means adjacent each wheel for preventing expansion of said springs beyond a predetermined maximum.

10. In a supporting mechanism for mobile hoisting mechanisms, the combination with a highly springed vehicle comprising a frame, wheels, and springs interconnecting said wheels and frame, of a truss structure comprising four pier legs having the properties of struts, and eight tie members, each tie member uniting opposite ends of adjacent legs, said truss structure being adjustable to lift the legs from a lower operating position to a higher vehicle traveling position, a hoisting mechanism bed frame, and means to secure the said pier legs to the said bed frame, said truss structure being adapted to usurp the weight supporting function of the said springs, and a hook member adjacent each wheel adapted to prevent expansive action of said springs beyond a predetermined maximum.

In witness whereof, I have hereunto signed my name this 7th day of March, 1921.

EUGENE G. DEUCHER