

April 27, 1965

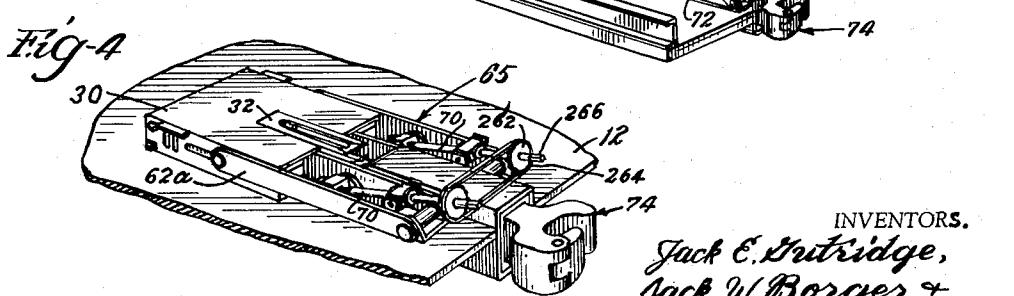
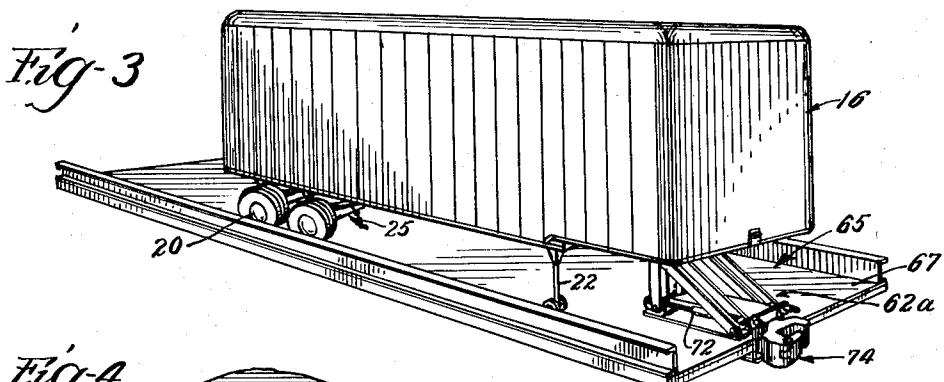
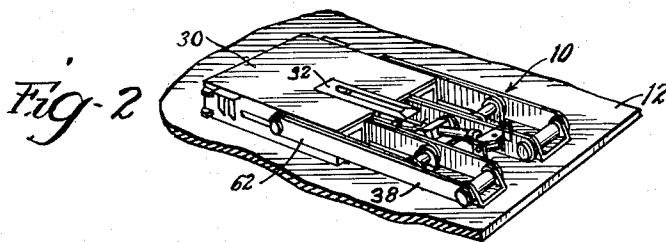
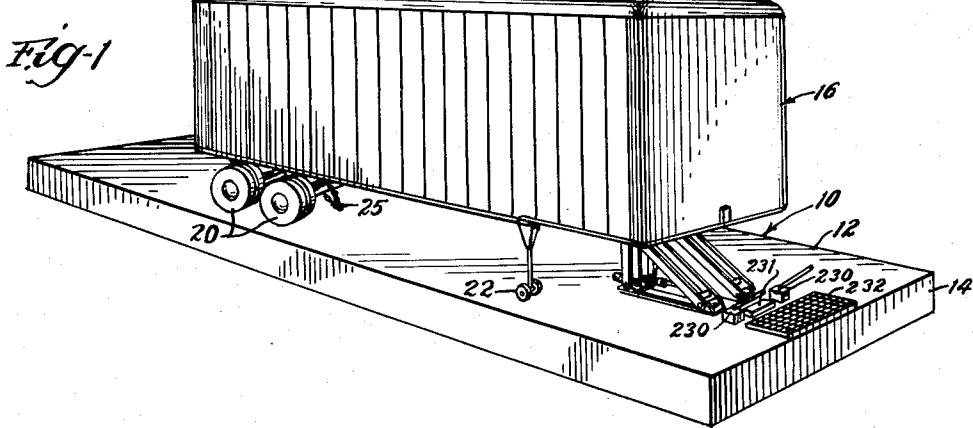
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3,180,282

FIFTH WHEEL STAND

Filed Jan. 23, 1958

10 Sheets-Sheet 1



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10 Sheets-Sheet 2

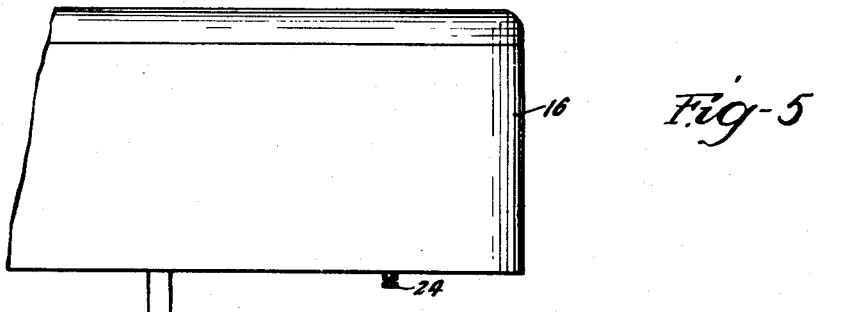


Fig. 5

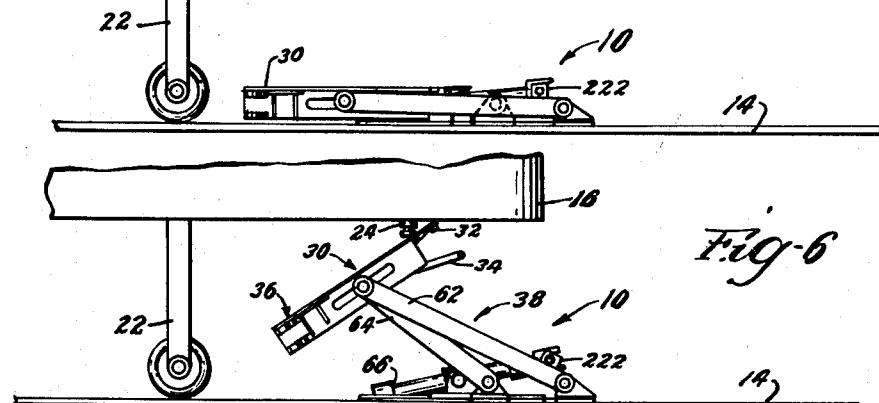


Fig. 6

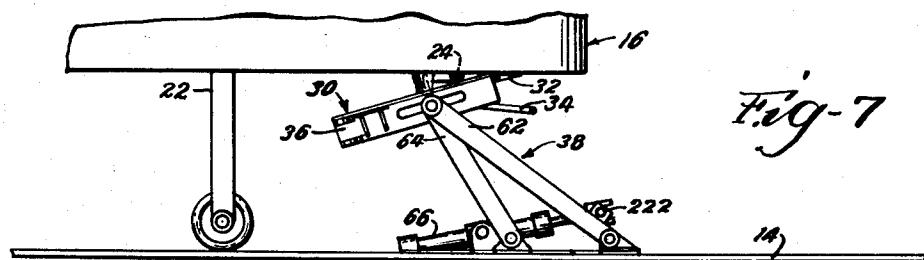


Fig. 7

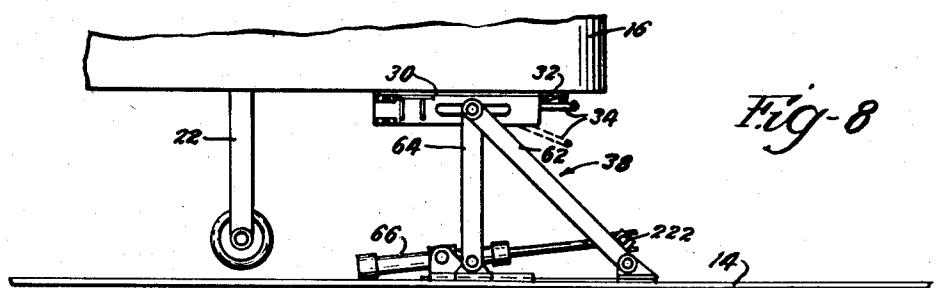


Fig. 8

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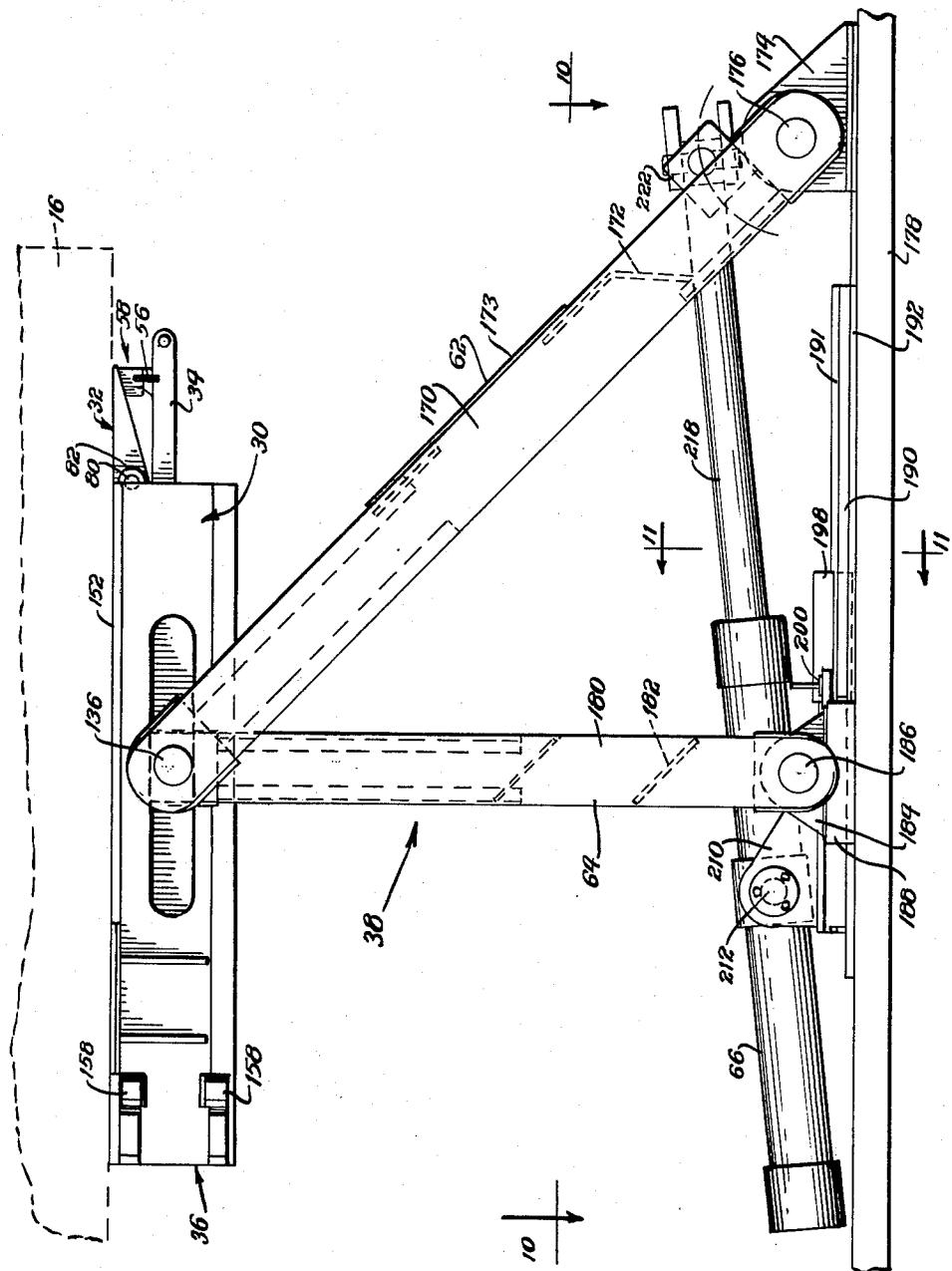


Fig. 9

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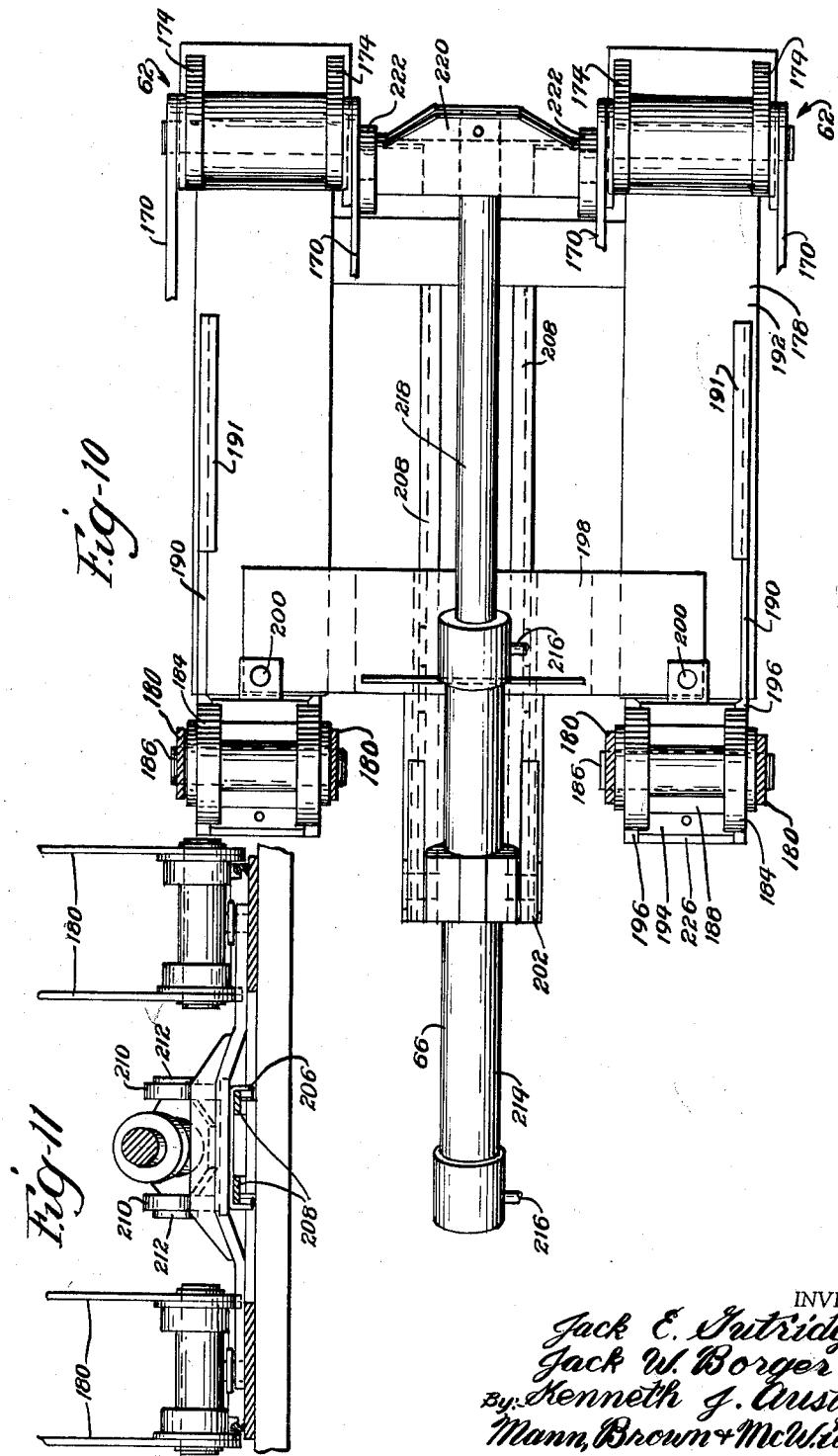
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FIFTH WHEEL STAND

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10 Sheets-Sheet 4



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FIFTH WHEEL STAND

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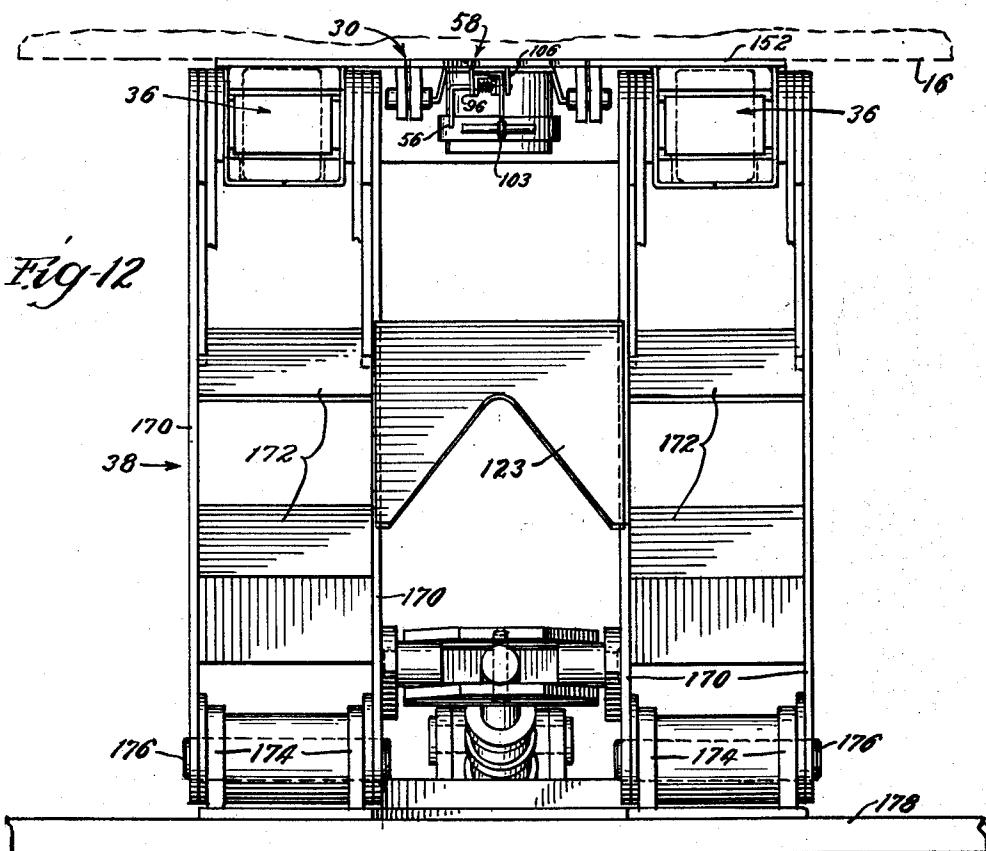
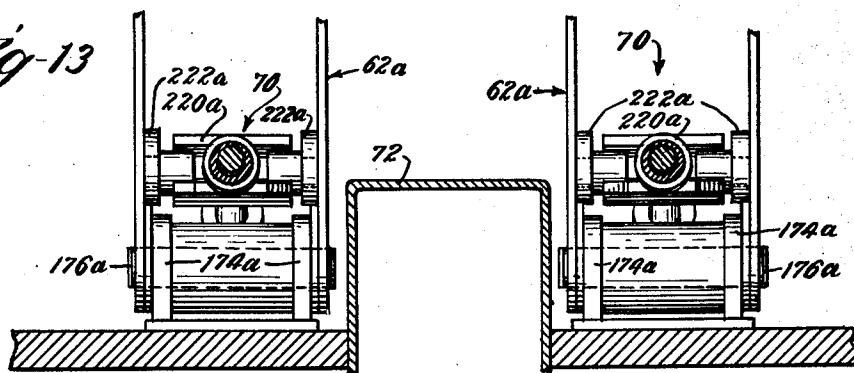


Fig-13



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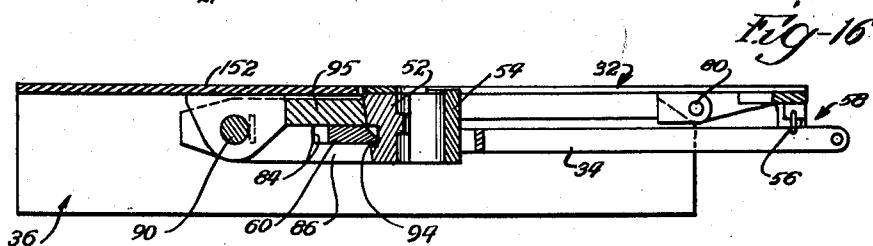
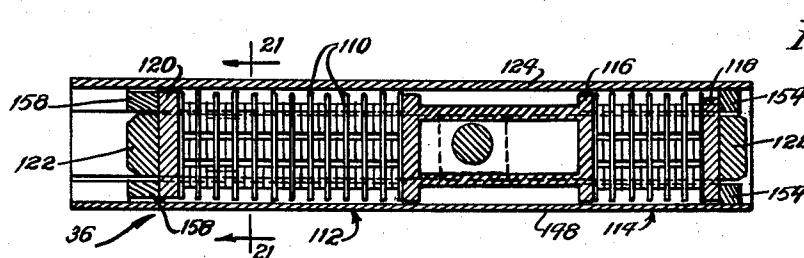
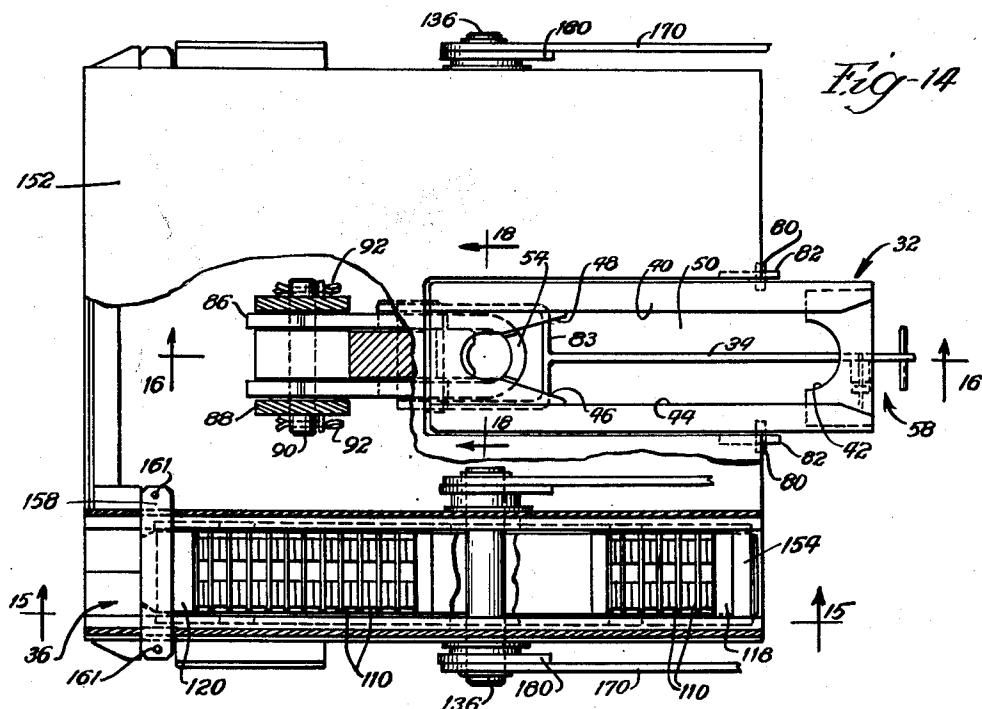
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FIFTH WHEEL STAND

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10-Sheets-Sheet 6



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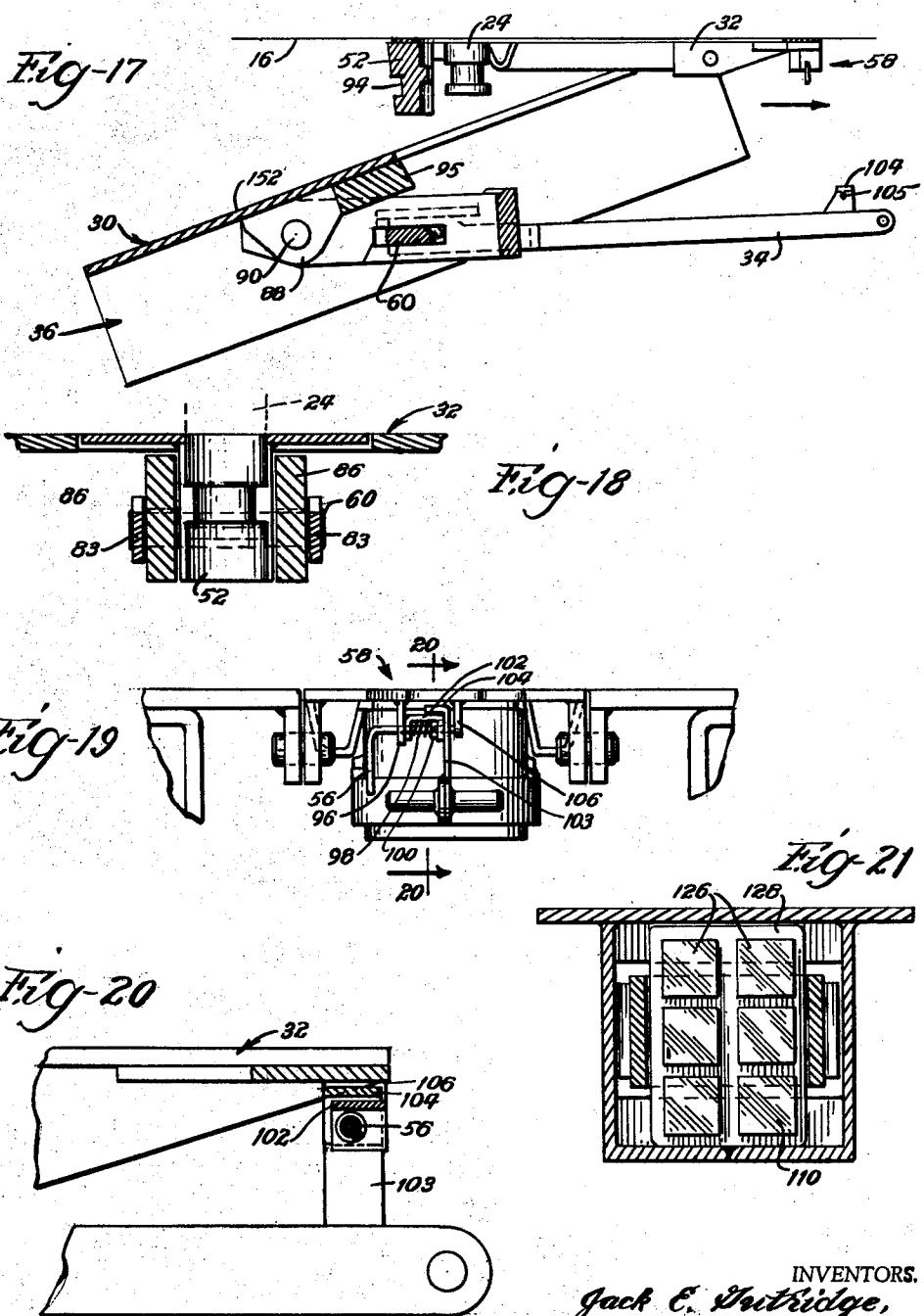
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FIFTH WHEEL STAND

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10 Sheets-Sheet 7



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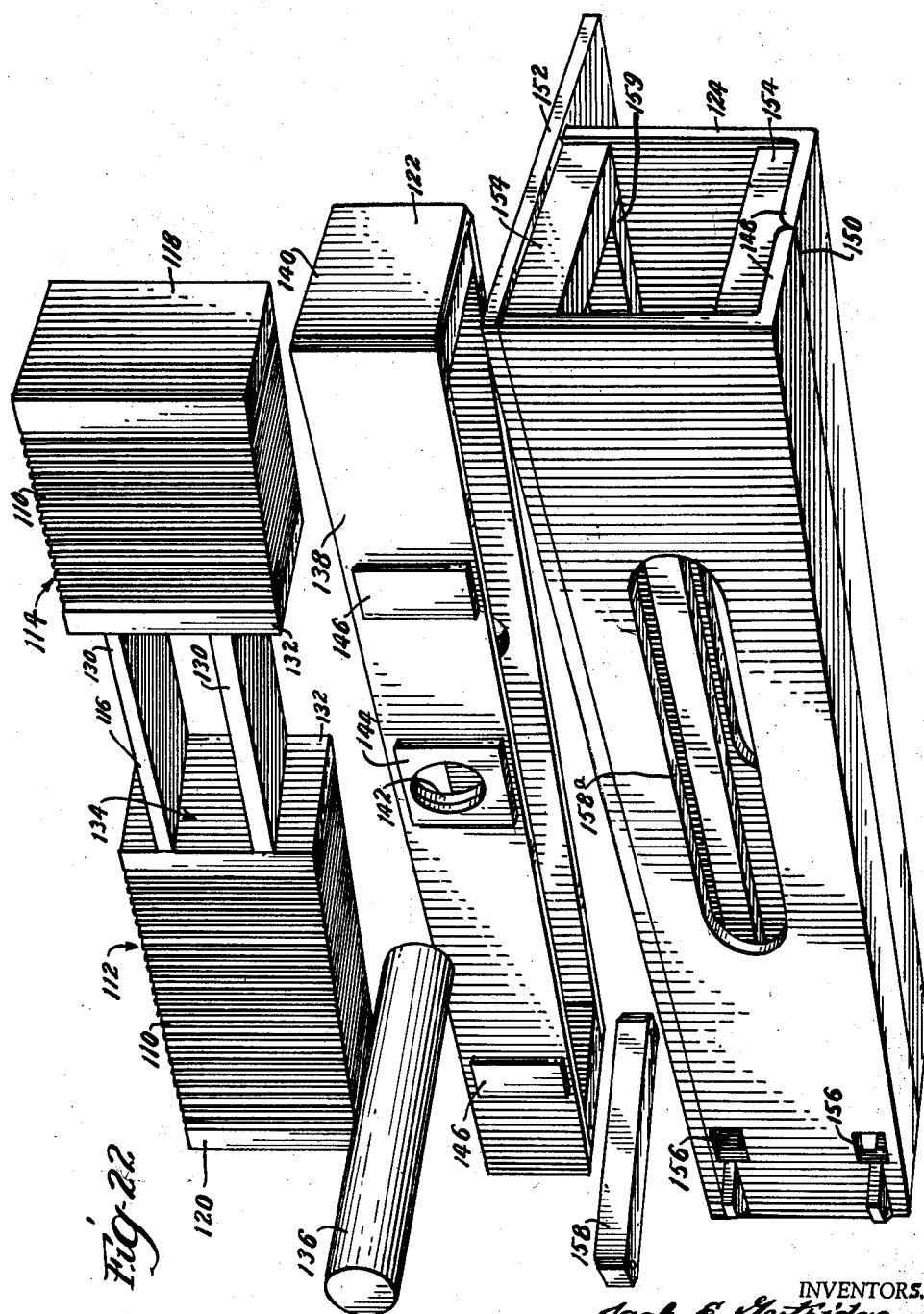
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10 Sheets-Sheet 8



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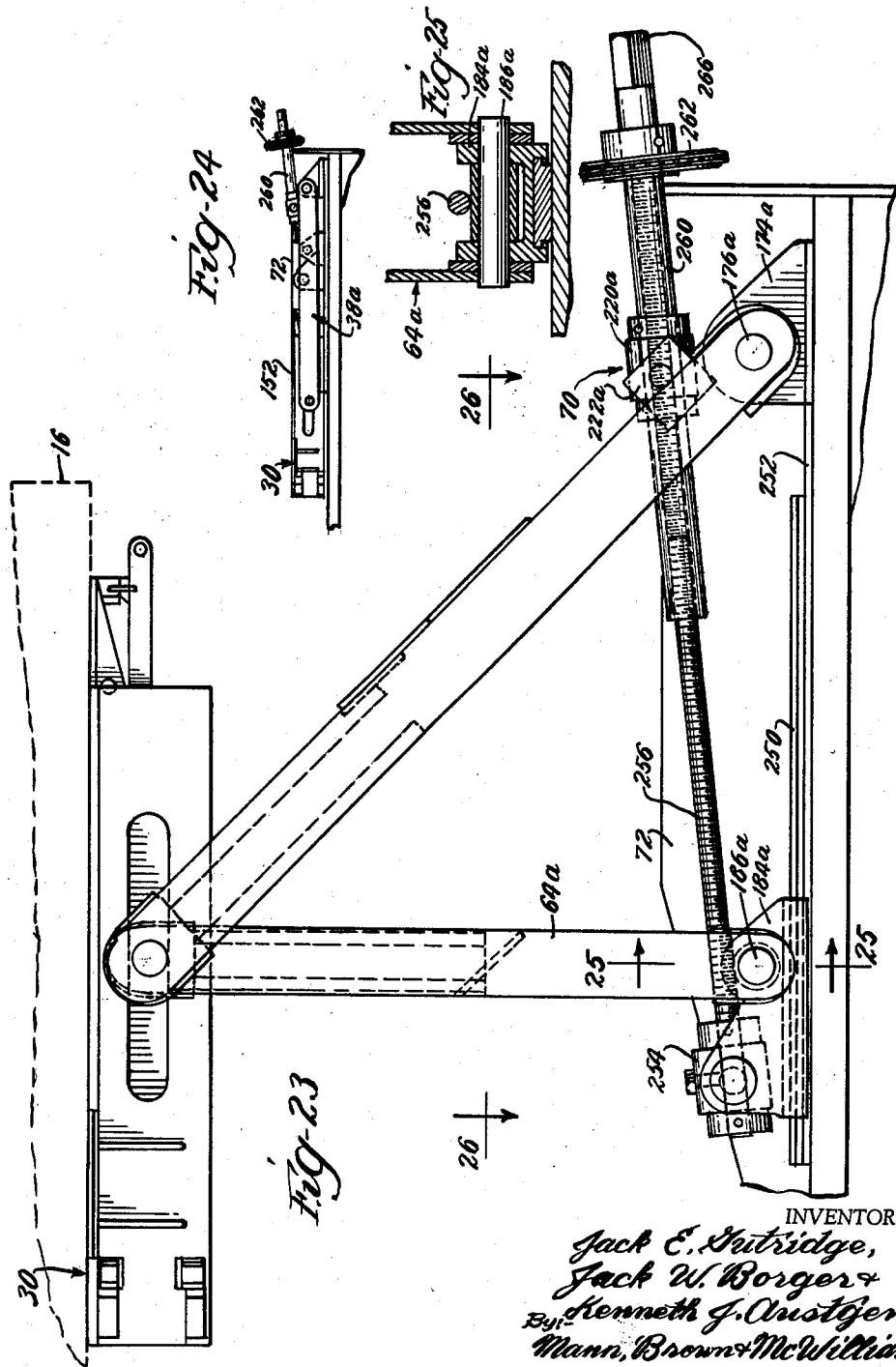
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10 Sheets-Sheet 9



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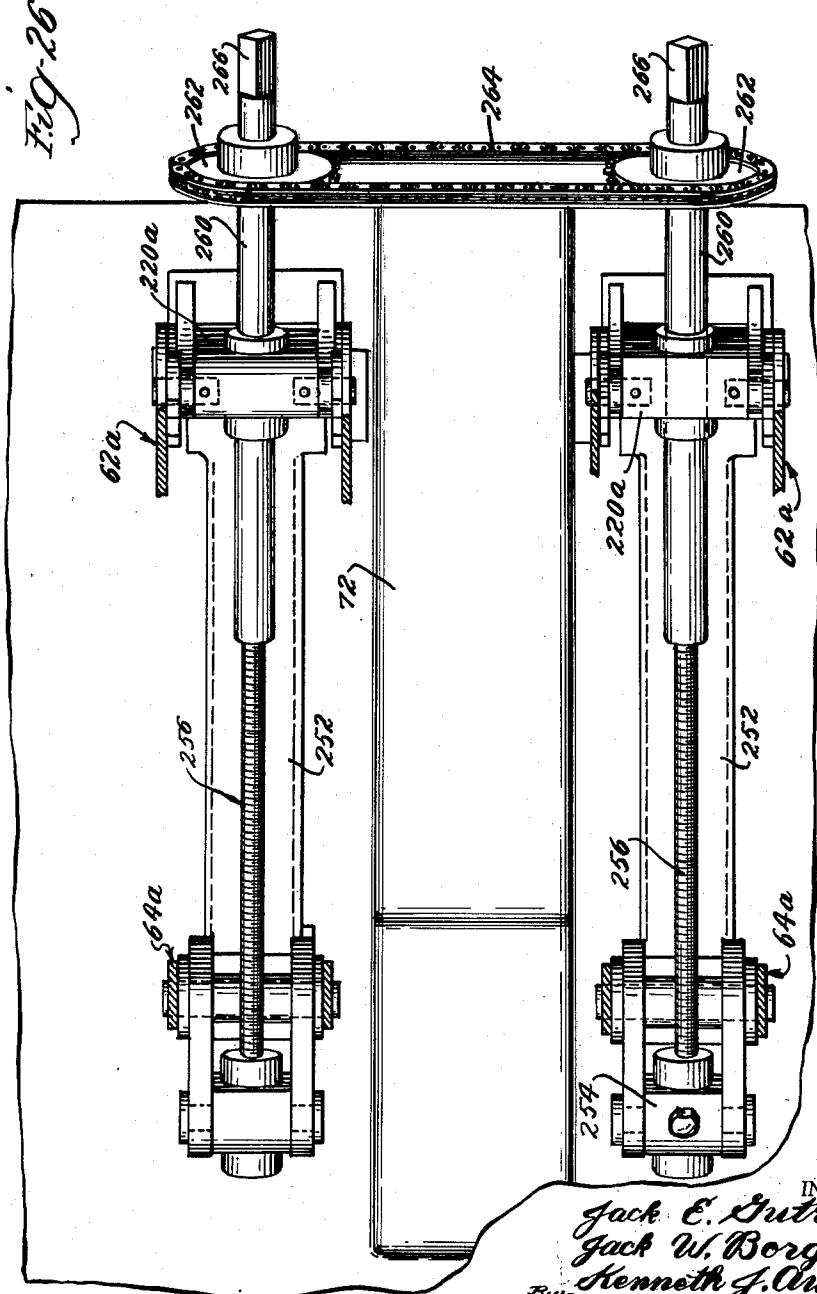
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10 Sheets-Sheet 10



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FIFTH WHEEL STAND

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9 Claims. (Cl. 105—368)

This invention relates to a fifth wheel stand for use in supporting the front end of a semi-trailer when the latter is being carried in railroad transit on a flatcar or car of similar design.

There is a growing practice in railway freight shipment to back semi-trailers onto flatcars, remove the tractor, and support the front end of the semi-trailer on some type of a stand for the so-called piggyback transit of the semi-trailer to a given destination, at which point the front end of the semi-trailer is temporarily supported on its landing gear, and the transit stand lowered or removed, whereupon another truck tractor picks up the semi-trailer for delivery to an ultimate destination. This piggyback operation is sometimes called TOFC (trailer on flatcar).

In current practice, the fifth wheel stand used on the railway car requires very accurate positioning of the semi-trailer on the flatcar by the truck driver in order that it will register with the kingpin on the semi-trailer after the truck tractor has been removed. One of the important objects of this invention is to provide a fifth wheel stand that allows greater latitude in the placement of the semi-trailer on the flatcar, so that less time is required to spot the semi-trailer in its proper position on the car.

Since all railway cars are subject to buff and draft forces while in transit and on occasions to severe buff forces when the cars are humped in classification yards, it is necessary to provide suitable cushioning means in the fifth wheel stand on the flatcar in order to protect the semi-trailer and its lading. In some prior art devices, the cushioning has been provided in diagonal struts, but this has the objection that longitudinal buff forces are translated into components of vertical force which still can cause lading damage.

Another important object of this invention is to provide a cushioning means in combination with a fifth wheel stand for railway cars which enables all buff and draft forces to be absorbed in horizontal planes, so that the front end of the semi-trailer always rides at a fixed elevation above the floor of the car.

For any piggyback operation to be successful, not only must the cost of the equipment required be kept to a minimum, but also it is equally important that the semi-trailer may be mounted on the railway car and removed therefrom with a minimum amount of time and labor. When one bears in mind that the fifth wheel stand must have an inoperative position that is substantially flush with the floor of the car to enable the semi-trailer to be backed into position and that the stand must also be capable of lifting and supporting 30,000 pounds or more, the problem becomes rather severe. In the present invention, the solution to this problem is found in mechanism which not only enables the entire stand to occupy a substantially flush position on the floor of the car, but also provides quick acting leverage which enables the stand to be lifted in a short period of time to its position in engagement with the kingpin, after which the leverage changes so as to supply the necessary mechanical advantage for lifting the front end of the semi-trailer to its transit position through reasonable manual or mechanical effort. The provision of mechanism to accomplish this objective constitutes a further object of the invention.

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Still further objects and advantages include the following:

To provide cushioning mechanism which inherently enables any desired length of cushion travel to be achieved; to provide a fifth wheel stand that is strong and durable, yet is comparatively light weight in construction; to provide a stand of this type which not only indexes the semi-trailer kingpin longitudinally and laterally with generous allowances of variation in the location of the kingpin with respect to the stand but also firmly locks the kingpin to the stand at the desired position; and to provide a stand which is devoid of mechanical springs and which may be operated by various sources of power.

Other objects, uses and advantages will be obvious or become apparent from a consideration of the following detailed description and the accompanying drawings.

In the drawings:

FIGURE 1 is a diagrammatic perspective view illustrating one embodiment of our invention as applied to a conventional railroad flatcar, illustrating the same in operative relation with a conventional trailer mounted for transit on the railroad car;

FIGURE 2 is a fragmental perspective view of the device shown in FIGURE 1, illustrating same as it appears in its inoperative position on the flatcar of FIGURE 1;

FIGURE 3 is a view similar to that of FIGURE 1 illustrating a modified form of the invention applied to a special low level railroad car;

FIGURE 4 is a diagrammatic perspective view of the device shown in FIGURE 3 showing same in inoperative position on the railroad car of FIGURE 3;

FIGURES 5 through 8 are diagrammatic side elevational views of the apparatus shown in FIGURE 1, illustrating the operation of same;

FIGURE 9 is an enlarged side elevational view of the fifth wheel stand shown in FIGURE 1, the trailer body being indicated in dashed lines;

FIGURE 10 is a cross-sectional view approximately along line 10—10 of FIGURE 9;

FIGURE 11 is a cross-sectional view along line 11—11 of FIGURE 9;

FIGURE 12 is an elevational view taken from the right hand side of FIGURE 9;

FIGURE 13 is a fragmental view similar in nature to that of FIGURE 12 but illustrating the modified embodiment shown in FIGURE 3;

FIGURE 14 is a plan view, partially in section, of the fifth wheel plate structure forming a part of our invention, parts being broken away for clarity of illustration;

FIGURE 15 is a cross-sectional view along line 15—15 of FIGURE 14;

FIGURE 16 is a cross-sectional view approximately along the line 16—16 of FIGURE 14;

FIGURE 17 is a view similar to that of FIGURE 16, but more particularly indicating the cooperation of the various fifth wheel plate structure locating and latching elements with the kingpin of a trailer;

FIGURE 18 is a fragmental cross-sectional view along line 18—18 of FIGURE 14, showing in phantom a trailer kingpin in locked position;

FIGURE 19 is an enlarged fragmental end elevational view of the kingpin locating and latching structure shown in FIGURE 14, the view being taken from the right hand side of FIGURE 14;

FIGURE 20 is an enlarged diagrammatic cross-sectional view along line 20—20 of FIGURE 19;

FIGURE 21 is a diagrammatic cross-sectional view along line 21—21 of FIGURE 15;

FIGURE 22 is an exploded perspective view of a cushion gear assembly that forms a part of our invention;

FIGURE 23 is an enlarged side elevational view of the fifth wheel stand shown in FIGURE 3, the trailer body being indicated in dashed lines;

FIGURE 24 is a small scale diagrammatic side elevational view showing the fifth wheel stand in its inoperative position and the relationship between the stand and the raised draft gear sill of the railroad car of FIGURE 3;

FIGURE 25 is a cross-sectional view along line 25-25 of FIGURE 23; and

FIGURE 26 is a cross-sectional view approximately along line 26-26 of FIGURE 23.

General description

Reference numeral 10 of FIGURE 1 generally indicates one embodiment of our invention secured to the supporting surface 12 of a standard railroad flatcar 14 (which may take any suitable form, and which is illustrated only diagrammatically), the stand 10 being shown applied to the front end of a conventional type of trailer 16. The illustrated trailer 16 is of the type that is conventionally provided with rear wheels 20 and landing gear 22 as well as a kingpin 24 (see FIGURE 5), though the invention is adapted for other forms of containers having a kingpin or equivalent structure that is adapted for cooperation with a fifth wheel stand. Suitable slack chains 25 may be applied to wheels 20 in any conventional manner.

The trailer 16 is transported on highways by a tractor to which it is secured by an appropriate fifth wheel mechanism that grasps the kingpin 24. As in accordance with standard piggyback practices, the trailer 16 is applied to railroad car 14 by being backed onto same, or otherwise positioned on the car, to the generally central position indicated in FIGURE 1, whereupon its front end is lowered onto landing gear 22 and the tractor disconnected and removed. Then, the fifth wheel stand 10 of the present invention is actuated to gather and grasp the kingpin 24 and lift the front end of the trailer off its landing gear 22. Stand 10 securely mounts the trailer for transit, and provides an improved cushioning action against buff and draft forces.

The inoperative or retracted position of the fifth wheel stand 10 is indicated in FIGURE 2, while the elevated position is indicated in FIGURES 1 and 8. The stand moves through the positions indicated in FIGURES 5 through 8 in moving between inoperative and operative positions.

Referring to FIGURES 5 through 8, the stand 10 generally comprises a fifth wheel plate structure 30 which includes a pivotally mounted indexing member 32, a latch device operated by handle 34, a pair of cushioning assemblies 36 of the type indicated in FIGURE 22, and a lift structure 38. The plate structure 30 is preferably trunnioned and proportioned so that its front end inclines upwardly by gravity when it is lifted off the floor of the car.

After the trailer has been positioned on the flatcar within the range of variations permitted by stand 10, and the trailer tractor removed, the lift structure 38 moves the fifth wheel plate structure 30 from the position of FIGURE 5 to the position of FIGURE 6 whereupon the indexing member 32 contacts the undersurface of the trailer forwardly of kingpin 24. Indexing member 32 comprises an open centered frame having the general configuration indicated in FIGURE 14, the elements of which define indexing and locating surfaces 40, 42, 44, 46 and 48; the positioning of the trailer 16 should be such that as the lift structure 38 raises the fifth wheel plate structure 30 from the position of FIGURE 6 to the position of FIGURE 7, the kingpin 24 is received in the indexing space 50 defined by member 32. As the lift structure 38 moves the fifth wheel structure to the position of FIGURE 7, member 32 tilts with respect to plate structure 30 and becomes flush with the bottom or undersurface of the trailer. The lift structure 38 in moving the plate structure 30 between the positions of FIGURES 7 and 8 moves the indexing member 32 forwardly of the trailer and at the

same time lifts the trailer off its landing gear 22. As the fifth wheel plate structure moves between the positions of FIGURES 7 and 8, the kingpin 24 is engaged by either of surfaces 46 or 48 which index the kingpin with respect to locking seat 52 that is carried by member 32 which is drawn against kingpin 24 as the stand assumes the final elevated position of FIGURE 8.

After the position of FIGURE 8 is obtained, the handle 34 is moved upwardly to position the U-shaped keeper member 54 (see FIGURE 14) in front of the kingpin 24 and then the handle is pulled outwardly so that handle 56 of latching device 58 (see FIGURE 19) at the front of the fifth wheel plate structure may be actuated to lock indexing member 32 against pivotal movement. This movement of handle 34 slides latch bar 60 (see FIGURE 16) into locking relation with the rear of seat 52.

As indicated in FIGURES 6 through 8, the lift structure 38 comprises a first set of relatively long struts 62 and a second set of relatively short struts 64 that are pivotally connected to the fifth wheel plate structure, and in the embodiment of FIGURE 1, are moved between the positions of FIGURE 5 and FIGURE 8 by hydraulic cylinder 66.

When the trailer is secured as indicated in FIGURE 8, it is transported to the desired destination and to render the fifth wheel stand inoperative, the operations above described are reversed. After the stand 10 has been lowered, a trailer tractor is secured to trailer 16 in the usual manner and the trailer delivered to its ultimate destination.

The embodiment of FIGURE 3 is generally similar to that of FIGURE 1 except that the struts are actuated by a pair of powered devices, such as the screw devices 70 diagrammatically illustrated in FIGURES 23 and 26, rather than the single hydraulic cylinder 66. The fifth wheel stand 65 of FIGURE 3 is shown applied to a special form of railroad car 67 in which the floor of the car is at a lower level than that of the car in FIGURE 1. Such cars are provided with a raised draft sill 72 in which the conventional draft gear and coupling mechanisms indicated at 74 are mounted. The raised sill must be provided since draft gear and couplers of railroad cars are required to be at a standard elevation above the track rails.

In operation, the fifth wheel stand of FIGURE 3 operates generally as illustrated in FIGURES 5 through 8 and in inoperative position nests with respect to the sill 72 as indicated in FIGURES 4 and 24.

Indexing and locking mechanisms

FIGURES 14 through 20 best illustrate the indexing and locking mechanisms forming a part of our invention. Indexing member 32 is pivoted to the forward end of the fifth wheel plate structure as by pins 80 mounted in lugs 82 that form a part of the fifth wheel plate structure. Handle 34 includes yoke portion 83 that is fixed in any suitable manner to latch bar 60 which is slidably mounted in openings 84 that are formed in arms 86 of keeper member 54. The arms 86 of keeper member 54 are pivotally secured to lugs 88 of the fifth wheel plate structure by pin 90 that may be secured in place by appropriate cotter pins 92.

The latch bar 60 engages in slot or recess 94 formed in the rear of seat 52 to lock the index member 32 as well as keeper member 54 in locking position. Fixed abutment 95 aligns bar 60 with slot or recess 94 when handle 34 is swung to its upper position.

Handle member 56 (see FIGURE 19) of latch device 58 located at the front end of the indexing member 32 is reciprocably mounted in an appropriate lug 96 that is carried by indexing member 32, member 56 being biased to the right of FIGURE 19 by an appropriate compression spring 98 that acts between a sleeve 100 that is keyed to the member 56 and the lug 96. U-shaped bracket 102 may be fixed at one end thereof to the lug 96 for maintaining the desired position of member 56. Handle 34 includes an upstanding projection 103 that is pro-

vided with a locating extension 104 that is adapted to be positioned over bracket 102 as latch bar 60 is moved into slot 94. Projection 103 is formed with an appropriate perforation 105 (see FIGURE 17) through which member 56 extends into an appropriate perforation formed in lug 106 that is also carried by index member 32. Projection 103 of handle 34 may be released by moving handle member 56 to the left of FIGURE 19 to withdraw same from perforation 105 of projection 103 whereupon the handle member 34 may be pushed to the left of FIGURE 16 to release the index member 32 and the handle member 34 for pivoting movement with respect to the fifth wheel plate structure.

Cushioning arrangement

The fifth wheel plate structure also comprises a pair of cushioning assemblies 36 that are diagrammatically illustrated in FIGURE 22. Each assembly 36 comprises a plurality of cushion gear segments 110 of the type generally indicated in FIGURE 21, the elements 110 being disposed in two groups 112 and 114 on either side of a cushioning gear separator 116, a front follower 118, a rear follower 120, a cushioning gear carrier 122 in which the cushion gear segments 110, the separator 116 and the followers 118 and 120 are received, and a cushioning gear carrier housing 124 which receives the carrier 122 and the structure that it carries.

The segments 110 may comprise a plurality of rubber segments 126 affixed to either side of a steel plate 128 and are of a type that are well known in the art. Other types of shock absorbing components will occur to those skilled in the art.

The gear separator 116 comprises a pair of horizontal plates 130 secured between a pair of vertical plates 132 as by welding, plates 130 and 132 defining a shaft opening 134 through which a stub shaft 136 extends that is connected with lift structure 38.

The cushion gear carrier 122 comprises a pair of straps 138 secured together at their ends by appropriate plates 140. Straps 138 are formed with perforations 142 through which shaft 136 extends. A perforated plate 144 may be fixed to each strap 138 about the openings 142 for reinforcing purposes. Plates 146 of each strap 138 space the carrier 122 from the side walls of housing 124.

Housing 124 in the illustrated embodiment comprises a pair of angle members 148 (see FIGURE 22) secured together at 150 as by welding and to plate 152 which forms the upper surface of the fifth wheel plate structure 30. Lugs 154 are fixed between angle members 148 at one end of the housing; at the other end of the housing these members are formed with perforations 156 that receive removable lugs 158 after the cushion gear carrier and the elements it contain have been mounted in the housing 124. Reinforcing bars 159 may be applied between lugs 154 and 158 on both sides of housing 124 and carrier 122 rides between bars 159 under the action of buff and draft forces applied to the plate structure 30, thus serving a function similar to the familiar draft gear yoke.

Lugs 158 are inserted in perforations 156 after the cushion gear and carrier are mounted within housing 124; they may be secured against removal by appropriate pins applied to holes 161 (see FIGURE 14).

The angle members 148 are each formed with an elongated slot 158a through which the ends of the stub shaft 136 extend. The shaft 136 is inserted through slots 158a, openings 142 of carrier 122 and opening 134 of separator 116 after the carrier 122 and the elements it carries have been mounted within housing 124.

In accordance with our invention, a cushioning assembly 36 is positioned on either side of the fifth wheel plate structure 30, plate 152 forming a part of both cushioning assemblies.

The cushioning assemblies 36 provide a cushioning action against both buff and draft forces during transit. The groups 112 and 114 of each cushioning assembly act in tandem by virtue of separator 116, which means that

both groups of cushioning units contribute to the cushioning effect whether the forces to be cushioned are in buff or in draft.

An important feature of the invention is that buff and draft forces are absorbed only in a horizontal plane since the cushioning devices act in the plane of the fifth wheel plate structure, and the plate structure is horizontally disposed when secured to the trailer. This eliminates the whipping action that is applied to trailers when the cushioning mechanism is located in a diagonal strut or brace.

Lift structure

The lift structure 38 of the embodiment of FIGURE 1 is illustrated in FIGURES 9 through 12 while the lift structures 38a of the embodiment of FIGURE 3 is shown in FIGURES 13 and 23 through 26. The struts 62 of the embodiment of FIGURES 9 through 12 each comprise a pair of elongate bars 170 fixed to each other by appropriate spacers 172, brace member 173 interconnecting struts 62. At their lower ends, bars 170 are pivoted to lugs 174 by pins 176. Lugs 174 are fixed to an appropriate base structure 178 and it in turn is mounted on the top of railroad car 14 in any suitable manner. Bars 170 at their upper ends are received over the ends of the shaft 136 on the side of the plate structure 30 that they are mounted on (see FIGURE 14). Shafts 136 thus form trunnions for the plate structure 30.

Struts 64 each comprise a pair of elongate bars 180 secured together by appropriate spacers 182 and received over the shafts 136 at the respective sides of the fifth wheel plate structure (see FIGURE 14). At their lower ends, the bars 180 are pivoted to sliding lugs 184 by appropriate pins 186. Lugs 184 are fixed to sliding plates 188 which move lengthwise of the railroad car under the guiding action of bars 190 that are fixed to base structure 178.

In the illustrated embodiment, the base structure 178 comprises a pair of spaced plates 192 on either side of the fifth wheel stand to the front ends of which lugs 174 are fixed in any suitable manner. Bars 190, which at their forward ends carry vertical movement restraining projections 191, are secured along the outer sides of plates 192, and the plates 192 at their rear ends are formed with reduced portions 194 that are provided with guideways 196 longitudinally of the railroad car. The sliding plates 188 are secured to a cross-plate 198 as by pins 200; cross-plate 198 is fixed to a sliding assembly 202 that pivotally carries hydraulic cylinder 204.

Assembly 202 comprises a carriage 206 slidably mounted on guide bars 208 of base structure 178 and carrying lugs 210 which pivotally receive trunnions 212 of hydraulic cylinder 66.

Hydraulic cylinder 66 may be of any conventional double acting type, and normally includes a cylinder 214 provided with fittings 216 adapted for connection to an appropriate hydraulic system, and a piston including rod 218 that is fixed in any suitable manner to cross-head 220 which is pivotally secured between struts 62.

In accordance with our invention, cross-head 220 is pivotally secured to struts 62 in such a manner that even in the inoperative position of the lift structure, a sufficient leverage action is provided to enable the fifth wheel plate structure 30 to be lifted from the floor of the car and started toward the undersurface of the trailer.

In the illustrated embodiment this is done by pivotally securing the cross-head 220 between brackets 222 that are in turn fixed to project upwardly from the adjacent inner bars 170 of each strut 62.

As indicated in FIGURE 5, this positions the cross-head 222 above the dead center line that extends between pins 176 and 186. In the inoperative position, struts 62 and 64 are substantially horizontal, sliding lugs 184 being positioned relatively close to fixed lugs 174. As hydraulic pressure is applied to cylinder 66

to extend rod 218 therefrom, struts 62 move upwardly about pins 176 and lugs 184 move to the left of FIGURE 9 (and FIGURES 5 through 8). This movement continues until struts 64 assume a substantially vertical position wherein further movement of lugs 184 is precluded by stops 226 that are fixed to plates 192.

It will thus be seen that the struts 62 and 64 and the hydraulic cylinder 204 are so arranged that the cylinder 66 initially lifts the plate structure 30 through a quick acting leverage, this being sufficient to lift the plate structure off the floor of the car and start it toward the undersurface of the trailer. As the lifting continues the leverage changes, struts 62 in effect rocking the trailer up on struts 64 as the struts 64 are moved toward their vertical positions.

The fifth wheel stand is lowered to inoperative position by reversing the action of the hydraulic liquid.

The hydraulic liquid may be supplied by appropriate hand operated pumps 230 which draw hydraulic liquid from any appropriate source such as a tank 231 mounted on the railroad car. The operator may stand on appropriate platform 232 to operate the mechanism.

The embodiment of FIGURES 3, 4, 13, and 23 through 26 is similar to that of FIGURE 1 except that screw devices 70 are substituted for the hydraulic cylinder 204, and a screw device 70 is applied between a strut 62a and a strut 64a on each side of the fifth wheel stand. The stationary lugs 174a to which struts 62a are pivoted by pins 176a, respectively, are fixed to the car 67 in any suitable manner while sliding lugs 184a move along appropriate guides 250 that are carried by appropriate base plates 252. On each side of the fifth wheel stand 19a, a strut 64a is pivotally secured to lugs 184a by a pin 186a. Lugs 184a in the illustrated embodiment are extended rearwardly and pivotally mount a cross-head 254 which fixedly holds screwthreaded rod 256 forming a part of a screw device 70. Struts 62a each carry lugs 222a between which are pivotally mounted cross-heads 226a that rotatably mount an internally screwthreaded member 260 that is journaled in appropriate bearings mounted in cross-head 220a the latter components also forming a part of screw devices 70. At the front end of the fifth wheel stand, a sprocket 262 is keyed to each member 260, said sprockets being inner-connected by an appropriate endless chain 264. The ends of members 260 may be given an appropriate polygonal shape as indicated at 266 for cooperation with a suitable mechanism or device for rotating members 260.

When members 260 are rotated in the appropriate direction, the lifting action provided by the modified form of lift structure is the same as that shown in FIGURES 5 through 8.

The device of FIGURES 3, 4, 13, and 23 through 26 includes the fifth wheel plate structure 30 that is described above together with the indexing and latching mechanisms and cushioning mechanisms carried thereby. The cushioning assemblies 36 are spaced apart sufficiently so that they will be disposed on either side of draft gear sill 72 when the fifth wheel stand is in inoperative position (see FIGURES 4 and 24). In this position, the plate 152 is substantially level with sill 72, and housings 124 nest on either side of sill 172.

Alternately, a single screw type power applied device may be substituted for cylinder 66, and a pair of hydraulic cylinders may be substituted for the screw devices 70.

Advantages

Our invention achieves the important objective of making the use of the fifth wheel stand a one-man operation. That is, only one man is required to secure a trailer to a railroad car after it has been backed in position on the car, rested on its landing gear, and the trailer tractor removed. After the trailer tractor has been spotted, it should be approximately in position for securing to the

car by the fifth wheel stand. Conventional fifth wheel stands require rather accurate positioning of the trailer, but our invention permits the tractor driver a considerable tolerance longitudinally of the railroad car, for instance, twelve to eighteen inches in the illustrated embodiment. A tolerance of about three to four inches transversely of the railroad car is also provided for, though this tolerance is not so critical as the positioning of the trailer transversely of the car is well defined by the width of the railroad car.

When the stand is operated in the manner indicated in FIGURES 5-8 to secure the trailer for transit, which may be accomplished by the single worker operating hand pumps 228 or other appropriate actuating devices, the fifth wheel plate structure both indexes the kingpin of the trailer with respect to the locking seat of the fifth wheel stand and raises the front end of the trailer off of its landing gear. This is to be contrasted with conventional apparatus which index only after the stand is lifted to full height. When the fifth wheel stand is in its fully extended position, the worker manipulates handle 34 and latch device 58 to lock indexing member 32 against pivotal movement. Aside from application of slack chains 25 to rear axles, this is all that need be done to ready the trailer for transit.

At the destination, release and retraction of the stand is just as simplified, a single worker being required to unlatch handle 34 and operate the lift structures to retract the stand and lower the trailer onto its landing gear. After chains 25 have been removed, the trailer may be removed from the car in a conventional manner.

It will be noted that when secured for transit, the lengths of struts 62 and 64 are such that the fifth wheel plate structure is substantially horizontally disposed, and as has been pointed out hereinbefore, buff and draft forces are thus absorbed only in a horizontal plane. This eliminates the application of vertical forces to the trailer during cushioning thereof which would tend to rock the trailer violently and permits the landing gear to be lowered almost to the floor of the car for further transit stability. A specific embodiment of the invention provides a cushioning travel of about twelve inches in either direction.

The tandem action of the cushioning devices on each side of the fifth wheel stand insures that the same cushioning action, as well as maximum cushioning action, is provided for both buff and draft forces. The divided cushion arrangement cuts down the length of the cushioning device that is required and permits it to assume a limited depth.

The quick acting leverage arrangement of the lift structure that is provided for initial operation of the device assures that the same power supplying mechanism that is applied to lift the trailer is also capable of initially actuating the levers of the lift structure. This also permits the levers of the lift structure to be positioned closely adjacent the floor of the car during their inoperative positions. The illustrated lever arrangement is designed to lift a 30,000 pound load about five inches at the upper limit of its extended position. The plate structure is raised about forty-three inches to contact the under surface of the trailer which means that the plate structure moves through a vertical distance of about four feet. Initially, the lift structure has a load of about 1000 pounds to lift off the floor of the railroad car.

The foregoing description and the drawings are given merely to explain and illustrate our invention and the invention is not to be limited thereto, except insofar as the appended claims are so limited, since those skilled in the art who have our disclosure before them will be able to make modifications and variations therein without departing from the scope of the invention.

We claim:

1. A fifth wheel stand for railroad cars comprising a lift structure, a fifth wheel plate structure carried by

said lift structure, means for actuating said lift structure to move said plate structure between a lowered inoperative position and an elevated operative position, said fifth wheel plate structure being proportioned to tilt upwardly toward the front of the car when raised from said inoperative position, latch means including a kingpin seat for cooperation with the kingpin of trailers and the like for securing the front end of same for transit on the car, and an indexing member pivotally secured to said fifth wheel plate structure adjacent the forward end of the latter and extending forwardly thereof, said indexing member comprising a rigid open centered frame formed to define indexing the surfaces adapted to be disposed on either side of the kingpin for indexing the kingpin with respect to said latch means, said indexing member carrying adjacent the rearward end thereof a forwardly facing seat portion forming a part of said seat, the forwardly extending end of said member contacting the undersurface of the trailer or the like as the plate structure is moved to operative position and said surfaces thereupon indexing the kingpin with respect to said latch means.

2. A fifth wheel stand for railroad cars comprising a lift structure, a fifth wheel plate structure carried by said lift structure, trunnion means securing said plate structure to said lift structure, said lift structure including lever means for swinging said plate structure along an arcuate path between a rearwardly disposed lowered inoperative position and a forwardly disposed elevated operative position, said fifth wheel plate structure being proportioned to tilt upwardly toward the front of the car when raised from said inoperative position, latch means including a kingpin seat for cooperating with the kingpin of trailers and the like for securing the front end of the same for transit on the car, an indexing member pivotally secured to said fifth wheel structure adjacent the forward end of the latter and extending forwardly thereof, said member comprising a rigid open centered frame formed to define spaced internal indexing surfaces adapted to be disposed on either side of the kingpin for indexing the kingpin with respect to said latch means, said indexing member carrying adjacent the rearward end thereof a forwardly facing seat portion forming a part of said seat, the forwardly extending end of said member contacting the undersurface of the trailer or the like as the plate structure is moved to operative position and said surfaces thereupon indexing the kingpin with respect to said latch means, and cushioning means interposed between said fifth wheel plate structure and said trunnion means for providing a cushioning action against buff and draft forces along the plane of said plate structure.

3. A fifth wheel stand for railroad cars comprising a lift structure, a fifth wheel plate structure carried by said lift structure, trunnion means securing said plate structure to said lift structure, said lift structure including lever means for swinging said plate structure along an arcuate path between a rearwardly disposed lowered inoperative position and a forwardly disposed elevated operative position, said fifth wheel plate structure being proportioned to tilt upwardly toward the front of the car when raised from said inoperative position, latch means including a kingpin seat for cooperating with the kingpin of trailers and the like for securing the front end of same for transit on the car, an indexing member pivotally secured to the fifth wheel structure adjacent the forward end of the latter and extending forwardly thereof, said member comprising a rigid open centered frame formed to define spaced internal indexing surfaces adapted to be disposed on either side of the kingpin for indexing the kingpin with respect to said latch means, said indexing member carrying adjacent the rearward end thereof a forwardly facing seat portion forming a part of said seat, the forwardly extending end of said member contacting the undersurface of the trailer

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or the like as the plate structure is moved to operative position and said surfaces thereupon indexing the kingpin with respect to said latch means, said latch means comprising a keeper member mounted for movement into engagement with the kingpin and latch bar means for releasably locking said indexing member against pivotal movement with respect to said plate structure, and cushioning means interposed between said fifth wheel plate structure and said trunnion means for providing a cushioning action against buff and draft forces along the plane of said plate structure.

4. A fifth wheel stand for railroad cars comprising a lift structure, a fifth wheel plate structure carried by said lift structure, said plate structure being secured to said trunnion means for movement longitudinally of the car, said fifth wheel plate structure including latch means for cooperating with the kingpin of trailers and the like for securing the front end of same for transit on the car, means for actuating said lift structure to move said plate structure between a lowered inoperative position and an elevated operative position wherein said latch means is brought into engagement with the kingpin, and cushioning means interposed between said fifth wheel plate structure and said trunnion means, said cushioning means comprising follower means carried forwardly and rearwardly of said trunnion means, resilient means interposed between the respective follower means, separator means interposed in said resilient means and about said trunnion means, said separator means defining an elongate opening extending forwardly and rearwardly of said fifth wheel plate structure in which said trunnion means is positioned, said opening being proportioned to permit relative movement between said separator means and said trunnion means forwardly and rearwardly of said fifth wheel plate structure, and yoke means encircling said cushioning means and engaging said follower means, respectively, at the forward and rearward ends of said cushioning means, said trunnion means being keyed to said yoke means for movement therewith and said yoke being mounted for movement forwardly and rearwardly of said plate structure, and lug means engaging each of said follower means at said ends of said cushioning means and made fast to said fifth wheel plate structure, whereby a cushioning action against buff and draft forces is provided along the plane of said plate structure, and the movement of said plate structure with respect to said trunnion means is cushioned by said resilient means acting in tandem.

5. A cushioned fifth wheel stand comprising a fifth wheel plate structure including a housing, trunnion means mounted in said housing and defining a pivotal axis, said trunnion means being mounted for movement transversely of the axis thereof with respect to said housing, said housing carrying a first follower on one side of said trunnion means and a second follower on the other side of said trunnion means, cushion gear means interposed between said first follower and said trunnion means and cushion gear means interposed between said second follower and said trunnion means, cushioning gear separator means interposed between the respective cushion gear means, said separator means defining an elongated opening extending forwardly and rearwardly of said fifth wheel plate structure in which said trunnion means is positioned, said opening being proportioned to permit relative movement between said separator means and said trunnion means transversely of said axis, and yoke means encircling said followers, said cushion gear means and said separator means, and engaging said followers, said trunnion means being keyed to said yoke means for movement therewith and said yoke means being mounted for movement transversely of said axis with respect to said plate structure, and lug means engaging

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each of said followers and made fast to said plate structure, whereby said cushioning gear means acts in tandem transversely of said trunnion means.

6. A cushioned fifth wheel stand comprising a fifth wheel plate structure including a housing along each of two opposed sides thereof, trunnion means mounted in each of said housings respectively defining pivotal axes, said trunnion means each being mounted for movement transversely of the axis thereof with respect to said housings, said housing each carrying a first follower on one side of its trunnion means and a second follower on the other side of its trunnion means, cushioning gear means interposed between the first follower and trunnion means of each housing and further cushioning gear means interposed between the second follower and the trunnion means of each housing, cushioning gear separator means interposed between the respective cushioning gear means of each housing, with said cushioning gear separator means of each housing being formed to define elongate openings extending transversely of said axis thereof in which the respective trunnion means are respectively positioned, said openings being proportioned to permit relative movement between said trunnion means and their respective separator means transversely of said axes, respectively, and yoke means in each of said housings surrounding and engaging said first and second followers thereof, respectively, said trunnion means of each housing being keyed to the yoke means thereof for movement therewith and said yoke means respectively being mounted for movement transversely of said axes, respectively, to provide said trunnion means movement, each of said housings including lug means fixed with respect thereto and engaging said first and second followers thereof, respectively, whereby said cushioning gear means and said further cushioning gear means of each housing act in tandem transversely of the respective trunnion means.

7. In a fifth wheel stand for railroad cars including a fifth wheel plate structure provided with a latch device adapted for cooperation with the kingpin of trailers and the like to secure the front end of same for transit on the car, and means for raising and lowering said fifth wheel plate structure between an elevated operative position in association with the kingpin and a lowered inoperative position, the improvement wherein said fifth wheel plate structure includes means for indexing the kingpin with respect to said latch device as said fifth wheel plate structure is raised to its operative position, said means comprising an indexing member formed with kingpin indexing surfaces adapted to be disposed on either side of the kingpin and leading to said latch device, said member being coupled to said fifth wheel plate structure for movement out of the plane thereof and into a plane that extends generally transversely of the kingpin as said fifth wheel plate structure approaches its operative position, and means for effecting said movement of said indexing member with respect to said fifth wheel plate structure, whereby, the kingpin is indexed with respect to the latching device by engagement with said member during the raising of said fifth wheel plate structure to its operative position.

8. A fifth wheel stand for railroad cars comprising a lift structure, a fifth wheel plate structure carried by said lift structure, means for actuating said lift structure to move said plate structure between a lowered inoperative position and an elevated operative position, said fifth wheel plate structure being proportioned to tilt upwardly toward the front of the car while being raised from said inoperative position, latch means including a kingpin seat for cooperation with the kingpin of trailers and the like for securing the front end of said trailer for transit on the car, and an indexing member pivotally secured to said fifth wheel plate structure adjacent the forward end of the latter and extending forward thereof,

said indexing member comprising a rigid open centered frame formed to define spaced indexing surfaces adapted to be disposed on either side of the kingpin for indexing the kingpin with respect to said latch means, said indexing member carrying adjacent the rearward end thereof a forwardly facing seat portion forming a part of said seat, the forwardly extending end of said member contacting the undersurface of the trailer or the like as the plate structure is moved to operative position and said surfaces thereupon indexing the kingpin with respect to said latch means, said latch means comprising means including said seat portion for restraining forward and rearward movement of the kingpin with respect to said fifth wheel plate structure, and means for latching said member against pivotal movement with respect to said fifth wheel plate structure.

9. Apparatus for transporting trailers and the like, said apparatus comprising a railroad flatcar having a depressed bed and a relatively higher draft gear sill having at least at one end thereof flanked by said depressed bed, said bed defining a deck having a width sufficient to support trailers with said deck being at a level below the upper portion of said draft gear sill and said draft gear sill projecting upwardly from the level of said deck, said sill terminating at its inner end inwardly of said one end of the car and at said deck and said deck extending forwardly to said car one end on either side of said sill, a fifth wheel plate structure including a latch device adapted for connection to the kingpin of trailers and the like, said plate structure having a vertical dimension that is substantially equivalent to the projection of said draft gear sill above said deck, a lift structure for said fifth wheel plate structure, said lift structure including a first pair of substantially coplanar struts pivotally secured at their lower ends to the flatcar on either side of said draft gear sill and adjacent said one end of said car for pivotal movement about a horizontal axis which extends transversely of the car and a second pair of substantially coplanar struts secured at their lower ends to said car on either side of said sill at points spaced inwardly of said first strut lower ends, respectively, for movement of said second struts between lowered, substantially horizontal inoperative positions and raised, substantially upright, operative positions to dispose said plate structure in its operative elevated position, said struts being pivotally secured at their upper ends to said fifth wheel plate structure, said struts being proportioned in length such that in their lowered inoperative positions they lie on either side of said sill and dispose said plate structure in its lowered inoperative position adjacent said inner end of said sill, and means for actuating said lift structure for raising and lowering said fifth wheel plate structure between its said lowered inoperative position and its said operative position including means for swinging said second struts to their said upright positions, said axis being positioned so that when said fifth wheel plate structure is lowered by said actuating means to its said inoperative position and thereby swinging said first struts downwardly about said axis and inwardly of the flatcar, said fifth wheel plate structure is disposed inwardly of and adjacent the inner end of said draft gear sill with said fifth wheel plate structure and struts disposed in nesting relation about and with said sill and with the top of said fifth wheel plate structure being substantially level with said sill.

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UNITED STATES PATENT OFFICE
CERTIFICATE OF CORRECTION

Patent No. 3,180,282

April 27, 1965

Jack E. Gutridge et al.

It is hereby certified that error appears in the above numbered patent requiring correction and that the said Letters Patent should read as corrected below.

Column 9, line 13, after "indexing" strike out "the"; line 54, after "structure" insert a comma; column 10, line 63, for "elongated" read -- elongate --; line 67, for "sepaartor" -- separator --; column 11, line 2, for "acts" read -- act --; line 10, for "housing" read -- housings --; same column 11, line 63, for "fith" read -- fifth --; column 12, line 57, for "whel" read -- wheel --.

Signed and sealed this 21st day of September 1965.

SEAL)

Attest:

ERNEST W. SWIDER
Attesting Officer

EDWARD J. BRENNER
Commissioner of Patents