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3,176,853

MOBILE LIFT APPARATUS

Original Filed May 23, 1960

5 Sheets-Sheet 1

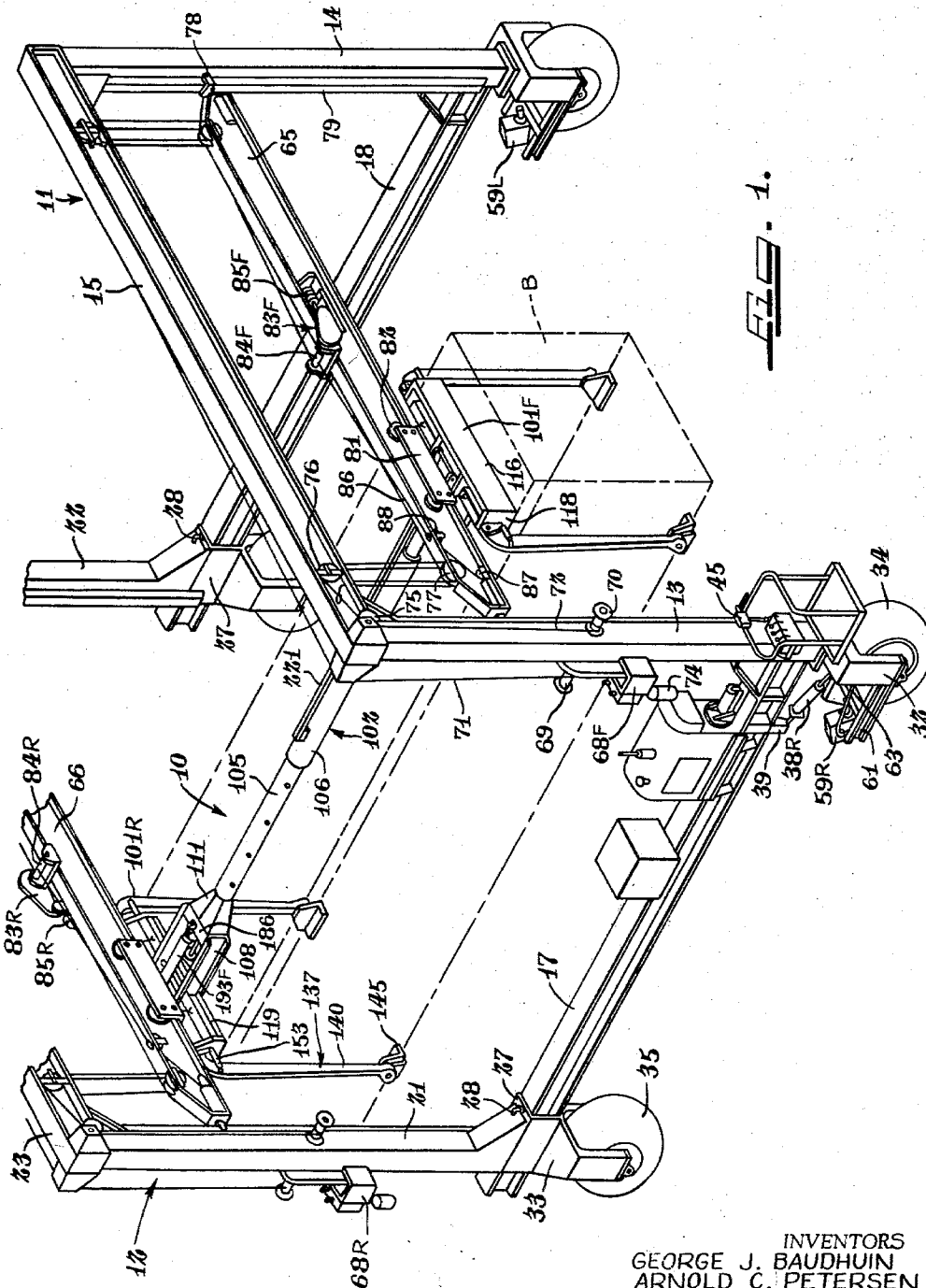


FIG. 1.

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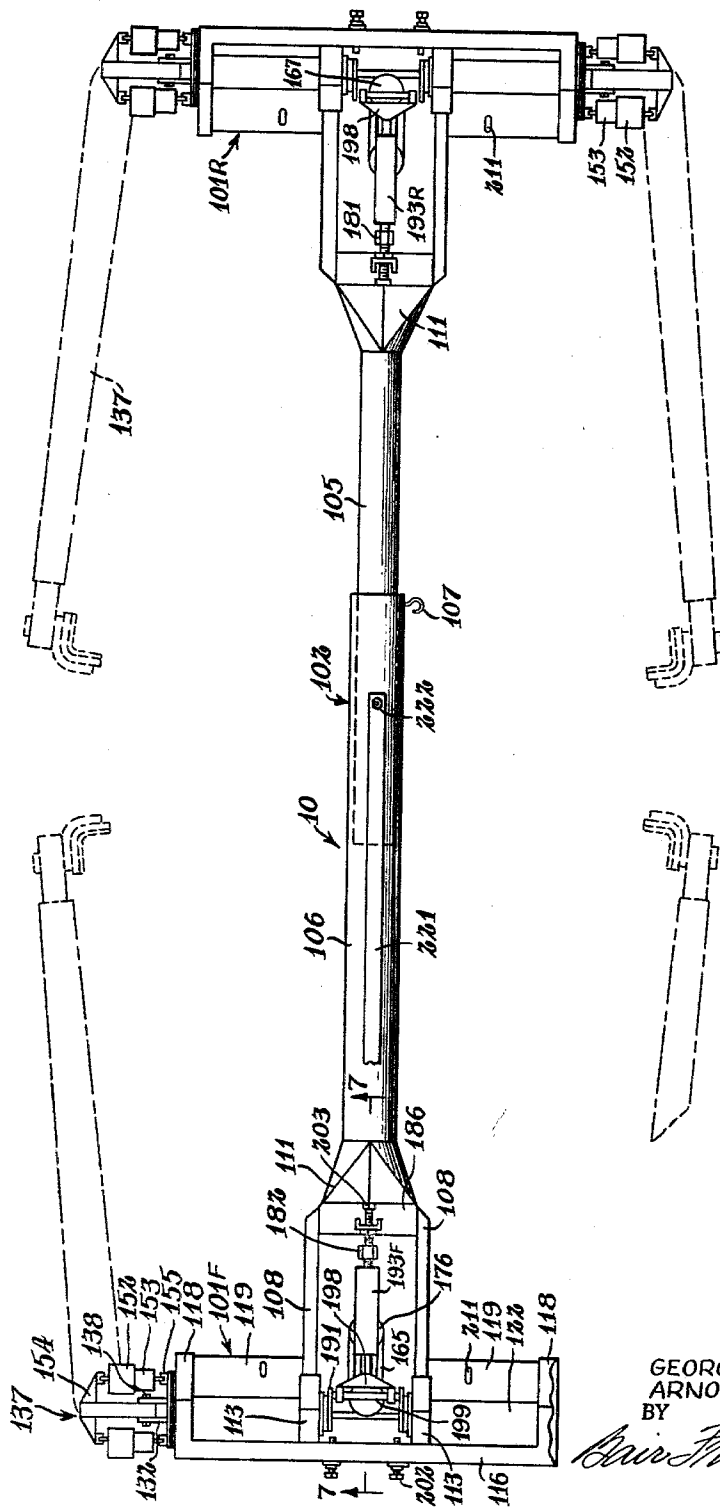
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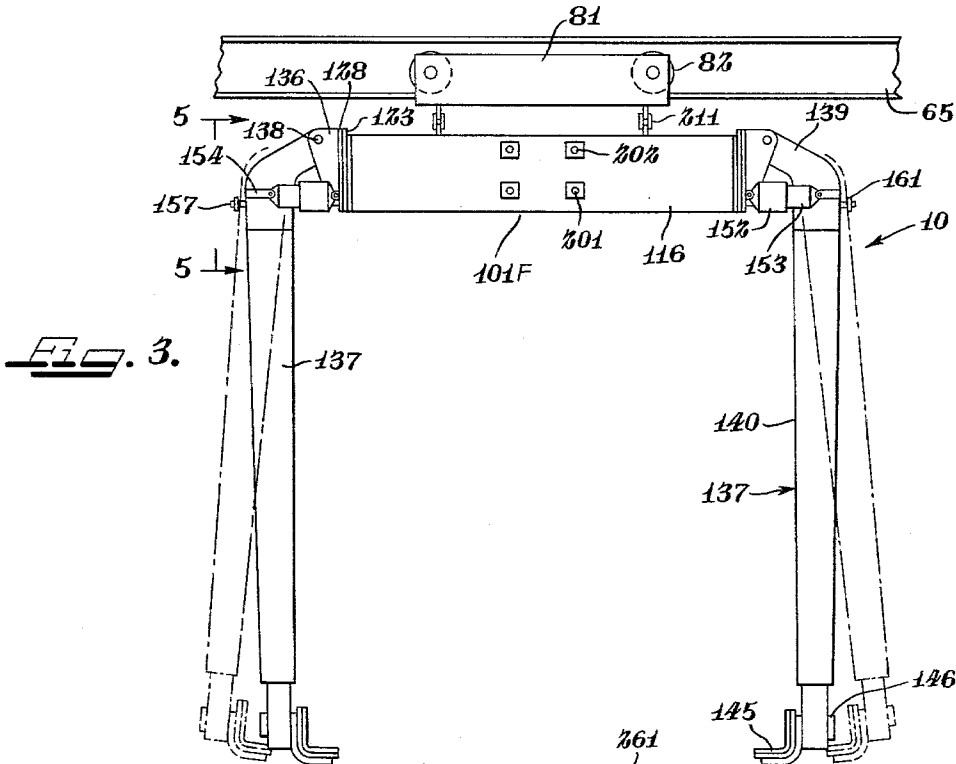
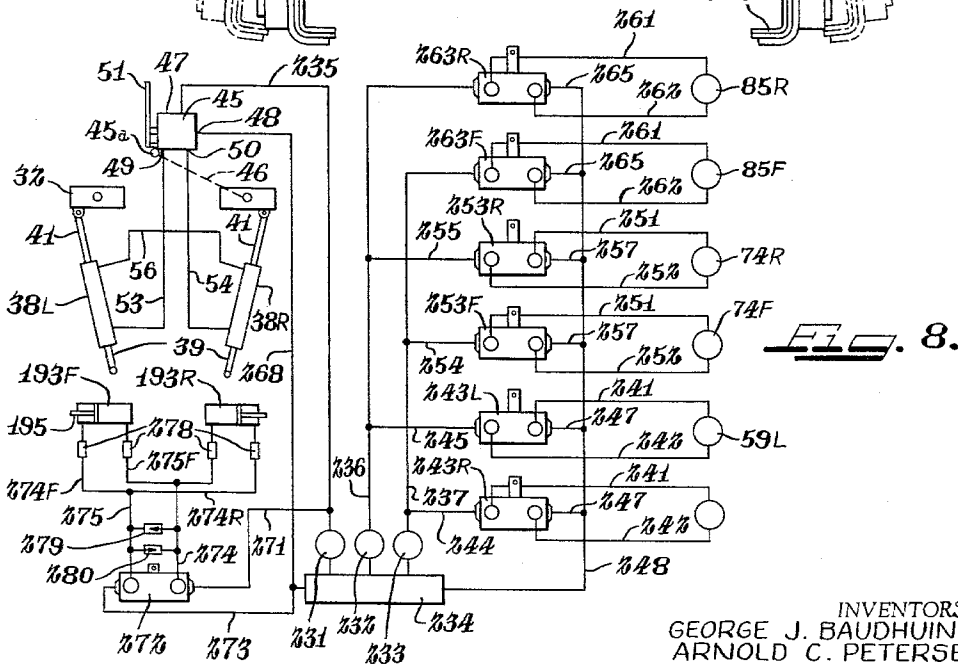
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MOBILE LIFT APPARATUS

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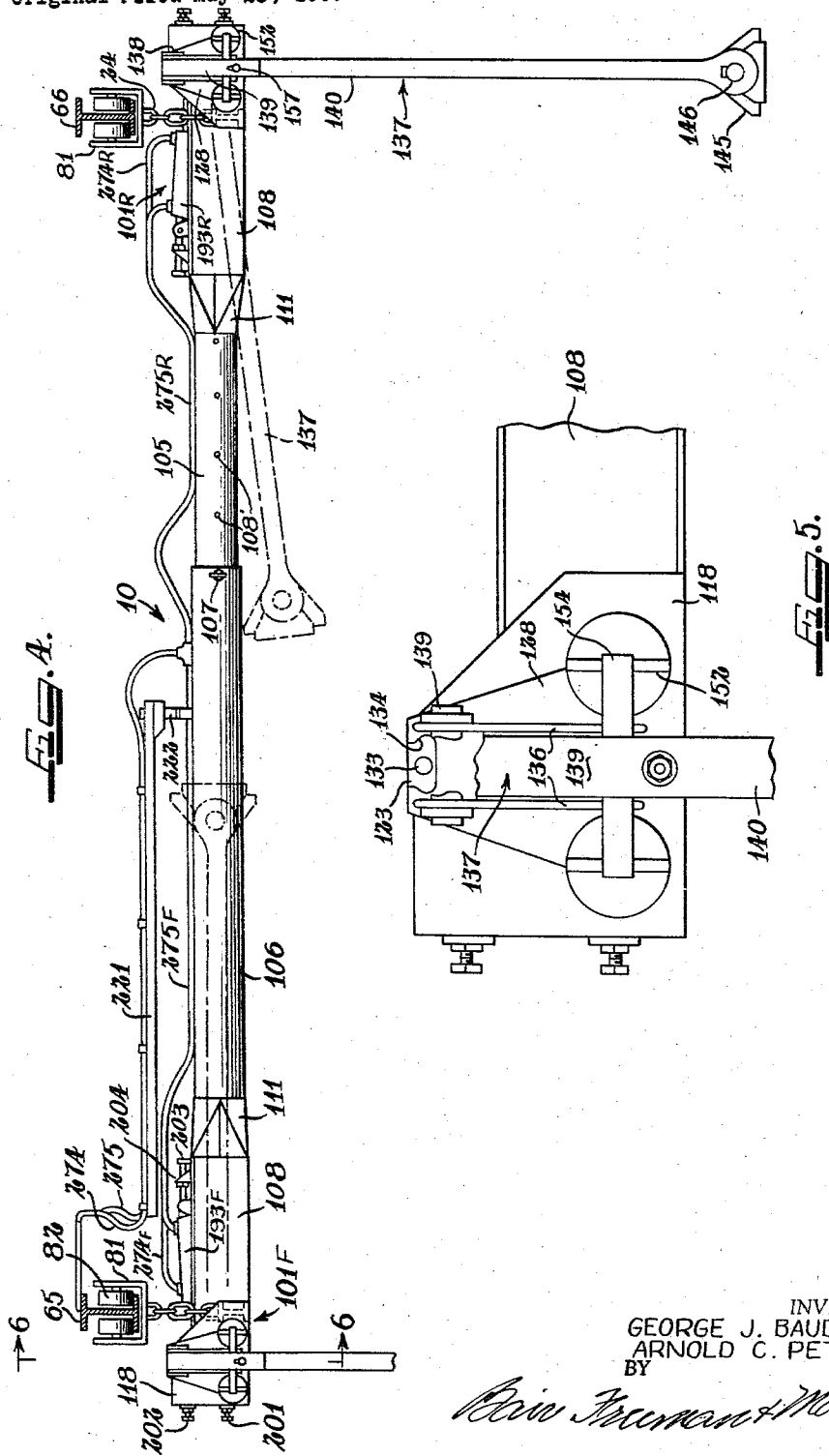
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MOBILE LIFT APPARATUS

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3,176,853

MOBILE LIFT APPARATUS

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Original application May 23, 1960, Ser. No. 30,947, now Patent No. 3,161,309, dated Dec. 15, 1964. Divided and this application July 8, 1964, Ser. No. 381,137
4 Claims. (Cl. 212—14)

This application is a division of our copending application, Serial No. 30,947, filed May 23, 1960, now Patent No. 3,161,309, issued December 15, 1964.

This invention relates to load handling apparatus and particularly to an improved grapple mechanism for use on a mobile lift for handling large articles.

An important object of this invention is to provide a lift apparatus of the type which is adapted to lift and transfer large units such as truck trailers, trailer bodies and the like between a railroad car and a loading station, and which has an improved grapple which enables handling of such large bodies without necessitating special fittings on the bodies.

Another object of this invention is to provide a grapple for handling large units such as truck bodies and the like, and which does not require a high overhead clearance when moving the grapple laterally into and out of position over the body or unit.

A more particular object of this invention is to provide a grapple for large objects and which has depending arms for engaging and supporting the body and in which the arms are foldable to a generally horizontal position to facilitate movement of the grapple into and out of position over the body.

Yet another object of this invention is to provide a grapple for handling large objects, in which the grapple can pick up and transfer the object even when there is some misalignment between the object and the grapple.

Still another object of this invention is to provide a grapple having depending load engaging arms for supporting the object and in which the arms are supported to enable limited movement in a direction longitudinally and crosswise of the lift apparatus to thereby accommodate minor shifting of the load due to inertia when moving the same without overstressing of the grapple mechanism.

A further object of this invention is to provide a grapple construction having opposed pairs of load supporting arms which are movable toward and away from each other into and out of a load supporting position and in which the arms are also swingable to a generally horizontal retracted position, and which grapple has a novel arrangement for manipulating the arms to effect movement of the same into and out of their article supporting position.

A still further object is to provide a load handling apparatus in which the load is supported on carriages movable on horizontal beams which are vertically movable in upright frames and which are guided by the frames securely to support the load.

These, together with various ancillary objects and advantages of this invention will be more readily appreciated as the same becomes better understood by reference to the following detailed description when taken in connection with the accompanying drawings wherein:

FIG. 1 is a perspective view of a mobile lift device having a load supporting grapple apparatus mounted thereon;

FIG. 2 is a top plan view of the grapple apparatus;

FIG. 3 is an end elevational view of the grapple apparatus illustrating the manner in which it is supported on the mobile lift;

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FIG. 4 is an elevational view of the left side of the grapple;

FIG. 5 is a fragmentary view taken on the plane 5—5 of FIG. 3 illustrating on a larger scale the mounting of the grapple arms on the frame;

FIG. 6 is a fragmentary transverse sectional view taken on the plane 6—6 of FIG. 4;

FIG. 7 is a fragmentary longitudinal sectional view taken on the plane 7—7 of FIG. 2; and

FIG. 8 is a schematic diagram illustrating the hydraulic circuit for the mobile lift and grapple.

The load handling apparatus of the present invention is generally adapted for use in handling relatively large objects such as truck trailers, demountable trailer bodies, and the like, to lift the same and move the bodies laterally and/or longitudinally for loading and unloading the same from a loading station, railroad car or the like, or, alternatively, to transport the bodies from one location to another. The load handling apparatus includes a grapple apparatus 10 for engaging and supporting the bodies, and which grapple apparatus is generally adapted for use with a mobile lift of the type which has mechanism for lifting the grapple and for moving the grapple laterally into and out of position over the body to be transported. One suitable mobile lift is shown in FIG. 1 and is of the type generally disclosed in the patent to George J. Baudhuin No. 2,909,298, and in the copending application of George J. Baudhuin and Arnold C. Petersen, Serial No. 854,921, filed November 23, 1959, now abandoned, for "Mobile Lift Device."

In general, the mobile lift includes first and second gantry-type frames designated 11 and 12, hereinafter sometimes referred to as the front and rear frames, it being understood that this designation is for convenience in describing the invention and that the mobile lift can be propelled in either direction. The front frame 11 includes spaced legs 13 and 14, herein shown formed with a box-type cross-section, and a connecting bridge 15 having a generally H-shaped cross-section. Spaced side members 17 and 18 are attached to the legs 13 and 14 and extend rearwardly therefrom. The rear frame 12 is similarly constructed and includes spaced legs 21 and 22 and a connecting bridge 23. The rear frame is advantageously mounted for adjustment toward and away from the front frame and for this purpose is attached to elongated bearing members or sleeves 27 which are slidable along the side members 17 and 18 and arranged to be locked in adjusted position, as by screws 28. Front and rear wheel mounting brackets or forks 32 and 33 are provided for supporting the lift device on wheels 34 and 35, respectively. At least one set of wheels is mounted for steering movement and as herein shown the front wheel forks 32 are mounted for turning movement about an axis aligned with the legs 12 and 13 of the front frame 10.

Turning of the front wheels is effected by hydraulic steering cylinders 38L and 38R on the left and right sides of the vehicle respectively. As best shown in FIG. 8, the steering cylinders are pivotally connected at 39 to a respective one of the side members 17 and 18 and a piston rod 41 on each cylinder is pivotally attached to a respective one of the front wheel forks 32 at a point spaced radially outwardly of the pivot axis of the forks. Fluid is supplied to the cylinders under the control of a 4-way valve 43 which is rotatable about an upright axis 45a and is connected through a linkage diagrammatically indicated at 46 to one of the front wheel forks for turning movement therewith. The valve has a pressure inlet 47, a return outlet 48 and service outlets 49 and 50. The valve also includes an operating lever 51 which is pivotal relative to the valve 48 about an upright axis and is operative when moved in one direction from its neutral posi-

tion to supply fluid pressure from the inlet port 47 to the line 53 leading to the left cylinder 38L and to simultaneously exhaust fluid from the right cylinder 38R through conduit 54 and return port 48. The ends of the cylinders at the other side of the pistons therein are hydraulically interconnected by a line 56 so that fluid displaced from one cylinder will be forced into the other cylinder to effect simultaneous substantially equal movement of the pistons in relatively opposite directions. Driving of the mobile lift apparatus may be effected in any desired manner and, as herein shown, hydraulic motors 59R and 59L are mounted on brackets 61 attached to the respective front wheel forks 32 for turning movement therewith, and are connected through a belt 63 to the front wheels 34.

Cross beams 65 and 66, herein shown as having a generally I-shaped cross-section, are mounted to extend between the legs of the front and rear frames. The cross beams are elevated and lowered by means of hoists 68R and 68F, each having a pair of drums 69 and 70 which are connected through cables 71 and 72 to relatively opposite ends of each cross beam to elevate and lower the latter. The drums of the front and rear hoists are driven by hydraulic motors 74F and 74R respectively. The cables 71 and 72 extend over idler pulleys 75 at the upper right corner of the respective frames, and over sheaves 76 and 77 on the bridges and cross beams respectively, to raise and lower the cross beam in response to operation of the winches. In order to minimize movement of the cross beams in a direction longitudinally of the winch, the ends of the cross beams have guide brackets 78 thereon which are guidably supported on vertical rails 79 attached to the upright posts 13 and 14 of the frames. Carriages 81 are mounted by rollers 82 on each of the cross beams 65 and 66 for movement therealong and the grapple 10 is mounted on the carriages for movement therewith crosswise of the mobile lift. The carriages are power operated by means of front and rear traverse winches 83F and 83R mounted on each of the cross beams 65 and 66, and the front and rear traverse winches include drums 84F and 84R which are driven by an hydraulic motor 85F and 85R respectively through a suitable speed reducing mechanism. A cable 86 is terminally attached to each of the carriages 81 and entrained over pulleys 87 and 88 at each end of the respective cross beams, the intermediate portion of the cable being wound around the drums 84F and 84R so that rotation of the drums will reversibly move the carriages along the cross beam.

The mobile lift apparatus is specifically designed for use in transferring truck trailers, and demountable trailer bodies onto and off from railroad cars and for this purpose the mobile lift has a width sufficient to enable the body B to be moved laterally onto and off from the railroad car or loading platform. The load handling grapple 10 is designed to facilitate movement of the grapple apparatus crosswise into and out of a position over the body B, and to selectively engage or disengage the body to enable transferring or transporting of the same.

The grapple apparatus 10 includes a frame having front and rear frame end sections 101F and 101R which are adjustably connected to each other by a beam 102. The end frame sections are similarly constructed and like numerals are used to designate corresponding parts. The beam 102 includes inner and outer telescopic members 105 and 106 which are attached to a respective one of the end frame sections and are telescopically interconnected. A fastening means such as a pin 107 is mounted on the outer section 106 and is adapted to be received in openings 108' (FIG. 4) in the inner section 105 to releasably secure the sections in adjusted position. The end frame sections 101 each include spaced longitudinally extending channel members 108 which are connected to the respective beam sections by a transition piece 111. Plates 113 are attached to the outer ends of the longitudinal members 108 and, as shown in FIG. 6, have aligned bearings 115 mounted thereon. A channel shaped

cross member 116 is secured to the outer end of the plates 113 and end plates 118 are affixed to the outer ends of the cross member. I-shaped crosspieces 119 extend between the respective end plates 118 and the longitudinal members 108, in parallel spaced relation to the cross member 116. Bearings 121 are provided in the end plates 118 and are aligned with the bearings 115 in the plates 113. A pair of aligned shaft sections 122 are rotatably supported in the bearings 115 and 121 for turning about an axis extending crosswise of the frame. A grapple arm drive plate 123 is non-rotatably attached to a sleeve 124 secured to the outer end of each of the shaft sections 122 and a key 125 extends into a peripheral slot 126 in the sleeve to hold the shaft sections against axial sliding movement while permitting free rotation thereof. A grapple arm mounting bracket, including a plate 128 and a tubular stub shaft 129, is supported at the outer ends of each of the shaft sections 122 for limited rotation relative thereto. A key 131 extends into a slot 132 in the stub shafts to non-slidably and rotatably support the stub shafts in the respective shaft section. As is apparent from FIG. 6, the plate 128 overlies the drive plate 123 and a pin 133 is mounted on the drive plate and extends through an arcuately elongated slot 134 (see FIG. 5) in the bracket plate to provide a lost-motion type drive between the plates 123 and 128.

The bracket 128 also includes spaced flanges 136 which extend laterally from the bracket plate 128. Elongated grapple arms 137 are pivotally supported by a pin 138 between the flanges 136 for movement about an axis disposed transverse to the axis of the shaft sections 122 and laterally offset thereabove as is clearly shown in FIG. 6. The grapple arms each have an angulated upper end portion 139 which extends downwardly and outwardly from the respective mounting bracket and an elongated generally straight lower end portion 140. The grapple arms have a generally box-type cross-section and a sheave 141 (FIG. 6) is rotatably supported by a pin 142 inside the grapple arm adjacent the juncture of the upper end portion 139 with the lower end portion 140. An opening 143 is formed at the inner side of the arms adjacent the pulleys or sheaves 141, for a purpose to be described hereinafter. Generally L-shaped support shoes 145 are mounted on the lower ends of each of the arms 137 and are preferably supported by means of a pin 146 for limited turning movement about an axis extending crosswise of the longitudinal axis of the frame to enable the shoes to tilt in a direction fore and aft of the vehicle to align the same with the underside of the object B being lifted.

The grapple arms 137 are thus supported on the brackets for swinging movement toward and away from each other between the load supporting position shown in solid lines in FIG. 3 to a release position shown in dotted lines.

The arms are yieldably urged to their release position by means of a pair of springs 151 (FIG. 6), each of which are disposed in a housing having telescopic sections 152 and 153 that are terminally attached to the grapple arm support bracket and the grapple arm. As best shown in FIG. 2, the springs are disposed at relatively opposite sides of each arm 137 and one housing section 152 is pivotally attached to ears 154 on the arm 137 and the other housing section 153 is attached by a fitting 155 to the bracket plate 128. The springs 151 yieldably urge the arms outwardly and a stop rod 157 is pivotally attached by a pin 158 between the flanges 136 and extends through opening 143 and the opening 158 in the arm. An adjustable stop nut 161 is threaded on the outer end of the rod and is adjustable therealong to limit the outward swinging movement of each of the arms.

The grapple arms 137 are drawn together by an apparatus which equalizes the pressure applied to the opposing pair of arms. For this purpose, a cable of 165 (FIG. 6) is entrained over the sheaves 141 of each op-

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posing pair of pulleys and is terminally attached to an anchor pin 166 mounted on the flanges 136 of the mounting bracket. The cables extend through the tubular shaft sections 122 and over upper and lower pulleys 167 and 168 located medially between the ends of the shaft sections. The pulleys 167 and 168 are rotatably mounted by a pin 169 on the pulley support plate 171 located between the plates 113. The pulley support plate 171 is rigidly secured as by welding to the cross member 116 and to a crosspiece 173 which extends between the plates 113, and an opening 174 is provided in the crosspiece 173 to permit the cable 165 to extend therethrough. The cable 165 extends over an equalizing sheave 176 which is supported in a yoke 177. The yoke has a rod 178 attached thereto and which extends through a sleeve 179 having lateral trunnions 181 which are supported between spaced bell cranks 182 on the respective frame end sections. The bell cranks, as shown in FIG. 7, are pivotally mounted by a pin 183 on a bracket 184. The latter bracket is attached to channel-shaped crosspieces 185 and 186 which extend between the longitudinally extending members 198. As is apparent, when the equalizing sheave 176 is drawn to the right as shown in FIG. 7, the cable 165 will draw the arms toward each other against the bias of the springs 151. Since the cable passes freely over the equalizing sheave, the pressure applied to the opposed pair of arms will be equalized and, if one arm engages the load before the other arm of that pair, as when the grapple is not centered over the load, then one arm will be drawn a relatively greater distance inwardly to properly pick up the load. When the arms are drawn inwardly, the equalizing sheave will maintain substantially the same spacing between the arms, but will permit limited relative parallel shifting of the arms. Consequently, the arms can swing relative to the grapple when the load is lifted to properly center the load with respect to the grapple frame, and to also permit inertial shifting of the load relative to the frame when the grapple frame is moved laterally.

The arms 137 are also adapted to be swung about the axis of the shaft sections 122 between the depending position shown in solid lines in FIG. 4, and the retracted position shown in dotted lines in that figure, to enable the grapple to be moved crosswise of the load such as the trailer B without requiring the grapple to be elevated the full length of the arms above the load. This is achieved by means of crank plates 191 (FIGS. 6 and 7) which are attached as by fasteners 192 to the adjacent ends of the aligned pairs of shaft sections 122. The pin 133 on the drive plate 123 and the slot 134 of the grapple arm mounting brackets permits limited angular lost-motion of the grapple arms in a direction longitudinally of the vehicle to accommodate inertial shifting of the load when moving the same in a direction longitudinally of the frame. However, when the shaft 122 is turned through a relatively greater angle than the lost-motion provided by the pin and slot construction, the arms are swung upwardly to a generally horizontal position disposed substantially in the plane of the frame. When the arms are in this position, the grapple can be moved laterally into and out of a position over the object being moved.

In order to simplify the operation of the grapple, and to also reduce the number of hydraulic lines which must be extended to the grapple frame, a common operator is provided for controlling movement of the opposed pairs of arms toward and away from each other and for also swinging the front and rear pairs of arms upwardly to their retracted position. The common operator comprises fluid cylinders designated 193F and 193R for the front and rear pairs of arms respectively. Each cylinder has a piston rod 195 and, as shown in FIG. 7, one end of the cylinder 193 is pivotally attached by a pin 196 between the bell cranks 182, and the rod 195 is connected by a yoke 198 to a crank pin 199 connected to

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the crank plates 191. A pair of adjustable stop screws 201 are threaded in the cross member 116 and are arranged to engage stop fingers 200 formed on each of the crank plates 191 to limit downward swinging movement of the respective grapple arm. A second pair of stop screws 202 are also threaded in the cross member 116 and arranged to engage the respective one of the crank plates 191 to limit upward swinging movement of the grapple arms. A third adjustable stop screw 203 is threaded in a bracket 204 on the crosspiece 186 and is arranged to engage the bell crank 182 to limit movement of the same during extension of the fluid operator. As previously noted, the arms are moved to their lower position and are drawn together, when the fluid operator is retracted as shown in solid lines in FIG. 7. As fluid is supplied to the operator to extend the same, the weight of the grapple arms 137 will tend to inhibit upward swinging movement so that the operator will initially move the bell crank toward the dotted position shown in FIG. 7. This allows the equalizing sheave 176 to move outwardly, that is to the left as viewed in FIG. 7, and enables the grapple arms 137 to swing outwardly under the bias of springs 151. When the bell crank 182 engages the stop screw 203, further extension of the bell crank will rotate the shaft sections 122 and swing the arms upwardly to a generally horizontal position shown in dotted lines in FIG. 4. As the arms reach their retracted position, the crank plates 191 engage the stop fingers 202 to stop further movement of the drive plates 123. When the operator is thereafter retracted, the weight of the arms will initially draw the arms downwardly until the stop finger 200 on the crank plates engages the stop 201. Further retraction of the operator will swing the bell crank to the full line position shown in FIG. 7 and draw the arms inwardly to their load supporting position shown in full lines in FIG. 3.

The end frame sections are supported on the carriages 81 by spaced sets of links 211 which extend between the cross-pieces 119 and the respective carriage 81. The links permit limited angular shifting of the frame relative to the respective carriage, to facilitate alignment of the grapple frame with the object to be lifted. An hydraulic line support arm 221 is pivotally mounted by a pin 222 on the support frame intermediate the ends of the latter, for horizontal swinging movement relative to the frame. The hose support arm extends to a point adjacent one end of the grapple frame and the hydraulic supply and return lines 274 and 275 extend from a point intermediate the ends of the cross beams 65 through a slack loop onto the support arm. The other ends 274F, 275F and 274R and 275R of the hydraulic lines are connected to the fluid operators at the front and rear ends of the grapple frame.

Reference is now made more specifically to the hydraulic control circuit shown in FIG. 8. Fluid is supplied to the several hydraulic motors and operators from three pumps designated 231, 232, and 233, each having their inlets connected to a reservoir 234 and their outlets respectively connected to supply lines 235, 236 and 237. The left and right drive motors 59L and 59R are connected through conduits 241 and 242 to flow reversing valves 243L and 243R. The valve 243R is connected through a conduit 244 to the supply line 237 and the valve 243L is connected through a conduit 245 to the supply line 236. The valves are each otherwise connected through conduits 247 to the return line 248. The front and rear hoist motors 74F and 74R are connected through conduits 251 and 252 to flow reversing valves 253R and 253F. The valve 253F is connected through conduit 254 to the supply line 237 and the valve 253R is connected through conduit 255 to the supply line 236. The valves 253 each have a conduit 257 connected to the return line 248. Similarly, the front and rear traverse winch motors 85F and 85R are connected through conduits 261 and 262 to reversing valves 263R and 263F. Fluid is supplied to valve 263F

from supply line 237 and to valve 263R from supply line 236, and return lines 265 connect each of these valves to the return line 248. The other pump 231 has its supply line 235 connected to the inlet port 47 or the steering valve 45, and the return port 48 of the steering valve is connected through conduit 268 back to the reservoir 234. The pump 231 also is advantageously used to supply fluid to the front and rear grapple operating cylinders 193F and 193R respectively. As shown, the supply line 235 is connected through a conduit 271 to a flow reversing valve 272, and a return line 273 connects the valve 272 back to the reservoir 234. The controlled outlet ports of the valve 272 are connected through a conduit 274 and branch lines 274R and 274F to both of the grapple cylinders 193, at one side of the piston therein. The other controlled line 275 is connected through branches 275F and 275R to both of the grapple cylinders at the other side of the pistons therein, and adjustable flow control valves 278 are provided in each of the branches to enable independent adjustment of the rate of flow to each of the ends of the cylinders. Cross relief valves 279 and 280 are connected between the controlled lines 274 and 275 to limit the maximum pressure supplied to the grapple cylinders.

From the foregoing it is thought that the operation of the load handling apparatus will be readily understood. The mobile lift can be steered and propelled under the control of valves 45 and 243L and 243R to locate the lift in a position straddling a railroad car or a loading station. The grapple apparatus 10 is then operated under the control of valve 272 to swing the arms 140 downwardly to a position along opposite sides of the article to be picked up and the opposed pairs of arms thereafter drawn inwardly to the solid line position shown in FIG. 3 to engage and support the article. The article is then elevated by the hoists under the control of valves 253F and 253R, and the article is moved laterally by the traverse winch under the control of valves 263F and 263R. By reason of the limited lost motion between the arm mounting plate 128 and the drive plate 123, and the equalizing action of the equalizer sheave 176, the arms can shift somewhat relative to the grapple frame due to inertia of the load. Further, the front and rear pairs of grapple arms can be adjusted toward and away from each other by adjusting the telescopic sections 105 and 106 of the grapple frame while adjusting the relative spacing between the front and rear gantry frames of the mobile lift.

After the load B has been picked up by the grapple, it can be moved laterally onto or off from the loading station or railroad car, or, alternatively, the lift can be operated to transport the load to a different location. Since the grapple arms can be folded to a generally horizontal position, they do not interfere with the movement of the grapple frame into and out of a position above the object to be moved. Preferably, the stops 202 which control the upper positions of the grapple arms are adjusted so that the arms at the front and rear of the frame are offset from each other when the arms are raised, as shown in dotted lines in FIG. 4, so that the arms do not interfere with each other when the frame members 105 and 106 are adjusted to a position in which the grapple arms would overlap.

While one embodiment of the invention has been shown and described herein, it will be understood that it is illustrative only and not to be taken as a definition of the scope of the invention, reference being had for this purpose to the appended claims.

What is claimed is:

1. A mobile lift apparatus including first and second gantry-type frames each including a bridge portion and depending legs, a side beam attached to each of the legs of said first frame, a bearing member slidably mounted on each of said side beams, the legs of said second frame being attached to said bearing members for movement toward and away from said first frame, support wheels attached

to said first and second frames, first and second transverse beams respectively extending between the legs of said first and second frames, power means mounted on each of said first and second frames and having cables attached to the ends of the respective ones of said transverse beams for elevating and lowering the same, a vertical guide rail on each of the legs of said first and second frames, a guide on each of said rails, means connecting the guides to the respective transverse beams to inhibit movement of the transverse beams in a direction longitudinally of the lift apparatus, carriage means on each transverse beam, a cradle including first and second sections attached to said carriages respectively and adjustable relative to each other in a direction longitudinally of the lift apparatus as said first and second frames are moved toward and away from each other, and means on said cradle for supporting the object to be lifted by the lift apparatus.

2. In a mobile lift apparatus including first and second gantry-type frames and spaced side members, means attaching said first frame to said side members, means attaching said second frame to said side members for adjustment toward and away from said first frame, an elongated cradle, a first lift means connected to said first frame and to said cradle adjacent one end thereof for elevating and lowering said one end of the cradle and for moving the cradle crosswise of the lift apparatus, a second lift means connected to said second frame and to said cradle adjacent the other end thereof for elevating and lowering said other end of the cradle and for moving the cradle crosswise of the lift apparatus, said first and second lift means each include a beam extending transverse to the lift apparatus, and means guidably mounting the ends of each beam on a respective one of the frames for vertical movement thereon while preventing movement of the beams longitudinally of the lift apparatus, said cradle including first and second interconnected sections adjustable relative to each other in a direction longitudinally of the lift apparatus when said first and second frames are adjusted toward and away from each other, and first and second grapple means on said first and second sections of the cradle adjustable with said sections to accommodate loads of different length.

3. A mobile lift apparatus comprising first and second gantry type frames each including an upper bridge portion and spaced parallel vertical legs, a pair of side members connecting the frames in spaced parallel relationship, support wheels mounted on said first and second frames to support them for movement over the ground, first and second horizontal beams respectively extending between the legs of the first and second frames, power means mounted on each of the first and second frames and having cables attached to the beams respectively for raising and lowering the beams, means on each of the legs forming a vertical guide surface, a guide member at each end of each of the beams slidably engaging one of the guide surfaces to guide the beams for vertical movement while preventing swinging thereof out of the plane of the legs, a carriage mounted on each of the beams and movable lengthwise thereof, an elongated cradle connected at its ends to the carriages respectively, and grapple means carried by the cradle to engage and support a load.

4. A mobile lift apparatus comprising first and second gantry type frames each including an upper bridge portion and spaced parallel vertical legs, a pair of side members connecting the frames in spaced parallel relationship, support wheels mounted on said first and second frames to support them for movement over the ground, the side members and frames being so constructed and connected as to provide for adjustment of the frames toward and away from each other, first and second horizontal beams respectively extending between the legs of the first and second frames, power means mounted on each of the first and second frames and having cables attached to the beams respectively for raising and lowering the beams,

means on each of the legs forming a vertical guide surface, a guide member at each end of each of the beams slidably engaging one of the guide surfaces to guide the beams for vertical movement while preventing swinging thereof out of the plane of the legs, a carriage mounted on each of the beams and movable lengthwise thereof, an elongated cradle connected at its ends to the carriages respectively, the cradle being formed in two sections adjustably connected to each other for relative movement in a direction lengthwise of the cradle, and grapple means

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carried by the cradle actions to engage and support a load.

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