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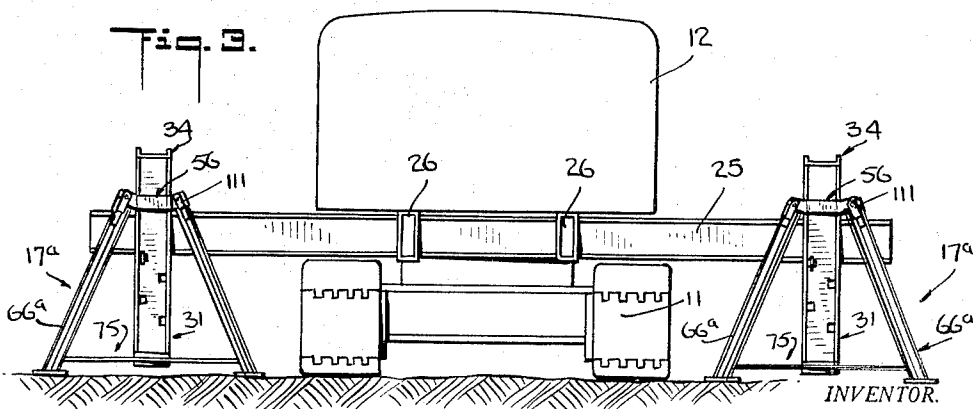
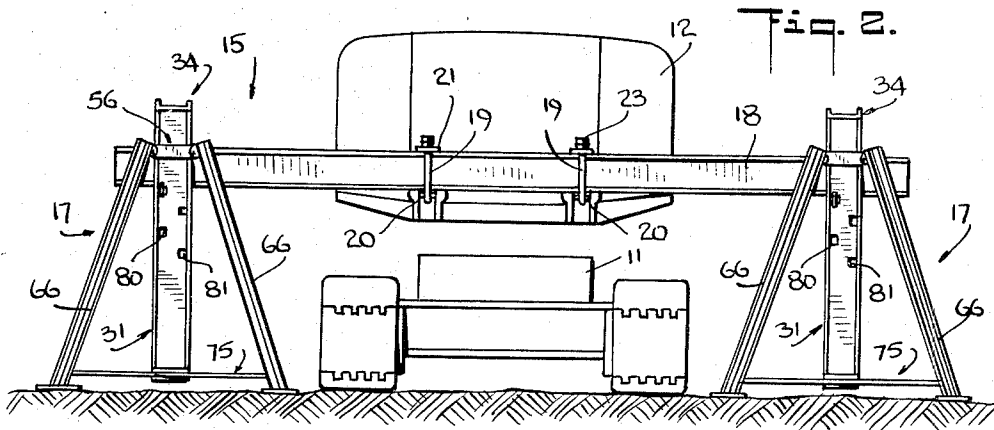
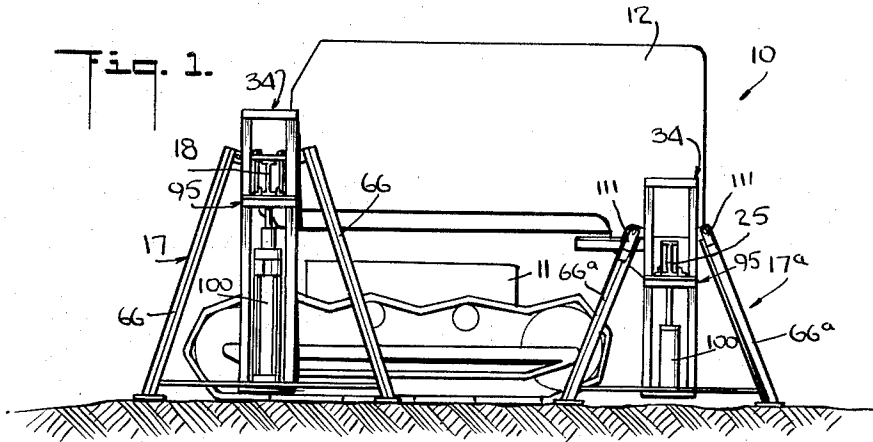
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2,958,508

DEVICE FOR LIFTING HEAVY EQUIPMENT

Filed May 23, 1955

3 Sheets-Sheet 1



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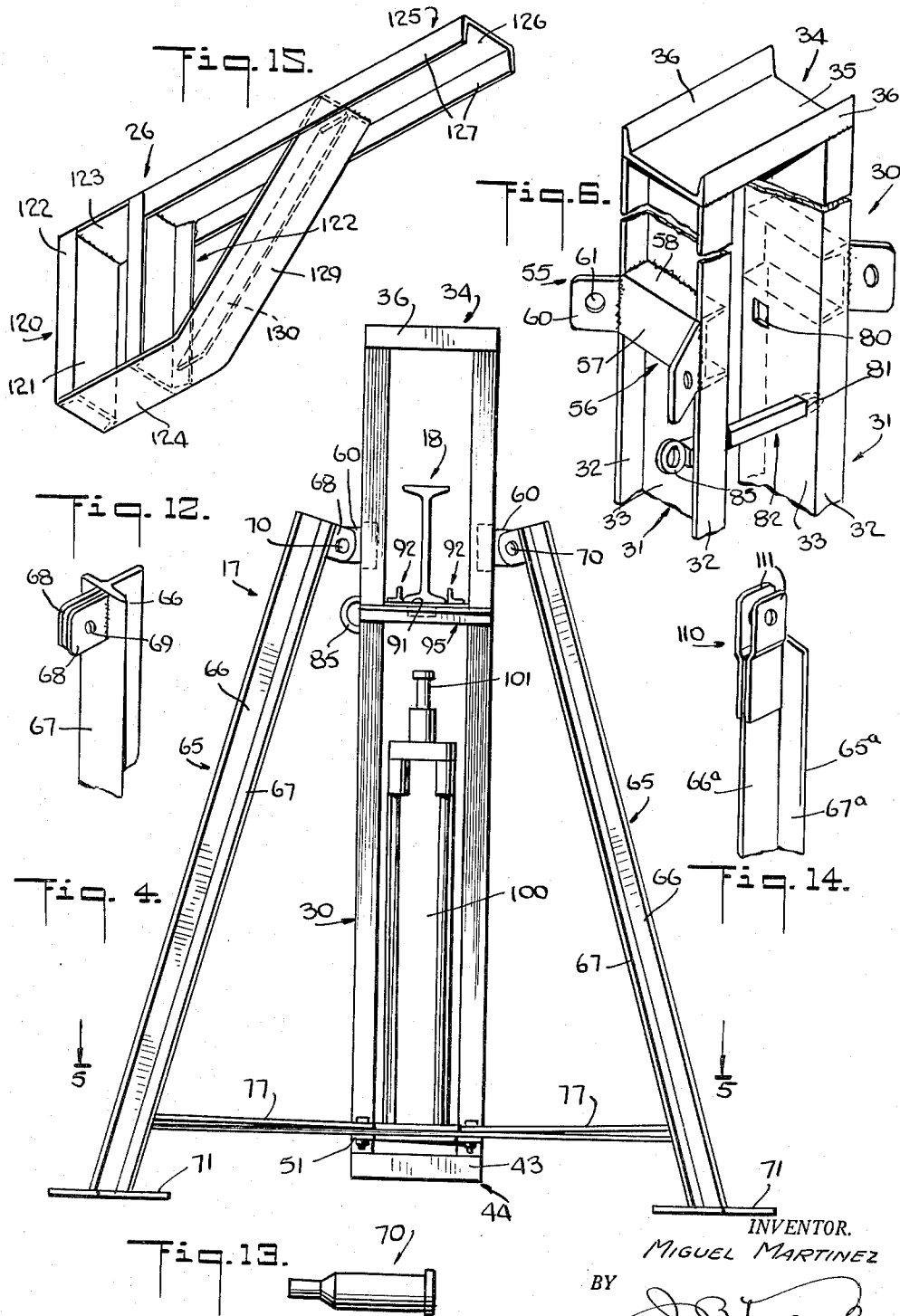
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DEVICE FOR LIFTING HEAVY EQUIPMENT

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3 Sheets-Sheet 2



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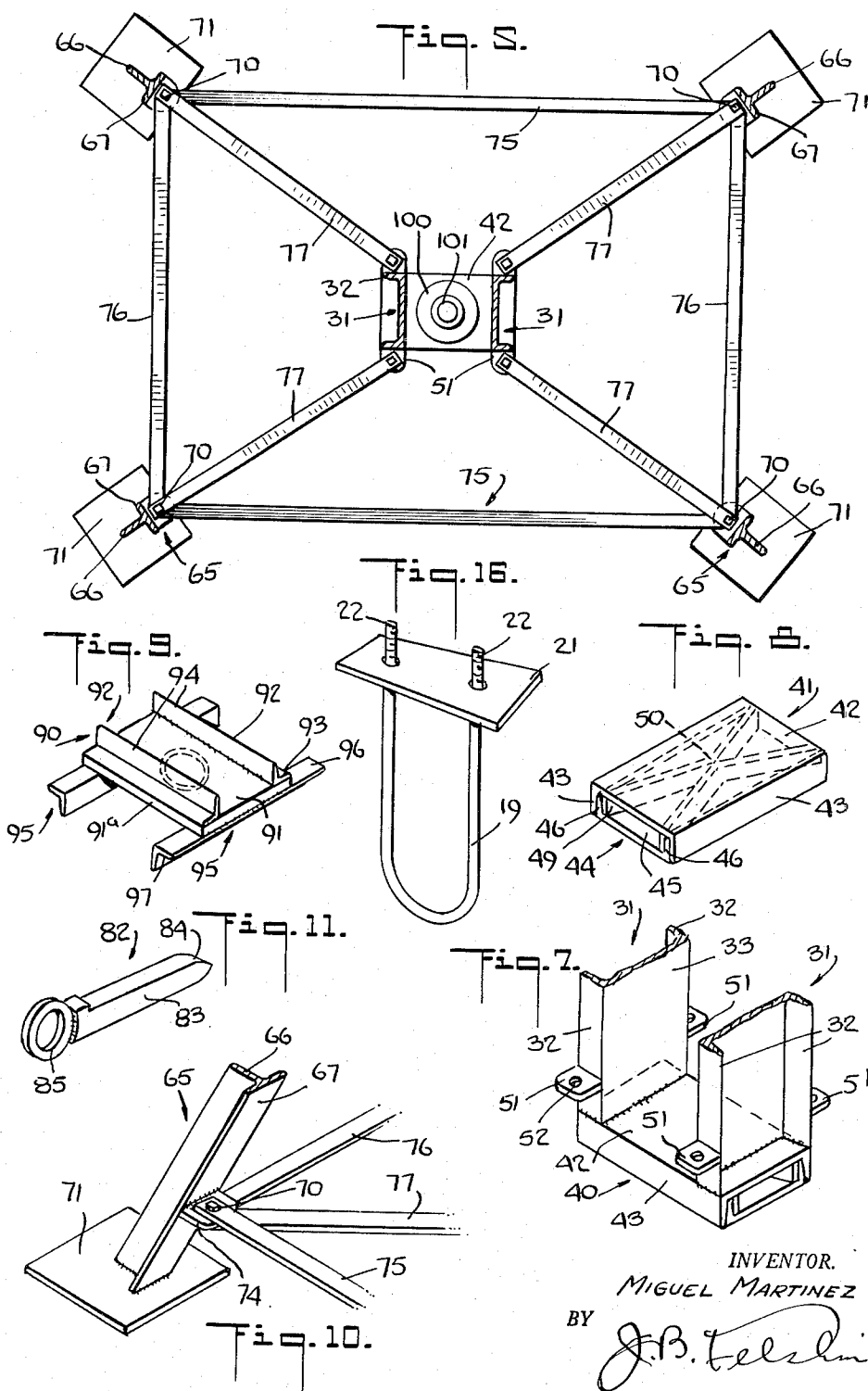
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DEVICE FOR LIFTING HEAVY EQUIPMENT

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3 Sheets-Sheet 3



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DEVICE FOR LIFTING HEAVY EQUIPMENT

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This invention relates to a device to lift heavy equipment.

Difficulty has been experienced with earth moving tractor-operated excavating, digging and the like equipment. One of such difficulties has been the fact that such equipment is so heavy that it cannot be moved over many bridges which could support either the tractor or body of such equipment separately. It is therefore one object of the present invention to provide a highly improved mechanism for lifting the body of such equipment, so that the tractor may be removed and transported separately, and also, to permit the body to be placed on a trailer and moved over a bridge separately from the tractor.

Another advantage of the mechanism embodying the present invention, is to permit working on the underside of the body of such equipment as for example, when making repairs.

The equipment embodying the present invention comprises a pair of front jacks supporting a cross beam connected to the front of the body, and a pair of rear jacks supporting a cross beam connected to the rear of the body. These jacks each comprise a jack pump which may be hydraulically or air operated, or operated in some other way. These pumps may be operated separately by four men or they may be connected together to a single oil or air pump to pump all four jack pumps at once through proper pipe connections.

Another object of this invention is to provide in a device of the character described, a jack comprising four inclined legs pivoted at their upper ends to a center guide post, the lower end of the post being connected by links to lower position of the legs, a hydraulic jack pump being positioned within the centerpost and resting on its lower end, and a slider being slidably mounted on the centerpost and adapted to be raised by the jack pump, said slider supporting one end of a cross beam attached to the body of the tractor-operated equipment.

Another object of this invention is to provide apparatus of the character described which may be quickly set up or disassembled and which shall be rugged, strong and durable and capable of lifting heavy truck bodies.

In accordance with the present invention, the two front jacks are substantially similar to the two rear jacks, except that the front jacks are taller, and one embodies a slight modification of the other.

Still a further object of this invention is to provide a strong, durable and rugged device of the character described which shall be relatively inexpensive to manufacture, and which shall be relatively inexpensive to a high degree in use.

These and other objects and advantages will become apparent from the consideration of the description following, taken in connection with the accompanying drawings illustrating one operative embodiment by way of example.

In the drawings, wherein like reference numerals denote corresponding parts throughout the several views:

Fig. 1 is a side elevational view of a device to lift heavy equipment embodying the invention, and showing the body of earth removing equipment lifted off the tractor;

Fig. 2 is a front elevational view of the structure shown in Fig. 1;

Fig. 3 is a rear elevational view of the structure shown in Fig. 1;

Fig. 4 is a side elevational view of one of the front jacks;

Fig. 5 is a cross sectional view taken on line 5—5 of Fig. 4;

Fig. 6 is a perspective view of the upper end of the centerpost of the jack shown in Fig. 4;

Fig. 7 is a perspective view of the lower end of said centerpost;

Fig. 8 is a perspective view of the bottom jack pump supporting end of the centerpost;

Fig. 9 is a perspective view of the beam-supporting slider of the centerpost;

Fig. 10 is a perspective view showing the connections for the links which support the lower end of the centerpost to one of the legs of the front jack;

Fig. 11 is a perspective view of a supporting pin for supporting the slider on the center post;

Fig. 12 is a perspective view of the upper end of one of the inclined legs of the front jack;

Fig. 13 is a side elevational view of one of the bolts used for hinging the legs of the center post;

Fig. 14 is a view similar to Fig. 12, but illustrating the upper end of one of the legs of a rear jack;

Fig. 15 is a perspective view of one of the front beam-receiving members; and

Fig. 16 is a perspective view of one of the front beam-receiving members.

Referring now in detail to the drawings, 10 designates excavating equipment of usual construction comprising generally a tractor 11 and a body 12. The drawing furthermore illustrates a device 15 embodying the invention for lifting the body 12 off the tractor 11. Said device 15 comprises generally a pair of similar front jacks 17 supporting a front cross beam 18, passing through a pair of U-bolts 19 engaging pins 20 at the front end of the body. On the U-bolts are spacer plates 21 through which the threaded ends 22 of the U-bolts pass. Nuts 23 are screwed to the threaded ends 22 of the U-bolts.

The device further comprises generally a pair of rear jacks 17a similar to the jacks 17 except as hereinafter described, and supporting a rear transverse beam 25 passing through a pair of members 26 (see Fig. 15) engaged beneath the rear end of the body 12.

The front jack 17 comprises a center-post 30. Said centerpost 30 comprises a pair of parallel spaced, vertical, opposed channel members 31, each comprising parallel flanges 32 connected by a web 33. The webs 33 of members 31 are parallel to each other and the flanges 32 of one member 31 are in alignment with the flanges 32 of the other member 31. The upper ends of the two channel-shaped members 31 are interconnected by a top channel-member 34 comprising a web 35 having parallel upstanding channels 36. The web 35 of the channel-member 34 is welded to the top edges of the web and flange portions of the two members 31. It will be noted that the flanges 36 are at right angles to the webs 33.

The lower ends of the channel members 31 are welded to a lower supporting member 40 (see Figs. 7 and 8). Member 40 comprises a top channel member 41 having a top web portion 42 and downwardly extending parallel

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side flanges 43. Fitted within the channel 41 is a channel 44. The channel 44 comprises a bottom web 45 parallel to web 42 and side flanges 46 contacting the inner sides of the flanges 43. Between the webs 42 and 45 are inserted a pair of opposite V-shaped bars 49. The apices 50 of the bars 49 contact one another while the outer ends of the arms of the V-shaped bars 49 contact the inner sides of the outer ends of the flanges 46. The channel-shaped members 41 and 44 and the bars 49 are welded together and the top web 42 is welded to the lower ends of the webs 33 and flanges 32 of members 31. It will be noted that the flanges 43 are at right angles to the webs 33. Welded to the flanges 32, several inches above the lower ends of said flanges, are apertured ears 51 for the purpose hereinafter appearing. These ears 51 are each formed with a through opening 52.

Referring now to Fig. 6, it will be noted that there is welded within each of the channel members 31 below the upper end thereof, a bracket 55. Each bracket 55 comprises a channel-shaped member 56 having a web 57 from which extend flanges 58. The flanges 58 extend from one flange 32 to the opposed flange 32. The flanges 58 are horizontal, one above the other, and the web 57 is parallel to the web 33 and located substantially in alignment with the outer edges of the flanges 32. Said channel 56 is welded at all its outer edges to the channel 31. Welded to the outer ends of the webs 37 are inclined ears 60. The ears 60 are in vertical, diagonal planes, and each is formed with an aperture 61. Said ears 60 project at an angle of 45° to the planes of the flanges 32.

The centerpost 30 is supported by four similar, diagonal, inclined legs 65. Each leg 65 is of T-shaped cross section and is inclined. Each leg 65 comprises a flange 66 which extends outwardly from the center of a web 67. Welded to the upper end of the web 67 of each leg are a pair of spaced parallel, apertured ears 68, each formed with an aperture or through opening 69. Each pair of ears 68 receives therebetween one of the ears 60. The opening 69 registers with the opening 61. Extending through each pair of registering openings 61, 69 is a bolt 70 shown in Fig. 13. The lower end of each leg 65 is cut at an incline, and welded thereto is a horizontal foot plate 71. It will be noted that the legs 65 extend diagonally inwardly and upwardly from four corners.

Welded to the inner surface of the web 67 of each leg 65 (see Fig. 10), several inches above its lower end, is an apertured ear 74 each receiving a through-bolt 70. The bolts 70 on the ears 74 are interconnected by links 75 and 76. Said bolts 70 are also interconnected by links 77 to bolts 70 passing through openings 52 in the ears 51. Thus the links 77 are diagonal, whereas the links 75 and 76 form a rectangle. The ears 74 are substantially at the level of the ears 51.

The webs 33 are formed with pairs of aligned, square openings 80 located on one side and alternating with openings 81 located on its opposite side. The openings 80 and 81 are at different levels. Extending through one pair of openings 80 or 81 is supporting pin 82 (see Figs. 6 and 11). Each pin 82 comprises a square bar 83 having a beveled off front end 84. Welded to the rear end of bar 83 is a hand ring 85. The pin 82 may be removed from one pair of openings 80 or 81 at one level and inserted through another pair of such openings on another level, as will be seen hereinafter.

Slidably mounted on the centerpost and between the channel-shaped members 31 thereof, is a slider 90 (see Figs. 4 and 9). The slider 90 comprises a flat rectangular plate 91 to opposite sides of which are welded angle-irons 92. Each angle-iron 92 has an outwardly extending bottom flange 93, contacting and welded to the plate 91, and an upstanding flange 94. The flanges 94 are parallel to one another and are spaced inwardly from the outer edges 91a of the plate 91. Welded to the

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undersides of the ends of the plate 91 are a pair of parallel angle-irons 95. The angle-irons 95 are at right angles to the angle-irons 92. Each angle-iron 95 comprises a top flange 96 contacting the underside of plate 91 and a downwardly extending flange 97. The outer edges of the flange 96 are co-extensive with the end edges of the plate 91. The outer ends of the angle-irons 95 extend beyond the end edges 91a of plate 91. It will now be understood that the plate 91 is disposed between the webs 33 of channel-shaped members 31. The outer ends of the angle-irons 95 contact the outer sides of the flanges 32 of the channel-shaped members 31. The angle-irons 92 pass between the webs 33 of the channel-shaped members 31.

The front cross beam 18 rests on the plate 91 and between the flanges 94 of the channel-shaped members 92 as shown in Fig. 4 of the drawing. Said slider may be supported on the pin 82 when said pin is inserted in a pair of openings 80 or 81. Thus the slider may be supported at various heights by the pin 82.

Supported on the member 41 is a hydraulic jack pump 100 of any suitable construction. Said pump is disposed between the webs 33 and its plunger 101 may contact the underside of the plate 91. The four jack pumps 100 may be simultaneously actuated by four men, or they may be connected by suitable connections to a single hydraulic pressure system. Air jack pumps may be used instead of hydraulic ones.

The rear jacks 17a differ from the front jacks only in that they are lower, and also in a detail shown in Fig. 14. In Fig. 14 there is shown a leg 65a of one of the rear jacks. Said leg 65a comprises an inwardly extending flange 66a extending from an outer web 67a. The leg 65a is of T-shaped cross section like the leg 65. However, a pair of ears 110 are welded to the upper end of the flange 66a. These ears have spaced apertured walls 111 to receive the ears 55 on the centerpost of the rear jacks.

The members 26 for supporting the rear beam 25 may each comprise a pair of spaced parallel opposed channel-members 120 having parallel webs 121 and aligned flanges 122. The upper and lower ends of said channel-shaped members 112 are interconnected by a top plate 123 and by a bottom plate 124. Extending to one side of the upper end of one of the channel members 112, is a top channel 125 having a top web 126 and downwardly extending side flanges 127. Interconnecting the bottom plate 124 with the underside of the web 126 is an inclined plate 129 provided with a central supporting or bracing rib 130. The rear beam 25 passes between the channel members 122. The top plates 123, 125 engage beneath the rear end of the truck body 12 for supporting said body. The front end of the body is supported on the front cross beam 18 passing through the bolts 19. Thus, when the four jack pumps 100 are simultaneously operated, the two cross beams 18 and 25 are simultaneously raised for lifting the body 12.

While the invention has been described in relation to the lifting of a tractor body, it will be understood that other objects or heavy equipment may be lifted with the device described and disclosed herein and embodying the present invention.

It will thus be seen that there is provided an apparatus in which the several objects of this invention are achieved and which is well adapted to meet the conditions of practical use.

As possible embodiments might be made of the above invention, and as various changes might be made in the embodiment above set forth, it is to be understood that all matter herein set forth or shown in the accompanying drawing is to be interpreted as illustrative and not in a limiting sense.

I claim:

1. A jack comprising a centerpost, said centerpost

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comprising a pair of vertical, channel-shaped members having vertical, parallel, spaced webs and aligned flanges extending outwardly from one another, a top plate welded to the upper ends of said vertical channel-shaped members, a bottom member welded to the lower ends of said vertical channel-shaped members, transverse members aligned with one another and disposed within the channel-shaped members of said centerpost and welded thereto, outwardly inclined apertured ears welded to the ends of said transverse members, upwardly and inwardly inclined diagonal legs bolted to said apertured ears, ears welded to the flanges of said vertical channel-shaped members above said bottom member, apertured ears welded to said legs above their lower ends, links interconnecting each pair of adjacent legs by bolts passing through the apertured ears at the lower ends of said legs, diagonal links interconnecting the ears at the lower ends of said legs with the ears at the lower ends of said channel-shaped members, a slider slidably mounted between the vertical channel-shaped members of said centerpost and means on the centerpost to raise the slider.

2. The combination of claim 1, the webs of said channel-shaped members being formed with aligned pairs of openings and a pin received within a pair of said openings and transversing the space between said webs for supporting said slider.

3. The combination of claim 2, said slider comprising a plate disposed between the webs of said channel-shaped members of the centerpost and a pair of angle-irons welded to the underside of the plate and extending therebeyond, and contacting the outer sides of the flanges of said channel-shaped members.

4. The combination of claim 3, and a second pair of angle-irons welded to the top of the plate and disposed parallel to said webs.

5. The combination of claim 1, said bottom members comprising a channel having a top web and downwardly extending flanges and a second channel having a bottom web and upwardly extending flanges fitted within the first channel of said bottom member, and a pair of oppositely extending V-shaped bars between the webs of the channels of said member and welded thereto.

6. A pair of jacks, each comprising a centerpost, having opposed vertical walls, a plurality of inclined diagonal legs detachably attached at their upper ends to the centerpost, links detachably attaching the legs to each other and to the lower ends of the centerpost, said centerpost having a bottom member and a top member interconnecting said opposed vertical walls, a slider slidably mounted on the centerpost and between said vertical walls, the opposed walls of one centerpost being aligned with the opposed walls of the other centerpost, a cross beam having its ends received between the vertical walls of said centerposts and resting on said sliders, and a fluid jack pump on the centerpost of each jack, resting on the bottom member thereof and between the vertical walls thereof, and below said slider for raising the slider whereby the height of the cross beam may be varied in combination with a pair of members receiving the cross beam therethrough and adapted to engage an object to be lifted.

7. The combination of claim 6, in combination with means to fix each slider to its centerpost at different heights for retaining said slider at said height even when the jack pump is released.

8. A jack support, comprising a centerpost, said centerpost comprising a pair of opposed parallel symmetrically arranged walls, a platform interconnecting the

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lower ends of said walls, means to interconnect the upper ends of said walls, a pair of outwardly inclined apertured ears below the upper end of each wall, a slider slidably mounted between said walls for vertical movement, means on the centerpost to raise the slider, said slider having guides contacting said walls, a pair of outwardly extending apertured ears fixed to the lower end of each wall, a pair of inclined legs having apertured ears at their upper ends registering with the outwardly inclined apertured ears on each of said walls, pins interconnecting the outwardly inclined apertured ears on the walls with the apertured ears on said legs, said legs being provided with apertured ears adjacent their lower ends, links connecting the outwardly extending apertured ears at the lower end of each wall with the ears adjacent the lower ends of a pair of said legs, and links interconnecting the apertured ears adjacent the lower end of each leg with the apertured ears at the lower ends of a pair of adjacent legs.

9. In combination, a pair of jack supports, each of the jack supports comprising a centerpost, said centerpost comprising a pair of parallel spaced opposed walls, a platform interconnecting the lower ends of each pair of walls, means interconnecting the upper ends of each pair of walls, a slider for each of said pair of jack supports, each slider being slidably mounted for vertical movement between each pair of walls, means on the jack supports for raising the sliders, means to maintain each slider in each of various selected vertical heights, a pair of outwardly inclined legs connected at their upper ends to each of the walls of each jack support, below the upper ends thereof, means to connect the legs of each jack support to the lower end of each centerpost, said centerposts being aligned with each other, and the walls of one centerpost being in alignment with the walls of the other centerpost, whereby the spaces between the walls of said centerposts are in alignment, and a cross beam having the ends thereof passing through the spaces between the opposed walls of said centerposts and resting on said sliders in combination with a pair of members slidably mounted on said beam and between said jack supports and having means to support a load.

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