LOAD HOISTING DEVICE

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1. The lower ends of the legs are fastened to the bed of the truck in a suitable manner, the front legs being secured between channel irons 8 running across the truck bed.

Mounted vertically on the bed 2 of the truck is a mast or post 10, the lower end being secured to the bed through a bearing plate 11 and the upper end engaging in a bearing 12 secured to the end of the ridge rail 7 as best illustrated in Fig. 1.

A plate or shelf 13 is rigidly mounted by welding or other suitable means to the lower portion of the legs 5 and 6 and rigidly secured to this shelf or plate is a bearing 14 for the mast 10.

A pulley 15 is rigidly secured to the mast above the platform and is braced thereto like the like 16 and 17. The axis of the pulley is in substantially vertical position. The pulley 15 has two grooves 17 and 18 connected by a slot 19.

Mounted on the shelf 13 between the posts 5 and 6 is a cylinder 20 which is secured to the shelf by means of brackets 21 welded or otherwise suitably attached thereto as indicated at 21 (Fig. 3). The brackets 21 extend around the periphery of the cylinder 20, the free ends being provided with bolts or other suitable clamping devices. The cylinder is provided with a piston 22 dividing the cylinder into compartments 23 and 24. Piston rods 25 and 26 are secured to the piston and extend outwardly through a boss provided with a fluid retaining ring at the ends of the cylinder as indicated at 27 and 28.

Mounted on the ends of the piston rods by brackets 29 and 30 are pulleys 31 and 32. A U-shaped bracket 33 is rigidly secured to the plate 13 and eye bolts 34 and 34' are provided for connecting the ends of a cable 35 to the bracket 33. The cable 35 is attached securely to the horizontal pulley 16 by a keeper 36 extending transversely of the slot 18. The cable is fixed to the horizontal pulley 16 by the keeper 36 substantially at its center. The cable is thus divided into two portions of substantially equal lengths, each extending around the pulley 16 in their respective peripheral grooves 17 and 18, guided away and crossing each other at 37 by idler guide pulleys 38 and 39 continuing to the pulleys 31 and 32 and extending through and securely attached to eyes of bolts 34 and 34' as indicated at 40 and 40'.

A fluid medium is provided for the compartments of the cylinder as indicated at 41 and is supplied thereto from a sump 42 by a pump 44 through a four-way valve 45. While I have shown the supply from the sump, it will be obvious any source may be utilized or supplied hydraulically from the motor vehicle.

A line 46 leads from the sump 42 to the pump and a line 47 to the four-way valve 45; line 48...
leads from the four-way valve to the compartment 23 of the cylinder; a line 49 leads from the compartment 24 of the cylinder to the four-way valve and a line 50 leads from the four-way valve to the sump.

A boom 51 is pivotally secured to the mast above the brackets 16 and 16' by a bracket 52 and bolt 53. The boom consists of a tubular member 54 adapted to accommodate a rod 55 slidably secured in the tube and held in place therein by a pin 56. The wing 57 extends through openings in the tube and rod as in the usual practice for adjusting the boom to the desired length. The outer end of the rod 55 is provided with a head 57, having depending brackets 58 between which is mounted a pulley 59 adapted to receive a cable 60 which extends underneath the boom and is held in place by loops 61 and the opposite end wound over a drum 62.

The end of the platform 2 of the truck near the cab thereof is cut away and the drum is mounted therein by brackets 63. The drum may be operated from the truck or an independent source (not shown) as is the usual practice. The outer end of the cable is secured to a chain or the like 64 for attachment to the object to be lifted by the hoist. A pulley 65 is mounted on the pin 53 at the pivoted end of the boom and extends through an opening 66' in the mast. The cable 66 runs through an opening in the mast as indicated at 66 (Fig. 2), up through the mast, over pulleys 65' and 66' mounted in the respective ends of the ridge rail 7 and down to the drum 62.

The head 57 has upwardly extending brackets 67 provided with a pulley 68 adapted to receive a cable 69 having one end secured by a hook 70 to a loop 71 secured to the upper end of the mast. The cable runs over pulley 68 and pulley 72 mounted in brackets 73 on the upper end of the mast and thence runs downwardly over a pulley 74 secured by brackets 75 to the center of the mast, and has its end secured to a drum or winch 76 operated by a crank 77 rigidly secured to the upper side of the boom 51 for raising and lowering the boom as is the usual practice.

A brace 78 is rigidly secured between the front legs 79 of the frame and secured thereto is a plate 80 to which is secured a bearing 81 for the mast so that the mast is freely rotated therein, as well as the bearings 11 and 12 at its lower and upper ends.

Rods or tubular members 81 and 82 are secured to the respective sides of the bed 2 in the channels of channel iron 8 and are bent rearwardly and are secured together at their opposite ends by a cross bar 83 rigidly secured to the posts 6 by welding or other suitable means. Rods 84 having one end secured to the cross bar 83 and their opposite end secured to the upright posts 5 provides further bracing for the framework structure and cross rods 85 are provided between the side rods 81 and 82 and the rods 64. Rods 86 and 87 are also secured to the side rods 81 and 82 and to the front posts 5 of the framework structure to provide a more rigid structure. The framework structure just described provides protection for the hydraulic cylinder and cable mechanism underneath thereof.

Underneath the bed 2 and extending outwardly from each side thereof and above the rails 88, the outer ends of which are provided with a cylindrical member 89 centrally bored as at 90 to accommodate posts 91, secured to a base 92 so that when the hoist is in operation, the majority of the weight will bear on the ground rather than on the truck bed. The posts 91 are provided with a plurality of openings 93 and the cylindrical member 89 provided with openings 94 adapted to register with said removable pins 95, thereby providing means for adjusting height of the post 91.

Operation of a device constructed and assembled as described is as follows:

When the truck is moved to the desired place and the object to be moved is secured to the posts 91 are adjusted so that the base 92 will rest on the ground and the chain 64 secured to the load. The boom 51 is raised and lowered through operation of the drum 76 by movement of the crank 77. The chain 64 is raised or lowered by the cable 69 through the operation of the drum 62. The load thus may be raised to the desired height through operation of the drum 62 or 76 or both. Rotation of the mast and movement of the crane laterally is accomplished through operation of the oil power piston 22 in the cylinder 20 and the reaction thereof on the cable 69. When it is desired to move the boom to the right, the valve 45 is opened by lever 55, as shown in the position in Fig. 2, allowing fluid medium to pass through line 47 and 48 to the compartment 23, to move the piston 22 to the right, extending the piston rod 26 and pulley 32 outwardly as shown in dotted lines. The movement draws the cable 35 to the right. The cable being fastened securely to pulley 15 by keeper 36 will cause clockwise movement of pulley 15 and boom 10. In this movement the fluid in compartment 24 will move through line 45 and 46 back to the pump 44. When it is desired to move the boom to the left, the valve is turned by its handle 56 so as to connect line 47 with line 45, and connect line 48 with line 60 so that the pump 44 will force the fluid into compartment 24 and allow the fluid in compartment 22 of the cylinder to move to the sum 42 and move the piston to the left to the extent the piston rod 26 and pulley 31 to rotate the pulley 15 in an anti-clockwise direction.

It will be obvious from the foregoing that I have provided an improved hoisting device in which the means for operating a double acting, single piston cylinder operated hydraulically from a source of fluid supply by a cable operating over a pulley secured to the mast of the hoisting mechanism.

What we claim and desire to secure by Letters Patent is:

1. A hoisting device comprising, a frame mounted on a support, said frame having a ridge rail extending outwardly from said frame, a boom supporting upright mast having its lower portion rotatably mounted on said support, means for extending ridge rail rotatably supported on the mast adjacent its upper end, a platform rigidly secured to said frame, a pulley mounted on said mast having its axis in substantially vertical position, a cylinder horizontally mounted on said support in substantial horizontal alignment with the pulley on said mast, a piston in said cylinder, rods secured to the opposite sides of said piston and extending outwardly through the respective ends of said cylinder, a pulley on the outer end of each rod, a cable engaging over the pulley on the mast and said pulleys on said rods, means for securing the outer ends of the cable in said cylinder, fluid means for operating said piston in said cylinder for rotating said mast, said pulley on said mast having two grooves, and a slot in one side of said last named pulley connecting said grooves for accommodating said cable in substantial alignment therewith.
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3. In a motor vehicle having a platform body, in combination a frame mounted on said body, a boom supporting mast rotatably mounted on the body adjacent said frame, a pulley mounted on said mast in a horizontal position, said pulley having two grooves therein and a slot connecting said grooves, a shelf mounted on said frame, a cylinder mounted horizontally on said shelf, a piston in said cylinder, rods secured to opposite sides of said piston and extending outwardly through the ends of said cylinder, a pulley mounted on the end of each rod, rollers mounted on said platform adjacent said cylinder, a cable having its free ends secured in fixed relation to said cylinder, said cable running over the pulleys on said piston rods and engaging said rollers and crossing each other for engaging in the grooves on said horizontal pulley, and fluid means for operating said piston in said cylinder for rotating said mast.

4. A hoisting device comprising, a boom supporting upright mast rotatably mounted on a support with the axis of rotation substantially vertical, a member having an arcuate periphery fixed on the mast in horizontal position with said periphery coaxial with the axis of the mast, spaced peripheral grooves in said member, a cylinder mounted on said support, a piston in said cylinder, rods secured to opposite sides of said piston and extending outwardly through the respective ends of said cylinder, a pulley on the outer end of each rod, a cable, means securing said cable to said member for operation in the peripheral grooves thereof and over said pulleys on said rods, means securing the free ends of the cable in fixed relation to said cylinder, and fluid means for operating said piston in said cylinder for rotating said mast.

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