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OFF BEARER

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2 Sheets-Sheet 1

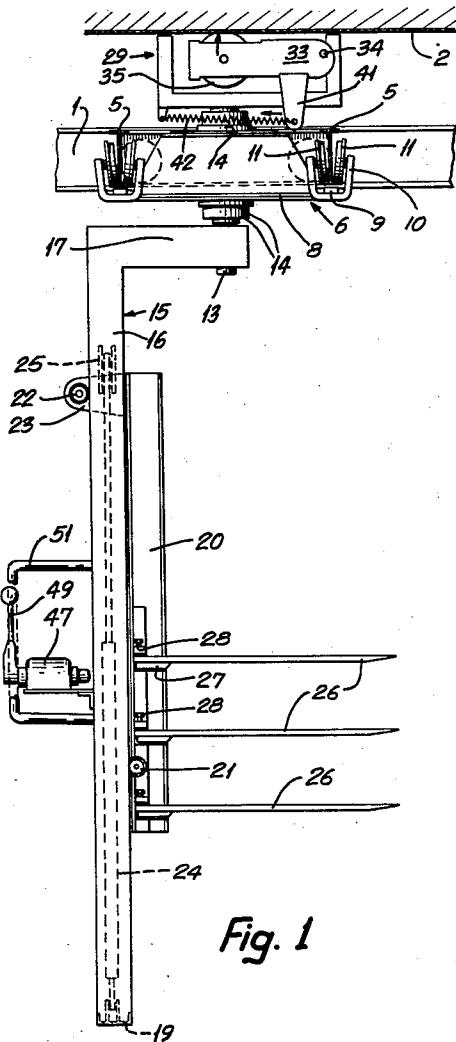


Fig. 1

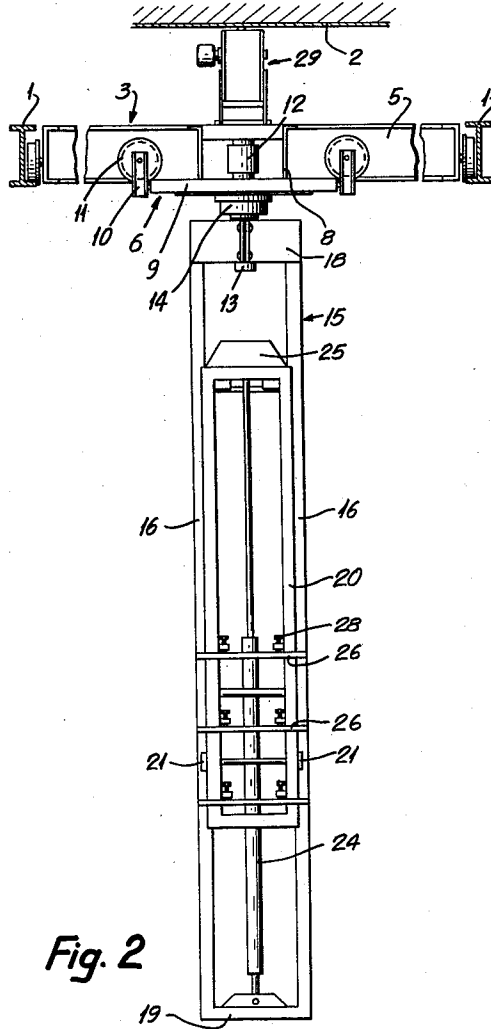


Fig. 2

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1

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OFF BEARER

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The present invention relates to carrier means and more particularly to a suspended load carrier arranged for free movement in all horizontal directions with a vertically movable load supporting assembly for loading articles at any desired station and transporting and unloading said articles at any other desired stations.

The load carrier of the invention is more specifically designed as an off bearer for transporting freshly molded concrete blocks on pallets from a concrete block molding machine to a conveyor leading the blocks to a curing chamber or for transporting cured blocks with or without pallets from the curing chamber to a stacking or cubing station. Conventional off bearers are moved by hand and are thus limited in their carrying capacity.

It is the main object of the present invention to provide a suspended load carrier or off-bearer of the character described which is motorized and which thus enables a single operator to manipulate a much larger load than with non-motorized off bearers and yet with a more precise control of the movements of load carrier and without effort.

The foregoing will become more apparent by referring to the following description and to the annexed drawings wherein:

FIGURE 1 is a side elevation, partly in section, of the off bearer according to the present invention;

FIGURE 2 is a front elevation;

FIGURE 3 is a top plan view; and

FIGURE 4 is a perspective view of the head assembly of the off bearer.

In the drawings, like reference characters indicate like elements throughout.

As in conventional off bearers, there is provided a system for allowing movement of the carrier itself in all horizontal directions. This system comprises a pair of horizontally disposed spaced parallel main rails 1 spacedly mounted below ceiling 2 and which support and guide a wheeled carriage 3 for free movement in accordance with arrows 4, 4' of FIGURE 3.

Carriage 3 consists of a rectangular frame providing a pair of I-beams forming spaced parallel secondary rails 5 disposed at right angles to main rails 1.

A trolley 6 is carried by rails 5 for free movement in the direction of arrows 7, 7' of FIGURE 3.

Trolley 6 consists of a sheet metal frame 8 and of transverse end members 9 extending underneath rails 5 and in turn provided at their ends with U-shaped brackets 10 embracing rails 5 and supporting idle wheels 11 bearing on rails 5 on each side thereof.

Frame 8 supports at the center thereof a vertical bushing 12 in which is freely rotatable a hollow shaft 13 provided with thrust flanges 14 to prevent longitudinal movement thereof.

An elongated vertically disposed frame 15 is rigidly secured to shaft 13 in offset relationship thereto. Frame 15 comprises a pair of spaced parallel vertical legs 16 and top horizontal legs 17, which are secured to shaft 13 by transverse connecting members 18. The lower ends of legs 16 are rigidly interconnected by bottom transverse member 19.

A vertical rectangular carrier frame 20 is mounted alongside the front face of legs 16 and is guided for vertical movement with respect to legs 16 by bottom idle

2

flanged rollers 21 riding on the front face of legs 16 and by top idle flanged rollers 22 riding on the back face of legs 16. Rollers 22 protrude laterally outwardly from the rear ends of ears 23 which extend rearwardly from the top end of frame 20 between vertical legs 16. A hydraulic cylinder and piston unit 24 is pivotally connected at its lower end to bottom member 19 of frame 15 and at its top end to a yoke 25 attached to and extending between ears 23 of carrier frame 20.

Horizontally disposed and superposed support plates 26 are removably secured to the lower part of carrier frame 20 by brackets 27 and set screws 28. Three plates 26 are shown in the drawings, but less or more plates may be provided. Plates 26 are replaced by sets of forks whenever desired.

A head assembly 29 is secured to the top of shaft 13 and located above rails 1 and 5. Assembly 29 comprises horizontal channel member 30 directly secured to the top of shaft 13 and upstanding spaced channel members 31 provided at their top free ends with abutment pads 32.

A pair of lever plates 33 are pivoted on one member 31 near the top thereof by a cross pin 34.

A rubber rim driving wheel 35 is journaled between the free ends of lever plates 33 and has a sprocket wheel 36 on which is trained a sprocket chain 37 the other end of which meshes with a driving sprocket wheel 38 of smaller diameter and secured to the output shaft 39 of a reversible hydraulic motor 40 which is mounted on the outside of one of the lever plates 33.

Each lever plate 33 has a downward extension 41 to which is connected one end of a tension spring 42 the other end of which is attached to hook bolt 43 adjustably secured by nut 44 to block 45 welded to the lower end of channel member 31.

Bolts 43 and nuts 44 serve to adjust the tension of springs 42 and consequently the bearing pressure of driving wheel 35 on the ceiling 2.

Abutment blocks 46 are secured to the sides of channel member 30 to limit the downward pivotal movement of lever plates 33 by abutting against extensions 41 of said lever plates.

Hydraulic fluid under pressure is fed from an external source (not shown) by feeding and return flexible hoses (not shown) attached to trolley 6 and connected to a pair of lever actuated hydraulic control valves 47 (one of which is shown in FIGURE 1). Tubing 48 connects motor 40 to one of the control valves 47 while piston and cylinder unit 24 is connected by tubing to the other valve 47.

Each valve 47 has three states corresponding to three positions of its associated lever 49, namely, an upright position, a forwardly inclined position and a rearwardly inclined position.

The valve 47 associated with motor 40 blocks the hydraulic circuit to said motor and consequently the off bearer is positively blocked in the normal upright position of the lever 49; motor moves the off bearer forwardly and rearwardly in the forwardly and rearwardly inclined positions of the lever 49 respectively. The valve 47 associated with cylinder unit 24 blocks said unit in any desired state of extension in the normal upright position of lever 49 and said unit 24 raises and lowers the carrier frame 20 in the forwardly and rearwardly inclined position of lever 49 respectively.

Levers 49 are aligned with the vertical portions of handles 51 secured to legs 16 of frame 15 whereby the operator can easily actuate levers 49 while grasping handles 51.

Ceiling 2 may be a plate or other smooth horizontal

surface of any desired area and provides a running surface for rubber wheel 36.

The axis of wheel 36 substantially intersects at right angles the axis of shaft 13 so that no torque is exerted on the off bearer by the wheel 36 when in operation.

The wheel 36 rotates in a plane corresponding to the central longitudinal plane of the carrier frame 20.

The ceiling contacting portion of wheel 36 is very close to the pivotal connection of shaft 13 to close to the pivotal connection of shaft 13 to trolley 6 whereby operation of wheel 36 causes minimum swinging tendency of the frame 15. The offset position of legs 16 of frame 15 with respect to the axis of shaft 13 provides a lever arm which enables the operation to easily rotate the frame 15 by means of handles 51 even when motor 40 is operating. This offset position also enables to position the center of gravity of the load carried on support plates 26 in substantial vertical alinement with the shaft 13.

The off bearer moves at any instant in the direction of its orientation whether forwardly or rearwardly depending on the direction of rotation of motor 40. The positive displacement is assured solely by driving wheel 36 while trolley 6 and carriage 3 automatically move in accordance with the right angular components of the instantaneous direction of movement of frame 15.

Due to the fact that the off bearer is motorized a much greater load can be carried thereby without requiring human effort. For instance, three superposed palletized layers of concrete blocks may be carried on the three support plates 26 shown in the drawings.

While a preferred embodiment has been illustrated and described, it is understood that various modifications may be resorted to without departing from the spirit and scope of the appended claims.

What we claim is:

1. A motorized carrier comprising overhead carriage means mounted for a trolley free movement in all horizontal directions, a vertically disposed elongated frame pivotally connected to and suspended from said carriage means for free pivotal movement of said frame relative to said carriage means about a vertical axis, a power driven wheel carried by said frame and rotatable in a substantially vertical plane which has a constant angular relation to said frame, said wheel adapted to frictionally engage a horizontal surface whereby manual rotation of

said frame in a horizontal plane and actuation of said wheel will cause motorized travel of said carrier in any horizontal direction, and load supporting means carried by said frame.

2. A motorized load carrier as claimed in claim 1, wherein the axis of said wheel substantially intersects said vertical axis.

3. A motorized load carrier as claimed in claim 1, wherein said wheel protrudes upwardly from said carriage means and said horizontal surface overlies said wheel whereby said wheel engages said surface from underneath.

4. A motorized load carrier as claimed in claim 3, wherein the axis of said wheel substantially intersects said vertical axis.

5. A motorized load carrier as claimed in claim 4, wherein said wheel is driven by a reversible hydraulic motor.

6. A motorized load carrier as claimed in claim 4, including spring urged lever plates pivotally mounted at one end on said frame, said wheel rotatably mounted at the free ends of said lever plates whereby said plates resiliently maintain said wheel in frictional pressure contact with said horizontal surface, and reversible motor means mounted on said lever plates and in driving connection with said wheel.

7. A motorized load carrier as claimed in claim 1, wherein said load supporting means include a wheeled carrier frame in rolling and guided engagement with said first named frame for up and down movement with respect to the latter, power means to lower and elevate said carrier frame and cantilevered horizontal load carrying members secured to said carrier frame and disposed in superposed relation.

8. A motorized load carrier as claimed in claim 7, further including handle means on said first named frame and control members adjacent said handle means for controlling the operation of said power means and of said motorized wheel.

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