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INDUSTRIAL TRUCK

Original Filed April 8, 1925

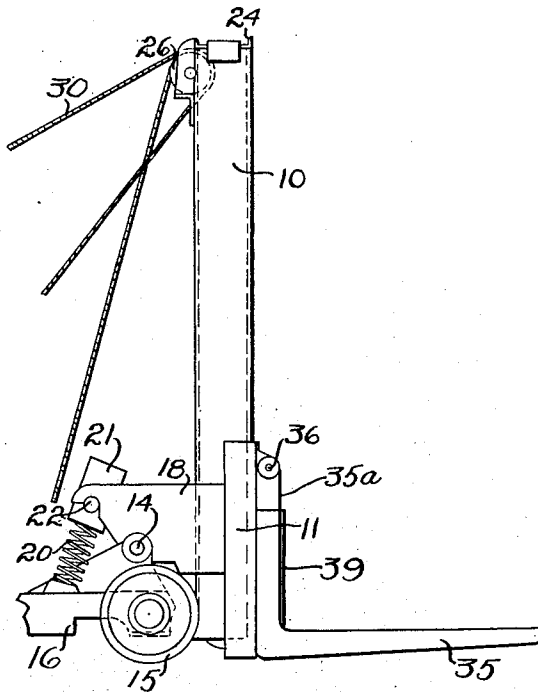


FIG. 1

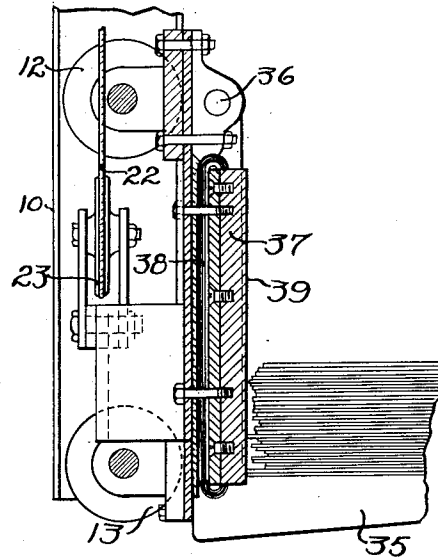


FIG. 2

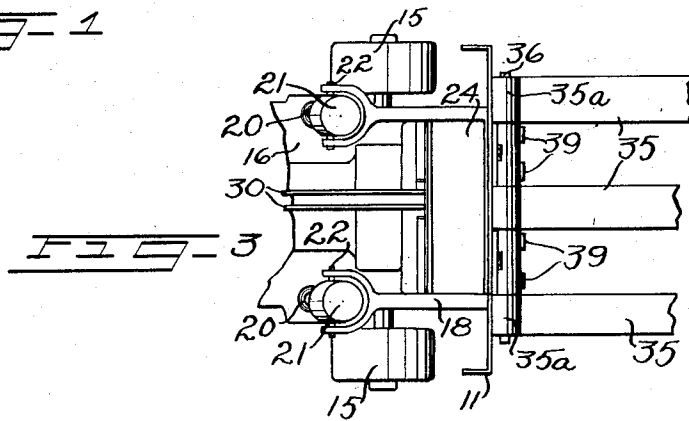


FIG. 3

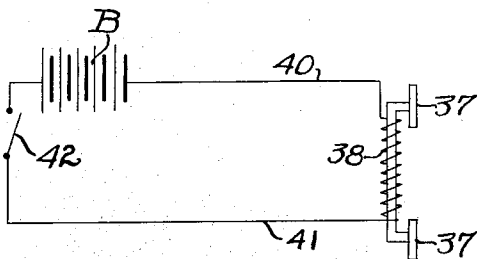


FIG. 4

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UNITED STATES PATENT OFFICE.

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INDUSTRIAL TRUCK.

Original application filed April 8, 1925, Serial No. 21,487. Divided and this application filed November 18, 1925. Serial No. 69,780.

This invention is concerned with load lifting and transporting mechanisms and comprises a division of the subject matter set forth in my co-pending application pertaining to industrial trucks, Serial No. 21,487 filed April 8, 1925.

An object of my present invention is the provision of a load elevating mechanism having in association therewith, a novel apparatus for retaining sheet metal loads upon the load lifting mechanism.

Further objects of my invention will hereinafter be set forth in the following description which refers to the accompanying drawings illustrating a preferred form thereof. The essential characteristics are summarized in the claims.

In the drawings Figure 1 is a side elevation of a load elevating mechanism embodying the features of my invention, the load elevating mechanism being particularly adaptable to use on industrial trucks; Figure 2 is an enlarged fragmentary cross-sectional elevation of an electromagnetic means in association with a load lifting platform; Figure 3 is a plan view of the mechanism disclosed in Figure 1 and Figure 4 is a diagrammatic representation of the electrical connections for energizing the electromagnetic means shown in Figure 2.

The mechanism disclosed in the drawings is particularly adaptable to the handling and transporting of sheet metal in stacks. Efforts have been made to handle such material by gripping the top and bottom of the stack of sheets and to thus retain it upon the truck while being transported. Due to the fact that when such a stack of sheet material is engaged by the grappling or gripping mechanism, the air entrapped on the surface of the sheets of material is squeezed or forced outwardly, thus causing a slipping or shifting of the sheets.

In the present form of my invention I provide a load lifting mechanism which is adapted to be extended beneath a stack of sheets, resting upon members which space the bottom of the stack from the floor and the vertical movement of this load lifting mechanism causes the stack of sheets to be elevated.

If it were desired to only elevate such stacks of sheet metal, the sheets would re-

main in position but in order to transport them it is necessary to retain them upon the load lifting platform to prevent their displacement, due to vibration, when the truck carrying the elevating mechanism is moved from place to place. I retain the sheets upon the load lifting platform by an electromagnetic device built into the load lifting mechanism in such manner that vertical surfaces formed on the magnet are juxtaposed to an edge of each sheet, when the sheets in the stack are being elevated.

I show in Figure 1 an upright frame comprising channel members 10 positioned with the flanges thereof extending inwardly whereby a load lifting mechanism, which includes a frame 11, may carry rollers 12 and 13 to engage the flanges of the upright frame 10. The upright frame 10 is pivotally mounted at 14 to overhang and wheels 15 of an industrial truck 16 and plate members 18 may be secured to the channel members 10 adjacent the bottoms thereof. These plate members may constitute a pivotal connection between the upright frame and the truck chassis. Resilient means in the form of springs 20 may bear against the truck 16 at the bottoms thereof and terminate in cup shaped members 21 pivotally connected at 22 to extensions of the plate members 18.

The load lifting mechanism 11, as described in my co-pending application referred to, may be actuated by a cable 22 looped over a sheave 23, suitably attached to the load lifting mechanism to be disposed between the upright members 10. This cable may have one end thereof secured to a top frame member in the form of a channel 24 from which the cable may extend downwardly to pass over the sheave 23, thence extended upwardly and over a second sheave 26, suitably mounted adjacent the top of the upright frame and then to a winding mechanism, (not shown) carried by the truck.

It is desired, that the load not only be elevated vertically but that it also be tilted so that the sheets can be stacked against a gauging surface whereby the edges of the sheets, comprising two opposite sides of the pile or stack, will become aligned, and for this purpose the pivotal connection 13, already described, is provided whereby the

upright frame 10 and the load elevating mechanism 11 may be tilted after the load has been elevated from the floor.

The tilting of the upright frame may be effected in any desired manner and, as shown in Figure 1, a cable 30 extending over a sheave mounted adjacent the sheave 26, may be actuated by the winding mechanism mounted on the truck frame to tilt the upright frame.

The load lifting mechanism has attached thereto a load lifting platform, comprising a plurality of L shaped arms 35, pivotally attached to the load lifting mechanism at 36. These arms are spaced apart, as shown in Figure 3, and disposed therebetween are a pair of magnets 37, having incorporated in their construction energizing coils 38. The surfaces 39 of the magnets extend vertically in a plane spaced from the vertical faces 35^a of the L shaped members 35 whereby the edges of the sheets in the stack may be decked or gauged against the magnet surfaces when the lifting mechanism is tilted a sufficient distance to cause the sheets to slide against the magnet faces, or the operator, may cause a violent agitation of the upright frame by rapid starts and stops of the winding mechanism to thus agitate the sheets. The electromagnetic coils 38 may be connected to battery B of the industrial truck, by a line 40 and a line 41 controlled by a switch 42 suitably disposed adjacent the operator's position on the truck.

The operation of the mechanism is as follows:

Assuming a stack of sheets are positioned upon spaced apart members resting upon the floor, the truck is maneuvered to bring the arms 35 between the stack supporting members. The load is raised off of the supporting members by actuation of the load lifting mechanism 11 through the taking in of the cable 22 by the winding mechanism to cause the load to be raised in a vertical direction. The operator may then start the transporting movement of the truck and while doing so, cause the upright frame 10 to be tilted by taking in the cable 30 and by manipulating the cable 30, the upright frame may be violently jogged through the influence of the springs 20 and the winding mechanism, thus causing the sheets to be stacked against the surfaces of the magnets 37. The operator may then close the switch 42 to energize the magnets and thus cause the sheets to be held in stacked condition on the truck during the transporting movement thereof.

I claim:

1. In combination a load elevating means including an elevator traversing an upright frame and having a vertically movable load supporting surface and electrically energized magnetic means for maintaining a me-

tallic load upon said load supporting surface.

2. In combination a load tilting means including an elevator traversing an upright frame and having a vertically movable load supporting surface and electrically energized magnetic means for maintaining a metallic load upon said means when it is being tilted.

3. In combination a load engaging and lifting means including an elevator traversing an upright frame and having a vertically movable load supporting surface and magnetic means comprising a part of the load lifting means and disposed thereon to maintain a metallic load upon said load supporting surface.

4. In combination a load elevating means having a vertically movable load support upon which the load may be placed including an elevator traversing an upright frame and electrically energized magnetic means carried by the load support and disposed to maintain a metallic load upon said load support when the load is being elevated.

5. In combination a load tilting means having a vertically movable load support, said means being mounted adjacent an end of an industrial truck frame and electrically energized magnetic means on the load support and adapted to influence a metallic load to maintain it on the support when it is being elevated and tilted.

6. In an industrial truck the combination of a vertically movable load elevating means mounted at one end thereof including a tiltable upright frame, means for actuating said load engaging means and an electrically energized magnetic means carried by the load engaging means for maintaining a metallic load upon said load supporting surface.

7. In an industrial truck, the combination of a load elevating means mounted at one end of the truck, said load elevating means including an upright frame, a load lifting platform, a carriage mounted upon the upright frame to traverse the same and to which the load lifting platform is attached, an electrically energized magnet attached to the carriage, said magnet having substantially vertically extending faces extending from the surface of the load lifting platform upwardly along the carriage.

8. In an industrial truck, the combination of a load elevating means mounted at one end of the truck, said load elevating means including an upright frame formed of channel members having the flanges thereof facing inwardly, a load lifting platform, a carriage mounted upon the upright frame to which the load lifting platform is attached, said carriage having wheels mounted thereon engaging the flanges of the channels of the upright frame, an electrically energized

magnet attached to the carriage, said magnet having substantially vertically extending faces extending from the surface of the load lifting platform upwardly along the carriage.

9. In an industrial truck of the character described, the combination of an upright frame, a vertically movable carriage mounted upon the upright frame, a load lifting platform comprising a plurality of spaced apart L shaped arms, and an electrically energized magnet member secured to the carriage between said arms.

10. In an industrial truck of the character described, the combination of an upright frame, a vertically movable carriage mounted upon the upright frame, a load lifting platform comprising a plurality of spaced apart L shaped arms pivotally attached to the carriage, and an electrically energized magnet member secured to the carriage between said arms.

11. In an apparatus of the character described, the combination of an industrial truck chassis, an upright frame pivotally attached to overhang one end of the chassis, said upright frame having inwardly extending members attached thereto affording pivotal connection to said chassis, a resilient member disposed between said pivotal mounting and said chassis for maintaining the frame in an upright position, a vertically movable carriage mounted on the upright frame and adapted to be lowered to the floor or supporting medium of the truck, a load lifting platform mounted on the carriage, and an electromagnet mounted on the carriage in juxtaposition to the load lifting platform, said electromagnet having a load engaging surface extending substantially at an angle to the load engaging surface of the load lifting platform.

12. In an apparatus of the character described, the combination of an industrial truck chassis, an upright frame pivotally attached to overhang one end of the chassis, said upright frame having inwardly extending members attached thereto affording pivotal connection to said chassis, a resilient member disposed between said pivotal mounting and said chassis for maintaining the frame in an upright position, a vertically movable carriage mounted on the upright frame and adapted to be lowered to the floor or supporting medium of the truck, a load lifting platform mounted on the carriage, and an electromagnet mounted on

the carriage in juxtaposition to the load lifting platform, said electromagnet having a load engaging surface extending substantially at right angles to the load engaging surface of the load lifting platform.

13. In an industrial truck of the character described, the combination of a truck frame, an upright frame pivotally mounted at one end of the truck frame to overhang said end thereof, said pivotal mounting being substantially above a pair of wheels of the truck, resilient means reacting on the truck frame and attached to the upright frame in offset relation to said pivotal mounting, a carriage adapted to traverse said upright frame, a horizontally disposed load lifting platform mounted on the carriage, an electromagnet also mounted on the carriage, the load lifting platform having a surface substantially normal to a load engaging surface of the magnet, means for elevating the carriage, means for tilting the upright frame when the carriage is elevated with a load thereon to cause the load to be brought into engagement with the load engaging surface of the magnet, a battery and electrical connections extending between the battery and the electromagnet for energizing the magnet when the load has been brought into engagement with the surface thereof consequent to the tilting of the upright frame.

14. In an industrial truck of the character described, the combination of a truck frame, an upright frame pivotally mounted at one end of the truck frame to overhang said end thereof, resilient means reacting on the truck frame and attached to the upright frame in offset relation to said pivotal mounting, a carriage adapted to traverse said upright frame, a horizontally disposed load lifting platform mounted on the carriage, an electromagnet also mounted on the carriage, means for elevating the carriage, means for tilting the upright frame when the carriage is elevated with a load thereon to cause the load to be brought into engagement with the load engaging surface of the magnet, a battery and electrical connections extending between the battery and the electromagnet for energizing the magnet when the load has been brought into engagement with the surface thereof consequent to the tilting of the upright frame.

In testimony whereof, I hereunto affix my signature.

CLYDE E. COCHRAN.