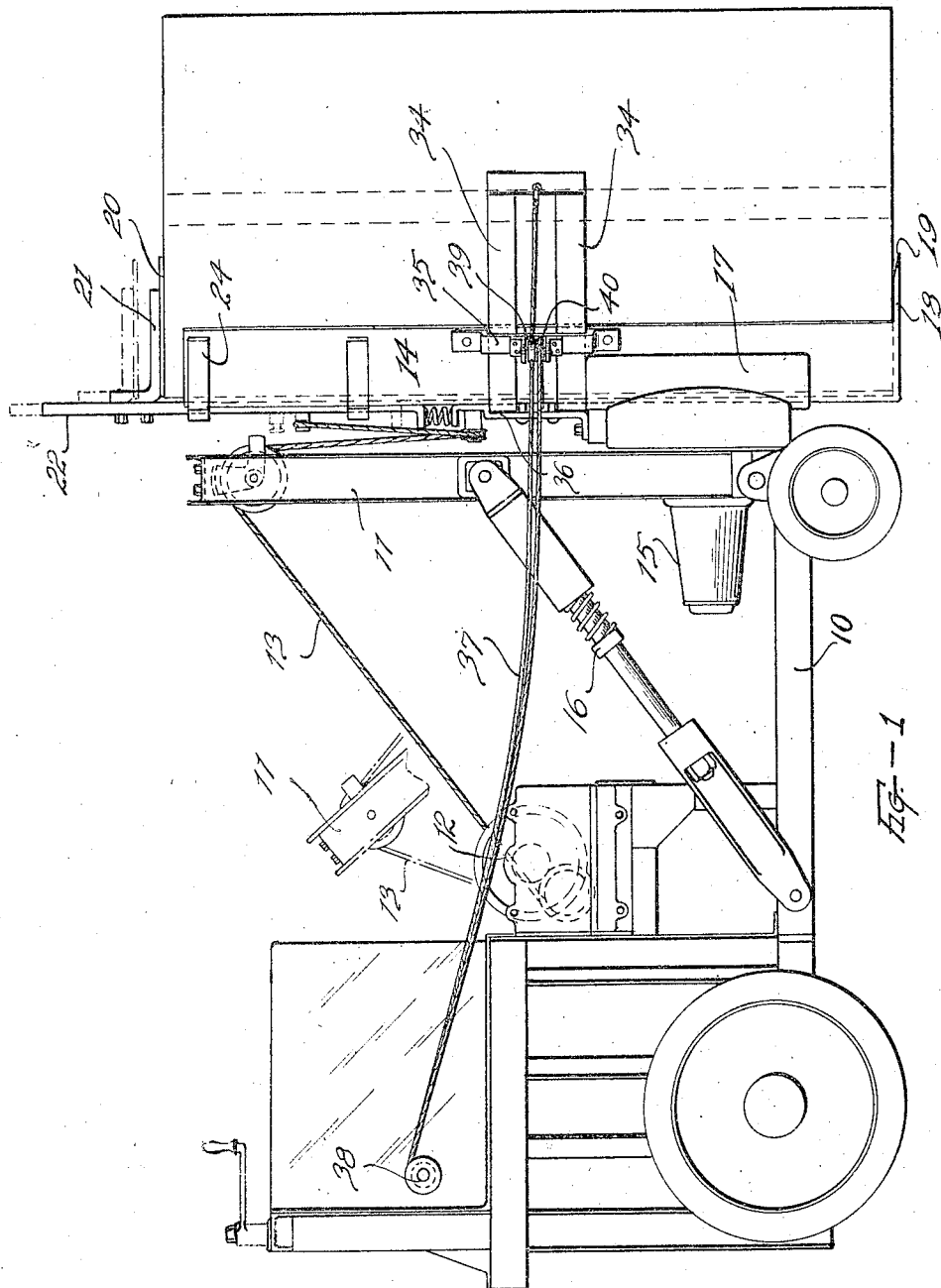


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LOAD SECURING MEANS FOR INDUSTRIAL TRUCKS.
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2 SHEETS-SHEET 1



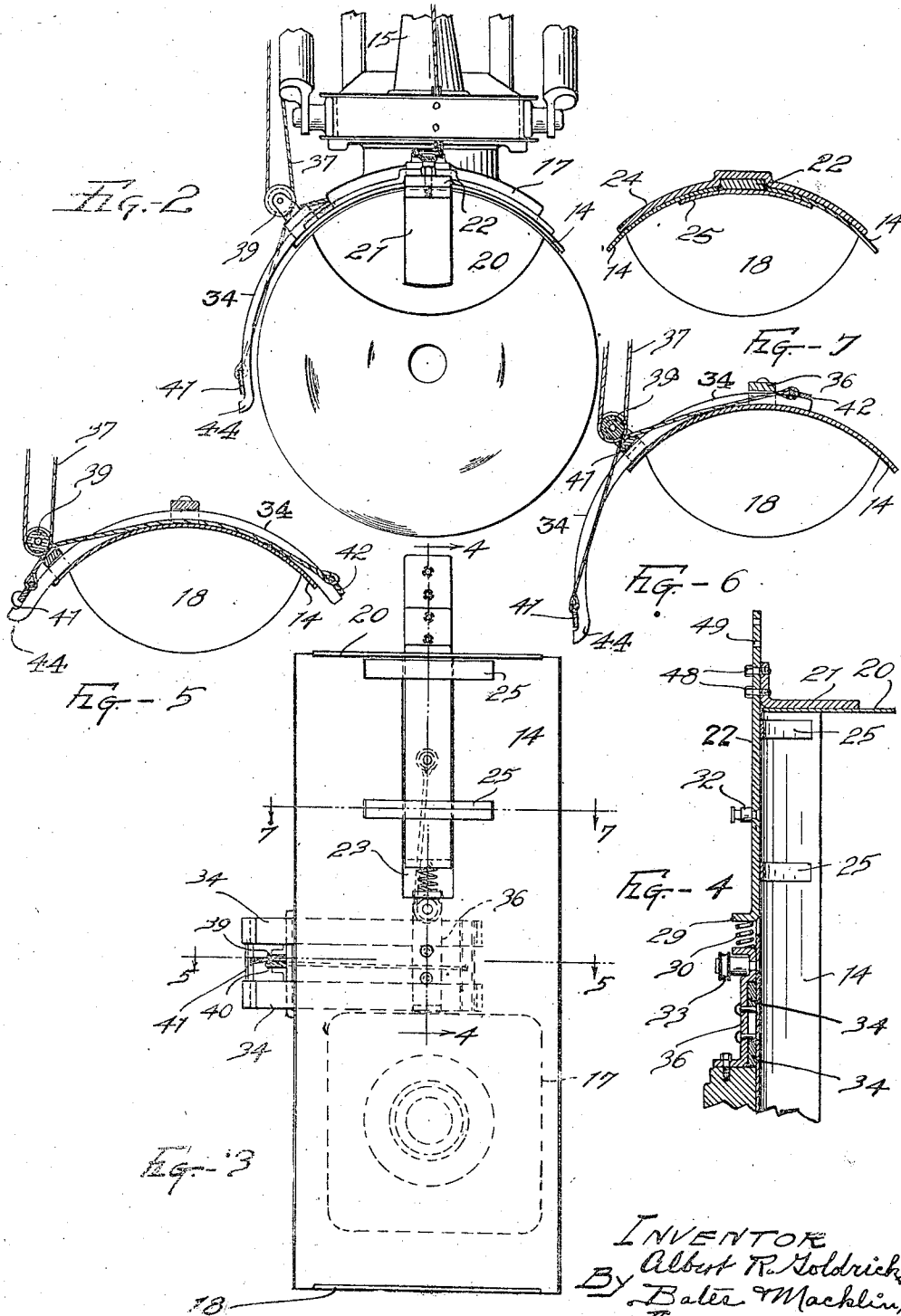
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2 SHEETS-SHEET 2



UNITED STATES PATENT OFFICE.

ALBERT R. GOLDRICK, OF CLEVELAND, OHIO, ASSIGNOR TO THE ELWELL-PARKER ELECTRIC COMPANY, OF CLEVELAND, OHIO, A CORPORATION OF OHIO.

LOAD-SECURING MEANS FOR INDUSTRIAL TRUCKS.

Application filed August 20, 1921. Serial No. 493,799.

REISSUED

To all whom it may concern:

Be it known that I, ALBERT R. GOLDRICK, a citizen of the United States, residing at Cleveland, in the county of Cuyahoga and State of Ohio, have invented a certain new and useful Improvement in Load-Securing Means for Industrial Trucks, of which the following is a full, clear, and exact description, reference being had to the accompanying drawings.

This invention relates to industrial trucks wherein a truck is provided with mechanism for lifting, transporting and depositing loads.

In an application for Letters Patent on an industrial truck, filed July 9, 1920, Serial No. 394,933, by Clyde E. Cochran, an industrial truck is shown and described as equipped with load handling mechanism which is particularly adapted to the loading and unloading of large paper rolls. The load handling mechanism described in that application is comprised of a boom pivotally mounted on one end of the truck and a loading scoop rotatably mounted on the boom which is adapted to load an article, elevate it to an inclined transportable position over the truck and subsequently lower and deposit it. This loading scoop may also be rotated when in the inclined position to a substantially horizontal position. An up-ending of the boom will cause the load to be deposited in a horizontal position. The loading mechanism described in the aforesaid application, however, engages a considerable part of the circumferential surface of the roll. Hence, in order to use the truck efficiently, clearance space must be present about the circumference of the roll.

It is particularly desirable to have the foregoing mechanism arranged in such a manner that large paper rolls may be handled by the truck without necessitating any physical effort on the part of the operator except to manipulate the levers controlling the mechanism. Likewise, it is quite desirable that the mechanism be arranged to deposit the rolls in an up-ended position and in juxtaposition. This is particularly true when the truck is being utilized to unload the rolls in railroad cars as it is essential that all of the floor space of the car be used.

The general object of this invention, therefore, is the provision of mechanism in combination with an industrial truck which is adaptable for the efficient loading, transport-

ing and unloading of large paper rolls, irrespective of the relative positions of the rolls.

More specifically, the object of the present invention is to provide a tiltable boom on an industrial truck having loading means and load-securing means in combination therewith which are arranged to automatically co-operate in engaging the load; the co-operating action being brought about by boom tilting mechanism carried by the truck prior to the tilting of the boom.

A further object of this invention is to so arrange the above mentioned means that the operator may approach any one of a number of up-ended rolls positioned closely together, engage it with the load-handling mechanism, secure it thereon, and remove it from its position relative to the other rolls, after which it may be tilted to an inclined transportable position on the truck.

Other objects will become apparent from a description hereinafter set forth in reference to the accompanying drawings which illustrate a preferred embodiment of my invention. The essential characteristics are summarized in the claims.

In the drawings, Fig. 1 is a side elevation of the truck such as I have referred to, having load-handling and load-securing means incorporated therein; the load being shown in substantially vertical position; Fig. 2 is a plan elevation of the roll mechanism in the truck; Fig. 3 is a front elevation of the load-handling and load-securing mechanism, while Fig. 4 is a cross-sectional elevation substantially along the line 4—4 of Fig. 3; Fig. 5 is a section on the line 5—5, Fig. 3; Fig. 6 is a view similar to Fig. 5 showing the parts in different relation; and Fig. 7 is a section on the line 7—7, Fig. 3.

Designating the various parts of the truck and load-handling mechanism by reference characters, Figure 1 illustrates a truck which may be comprised substantially of a frame 10 and boom 11 pivotally secured to the end thereof and boom actuating means 12 consisting of a winding mechanism and a flexible member 13. The end of the flexible member or cable is secured to a load supporting apron 14 a sufficient distance from a pivot mounting 15 on the boom to effect a turning movement of the apron. When the winding mechanism draws on the cable the boom apron and load will be tilted to an inclined position as indicated by the dot and dash

lines in Fig. 1. While the boom is in the tilted position the apron and load may be swung to a horizontal position about the pivot 15 upon a slackening of the cable by the winding mechanism. Suitable telescopic members 16 serve to limit the inward and outward swing of the boom.

The load supporting apron, however, is described in the application hereinbefore mentioned as being comprised of a semi-circular metallic sheet. A difficulty encountered in manipulating the loading mechanism having an apron of such dimensions was that when the rolls were stored in an up-ended position and in contact with one another, considerable annoyance was experienced in that the apron could not be brought into engagement with one roll without first moving the roll a sufficient distance away from the other rolls to obtain clearance therebetween for the apron. The apron 14, therefore, may be arranged to extend about the circumference of the roll, a distance not greater than a quarter thereof. This apron may be rigidly secured to a pivot member 17 associated with the pivotal bearing member 15, carried by the boom. A bottom projecting portion 18 may be arranged to lie in a horizontal position on the ground or floor when the apron is in a substantially up-ended loading position. This projecting member may have a tapered edge 19 to facilitate the forcing thereof under the load by a backward movement of the truck. Experience in using this type of truck has shown, however, that it is necessary to have some means co-operating with the loading apron for retaining the load in position thereon when the load is being tilted to a transportable position on the truck.

To effectively secure the load on the load apron, I have provided a load gripping member 20 corresponding in shape to the projecting portion 18 secured to the bottom of the apron, and which may be automatically brought into engagement with the load. This gripping member may be carried by a supporting member 21 adjustably secured to a movable member 22 slidably mounted on the upper portion of the apron 14. The slide member may be retained in an elongated opening 23 in the apron by reinforcing bars 24 and 25 rigidly secured thereto.

The slide member 22 may have the lower end thereof turned outwardly to form a seat 29 for the resilient member 30; the resilient member thus maintains the slide bar and the gripping member 20 in a sufficiently elevated position, as illustrated by the dot and dash lines in Fig. 1, to provide adequate space between the gripping member and the top of the roll when the truck is approaching the load.

The slide bar and gripping member may be lowered into engagement with the top of

the load by any suitable means. I prefer, however, to make this operation automatic and contingent upon the operation of the boom. This automatic action may be obtained in a very effective manner by securing the end of the cable 13 to a stud member 32 rigidly attached to the slide member 22. A sheave member 33 positioned on the apron below the slot 23 serves the double purpose of a guide for the cable as well as to obtain an increase in the pull exerted upon the slide bar 22 and gripping member 20. The positioning of the member 33 is likewise dependent upon the amount of torque which would be required to rotate the maximum load carried by the apron 14 about the pivotal axis 15. Hence, as a winding mechanism 12 draws in on the cable 13 to tilt the boom, the cable will move sufficiently to draw the member 20 downwardly into engagement with the upper end of the load and at the same time compress the resilient member 30 and as the movement of the cable will stop momentarily upon the engagement thereof, a sufficient gripping force will be obtained between the projecting portion 18 and the gripping member 20 to secure the load on the apron 14 before any tilting movement of the boom takes place. A further drawing in movement of the cable will then tilt the boom inwardly over the truck. The telescopic members 16 serve to resiliently oppose this tilting movement a sufficient amount to always maintain a considerable tension in the cable, hence, the gripping member is rigidly maintained in engagement with the load during this movement.

If it is desired to rotate the load from this inclined position to a substantially horizontal position and then deposit it, the boom may be retained in the tilted position by suitable catch mechanism (not shown) as the cable is gradually payed out by the winding mechanism; the center of gravity of the load and boom being arranged with relation to the rotating axis of the apron. Any substantial tilting movement of the boom must be prevented to effect this rotating movement. The relation of the various parts adapted to obtain this result is described in my application hereinbefore referred to.

In order to rotate a load into a horizontal position, however, it is necessary that an extension be provided on the apron which may be shifted in a circumferential direction about the side of the load a sufficient distance to pass the center thereof. A very simple and economical supporting mechanism which can be manipulated from the driver's position on the truck, may be comprised of arcuate members 34 maintained in sliding relation on the apron by supporting bars 35 and 36 rigidly secured to the apron. The position of these members which may be

substantially half-way between the portion 18 of the apron and the gripping member 20. The members 34 should be of sufficient strength to withstand the maximum bending moment which can be exerted thereon by the load as the load is being rotated to or from a horizontal position.

I prefer to mount these arcuate members on the apron in such a manner that they can be manipulated by the operator by means of a flexible member 37. The flexible member may have sufficient slackness to permit the retaining of a looped portion thereof by a sheave member 38 positioned at the front of the truck, when the apron is rotated about the pivotal axis 15. A pair of sheaves 39 and 40 serve as guide members for the cable; the ends of the cable being attached to connecting plates 41 and 42 which are secured to the ends of the arcuate members 34. The operator may thus slide the members 34 to the extended position illustrated in Figs. 1 and 6 when raising or lowering the load from or to a horizontal load, or, if it is desired to approach one of the rolls standing in a vertical position, the operator may slide the member 34 in an arcuate direction about the apron substantially to the position illustrated in Fig. 5. No interference will thus be encountered between the loading apron and any of the adjacent rolls when one of the rolls is being loaded onto the truck.

I prefer to have the outer ends of the members 34 rounded and bent outwardly so that when the boom is tilted to an up-ended position with the loading apron and mechanism carried thereby in a horizontal position, the ends 44 will be in contact with the ground or floor as the case may be. The load may then be rolled over the ends 44 of the members 34 and be positioned thereon. Hence, as the winding mechanism draws in on the cable, the gripping member 20 will be brought into engagement with the end of the roll (the end surfaces of which are now in vertical planes) and a gripping movement of the member 20 will shift the end slightly until the other end is in engagement with the end 18 of the apron. The roll will then be gripped sufficiently to maintain it on the members 34 as the apron is rotated into transportable position on the truck.

The supporting bar 21 may be adjustably secured to the slide bar 22 in any convenient manner such as removable bolts 48 which may be inserted in any pair of a series of openings 49 formed in the upper end of the bar. The loading mechanism may thus be adjusted for rolls of any length within the capacity of the truck by the proper adjustment of the bar 22.

From the foregoing description, it is obvious that by the use of my device in combi-

nation with an industrial truck, extremely heavy loads may be loaded and secured automatically in a transportable position on the truck irrespective of the position of the load; i. e. the load may be picked from either a vertical or horizontal position, elevated to an inclined position on the truck and subsequently be deposited in either of those positions without necessitating any manual effort on the part of the operator outside of the manipulation of the cable member 37 and the usual levers which control the movement of the truck and the operation of the winding mechanism.

Having thus described my invention, I claim:—

1. The combination of a truck, a boom pivotally secured thereto, a load tilting means supported by the boom adapted to shift the load from a vertical to an inclined position, means carried by the latter means for engaging the top and bottom surfaces of a load to be transported and means for causing said last named means to engage the load and thereafter tilt the boom and load.

2. The combination in a truck of a boom pivotally mounted thereon, a load lifting member secured to the boom and adapted to swing in one position to approximate the vertical, means to tilt the boom and said load lifting member, and means carried by the load lifting member and operable by the said first mentioned means for automatically engaging the load when said last named means tilts the boom.

3. The combination of a truck, a boom pivotally secured thereto, means to shift the boom, a load lifting member pivoted to the boom, said load lifting member having a bottom load engaging portion rigid therewith and an upper movable load engaging member adapted to clamp the load on the load lifting member when said boom shifting means is operated.

4. The combination of a truck, a boom pivotally connected therewith, means movable with said boom for engaging the top, bottom and side of a load, and means for tilting the boom and causing said last named means to engage the load prior to imparting a tilting movement to the boom.

5. The combination in a truck adapted to carry a roll of paper, of a boom pivotally secured thereto and adapted to swing from a substantially vertical to an inclined position, load-lifting means carried by the boom for engaging the bottom of the load, and means for tilting the boom, said load-lifting means having a rigid member adapted to engage the bottom of the load and a member actuated when the load-lifting member is operated and adapted to engage the top of the load when said boom tilting means is operated.

6. The combination of a truck, a boom piv-

otally secured thereto, load lifting means supported by the boom adapted to shift the load from a horizontal to an inclined position, means carried by the latter means for engaging the ends of the load and means for causing said last named means to engage the load and thereafter raise the load.

7. The combination in a truck of a boom pivotally mounted thereon, a load lifting member secured to the boom and adapted to swing in one position to approximate the horizontal, means to swing the boom and to rotate said load lifting member, and means carried by the load lifting member and operated when the means to swing the boom is actuated for automatically engaging the load prior to any swinging movement of the boom.

8. The combination of a truck, a boom pivotally secured thereto, lifting means rotatably mounted on the boom, means for securing the load to the load lifting means, and mechanism for successively operating said load securing means and said boom respectively.

9. The combination of a truck, a boom pivotally secured thereto, means to shift the boom, and load handling and lifting means comprised substantially of an arcuate load support rotatably secured to the boom and having a projecting portion rigidly secured at the bottom thereof for engaging the bottom of the load, and a relatively movable projecting member positioned at the top of the support adapted to be brought into engagement with the load by said boom tilting mechanism prior to the tilting of the boom.

10. The combination in a truck adapted to carry a roll of paper, of a boom pivotally

mounted thereon, load handling and lifting means comprised substantially of an arcuate support rotatably mounted on the boom and having a projecting member rigidly secured thereto adapted to be inserted beneath the load, winding mechanism for shifting the boom, a movable member positioned at the top of the support and operated by said winding mechanism, and extensible means slidably mounted on the arcuate support for supporting one side of the load when the same is being lowered from a recumbent position to a horizontal position or vice versa.

11. The combination of a truck, a boom pivotally secured thereto, load handling and lifting means rotatably mounted on the boom, and mechanism for successively operating said load handling means and said boom including a load engaging member movable longitudinally of the load.

12. The combination of a truck, a boom pivotally secured thereto, means to shift the boom, load handling and lifting means comprised substantially of a rotatable load support having an arcuate member slidably mounted thereon and controllable from the operator's position on the truck, and a relatively movable member positioned at the top of the support adapted to be brought into engagement with the load by said boom tilting mechanism, said arcuate member being adapted to retain the load on the support when the support is being rotated from a horizontal to a vertical position or vice versa.

In testimony whereof, I hereunto affix my signature.

ALBERT R. GOLDRICK.