

April 22, 1952

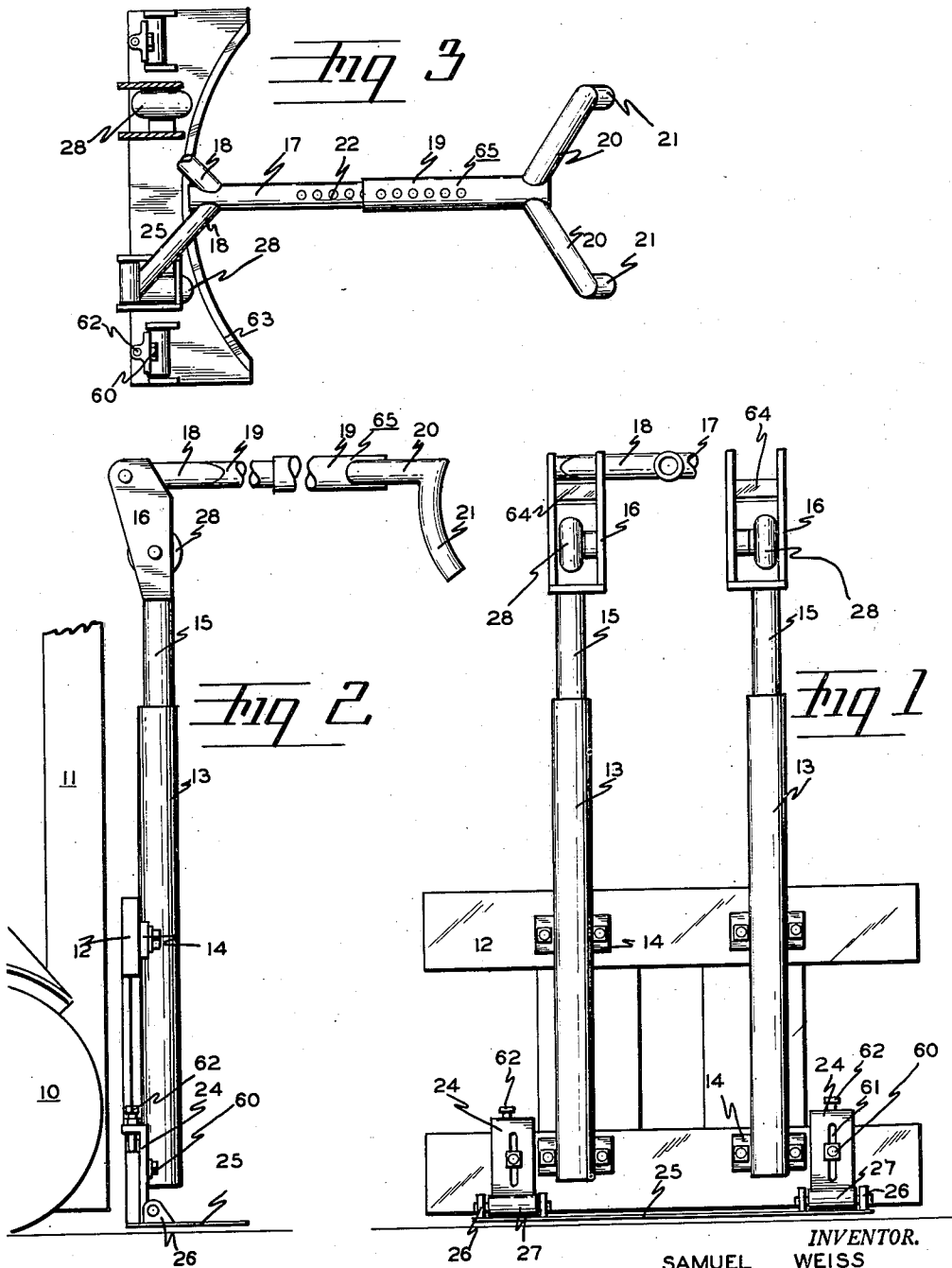
S. WEISS

2,593,820

ATTACHMENT FOR INDUSTRIAL TRUCKS

Filed Feb. 19, 1949

3 Sheets-Sheet 1



April 22, 1952

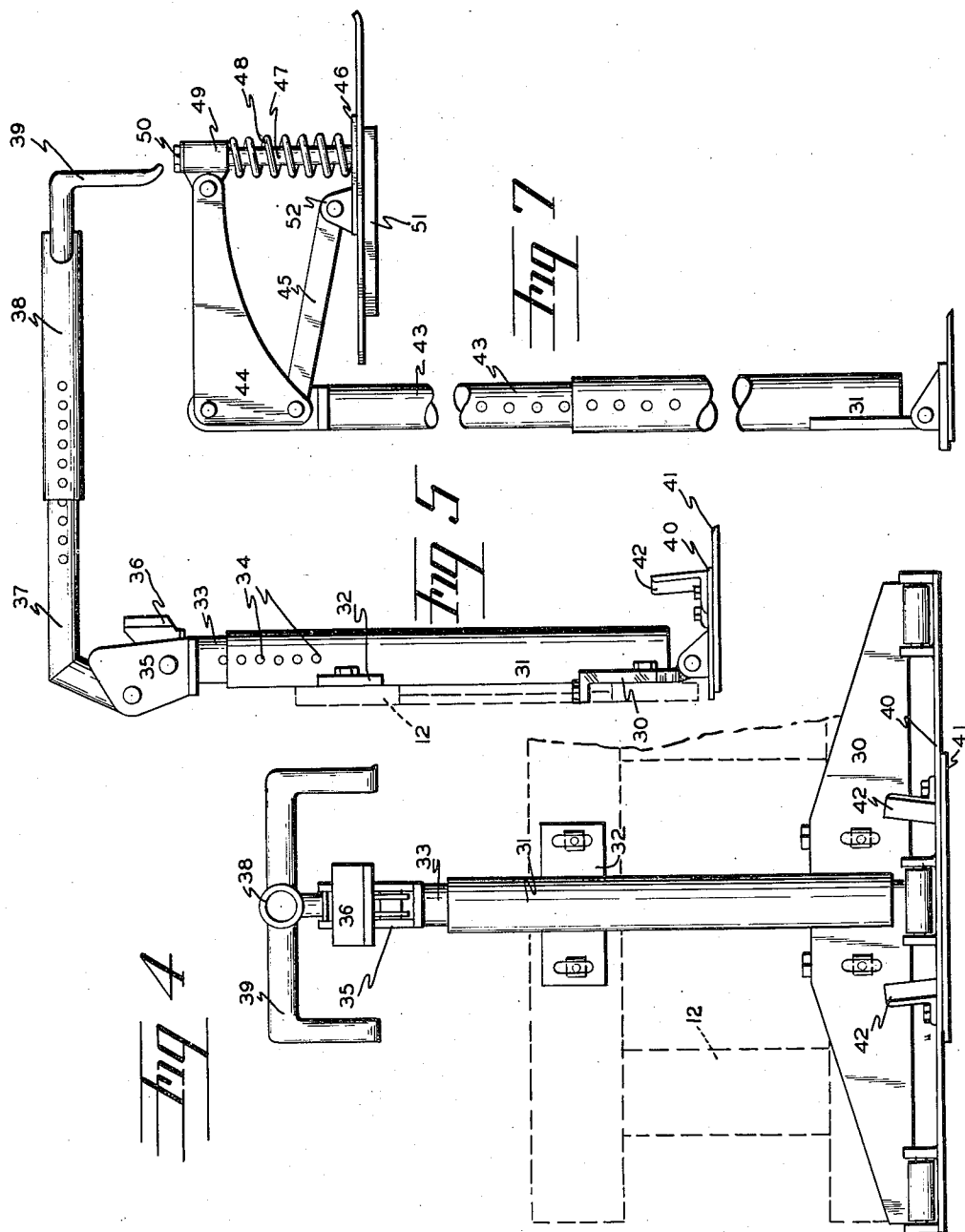
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Fig 6A

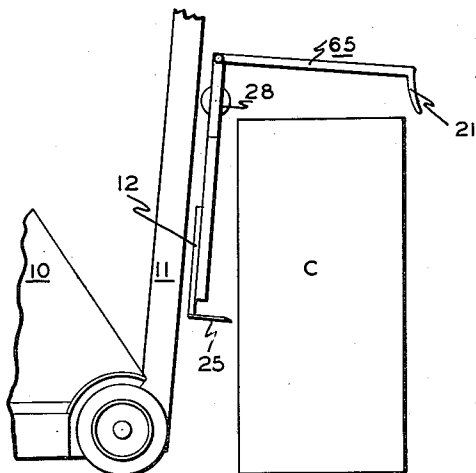


Fig 6B

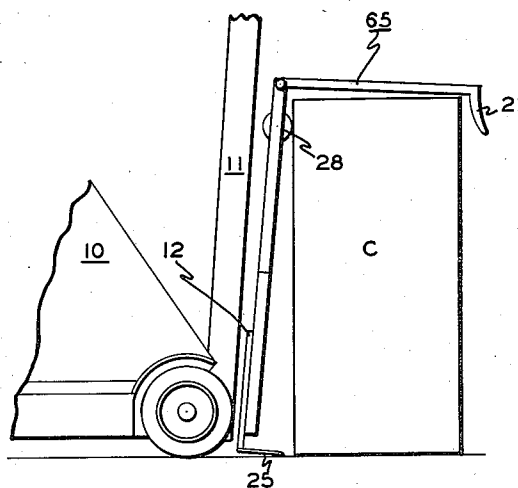


Fig 6C

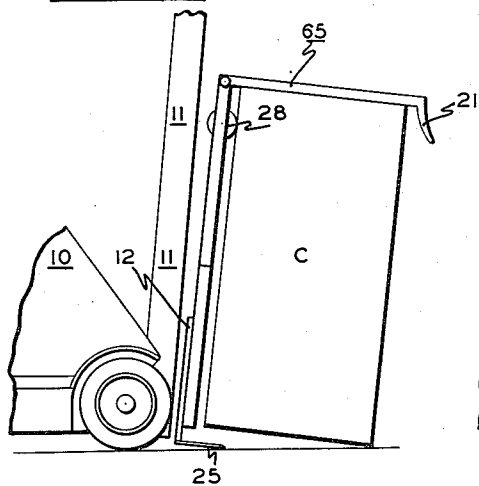
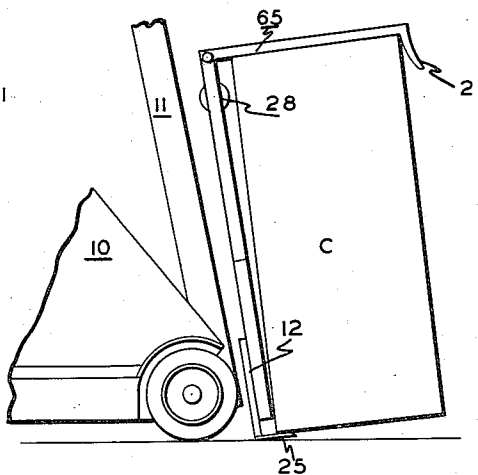


Fig 6D



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ATTACHMENT FOR INDUSTRIAL TRUCKS

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2 Claims. (Cl. 214-66)

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This invention relates to attachments for industrial or end lift trucks by means of which crates, barrels and similar articles of freight may be handled by the truck.

An object of this invention is to provide an improved and special attachment, capable of being mounted on the end of an industrial truck, which will facilitate the lifting and moving of a crate, barrel, or similar article of freight by the operator of the truck.

Ordinarily, when an object such as a crate or barrel is to be loaded on the end lift of an industrial truck, such object must first be tipped manually in a forward direction to enable the load-supporting member or members attached to the end lift to be inserted under the object, after which the object is tipped back in opposite direction until it is supported entirely by the end lift.

A further object of the present invention is to provide an end lift attachment by which this tipping and loading of the object will be done entirely through the medium of the attachment in cooperation with the end lift, and entirely by and under the control of the operator on the truck, thus simplifying and facilitating the handling and moving of such freight and reducing the labor costs involved.

The manner in which my present attachment is constructed and operated, and the way in which the above objects and other incidental advantages are attained will be briefly explained with reference to the accompanying drawings, wherein:

Fig. 1 is a front elevation of the main portion of my attachment, showing the same attached in position on the elevator frame of the end lift of an industrial truck, the truck and end lift, however, being entirely omitted from the figure;

Fig. 2 is a corresponding side elevation of my attachment showing the same in place on the front of an industrial truck;

Fig. 3 is a top plan view of the attachment alone;

Fig. 4 is a front elevation of a slightly modified form of my attachment;

Fig. 5 is a corresponding side elevation of the attachment of Fig. 4;

Figs. 6A, 6B, 6C and 6D are diagrammatic side elevations illustrating the operation of my attachment; and

Fig. 7 is a side elevation showing a further slightly modified form in which my attachment may be made.

Referring to Figs. 1, 2 and 3, my attachment consists of two parts, namely a base section, on

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which the base of the article to be lifted and moved is caused to rest, and an upper section, which includes means for engaging the top or upper portion of the article for the purpose of

5 tipping the article and then for the purpose of holding the article steadily on the end lift. The functions performed by these two parts will be more clearly apparent later. These two parts are mounted on, and removably secured to, the

10 elevator frame 12 of the customary end lift 11 (indicated in part in Fig. 2) of the industrial truck (the forward end of which is indicated in Fig. 2 by the reference character 10). The base section of my attachment will be first described.

15 A pair of foot, L-shaped brackets 24 are adjustably mounted on the bottom cross member of the elevator frame 12 by means of bolts 60, which extend through vertical adjustment slots 61 in the brackets 24. Top positioning screws 62 extend downwardly through the top horizontal flanges of the brackets 24 to engage the top edge of the bottom cross member of the elevator frame 12 and thus combine in holding such brackets in the desired position at the bottom of the elevator frame. Each bracket 24 terminates at the bottom in a sleeve 27. A hinge pin extending through each sleeve 27 has its ends mounted in a pair of ears 26 respectively, which are formed integral with, and extend upwardly from, the

30 hinged base plate 25. When the end lift 11 and the elevator frame 12 of the end lift are in vertical position, as shown in Fig. 2, the hinged base plate 25 will be substantially horizontal and parallel with the ground surface and, when the elevator frame is in lowest position the base plate 25 will be spaced a slight distance above the ground surface. The inner edge of the base plate extends under the bottom edge of the elevator frame, as shown in Fig. 2, and engages the bottom edge when the elevator frame is positioned vertically, and thus keeps the base plate 25 from swinging downwardly into contact with the ground surface. However, it will be evident from Fig. 2 that when the end lift 11, and with it the elevator frame 12, are tipped forwardly, the front edge of the base plate 25 can be made to contact the ground surface. The base plate 25 may be rectangular or may be of any desired and convenient shape most suitable for the particular type of freight article being handled by the truck. For example, I have found it convenient when moving barrels with my attachment, to have the front edge of the base plate cut back to form an arc of a circle of a diameter slightly less than that of the bottom

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of a standard barrel. Such an inwardly curved front edge for the base plate is shown at 63 in Fig. 3. Moreover, the front edge may also be beveled to facilitate the shoving of the base plate under an object to be moved.

The upper section of my attachment when my attachment is made in the form illustrated in Figs. 1, 2 and 3, includes a pair of tubular supports 13, each formed with a double pair of flanges 14, by means of which the tubular supports are secured to the elevator frame 12 in parallel upwardly-extending position. A bar 15 is slidably mounted in each tubular support 13. A box-like bracket 16, having two parallel side walls, is welded or otherwise rigidly secured to the top of each bar 15.

An adjustable top arm assembly, indicated as a whole by the reference character 65, includes a main bar 17, having a pair of rear branch arms 18 which in turn are pivotally mounted in the brackets 16 respectively, and a sleeve member 19, adjustably positioned on the main bar 17 and having a pair of branches 20 extending in opposite, forward, oblique directions from the forward end of the sleeve member 19 and terminating in downwardly curved ends 21, as shown in Figs. 2 and 3. The sleeve member 19 is secured in the desired position on the main bar 17 by a pin or bolt (not shown) extending through registering holes in the series of holes 22 (Fig. 3) in both main bar 17 and sleeve member 19, and thus the overall length of the top arm assembly, and consequently the distance at which the forward ends 22 will be positioned ahead of the brackets 16, can easily be adjusted. A web or stop 64 in each bracket 16 below the hinge joints for the branch arms 18 hold the hinged top arm assembly from dropping down below a position substantially at right angles with respect to the bars 15, while permitting the top arm assembly to be moved to a position of greater angularity with respect to the bars 15. A roller 28 is mounted on a horizontal stub shaft in each bracket 16 and the periphery of the roller extends beyond the front edges of the bracket.

The manner in which my attachment, as thus far described, may be employed in the handling of an article of freight such as a crate, for example, will be now explained with reference to the diagrammatic illustrations Figs. 6A, 6B, 6C and 6D. In these figures C indicates a crate which is to be lifted and moved by the truck. The elevator frame 12, to which my attachment is secured as previously described, is raised in the end lift 11 of the truck 10 until the top arm assembly 65 has reached a height above the top of the crate C and the end lift 11 of the truck is tilted slightly forwardly. The truck 10 is then moved up close to the crate C approximately into the position indicated in Fig. 6A. If necessary the length of the top arm assembly 65 is previously adjusted so that the assembly will be long enough to extend the entire distance across the top of the crate C and so that the downwardly curved ends 21 will be positioned above the outer face of the crate. With the truck, end lift, and my attachment approximately in the relative positions with respect to the crate C as shown in Fig. 6A, the elevator frame 12 is then lowered in the end lift 11.

By the lowering of the elevator frame 12 my attachment is brought into the position illustrated in Fig. 6B. The top arm assembly 65 during the lowering of the elevator frame 12 is brought into engagement with the top of the

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crate C, but since the bars which support the top arm assembly are slidably mounted in their upright tubular supports 13 (Figs. 1 and 2), the lower part of my attachment is free to be moved downwardly while the top arm assembly 65 remains resting against the top of the crate C.

When the various parts of my attachment are in the relative positions shown in Fig. 6B, and the end lift 11 of the truck is in the forwardly-tilted position illustrated, the operator of the truck now moves the truck forward a few inches. This causes the upper part of my attachment, specifically the rollers 28, to push against the upper part of the crate C and to tip the crate C forwardly until the adjacent wall of the crate becomes substantially parallel to the frame of the end lift 11, as shown in Fig. 6C, and the hinged base plate 25 to be below the adjacent bottom edge of the crate C.

The operator on the truck now tilts the end lift 11 in the reverse position, or backwardly, into the position shown in Fig. 6D. This tipping of the end lift also causes the crate C to be tipped correspondingly, due to the engagement of the top arm assembly, and its downwardly-extending ends 21, with the crate. The result is that the bottom edge of the crate will rest on the base plate 25 of my attachment and the crate will then be supported entirely by the attachment and consequently supported entirely on the end lift. The crate C can now be raised by the end lift and moved about by the truck as desired. Obviously, in unloading the crate C from the truck, when the crate has been moved to its desired new location, substantially the same procedure will be followed but in reverse order. Thus the loading, moving, and unloading can all be done by the operator of the truck without assistance and without the necessity of the operator leaving his position on the truck.

When the crate C is being tipped, first on the forward bottom edge, and then on the rear bottom edge, thus, for example, when the crate is being tipped from the position of Fig. 6B to the positions of Fig. 6C and Fig. 6D a slight sliding engagement occurs between the lift attachment and the adjacent wall of the crate. This sliding engagement is taken care of by the rollers 28 which serve as the contact elements bearing against the adjacent crate wall.

In the event the article to be moved consists of a barrel instead of the rectangularly shaped crate illustrated, the barrel can be handled in the same manner with equal facility. In the handling of barrel it is an added convenience to have the front edge of the base plate 25 curved, as shown at 63 in Fig. 3, since the engagement of the bottom curved rim of the barrel with the beveled and curved edge 63 causes less likelihood of any tendency on the part of the barrel to sway laterally while the barrel is resting on the base plate during the positioning of the barrel.

In the modified form of my attachment shown in Figs. 4 and 5, the attachment is made as a complete unit instead of having entirely separate base section and upper section. A single upright tubular support 31 takes the place of the pair of tubular supports in the previously described construction, and this tubular support 31 is welded at the bottom to the main mounting plate 30. The main mounting plate 30 is bolted to the lower portion of the elevator frame 12 of the end lift, and the attachment is further secured in place by bolts extending through the upper portion of the elevator frame 12 and

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through a pair of flanges 32 on the tubular support 31.

A shaft 33, mounted in the tubular support 31, and adjustably slidable therein, has a box-like bracket 35 mounted on its top end. The top arm assembly is hingedly mounted in the bracket 35 and includes a main top arm 37, shaped approximately as shown in Fig. 5, a sleeve member 38, adjustable thereon, and a pair of branch arms 39, having downwardly-extending tips, extending from the front portion of the sleeve member 38. The sleeve member 38 is held in desired position on the top arm 37 by a pin or bolt extending through registering holes in the sleeve and top arm, and similarly the shaft 33 is held at the desired height in the tubular support 31 by a bolt or pin extending through registering holes 34 in both members. A load-engaging block 36 is hingedly mounted on the bracket 35 below the hinge of the top arm assembly for the purpose of engaging the upper portion of the adjacent face of the article to be tilted and moved.

A foot plate 40 is hingedly connected to the bottom part of the main mounting plate 30, as indicated in Figs. 4 and 5, and a foot base extension 41 is secured to the bottom face of the foot plate by welding or other suitable means. When my attachment in this form is used primarily for barrels and drums, I find it convenient to provide a pair of obliquely-extending guide rests 42 on the foot plate, positioned as shown.

The manner in which my attachment, in this modified form, is employed is similar to that previously described. The shaft 33 supporting the top arm assembly, instead of sliding up and down in the tubular support 31, is set at approximately the right height for a standard barrel, for example. The truck approaches the barrel with the end lift tipped forwardly and with the attachment slightly raised so that the top arm assembly will pass over the top of the barrel. Then the attachment is lowered a few inches and the hinged block 36 is pushed against the barrel causing the barrel to tip slightly while the foot base extension 41 is shoved under the bottom edge of the barrel until the guide rests 42 engage the barrel wall. The rest of the operation follows in the manner already described.

In Fig. 7 I show my attachment with a modified top-engaging assembly adapted for engagement with the top face of the article to be moved, in place of the top arm assemblies shown in the preceding figures. Instead of having arms with downwardly-extending ends which reach over the crate or barrel to engage the top of the forward wall, I provide a top clamping plate designed to be held down by spring pressure in a panel of the top face, or between, or in engagement with transverse ribs on the top face, or within the upper rim or chime of the barrel. The purpose of the top clamping plate is of course the same as the purpose of the top arm assembly with the engaging elements previously described, namely to enable the crate or barrel to be tipped by my attachment, first forwardly and then backwardly during the loading operation.

Referring further to Fig. 7, the clamping plate assembly is supported on a bar 43 which in turn is mounted in the tubular support 31. A double bracket 44, formed from a pair of parallel side plates, is secured to the top of the bar 43. A hinged guide sleeve 49 is mounted at the outer end of the bracket 44, and a guide shaft 47 slides

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in this guide sleeve 49. The upper end of the guide shaft carries a limit nut 50. The plate 46 is rigidly secured, through suitable means, to the bottom end of the guide shaft 47. A coil spring 48 is carried on the shaft 47 and will be held under compression between the guide sleeve 49 and the plate 46. A bracket 52 is secured on the plate 46, and a link 53 has one end pivoted in the bracket 52 and the other end pivoted in the main bracket 44. An engaging block or engaging ribs 51 are secured on the bottom face of the plate 46 to provide proper engagement with a recessed panel in the top of the crate, or with slats or cleats on the top of the crate, or with the top rim on the top of the barrel.

With this modified top assembly in my attachment, the operation of the attachment is also similar to the operation of the attachment with the previously described top arm assemblies. The top plate 46 is positioned above the crate or barrel to be moved, and the lowering of the elevator frame with the end lift attachment then causes the top plate to press down on the crate or barrel and to maintain a firm hold on the same under spring pressure. The tipping and loading of the crate or barrel then follow as previously described.

In the carrying out of my invention other modifications could be made in portions of my lift attachment within the scope of the invention.

I claim:

1. In an industrial truck of the character described, the combination of an end lift adapted to be tilted forwardly and rearwardly, an elevator frame in said end lift, and a load-handling attachment on said elevator frame, said load-handling attachment including a member extending upwardly substantially parallel to said end lift, a mounting for said member, said mounting secured to said elevator frame, said member slidable up and down in said mounting, a load-engaging top assembly extending forwardly from said member and lift and hingedly mounted on the top of said member for limited up and down swing with respect to said member, said top assembly adapted to extend over the top of an object to be handled by said truck and having downwardly-extending engaging means at its outer end to engage the top edge on the forward side of said object, an element mounted at the upper end of said member adapted to bear against the upper portion of the rear side of said object adjacent said lift when said top assembly is in place over said object, said element adapted to tip said object forwardly when said truck is moved slightly forwardly with said lift tipped forwardly, and a base plate centrally positioned at the bottom of said elevator frame, extending forwardly and hinged to said frame for limited up and down movement with respect to said frame, whereby, when said top assembly is in place over said object, with said lift tilted forwardly, the lowering of said elevator frame until said base plate rests on the ground, followed by a slight forward movement of said truck, will cause said object to be tilted forwardly by said element and said base plate to be positioned under said object, whereupon subsequent rearward tilting of said lift will result in said object being positioned entirely on said attachment.

2. In an industrial truck of the character described, the combination of an end lift adapted to be tilted forwardly and rearwardly, an elevator frame in said end lift, and a load-handling attachment on said elevator frame, said load-

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handling attachment comprising a pair of members extending upwardly substantially parallel to said end lift, a pair of tubular mountings for said members respectively, said tubular mountings secured to said elevator frame, said members 5 slidable up and down in said tubular mountings, a load-engaging top assembly extending forwardly from said members and lift and hingedly mounted on the top of said members for limited up and down swing with respect to said mem- 10 bers, said top assembly adapted to extend over the top of an object to be handled by said truck and having downwardly-extending engaging means at its outer end to engage the top edge on the forward side of said object, an element 15 mounted at the upper end of each of said members adapted to bear against the upper portion of the rear side of said object adjacent said lift when said top assembly is in place over said object, said elements adapted to tip said object forwardly when said truck is moved slightly forwardly with said lift tipped forwardly, and a base plate attached at the bottom of said elevator frame, extending forwardly from said lift and hinged for limited up and down movement with respect to said frame, said base plate extending transversely across the bottom of said frame and having a beveled concave front edge, whereby,

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when said top assembly is in place over said object, with said lift tilted forwardly, the lowering of said elevator frame until said base plate rests on the ground, followed by a slight forward movement of said truck, will cause said object to be tilted forwardly by said elements and said base plate to be positioned under said object, whereupon subsequent rearward tilting of said lift will result in said object being positioned entirely on said attachment.

SAMUEL WEISS.

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