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LIFT TRUCK

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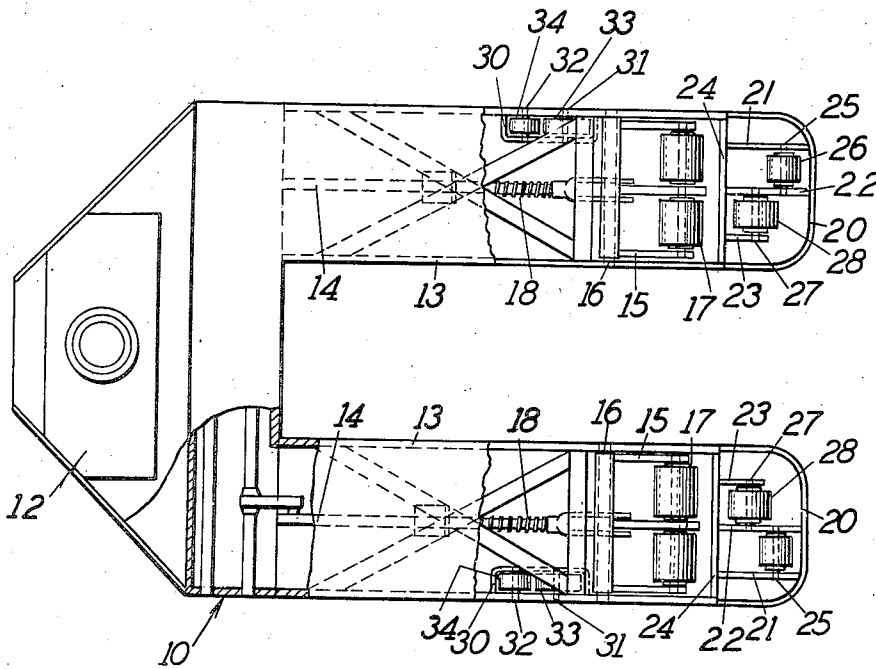


FIG. 1

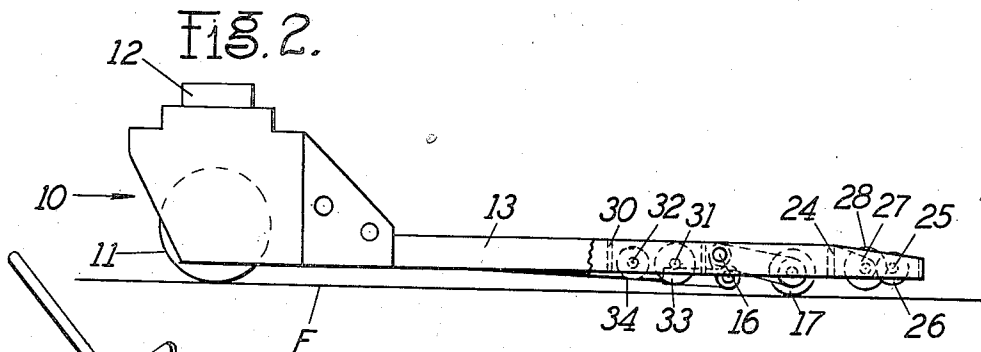


FIG. 2.

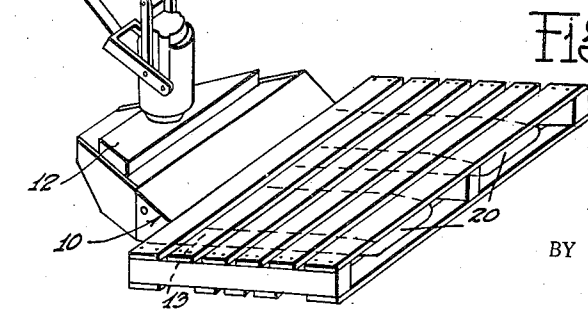


FIG. 3.

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## LIFT TRUCK

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14 Claims. (Cl. 280-44)

This invention relates to lift trucks and more particularly to the type of lift truck disclosed in applicants' copending application, Serial No. 164,540, filed September 18, 1937, entitled Lift truck adapted for use with a two faced pallet.

One primary object of this invention is the provision of an improved lift truck for use with two faced pallets wherein there is provided a simple means for facilitating the insertion of the fork of the truck between the two faces of the pallet.

An additional object is the provision in conjunction with an uncounterweighted lift truck having an extensible and retractable member adapted to be passed through an aperture in the lower face of a two faced pallet or adapted to extend completely through such a pallet, of means whereby the fork may readily ride over the lower face of the pallet either upon being inserted between the two faces thereof or withdrawn therefrom.

A further and more specific object is the provision of a stepped means carried by the fork of a lift truck to substantially eliminate the necessity of lifting the end of the truck off of the floor to any extent when the same is passed over an edge of the lower face of a two faced pallet.

A still further object is the provision of a lift truck incorporating all the advantages mentioned in the above objects which may be readily used with a single faced pallet if desired.

A further object is the provision of a lift truck which may be readily used particularly in conjunction with a pallet of the type described in applicants' co-pending application, Serial No. 164,541, filed September 18, 1937, entitled Pallet.

Other objects will in part be obvious and in part pointed out hereinafter.

The invention accordingly consists in the combination of elements, arrangement of parts and features of construction all as will be more fully pointed out hereinafter and disclosed in the accompanying drawing wherein:

Figure 1 is a top elevational view of a preferred form of lift truck in accordance with the present invention.

Figure 2 is a side elevational view of the structure shown in Figure 1.

Figure 3 is a perspective view of a lift truck illustrated in Figures 1 and 2, shown as associated with a two-faced pallet.

Similar reference characters refer to similar parts throughout the several views of the drawing.

Having reference now to the drawing there is generally indicated at 10 a lift truck frame provided with an elevating wheel 11 adjacent one end thereof and suitable lifting mechanism 12, only generally shown here but more clearly illustrated in our copending application Ser. No. 164,540 above referred to, to elevate frame 10 with respect to wheel 11. Frame 10 is provided with a pair of extending portions 13, which by reference to Figure 3, are adapted to be inserted between the two faces of a two faced pallet, for example, of the type shown in applicants' above mentioned co-pending application, Serial No. 164,541, entitled Pallet. Inasmuch as the two extending portions 13 are substantially identical they will hereinafter not be individually described.

An axially movable rod 14 actuated by said lifting mechanism passes through each of extending portions 13 and is secured in each case to a bracket 15 pivoted as on a pivot 16. Each of brackets 15 is provided with roller means 17 and the arrangement is such that upon actuation of lift mechanism 12 and consequently elevation of frame 10 with respect to wheel 11, bracket 15 is swung about pivot 16 in a clockwise direction as viewed in Figure 2 to move extending portions 13 upwardly with respect to rollers 17 and the floor surface generally designated at "F" in Figure 2. Springs 18 serve normally to bias brackets 15 and rollers 17 toward retracted position.

In the operation of such a lift truck, however, it has been found that, in order to maintain the thickness of extending portions 13 with such limits as to permit the ready passage between the two faces of a two faced pallet either of the conventional type or the type disclosed in applicants' above mentioned application entitled Pallet, rollers 17 must extend a substantial distance below the bottom surface thereof, as shown in Figure 2. This under certain circumstances has hitherto necessitated a slight elevation of the end of the frame by the operator.

One object of this invention is, therefore, to provide a means whereby such elevation may be accomplished without material effort on the part of the operator and whereby the ends of the extending portions 13 may be readily passed over the lower face of a pallet without occasioning any jar or bump to the truck mechanism. In order that this may be accomplished the ends of extending members 13 opposite lift mechanism 12, generally indicated at 20, are provided with a plurality of members 21, 22 and 23 extending longitudinally with respect thereto. Each of

these members is rigidly secured to a transverse member 24 and it may here be pointed out that members 21 and 22 extend to the end 26 of the portions 13 whereas member 23 terminates short thereof. Positioned between each of members 21 and 22 is an axle 25, on each of which axles is mounted a roller 26 of a diameter slightly greater than the thickness of extending portions 13. Positioned between each of members 22 and 23 is a second axle 27 on each of which is mounted a second roller 28 of a slightly greater diameter than roller 26. Roller 28 extends below the frame portion, however, a lesser distance than roller 17. It should also be pointed out that each of rollers 28 is positioned a distance from its corresponding end 26 of extending member 13 a distance greater than its associated roller 26.

Thus it will be seen that as extending portions 13 are moved adjacent the lower face of the pallet that roller 26 raises the same a slight distance from the floor as it is passed over the lower edge of the pallet. Roller 28 is next passed thereover and increases the lift a slightly greater distance so that when roller 17 is adjacent the end of said pallet the lift required to be performed thereby is relatively slight.

Thus each roller acts in turn to raise extending members 13 a slight distance and the combined effect raises the same a required distance above the edge of the pallet to permit the truck to be associated therewith in a relatively effortless and simple manner.

It is occasionally desirable when the lift truck is utilized with certain types of pallets that the same be passed completely therethrough. To avoid a similar relatively great lift on withdrawing the truck from the pallet additional rollers to the rear of roller 17 are provided, operating in the manner previously disclosed in connection with rollers 26 and 28.

Brackets 30 are secured to extending portions 13 and provided with a pair of axles 31 and 32. Axle 31 has mounted thereon a roller 33 which extends below the bottom portion of extending members 13 a distance slightly less than rollers 17. Similarly axle 32 is provided with a roller 34 of a lesser diameter than roller 33 and which correspondingly extends below extending portions 34 a still lesser distance. Thus on the withdrawal of a lift truck from beneath a pallet through which it is extended completely or on withdrawal of the same from an apertured pallet wherein the dimension of the aperture is such as to completely clear the distance between the rollers 34 and roller 17, rollers 34 and 33 provide a means of gradually lifting rollers 17 so that the truck may be drawn from the pallet simply and comparatively effortless.

It may here be pointed out also that rollers 26, 28, 33 and 34 provide in the case of apertured pallets, supporting means pressing on the lower surface thereof to provide a rolling rather than sliding friction for extending portions 13 subsequent to the lowering of lift truck 10 in the event that the said apertures are sufficiently small to permit engagement of any of the rollers with the surface upon such lowering of the truck.

Now from the foregoing it will be seen that there is herein provided a structure which accomplishes all the objects of this invention and others including many advantages of great practical utility.

As many embodiments may be made of the inventive concept herein shown and described and as many modifications may be made in the em-

bodiment hereinbefore set forth, it is to be understood that all matter hereinbefore described or shown is to be interpreted merely as illustrative and not in a limiting sense.

We claim as our invention:

1. In a lift truck, in combination, a frame, an extensible and retractible member carried by said frame, means to retract said member and a plurality of roller means extending a varying distance below said frame, carried by said frame and positioned adjacent said member.

2. In a lift truck, in combination, a frame, an extensible and retractible member carried by an end of said frame, means to retract said member and a plurality of roller means extending a varying distance below said frame, carried by said frame, positioned adjacent said member, said roller means which extend a greater distance below said frame being positioned relatively adjacent said member and said roller means which extend a lesser distance below said frame being positioned relatively remote therefrom.

3. In a lift truck, in combination, a frame, an extensible and retractible member carried by an end of said frame, said member including a roller, means to extend and retract said member, a plurality of roller means extending variable distances below said frame, carried by said frame and positioned adjacent said member, said first mentioned roller extending below said frame when in retracted position a distance greater than the extent of any of said plurality of roller means.

4. In a lift truck, in combination, a frame, an extensible and retractible member carried by an end of said frame, said member including a roller, means to extend and retract said member, a plurality of roller means extending variable distances below said frame, carried by said frame and positioned adjacent said member, said first mentioned roller extending below said frame when in retracted position a distance greater than the extent of any of said plurality of roller means, those of said roller means which extend a greater distance below said frame being positioned relatively adjacent said member and those of said roller means which extend a lesser distance below said frame being positioned relatively remote therefrom.

5. In a lift truck, in combination, a frame, lifting means carried by an end of said frame, extending portions comprising a part of said frame and adapted for insertion between the faces of a two faced pallet, extensible and retractible members carried by said portions, each of said members including a roller and extending when in retracted position a given distance below said extending portion, a second roller positioned adjacent said first mentioned roller in a direction away from said lifting means and extending below said extending portions a distance less than said first mentioned roller and a third roller positioned adjacent said second roller in a direction away from said lifting means and extending a still lesser distance below said extending portions.

6. In a lift truck, in combination, a frame, lifting means carried by an end of said frame, extending portions comprising a part of said frame and adapted for insertion between the faces of a two faced pallet, extensible and retractible members carried by said portions, each of said members including a roller and extending when in retracted position a given distance below said extending portion, a second roller positioned adjacent said first mentioned roller in a direction away from said lifting means and extending be-

low said extending portions a distance less than said first mentioned roller, a third roller positioned adjacent said second roller in a direction away from said lifting means and extending a still lesser distance below said extending portions, and a fourth roller extending below said extending portions a distance less than the first mentioned roller and positioned adjacent thereto in a direction toward said lifting means.

7. In a lift truck, in combination, a frame, lifting means carried by an end of said frame, extending portions comprising a part of said frame and adapted for insertion between the faces of a two faced pallet, extensible and retractible members carried by said portions, each of said members including a roller and extending when in retracted position a given distance below said extending portion, a second roller positioned adjacent said first mentioned roller in a direction away from said lifting means and extending below said extending portions a distance less than said first mentioned roller, a third roller positioned adjacent said second roller in a direction away from said lifting means and extending a still lesser distance below said extending portions, a fourth roller extending below said frame a distance less than the first mentioned roller and positioned adjacent thereto in a direction toward said lifting means, and a fifth roller extending below said extending portions a less distance than said fourth mentioned roller and positioned adjacent thereto in a direction toward said lifting means.

8. In a lift truck, in combination, a frame, lifting means carried by an end of said frame, extending portions comprising a part of said frame and adapted for insertion between the faces of a two faced pallet, extensible and retractible members carried by said portions, each of said members including a roller and extending when in retracted position a given distance below said extending portion, and a plurality of roller means extending varying distances below said extending portions positioned adjacent said first mentioned rollers, those of said roller means extending the least distance below said extending portions being situated at points more remote from said first mentioned roller than those of said roller means extending a greater distance.

9. In a lift truck, in combination, a frame, lifting means carried by an end of said frame, extending portions comprising a part of said frame and adapted for insertion between the faces of a two faced pallet, extensible and retractible members carried by said portions, each of said members including a roller and extending when in retracted position a given distance below said extending portion, and a plurality of roller means extending a varying distance below said extending portions positioned adjacent said first mentioned roller means in a direction away from said lifting means, those of said rollers extending the least distance below said extending portions being situated at points more remote from said first mentioned roller than those of said roller means extending a greater distance.

10. In a lift truck, in combination, a frame, lifting means carried by an end of said frame, extending portions comprising a part of said

frame and adapted for insertion between the faces of a two faced pallet, extensible and retractible members carried by said portions, each of said members including a roller and extending when in retracted position a given distance below said extending portion, and a plurality of roller means extending a varying distance below said extending portions positioned adjacent said first mentioned roller means in a direction toward said lifting means, those of said rollers extending the least distance below said extending portions being situated at points more remote from said first mentioned roller than those of said roller means extending a greater distance.

11. In a lift truck, in combination, a frame, lifting means carried by an end of said frame, extending portions comprising a part of said frame and adapted for insertion between the faces of a two faced pallet, extensible and retractible members carried by said portions, each of said members including a roller and extending when in retracted position a given distance below said extending portion, and a plurality of roller means extending a varying distance below said extending portions positioned adjacent said first mentioned roller in opposite directions from said first mentioned roller means with respect to said lifting means, those of said rollers extending the least distance below said extending portions being situated at points more remote from said first mentioned roller than those of said roller means extending a greater distance.

12. In a lift truck, in combination, a frame, an extensible and retractible member carried by an end of said frame, means to extend and retract said member carried by one end of said frame and roller means carried by said frame and positioned adjacent said member in a direction towards said means to extend and retract said member.

13. In combination with a lift truck having a frame including a portion adapted to be inserted between the faces of a two faced pallet, means to elevate said frame, and extensible and retractible means adapted to extend into said pallet, for extension through or beyond the same, successive roller means so positioned as to provide successive relative slight lifting movement of the leading end of said portion to facilitate introduction of the said portion into the space between said faces.

14. In combination with a lift truck having a frame including a portion adapted to be inserted between the faces of a two faced pallet, means to elevate said frame, and extensible and retractible means adapted to extend into said pallet, for extension through or beyond the same, successive roller means so positioned as to provide successive relative slight lifting movement of the leading end of said portion to facilitate introduction of the said portion into the space between said faces and successive roller means so positioned as to provide a relatively slight lifting movement of the end of said portions carrying said retractible and extensible means upon withdrawal of the same from said space.

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