

July 19, 1955

C. S. LORIMER

2,713,432

LEFT TRUCK APPARATUS FOR UNLOADING LUMBER AND THE LIKE

Filed Sept. 14, 1951

2 Sheets-Sheet 1

Fig-1

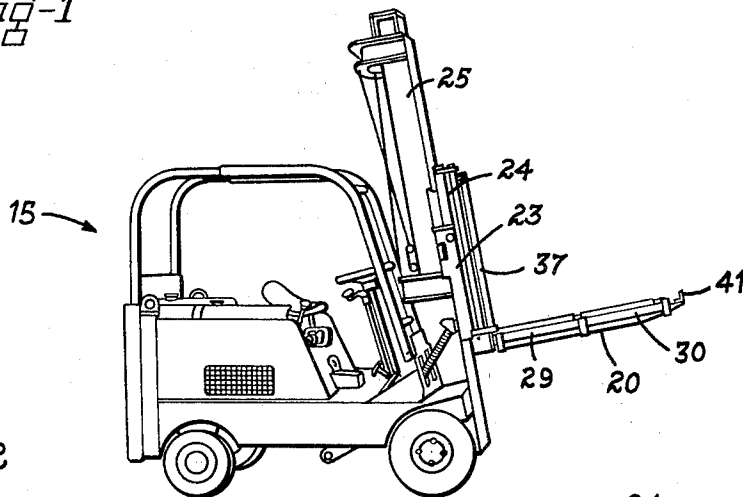
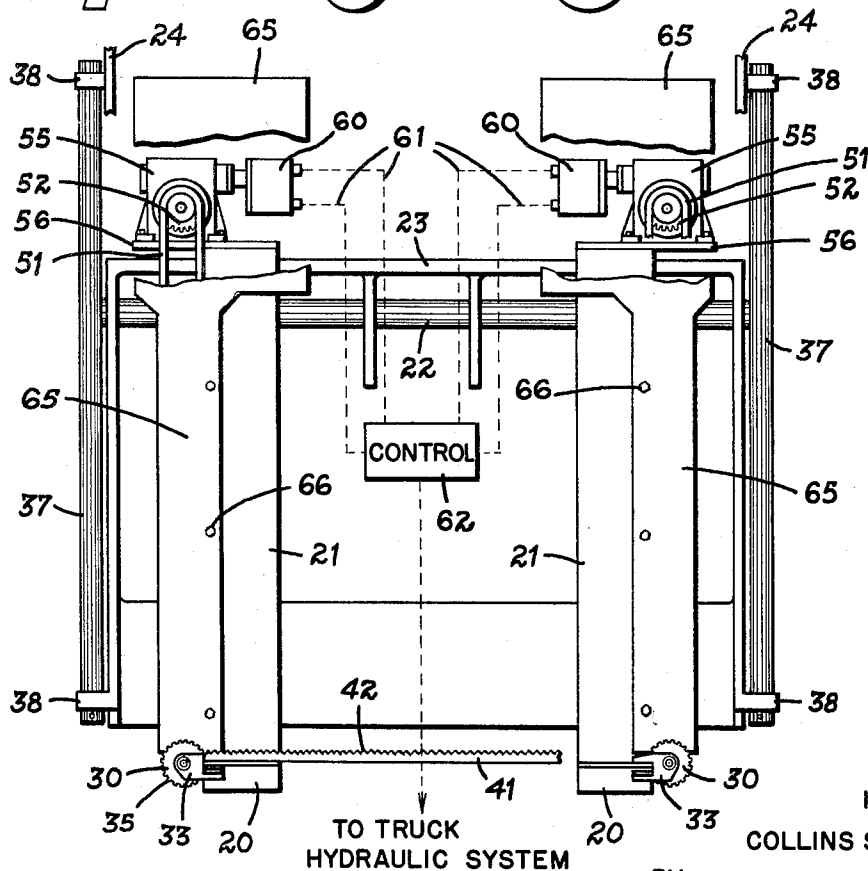


Fig-2



TO TRUCK
HYDRAULIC SYSTEM

INVENTOR
COLLINS S. LORIMER
BY *Marshall Biebel*
ATTORNEYS

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2 Sheets-Sheet 2

Fig-3

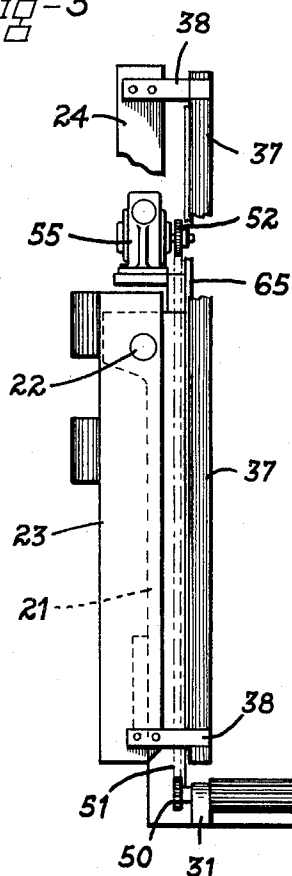


Fig-4

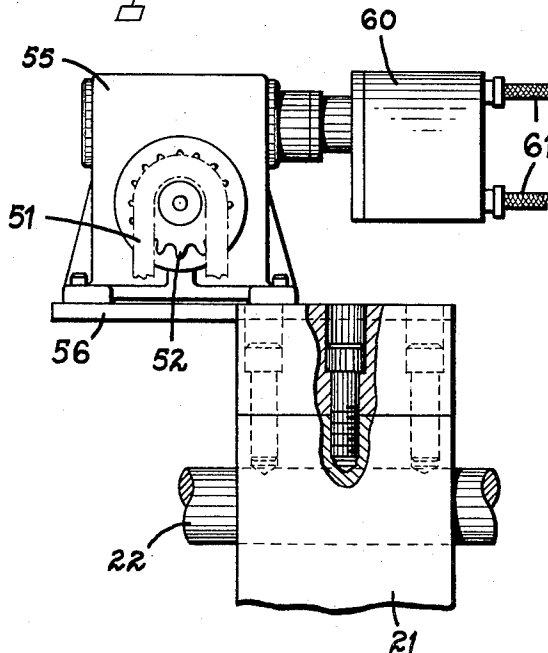


Fig-5

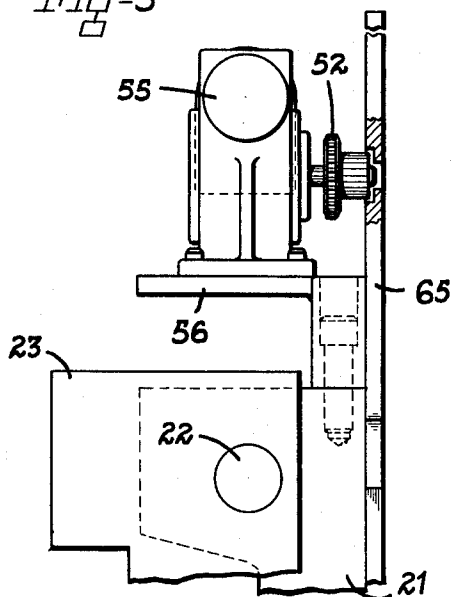


Fig-6

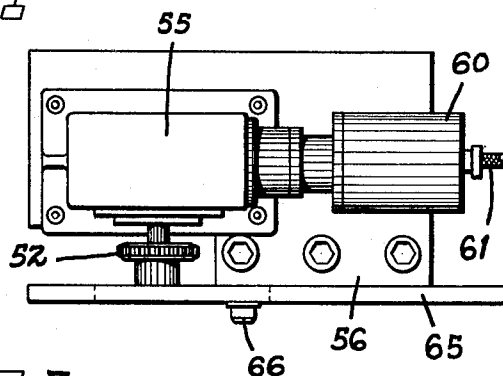
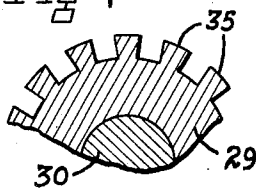


Fig-7



INVENTOR
COLLINS S. LORIMER
BY *Marechal & Biebel*
ATTORNEYS

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2,713,432

LIFT TRUCK APPARATUS FOR UNLOADING LUMBER AND THE LIKE

Collins S. Lorimer, Urbana, Ohio

Application September 14, 1951, Serial No. 246,632

5 Claims. (Cl. 214—512)

This invention relates to apparatus for use with lift fork trucks to load or unload an elongated load such as a stack or bundle of lumber by endwise movement thereof. This application is a continuation-in-part of my copending application Serial No. 110,758, filed August 17, 1949 and now Patent No. 2,665,019.

The invention has particular application to conditions such as are involved in handling lumber in yards or sheds wherein it is desired to stack the lumber with one end thereof outermost, for example in bins or decks or simply in piles. When lumber is stored in this fashion, it is readily piled or unpiled by hand, but this is a laborious and time consuming operation. On the other hand, since lumber is ordinarily stored in comparatively long pieces, when it is handled by a lift fork truck, the fork has to be positioned near the center of the load for proper balance, and the truck can accordingly move such a load only generally transversely of its length. As a result, if it is desired to unload a pile standing between two or more other piles with only an end exposed, there is no convenient way to gain access to the center of the desired pile with a conventional lift fork truck.

The lumber may be handled in individual pieces but it is found convenient and economical to gather the pieces into bundles of convenient size and then to band the bundles with steel tape. This not only simplifies the further handling of the lumber, but it provides for keeping the lumber in better condition and with less tendency for warpage, breakage and the like. Such bundles are relatively heavy and bulky, and it is important to provide for the proper handling, stacking and removal thereof.

My above noted copending application discloses a simple attachment for the forks of a lift fork truck which will enable the truck to load or unload a stack of lumber or other elongated load by endwise movement of the load without manual handling thereof by the operator and without impairing the utility of the truck for handling loads of other sizes and shapes. Rollers are provided on the forks in position to receive and support the load for normal lifting and carrying by the truck, and these rollers are disclosed as fitted with square ends or other suitable connections for a crank or other drive element to provide for rotation of the rollers and resulting endwise movement of the load transversely of the forks for loading or unloading, suitable locks being provided to prevent rotation of the rollers except when desired by the operator. In addition, the forks are equipped with a friction bar or other suitable projection located forwardly of the rollers in position for frictional engagement with the underside of the load when the latter is supported on the ground or pile, such as a bundle of lumber in a stack, and when the fork is elevated with this projection in position to engage and raise the end of the load, the latter can then be readily pushed or pulled by moving the truck as desired to complete the unloading operation or to initiate loading.

One of the principal objects of the present invention is to provide apparatus of this character for use in conjunc-

2

tion with a lift fork truck to handle a stack of lumber or similarly elongated load safely and conveniently, and more particularly to provide such apparatus wherein the rollers for transporting the load to and from the forks are power driven for more convenient operation.

An additional object of the invention is to provide such apparatus wherein the rollers on the forks are driven under the control of the operator by means of hydraulic pressure from the hydraulic system of the truck which also causes the other operative movements of the lift forks.

Other objects and advantages of the invention will be apparent from the following description, the accompanying drawings and the appended claims.

In the drawings—

Fig. 1 is a perspective view of a lift fork truck equipped with a lumber handling attachment in accordance with the invention;

Fig. 2 is a view partly in front elevation and partly broken away showing the forks of the truck of Fig. 1;

Fig. 3 is a side elevation of the forks and supporting frame therefor;

Figs. 4 and 5 are fragmentary front and side elevational views respectively on a larger scale showing the drive arrangement for the rollers on one of the forks;

Fig. 6 is a top view of the same fragment shown in Figs. 4 and 5; and

Fig. 7 is a fragmentary section on the line 7—7 of Fig. 3.

Referring to the drawings, which illustrate a preferred embodiment, of the invention, Fig. 1 shows a lift fork truck of conventional design indicated generally by the reference character 15. The forwardly extending lift forks 20 include upwardly projecting portions 21 supported by a shaft 22 on a frame 23—24 adapted to be raised and lowered on the standard or column 25 which is pivotally supported on the truck at its lower end for forward and backward rocking movement as desired. The construction and operation of these parts of the truck are conventional and accordingly require no further description.

A pair of rollers 29 and 30 is mounted on each of the lift forks 20 by means of brackets 31, 32 and 33, which are bolted to the forks and are so arranged as to locate the upper surfaces of rollers 31 above the upper surfaces of the forks and thus in position for directly receiving and supporting a load, and the rollers 29 and 30 are both formed with grooved peripheries providing teeth 35 as shown in Fig. 7. The two rollers 29 and 30 of each pair are provided with a driving interconnection, the shaft at the rearward end of the forward roller 30 being inserted in the forward end of the rearward roller 29 of the pair and being pinned thereto as indicated at 36 in Fig. 3 so that they turn together. Two additional rollers 37 are secured by brackets 38 to the frame 23—24, the rollers 37 extending upwardly at substantially right angles to rollers 30 to act as guides for a load being loaded on the forks or unloaded therefrom.

A plate or bar 40 is bolted to the front ends of the forks 20 and includes an upturned portion 41 extending across the front of the forks and having a sharpened and notched upper edge 42. This sharpened portion of the bar 40 is thus adapted for frictional engagement independently of rollers 29—30 with the underside of a load, satisfactory results having been obtained with the parts so proportioned that the sharpened edge 42 is in substantially the same plane above the upper surface of forks 20 as the uppermost portion of rollers 29—30. When the lift truck is used for other purposes, the friction bar may be simply lifted away from the forks and the truck used in the ordinary way.

A power drive is provided for rotating the rollers

29—30, and it has been found satisfactory and convenient to utilize hydraulic motor means operated from the hydraulic system commonly provided in the lift fork truck for operating the lift forks. Each of the rollers 29 carries a sprocket 50 at its rearward end which is connected to a chain 51 with a sprocket 52 driven from a gear reducer 55 carried by a bracket 56 bolted to the upper end of one of the upwardly extending fork portions 21, this structure being duplicated on each fork. Each gear reducer 55 is in turn shown as driven by a hydraulic motor 60 connected as by flexible lines 61 with the hydraulic system of the truck and provided with suitable controls shown diagrammatically at 62 such as valves for controlling the flow of the hydraulic fluid to and from motors 60. The controls 62 are preferably mounted in position for convenient operation by the driver of the truck from his normal operating position. Shield plates 63 are bolted at 66 to the fork portions 21 and extend in front of the sprocket chains 51 and the motors and gear reducers to protect them against contact with a load on the forks.

The operation of this lift fork truck for loading or placing a bundle of lumber by endwise movement onto a pile is generally similar to the same operation described and shown in detail in the above noted copending application. The forks are elevated to a position in which the load thereon is above and in line with the pile on which it is to be stacked, and a separate roller is placed on the outer end of the pile. The forks are then lowered until the load is just above the level of this separate roller, and then one or both motors 60 are actuated to cause the rollers 29 and 30 to rotate in the proper direction to cause the load to move transversely of the forks and endwise of the pile until its leading end overhangs the separate roller. The forks are then further lowered until the leading end of the load is resting on this separate roller, and the rollers 29 and 30 are then further rotated until at least the major portion of the load has been transferred to the pile. The truck is then moved away and brought into endwise relation with the load such that the notched bar 40—42 is under the outer end of the load, and the forks are then raised until this bar engages and raises the end of the load, after which the truck is moved forward to push the load fully onto the pile. Next the forks are raised sufficiently to elevate the load until the separate roller underneath it is free and can be replaced by spacers of sufficient height to provide clearance for removing bar 40 after the load is again lowered onto the spacers.

It will accordingly be seen that the present invention provides a simple attachment for the forks of a conventional lift fork truck which enables the truck to handle a stack of lumber or other elongated load and to unload such by endwise movement on to a pile. Furthermore, this attachment does not affect the operation of the truck for handling other loads, but at the same time it can be readily removed if desired by simply unbolting the brackets 31, 32 and 33 and the bar 40. The bundles of lumber can be removed from the pile with a lift fork truck by following the reverse sequence of operations. That is to say, the bar 40 can be inserted between bundles and the forks raised to elevate the outer end of the bundles sufficiently for removal of the spacers therebelow and replacement of the separate roller. The load can then be lowered on to this roller and pulled out in the same manner as described for pushing the load into position, and after a sufficient part of the load has been pulled out, the bundles can then be loaded on the forks by operation of rollers 29 and 30 through motors 60 and carried away.

The provision of the motor drive for rollers 29 and 30 is of special advantage in the practice of the invention, since it reduces the manual labor required for loading or unloading to the mere handling of the separate roller and spacers on the pile. Thus the driver of the truck can

perform almost the entire operation without leaving his seat, even when an elongated load is to be loaded endwise in a space between piles such that no more than a bare clearance is available. Furthermore, there is ample assurance of a firm support for the load while it is being carried on the forks, since the hydraulic controls for motors 60 will normally hold the motors stationary and thus effectively lock rollers 29 and 30 against rotation, and the toothed surfaces of these rollers will thus grip and hold the load against possible movement on the forks.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. Apparatus for loading or unloading an elongated load in combination with a lift fork truck having a frame and a hydraulic system for operating the forks thereof, comprising a plurality of generally horizontal rollers, means for supporting said horizontal rollers in fixed rotatable position on the forks of said truck and in substantially parallel relation with said forks in position to receive the load thereon for movement transversely of said forks upon rotation of said rollers, a bar having a serrated portion, means for supporting said bar on the forward ends of said forks with said serrated portion uppermost and located forwardly of said horizontal rollers in position for frictional engagement with the underside of a load located off said forks, a plurality of freely rotatable rollers mounted on said frame in generally upright position adjacent the rearward ends of said horizontal rollers to guide and support rearward thrust of said load during said transverse movement thereof, hydraulic motor means mounted on said frame rearwardly of the plane of said upright rollers for rotating said horizontal rollers to cause said transverse movement of said load, and means connecting said motor means with said horizontal rollers and with the hydraulic system of said truck for operation under the control of the operator of said truck.

2. Apparatus for loading or unloading an elongated load in combination with a lift fork truck having a frame and a hydraulic system for operating the forks thereof, comprising a plurality of generally horizontal rollers, means for supporting said horizontal rollers in fixed rotatable position on the forks of said truck and in substantially parallel relation with said forks in position to receive the load thereon for movement transversely of said forks upon rotation of said rollers, a bar having a serrated portion, means for supporting said bar on the forward ends of said forks with said serrated portion uppermost and located forwardly of said horizontal rollers in position for frictional engagement with the underside of a load located off said forks, a plurality of rollers mounted on said frame in generally upright position adjacent the rearward ends of said horizontal rollers to guide and support rearward thrust of said load during said transverse movement thereof, hydraulic motor means mounted on said frame rearwardly of the plane of said upright rollers for rotating said horizontal rollers to cause said transverse movement of said load, means connecting said motor means with said horizontal rollers and with the hydraulic system of said truck for operation under the control of the operator of said truck, and a control for said motor means effective in the stationary position thereof to lock said horizontal rollers against rotation.

3. Apparatus for loading or unloading an elongated load by endwise movement thereof in combination with a lift fork truck having a hydraulic operating system, comprising a plurality of rollers supported on the forks of said truck in upwardly spaced and generally parallel relation with said forks to receive the load thereon, hy-

5

draulic motor means mounted in fixed relation with said forks for rotating said rollers to cause movement of said load transversely of said forks, means for connecting said motor means with said rollers and with said hydraulic system of said truck for operation under the control of the operator of said truck, means for locking said rollers against rotation, bar means having a serrated portion, means for securing said bar means to the ends of said forks forwardly of said rollers and with said serrated portion thereof uppermost in position for frictional engagement with the underside of a load located off said forks, and guide members having a relatively low coefficient of friction supported on said forks in generally upright and perpendicular relation with said rollers to guide said load during said transverse movement thereof.

4. Apparatus for attachment to the forks of a fork lift truck having a hydraulic operating system to handle a heavy load in the form of elongated material such as lumber or the like having a length substantially greater than the spacing of said forks and adapted to be placed in or removed from a pile in the lengthwise direction thereof, comprising a pair of rollers, means for mounting said rollers substantially parallel with said forks and with the upper surfaces thereof projecting above the level of said forks to receive said load thereon, means for fixing said rollers against turning with a load balanced thereon with its ends overhanging said rollers and both sides of said forks for lifting and transporting of said load on said lift truck, hydraulic motor means mounted on said forks for imparting torque power to said rollers to cause the load thereon to travel in the direction of the length

6

thereof and transversely of said forks while one end of the load is supported on the pile, means for connecting said motor means with the hydraulic system of said truck for operation under the control of the operator of said truck, and load engaging means fixed at the outer ends of said forks and having projections on the surface thereof for engaging said load with a positive action following insertion of said forks beneath one end of said load with said forks extending in the general direction of the length of said load and of said pile to effect the pushing in or initiate the drawing out of said load by movement of said lift truck.

5. Apparatus as defined in claim 4 wherein said means for fixing said rollers against turning includes a control for said motor means effective in the stationary position of said motor to hold said rollers against rotation.

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