

Dec. 23, 1941.

R. A. NORBOM

2,266,791

APPARATUS FOR TRANSFERRING FREIGHT

Filed Aug. 2, 1940

2 Sheets-Sheet 1

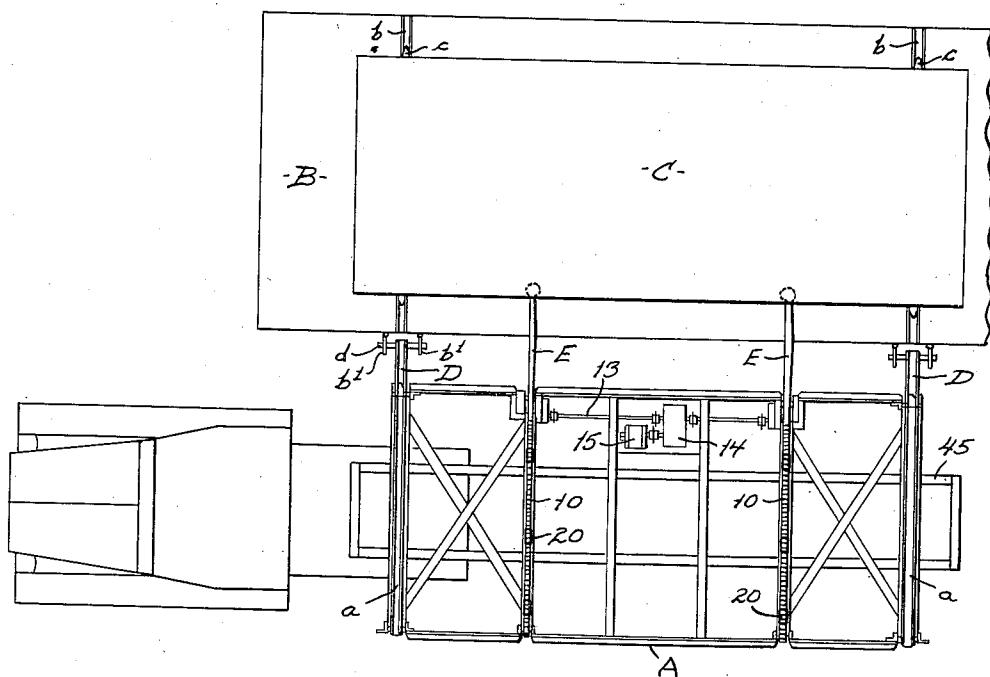


Fig. 1

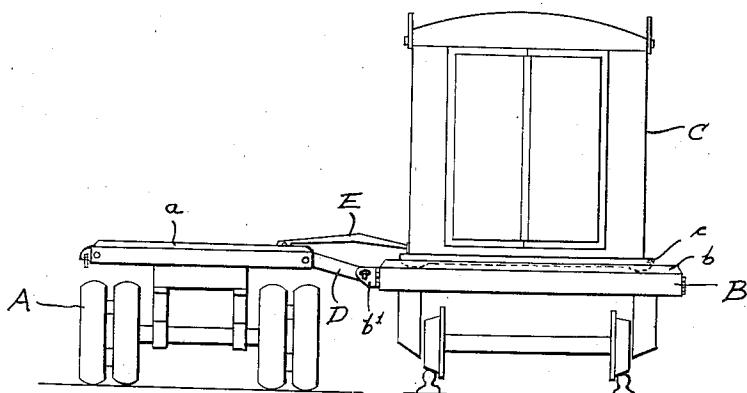


Fig. 2

INVENTOR.  
BY *Ragnar A. Norbom,*  
*Paulo Teixeira McLean*  
*Attorneys*

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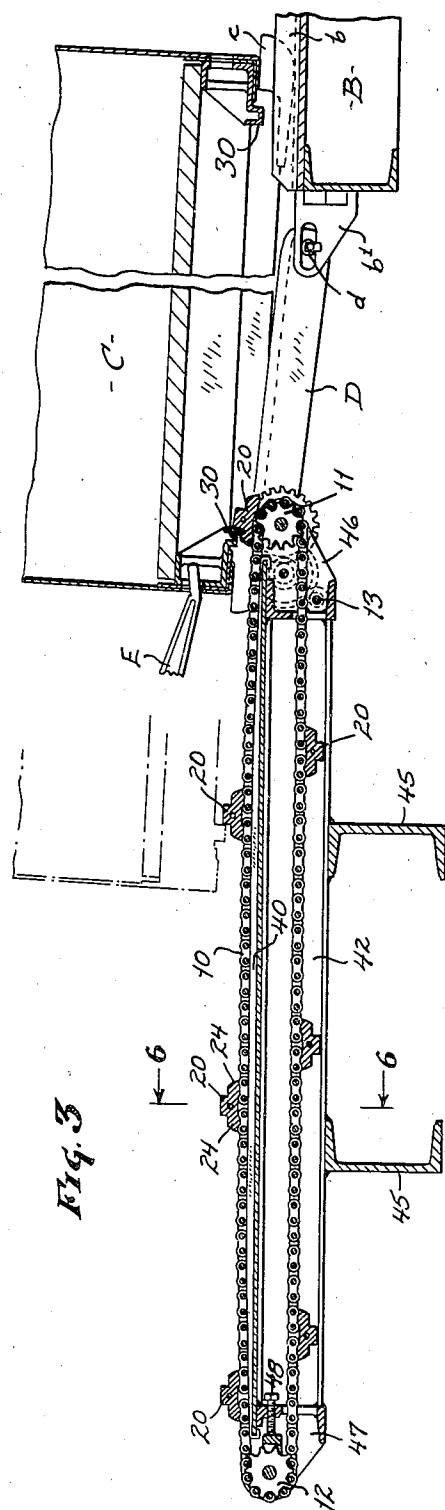
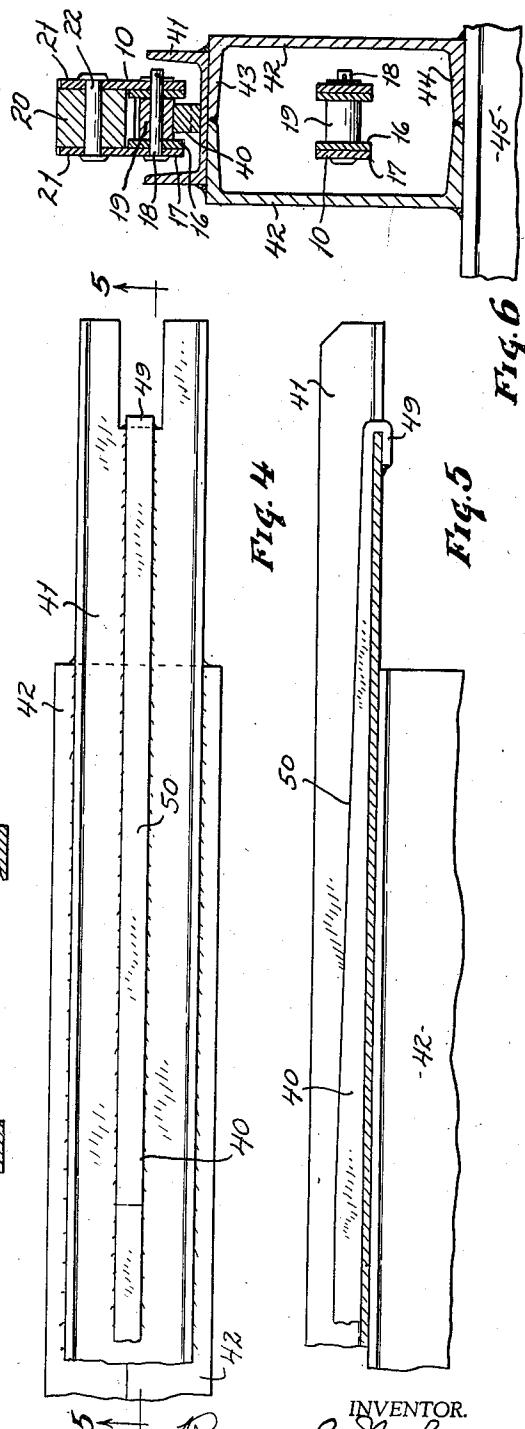


Fig. 3



INVENTOR.  
Ragnar A. Norbom  
BY Daley, Jean & McLean  
Attorneys.

## UNITED STATES PATENT OFFICE

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## APPARATUS FOR TRANSFERRING FREIGHT

Ragnar A. Norbom, New York, N. Y., assignor to  
 National Fitch Corporation, New York, N. Y., a  
 corporation of Delaware

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8 Claims. (Cl. 214—83)

This invention relates to a vehicle adapted to transport a demountable body, the vehicle being equipped with mechanism for shifting the body horizontally, so that it may be transferred, either loaded or unloaded, to or from another vehicle or a supporting platform.

More particularly, the invention comprises a vehicle, which may be a highway truck, which carries an endless propelling chain provided with lugs which on the upper reach of the chain are adapted to coact with downwardly projecting lugs on the demountable body. Such direct coaction enables the horizontal shifting of the body from the vehicle carrying it to a position where the chain lugs finally clear the lugs on the body. Further movement of the body may be effected by a pushing bar connecting the chain with the container. Similarly in pulling the body onto the highway truck the pulling bar may draw it into position where a portion of the body is over the chain in position to be engaged by a lug on the chain, which at that time is moving in the opposite direction from its discharging direction.

As the elevation of the truck may differ from the elevation of the platform or other vehicle from which the body is removed or to which it is to be transferred, it follows that the body may not be strictly vertical; that is to say, its base may be slightly inclined, at certain stages of the transfer. The object of the present invention is to so carry the propelling chain that it may readily engage the body and have its lugs remain in contact therewith, even though the body base be not strictly horizontal and though its path be at angle with the horizontal plane during the transfer. The invention is hereinafter more fully described in connection with the embodiment illustrated in the drawings.

In the drawings, Fig. 1 is a plan of a highway truck, a railway car and a container mounted on the car and coupled by push-and-pull bars with propelling chains on the truck; Fig. 2 is an end elevation of the parts shown in Fig. 1. These views show the position the parts occupy when the container is just about to be transferred from its normal position on the railway car to the truck or when it has just completed its transfer from the truck to the railway car; Fig. 3 is a cross section of the highway truck coupled with a railway car, showing the body in the act of being transferred to the truck; Fig. 4 is a plan of one of the portions of the highway truck which guides and supports one of the transfer chains; Fig. 5 is a vertical section of such support, taken in the plane indicated by the line

5—5 on Fig. 4; Fig. 6 is a vertical cross-section to the chain support and chain, as indicated by the line 6—6 on Fig. 3.

Referring first to Figs. 1 and 2 of the drawings, A represents a highway truck (which may comprise a tractor and a trailer), B a railway car, and C a demountable container adapted to stand on the car or truck. As illustrated the container is of considerable size and is adapted for mounting on a car or truck lengthwise thereof and shifted laterally across from the side of one of such vehicles to the other.

As shown, the container has skid rails c on its base which are adapted to occupy upwardly facing channels a on the truck and b on the car. To position the highway vehicle properly with reference to the car, and also to support the container during the transfer, I provide the truck with bridges D which are pivotally connected at one end to the truck and are adapted to be attached at the other end to the car side.

The bridges, when attached, register with the channels a on the truck and the channels b on the car and thus form supports for the container as it passes from one vehicle to the other, though the elevation of the two vehicles differ and though it changes during the transfer as the springs of one vehicle or the other are stressed or relieved due to change in the position or the weight of the container.

Incidentally, the bridges may be connected to the car by cross bars d on the bridges occupying slots in the wings b—1 hinged to the car side, as shown and claimed in Patent No. 2,126,763, of B. F. Fitch.

As shown in Fig. 1 there are mounted on the truck a pair of endless propelling chains 10 looped around suitable sprocket wheels (11 and 12, Fig. 3) adjacent to the edges of the truck. One sprocket wheel 11 of each chain may be coupled to a shaft 13 which is connected, through reduction gearing in a housing 14 with a driving motor 15, so that the motor may move the two chains in unison.

Each chain 10 is provided with a series of lugs 20 fastened thereto at equal distance apart, which lugs are adapted to coact with downwardly extending lugs 30 carried by the base of the container. Such mechanism is effective to shift the container, for instance, from its normal position on the truck across the bridges and partially onto the railway vehicle until the last lug on the container has been cleared by the lug on the chain. The completion of the shoving may be effected by interposed push-and-pull bars E,

which are attached to the container, and to the chain at a distance back from the container greater than the space between the vehicles. A reverse operation will draw the container by means of the push-and-pull bars from the railway car across the bridges partially on to the truck, after which the engagement of chain lugs directly with container lugs may complete the movement.

Due to the different elevations of the highway truck and the railway car, and the fact that these elevations mutually change during the transfer as the weight is relieved from one vehicle and its springs allow the body to rise and the weight is correspondingly increased on the other weight and its springs allow the body to descend. Due to these changes in elevation, during the transfer of the body, the latter is sometimes not strictly vertical, that is, its base is sometimes at an angle to the chain, it is important to provide special means for maintaining the lugs on the chain at such times in coaction with the body lugs. Such special means constitute the subject matter of the present invention.

The sprocket chain 10 is preferably of the roller type, and is made up of two parallel strands of overlapping links 16 and 17 and transverse pins 18 pivotally connecting the overlapping links of both strands and rollers 19 mounted on the pins 18, or coaxial with them, between the inner links of the two chain strands.

In my invention the chain rollers 19 in the upper reach of the chain ride on specially formed supporting bar 40. This bar in the embodiment shown extends the central region of the base of the transverse channel 41 on the truck frame. The transverse channel may rest on a transverse frame beam which may comprise a box-like girder made of two channel beams 42 with their webs vertical and their flanges 43 and 44 abutting and welded together as shown in Fig. 6. This box girder may be mounted on a main longitudinal sill 45 of the highway truck and forms a passageway for the lower, or idle, reach of the propelling chain.

The driving sprocket 11 for the chain may be fixedly journalled in a bracket 46 secured to the ends of the box girder, while, at the other end, a corresponding bracket 47 may adjustably carry the other sprocket wheel 12 (shown as adjustable by a screw 48, Fig. 3) in order that the chain may be kept taut.

The lugs on the chain may be provided by extending occasional outer links 17, of the two chains 10 (upwardly in the upper reach) as indicated at 21 (Fig. 6) and securing between such upward extensions the blocks 20, as by cross pins 22. This block 20 has wings 24 extending in opposite directions from it and bearing on the inner adjacent links at each side of the link carrying the block, as shown in Fig. 3. This prevents the tipping of the lug due to the horizontal stresses when the lugs pull against the container lugs.

To maintain the engagement of the lugs 20 with the container, notwithstanding the tipping of the container, illustrated in Fig. 3, I incline the bar 40 slightly upwardly from its extreme end for about a third of its length, as indicated at 50 in Figs. 4 and 5. This incline raises the lugs 20 while they are in the central region of the truck, as shown by the two intermediate lugs in Fig. 3, so that they may maintain their driving connection with the container until, in be-

ing transferred to the truck, it arrives in the region where the push-and-pull bar is detached.

Similarly, in discharging the container from the truck, when it is being pushed by a lug before the push-and-pull bar is attached, the lug 20 rides up the incline 50 of the supporting bar and maintains the lug in engagement until the container has reached a point where the push-and-pull bar is attached.

The incline downwardly from the high point of the supporting bar 40 enables the lugs to keep down below the container sufficiently so that the container will always be supported by the skid rail rather than by any lifting action of the chain lug upwardly on the container lug. Accordingly by this new arrangement of support for the upper reach of the chain, I effect ready engagement with the container at the start of its movement from the truck, or after it has been pulled onto the truck, and I maintain that engagement though the body base swing its engaged lug slightly upwardly either before the push bar is attached or after the pull bar has been removed.

It will be seen that the supporting bar 40 forms an effective guide for the chain, the links of the chain extending downwardly on the opposite sides of the supporting bar, as shown in Fig. 6. The bar is preferably welded to the base of its supporting channel and may have its ends bent around the ends of such base, as shown at 49 in Fig. 5.

I claim:

1. The combination of a vehicle, an endless propelling chain thereon, a series of lugs on the chain, a bar rigidly supporting the upper reach of the chain, which travels lengthwise of the bar, such bar having a top surface inclining downwardly toward a sprocket about which the chain 40 is looped, and a container having skid rails on its base adapted to slidably engage guides on the vehicle, said container having downwardly projecting lugs adapted to be engaged by the lugs on the chain.

2. The combination with a highway truck provided with a pair of parallel channels, a container having skid rails on its base adapted to occupy the channels of either the railway car or truck when being transferred from one to the

other, a pair of endless propelling roller chains on the highway truck, each having a series of lugs which extend upwardly from the upper reach of the chain and are adapted to engage downwardly projecting lugs on the container, the truck 55 having a pair of upwardly facing transverse channels which the upper reaches of the chains occupy and supporting bars resting on the bases of said channels and forming a support engaged by the rollers of the chain, said bars having their top surfaces inclining downwardly from an intermediate region to the ends of the bar.

3. The combination of a vehicle, an endless chain thereon operated in a vertical plane, wheels at the same elevation at the ends of the loop of the chain, an approximately horizontal supporting guideway on which the upper reach of the chain rests and along which it travels between said wheels, said guideway inclining upwardly in opposite directions from regions adjacent the wheels toward the central region of the guideway, and said chain having spacially arranged lugs which project therefrom in a direction which is upward along the upper reach of the chain.

4. The combination of a vehicle, an endless chain on the vehicle, said chain comprising two

strands of side links connected by cross pins carrying rollers, and a bar engaged by the rollers and supporting the upper reach of the chain, such bar inclining downwardly toward the end of the chain loop, the chain having lugs adapted to engage a container standing on the vehicle above the chain, whereby the chain may move the container.

5. The combination of a vehicle, wheels at the opposite side edges thereof, an endless propelling chain looped about said wheels, a support for the upper reach of the chain extending continuously from the region adjacent one of said wheels to the region adjacent the other and comprising a bar having its top surface inclining from an intermediate region downwardly toward the two wheels about which the chain travels, said chain having lugs which are rigidly secured to certain links thereof and project upwardly from the upper reach of the chain.

6. The combination of a highway truck, an endless propelling chain thereof, having a series of lugs, the chain operating in a vertical plane and the lugs extended in a direction which is upwardly from the upper reach of the chain, whereby such lugs may engage downwardly projecting lugs on a container above the chain, and

10 a bar extending lengthwise of the upper reach of the chain engaging and supporting such upper reach and having its intermediate supporting portion higher than its end supporting portions.

15 7. The combination of a highway truck having extending transversely across it an endless propelling chain operating in a vertical plane, a series of lugs on the chain which extend upwardly from the upper reach thereof and are adapted to engage downwardly projecting lugs on a container resting on the truck, a bar extending lengthwise of the upper reaches of the chain and supporting such upper reach, said bar having its top surface tapering downwardly toward the side edges of the truck.

20 8. The combination of a vehicle, a pair of endless propelling chains thereon extending crosswise thereof, a series of lugs on each chain, a bar rigidly supporting the upper reach of each chain as it travels lengthwise of the bar, such bar having a top surface inclining downwardly toward each end, a container having downwardly projecting lugs in its base adapted to be engaged by the upwardly projecting lugs on the chain, and 25 a pair of push-and-pull bars adapted to connect the container to the chains.

RAGNAR A. NORBOM.