Sept. 27, 1932. B. F. FITCH 1,879,607

APPARATUS FOR TRANSFERRING FREIGHT

Filed Sept. 7, 1929 3 Sheets-Sheet 1

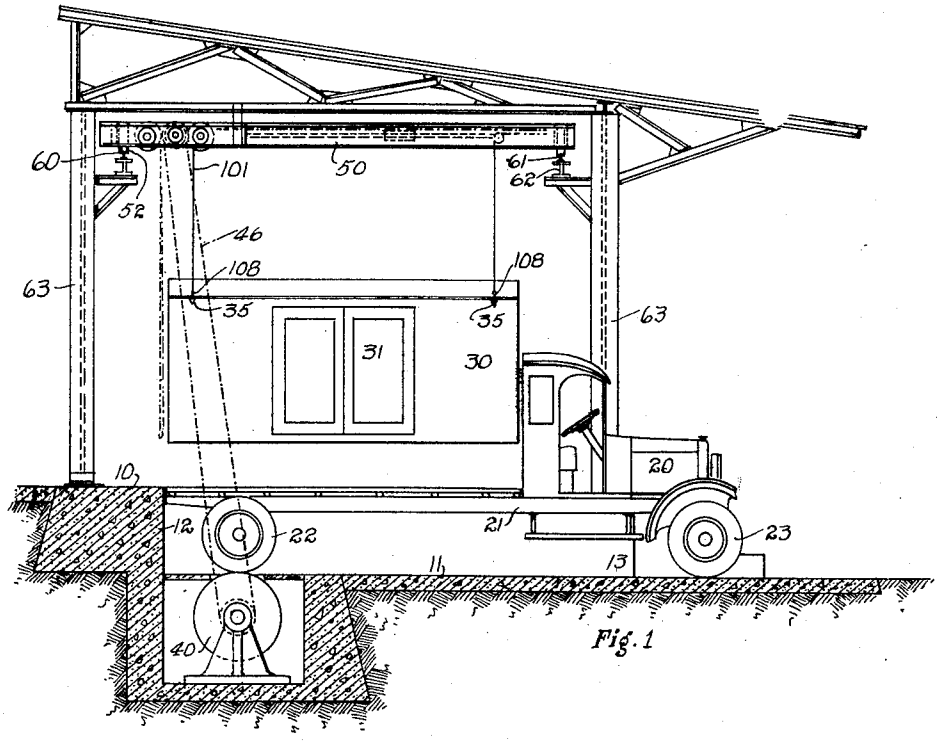


Fig. 1

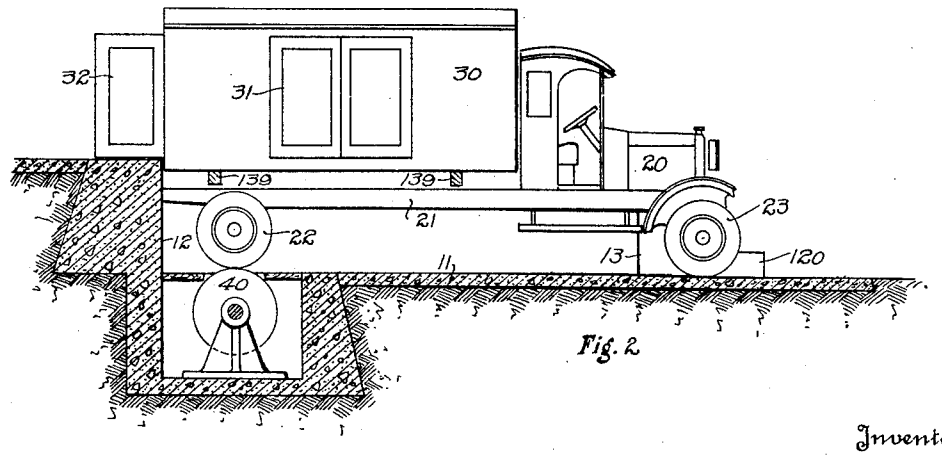


Fig. 2

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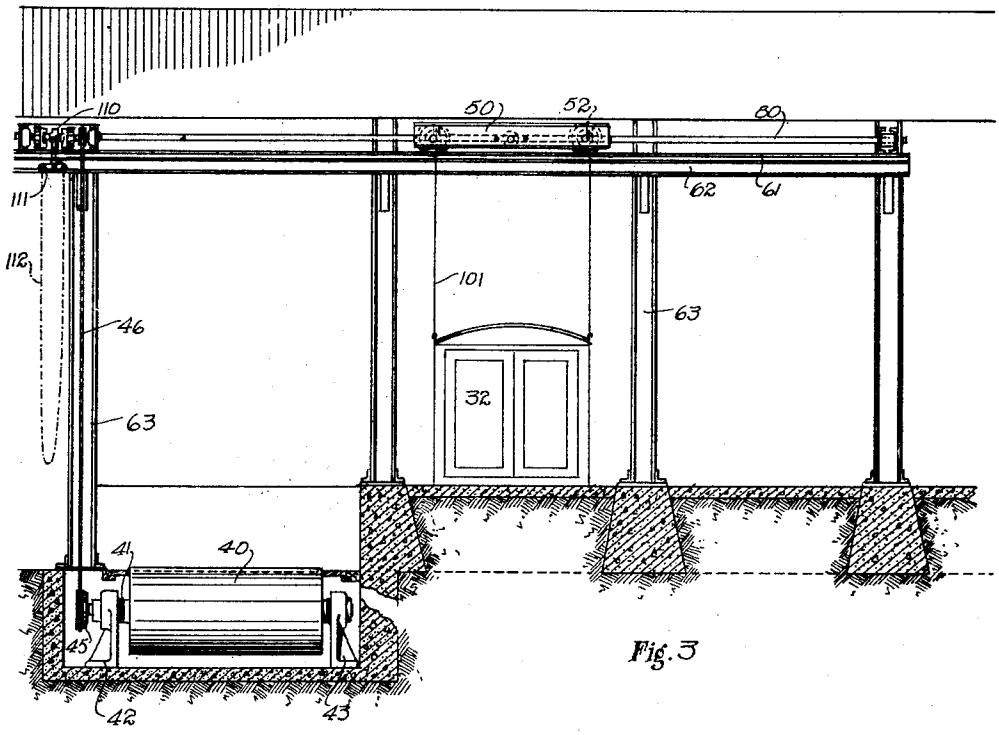


Fig. 3

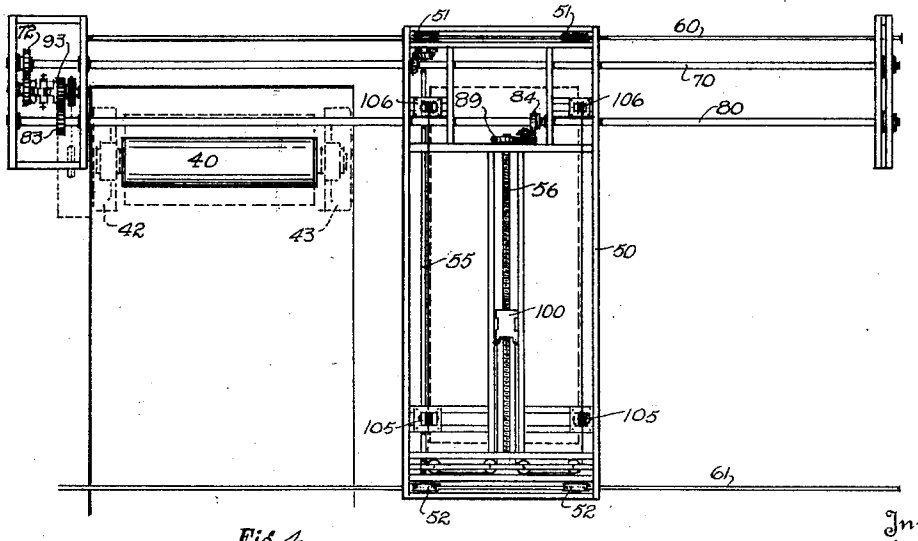


Fig. 4

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APPARATUS FOR TRANSFERRING FREIGHT

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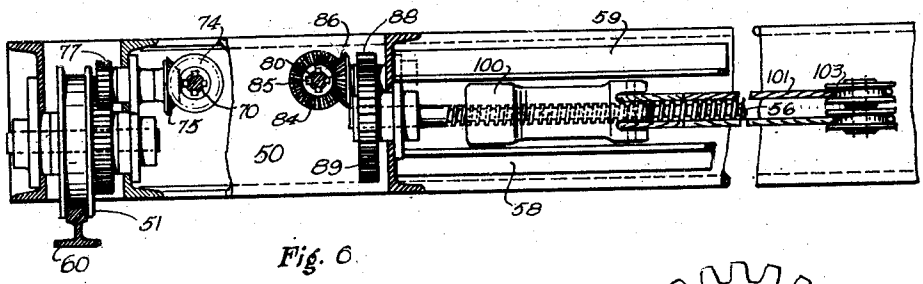


Fig. 6

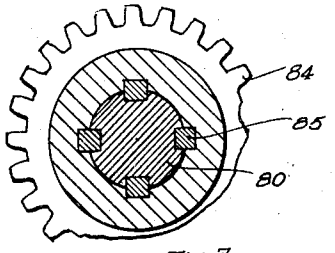


Fig. 7

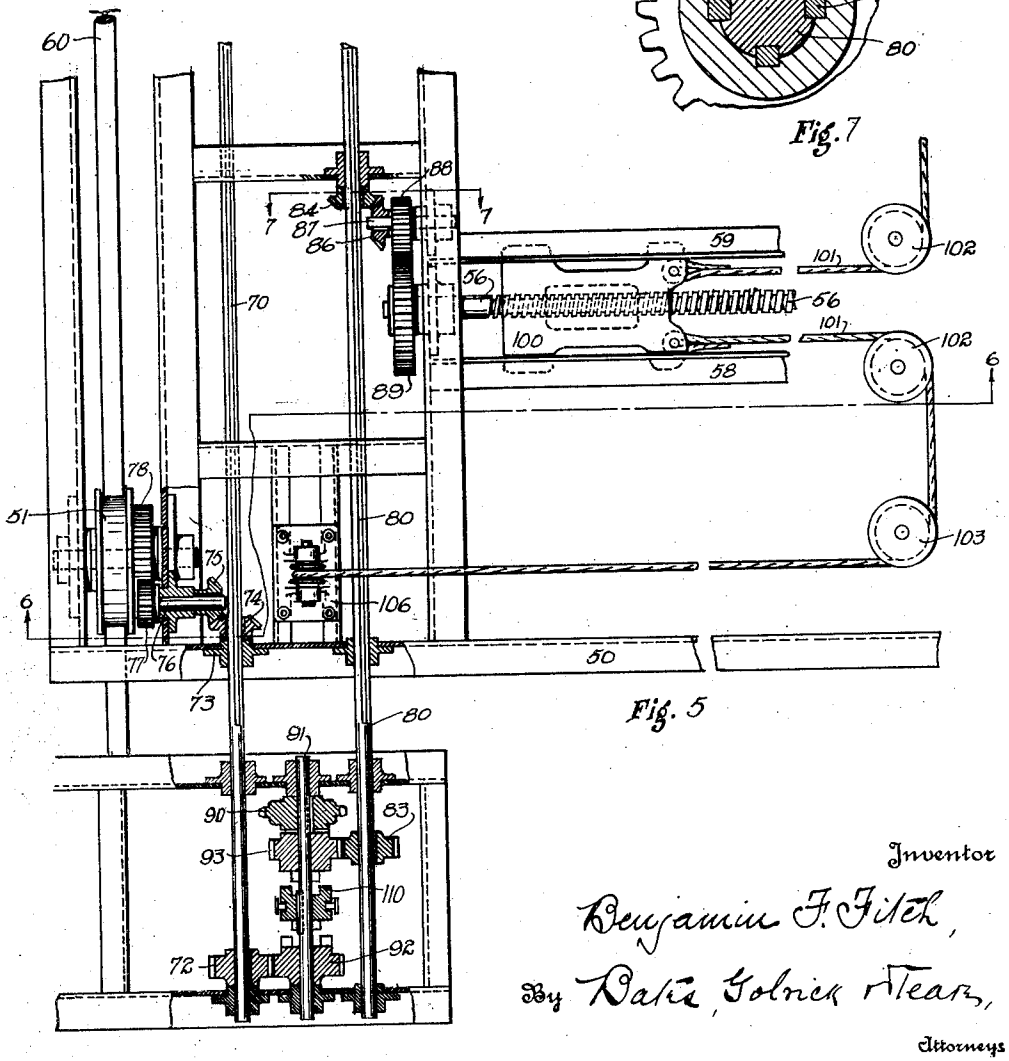


Fig. 5

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Patented Sept. 27, 1932

1,879,607

UNITED STATES PATENT OFFICE

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APPARATUS FOR TRANSFERRING FREIGHT

Application filed September 7, 1929. Serial No. 391,083.

This invention relates to an apparatus for transferring freight by the employment of automobile trucks and demountable bodies, any of which may be raised from the truck, then unloaded and reloaded, and returned to a truck for delivery. The primary object of the invention is to provide means enabling the power of the truck to be utilized for raising the body, thereby replacing the existing hand hoists or power hoists for this operation.

More specifically, I employ the rotative effort of the driving wheels of a truck which is held in position adjacent a platform for raising a demountable body from the truck frame to free it therefrom and bring it into loading or unloading position at the platform level, whereupon the truck is free for other duty while the body is being loaded or unloaded. I may also use the same power for trolleying the raised body laterally.

My invention is illustrated in the drawings hereof and it is hereinafter more fully described, and its essential novel features are summarized in the claims.

In the drawings Fig. 1 is a side elevation of one form of my body raising equipment, showing a truck in position and the body in the act of being raised therefrom or lowered thereon or trolleyed laterally; Fig. 2 is a side elevation illustrating a truck and body in position for dispersing the contents of the body without its lateral travel; Fig. 3 is an elevation at right angles to Figs. 1 and 2 looking toward a station platform equipped with my raising and trolleying mechanism; Fig. 4 is a plan of the structure shown in Fig. 3; Fig. 5 is a sectional plan on an enlarged scale of a portion of the overhead hoist mechanism shown in Figs. 1, 3 and 4; Fig. 6 is a vertical section substantially on offset plane indicated by the line 6—6 on Fig. 5; Fig. 7 is an enlarged cross-section through one of the main driving shafts of the hoist mechanism in a plane indicated by the line designated 7 on Fig. 5.

As shown in Figs. 1 and 2, a loading platform is indicated at 10, constructed of concrete. Into this platform is formed a bay or space on a lower level providing a truck runway or "pit" 11, into which the truck may back up to the end wall 12. Opposite sides of the pit are shown as bounded by walls 13, thus dividing the space into individual truck-backing spaces.

In Figs. 1 and 2, 20 indicates a truck having a low-height rearwardly-extended frame 21, and having the usual supporting wheels 22 and 23, the former being the driving wheels. This frame may be provided with suitable upwardly extending positioning devices (not shown) adapted to coact with a demountable body. Such body is shown at 30. It is preferably equipped with side doors 31 and rear doors 32. It has also suitable eyes or other fittings for the engagement of lifting hooks, these attaching elements being indicated at 35 in Fig. 1. The fittings may be made in accordance with my Patent No. 1,485,972 and comprise metal pockets having cross bars which are set into and attached to the body at the eaves, and adapted to be engaged by hooks on elevating cables.

In the rear portion of the pit 11 adjacent the wall 12 of the loading platform, and in a space principally beneath the pit floor, is a long horizontal drum 40 shown as having a shaft 41 journalled in standards 42 and 43. The drum is of a length somewhat greater than the gauge of the truck with which the apparatus is designed to cooperate and is located at such distances from the vertical wall of the platform that the rear truck wheels 22 will rest on the drum 40 when the rear end of the platform abuts such vertical wall. Accordingly as the truck backs into the pit 11 its rear wheels come onto the drum 40, its continued driving action as the truck frame abuts the wall 12 is transmitted to the drum 40 giving it a continuous rotation from the power of the truck engine.

My invention provides suitable means operated by the drum 40 for raising the demountable body 20 from the truck, and, if desired, for trolleying such body laterally over an adjacent portion of the platform. Two forms of this raising mechanism are shown. I will now describe that appearing in Figs. 1 to 7 inclusive.

On one end of the drum shaft 41 is a

sprocket wheel 45 from which a sprocket chain 46 leads upwardly to trolley hoist mechanism. The trolley hoist shown comprises a traveling crane mounted in a suitable rectangular frame 50 having wheels 51 and 52 riding on stationary rails 60 and 61 mounted on a suitable support, as the overhead horizontal beams 62 carried by upright posts 63. One of the wheels 51 and one of the wheels 52 are connected in the hoist frame by a shaft 55 which if rotated will progress the hoist in one direction or the other.

The hoist frame has suitable raising mechanism operated by a rotary screw 56 which if rotated in one direction or the other may raise or lower the demountable body carried by depending hoist members. The sprocket chain 46 operates, as hereinafter described, either of two longitudinal shafts 70 or 80, which have splined connections with gearing for rotating the shaft 55 and the screw 56 respectively. Accordingly the rotative effort of the truck wheels may be availed of either to raise or lower the load or to trolley it in either direction.

As shown particularly in Figs. 3, 4 and 5, the sprocket chain 46 passes over a sprocket wheel 90 carried on a lay-shaft 91 journalled in suitable bearings supported overhead. Loose on this lay-shaft is a spur gear 92 meshing with a spur gear 72 rigid on the shaft 70 which extends lengthwise of the superstructure through the hoist frame 50. This shaft has suitable keyways formed along it, and in these ways are keys 73 from a pinion 74 rotatively mounted in the hoist frame 50 and operating a bevel gear 75 which is shown in Fig. 5 as being on a short shaft 76. This shaft carries a pinion 77 meshing with a gear 78 rigid with one of the wheels 51 and with a shaft 55 connecting that wheel with a corresponding wheel 52. Accordingly, the rotation of the pinion 92 may operate the trolleying wheels of the hoist frame to carry it in one direction or the other according to the direction of the rotation of the pinion 92.

On the lay shaft 91 is a loose pinion 93 meshing with a pinion 83 on the shaft 80 which extends along the superstructure through the hoist frame 50 and has keyways by which it is splined to a bevelled pinion 84, there being preferably several keys 85 as indicated in Fig. 7. This bevelled pinion is shown as meshing with a pinion 86 on a short shaft 87 carried by the hoist frame, which shaft carries a pinion 88 meshing with a gear 89 on the screw 56 which operates the raising mechanism.

As shown, the hoist frame has a pair of longitudinal guide bars 58 and 59 on opposite sides of the screw 56. Meshing with the screw is a nut 100 which is slidably guided by the two frame bars 58 and 59. Anchored to one side of this screw are four raising cables 101 which lead from the nut parallel with the screw to a point adjacent the far end of the hoist frame, then around sheaves 102, then pass laterally to points near the outer sides of the hoist frame and then around sheaves 103. From these sheaves the cables pass forwardly, and two of them turn downwardly over vertical sheaves 105 near that end of the frame and two of them continue to points near the other end of the frame and then pass downwardly over vertical sheaves 106.

The result of the described construction is that there are four depending cables occupying positions corresponding to the four corners of a rectangle and all operated by the single nut 100. These four cables are provided with hooks 108 or other load engaging devices by which they may be attached to the demountable body 20. Accordingly whenever the pinion 83 is rotated, the demountable body is raised or lowered.

To rotate either the pinion 72 to trolley the hoist or the pinion 83 to raise or lower the load, I provide a dog clutch comprising a shiftable collar 110 which is splined to the shaft 91 and may be shifted by a suitable shipper lever into locking engagement with the pinion 92 loose on the shaft to drive the trolleying shaft 70, or, if moved in the other direction, into locking engagement with the loose pinion 93 to drive the hoisting shaft 80. To shift the collar 110, I have shown a double bell crank 111 provided with a hand chain 112 depending in a bite. A downward pull on one reach of this chain causes the collar 110 to engage one of the pinions, whereas a pull on the other reach effects its engagement with other pinion.

In the operation of the apparatus shown, if a loaded truck is backed into the pit 11 with the truck wheels 22 resting on the drum 40, the hand chain 112 may be manipulated to cause the collar 110 to engage the pinion 93, whereupon the continued rotation of the wheel 22 in the same direction as if it were backing into place rotates the drum 40 in a direction to operate the gearing and the shaft 80 to turn the screw in the direction to pull the nut toward the driving end of the screw, thus raising the body from the truck. The pitch of the screw is such that the device is self-locking so that the body may be left standing at any elevation to which it is brought by rotation of the screw. Accordingly, whenever desired, the truck, freed from its body, may drive out of the way, and, as its forward movement is unobstructed, its rear wheels 22 will pass immediately off of the drum 40.

The lowering of the body may be very readily effected by a suitable hand chain acting on a hand wheel (not shown) splined on the shaft 80, or the truck power may be availed of for this purpose, in which case

the truck with its rear wheels resting on the drum 40 is suitably blocked, as by a latch between its body and the platform or chocking blocks 120 under its front wheels, so that the driving wheels may be rotated forwardly without propelling the truck. In that case, the power of the truck operates to effect the lowering of the body.

To trolley the body in one direction or the other, it is only necessary that the truck be held stationary with its driving wheels on the drum 40, and that the chain 112 be manipulated to bring the collar 110 into engagement with the collar 92, then the engine of the truck may effect the trolleying of the load in one direction or the other according to the gear shift on the truck. The rearward drive will cause the trolleying in one direction and the forward driving cause it in the opposite direction, the lateral thrust in either case being taken by the platform wall or the chocking blocks or other locking means.

I claim:—

1. The combination of a traveling crane having raising mechanism and trolleying mechanism, two shafts extending lengthwise of the path of travel of the crane and having splined connections with the trolleying mechanism and the raising mechanism respectively, and driving mechanism for operating either of said shafts by means of the power of a truck.

2. The combination of a superstructure having a crane trackway, a bridge crane thereon, depending raising mechanism on the bridge crane, mechanism on the bridge crane for trolleying it, two shafts extending lengthwise of the path of travel of the bridge crane and having splined connections with the trolleying mechanism and the raising mechanism respectively, a rotary drum mounted in the ground and adapted to have a truck driven onto it whereby the driving wheels of a truck may rotate the rotary drum, and gearing between said rotary member and mechanism for operating said shafts.

3. The combination of a support for a bridge crane, a bridge crane thereon, trolleying mechanism on the bridge crane, load raising mechanism on the bridge crane, a movable member adapted to be engaged and driven by a driving wheel of a truck, mechanism driven by said movable member, and means for clutching the last mentioned mechanism at will with the trolleying mechanism or the driving mechanism.

4. The combination with a truck, a demountable body thereon, of a laterally shiftable raising mechanism adapted to engage the body, a movable device adapted to be engaged by a driving wheel of the truck, and connecting mechanism between said device and the load raising mechanism, whereby the power of the truck may raise the body from the truck, after which it may be shifted laterally in its raised condition.

5. An apparatus for transferring freight, comprising laterally shiftable overhead mechanism having a depending flexible member adapted to engage a demountable body, movable ground mechanism adapted to be engaged by a driving wheel of a truck in a position where the flexible member might be attached to its body, and mechanism adapted to drivingly connect the two mechanisms mentioned irrespective of the lateral position of the overhead mechanism.

6. In an apparatus for transferring freight, the combination of a stationary overhead support, a movable structure thereon carrying raising mechanism having four cables depending over sheaves, said cables being adapted to be attached at four points to a demountable body carried by the truck, means for shifting said structure laterally, movable mechanism located beneath the path of travel of said movable structure and adapted to be engaged by the driving wheels of the truck, and connecting mechanism between the mechanisms mentioned, whereby the power of the truck may pull up on the depending cables to raise the body from the truck.

7. In an apparatus for transferring freight, the combination of a movable device adapted to be engaged and moved by a driving wheel of a truck, a laterally shiftable raising mechanism, and means for operating the raising mechanism by the movement of the movable device for various lateral positions of the raising mechanism, and means for attaching the raising mechanism to a demountable body carried by the truck.

8. The combination of a station platform, of an overhead crane trackway, a bridge crane thereon, raising mechanism carried by the bridge crane adapted to engage and raise a demountable truck body, a rotary drum mounted in the ground and adapted to receive and support the driving wheels of a truck carrying such body, gearing connecting the drum with the raising mechanism on the bridge crane, and means for shifting the bridge crane irrespective of lateral position thereof laterally.

9. The combination of a bridge crane, raising mechanism carried thereby and adapted to be operatively attached to the demountable body of a truck, mechanism for trolleying the bridge crane, a movable device adapted to be engaged and driven by the driving wheel of such truck, and mechanism operated by said movable device for operating the trolleying mechanism of the bridge crane.

10. The combination of an overhead trackway, a bridge crane movably mounted thereon, four depending cables carried by the bridge crane and adapted to be attached to

opposite sides of a demountable truck body, raising mechanism on the bridge crane for operating the cables as a unit, trolleying mechanism for the bridge crane, driving mechanism for operating the trolleying mechanism or the raising mechanism as desired, a movable device located beneath the path of travel of the bridge crane and so positioned that a truck may be driven onto it, and gearing between said movable device and the driving mechanism mentioned.

11. In an apparatus for handling freight, the combination of a station platform, a truck pit adjacent the platform, a rotary drum mounted on a horizontal axis beneath the floor of a pit having its upper portion adapted to be engaged by the rear wheels of a truck when the truck has backed into the pit, an overhead superstructure extending laterally from the pit and having a crane trackway, a bridge crane thereon, four raising members adapted to depend vertically into engagement with a demountable body on the truck, mechanism on the bridge crane for operating said raising members simultaneously, mechanism for trolleying the bridge crane, means for transmitting the power from the rotary drum to the raising mechanism of the bridge crane.

12. In an apparatus for handling freight, the combination of a station platform, a truck pit adjacent the platform, a rotary drum mounted on a horizontal axis beneath the floor of a pit having its upper portion adapted to be engaged by the rear wheels of a truck when the truck has backed into the pit, an overhead superstructure extending laterally from the pit and having a crane trackway, a bridge crane thereon, raising mechanism on the bridge crane having flexible raising mechanism adapted to depend into raising engagement with a demountable body on the truck while the rear wheels of the latter are on said drum, mechanism for trolleying the bridge crane, means for transmitting the power from the rotary drum to a driving member carried by the superstructure, and means for clutching said member at will with the trolleying mechanism or a raising mechanism of the bridge crane.

In testimony whereof I hereunto affix my signature.

BENJAMIN F. FITCH.