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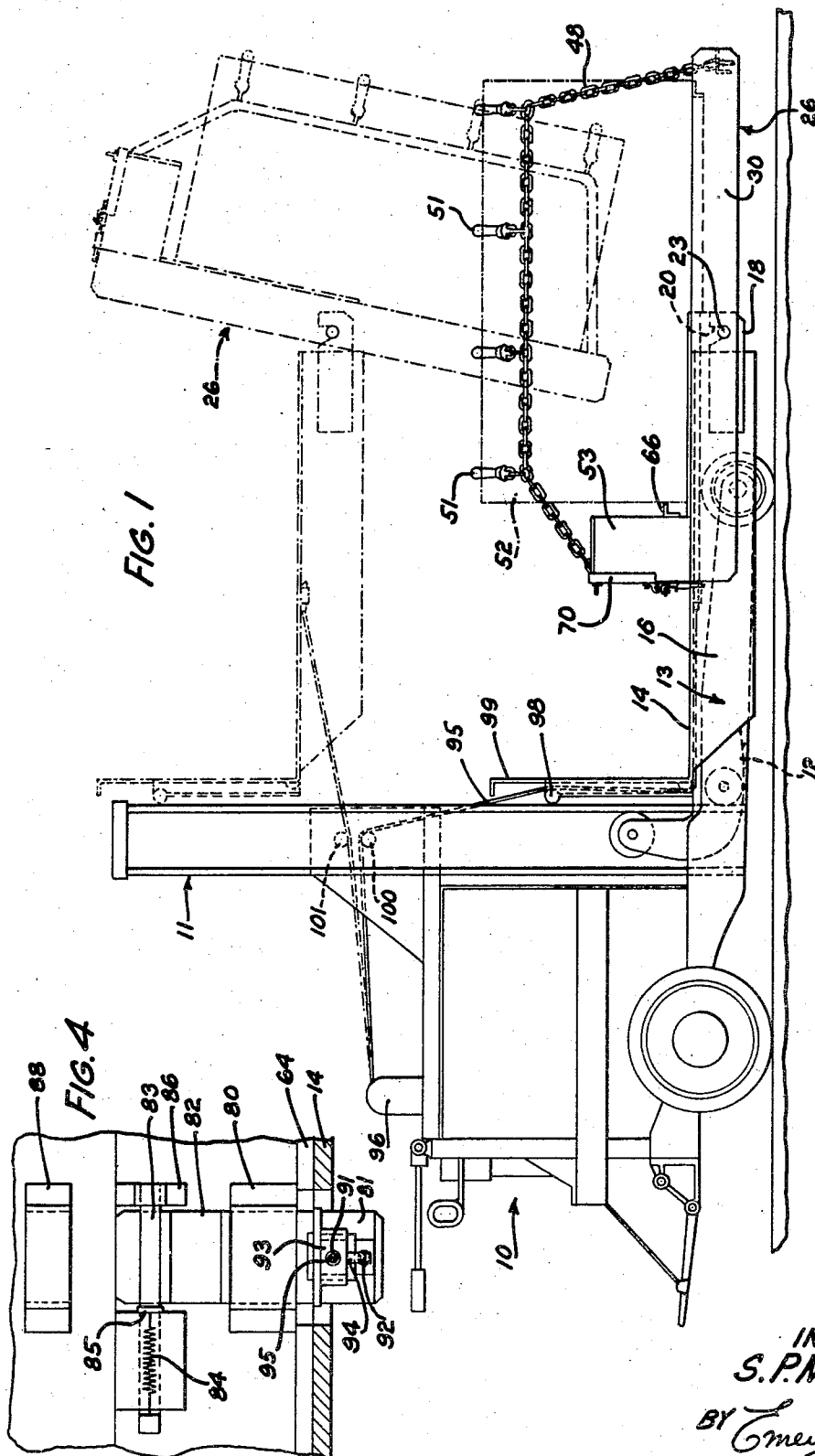
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MATERIAL HANDLING APPARATUS

Filed Jan. 10, 1941

3 Sheets-Sheet 1



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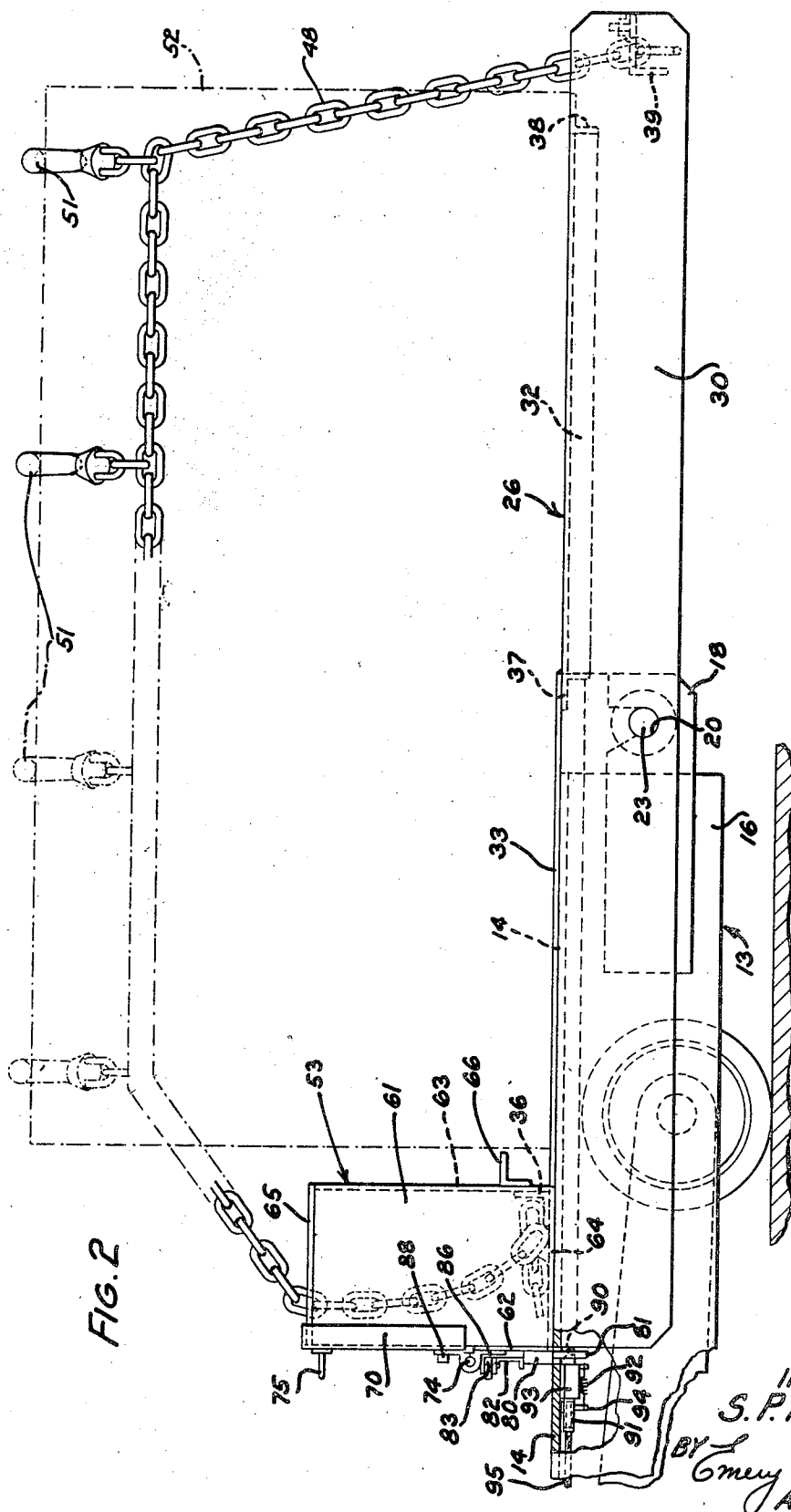
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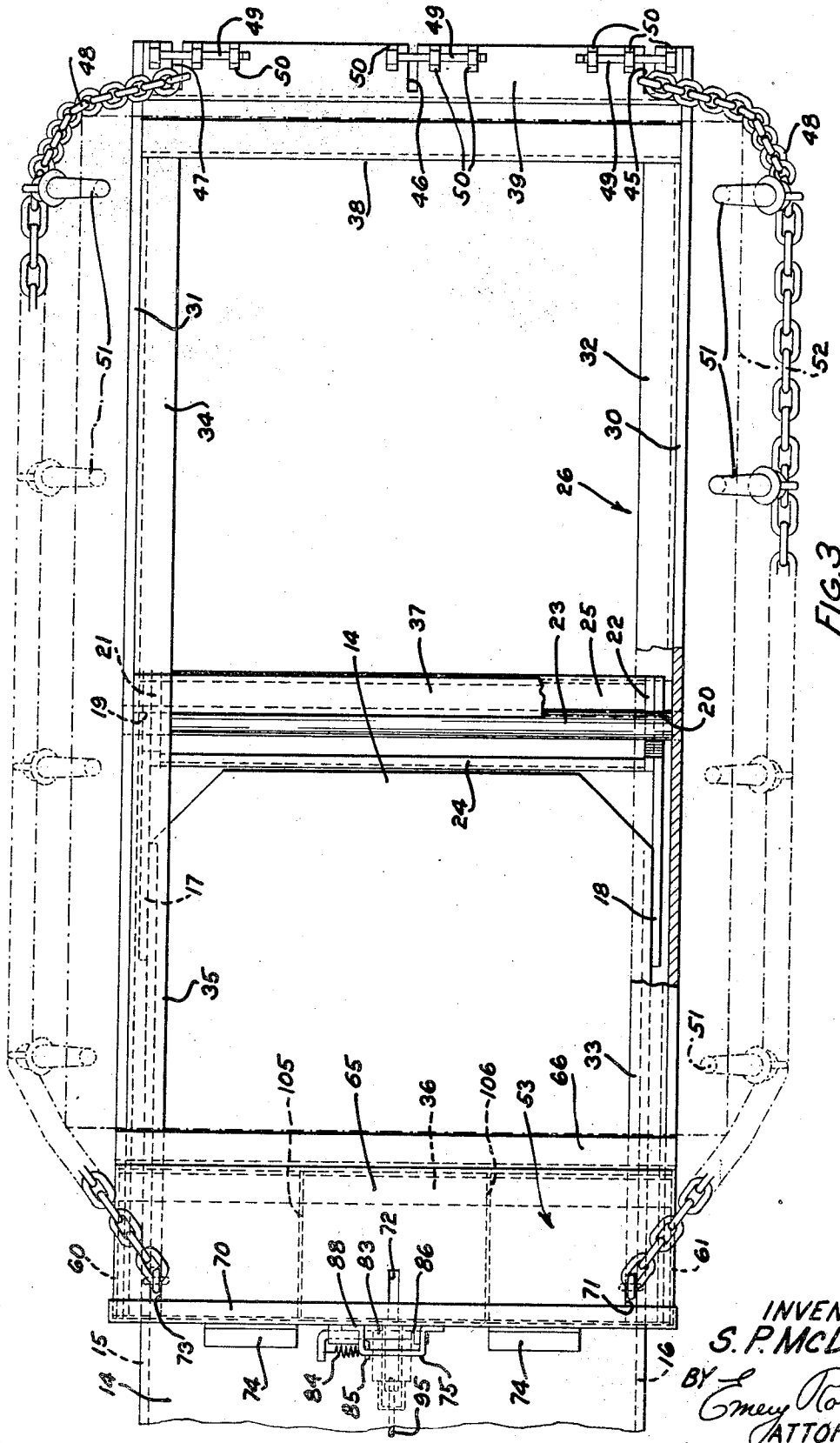
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MATERIAL HANDLING APPARATUS

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MATERIAL HANDLING APPARATUS

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9 Claims. (Cl. 214—98)

This invention relates to material handling apparatus and more particularly to a platform type industrial truck having a tilting frame attachment for dumping containers carried by it.

It is an object of the present invention to provide a simple, safe and economically constructed material handling apparatus.

In accordance with one embodiment of the invention, a trunnion cradle is fixed to the elevating platform of a platform type industrial truck for receiving a shaft fixed to opposite sides of a tiltable framework on which a load may be supported. The tiltable framework is rectangular and has more than half of its length extending outwardly beyond the shaft and away from the elevating platform so that it normally tends to tilt out of a horizontal plane, and is held in a horizontal plane by a spring pressed latch to which is attached a manually operable chain extending to the operator's position on the truck so that an operator may release the tiltable framework and permit it to tilt to position to empty material from a container held on it. The outer end of the tiltable framework has slots formed in it for engagement by chains and keepers are provided for locking the ends of the chains in the slots. At its inner end, the tiltable framework has a box-like structure fixed on it to hold chains not in use and is provided with slots in which the ends of chains may be secured to hold a container on the tiltable frame.

A better understanding of the invention will be had by reference to the accompanying drawings, wherein

Fig. 1 is a general view, in side elevation, of an industrial truck of the elevating platform type modified in accordance with the present invention;

Fig. 2 is an enlarged side elevational view of a portion of the structure shown in Fig. 1 showing, in detail, the features of construction of the tiltable platform and its appurtenances;

Fig. 3 is a plan view of the apparatus shown in side elevation in Fig. 2; and

Fig. 4 is a fragmentary detail view showing the latching mechanism on an enlarged scale.

Referring to the drawings, wherein like reference characters designate the same parts throughout the several views, particular reference being had at this time to Fig. 1, the numeral 10 designates, generally, an industrial truck having the usual controls and being provided with a vertically extending framework, designated generally by the numeral 11, for guiding an elevating mechanism 12, which may be driven in any

suitable manner and which is adapted to raise and lower an elevating platform 13. The industrial truck 10, as pointed out, is provided with the usual controls, which need not be described herein since they may be of any known commercial construction.

As most clearly shown in Figs. 1 and 3, the elevating platform comprises a horizontally extending load supporting plate 14 having formed integrally therewith vertically extending aprons 15 and 16. The aprons 15 and 16 have fixed thereto a pair of plates 17 and 18, respectively, which extend outwardly to the right (Figs. 1, 2 and 3) of the platform 13, being fixed to the aprons 15 and 16 in any suitable manner, for example, by welding. The plates 17 and 18, which form part of a trunnion cradle, have bearing notches 19 and 20 formed in them and have notched auxiliary plates 21 and 22 fixed to them in the area adjacent the notches 19 and 20 to provide a relatively large bearing surface for a shaft 23. The auxiliary plates 21 and 22 are interconnected by a channel member 24 and an angle member 25, which serve to tie the extending ends of the plates 17 and 18 together and form a unitary structure for supporting the open tiltable framework, designated generally by the numeral 26, to which the shaft 23 is fixed, as will be described.

The tiltable framework 26 includes side plates 30 and 31, which extend throughout the length of the framework. The side plates 30 and 31 are reinforced by longitudinally extending angle members 32, 33, 34 and 35 and by transversely extending angle members 36, 37, 38 and 39. While the side plates 30 and 31 and all of the angle members fixed thereto may be secured together in any suitable manner, this is preferably done by welding them together to form a strong and rigid framework.

The angle member 39 has a relatively wide horizontal flange and this flange is slotted, as shown at 45, 46 and 47, to receive the links of a chain 48, the width of the slot being such that if one link of a chain is slipped into the slot, the next adjoining lower link will prevent the chain from slipping through the slot unless the link in the slot is slipped out of the slot. Keepers 49 are mounted on the horizontal flange of the angle member 39 and are slidable in brackets 50 for retaining a chain in the slot 45, 46 or 47 in which it may be positioned. The chains 48 are provided with hooks 51 at spaced intervals throughout their lengths for engaging a container, which may be positioned on the tiltable framework 26.

A container which may be carried by the tiltable framework 26 may have any suitable configuration, and, in the present embodiment of the invention, has been disclosed as a rectangular box 52 shown in dot and dash lines.

Mounted at the left end of the framework 26 (Figs. 1, 2 and 3) is a chain box 53 for holding the chains 48 when they are not in use and for holding the extending ends of the chains while they are in use. The chain box, as most clearly shown in Figs. 2 and 3, has end members 60 and 61, side members 62 and 63, a bottom member 64, and a top member 65. The end members 60 and 61 extend down over the edge of the channel members 33 and 35 and serve as braces for holding the box against movement transversely of the tiltable framework 26 and the various members making up the box are welded together and to the framework 26, the angle member 36 extending within the box and serving as a means for securing the box to the framework 26. On the right end of the chain box 53, as most clearly shown in Fig. 2, there is secured an angle member 66, which serves as an abutment against which the container or box 52 rests when the box 52 is held in place on the framework 26 by means of the chains 48. The upper left side of the chain box 53 has a door 70 mounted on it which serves to close the chain box 53 and also serves to prevent the chains 48 from slipping out of slots 71, 72 and 73 formed in the top member 65 of the box. The slots 71, 72 and 73 are similar to the slots 45, 46 and 47 in the angle member 39 and serve a similar purpose. The door 70 is normally urged to remain closed since it is mounted on spring hinges 74—74 and may be opened by means of a handle 75. Mounted on the left face (Figs. 1, 2 and 3) of the chain box 53 is a guide bracket 80, in which there is slidably positioned a bolt receiving member 81. The bolt receiving member has a short channel member 82 fixed to it, which rests on the guide bracket 80 and prevents the bolt receiving member 81 from dropping downwardly beyond the position shown in Fig. 2. The upper surface of the channel member 82 is engaged by a keeper 83, which is normally urged into position over the channel member by a spring 84 fixed to the bent-up end of the keeper 83 and to a bracket 85, in which the keeper 83 is slidably mounted. The keeper 83 also extends into a bracket 86 to hold it against movement upwardly, as viewed in Fig. 2. The lower portion of the door 70 has a guide bracket 88 mounted on it for guiding the bolt receiving member 81 when it is moved upwardly and held in its upward position by moving the keeper 83 under the channel member 82. The bolt receiving member 81 extends downwardly through the load supporting plate 14 of the platform 13 and has an aperture 90 in it for receiving a latch bolt 91, which is normally urged in a direction to engage in the aperture 90 by a coiled spring 92 fixed to a guide member 93 in which the latch bolt is slidable and to a pin 94 extending from the latch bolt. Attached to the latch bolt is a chain 95, which extends from the latch bolt back to any suitable take-up mechanism 96 positioned on the truck body within reach of the operator. The chain 95 is passed under the bottom of the platform 13 and between a rounded guide member 98 and an upwardly extending apron 99 mounted on and extending upwardly from the load supporting plate 14. The chain 95 will thus be out of possible contact with a load which may be carried on the platform of the truck and extends from the guide member 98 between a pair of guide members 100

and 101 suitably positioned in the vertically extending framework 11. In this manner, the chain 95 is out of the way of any load to be carried on the platform of the truck and the spring take-up mechanism 96 will serve to keep the chain taut without withdrawing the latch bolt 91, whether the elevating platform 13 is in its lower position, as shown in full lines in Figs. 1, 2 and 3, or in its upper position, as shown in dot and dash lines in Fig. 1.

In the operation of this apparatus, the tiltable framework may be connected to the truck by simply elevating one end of it and guiding the truck into a position where the shaft 23 may drop into the rounded notches in the plates 17, 18 and auxiliary plates 21 and 22. After the shaft 23 registers in the notches in the plates 17, 18, 21 and 22, the framework 26 may be tipped to a horizontal position to cause the bolt receiving member 81 to be engaged by the latch bolt 9. A container may readily be secured in position on the tiltable framework by connecting the hooks 51 over the edges of the container and securing the right end (Figs. 1, 2 and 3) of the chain in the slots 45 46 and 47 in the angle member 39 and thereafter catching the left ends of the chains 48 in the slots 71, 72 and 73 in the top member 65 of the chain box 53. It should be noted at this time that the chain box 53 is divided into three separate compartments by means of wall plates 105 and 106 so that the chains, when not in use, will not become entangled and may readily be removed from the chain box for attachment to a container to be carried on the tiltable framework. After a container has been mounted on the tiltable framework 13, as just described, the truck may be used to transport material in the container and the material carried in the container may readily be dumped therefrom by simply elevating the platform 13 of the truck in the usual manner and then pulling the chain 95, whereupon the framework will tilt to the position shown in dot and dash lines in Fig. 1 to dump the contents of the box 52 from it.

Although a specific embodiment of the invention has been described hereinbefore, it will be understood that modifications thereof may be made without departing from the scope of the invention, which is to be limited only by the appended claims.

What is claimed is:

1. In combination with an elevating platform type industrial truck, a tiltable container supporting frame, means for pivotally supporting said frame on the platform of the truck in position to tilt by its own weight, and means for securing containers to said frame.

2. In a material handling apparatus, the combination with an elevating platform type industrial truck of a tiltable framework pivoted on the end of the platform of the truck and normally inclined to tilt from a horizontal position by its own weight, a latch for holding the framework in a horizontal position on the truck, and manually actuatable means for releasing said last mentioned means.

3. A tilting frame attachment for platform type industrial trucks including a framework tiltable mounted on the platform, flexible means for holding a load carrying container on the framework, a compartment on said framework for containing unused lengths of said flexible means, said compartment having a door cooperating with notches in the compartment to retain the flexible means in adjusted position.

4. A tilting frame attachment for platform type industrial trucks including a framework tiltably mounted on the platform, chains for holding a load carrying container on the framework, and a container on said framework for containing unused lengths of said chain, said container including a door cooperating with notches in a wall of the container to retain the chain in adjusted position.

5. A tilting frame attachment for platform type industrial trucks including a framework tiltably mounted on the platform, chains for holding a load carrying container on the framework, and a container on said framework for containing unused lengths of said chain, said container including a door cooperating with notches in a wall of the container to retain the chain in adjusted position, said container being divided into compartments to hold the chains separate one from another.

6. A tilting frame attachment for platform type industrial trucks including a framework tiltably mounted on the platform, chains for holding a load carrying container on the framework, a container on said framework for containing unused lengths of said chain, said container including a door cooperating with notches in a wall of the container to retain the chain in adjusted position, and chain engaging surfaces at the end of the framework opposite the container for receiving said chain.

7. A tilting frame attachment for platform type industrial trucks including a framework tiltably mounted on the platform, chains for holding a load carrying container on the framework, and a container on said framework for containing unused lengths of said chain, said container including a door cooperating with notches in a wall of the container to retain the chain in adjusted position, chain engaging surfaces at the end of the framework opposite the container for receiving said chain, and keepers for holding said chain in engagement with said chain engaging surfaces.

8. In combination with an elevating platform type industrial truck, a trunnion cradle attached to the platform of said truck, a removable container supporting frame, a shaft on said container supporting frame for registration with the trunnion cradle, said shaft being placed on said frame to the rear of the center of said frame so that the frame will tend to tilt in the trunnion cradle, and a latching mechanism on the platform of the truck for locking a container supporting frame from tilting.

9. In combination with an elevating platform type industrial truck, a trunnion cradle attached to the platform of said truck, a removable container supporting frame, a shaft on said container supporting frame for registration with the trunnion cradle, said shaft being placed on said frame to the rear of the center of said frame so that the frame will tend to tilt in the trunnion cradle, a latching mechanism on the platform of the truck for locking the container supporting frame from tilting, and means connected to said latching means and extending to the operator's station for releasing said latching means to permit the container supporting frame to tilt.

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