May 7, 1929. P. F. C. WILCKE 1,711,820

TRAY LOADER

Filed May 11, 1927 3 Sheets-Sheet 1

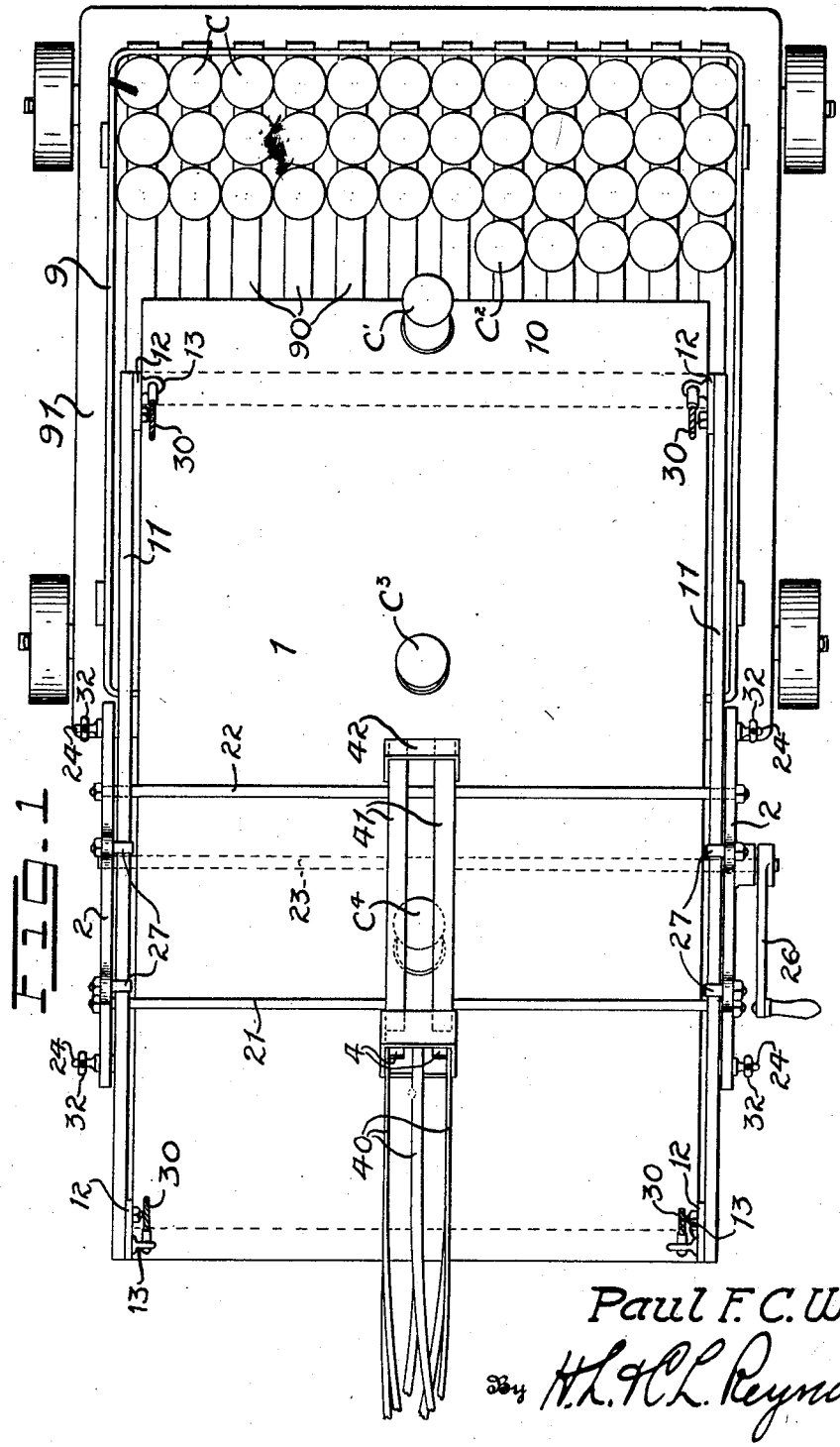


FIG. 1

Inventor

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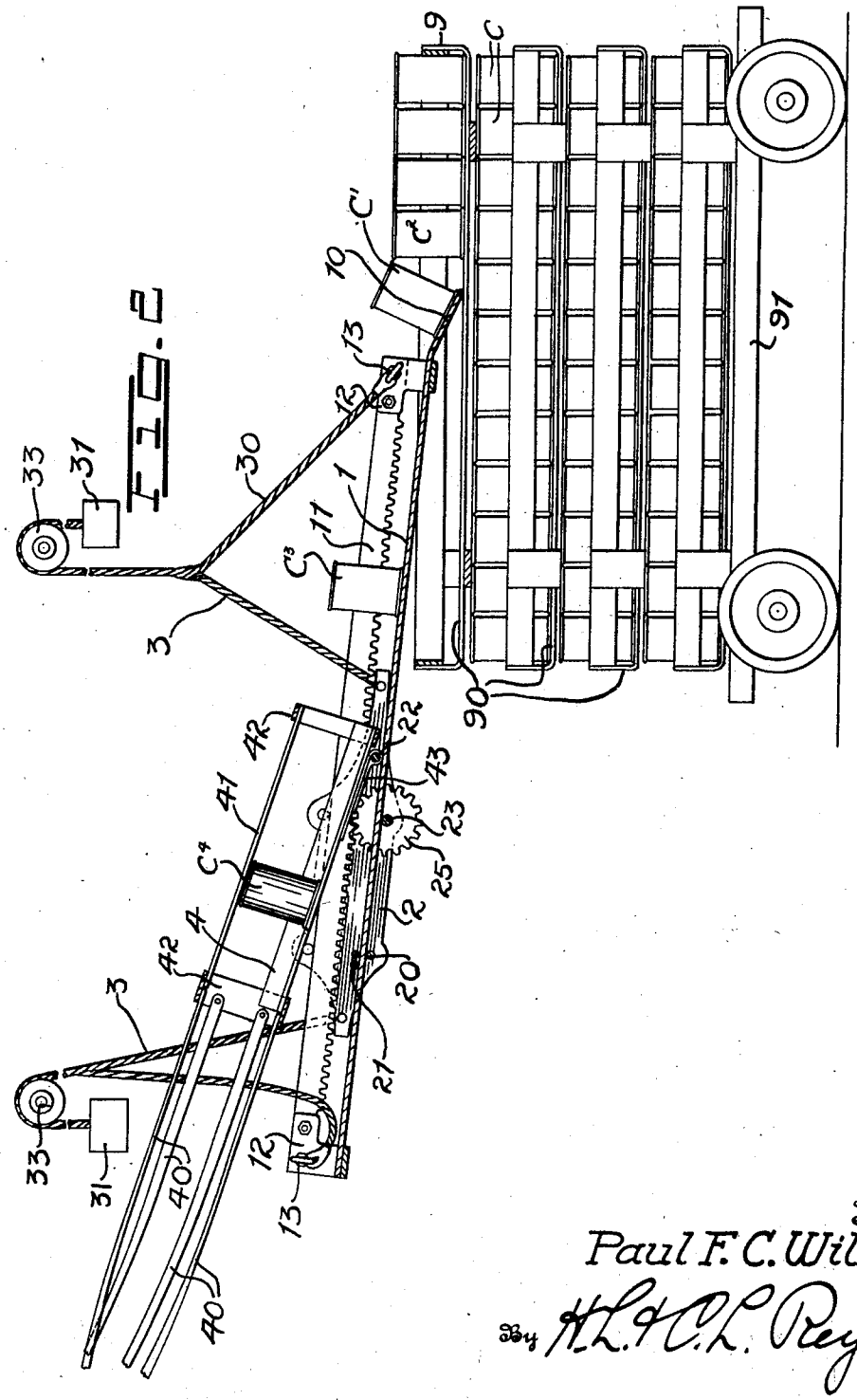
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TRAY LOADER

Filed May 11, 1927 3 Sheets-Sheet 2

FIG. 2



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TRAY LOADER

Filed May 11, 1927 3 Sheets-Sheet 3

FIG. 3

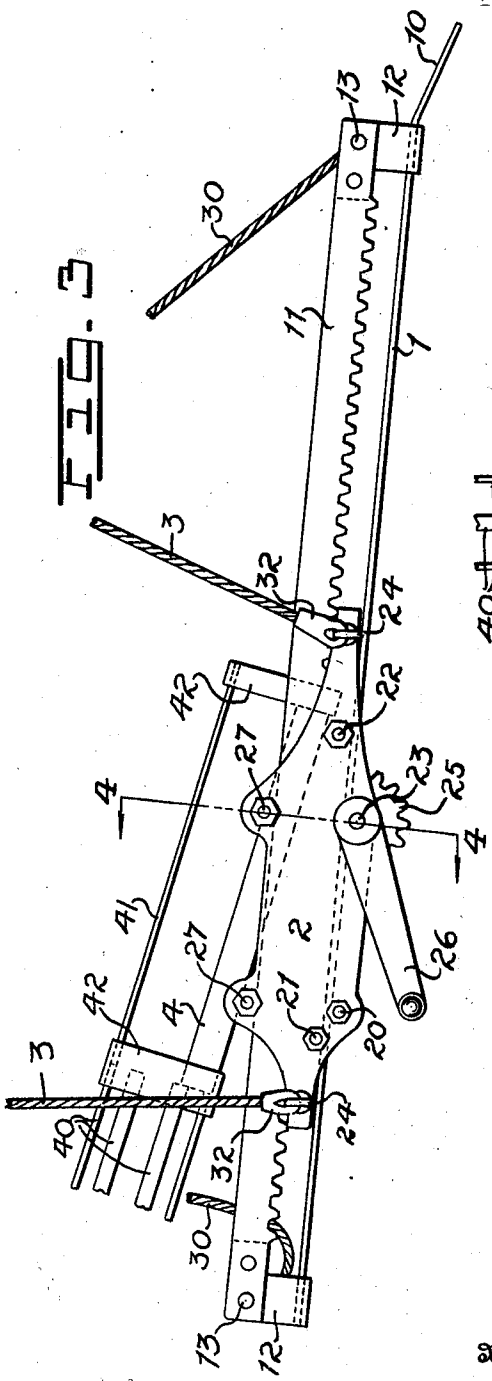
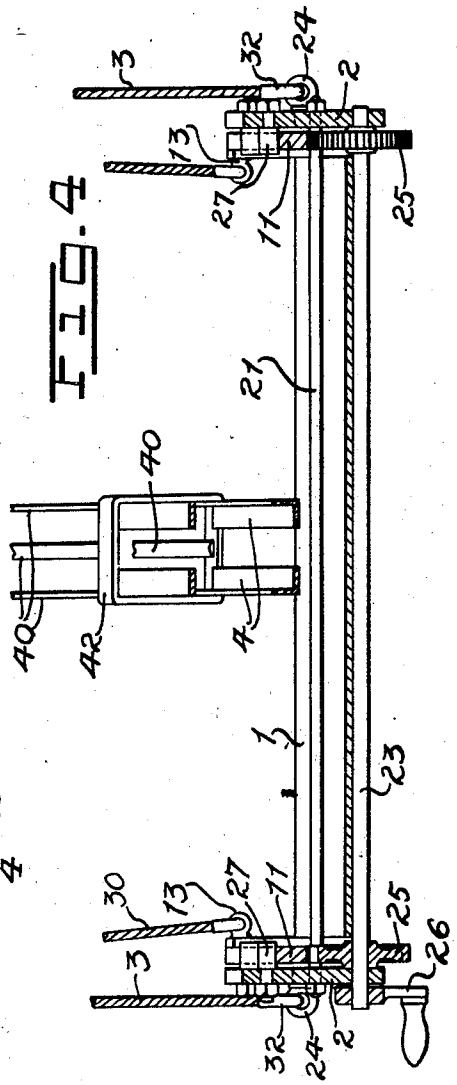


FIG. 4



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Patented May 7, 1929. 1,711,820

UNITED STATES PATENT OFFICE.

PAUL F. C. WILCKE, OF SEATTLE, WASHINGTON.

TRAY LOADER.

Application filed May 11, 1927. Serial No. 190,418.

My invention relates to an improvement in tray loading apparatus intended to facilitate the loading of cans on the trays which are employed to hold these cans during the processing thereof. It will, of course, be obvious that the device may be used for various other purposes, its chief object being to provide a means whereby cans or like articles delivered upon a platform may be removed from thence with the minimum of manual labor and attention.

It is an object to provide a tray loader of the general type described, wherein the platform, which primarily receives the cans, may be adjusted relative to its support, so that its edge may be withdrawn from beneath the cans as the rows accumulate, to deposit them in the trays.

Another object is the provision of a means for supporting such a tray loader which will not deviate laterally to any appreciable extent, whatever the adjustment of the platform relative to its support, but which will permit ready vertical and angular adjustment of the platform and its support.

Another object is the provision of means for associating a gravity conveyor with such a vertically and angularly adjustable tray loader.

Another object is the provision of such a tray loader of simple and inexpensive construction.

My invention comprises the novel parts and the novel combination and arrangement thereof, as shown in the accompanying drawings, described in the specification, and particularly defined by the claims terminating the same.

In the accompanying drawings I have shown my invention in a form which is now preferred by me.

Figure 1 is a plan view of my device shown in association with a tray being loaded;

Figure 2 is a longitudinal cross section through the loader and tray associated therewith;

Figure 3 is a side elevation of the loader alone;

Figure 4 is a section on line 4—4 of Figure 3.

The loader is provided with a platform 1, usually provided with a slightly downturned lip 10, which is arranged to contact with or lie closely adjacent at all times to the bottom 90 of a tray 9 which receives the cans C. The platform 1 is supported by cables 3 and 30, which, preferably, are counterweighted to permit the entire loader to be readily moved bodily upward as the trays are stacked one upon the other, as each one is loaded. It will be understood in this connection that a number of loaded trays are piled one upon the top of another and loaded upon a carriage, as 91, and thus are run into a retort for processing. With the type of loaders of which I have knowledge, it has been necessary heretofore to load the individual trays and then to lift the loaded trays one by one upon the car and upon previously loaded trays, and it will be understood that the weight of these loaded trays, carrying usually 144 cans, is considerable, but by use of the counterweights 31 it is possible to lift the entire loader from time to time as the trays accumulate, thus obviating the necessity of lifting loaded trays.

The platform is directly supported from a frame made up of the side plates 2 connected by bars or rods 20, 21 and 22, and by the shaft 23, which is in effect a fourth bar. The bar 20 and shaft 23 pass beneath the platform 1 to support it from beneath, while the bars 21 and 22 define a plane slightly above the plane of the bars 20 and 23, thus cooperating therewith to form a guide in which the platform 1 may only slide longitudinally. The ends of cables 3 carry clevises 32 which are received in hooks or eyes 24 carried by the side plates 2, and at their ends they carry the counterweights 31, whereby the loader is supported from overhead pulleys 33. The cables 30, which may be omitted, but which I prefer to use, are secured at the corners of the platform 1 itself, and are spliced in the cables 3 between the clevises 32 and the pulleys 33. The cables 30 are so arranged that when the platform is evenly balanced in the frame just described, these cables 30 are slack, and the loader is wholly supported from the cables 3; however, when the platform is extended in either direction, and its otherwise unsupported weight would tend to throw it out of

proper angular position, the cables 30 take part of the unbalanced weight, and prevent this.

The pulleys 33 are positioned a little outwardly of the normal positions of the corners of the side frames 2, to which the clevises 32 are secured, so that when the cables 30 assume a part of the load, upon extension of one end of the platform as in Figure 2, the point of support of the cables 3 and 30 depending therefrom will be between their points of securement on the loader, and the load will thus be balanced more evenly. If the platform itself were unsupported from the cables, it would, when projected and loaded as in Figure 2, tend to sag, and the proper inclination thereof would be disturbed. Yet it is not desirable that the loader be supported wholly by attachment of cables directly to the platform only, for if such were the case, it would not be possible to move the lip 10 rearwardly from time to time, as must be done, for such movement would cause the cables to assume an inclined position which would urge the platform to swing forward to its original position. By the suspension means described, with the cables 30 ordinarily slack, but coming into play when the platform is extended sufficiently to unbalance it, the load is kept more or less evenly balanced and the proper inclination and longitudinal position can be maintained.

Obviously, the loader might be otherwise supported, but the means described permits ready vertical adjustment of the entire loader, and ready adjustment of the angle of inclination of the platform, and accommodates the bodily longitudinal movement required by the arc of swing of the gravity conveyor to be described.

In order to shift the platform 1 longitudinally from time to time as the occasion requires, I provide a rack 11 carried by the platform; preferably two are used, one at each side thereof, and pinions 25 carried by the shaft 23, which mesh with the racks 11. The crank arm 26 permits turning of the shaft 23, and this causes movement, in the proper direction, of the platform 1 to which the racks are connected. The support of the racks may be through lugs 12 upturned at the corners of the platform 1, the rack being then secured to these lugs by the bolts 13. Preferably, also, pins 27 carried by the end frames 2 overlie the rack 11 to maintain the pinions 25 in proper mesh therewith.

Cans may be delivered to the platform 1 by any one of a number of conveyor means, but should be delivered so that they stand on end on the platform. They may be conveniently delivered by means of a gravity chute consisting of the various strips 40 outlining a rectangle, as best seen in Figure 4. At the platform a terminal frame is provided which is held in position relative to the platform and relative to the supporting frame thereof. This frame consists essentially of the spaced angle bars 4 along which the bottom of the can slides, and the straps 41 which prevent the can from flying upward from the slides 4, and which prevent it from turning over endwise. These members are suitably held together, as by the straps 42, which surround them and form rectangular frames at each end of the terminal member, and to one of which the ends of the chute members 40 are secured.

This terminal member of the conveyor is fixed in position relative to the support of the platform 1, as by means of the strap 43, secured to this terminal frame or to the angles 4 forming a part thereof and passing about the bar 22 (see Figure 2). By this means the cans are delivered to the platform in upright position and by a connection which is sufficiently flexible to permit the platform to be raised or lowered, as may be required to position it properly relative to the tray which is being loaded, whether this be the first or the last tray on the pile.

In Figure 2 a can C′ is shown, this having been previously delivered, and having slid to the edge of the platform and onto the lip 10 thereof, so that it leans against a can C^2, previously loaded on the tray. Another can C^3 has just been delivered from the terminal member 4 of the conveyor and is in movement toward the lip of the platform. Still another can C^4 is sliding down the angles 4 and will shortly be discharged upon the platform. The cans C^3 and C^4 will continue until they reach substantially the position of the can C′. When a number of the cans have thus piled up on the platform, they are roughly straightened into line and in the leaning position of can C′, whereupon the crank arm 26 is manipulated to draw the platform to the left in Figure 2 thus withdrawing it from beneath the cans which have been delivered. This deposits these cans upon the tray, and it will ordinarily be found that they require little or no straightening out. Thus, instead of loading each individual can into the tray by hand, it is possible to allow them to form in position almost automatically and with a minimum of attention.

What I claim as my invention is:

1. The combination, in a tray loader, of a platform, means forming the principal support for said platform, means for delivering cans upon said platform, and means for moving said platform relative to its supporting means to withdraw its edge from beneath cans supported thereby.

2. The combination, in a tray loader, of a platform, means for delivering cans upon said platform, and a support, said support being substantially fixed in position adja-

cent a tray to be loaded, and itself supporting said delivery means, and means interengageable between said support and the platform for shifting the latter relative to said support and the tray, to withdraw the edge of the tray from beneath cans supported thereby.

3. The combination, in a tray loader, of an inclined platform having its lower edge adapted to lie closely adjacent to the bottom of a tray to be loaded, a frame supporting and positioning said platform, and a delivery chute supported on said frame for delivering cans directly upon said platform to slide towards its lower edge, and means interengageable between said platform and said frame for shifting the platform relative to the frame, chute and tray, to withdraw its edge from beneath cans supported on the platform.

4. The combination, in a tray loader, of a platform, means for supporting said platform, means for delivering cans directly upon said platform, means for moving said platform relative to its supporting means to withdraw its edge from beneath cans supported thereby, and means for adjusting the vertical position of said platform-supporting means.

5. The combination, in a tray loader, of a platform, means for supporting said platform, means for delivering cans upon said platform, means for moving said platform relative to its supporting means to withdraw its edge from beneath cans supported thereby, means for adjusting the vertical position of said platform-supporting means, and means for adjusting the height and inclination of said frame and platform.

6. The combination, in a tray loader, of a platform, means for supporting said platform, means associated with said latter means for delivering cans upon said platform, and means for shifting said platform in a lateral manner relative to its supporting means.

7. The combination, in a tray loader, of a frame, means associated with said frame for delivering cans, a platform received in said frame for receiving cans thus delivered, and means for shifting said platform in a lateral manner relative to said frame.

8. The combination, in a tray loader, of a frame, means associated with said frame for delivering cans, a platform mounted in said frame for receiving cans thus delivered, means for shifting said platform longitudinally relative to said frame, and supporting means for said frame permitting adjustment of its elevation and inclination, but maintaining it against substantial lateral movement.

9. In a tray loader, in combination with a platform, a frame supporting said platform, means for delivering cans upon said platform, a co-operating rack and pinion meshing therewith, one carried by said frame and the other by the platform, whereby longitudinal adjustment of said platform relative to said frame may be obtained.

10. In a tray loader, in combination with a platform, a longitudinally extending rack bar carried thereby, means for delivering cans upon said platform, a frame supporting said platform, and a pinion carried by said frame and in mesh with said rack bar, whereby said platform may be adjusted longitudinally relative to said frame.

11. In a tray loader, in combination with a platform, a frame comprising end plates and spaced transverse bars connecting the end plates, said platform being supported on longitudinally spaced bars and being guided for longitudinal adjustment relative to the frame between vertically spaced bars, means for delivering cans upon said platform, and means for adjusting said platform longitudinally of said frame.

12. In a tray loader, a frame including side plates and two longitudinally spaced supporting bars, a platform supported on said bars, means for adjusting said platform longitudinally relative to said frame to withdraw its delivery edge from beneath cans supported thereon, and means for depositing cans upon said platform.

13. A tray loader as in claim 12, the frame including spaced bars overlying the platform and cooperating with the underlying bars to guide the platform for longitudinal movement relative to the frame.

14. A tray loader as in claim 12, the frame including a bar overlying the platform and cooperating with the underlying bars to guide it for longitudinal movement, the can-depositing means being pivotally connected to the overlying frame bar, and means for adjusting the height and angle of said frame and platform.

15. In a tray loader, a frame including side plates, two longitudinally spaced supporting bars, and two longitudinally spaced guide bars spaced above the plane defined by said supporting bars, a platform supported by said supporting bars and guided by said upper bars for longitudinal movement relative to the frame, means for maintaining said platform in a selected position relative to the frame, and means for depositing cans upon the platform terminating in a conveyor frame for supporting cans in upright position and delivering them by gravity upon the platform, said conveyor frame being secured to the farthest of said upper bars, in the direction of movement of the cans.

16. The combination, in a tray loader, of a platform having its delivery edge adapted to be positioned adjacent to, and to follow, the bottom of a tray to be loaded, a frame

supporting and positioning said platform, means for adjusting said platform longitudinally relative to said frame, means for delivering cans to said platform, and means engaged with said frame to suspend said platform.

17. The combination, in a tray loader, of a platform having its delivery edge adapted to be positioned adjacent to, and to follow, the bottom of a tray to be loaded, a frame supporting and positioning said platform, means for adjusting said platform longitudinally relative to said frame, means for delivering cans to said platform, cables secured to said frame, pulleys receiving and supporting said cables, and counterweights on said cables permitting adjustment of the height and inclination of said frame and platform.

18. The combination, in a tray loader, of a frame, a platform longitudinally movable in said frame, and means for supporting the loader comprising depending cables attached at the corners of said frame, and other cables attached at the corners of the platform and of such length and so supported relative to the first cables, that they are normally slack, and take up the load only as the platform is projected materially.

19. The combination, in a tray loader, of a frame, a platform longitudinally movable in said frame, and means for supporting the loader comprising supporting elements thereabove, cables depending from said elements to the forward and rear ends of the frame, other and normally slack cables secured to said first cables between the supporting elements and the frame, and connected to the platform, said cables being of such length as to take up a part of the load as the platform is projected materially beyond the frame.

20. The combination, in a tray loader, of a rectangular frame, a platform longitudinally movable in said frame, four pulleys supported above and outward of the corners of said frame, four cables extending over said pulleys and secured to the respective corners of said frame, and counterweights secured to the other ends of said cables and normally supporting the loader, and four other cables secured to said first cables between said pulleys and the frame, and secured to the corners of said platform, said latter cables being of such length that they are normally slack, when the platform is substantially balanced in the frame, but are drawn taut to assume a portion of the load upon extension of either end of the platform.

Signed at Seattle, King County, Washington, this 4th day of May, 1927.

PAUL F. C. WILCKE.