

March 2, 1943.

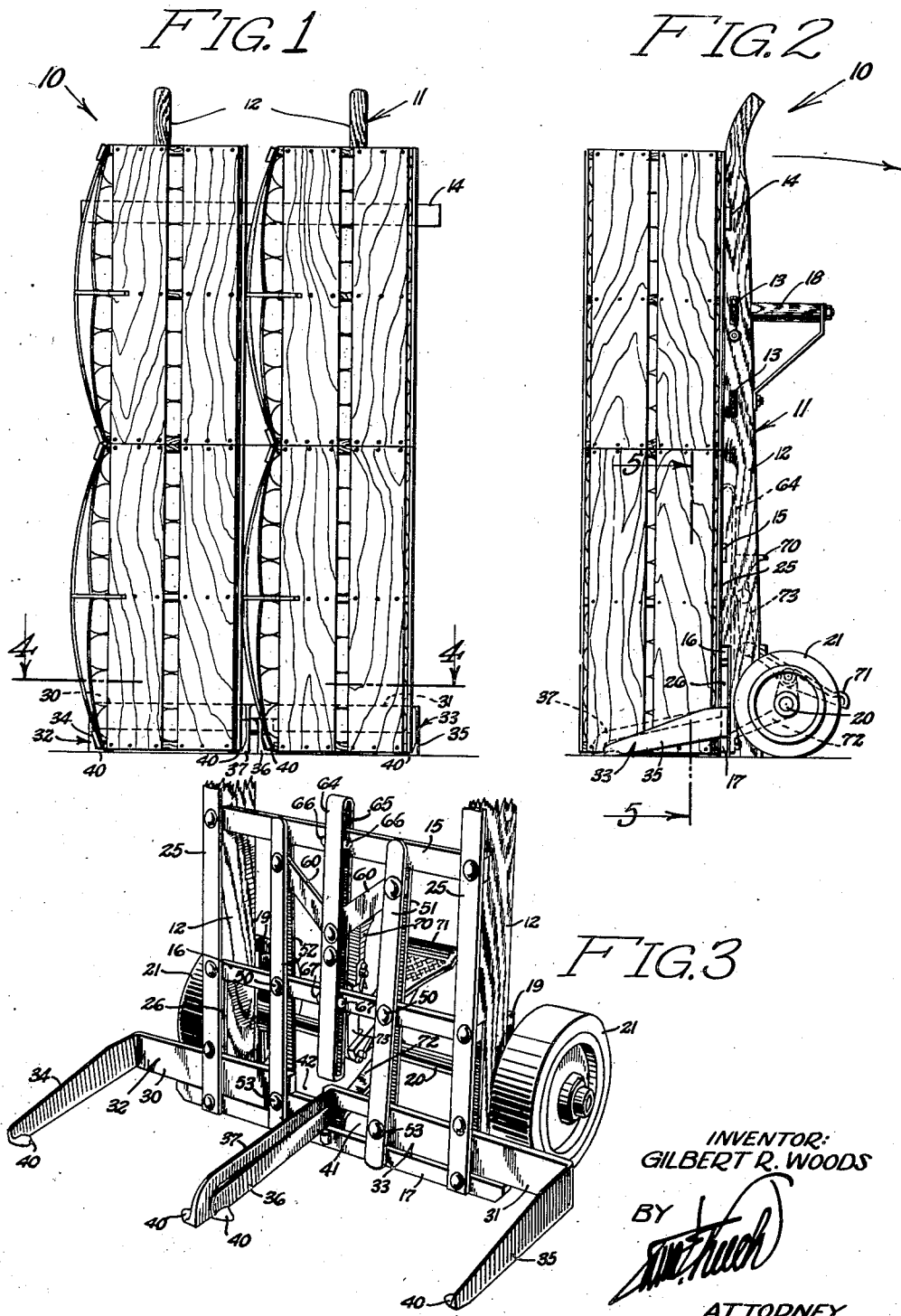
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2,312,461

HAND TRUCK FOR CARRYING BOX-ON-END STACKS

Filed Dec. 15, 1941

2 Sheets-Sheet 1



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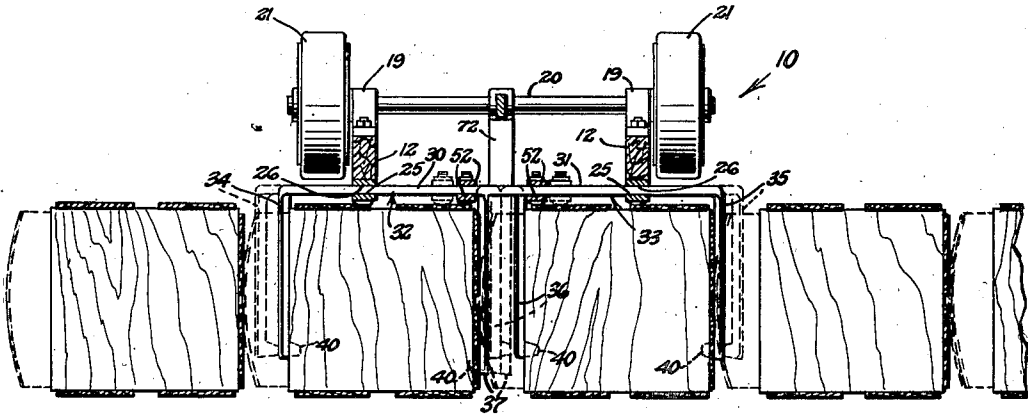


FIG. 4

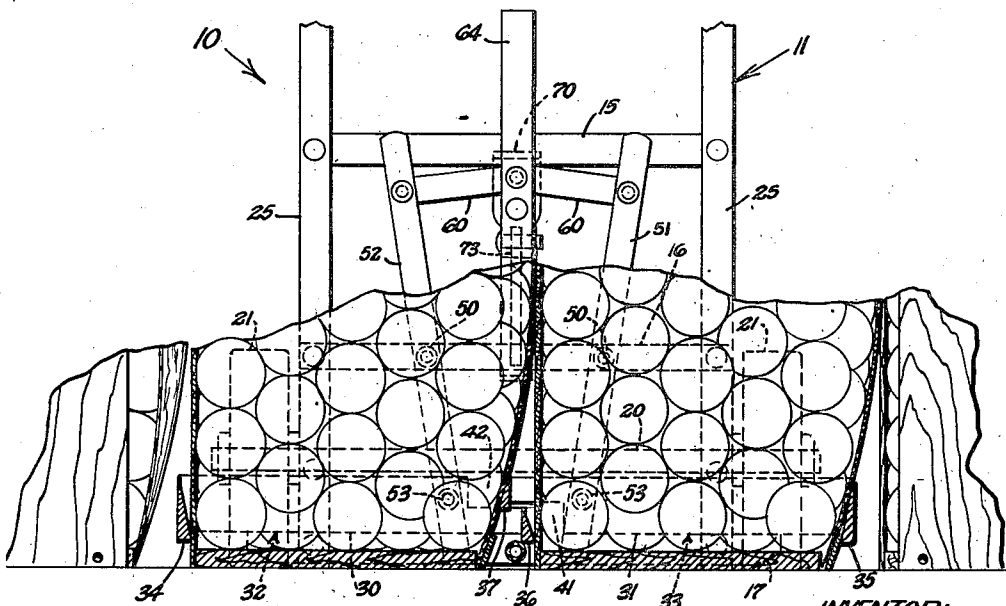


FIG. 5

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UNITED STATES PATENT OFFICE

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HAND TRUCK FOR CARRYING BOX-ON-END STACKS

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5 Claims. (Cl. 214—65.5)

This invention relates to hand trucks used in packing houses and warehouses for handling fruits packaged in boxes ready for shipping and in loading these boxes into cars and removing the same therefrom.

This invention is particularly useful in handling packed boxes of citrus products as these are customarily put up at present and it will accordingly be illustrated and described as thus used.

It is common practice in the United States to pack citrus fruits in shipping cases with what is known as an overfilled or crown pack in which the fruit holds the lid in outwardly arched conformation after the ends of the lid are nailed to the ends of the box. After the box is thus lidded, it is customary to place a metal strap over the middle of the lid and secure the ends of the strap to the sides of the box. Until recently it was common practice, since the time this package was first evolved, to place these boxes on-end in packing them in railway cars and to batten the lower layer of boxes in the car by wooden battens tacked to the upper ends of these boxes before loading a second layer of boxes, also placed on-end, on top of the first layer. When loading in this manner it was the general practice at the ladder to stack the packed boxes with these lying on their sides and deliver this stack by hand truck to the floor of the car where the boxes were individually removed from the stack and positioned on-end in which-ever layer was being formed at that time in the car.

Recently it has been found that battening may be dispensed with in loading packed boxes of citrus in railway cars so that the boxes in the upper layer may rest directly on the boxes in the lower layer. The function formerly performed by the battens is now taken care of by blocks nailed to the car wall and steel straps nailed on the inner faces of these blocks, these straps snugly engaging each of the two layers of boxes and their ends tied together to tightly encircle these layers after the car has been loaded and before the doors are closed.

It is an object of my invention to provide a means for loading packed boxes of citrus fruits in railway cars in the new form hereinabove described which will eliminate the necessity of re-handling boxes after they are delivered to the car.

It is another object of this invention to provide a hand truck by which one or more plural stacks of packed boxes of citrus placed on-end

may be trucked from one point to another without breaking down or disturbing the form of the stacks.

It is yet another object of the invention to provide a hand truck by which two stacks of packed boxes of citrus with the boxes in each stack arranged on-end and resting one on the other may be picked up and transferred from one point to another and there set down without disarranging these stacks.

A yet further object of this invention is to provide a hand truck by which two stacks on-end of packed boxes of citrus may be transferred from a packing house or warehouse into a railway car or truck and set down in the proper relation with the balance of the load in the car, and without the necessity of rehandling these boxes in order for them to be properly incorporated with said load.

It is still another object of this invention to provide a hand truck by which either one or two stacks on-end of packed boxes of citrus may be picked up and transported from point to point and then set down without disturbing the arrangement of said one or two stacks thus transported.

The manner of accomplishing the foregoing objects, as well as further objects and advantages, will be made manifest in the following description taken in connection with the accompanying drawings, in which:

Fig. 1 is a front view of a preferred embodiment of the hand truck of this invention with the latter in clamping engagement with two stacks on-end of packed boxes of citrus in readiness for the truck and these stacks to be tilted rearwardly and the stacks transported elsewhere on the truck.

Fig. 2 is a side elevation of Fig. 1.

Fig. 3 is an enlarged fragmentary perspective view of the clamping jaws and operating mechanism of the truck shown in Figs. 1 and 2 with said jaws in retracted positions.

Fig. 4 is a horizontal cross-sectional view taken on the line 4—4 of Fig. 1 and illustrating the positions of the truck jaws, both in retracted position and in clamping position, and also illustrating how two stacks of packed boxes of citrus on-end may be moved into or removed from a space just wide enough to receive the same in a row of stacks on-end of similar boxes.

Fig. 5 is a vertical sectional view taken on the line 5—5 of Figs. 2 and 4 and illustrating the cross-sectional contour of the jaws of said truck so as to indicate the reasons for this.

Referring specifically to the drawings, the truck 10 shown therein comprises a preferred embodiment of my invention, this including an upright frame 11 having wooden side bars 12 joined together by wooden spacers 13 and metal bars 14, 15, 16 and 17. The side bars 12 are also provided with handles 18 and bearings 19, the latter supporting a shaft 20 on which are rotatably mounted rubber-tired wheels 21. The front faces of the side bars 12 are covered by metal straps 25, slots 26 being formed in the bars 12 just beneath these straps and between the cross bars 16 and 17.

Slideable in the slots 26 are base bars 30 and 31 of U-shaped clamping members 32 and 33. These members have outer jaws 34 and 35, and inner jaws 36 and 37. These jaws are all formed with beveled inner faces, as clearly shown in Fig. 5, the reason for which will become apparent in describing the operation of the invention. The end of each of the jaws 34, 35, 36 and 37 is provided with a relatively flat tooth 40. These teeth on the member 32 extend in the same direction which is toward the member 33 and, in like manner, those on the member 33 extend in the opposite direction and toward the member 32. The jaw 37 is disposed above the jaw 36 and the base bars 30 and 31 are recessed respectively at 41 and 42 so that the inner portions of these bars are adapted to have telescopic or overlapping movement relative to each other in the operation of the truck.

Pivotaly mounted on the bar 16 on pins 50 are double bars 51 and 52, the lower ends of these bars straddling the bars 17 and being pivoted by pins 53 to the base bars 30 and 31 of the members 32 and 33. The double bars 51 and 52 form levers which fulcrum on the pins 50 and are actuated to shift the members 32 and 33 inwardly and outwardly by toggle links 60 the opposite ends of which are pivoted to the levers 51 and 52 and to a central double slide bar 64. This bar has a central slot 65 receiving the cross-bars 15 and 16 and is guided on the latter by pins 66 and 67. The clamping members 32 and 33 are adapted to be locked in their inner or clamping positions by the toggle links 60 riding upwardly over dead center, as shown in Fig. 5. Vertical movement of the slide bar 64 is effected by a depressing pedal 70 which is fixed on the rear face of this bar and an elevating pedal 71 which pivots on a bracket 72 which is mounted on the bar 17 and shaft 20, (see Figs. 2 and 3). The pedal 71 is connected to the pedal 70 by a link 73.

Operation

The truck 10, while having a wide variety of uses, is particularly designed for handling a plurality of on-end stacks of overpacked boxes of citrus fruit. As previously pointed out, it is the present practice, when loading these boxes in railway cars, to stack them in two layers, the boxes in each layer being on-end with each box in the upper layer super-imposed directly over a box in the lower layer and resting thereon.

Prior to my invention it was the practice, after the boxes have been lided in the packing house, to stack these boxes on their sides and truck the boxes thus stacked into the car where the boxes were manually removed from this stack and placed in their proper positions in one or the other of the two layers of boxes being loaded in the car.

In packing houses equipped with my inven-

tion this rehandling of the boxes in the cars is unnecessary as the boxes, when taken from the ladder can then be originally stacked on the packing house floor with the boxes on-end in stacks two boxes high. When lidding an over-packed box of fruit it is necessary for the lid to be arched from one end to the other when the ends of the lid are nailed to the box, so as to accommodate the quantity of fruit placed in the box in excess of that needed to fill it. When the boxes are stacked on-end with the arched lids all in a given direction there is thus provided a free space between the bottom ends of each adjacent pair of stacks.

The truck 10 of my invention is adapted to pick up a pair of these stacks, transport these to any place and set them down in the same relative positions as those in which they were picked up. To accomplish this, the truck with the jaws 34, 35, 36 and 37, disposed as shown in Fig. 3, is rolled on the wheels 21 so as to extend the jaws 36 and 37 in the free space between the two stacks to be transported on the truck and to extend the jaws 34 and 35 in the spaces just outside of these two stacks, as shown in dotted lines in Fig. 4. The operator then leans the truck forwardly so that the frame 11 is disposed vertically, as shown in Fig. 2, and presses his foot downwardly on the pedal 71 which rocks this from the position in which it is shown in Fig. 3 to the position in which it is shown in Fig. 2. This lifts the slidebar 64 and expands the toggle links 60 to shift the clamping members 32 and 33 inwardly with the result shown in full lines in Figs. 1, 2, 4 and 5. Here it is seen that the teeth 40 are driven underneath the inside lower edges of the two stacks being engaged and the teeth 40 of the jaws 34 and 35 are driven inwardly under the outside lower edges of these stacks. It also will be noted that the beveling of the faces of these jaws which are disposed toward the box engaged thereby permits those jaws which are adjacent the arched lid of one of the boxes to conform to this lid and thereby permit the tooth 40 on the end of this jaw to have an opportunity to extend beneath the adjacent lower corner edge of this box.

The toggle link 60, when positioned as shown in Fig. 5, locks the jaws in the stack clamping positions in which these jaws are shown in full lines in Figs. 1, 2, 4 and 5. This permits the two stacks engaged to be lifted bodily on the truck 10 by rocking the latter rearwardly about the axis of the wheels 21 and then rolling the truck and its load on these wheels to any point to which it is desired to transport these stacks. When arriving there, the truck is halted and rocked forwardly, gently setting down the two stacks on-end carried thereby. While Figs. 4 and 5 illustrate the manner in which two such stacks on-end of packed citrus boxes may be picked up, these views also illustrate how these two stacks may be delivered into a space in a partially loaded railway car just large enough to receive them.

Having set the stack down in such a space, the truck operator presses his foot downwardly on the pedal 70 thus releasing the toggle links 60, as shown in Fig. 3, and shifting the clamping members 32 and 33 outwardly bringing the jaws 34, 35, 36 and 37 into their retracted positions. These positions are shown in dotted lines in Fig. 4. It is now possible to back the truck 10 away from these stacks thus withdrawing the truck jaws from the spaces between and adjacent to these stacks of boxes.

While only a single embodiment of the invention is disclosed in this application, it is to be understood that various modifications may be made in this to adapt the invention to other uses than that illustrated without departing from the spirit of the invention or the scope of the appended claims.

What I claim is:

1. In a hand truck, the combination of: an upright frame; wheels on said frame about which said frame is adapted to be rocked in the operation of said truck; a pair of U-shaped clamping members slideably mounted on said frame close to the lower end thereof, each of said members having an outer clamping jaw and an inner clamping jaw the inner jaws of said members being adapted to by-pass each other; and means for shifting said members toward or away from each other to cause the inner jaw of one member and the outer jaw of the other member to cooperatively engage opposite portions of the bottom box of a stack of boxes which may be disposed between said jaws.

2. In a hand truck, the combination of: an upright frame; wheels on said frame about which said frame is adapted to be rocked in the operation of said truck; a pair of U-shaped members slideably mounted on said frame, each of said members having an outer jaw and an inner jaw which face in the same direction, the inner jaws of said members being adapted to by-pass each other; and means on said frame for actuating said members so that the outer jaw of each member and the inner jaw of the other member will,

when said members are shifted together, grip a stack of boxes disposed therebetween, said means incorporating locking means to lock said jaws in gripping relation with any stacks disposed between said jaws.

3. In a hand truck adapted for handling two closely spaced stacks of boxes on end, the combination of: a carriage; a pair of U-shaped clamping members slidably mounted on said carriage close to the lower end thereof, each of said members having an outer clamping jaw and an inner clamping jaw; teeth on said jaws adapted to underlie the lower edges of said stacks, the teeth on said inner jaws of said members being adapted to by-pass each other in the operation of said members; and means for shifting said members toward or away from each other to cause the teeth on the inner jaw of one member and on the outer jaw of the other member to cooperatively engage opposite portions of the bottom box of a stack of boxes which may be disposed between said jaws.

4. A combination as in claim 3, in which said teeth on said inner jaws by-pass each other while both said teeth are in contact with the floor.

5. A combination as in claim 3, in which the tooth on one of said inner jaws is disposed farther from said carriage than the tooth on the other of said inner jaws whereby said teeth are able to by-pass each other in the operation of said truck while said teeth remain in engagement with the floor.

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