Jan. 23. 1945. J. C. BROOME 2,367,752

HAND TRUCK

Filed Sept. 6, 1943 2 Sheets-Sheet 1

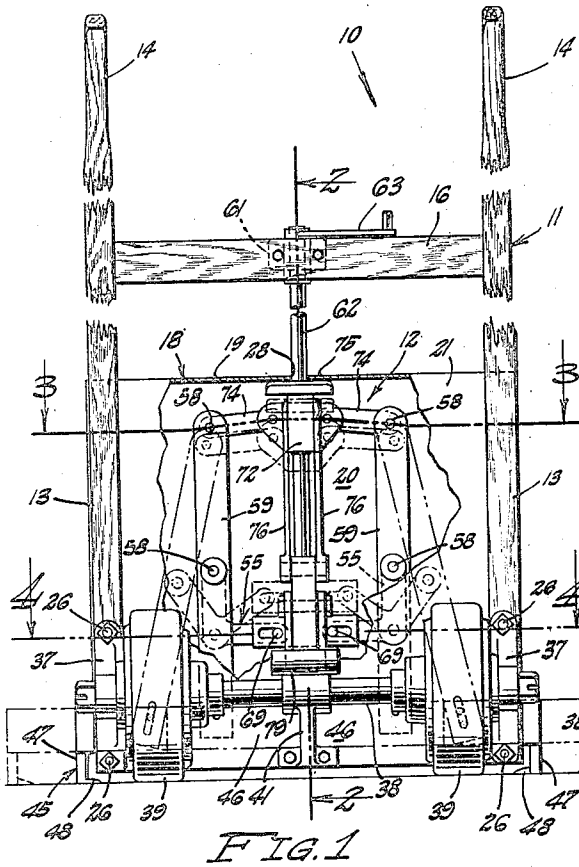


FIG. 1

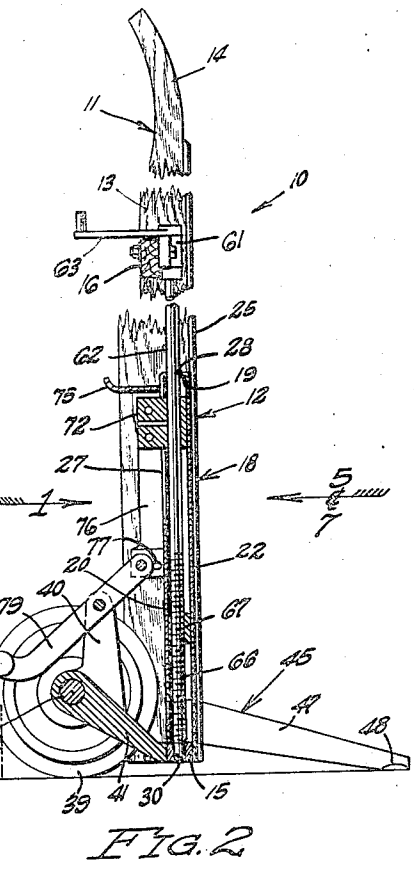


FIG. 2

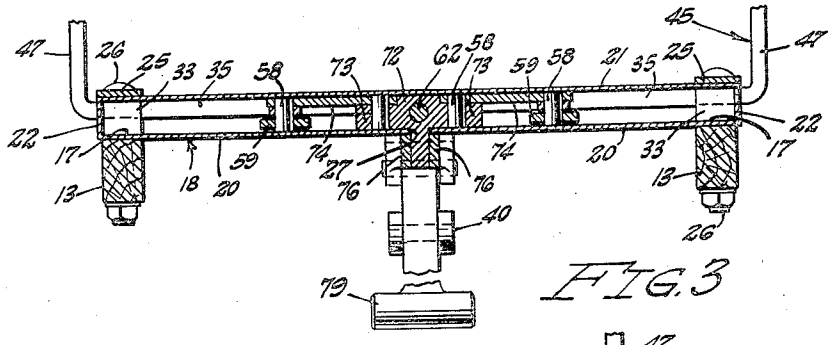


FIG. 3

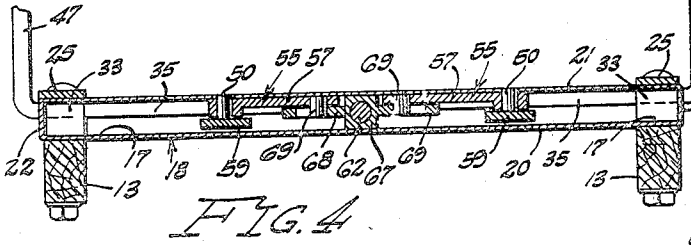


FIG. 4

INVENTOR:
JOHN C. BROOME

BY

ATTORNEY

Jan. 23, 1945. J. C. BROOME 2,367,752

HAND TRUCK

Filed Sept. 6, 1943 2 Sheets-Sheet 2

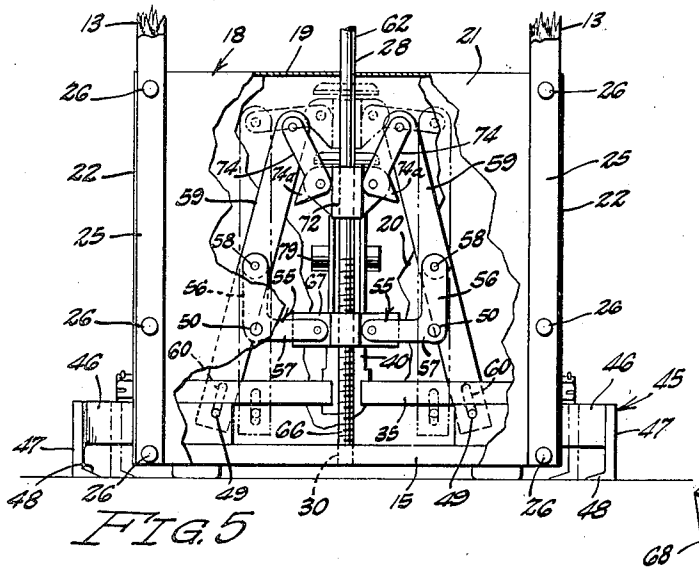


FIG. 5

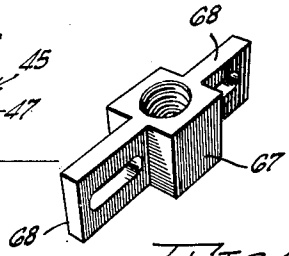


FIG. 6

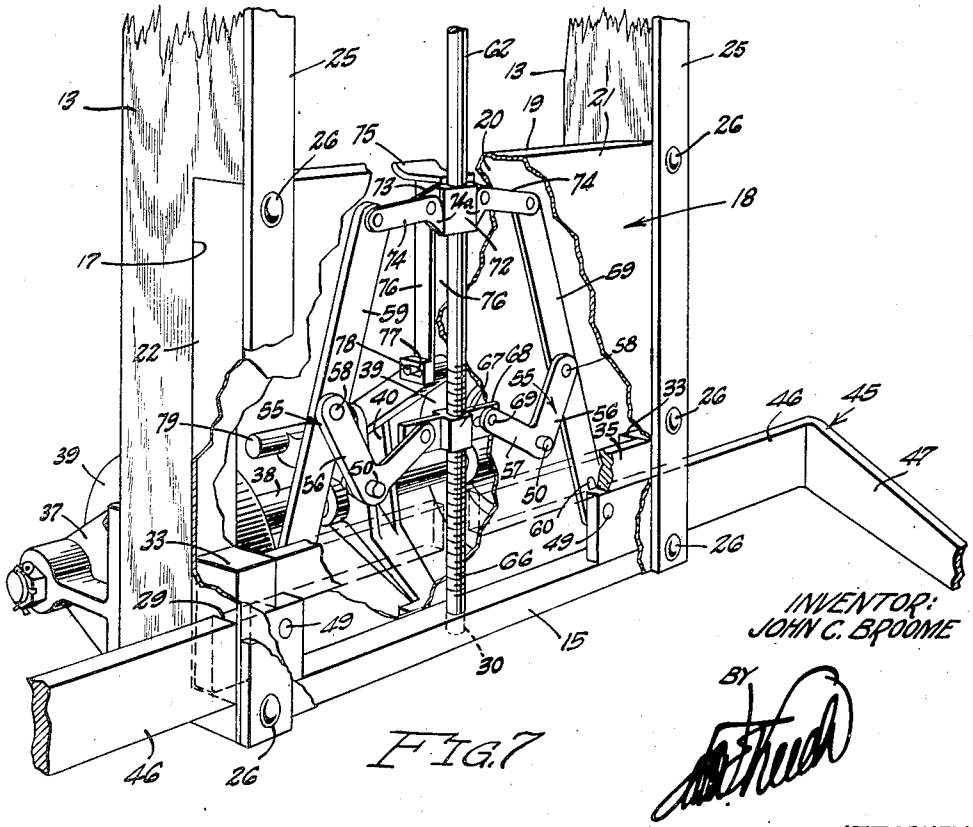


FIG. 7

INVENTOR:
JOHN C. BROOME

BY

ATTORNEY

Patented Jan. 23, 1945

2,367,752

UNITED STATES PATENT OFFICE

2,367,752

HAND TRUCK

John C. Broome, Dunedin, Fla., assignor to Food Machinery Corporation, San Jose, Calif., a corporation of Delaware

Application September 6, 1943, Serial No. 501,385

12 Claims. (Cl. 214—65.5)

This invention relates to hand trucks, and particularly to clamp trucks which are adjustable for adaptation for handling boxes differing considerably in length.

It is an object of the invention to provide a truck of this type having a novel adjustment mechanism whereby normal operation of the truck, to hold a box of any given length between the clamping jaws of the truck, locks these jaws in clamping relation if before engaging this box the truck had been adjusted for handling boxes of that length.

The manner of accomplishing the foregoing object, 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 rear elevational view of a preferred embodiment of the invention illustrating the clamping jaws in clamping position in the minimum and maximum adjustments provided therefor.

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1.

Fig. 3 is an enlarged cross sectional detail view taken on the line 3—3 of Fig. 1.

Fig. 4 is an enlarged cross sectional view taken on the line 4—4 of Fig. 1.

Fig. 5 is a fragmentary front elevational view illustrating the truck of my invention adjusted for gripping a box of minimum length of those within the range of lengths which the truck is adapted to handle, and showing the jaws and operating mechanism in full lines in expanded position and in broken lines in the clamping position.

Fig. 6 is a perspective view of the rocker control nut of the invention.

Fig. 7 is a fragmentary perspective view of the operating mechanism of my invention with the housing thereof broken away to expose the operating parts, this view showing the clamping jaws in clamping position with the truck adjusted for operation on a box of maximum length.

Referring specifically to the drawings, the clamp truck 10 there illustrated includes a wheeled carriage 11 upon which is mounted an adjustable box clamping mechanism 12.

The carriage 11 has wooden side members 13 terminating at their upper ends in handles 14 and joined at their lower ends by a metal cross bar 15 and near the handles 14 by a wooden cross bar 16. The side members 13 have recesses 17 in lower portions of their front edges. Opposite ends of the cross bar 15 fit into these recesses while the upper portion of these recesses is filled by side portions of a metal housing 18 having a top wall 19, a rear wall 20, a front wall 21 and side walls 22. Covering front faces of the side members 13 and extending downwardly over side edge portions of the housing 18 and ends of cross bar 15, are metal straps 25 which are secured to the members 13 as by bolts 26 certain of which also pass through the housing 18 and the cross bar 15 so as to secure these to the side members 13 in the recesses 17.

The back wall 20 of the housing 18 has a vertical slot 27 therein. The upper wall 19 has a hole 28, and the side walls 22 have holes 29. Also a hole 30 is formed in the middle of the cross bar 15.

Disposed in the lower outer corners of the housing 18 are metal blocks 33 the front faces of which are flush with the rear edges of the holes 29 in the housing side walls 22. Secured to the inner face of the front housing wall 21 at a level so that their lower faces are coextensive with the upper faces of the holes 29 are guide bars 35.

The lower two pairs of bolts 26 not only secure the blocks 33 in place, but also serve to attach axle brackets 37 to the lower ends of the side members 13. These brackets support an axle 38 therebetween. Rotatably mounted on this axle are carriage wheels 39. Supported centrally on this axle is a pedal yoke 40 having an arm 41 which extends downwardly and is fastened onto the cross bar 15 to prevent the yoke 40 turning on the axle 38.

The clamping mechanism 12 has a pair of clamping jaws 45 each of which includes a back bar 46, a forwardly projecting arm 47 and a tooth 48 extending inwardly from the bottom edge of the arm 47 at its tip. The back bars 46 are slidably inserted inwardly through the holes 29 and slideways 34, and have pins 49 extending rearwardly from their inner ends. Disposed within the housing 18 in symmetrical lateral spaced relation with the vertical central axis thereof and secured as by welding to the inner face of the housing front wall 18 are pivot pins 50. Pivoted on these pins are rockers 55 having upwardly disposed arms 56 and inwardly disposed arms 57. The upper arms 56 have fulcrum pins 58 on which are pivoted levers 59, the lower ends of which have slots 60 into which the pins 49 extend.

Extending downwardly through a bearing 61 provided on the cross bar 16 is a screw shaft 62 having a crank handle 63 at its upper end, this shaft extending through the hole 28 in the upper housing wall 19, the lower end of the shaft jour-

nalling in the hole 30 formed centrally in the cross bar 15. Beginning at a point above its lower end the shaft 62 has threads 66. These threads are screwed into a nut 67 having slotted wings 68, these horizontal slots receiving pins 69 formed on the inner ends of the rocker arms 57.

Slideable on the smooth portion of the shaft 62 above the threads 66 and within the housing 18, is a toggle head 72 having ears 73 which are pivotally connected by toggle links 74 to upper ends of the levers 59. Links 74 have lugs 74*a* on their inner ends the purpose of which will be made clear hereinafter. The toggle head 72 extends rearwardly through the slot 27 in the rear housing wall 20 and carries a foot pedal 75 and a pair of downwardly extending arms 76 having slots 77 which receive opposite ends of a pin 78 provided on the inner end of a foot pedal 79 which is pivoted on the upper end of the pedal yoke 40.

Operation

One of the advantages of the clamp truck 10 of my invention is that it is always adjusted for handling a box of some length which lies within the range of box lengths which this truck is adapted to handle. The adjustment to change the truck to render it adaptable to handle a box of a different length, is accomplished by rotation of the crank 63, thus rotating the shaft 62 and causing the nut 67 to move upwardly or downwardly depending upon which direction the shaft 62 is rotated. If the shaft is rotated to move the nut 67 upwardly this rocks the rockers 55 so as to shift the fulcrum pins 58 apart and thereby adjust the clamping mechanism 12 for a box of greater length than it was formerly adjusted to handle. Should the rotation of the shaft 62 be such as to lower the nut 67 this changes the adjustment of the clamping mechanism 12 to adapt the truck 10 to handle a box of a length which is shorter than that for which it was formerly adjusted. Each such adjustment is effected merely by rotation of the shaft 62 and when the desired adjustment is reached it is not necessary to do anything to hold the mechanism 12 in this adjustment as the truck is at once ready to go ahead and handle the box of the length for which the mechanism 12 has just been adjusted.

For any given adjustment of the clamp truck 10, it is operated to perform its function in carrying a stack of boxes by first stepping on the jaw-expanding pedal 75 so as to depress the cross head 72 and swing the upper ends of the levers 59 inwardly as shown in full lines in Fig. 5. This shifts the lower ends of these levers outwardly whereby the pin and slot connection of these levers with the clamp jaws 45 spreads these jaws so that they will go outside a box of the length for which the truck is now adjusted to handle.

The pressing down of the pedal 75 lifts the outer end of the pedal 79 so that when the truck is in position to take hold of a stack as above described, stepping on the pedal 79 lifts the toggle head 72 and operates the toggle links 74 to spread the upper ends of the levers 59 and thereby pull the clamping jaws 45 inwardly into clamping relation with the lowermost box in said stack. As this inward clamping movement is being completed the links 74 pass over dead center and the lugs 74*a* come against the toggle head 72 so that the jaws 45 are locked in clamping position.

The stack of boxes thus engaged may now be lifted by rocking the truck and the stack rearwardly so that the center of gravity of the truck and the load is disposed slightly rearwardly from above the line of contact between the wheels and the floor. The stack may then be set down in the well-known manner by halting the truck and load, placing the foot on the pedal 79, permitting the truck to rock forwardly about the axle 38 until the load again rests on the floor and then depressing the pedal 75 to swing the levers 58 into their full line position shown in Fig. 5 which expands the jaws 45 and releases the stack of boxes permitting the truck to be withdrawn from about these for use elsewhere.

It is to be noted in Fig. 1 that adjusting the fulcrum pins 58 by swinging the rockers 55 raises or lowers these pins. This raises or lowers the levers 59 mounted on these pins. In spite of this change, the locking of the toggle links 74, when a box stack is being clamped between the jaws 45, is always uniformly accomplished due to the lugs 74*a* stopping upward movement of the toggle head 72 just after the links 74 have passed over dead center.

I claim:

1. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; means for adjustably rotating said rockers to adjust the distance between said fulcrums; and means to actuate said clamp jaws by rocking said levers about said fulcrums.

2. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; unitary irreversible screw means for adjustably rotating said rockers to adjust the distance between said fulcrums; and means to actuate said clamp jaws by rocking said levers about said fulcrums.

3. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; a vertical screw journalled on said carriage between said rockers; a nut on said screw for engaging said rockers and rocking the same in opposite directions to adjust the distance between said fulcrums; and means to actuate said clamp jaws by rocking said levers about said fulcrums.

4. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; a vertical screw journalled on said carriage between said rockers; a nut on said screw for engaging said rockers and rocking the same in opposite directions to adjust the distance between said fulcrums; and toggle means connecting to the upper ends of said levers for drawing these towards each other or separating the same to actuate said clamp jaws.

5. A clamp truck for handling boxes differing

in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; a vertical screw journalled on said carriage between said rockers; a nut on said screw for engaging said rockers and rocking the same in opposite directions to adjust the distance between said fulcrums; pin and slot means connecting said nut and said rockers; and means to actuate said clamp jaws by rocking said levers about said fulcrums.

6. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; a vertical screw journalled on said carriage between said rockers; a nut on said screw for engaging said rockers and rocking the same in opposite directions to adjust the distance between said fulcrums; pin and slot means connecting said nut and said rockers; and toggle means connecting to the upper ends of said levers for drawing these towards each other or separating the same to actuate said clamp jaws.

7. A combination as in claim 4 in which said toggle means is pedal actuated and passes over dead center when extended to lock said jaws in box-clamping position.

8. A combination as in claim 1 in which said clamp jaws are horizontally slidable on said carriage; and pin and slot connections between said jaws and the lower ends of said levers.

9. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; an upright shaft disposed centrally with respect to said levers and rockers; means operated through said shaft for rocking said rockers thereby determining the spacing apart of said fulcrums; and toggle means including a head slideable on said shaft and links between said head and said levers to rock said levers about said fulcrums to actuate said clamp jaws.

10. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; a pair of laterally spaced rockers pivoted on said carriage, said levers having laterally spaced fulcrums on said rockers; an upright shaft on said carriage disposed centrally with respect to said levers and said rockers; screw means including a nut threadedly associated with said shaft and connected to said rockers to effect rotation of the latter to adjust the spacing of said fulcrums by rotation of said shaft; and toggle means including a head slideable on said shaft and connected by links to said levers for rocking said levers about said fulcrums to actuate said clamp jaws.

11. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; an upright shaft mounted centrally on said carriage; fulcrum forming members on said carriage, said levers having laterally spaced fulcrums on said members; means actuated by movement of said shaft to shift said members to alter the spacing of said fulcrums and toggle means including a head slidable on said shaft and links connecting said head to said lever for rocking said levers about said fulcrums to actuate said clamp jaws.

12. A clamp truck for handling boxes differing in length which comprises: a wheeled carriage; laterally shiftable clamp jaws for gripping a box; a pair of levers operatively connected at their lower ends to said jaws; an upright shaft mounted centrally on said carriage; fulcrum forming members on said carriage, said levers having laterally spaced fulcrums on said members; threads on said shaft; screw means operated by said thread by rotation of said shaft; means for connecting said screw means to said fulcrum members so that rotation of said shaft adjusts the distance between said fulcrums; and means guided vertically on said shaft and connecting to said levers for rocking said levers about said fulcrums to actuate said clamp jaws.

JOHN C. BROOME.