Oct. 27, 1959 C. L. CAYLOR 2,910,304

ONE MAN REFRIGERANT CYLINDER HANDLING TRUCK

Filed Oct. 11, 1957 2 Sheets-Sheet 1

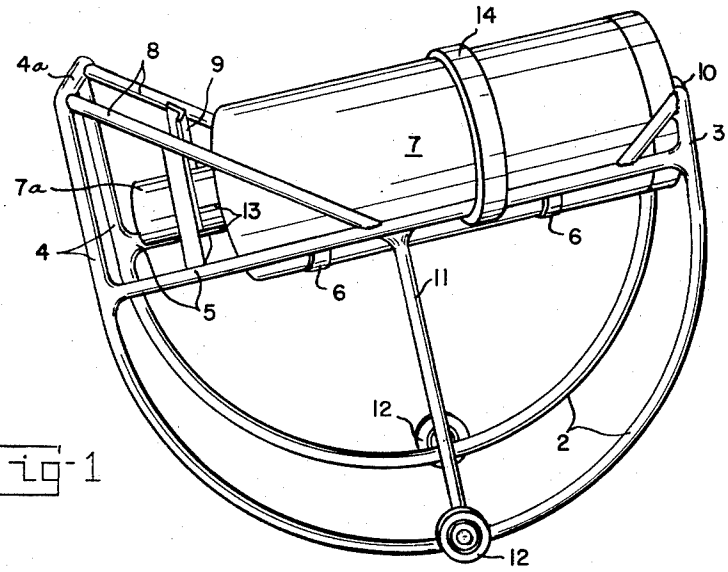


Fig-1

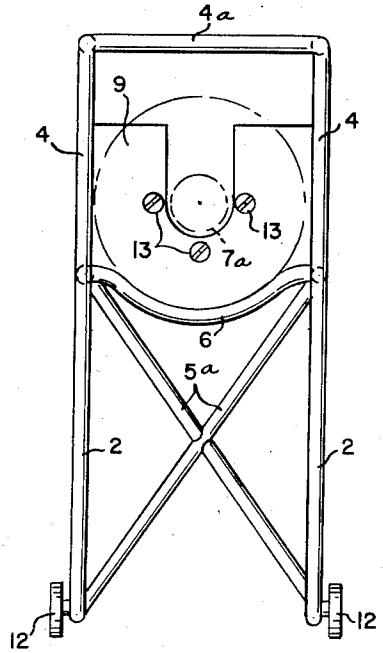


Fig-3

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ONE MAN REFRIGERANT CYLINDER HANDLING TRUCK

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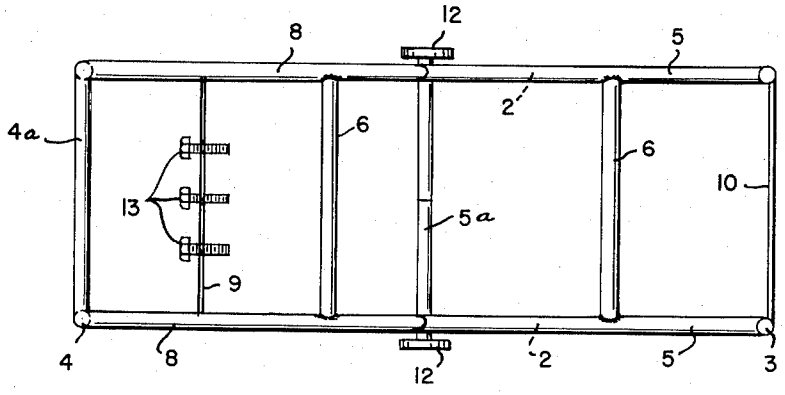


Fig-4

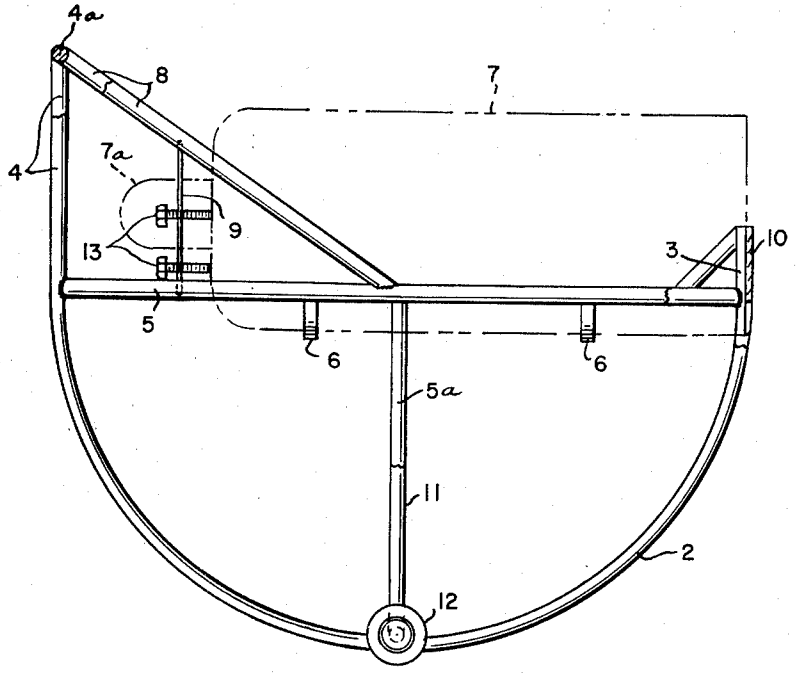


Fig-2

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ONE MAN REFRIGERANT CYLINDER HANDLING TRUCK

Charles L. Caylor, Clayton, Ohio

Application October 11, 1957, Serial No. 689,684

2 Claims. (Cl. 280—47.13)

(Granted under Title 35, U.S. Code (1952), sec. 266)

The invention described herein may be manufactured and used by or for the United States Government for governmental purposes without payment to me of any royalty thereon.

This invention relates to a hand truck for supporting a heavy refrigerant cylinder in any position from right side up to inverted for content discharge and for moving the cylinder easily from place to place, by one man.

An object of the invention is the provision of a cradle frame comprising a pair of semi-circular shaped tubular bars with straight extensions at its outer ends which constitute the support for the cradle to which the cylinder is fastened, in which the cylinder is maintained right side up and in the inverted position by the straight extensions, and can be rocked from one position to the other on the curved base, and is also provided with casters mounted midway on the curved bars and projecting radially beyond the bars to enable the operator to move the cylinder to the point of discharge while in a horizontal position.

A further object is the provision of means whereby the cylinder is substantially balanced on the rockers or cradle while it is in horizontal and inclined positions so as to require a minimum effort to tilt the same while it rests on the rockers.

A further object is the provision of supporting means on one of the extensions arranged to support the base of the cylinder thereon, whereby the cylinder can be tilted and this supporting means inserted under the cylinder without raising the cylinder from the floor or its supporting surface.

A further object includes a supporting plate spaced from and parallel to the extension at the other end having a U-shaped slot for receiving the neck of the refrigerant cylinder when it is resting on the supporting means, and clamping means for engagement of the cylinder below the neck for securing the base of the cylinder on the supporting means.

A further object is the provision of connecting brace means between the rockers which is curved to receive and support the cylinder intermediate the ends of the rockers, and strap means engaging the side of the cylinder to retain the cylinder in said curved brace means.

Other objects and advantages of the invention will become apparent from the following description and accompanying drawings in which like reference characters refer to like parts in the several figures.

Figure 1 is a perspective view of the improved cylinder handling truck showing a refrigerant cylinder or bottle secured thereon and in process of being transported by the truck.

Figure 2 is a side elevation of the truck with the cylinder shown in dotted lines, parts being broken away and shown in section;

Figure 3 is an end view with the refrigerant cylinder removed; and

Figure 4 is a top plan view with the refrigerant bottle omitted.

Referring more particularly to Figures 2 to 4, the invention comprises a pair of curved, substantially semi-circular supporting bars or rails 2 having short parallel extensions 3 at one end and much longer parallel extensions 4 at its opposite end.

The opposite ends of the curved rails 2 are connected by parallel container supporting rails 5, and connected intermediate their ends by parallel curved container supporting straps or bars 6 in which, or on which, the heavy refrigerant supply bottle 7 is cradled.

The longer parallel extensions 4 are braced to the curved rails 5 by diagonal braces 8 connected together by a notched out cross plate 9 having a U-shaped notch 9^a to receive the neck or head 7^a of the bottle 7 and retain it from material axial shifting.

The short extensions 3 are connected by a cross or bottom plate 10, preferably by welding, to receive and support the bottom of the container 7. The length of the plate 10 beyond the end of the circular portion or rocker member 2 is somewhat less than the diameter of the bottom of the cylindrical container 7 so that when the cradle is tilted to dispose the short extension 3 next to the ground the cylinder 7 can be tilted and the plate inserted under the bottom of the cylinder 7 without lifting the heavy cylindrical container 7 off of the ground.

A pair of intermediate parallel braces 11 connect and brace the centers of the supporting rails 5 to the centers of the semi-circular curved rails 2. These rails 5 are cross-braced by brace members 5^a and carry casters or rollers 12 at their lower ends, projecting slightly below the arc of the curved rails 2. The casters 12 are preferably on stub axles projecting laterally from the sides of the rockers 12 as shown more clearly in Figures 3 and 4.

A plurality of jack screw members are threaded through the head plate 9, surrounding the base and sides of the notched out portion 9^a of the head plate 9.

When the container 7 is supported on the curved supporting straps or bars 6, with its bottom in resting engagement with the bottom plate 10 and the neck portion of the container seated in the U-shaped notch 9^a, the jack screw members 13 can be tightened against the top of the container 7 below its neck to seat the container 7 firmly on the bottom plate 10 and prevent any axial or longitudinal movement of the container as the cradle is tilted to incline the head or discharge end of the refrigerant container 7 downwardly, as shown partly so inclined in Figure 1.

In order to secure the refrigerant cylinder in place on the curved supporting straps 6 against lateral displacement a suitable heavy retainer strap 14 is provided which is tightened over the container between the side rails 5.

The refrigerant container 7 is so mounted that its center of gravity is slightly above the top straight rails 5 as shown in Figure 1 so that when the truck or carrier is rocked to dispose the short extension down next to the ground the container will remain in the upright position with one edge of the bottom in engagement with the ground.

Depression of the handle 4^a, which is formed by a bar connecting the outer ends of the longer extensions 4 together, rocks the cradle on the curved supporting rails 2 until the casters 12 engage the ground. Further depression substantially balances the cradle and refrigerator bottle on the casters 12 so that it can be easily moved to its place of dispensing, or returned to storage.

Further depression of the handle 4^a tilts the head of the refrigeration container or bottle 7 downwardly and again

disposes the curved supporting rails 2 on the ground or supporting surface.

The container can be thus tilted easily on the curved supporting rails 2 up to a vertical inverted position where the longer extensions 4 and handle engage the ground. In this position the slight "overbalance" will tend to retain the container in this inverted position, the container 7 being prevented from shifting by the three jack screws 13 with the discharge end of the container 7 spaced from the ground in this inverted position. The end closure 7a can be removed in this or any intermediate position for dispensing the refrigerant content to any desired refrigeration apparatus or location (not shown).

The slightly off center location of the container directly over the centers of the longer parallel extensions 4 permit the container and carrier to stand in this position while the content of the container is being emptied, and the container does not have to be lifted manually in or during any of the above operations. Also the same is fully portable from place to place on the casters 12.

Removal of the container is also convenient and easy. The carrier is rocked to dispose the shorter extensions 3 (and plate 10 on the ground), after which the jack screws are loosened and the strap 14 released. The container can now be tilted slightly to remove the weight thereof off of the plate 10, and the carrier or truck (which is light in weight) can be slid to pull the plate 10 out from under the bottle 7 and the bottle 7 allowed to tilt back on its bottom. As before mentioned a reversal of this process is necessary to again reload the truck with a fresh refrigerant bottle.

Having described my invention what I claim is:

1. A refrigerant bottle supporting and tilting rocker frame for supporting a necked refrigerant bottle completely between the ends of the rocker frame in upright and inverted positions comprising, a pair of semicircular rockers disposed in spaced side by side parallel relation, a pair of straight parallel extensions projecting from the rockers at one of the ends thereof tangent to the rockers at said ends, a refrigerant bottle supporting plate extending between said extensions from said ends of the rockers having a width less than half the diameter of the bottom of the necked refrigerant bottle to be supported, a second pair of straight parallel rocker supporting extensions projecting from the opposite ends of the semicircular rockers tangent to the rockers at said opposite ends, a handle bar connecting the outer end of said second pair of parallel rocker supporting extensions together, a pair of parallel brace bars connecting the opposite ends of the semicircular rockers together, curved refrigerant bottle supporting bars connecting said parallel brace bars together at spaced points intermediate the opposite ends of the rockers, a pair of inclined spaced parallel brace bars connecting the outer ends of said second pair of parallel extensions to said parallel brace bars at substantially mid points in the lengths of said parallel brace bars, a bottle retainer plate fixed to said parallel brace bars and said inclined brace bars intermediate the ends of the inclined brace bars and parallel to said rocker extensions, said bottle retainer plate having a bottle neck receiving opening formed therein opening outwardly away from said rockers to receive only the neck of the refrigerant bottle when the same is disposed with its bottom in contact with said bottle supporting plate, and means carried by said retainer plate for impinging engagement with the neck of the refrigerant bottle for fixing the bottle on said rocker frame with its bottom in firm contact with said supporting plate when said rocker frame is tilted to invert the refrigerant bottle.

2. A refrigerant bottle supporting and tilting rocker frame for supporting a necked refrigerant bottle completely between the ends of the rocker frame in upright and inverted positions comprising, a pair of semicircular rockers disposed in spaced side by side parallel relation, a pair of straight parallel extensions projecting from the rockers at one of the ends thereof tangent to the rockers at said ends, a refrigerant bottle supporting plate extending between said extensions from said ends of the rockers having a width less than half the diameter of the bottom of the necked refrigerant bottle to be supported, a second pair of straight parallel rocker supporting extensions projecting from the opposite ends of the semicircular rockers tangent to the rockers at said opposite ends, a handle bar connecting the outer end of said second pair of parallel rocker supporting extensions together, a pair of parallel brace bars connecting the opposite ends of the semicircular rockers together, curved refrigerant bottle supporting bars connecting said parallel brace bars together at spaced points intermediate the opposite ends of the rockers, a pair of inclined spaced parallel brace bars connecting the outer ends of said second pair of parallel extensions to said parallel brace bars at substantially mid points in the lengths of said parallel brace bars, a pair of spaced parallel rollers journalled on said rockers substantially midway between the ends thereof with the peripheries thereof projecting radially beyond the outer radius of curvature of said rockers to support the rockers thereon when said rockers are positioned to dispose said rollers in contact with a supporting surface, a bottle retainer plate fixed to said parallel brace bars and said inclined brace bars intermediate the ends of the inclined brace bars and parallel to said rocker extensions, said bottle retainer plate having a bottle neck receiving opening formed therein opening outwardly away from said rockers to receive only the neck of the refrigerant bottle when the same is disposed with its bottom in contact with said bottle supporting plate, and means carried by said retainer plate for impinging engagement with the neck of the refrigerant bottle for fixing the bottle on said rocker frame with its bottom in firm contact with said supporting plate when said rocker frame is tilted to invert the refrigerant bottle.

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