

April 30, 1946.

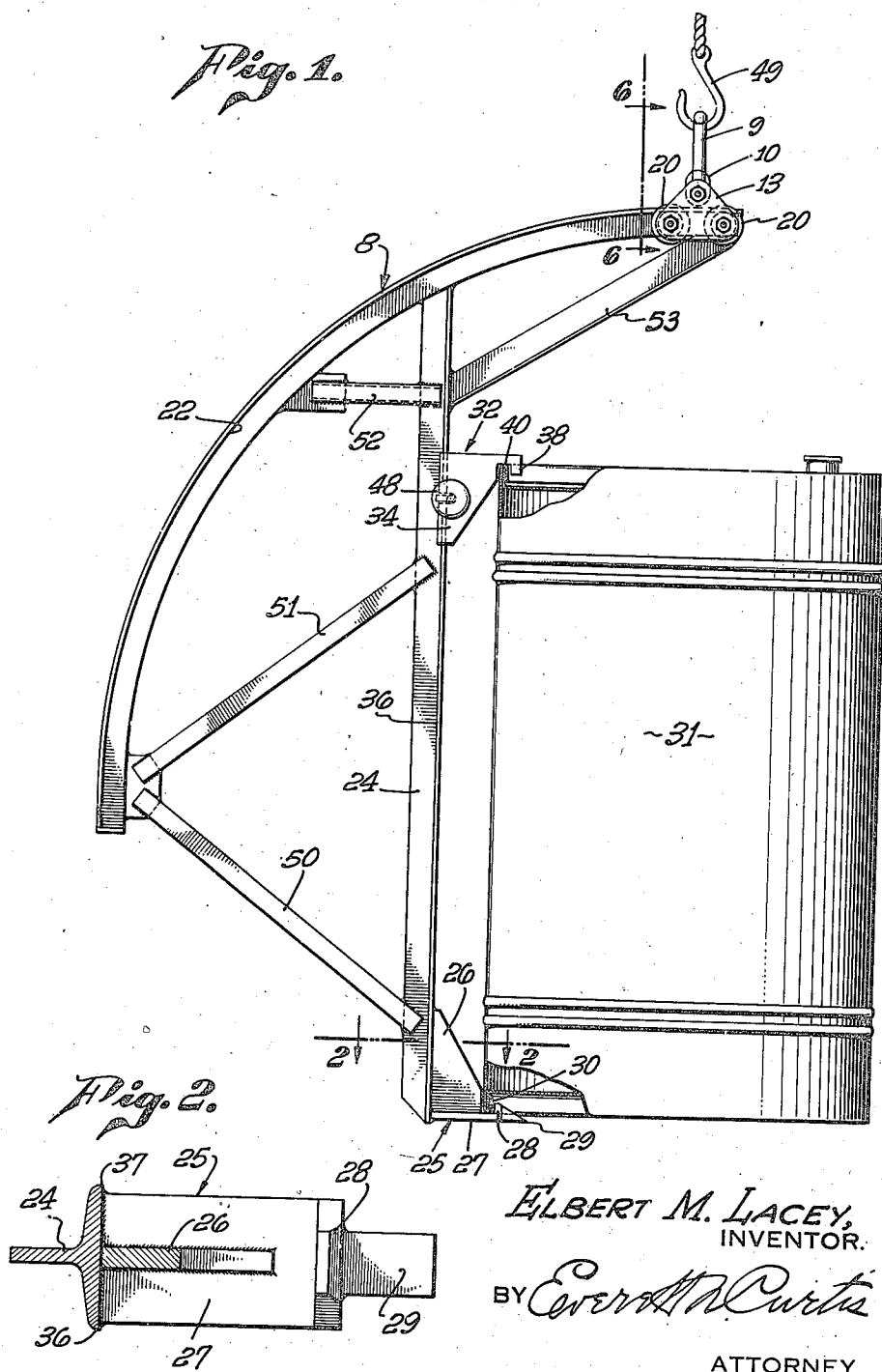
E. M. LACEY

2,399,360

DRUM TILTING ARC

Filed Dec. 27, 1944

3 Sheets-Sheet 1



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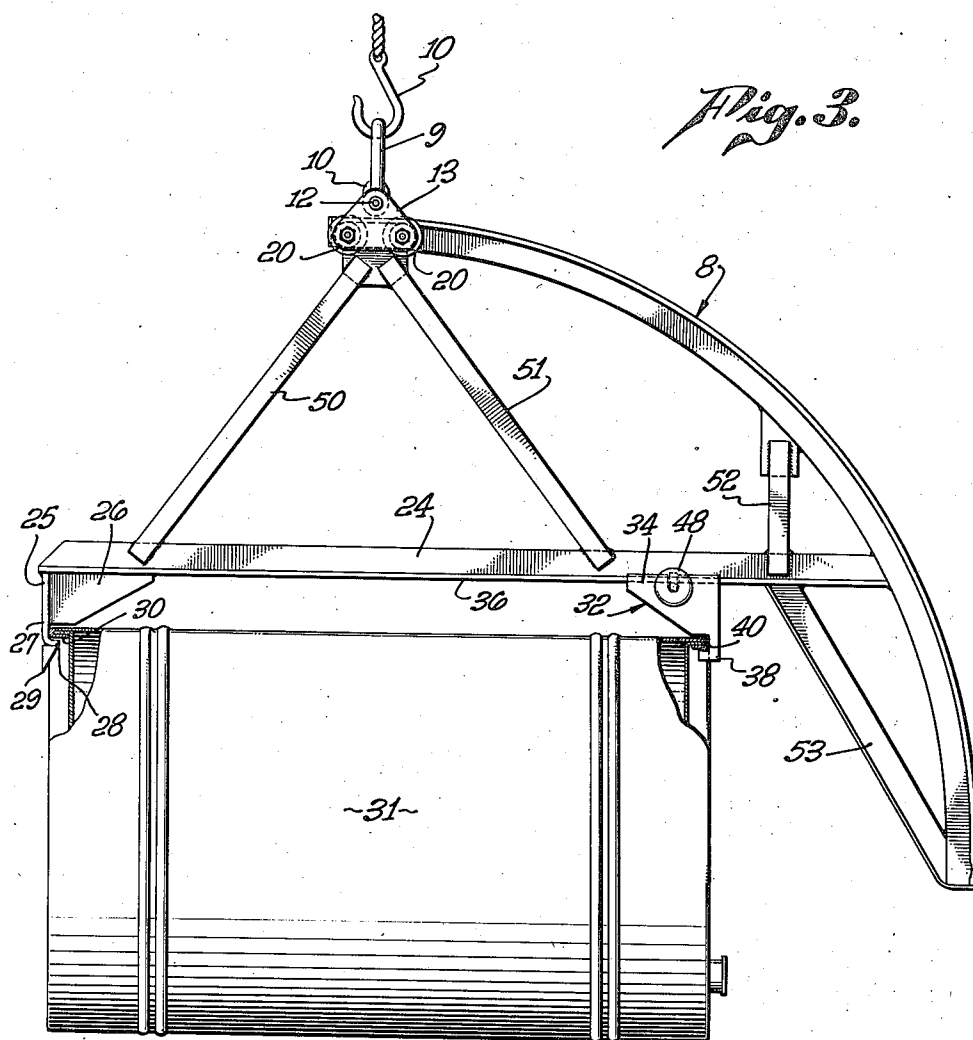
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3 Sheets-Sheet 2



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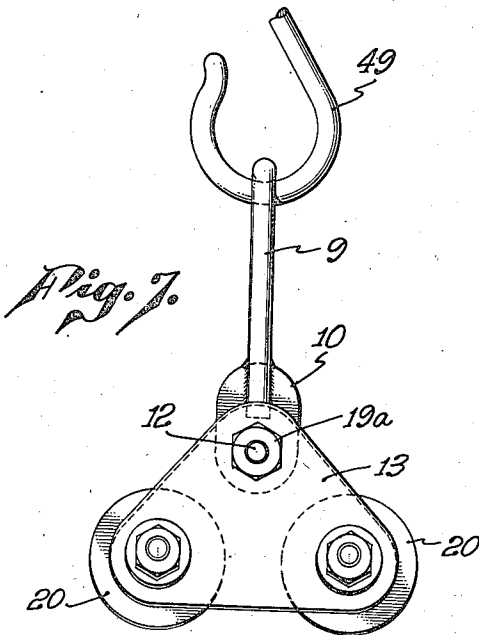
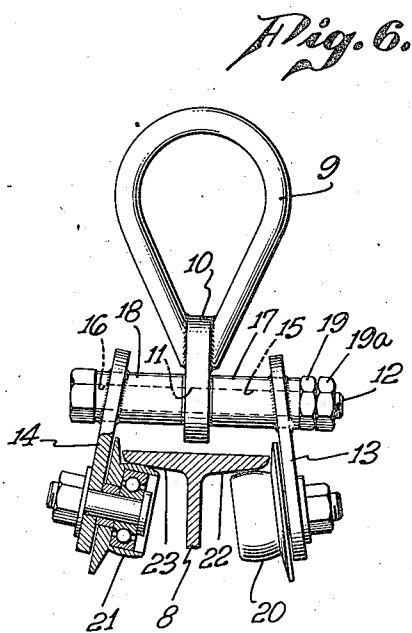
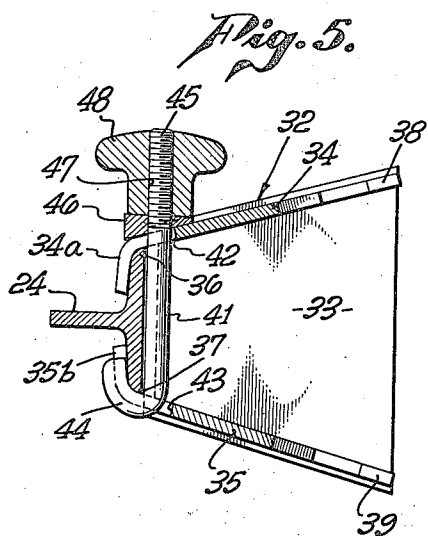
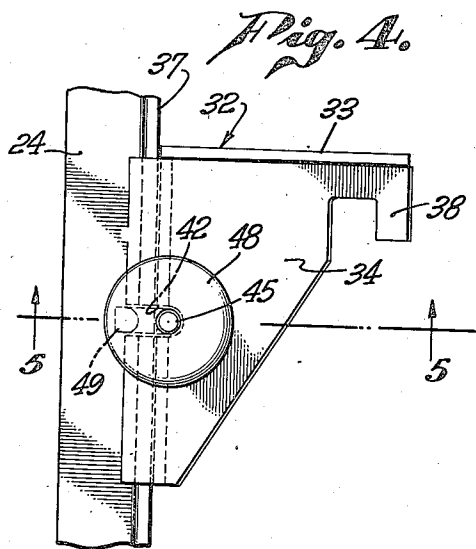
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DRUM TILTING ARC

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3 Sheets-Sheet 3



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UNITED STATES PATENT OFFICE

2,399,360

DRUM TILTING ARC

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Application December 27, 1944, Serial No. 570,019

6 Claims. (Cl. 294—78)

My invention relates to drum tilting arcs, particularly those employed for movably supporting large and unwieldy drums and fluid containers or other heavy receptacles; and its objects are, to balance such receptacles so that whatever their proportionate amount of solid, powdered or fluid content, they may readily be manually turned and moved into any desired position for filling or discharge of their contents or other purpose; to provide a more efficient means for the easy attachment, detachment and steadying of such receptacles upon said arc, including a three-point suspension from the rail thereof; to furnish a more rapid and satisfactory sling for picking up, transporting and piling or unpling said loads; and to guard against the possibility of personal injuries to the operator or neighboring employees in the operation of said arc, while insuring more efficiency and saving of time in the handling of said containers than has heretofore been accomplished. These and various other objects and advantages will become apparent as shown in the drawings and as hereinafter set forth and described.

While tilting arcs used for supporting and handling bulky and heavy objects, the center of gravity of which is made to conform with the radius point of the rail of such arc, are old in the art, I believe that my invention is the first means anywhere employed for utilizing, modifying, adapting and changing such arcs for a three-point suspension against dislodgment of heavy drums or receptacles of varying size and content. Such containers as now used in manufacturing plants are generally in the form of large and unwieldy metallic cylinders with or without heavy flanges at either end; and they are in the usual form provided for the reception and handling in quantity of a great variety of materials, including solids, powders, and fluids such as oil, gasoline, chemicals, paint and other liquids, the standard size of drum being of capacities up to about fifty-five liquid gallons, and the larger drums weighing up to seven hundred and fifty pounds when filled. Through careful experimentation, I have discovered that any two-point suspension of any of such receptacles through a single point attachment applied to each end thereof is dangerous and unsatisfactory, in that such support is unstable and unsteady and likely to slide or slip off said receptacle, even where extreme care is exercised; and that in order to secure stable suspension it is necessary to employ three or more cooperating point attachments (preferably

locked) to said receptacle, that is, at least a single point attachment for one end and two separated locking point attachments for the opposite end thereof, so that the tendency of the receptacle to rock or slip out of position, which tendency is always present with two-point suspension, is completely eliminated. Also it is necessary to devise and construct for the adequate and proper operation of such attachments a boom and supporting framework therefor firmly secured to the rail of the arc. Such rearrangements, changes and modifications of the old tilting arc constructions are necessary in adapting the same to drum tilting arcs; for while the center of gravity of a standard size drum when filled with fluid as well as when completely empty may be made practically to coincide with the radius point of the rail, yet where different sized drums are used or where the fluid contents of the drum is depleted, this coincidence of center of gravity with said radius point is difficult to maintain or secure and only an approximation of the same can be brought about, and there is always present the tendency of the drum by reason of the displacement of the fluid therein contained, to rock and to break away from its attachments when moved upon the tilting arc. This tendency is compensated for and avoided through the use of my improved and perfected steadying means herein-
after more specifically described and set forth.

Attention is hereby directed to the accompanying drawings illustrating a preferred form of my invention in which similar numerals of designation refer to similar parts throughout the several views, and in which,

Figure 1 is a side elevation of my improved drum tilting arc, showing generally the means of suspending and locking the drum in upright position with the bung at the top, some of the parts being broken away for the purpose of better illustration;

Fig. 2 is an enlarged section on line 2—2 of Figure 1, looking in the direction of the arrows, of the single point attachment bracket and its connection with the lower or outer end of the supporting frame affixed to the rail of the tilting arc;

Fig. 3 is a side elevation of my drum tilting arc, showing the drum suspended in horizontal position, the parts otherwise being in the same relation as shown in Fig. 1;

Fig. 4 is an enlarged side elevation of the sliding two-point attachment bracket, showing its adjustable connection with that part of the supporting frame adjacent to the end of the drum

opposite to that supported by the bracket shown in Fig. 2;

Fig. 5 is a section of the two-point attachment bracket on line 5—5 of Fig. 4, looking in the direction of the arrows;

Fig. 6 is an enlarged end elevation of the trolley lifting eye, side plates, trolley wheels and adjacent parts, showing the manner of attachment to the boom or T-beam rail, and

Fig. 7 is a side elevation of the construction shown in Fig. 6, together with its hook connection to the lifting hoist.

Referring to the drawings, the arcuate rail 8 is the supporting member of my improved drum lifting arc, and is preferably of metal in the form of a conventional T-beam, but may be of any material and in any form suitable for the purpose. Located above the rail 8 and forming the main support thereof is the lifting eye 9, shaped to engage with the hook 49 of a conventional shiftable hoist, so that the same may be transferred to suitable locations about a plant as occasion requires. Affixed to said eye 9 is the tongue 10 having an opening 11 therein through which extends the shank of the bolt 12, and serves to connect the said tongue thereto. (See Fig. 6.) Also mounted upon the shank of said bolt are the trolley plates 13 and 14, the said bolt passing through openings 15 and 16 in hubs 17 and 18 thereof; all of these parts being preferably of metal and being firmly secured in position upon the tightening of the nuts 19 and 19a engaging with the threaded end of bolt 12. Pivotaly mounted upon the plates 13 and 14, and extending inwardly from the walls thereof, are the trolley wheels 20 and 21, which are shaped to engage with the channels 22 and 23 respectively, of the T-beam arcuate rail 8, and to travel therein.

Firmly welded or secured at one end to the under part of the rail 8, and having the other end extending outwardly therefrom, is the metal boom 24, (preferably in the form of an inverted T-beam), firmly secured in position by metal supports 50 and 51 and metal braces 52 and 53, the inner ends of which supports and braces are welded or otherwise secured to the rail 8, and whose outer ends are welded or otherwise secured to the boom 24. Downwardly depending from the outer end of the boom 24, and preferably welded thereto is the bracket 25, having the gusset 26 and integral therewith the foot plate 27; the bottom of said plate being turned inwardly to form the catch 28, which for greater strength is provided with the wedge shaped reinforcement 29, and which is formed to make a single contact engagement with the adjacent rim 30 of the drum 31.

Slidably mounted upon the boom 24 is the two-point attachment bracket 32, constructed with a back 33 and clevis plates 34 and 35, similarly formed and having their upper ends 34a and 35b turned inwardly to straddle and shaped to make sliding contact with the edges 36 and 37 of the boom 24, and their outer ends provided with the catches 38 and 39 shaped to make a double contact engagement with the rim 40 of the drum 31. In order that the bracket 32 and the catches 38 and 39 may be securely locked in position once their contact is made with said rim, I preferably provide the clevis plates 34 and 35 with the clamp 41, the shank of which passes through openings 42 and 43 in said plates; one end of said shank being bent to form a hook 44 engaging with the edge 37 of the boom 24, and

the other end 45 of said shank passing through the wedge shaped washer 46 and being threaded to make engagement with the threaded opening 47 provided therefor in the adjusting knob 48. (See Figs. 4 and 5.)

As will be observed from Figs. 1 and 3 of the drawings, practically any ordinary size of drum can be supported and handled by my improved tilting arc, simply by sliding and adjusting the two point or double contact attachment bracket 32 upon the boom 24 to accommodate the length of the drum. Preferably, the drum being upon the floor or ground beneath the arc, I lower the hoist thereof so that the boom 24 is parallel to and is in more convenient handling position in respect to said drum. Then, I first make attachment of the single catch of the outer bracket 25 to one of the rims of the drum, and thereupon slide the bracket 32 upon the boom 24 toward the other rim of said drum and make firm attachment thereto of the double contacts of said bracket 32, and lock the same in position by means of the clamp 41. Thereupon the hoist may be lifted carrying with it said arc and drum to the desired position; and so firm will be found the three-point or three contact anchorage of the drum to the arc, that the drum may be tilted to any desired position and handled even by an inexperienced operator without danger of its breaking away.

While I have shown, in this my preferred form of construction, attachment means limited to a three-point or three emplacement contact anchorage, it is obvious that other multiple point suspension of the same general character and exceeding such triplicate means might be employed without departing from the spirit and scope of my invention.

Wherein the claims I refer to a "drum," I desire by the use of such word to be understood as meaning to include any form of cylindrical or prismatic receptacle or container, or any mass of material of similar form, to which crane attachment may be made for the suspension and handling of the same.

My invention may be embodied in other forms or carried out in other ways without departing from the spirit or essential characteristics thereof. The present embodiment of my invention as hereinbefore set forth is therefore to be considered as in all respects as illustrative and not restrictive, the scope of my invention being indicated by the appended claims, and all changes which come within the meaning and range of equivalency of the claims are intended to be embraced therein.

What I claim and desire to secure by Letters Patent is:

1. In drum tilting arc apparatus, the combination of an arcuate rail, a trolley lifting carrier running upon said rail and operating to support the same, a boom protruding from within the curve of said rail and having its inner end firmly secured thereto and braced thereon, and multiple contact means for detachably suspending a drum by both of its ends from said boom.

2. In drum tilting arc apparatus, the combination of an arcuate rail, a trolley lifting carrier running upon said rail and operating to support the same, a boom protruding from within the curve of said rail and having its inner end firmly secured thereto and braced thereon, and adjustable three-point suspension means for making detachable connection of said boom with the flanges at both ends of a flanged drum.

3. In drum tilting arc apparatus, the combination of an arcuate rail, a trolley lifting carrier running upon said rail and operating to support the same, a boom protruding from said rail and firmly secured thereto and braced thereon, suspension means for making detachable connection of one part of said boom with the flange at one end of a flanged drum and slidable suspension means for making detachable connection of another part of said boom with the flange at the other end of said drum.

4. In drum tilting arc apparatus, the combination of an arcuate rail, a trolley lifting carrier running upon said rail and operating to support the same, a boom protruding from said rail and having its inner end firmly secured thereto and braced thereon, suspension means for making detachable connection of the outer end of said boom with the flange at one end of a flanged drum, and slidable suspension means cooperating therewith for making detachable locking contact of said boom with the flange at the other end of said drum.

5. In drum tilting arc apparatus, the combination of an arcuate rail, a trolley lifting carrier running upon said rail and operating to

support the same, a boom protruding from said rail and having its inner end firmly secured thereto, a bracket firmly affixed to the outer end of said boom and constructed to make detachable connection with the flange at one end of a flanged drum, and a bracket slidably mounted upon said boom and constructed to make plural detachable locking contacts with the flange at the other end of said drum.

6. In drum tilting arc apparatus, the combination of an arcuate rail, a trolley lifting carrier running upon said rail and operating to support the same, a boom protruding from said rail and having its inner end firmly secured thereto, a bracket immovably affixed to the outer end of said boom and constructed to make a detachable single point connection with the flange at one end of a flanged drum, a bracket slidably mounted upon said boom and constructed to make detachable double point connection with the flange at the other end of said drum, and means for locking said slidable bracket in position after its said double point connection has been effected.

ELBERT M. LACEY.