

Aug. 6, 1963

E. C. SCHMIDT
TILTING ARC DEVICE

3,100,123

Filed May 31, 1961

3 Sheets-Sheet 1

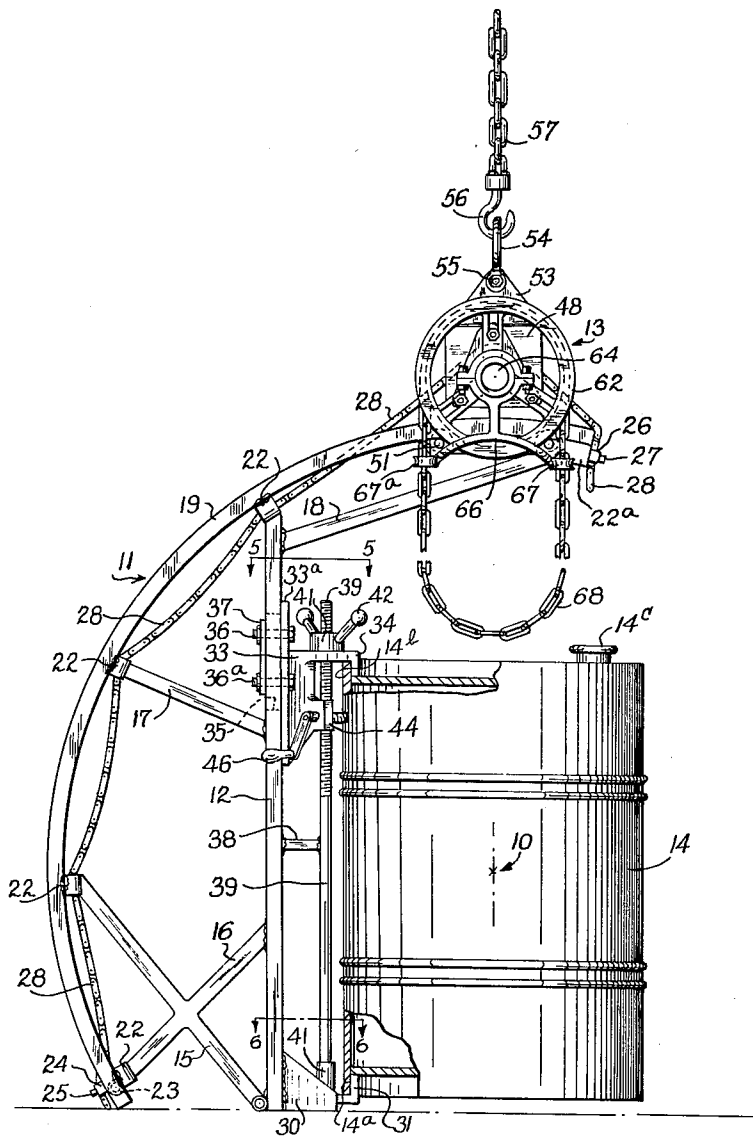


FIG. 1

INVENTOR.
EDWARD C. SCHMIDT
BY *W. swelling, Trust,*
Swanson and Trust.
ATTORNEYS

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3 Sheets-Sheet 2

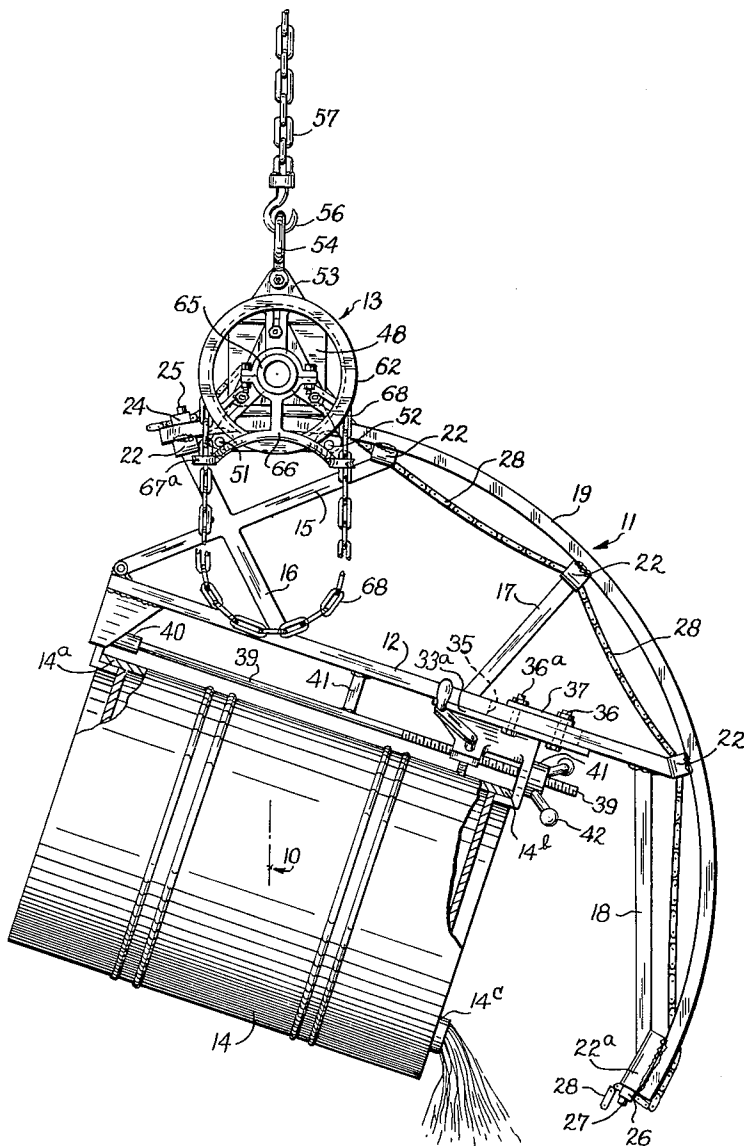


FIG. 2

INVENTOR.
EDWARD C. SCHMIDT
BY *Worthington, Trust,*
Swanger and Rust.
ATTORNEYS

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3 Sheets-Sheet 3

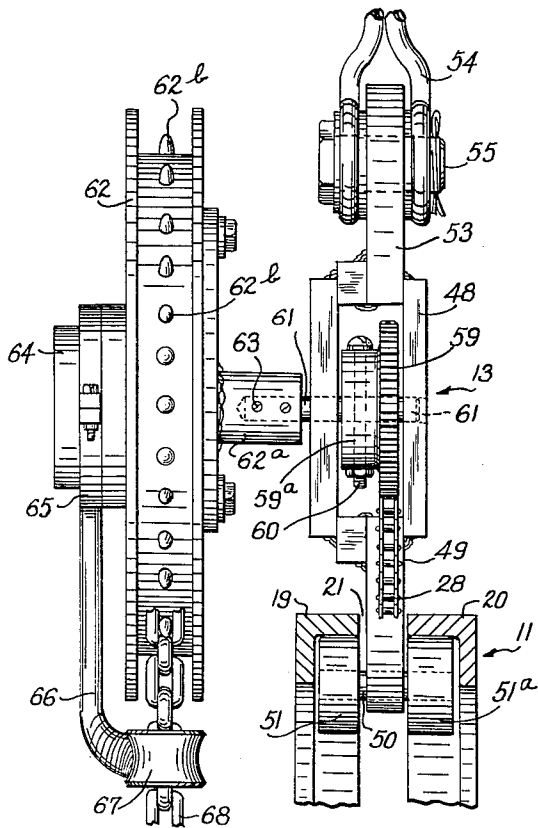


FIG. 3

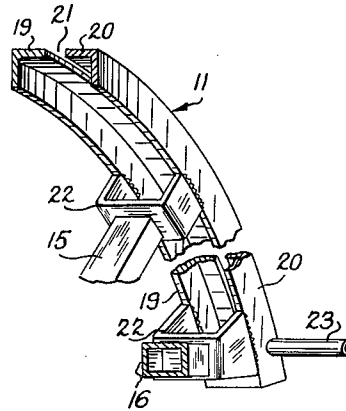


FIG. 4

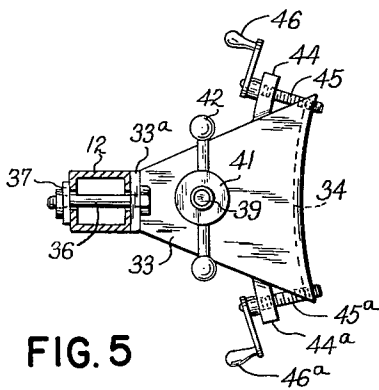


FIG. 5

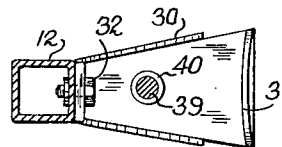


FIG. 6

INVENTOR,

EDWARD C. SCHMIDT
BY *Woodling, Krost,*
Branger and Krost.

ATTORNEYS

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3,100,123

TILTING ARC DEVICE

Edward C. Schmidt, Cleveland, Ohio, assignor to

Edward L. Pucel

Filed May 31, 1961, Ser. No. 113,730

1 Claim. (Cl. 294-103)

My invention relates to tilting arc devices used for supporting and tilting containers such as drums, boxes, and other receptacles. My invention is of the class described in United States Patent No. 2,399,360.

An object of my invention is to provide an improved tilting device efficient in operation and safe in use.

Another object is to provide a novel structure and arrangement of parts in a tilting device which produces a unique and important result.

Another object is to provide a useful actuating mechanism for a tilting device and load carried thereby with a minimum of effort and a maximum of safety.

Other objects, and a fuller understanding of my invention, may be had by referring to the following description and claim taken in conjunction with the accompanying drawings, in which:

FIGURE 1 is a side view in elevation of the improved form of my invention, and showing a drum clamped thereto in an upright position;

FIGURE 2 is a view somewhat similar to that of FIGURE 1 and showing my device and the drum carried thereby in a tilted or a discharging position.

FIGURE 3 is an enlarged view showing the detail of the trolley and actuating mechanism incorporated in my device;

FIGURE 4 is an enlarged view partially in section of the arcuate rail incorporated in my device;

FIGURE 5 is an enlarged detailed view looking in the direction of the arrows 5-5 of FIGURE 1; and

FIGURE 6 is an enlarged detailed view of my device looking in the direction of arrows 6-6 of FIGURE 1.

With reference to the several views of the drawings, my device has an arcuate rail 11 made up of rail portions 19 and 20 disposed close to each other, but with a space 21 therebetween. The rail portions 19 and 20 making up the arcuate rail 11 are in the form of an arc or segment of a circle generated around a center indicated by reference character 10 in FIGURE 1.

The two parallel rail portions 19 and 20 are joined at spaced intervals by the U-shaped members 22. At the one end of the rail 11, the U-shaped member joining the portions 19 and 20 is somewhat longer and has been denoted by reference character 22a.

A boom member 12 is disposed radially inward of the curve of the rail 11 and in a plane transversing the curve of the rail as illustrated in the drawings. The boom member 12 is connected at its upper end to a U-shaped member 22 at that point and is supported and braced in rigid position relative to the rail 11 by means of brace members 15, 16, 17, and 18, which in turn are connected at their outer ends to U-shaped members 22 and the U-shaped member 22a at the upper end of the rail 11.

To provide ready means for grasping the rail 11, there is provided a handle 23 which extends outwardly from the portion 20 near the bottom thereof. Secured to the rail 11 adjacent to the bottom end, as seen in FIGURE 1 is an anchor piece 24 and threadably secured to the

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anchor piece 24 is an anchor bolt 25. Secured to the opposite end of the rail 11, that is near its upper end, seen in FIGURE 1, is an anchor piece 26 and secured to the anchor piece 26 is an anchor bolt 27.

My device, in its preferred form, includes a sprocket-chain 28, which has a plurality of links formed thereon with rollers mounted on the cross pieces. Such a sprocket chain is commonly referred to as a bicycle chain and is so adapted to be enmeshed with the teeth of a sprocket wheel or gear. One end of the sprocket chain 28, that is the lowermost end shown in FIGURE 1, is firmly secured to the anchor piece 24 by means of the anchor bolt 25. The opposite end of the sprocket chain 28, that is the end near the upper end of the arc 11 shown in FIGURE 1, is firmly secured to the anchor piece 26 by means of the anchor bolt 27. The sprocket chain 28 is generally of the same length as the rail 11 along its length around the curve thereto. As the anchor sprocket chain 28 is secured only at its opposite ends to rail 11 it rests upon the three U-shaped members 22 intermediate of the ends of the rail 11. Thus, as seen in the drawings the weight of the chain 28 tends to make it disposed in a series of chords to the arc of the rail 11 between its points of support thereon.

A drum or container 14 which it is desired to raise and tilt for dumping the contents thereof is secured to my device by means of a clamping mechanism attached to the member 12.

Secured to the bottom end of the boom member 12, in its position shown in FIGURE 1, is a bottom piece 30. Standing up from the bottom piece 30 is an arcuate portion 31 which fits within the chime 14a of the drum 14 at the lower end thereof. The fit of the portion 31 with the chime 14a is such as to firmly hold the drum 14 against lateral displacement relative to the boom member 12. The bottom piece 30 is secured to the boom member 12, which is square in cross section, by a bolt-and-nut assembly 32 whereby the bottom piece 30 is securely anchored in position. The detail of the construction of the bottom piece 30 is illustrated in FIGURE 6.

A rod 39 is secured by a mounting 40 to the bottom piece 30 in such a manner that the rod 39 extends upwardly therefrom. The upper portion of the rod 39 is threaded. Aligned with the bottom piece 30, at an elevation above the same, is a top piece 33. The top piece 33 has an upright portion 33a which butts against and slidably engages the boom member 12. The boom member 12 has a longitudinal slot 35 extending therealong and bolts 36 and 36a extend through the portion 33a and through the elongated slot 35. The two bolts 36 and 36a are spaced apart longitudinally of the portion 33a and both are slidably mounted within the slot 35 to move within limits therein. A plate 37 is secured by nuts on the ends of the respective bolts 36 and 36a in such manner that the plate 37 slides upwardly and downwardly along the boom member 12 with the bolts 36 and 36a and hence with the top member 33 secured to the bolts 36 and 36a.

The inner edge portion 34 of the top piece 33 is in arcuate form and extends downwardly to fit within the chime 14b. At the upper end of the drum 14, the top piece 33 is moved downwardly to the position illustrated in FIGURE 1, for example, with the portion 34 disposed adjacent the inner surface of the chime 14b so as to hold

the drum 14 against lateral movement relative to the boom member 12. A cross brace piece 38 secured to the boom member 12 and the rod 39 provides means for maintaining the rod 39 upright and parallel to the boom member 12.

A threaded member 41 is threadably secured to the threaded upper end of the rod 39 in such manner that rotation of the member 41 moves the member 41 along the rod 39. Extending in wing-like fashion from the thread member 41 are handles 42 provided for ready turning of the threaded member 41. It is seen that the top piece 33 is slidable upwardly and downwardly along the boom member 12 relative to the bottom piece 30. Upon raising the top piece 33 so as to insert the portion 34 inwardly of the drum 14 adjacent to the chime 14b and the portion 31 adjacent the chime 14a as illustrated in FIGURE 1, the drum 14 is confined between parts 30 and 33 and held against displacement. By turning the threaded member 41 downwardly to the position shown in FIGURE 1 then the top piece 33 is held against sliding upwardly and the drum is firmly locked in position.

Extending outwardly from the top piece 33 and in the same arcuate shape as the portion 34 are side extensions 44. Threadably engaged in each side extension 44 is a bolt 45 having a crank handle 46 at its end remote from the drum 14. By turning the handles 46, the bolts 45 may be turned against the side of the drum 14 and thus to firmly clamp the drum 14 in position, that is to hold the chime 14b against the portion 34.

The structure of the trolley carrier 13 is better illustrated in FIGURE 3. The carrier 13 includes a block portion 48 made up of spaced plates welded to filler blocks and portions 49 and 53. The tongue portion 49 welded to the block 48 extends downwardly to within the space 21 between the rail portions 19 and 20. As seen in the drawings, there are two pairs of trolley rollers carried by the tongue 49 by means of shafts 50 extending through the tongue 49 at spaced locations. One pair of trolley rollers 51 and 51a is on one shaft 50 and another pair of trolley rollers 52 and 52a is mounted on another shaft 50 carried by the tongue 49. The two pairs of rollers engage the under surface of the rail portions 19 and 20 and are confined between the downwardly extending flanges thereto. The rollers are rotatably mounted on the respective shafts so that the rollers give rolling support to the rail 11. In other words, the arcuate rail 11 may move along the arc or curve of its formation while supported on the two pairs of rollers which in turn are carried by the trolley carrier.

The portion 53 welded to block 48 extends upwardly therefrom and an eye 54 is secured to the upwardly extending portion 53 by means of a bolt 55. As seen in FIGURES 1 and 2, the eye or shackle 54 is hung on a hook 56 which in turn is secured to a chain 57. Chain 57 is suspended from a hoist (not shown). Thus the trolley carrier 13 is hung in a vertical reference line from a hoist or other suitable support.

A sprocket wheel or toothed gear 59 is journaled on the block 48, by means of a shaft 61 extending through aligned openings in the block 48. The sprocket wheel 59 is held by a nut-and-bolt assembly 60 extending through the hub portion 59a of the sprocket wheel and through the shaft 61 so as to provide non-rotative engagement of the sprocket wheel 59 and the shaft 61.

An actuating wheel 62 of the toothed variety is secured on and in alignment with the shaft 61 by means of set screws 63 interengaging the hub portion 62a of the wheel 62 and the shaft 61. The actuating wheel 62 has a plurality of equidistantly spaced teeth 62b extending around its peripheral circumference and protruding radially therefrom. The teeth 62b interengage with links of an endless chain 68 in such manner that pulling on the chain 68 on one side rotates the wheel 62 in one direction, and upon pulling the chain 68 on the other side, operates the wheel 62 in the opposite direction.

A stub shaft 64 carried by the wheel 62 extends axially therefrom opposite from the hub portion 62a, journaled upon the stub shaft 64 is a collar 65 and extending downwardly from the collar 65 is a bifurcated arm 66. The ends of the two lower portions of the arm 66 carry ring guides 67 and 67a in such manner that the chain 68 is slidably guided within the respective guides 67 and 67a. The arm 66 on the collar 65 by weight of gravity is free to swing relative to the stub shaft 64 in such manner that one of the guides 67 or 67a guides the chain on that side of which is pulled by the operator to rotate the wheel 62.

By means of the construction illustrated and described, it is seen that with a drum 14 in upstanding position the tilting device may be readily secured thereto by clamping the drum 14 between the parts 30 and 33. Thereafter by operating the hoist to which the chain 57 is connected, the tilting device with drum secured thereto may be raised to an elevated position above the floor or ground surface. As the chain 68 is relatively long, the lower end thereof is preferably within the reach of the operator standing on the floor or ground surface. After the tilting device and drum secured thereof is raised and moved by the hoist to the position where it is desired to dump or discharge the contents of the drum 14, the chain 68 is pulled on one side, that is on the right side illustrated in FIGURE 1 so as to rotate the wheel 62. The rotation of the wheel 62 in turn rotates the sprocket wheel 59 which by reason of its enmeshment with the sprocket chain 28 moves the rail 11 along its arcuate length relative to the suspended trolley so that the trolley by pulling upon the chain 28 moves along the rail 11 to the position illustrated in FIGURE 2. Here the trolley is located at the opposite end of the rail 11 and the drum secured to the tilting device is tilted to an angle so as to discharge the contents of the drum 14 through the opening 14c of the drum. As the exact amount of the tilting desired may be readily attained by manipulating the chain 68, the desired degree of dumping or discharging of the contents of the drum 14 may be readily obtained. When it is desired to tilt the drum 14 back toward its original upright position, then the other side of the chain, that is the chain on the lefthand side in FIGURE 2, may be pulled so as to rotate the wheel 62 in the opposite direction. Continued rotation of the wheel 62 causes the sprocket wheel 59 enmeshed with the chain 28 to pull the rail 11 along relative to the trolley and hence ultimately back to the relative position of the parts illustrated in FIGURE 1.

It is seen from the foregoing that a convenient and safe means is provided for raising a container such as a drum, for transporting the same to a desired location and for safely tilting the container at any required angle for a pouring or discharging of the contents from the container.

The present disclosure includes that contained in the appended claims, as well as that of the foregoing description.

Although this invention has been described in its preferred form with a certain degree of particularity, it is understood that the present disclosure of the preferred form has been made only by way of example and that numerous changes in the details of construction and the combination and arrangement of parts may be resorted to without departing from the spirit and scope of the invention as hereinafter claimed.

What is claimed is:

A tilting arc device comprising an arcuate rail, holding means carried by the arcuate rail for holding a container within the curve of the rail at an angle to the vertical in accordance with the tilt of the rail relative to the vertical, said rail having spaced arcuate portions and interconnecting portions connecting said arcuate portions at intervals therealong and radially inward of the curve of

the arcuate rail, a trolley carrier movable along the arcuate rail and operable to support the same upon suspension of the carrier in a vertical reference line, said carrier having rollers rollingly engaging and supporting the said arcuate portions radially inwardly thereof for providing rolling support thereof, the carrier having a block portion disposed radially outward of the arcuate rail and tongue portions extending therefrom between said arcuate portions of the rail and connected to said rollers for supporting the same, a sprocket wheel journaled on said block portion of the carrier, a sprocket-chain having its ends anchored adjacent the opposite ends of said rail and enmeshed with said sprocket wheel, said chain being disposed to extend between said spaced arcuate portions and limited in radial inward movement by said interconnecting portions, and a rotative member carried by said block portions and operatively engaging said sprocket

wheel for rotating said sprocket wheel in selected alternate directions, the rotation of the sprocket wheel pulling on said chain to tilt the arcuate rail and a container held by the holding means relative to the vertical in accordance with the direction of rotation of the sprocket wheel.

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