

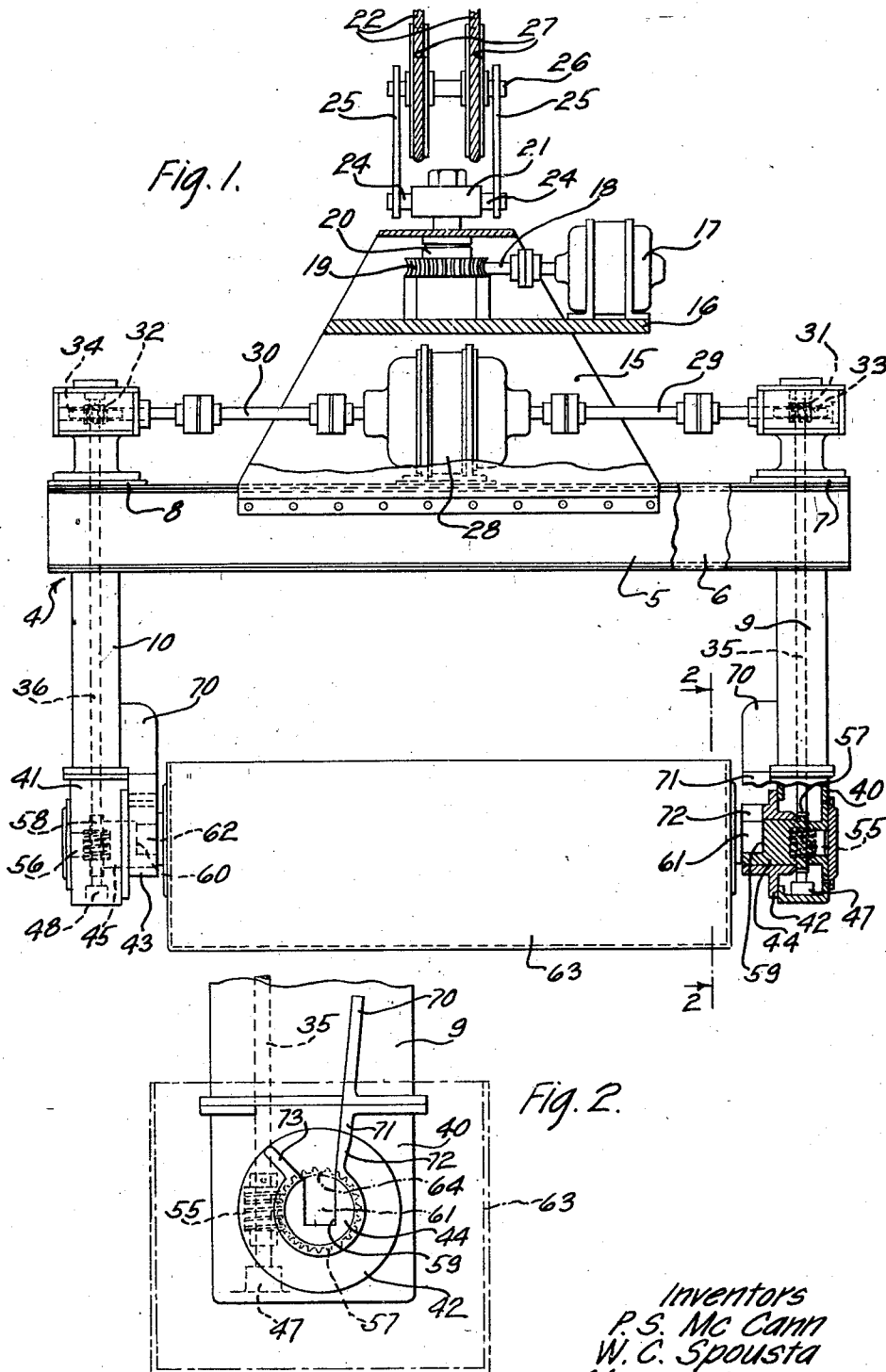
April 26, 1932.

P. S. McCANN ET AL

1,855,862

CONTAINER HANDLING AND DUMPING DEVICE

Filed Oct. 8, 1930



Inventors
P. S. McCann
W. C. Spousta
By H. B. Whitfield Atty.

UNITED STATES PATENT OFFICE

PAUL S. McCANN, OF LA GRANGE, AND WINSLOW C. SPOUSTA, OF CHICAGO, ILLINOIS,
ASSIGNORS TO WESTERN ELECTRIC COMPANY, INCORPORATED, OF NEW YORK,
N. Y., A CORPORATION OF NEW YORK

CONTAINER HANDLING AND DUMPING DEVICE

Application filed October 8, 1930. Serial No. 487,267.

This invention relates to container handling and dumping devices, and more particularly to an apparatus for securing a container for transportation and for emptying the container.

An object of the invention is the provision of a simple, efficient and safe mechanism for transporting and emptying containers.

In accordance with one embodiment, the invention contemplates the provision of a supporting frame provided with mechanism for rotating it to any desired position and having mounted on the depending portions thereof means for supporting a container during its transportation, which means are rotatable to effect the dumping of the material from the container. The means for emptying the container comprises a pair of shafts having rectangular openings in the ends thereof to receive the trunnions of a container and, upon rotation of the shaft to empty the container, and to lock the trunnions in position until the container is returned to an upright position.

A better understanding of the invention will be had by referring to the following detailed description when taken in conjunction with the accompanying drawings, wherein

Fig. 1 is a front elevational view of a material handling apparatus embodying the features of the invention, parts being broken away to show the details of construction thereof, and

Fig. 2 is a vertical sectional view taken on the line 2—2 of Fig. 1 in the direction of the arrows showing the construction of the rotatable shaft which supports the container, the container being shown in dot and dash lines so as to disclose more clearly the construction of the shaft and its cooperating parts.

Referring now to the drawings wherein like reference characters designate the same parts throughout the several views, numeral 4 designates generally a substantially U-shaped frame comprised of a pair of channel members 5 and 6 extending horizontally and parallel to each other, and having secured to the upper flanges thereof a pair of cross plates 7 and 8 which support depending members 9 and 10, respectively. The U-shaped frame 4 has extending upwardly therefrom

and attached to the outer surfaces of the channel members 5 and 6 an inverted U-shaped apron 15 having a cross piece 16 secured between the downwardly extending portions thereof for supporting a motor 17. Driven by the motor 17 is a shaft 18 which carries a worm adapted to mesh with a worm gear 19, secured to the end of a swivel bolt 20, the upper end of which is held in a suspended position in a swivel member 21. The swivel member 21 is provided with oppositely extending studs 24 which are pivoted in vertically extending and oppositely disposed straps 25, the upper ends of which are supported upon a horizontal shaft 26 having journaled thereon a pair of pulleys 27, for receiving cables 22 connected to any known type of hoisting apparatus.

Positioned upon the channel members 5 and 6 within the inverted U-shaped apron 15 is an electrical motor 28 having extending therefrom parallel to the members 5 and 6 a pair of driven shafts 29 and 30, adjacent the extreme ends of which are mounted oppositely threaded worms 31 and 32, respectively. Worms 31 and 32 mesh with worm gears 33 and 34, respectively, secured to vertical shafts 35 and 36 journaled in the members 9 and 10.

The members 9 and 10 have fixed to the lower ends thereof a pair of supporting housings 40 and 41 to which are secured journal members 42 and 43, respectively, for rotatably supporting a pair of stud shafts 44 and 45, respectively. The lower ends of the shafts 35 and 36 are journaled in bearings 47 and 48 mounted in the bottom of the housings 40 and 41, respectively. Adjacent the bearings 47 and 48, the shafts 35 and 36 have formed thereon worms 55 and 56, respectively, which mesh with worm gears 57 and 58 formed on the stud shafts 44 and 45, respectively.

The inwardly extending ends of the stud shafts 44 and 45 are slotted as shown at 59 and 60, to receive trunnions 61 and 62, respectively, secured to a container 63. The trunnions are substantially rectangular in cross-section, the upper surfaces thereof being rounded as shown at 64, and are adapted to fit snugly within the slots 59 and 60 formed in the stud shaft, and upon rotation

of the stud shafts are adapted to be rotated thereby to rotate the container 63 as desired. In order to maintain constant the strain on the motor 28, a plurality of containers may be provided, the trunnions 61 and 62 being positioned on the various containers at relatively higher and lower levels, depending upon the weight of material to be carried in a particular container, so that when the stud shafts are driven to empty a container supported thereby, the axis of rotation of the container will be at about the same level as the center of gravity of the load. The positioning of the trunnions in this manner prevents undue strain on the motor at the beginning of rotation of the stud shafts and prevents the container from tending to drive the motor during the last part of the rotation of the shafts in dumping a container. This limiting of the gravitational effect of the load upon the motor permits of a smooth operation and relieves the gearing and bearing surfaces of the dumping apparatus from an excessive strain.

The member 9 has a flange 70 formed thereon, which cooperates with a flange 71 on the housing 40 and with a flange 72 formed on the journal member 42 to provide a guide for directing the trunnion 61 into the slot 59 when the U-shaped frame is moved into position for lifting a container. A second flange 73 is formed on the journal member 42 in converging relation to flanges 70, 71 and 72 and cooperates therewith for directing the trunnion 61 into the slot 59. A similar construction is provided on the member 10, housing 41 and journal member 43 for directing the trunnion 62 into the slot 60 formed in the stud shaft 45.

It is believed that a better understanding of the invention will be had by reference to the following brief description of the operation thereof. Let it be assumed that a number of filled containers 63 are disposed in upright position about the floor of a storage room and not arranged in any particular order. If it is desired to empty the contents of a given container into a receiving bin, the operator may by means of a suitable hoisting mechanism (not shown) move the frame 4 into position over the selected container and by actuation of the motor 17 may rotate the frame to bring it into alignment with the container, whereupon the frame may be lowered by the hoisting mechanism into a position beside the container. The operator then manipulates the hoisting mechanism to move the frame laterally until the trunnions 61 and 62 engage the flanges 70 on the members 9 and 10, whereupon the frame may be raised and the trunnions 61 and 62 directed into the slots 59 and 60 in the stud shafts 44 and 45, respectively, by means of the cooperating flanges 70, 71, 72, and 73. A continued lifting operation will raise the container 63 from

the floor and it may be transported to a receiving bin (not shown), the motor 17 actuated to drive the shaft 18 and thereby through the worm gear 19 rotate the frame 4 to the desired angular position, at which time current may be supplied to the motor 28 to rotate the shafts 29 and 30. Upon rotation of the shafts 29 and 30, they will drive the worm gears 33 and 34, thereby to rotate the shafts 35 and 36, which in turn will drive the stud shafts 44 and 45. The stud shafts 44 and 45 with the trunnions 61 and 62 supported in the slots 59 and 60 therein will be rotated to rotate the container 63 and empty any material which may be in the container, into the bin (not shown).

It will be noted that the construction of the trunnions 61 and 62 is such that upon a slight rotative motion being imparted to the stud shafts 44 and 45, the trunnions will be locked in place in the slots due to the configuration of the trunnion the rounded upper surface 64 of which will engage the bearing surfaces of the bearing members 42 and 43, and will effectively prevent the container from being disengaged from the stud shafts 44 and 45 until the container has again been returned to an upright position.

The shape of the trunnions 61 and 62 also prevents them from moving in the slots 59 and 60 when the stud shafts are rotated since they completely fill the slots and as soon as the shafts are rotated the rounded upper surface of each trunnion will bear against the bearing surface of the journal member associated with the stud shaft in which the trunnion is positioned.

After the container has been emptied by rotating the stud shafts 44 and 45 in the manner just described, it may be carried to any desired position either in an upright or an inverted position, and after being turned to its upright position may be deposited in any desired position within the limits of the hoisting mechanism.

What is claimed is:

1. A container handling and dumping device comprising a U-shaped frame, a pair of vertically extending shafts mounted therein, and container engaging means adapted to be driven by said shafts.

2. A container handling and dumping device comprising a U-shaped frame, shafts mounted in the horizontal and vertical portions of said frame, shafts mounted adjacent the lower end of said vertical portions having slots formed therein for receiving the trunnions of a material container, and means for rotating said shafts to rotate a container supported by said slotted shafts.

3. A container handling and dumping device comprising a U-shaped frame, shafts mounted in the horizontal and vertical portions of said frame, shafts mounted adjacent the lower end of said vertical portions having

rectangular slots formed therein for receiving the trunnions of a material container, means for rotating said shafts to rotate a container supported by said slotted shafts, and guide-
ways formed on said vertically extending portions for directing the trunnions of a container into the slots.

4. A container handling and dumping device comprising a U-shaped frame, shafts mounted in the horizontal and vertical portions of said frame, shafts mounted adjacent the lower end of said vertical portions having rectangular slots formed therein for receiving the trunnions of a material container, guideways formed on said vertical portions for directing the trunnions of a container into the slot, and means common to said horizontally extending shafts for actuating them to invert a container supported by the slotted shafts.

5. A container handling and dumping device comprising a U-shaped frame, shafts mounted in the horizontal and vertical portions of said frame, shafts mounted adjacent the lower end of said vertical portions having rectangular slots formed therein for receiving the trunnions of a material container, means for rotating said shafts to rotate a container supported by said slotted shafts, guideways formed on said vertically extending portions for directing the trunnions of a container into the slot, and means supported by said U-shaped frame for rotating the frame.

6. In a container handling and dumping apparatus, a rotatably mounted U-shaped frame, means supported by said frame for actuating it, means positioned in the vertically extending portions of said U-shaped frame for receiving the trunnions of a material container, and means supported by the horizontally disposed portion of said U-shaped frame for actuating said trunnion receiving members.

7. In a material handling and dumping apparatus, a rotatably mounted U-shaped frame, means supported indirectly by said frame for rotating it, driving shafts mounted upon said U-shaped frame member, means for actuating said shafts, and means driven by said shafts comprising a pair of stud shafts slotted to receive the trunnions of material containers.

8. In a material handling and dumping device, a U-shaped frame, bearing members positioned in the vertically extending portions of said U-shaped frame having a portion thereof mutilated for permitting the passage of the trunnions of a material container there-
through, stud shafts journaled in said bearings and slotted to receive said trunnions, and means for rotating said stud shafts to rotate the material container and lock its trunnions in said bearings.

9. In a material handling and dumping de-

vice, a U-shaped frame, bearing members positioned in the vertically extending portions of said U-shaped frame having a portion thereof mutilated for permitting the passage of the trunnions of a material container there-
through, stud shafts journaled in said bearings and slotted to receive said trunnions, means for rotating said trunnions to rotate the material container and lock it in said bearing, and flanges formed on said bearing member for directing the trunnions of a material container through the mutilated portion of the bearing and into the slot in the stud shafts.

10. In a container handling and dumping device, the combination with a pair of driving shafts slotted to receive the trunnions of a material container, of means for rotating said shafts to tip a container supported thereby, and a pair of journal members for rotatably supporting said stud shafts with a container having trunnions mounted at each end thereof, the upper ends of said trunnions being rounded to coact with the journal members to prevent the disengagement of the trunnions from the stud shafts.

11. In a container handling and dumping device, a pair of supports for the trunnions of a container, one of said supports comprising a rotatably mounted member having a radial slot for receiving a squared trunnion, means for rotating said member, and a slotted sleeve surrounding said member permitting the insertion of the trunnion, but locking it against removal when the container is tilted.

In witness whereof, we hereunto subscribe our names this 30th day of September, A. D., 1930.

PAUL S. McCANN.
WINSLOW C. SPOUSTA.