May 21, 1940. F. B. DEANS 2,201,161

CONTAINER COVER OPERATING MEANS

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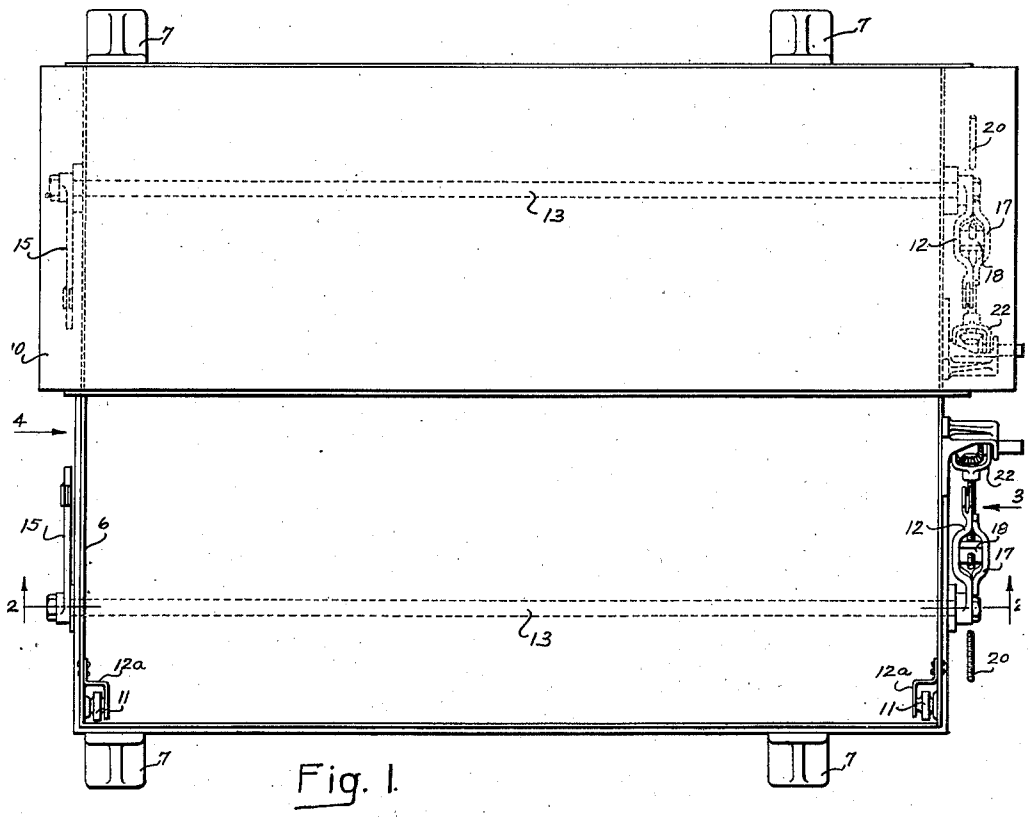


Fig. 1.

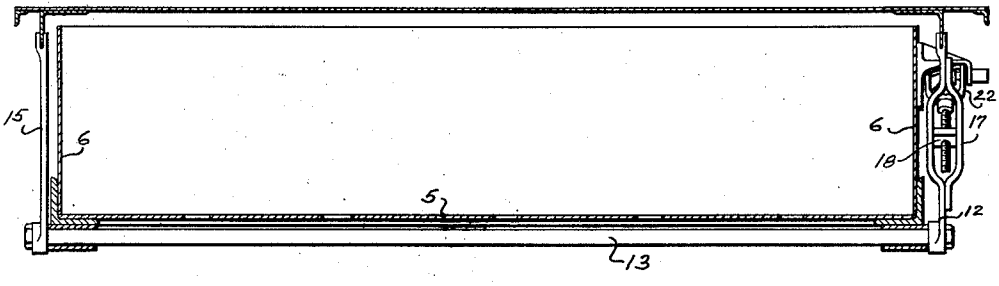


Fig. 2

INVENTOR
FRANK B. DEANS
BY
ATTORNEY

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Fig. 3

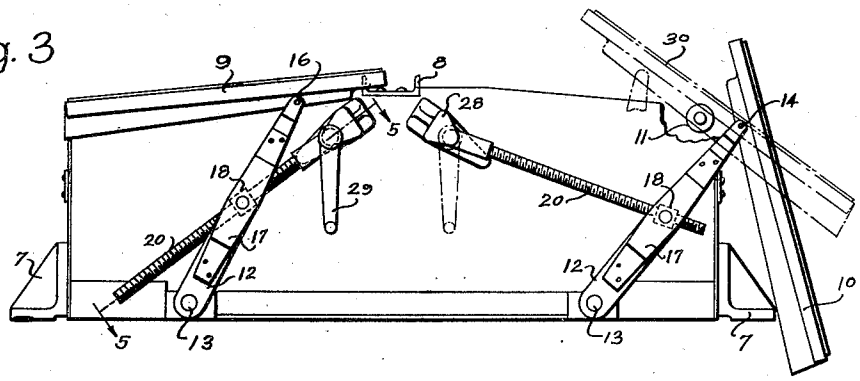


Fig. 4

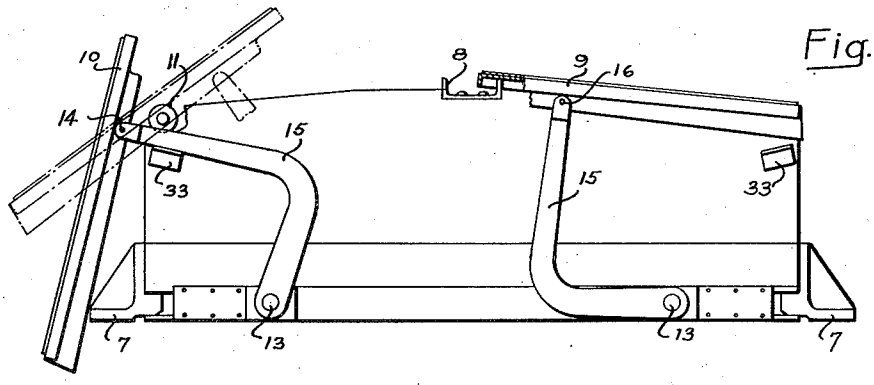
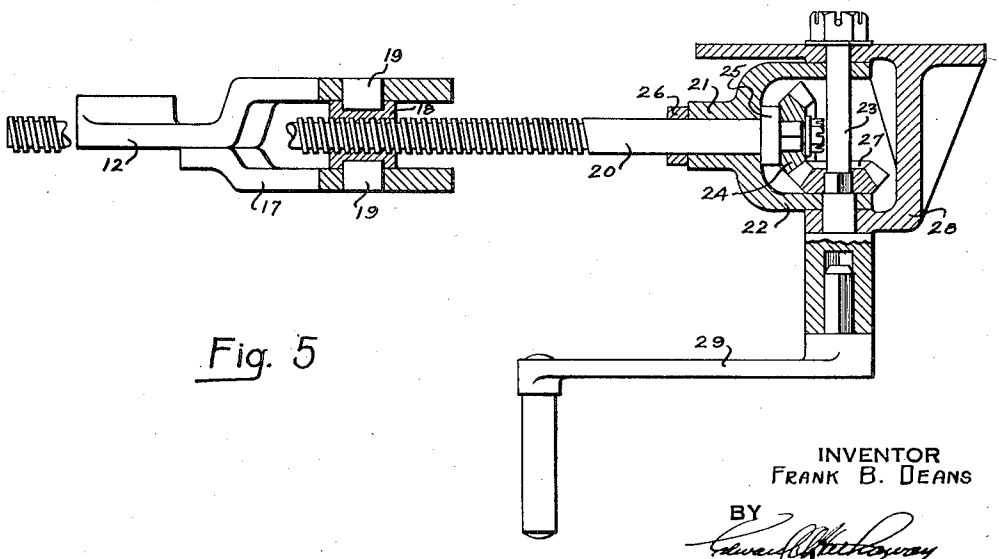


Fig. 5



INVENTOR
FRANK B. DEANS

BY

ATTORNEY

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CONTAINER COVER OPERATING MEANS

Frank B. Deans, Sharon Hill, Pa.

Application March 27, 1937, Serial No. 133,402

6 Claims. (Cl. 220—47)

This invention relates generally to a storage container having a bodily removable cover and more particularly to operating means for removing or replacing a heavy cover of a container, especially a battery crate of a storage battery locomotive.

Various means and arrangements have heretofore been proposed and used for removing or replacing the relatively heavy covers of locomotive battery crates, but these prior arrangements have been deficient in various respects, particularly in the inability to positively control movement of the cover when it changes from a horizontal to a vertical position as at this moment there is a sudden increased load thrown on the operating mechanism and conversely the operating force required to replace the cover greatly increases as the cover moves through certain of its critical positions.

It is an object of my invention to provide an improved operating means that will permit a relatively heavy cover to be conveniently, easily and positively moved and controlled throughout its entire range of movement either during covering or uncovering of the container.

Another object is to provide an improved cover arrangement and operating means that is relatively simple and economical in construction, operation and maintenance and which is compact and sturdy.

Other objects and advantages will be more apparent to those skilled in the art from the following description of the accompanying drawings in which:

Fig. 1 is a plan view of a battery crate with one cover in closed position and the other cover removed for purposes of clarity;

Fig. 2 is a longitudinal section on line 2—2 of Fig. 1;

Fig. 3 is an end elevation viewed in the direction of arrow 3 of Fig. 1;

Fig. 4 is an elevation of the other end of the crate and mechanism viewed in the direction of arrow 4 of Fig. 1;

Fig. 5 is a sectional view on the line 5—5 of Fig. 3.

In the particular embodiment of the invention such as is disclosed herein merely for the purpose of illustrating one specific form among possible others that the invention might take in practice, I have shown in Fig. 2 a battery crate having a bottom 5 and sides 6. This crate is relatively large considering that it is employed in connection with storage battery electric locomotives although it will be apparent from the disclosure herein that the invention is also applicable to other fields. The crate is supported in any suitable manner upon a framework through lateral lugs 7, while two of its sides are connected across its top by a channel iron 8. This channel serves to support the inner edges of a pair of covers 9 and 10 when in their closed position as shown in Figs. 3 and 4. The covers may be of any suitable construction but ordinarily are of such weight as to require satisfactory means for bodily removing or replacing the same when it is desired to have access to the container or the batteries therein. Suitable rollers 11 are supported in stationary brackets 12*a*, Fig. 1, secured to the walls 6. These rollers engage the under side of the outer edge of the cover, when in its closed position, and are adapted to facilitate movement especially at the critical position when the cover turns from horizontal to vertical or vice versa.

Inasmuch as the operating and supporting means for the two covers are identical, it will suffice to describe only one. The lower end of an arm generally indicated at 12 is rigidly secured to a shaft 13 while its upper end is pivotally connected at 14 to the cover 10. Shaft 13, as shown in Figs. 1 and 2, is suitably rotatably supported on the under side of bottom 5. The other end of said shaft as shown in Fig. 4 has an L-shaped arm 15 rigidly secured thereto for rotation therewith while the upper end of said arm is pivotally connected at 16 to the cover 9. Hence the arms and shafts 12, 13 and 15 constitute an integral unit for bodily supporting and swinging the cover as it is moved over rollers 11.

To actuate the foregoing integral unit, arm 12 as shown in Fig. 5, includes a side plate 17 bolted or otherwise suitably secured to the main arm 12 but in spaced relation thereto to receive a nut 18. This nut is journalled at 19 in the spaced members 12 and 17. A shaft 20 extends through nut 18 in threaded engagement therewith and through a collar 21, Fig. 5, formed as part of a bracket 22. This bracket is pivotally supported on a cranking shaft 23 which in turn is supported in a stationary bracket 28 mounted on the side of the containers. A bevel gear 24 is secured to shaft 20 while collars 25 and 26 thereon are adapted to take the axial thrust on shaft 20. A gear 27 secured to the cranking or actuating shaft 23 meshes with gear 24 at all times. A crank handle 29 is adapted to be removably received on the square end of shaft 23 so that a single removable handle may be employed for alterna-

tively operating both covers. This arrangement permits the operating means to be disposed relatively closely together as shown in Fig. 3 but without having rotation of the handle interfered with by either operating structure.

In operation, assuming the cover to be closed, the arms and operating mechanism will be in the position shown in the left side of Fig. 3 and the right side of Fig. 4. Thereupon the operator places the handle 29 on the squared end of shaft 23 and rotates threaded shaft 20 through gears 22 and 24, thus causing nut 18 to move along the shaft and rotate the arm 12, shaft 13 and arm 15. By reason of arm 12 being inclined inwardly toward the inner end of the closed cover, the inner end of the cover is initially moved slightly upwardly to clear the flange of channel 8 and is thence bodily moved laterally over rollers 11. As the pivots 14 and 16 pass over the center of roller 11 outside thereof, as shown in dotted line position 30, Fig. 3, the cover will thereafter move to a vertical position as shown in full lines at the right side of Fig. 3. However, throughout this movement it is seen that the cover will not suddenly drop when passing to its vertical position because the screw 20 and nut 18 together with arm 12, shaft 13 and arm 15 will constitute a positive locking means for preventing the weight of the cover rotating the screw out of the control of the operator. In fact, due to this locking action of the screw and nut, the operator can leave the cover in any partial open position without the necessity of holding handle 29. When the cover is fully removed, the L-shaped arm 15 will rest on a stop 33 secured to the container side. To replace the cover from its full open position, the operator merely rotates the screw 20 in the opposite direction which initially brings the cover against the rollers 11 and then tilts the cover over said rollers and into a horizontal position and finally lowers the cover over the upturned flange of channel 8. During all of the foregoing operations, it is seen that the screw is pivotally and rotatably supported by bracket 22.

From the foregoing disclosure it is seen that I have provided an extremely simple and yet highly effective operating mechanism for removing or replacing a heavy cover such as for a battery crate. At no time can the cover get out of control during its movement and yet the cover may be easily and conveniently moved through the screw and nut arrangement. It is also seen that my improved arrangement is most rugged, compact and economical in construction and maintenance consistent.

It will of course be understood that various changes in details of construction and arrangement of parts may be made by those skilled in the art without departing from the spirit of the invention as set forth in the appended claims.

I claim:

1. In combination, a container having a removable cover, an arm pivotally supported by said container and pivotally connected to said cover to move the same, a nut pivotally supported by said arm, a screw having threaded engagement with said nut, means for pivotally and rotatably supporting said screw by said container, and means for rotating said screw.

2. In combination, a container having a removable cover, an arm pivotally supported by said container and pivotally connected to said cover to move the same, a screw and nut, one of which is pivotally supported by said arm and the other of which is pivotally and rotatably supported by said container, and means for effecting relative rotation between said screw and nut thereby to move said arm laterally and effect bodily lateral movement of said cover.

3. In combination, a container having a removable cover, an arm pivotally supported by said container and pivotally connected to said cover to move the same, a screw and nut one of which is supported by said arm and the other of which is supported by said container, and means for effecting relative rotation between said screw and nut thereby to move said arm laterally to effect bodily lateral movement of said cover.

4. The combination set forth in claim 3 further characterized in that said cover has two longitudinally extending edges and said pivotal connection to the cover is located between said edges thereby allowing both of the edges to have free swinging movement about the axis of the pivotal connection to the cover.

5. The combination set forth in claim 3 further characterized in that said cover has two longitudinally extending edges and said pivotal connection to the cover is located between said edges thereby allowing both of the edges to have free swinging movement about the axis of the pivotal connection to the cover, and means for movably supporting said cover on said container near one side thereof and in such relation to the pivotal connection of said arm to said cover that when the cover is in its normally closed position said supporting means is located near one longitudinal edge of the cover and said pivotal connection with the cover is located inwardly of said supporting means, the axis of the pivotal connection of the arm with the cover being normally movable over the top of said cover supporting means.

6. The combination set forth in claim 3 further characterized in that said cover has two longitudinally extending edges and said pivotal connection to the cover is located between said edges thereby allowing both of the edges to have free swinging movement about the axis of the pivotal connection to the cover, and means for supporting said cover during lateral movement thereof whereby during initial uncovering movement the cover first moves laterally in a substantially horizontal position and then tilts to a substantially vertical position along side of the container.

FRANK B. DEANS.