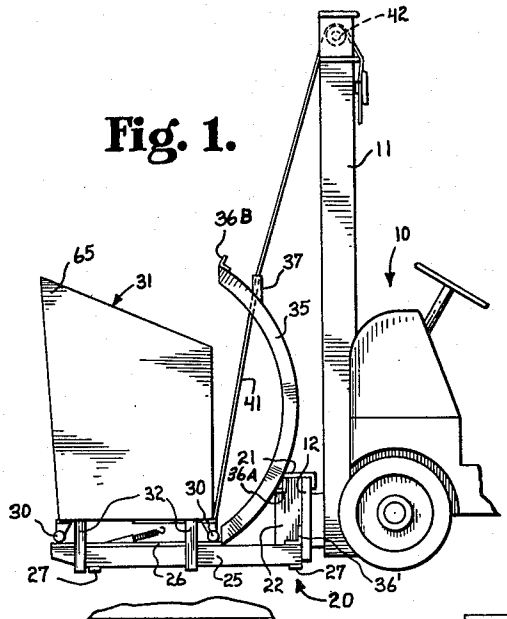
March 17, 1964 L. A. HUFF 3,125,236

ATTACHMENT FOR A FORK LIFT

Filed July 20, 1961 2 Sheets-Sheet 1

Fig. 1.



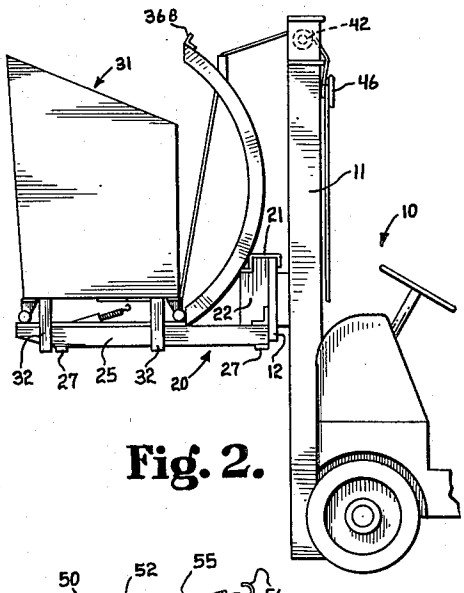


Fig. 2.

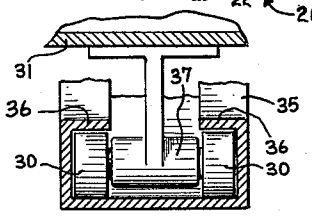


Fig. 5.

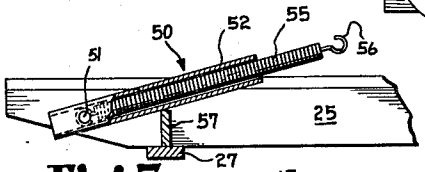


Fig. 7.

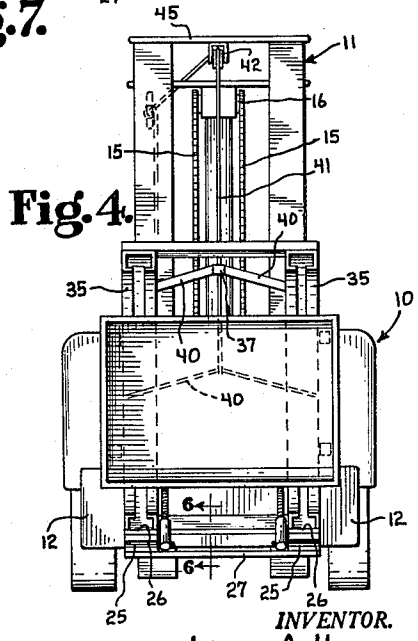


Fig. 4.

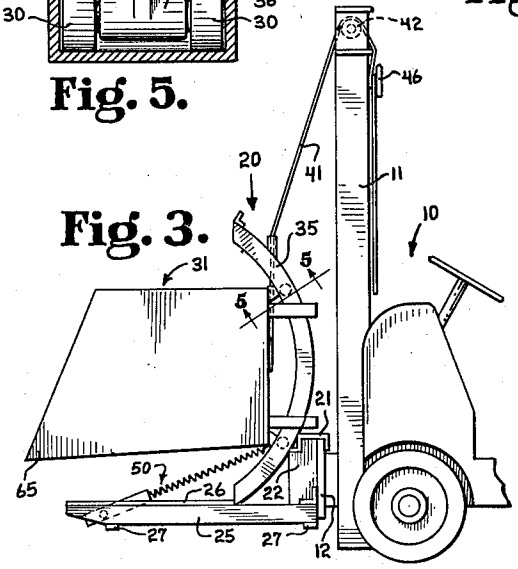


Fig. 3.

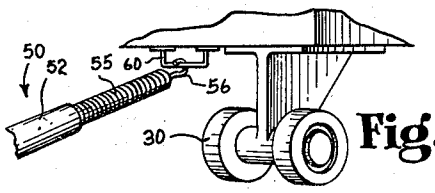


Fig. 6.

INVENTOR.
LOUIE A. HUFF

BY

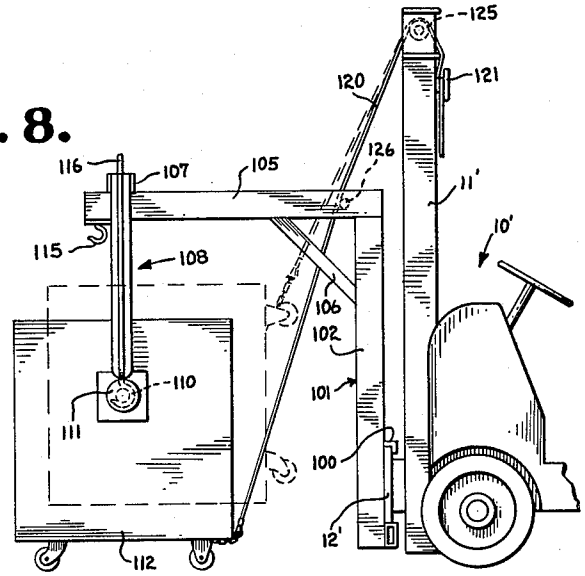
Lockwood, Woodard, Smith & Wickert
Attorneys

March 17, 1964 L. A. HUFF 3,125,236

ATTACHMENT FOR A FORK LIFT

Filed July 20, 1961 2 Sheets-Sheet 2

Fig. 8.



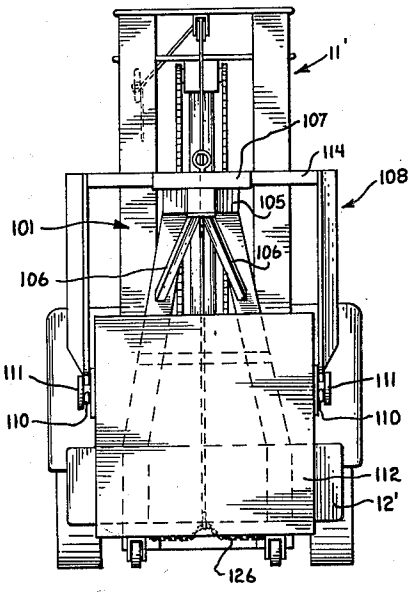


Fig. 9.

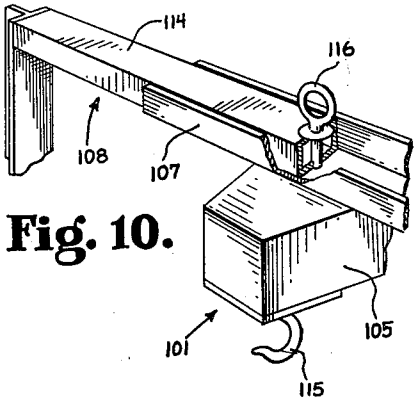


Fig. 10.

INVENTOR.
LOUIE A. HUFF

BY

Lockwood, Woodard, Smith & Wikert

Attorneys

United States Patent Office 3,125,236 Patented Mar. 17, 1964

3,125,236

ATTACHMENT FOR A FORK LIFT

Louie A. Huff, Box 111, Hutsonville, Ill.

Filed July 20, 1961, Ser. No. 125,445
5 Claims. (Cl. 214—620)

The present invention relates to an improved carrying and dumping device finding primary utility as an attachment for a fork lift.

It is known in the art to provide an attachment for a lift truck including a dumpable container. Such attachments, however, have not been completely satisfactory for various reasons. For example, in one such device, it is necessary to return the container to an upright position by manually lifting and pivoting a good proportion of the full weight of the container. In this particular prior art device, the container is restricted in size because of the particular operation of the device. Consequently, it is a primary object of the present invention to provide a lift fork attachment incorporating improved container dumping means.

A further object of the present invention is to provide a lift fork attachment whereby a container may be dumped away from the lift truck.

Still another object of the present invention is to provide a fork lift attachment which is relatively inexpensive and uncomplicated in nature and is easily attached to conventional lift trucks.

Related objects and advantages will become apparent as the description proceeds.

The present invention is intended to be used with a lifting device including a support, an element mounted for vertical movement upon said support and means for vertically moving the element upon the support. One embodiment of the present invention might include a container located forwardly of the support, means secured to the element and supporting the container so as to permit pivoting thereof about a horizontal axis. The embodiment further includes a line secured to said vertical support and to the rearward portion of the container whereby downward movement of the element dumps the container forwardly.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims.

FIG. 1 is a side elevation of a lift truck showing one embodiment of the present invention mounted thereon.

FIG. 2 is a view similar to FIG. 1 but showing the apparatus in a different operating position.

FIG. 3 is a view similar to FIGS. 1 and 2 but showing the apparatus in still a further operating position.

FIG. 4 is a front elevation of the structure shown in FIG. 3.

FIG. 5 is an enlarged section taken along the line 5—5 of FIG. 3 in the direction of the arrows and showing the details of roller supports and guide elements therefor forming a part of the illustrated embodiment.

FIG. 6 is a perspective view of the roller supports of FIG. 5 and also shows means for resiliently returning the container to the position of FIG. 1.

FIG. 7 is a section taken along the line 6—6 of FIG. 4.

FIG. 8 is a side elevation of a lift truck having a further embodiment of the present invention mounted thereon.

FIG. 9 is a front elevation of the structure of FIG. 8.

FIG. 10 is a perspective fragmentary view showing certain details of the structure of FIGS. 8 and 9.

For the purposes of promoting an understanding of the principles of the invention, reference will now be made to the embodiments illustrated in the drawing and specific language will be used to describe the same. It will nevertheless be understood that no limitation of the scope of the invention is thereby intended, such alterations and

further modifications in the illustrated device, and such further applications of the principles of the invention as illustrated therein being contemplated as would normally occur to one skilled in the art to which the invention relates.

Referring now more particularly to the drawings and to FIGS. 1–7, there is illustrated a lift truck 10 of conventional design having a vertically extending support structure 11 mounted thereon. A horizontally and vertically extending flat plate or element 12 is mounted on the vertically extending support 11 for vertical movement by means of chains 15 which are received upon suitable sprockets 16 and are driven by suitable power means for raising and lowering the element 12, for example, to and past the position illustrated in FIG. 2. The above structure is conventional and commercially available in lift trucks.

An attachment 20 is fixedly mounted upon the element 12 by means of a hook arrangement 21 which extends transversely of the attachment and may comprise a channel welded to a pair of spaced vertical members 22. Secured to the lower ends of the vertical members is a pair of forwardly projecting members 25 which have elongated flat elements or tracks 26 fixed to their upper surfaces. The forwardly projecting members 25 are spaced apart by transversely extending braces 27 fixed to the lower surfaces of the members 25.

It will be appreciated that the tracks 26 are spaced in parallel relation for receiving and providing a pathway for rollers 30 mounted upon the bottom four corners of a generally rectangular container 31. Fixed to the bottom of the container are four supports 32 which normally support the container with the rollers hanging freely. These supports are spaced apart only a slightly greater distance than the spacing of the outer surfaces of the forwardly projecting members 25. For this reason, the rollers 30 will always be positioned over the trackways 36 when the forwardly projecting members are positioned between the supports 32 by maneuvering of the lift truck.

Fixed to the forwardly projecting members is a pair of guideways or roller guides 35 which curve upwardly first rearwardly and then forwardly and form smooth continuations of the trackways 26. The guideways or roller guides 35 have a C-shaped cross section all along their length as shown in FIG. 5 and have flanges 36 at the distal ends of the C-shaped cross section, said flanges projecting toward and spaced from one another for retaining the rollers 30 within the guideways. It will be noted from FIG. 5 that at each of the four bottom corners of the container, there is provided a pair of rollers 30, thus insuring that the rollers will be retained within the roller guides with respective rollers acting against respective flanges 36. Each pair of rollers is rotatably mounted upon central supports 37 which are in turn fixed to the base of the container 31. The roller guides are also fixed to the transversely extending channel 21 to insure a sturdy structure for the attachment.

It should be noted that there is also provided a transversely extending brace 36A which is fixed to the vertical elements 22 and a transversely extending brace 36' fixed to vertical elements 22 and the forwardly projecting elements 25. Brace 36' bears against the element 12 when the attachment is mounted thereon thus supporting the forwardly projecting members 25 in horizontal position. The transversely extending braces 36A and 36' also insure that the complete attachment is sturdy in nature. At the upper ends of the roller guides 35 is fixed a further transversely extending brace 36B which also functions to maintain sturdiness.

An eye 37 is arranged with its opening extending generally vertically and is fixed in place by supports 40

which are secured at their outer ends to the roller guides 35. As mentioned, the present attachment may include a container 31. A line 40 which assumes a V-shape is fixed at its opposite ends to the bottom of the container so as to extend transversely across the bottom of the container near the rear thereof. Fixed to the V-line 40 (FIG. 4) is a line 41 which extends from the rear of the container upwardly through the eye and over the top of a pulley 42 mounted on the uppermost transversely extending portion 45 of the vertical support 11. When the device is in use in a manner to be described, this line is wrapped about a post 46 with an enlarged head and a half hitch is tied to the post.

A pair of spring arrangements 50 (FIGS. 6 and 7) are fixed to the inside surfaces of the forwardly projecting members 25 by means of suitable bolts at 51. Each of the spring arrangements 50 includes a cylinder 52 which receives a tension spring 55 having a hook 56 at the distal end thereof. Each cylinder 52 is supported upon a transversely extending spacing member 57 fixed to a transversely extending brace 27 and between the forwardly projecting members 25. In operation, the hook 56 of each spring arrangement 50 engages a loop 60 secured to the bottom of the container 31. Each of the loops 60 is so fixed to the bottom of the container adjacent the most rearward rollers 30 so that as the most rearward rollers pass each hook, the hooks engage the loops 60. As will be more apparent below, the function of the spring arrangements 50 is to return the container 31 to the upright position of FIG. 2 after a dumping operation.

It can be appreciated that a number of the containers 31 might be provided for a single lift truck and an attachment. These containers might, for example, be located at various locations within a manufacturing plant as refuse receptacles or, alternatively, as liquid receptacles. After a particular receptacle has been filled, the life truck is maneuvered so that the forwardly projecting members with their trackways 26 are located in the position of FIG. 1 beneath the rollers 30. The element 12 is raised a slight distance in order to support the container 31 and it is moved to the dumping location by operation of the lift truck. If desired, small stops may be provided at the ends of the forwardly extending tracks 26. Alternatively, the support 11 and tracks 26 may be tilted rearwardly by the lift truck in conventional manner for retaining the container in place as it is moved.

In order to dump the container, element 12 is raised by operation of the lift truck to the position shown in FIG. 2. The line 41 should be secured to line 40 and is pulled taut over the pulley 42 and secured by means of a half hitch or the like to the post 46 thus resulting in the arrangement of FIG. 2. The element 12 with its attachment 20 is then lowered causing the line 41 to pull the container 31 rearwardly and causing the rollers 30 to travel into the curved roller guides 35. As the element 12 continues its downward movement, the container is dumped forwardly as shown in FIG. 3. As mentioned, the hooks 56 engage the loops 60 as the rollers 30 pass into the roller guides and the springs 55 are extended and tensioned by further downward movement of the element 12.

It should be noted that the container 31 has a forward portion 65 which extends upwardly in FIG. 1 a sufficient distance that, when the structure is in the dumping position of FIG. 3, the portion 65 projects beyond the forwardly projecting members 25 and thus, insures that none of the material being dumped will drop on the forwardly projecting members. After completion of the dumping operation, the element 12 is again raised and the springs 55 cause the container to return to upright position and the rollers 30 to travel back down the roller guides 35 onto the tracks 26. Thus, the device returns to the upright position of FIG. 2. The container may be unloaded from the apparatus by releasing the half hitch on the post 46 and lowering the element 12 sufficiently so that the supports 32 again engage the floor permitting the lift truck to back away from the container.

Referring to FIGS. 8–10, there is illustrated an alternative embodiment of the invention which comprises the left truck 10', vertical support 11', and vertically movable element 12' substantially the same or identical to the above described lift truck structure.

Mounted upon the vertically movable element 12 by means of hook-defining transversely extending channel 100 is a frame structure 101 which includes a vertically extending portion 102 and a forwardly projecting horizontal portion 105 extending from the upper end of said vertically extending portion, the channel 100 being fixed to the vertical portion 102. Suitable bracing 106 is provided for insuring that the structure is sturdy. The forwardly projecting portion 105 has fixed to its upper surface an upwardly opening channel 107 which extends laterally of the structure. This channel receives a U-shaped element 108 which has hook-shaped bearings 110 at the lower distal ends of the legs thereof.

These bearings receive oppositely projecting trunnion elements 111 having suitable heads for retaining the trunnion elements upon the bearings. It should be noted that the trunnion elements are fixed to container 112 above the center of gravity thereof and thus, when the container is hung by the trunnion elements, it will assume the upright position of FIG. 8.

The forwardly projecting portion 105 has fixed to its lower forward end a hook 115 which may be used for lifting any desired object. Secured to the upper surface of the base 114 of the U-shaped member 108 is an eye 116 which may be used for hanging the U-shaped member in any desired storage location.

The base 114 of the U-shape member is generally rectangular in cross section and thus, has the same configuration as the upwardly opening channel 107. The base 114 is proportioned to have a complementary rectangular shape the same as the inside of the channel 107 and thus, when the lift truck 10' is moving, the U-shaped element 108 will not swing and rock but instead will retain the illustrated upright position.

The dumping operation of the present embodiment is generally similar to the above described embodiment. After the lift truck has been maneuvered to locate the trunnion elements 111 within the bearings 110, the element 12' is raised so that the frame 101 and container 112 is lifted from the floor. The lift truck may then be maneuvered to a location where it is desired to dump the container. The element 12' is then raised and after such raising, a line 120 is attached by means of a half hitch or the like to a post 121 extending from the rear of the vertical support 11'.

The line 120 is fixed to the bottom of the container and passes over a pulley 125 rotatably mounted on the vertical support 11'. It also rides over a transversely extending member 126 forming a part of the frame 101. When the frame 101 is then again moved downwardly by means of the downward movement of the element 12', the container 112 is dumped forwardly and assumes the dotted line position shown in FIG. 8. After such dumping, the frame is again raised and the line 120 released so as to permit return of the container to its previous location.

It should be noted that similarly to the above described embodiment, the line 120 is attached to the bottom rear of the container 112 by means of a V-chain 126 fixed at its opposite ends to the sides of the bottom of the container. Thus, the line 120 may be easily attached to the bottom of the container by attaching it to this chain, for example, by means of a spring-locked hook or the like. If desired, the attachment of the line 120 to the chain may be made just prior to the lowering of the element 12' for dumping. In such a situation, the half hitch could remain tied at all times.

From the above description, it will be obvious that the present invention provides a lift fork attachment incorporating an improved container dumping means which makes possible easy return of the container to an upright position. It will also be apparent that the lift fork attachment of the present invention permits dumping of the container away from the lift truck.

While the invention has been illustrated and described in detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character, it being understood that only the preferred embodiment has been shown and described and that all changes and modifications that come within the spirit of the invention and the scope of the claims are also desired to be protected.

For example, one alternative embodiment falling within the scope of the invention eliminates the pulley **42** and merely passes the line **41** over the top of the transversely extending portion **45**. Actually this last mentioned arrangement is preferred over the illustrated arrangement since, in actual dumping, the pulley **42** does not rotate but merely supports a load. It should be made clear, however, that this last mentioned embodiment necessitates that the top of portion **45** be smooth and free of sharp edges.

The invention claimed is:

1. With a lifting device including a vertical support, an element mounted for vertical movement upon said support, and means for vertically moving said element upon said support, the combination comprising an open topped container;

rollers mounted at the bottom of said container;

a frame secured to said element for vertical movement therewith, said frame including forwardly projecting supports adapted to extend under said container and to provide trackways for said rollers;

a pair of roller guides fixedly secured to said forwardly projecting supports adjacent the proximal ends thereof and defining an arcuate path which curves upwardly rearwardly and then forwardly, and forms a smooth continuation of said trackways said roller guides including limiting surfaces fixed with relation to said frame and arranged to limit said rollers to said arcuate path;

and a line secured to said container at a rearward portion thereof and extending upwardly to a connection with said support whereby downward movement of said frame causes said rollers to move into said roller guides and said container to be thereby dumped forwardly.

2. With a lifting device including a vertical support, an element mounted for vertical movement upon said support, and means for vertically moving said element upon said support, the combination comprising an open topped container;

rollers mounted at the bottom of said container;

legs secured to said container and adapted to support said container off the ground with the rollers hanging free;

a frame secured to said element for vertical movement therewith, said frame including forwardly projecting supports adapted to extend under said container and to provide trackways for said rollers;

a pair of roller guides fixedly secured to said forwardly projecting supports adjacent the proximal end thereof and defining an arcuate path which curves upwardly rearwardly and then forwardly, and forms a smooth continuation of said trackways said roller guides including limiting surfaces fixed with relation to said frame and arranged to limit said rollers to said arcaute path;

and a line secured to said container at a rearward portion thereof and extending upwardly to a connection with said support whereby downward movement of said frame causes said rollers to move into said roller guides and said container to be thereby dumped forwardly.

3. With a lifting device including a vertical support, an element mounted for vertical movement upon said support, and means for vertically moving said element upon said support, the combination comprising a generally rectangular open topped container;

four pairs of rollers mounted at the bottom four corners of said container;

legs secured to said container and adapted to support said container off the ground with the rollers hanging free;

a frame secured to said element for vertical movement therewith, said frame including a pair of forwardly projecting supports adapted to extend under said container and to provide trackways for said rollers;

a pair of roller guides fixedly secured to said forwardly projecting supports adjacent the proximal end thereof, curving upwardly rearwardly and then forwardly, and forming a smooth continuation of said trackways, said roller guides having a **C**-shaped cross section all along their length with flanges at the distal ends of the **C**-shaped cross section projecting toward and spaced from one another;

said rollers being proportioned to be retained within said roller guides by said flanges as said rollers move within said roller guides;

and a line secured to said container at a lower rearward portion thereof and extending upwardly to a connection with said support whereby downward movement of said frame causes said rollers to move into said roller guides and said container to be thereby dumped forwardly.

4. With a lifting device including a vertical support, an element mounted for vertical movement upon said support, and means for vertically moving said element upon said support, the combination comprising a generally rectangular open topped container;

four pairs of rollers mounted at the bottom four corners of said container;

legs secured to said container and adapted to support said container off the ground with the rollers hanging free;

a frame secured to said element for vertical movement therewith, said frame including a pair of forwardly projecting supports adapted to extend under said container and to provide trackways for said rollers;

a pair of roller guides fixedly secured to said forwardly projecting supports adjacent the proximal end thereof, curving upwardly rearwardly and then forwardly, and forming a smooth continuation of said trackways, said roller guides having a **C**-shaped cross section all along their length with flanges at the distal ends of the **C**-shaped cross section projecting toward and spaced from one another;

said rollers being proportioned to be retained within said roller guides by said flanges as said rollers move within said roller guides;

a line secured to said container at a lower rearward portion thereof and extending upwardly to a connection with said support whereby downward movement of said frame causes said rollers to move into said roller guides and said container to be thereby dumped forwardly;

a spring secured at one end portion to said frame and projecting upwardly beneath said container;

and a hook at the distal end of said spring adapted to releasably engage said container as it moves upwardly in said roller guides for returning said container to an upright position after dumping.

5. With a lifting device including a vertical support, an element mounted for vertical movement upon said support, and means for vertically moving said element upon said support, the combination comprising a generally rectangular open topped container, four rollers mounted at

the bottom four corners of said container whereby said container may be moved from place to place, trunnion elements projecting oppositely from opposite sides of said container, a frame including a vertically extending portion and a forwardly projecting portion fixed to and extending from the upper portion of said vertically extending portion, said frame being fixedly secured at its lower end portion to said element, a U-shaped member having bearings at the distal ends of the legs thereof adapted to receive said trunnion elements, said forwardly projecting portion of said frame formed with a saddle complementary in shape to the base of said U-shaped member, said saddle adapted to receive said U-shaped member with the legs of said member projecting downwardly, and a line secured to said container at a rearward portion thereof and extending upwardy to a connection with said support whereby downward movement of said frame causes pivoting of said container about said trunnions and dumping of

said container, said trunnions being located above the center of gravity of said container to effect return thereof to an upright position after dumping.

References Cited in the file of this patent

UNITED STATES PATENTS

722,868	Mitchell	Mar. 17, 1903
1,165,900	Rahm	Dec. 28, 1915
1,775,220	Aeschbach	Sept. 9, 1930
2,411,228	Poulsen	Nov. 19, 1946
2,750,060	Sherriff	June 12, 1956
2,760,661	Wight et al.	Aug. 28, 1956
2,762,518	Streb et al.	Sept. 11, 1956
3,009,591	Jones	Nov. 21, 1961
3,027,032	Selby	Mar. 27, 1962

FOREIGN PATENTS

130,182	Great Britain	July 31, 1919