July 7, 1942. W. E. LAMBERT 2,289,024

CONVEYING EQUIPMENT

Filed May 5, 1939 3 Sheets-Sheet 1

Fig. 1.

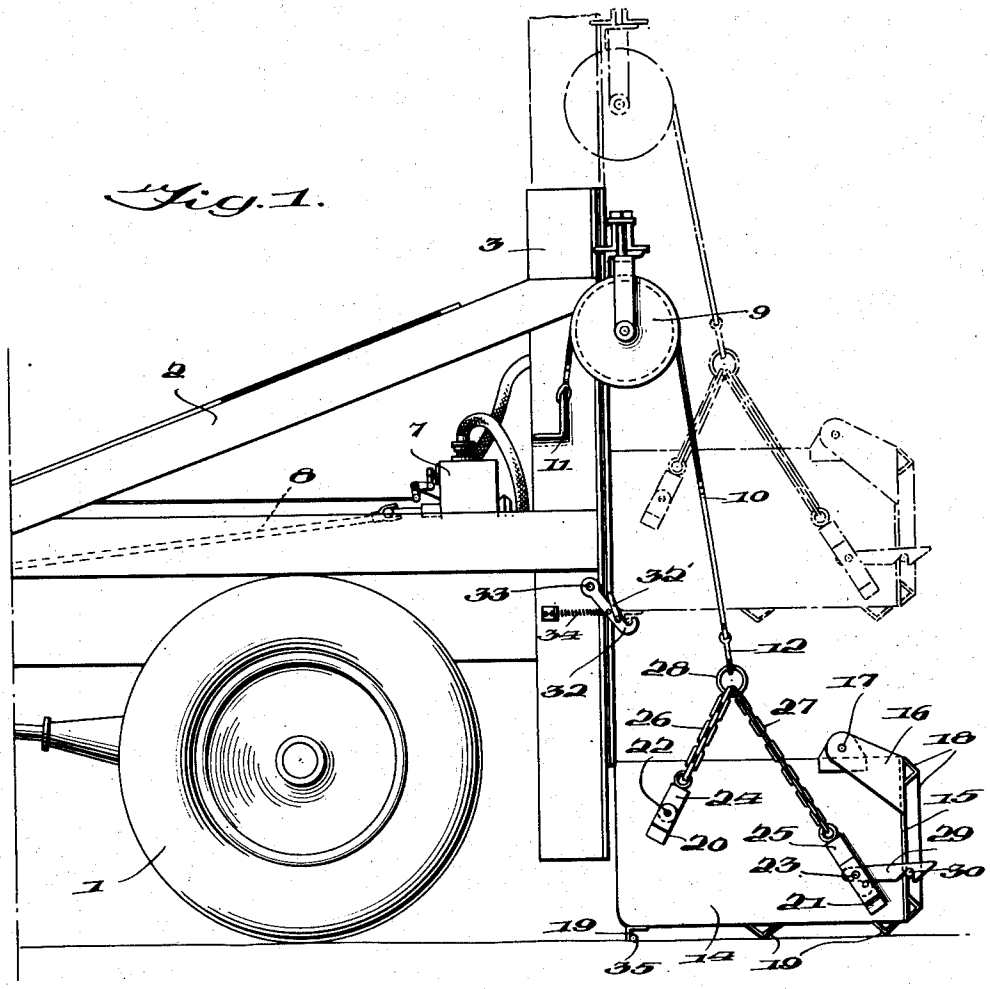
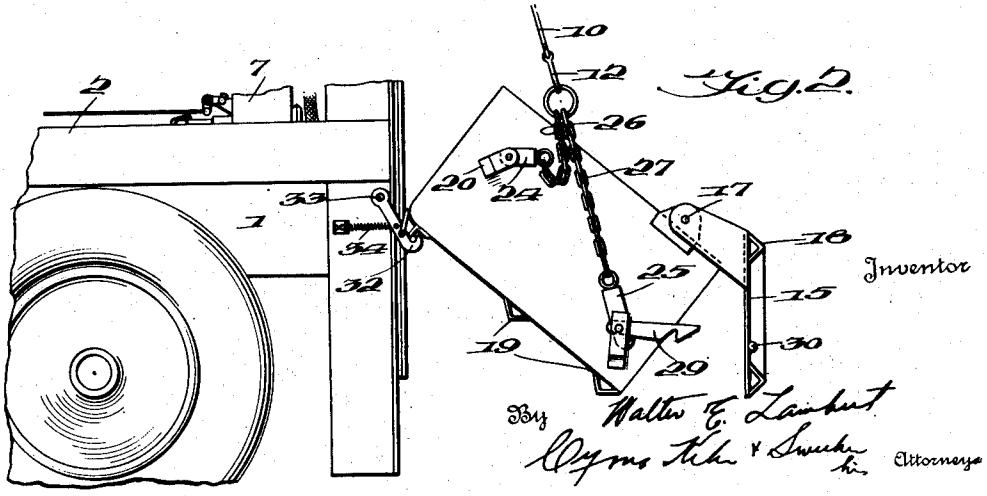


Fig. 2.



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July 7, 1942. W. E. LAMBERT 2,289,024

CONVEYING EQUIPMENT

Filed May 5, 1939 3 Sheets-Sheet 2

Fig. 3.

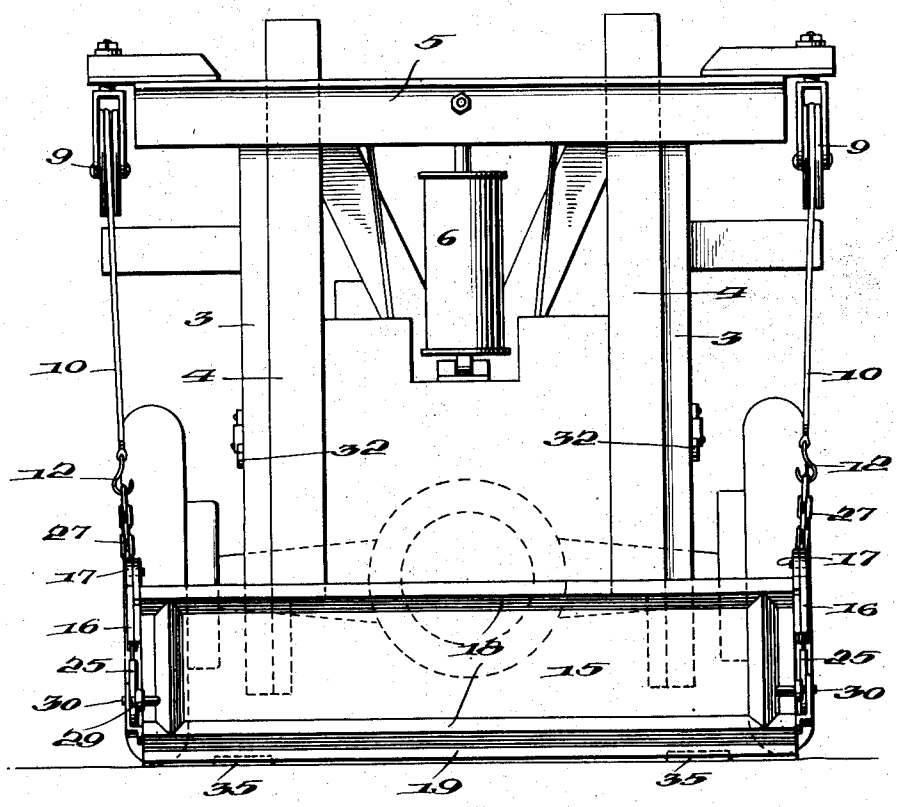


Fig. 4.

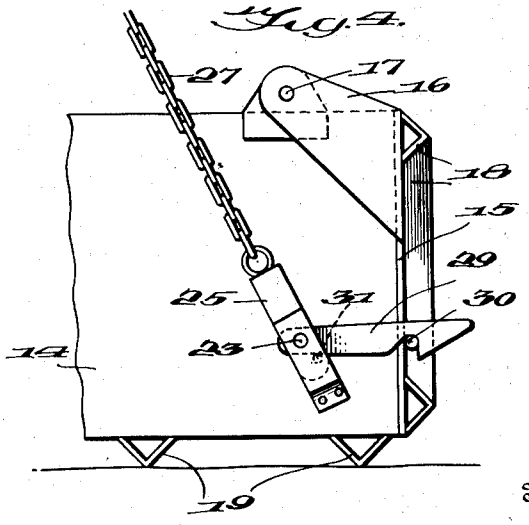
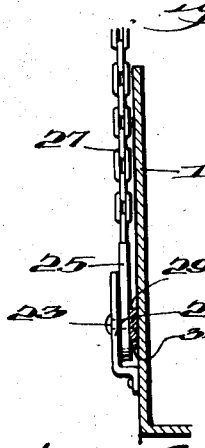


Fig. 5.



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July 7, 1942. W. E. LAMBERT 2,289,024

CONVEYING EQUIPMENT

Filed May 5, 1939 3 Sheets-Sheet 3

Fig. 6.

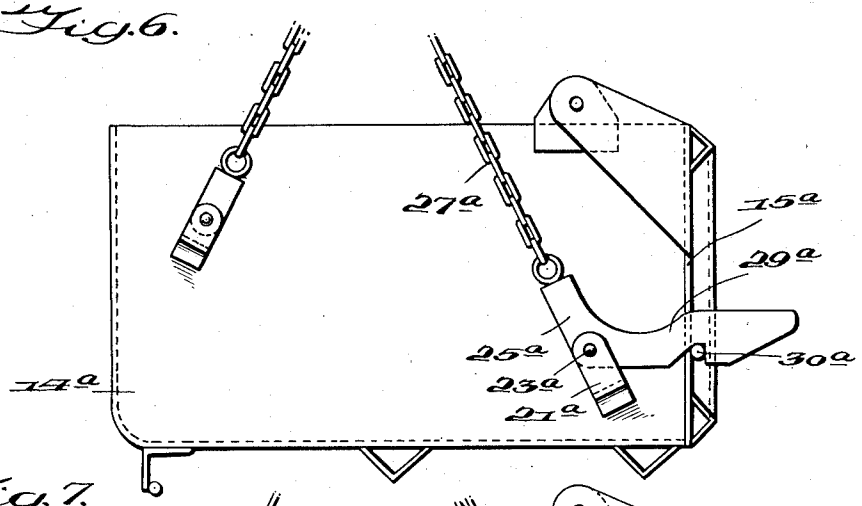


Fig. 7.

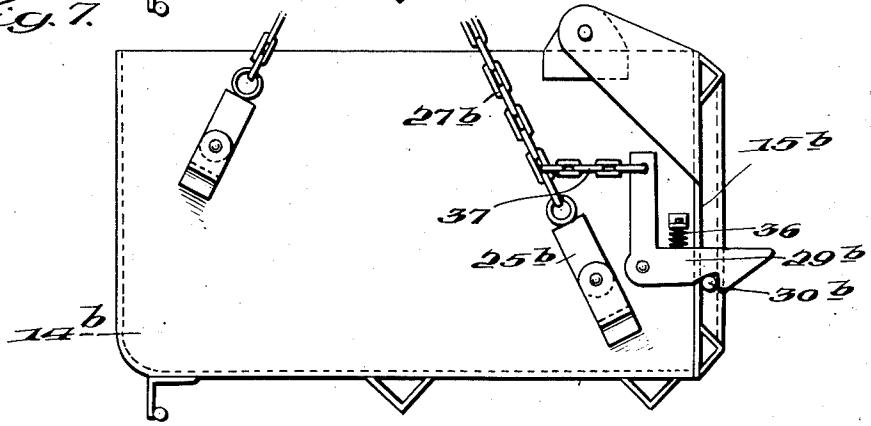


Fig. 8.

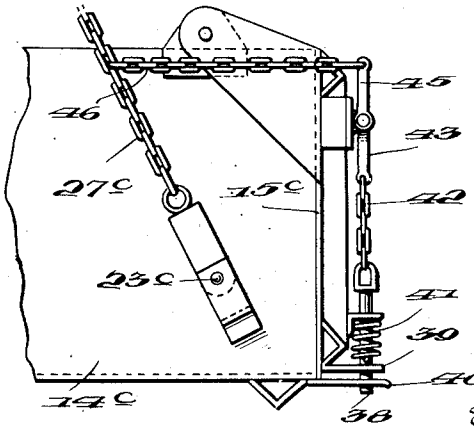
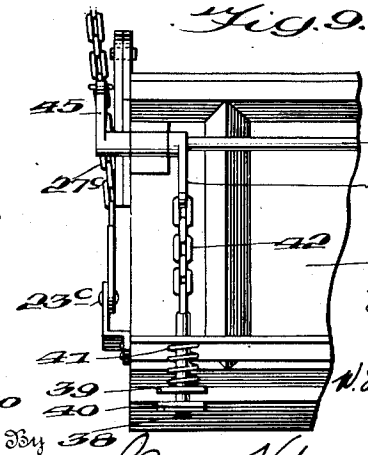


Fig. 9.



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Patented July 7, 1942

2,289,024

UNITED STATES PATENT OFFICE

2,289,024

CONVEYING EQUIPMENT

Walter E. Lambert, Knoxville, Tenn., assignor to McMurray Structural Steel Company, Inc., Nashville, Tenn., a corporation of Tennessee

Application May 5, 1939, Serial No. 272,048

12 Claims. (Cl. 214—117)

This invention relates to an improvement in conveying equipment, and more particularly to a vehicle for transporting material from one point to another and dumping said material upon delivery to the desired point. It is an improvement on the conveying rig set forth in my prior application, Ser. No. 118,653, filed December 31, 1936, now Patent No. 2,210,323, granted August 6, 1940.

It has been the custom heretofore to provide conveying skips that are designed to be loaded with material to be transported to a desired destination, which skips are filled by hand and then are hauled one by one by a conveying truck, dumped and then returned to the point of loading for refilling.

The object of this invention is to provide not only for the automatic dumping of these skips but also to simplify the construction of the dumping thereof at the desired point.

This is accomplished by the use of a side dumping skip having a side door that is designed to swing open on dumping when released by a latch provided therefor and which normally holds the door closed. This latch is released automatically upon the lowering of the skip for dumping, when an edge of the skip is caught by a hook or hooks that engage thereunder and tilt the skip automatically for dumping. This makes it unnecessary for an operator to release the latch of the door manually at the desired point of dumping, and the entire operation is automatic, not requiring the services of an additional operator than the one on the truck.

The invention is embodied in a preferred form which, together with modifications thereof are illustrated in the accompanying drawings in which:

Fig. 1 is a side elevation of the rear portion of a conveying truck showing a skip attached thereto;

Fig. 2 is a similar view showing the skip in a position for dumping;

Fig. 3 is a rear elevation of the conveying rig and skip with the latter resting on the ground;

Fig. 4 is an enlarged detail side elevation of a portion of the conveying skip;

Fig. 5 is a vertical sectional view through a portion of the wall thereof;

Fig. 6 is an end elevation of a skip showing a modified form of latching means therefor;

Fig. 7 is a similar view showing still another form of latching means;

Fig. 8 is a fragmentary end elevation of the skip showing a further modification of the latching means; and

Fig. 9 is a fragmentary rear elevation of the skip having the latching means shown in Fig. 8.

The invention is shown applied to a rig structure generally like that set forth in my said former application on Conveying rig, Ser. No. 118,653, filed December 31, 1936.

This structure involves a vehicle chassis which is designated generally by the numeral 1, and on which is mounted and secured a rig frame 2, that includes a pair of transversely spaced upright guides 3 that are preferably in the form of channel bars to form a trackway therebetween. Slidably mounted in the trackway is a shuttle 4 that has a bar 5 at its upper end to which is pivotally connected a piston rod of a hydraulic power device 6, the lower end of which is pivoted on the rig frame 2 and receives fluid under pressure from a pump 7 operated by a drive shaft 8, which is preferably driven by a power take-off from the internal combustion engine. This structure, as illustrated, is operated in the manner described in my application.

The opposite ends of the bar 5 of the shuttle carry a pair of sheaves 9 on opposite ends thereof, over which cables 10 extend from brackets 11 on the rig frame 2, one end of each cable being rigidly secured to the bracket 11, and the other end having a hook 12 adapted to engage and support a skip.

A skip is designated generally by the numeral 14 comprising opposite ends and front wall and bottom, being closed at the rear side by a door 15 having arms 16 thereon pivoted at 17 to the end walls of the skip. The door 15 is braced preferably by suitable angle bars 18 and similar angle bars are shown at 19 for bracing the bottom of the skip.

Each of the end walls of the skip 14 is provided with a pair of brackets 20 and 21 secured thereto, to which are pivoted respectively, at 22 and 23 links 24 and 25 attached to chains 26 and 27 that are joined together at a ring 28, and forming a supporting connection at each end of the skip for engagement by one of the hooks 12 to support each opposite end of the skip 14 during transportation thereof.

In order to hold the door 15 closed when the skip is being loaded and during transportation, a latch 29 is provided to engage a pin 30 attached to an end of the door and such a latch and pin are preferably provided at both opposite ends of the door and skip, although for light loads, only one latch need be provided, if desired. The latch

29 is pivotally mounted on the pivot pin 23, as shown also in Figs. 4 and 5 of the drawings. For releasing the latch 29, a pin 31 is carried by the lower end of the link 25 below the pivot 23 and normally bears upward against the under side of the latch 29 to release the latch automatically when the skip turns angularly, as shown in Fig. 2 for dumping.

Normally a plurality of skips are provided for each rig and are picked up and transported one by one, after having been filled manually. The rig is backed up to a skip in loaded position and the shuttle 4 is lowered substantially as shown in Figs. 1 and 3, which lowers the cables 10 until the hooks 12 thereof can be engaged in the rings 28 attached to the chains 26 and 27, at opposite ends of the skip. Then upon operation of the hydraulic power device 6, the skip may be lifted to its dotted line position in Fig. 1, for transportation to a desired point of dumping, the loaded skip bearing against the shuttle and rig frame with sufficient pressure to hold the skip against sidewise movement relative thereto during transportation.

The guides 3 have hooks 32 pivoted thereon at 33 and are normally pressed rearwardly by springs 34 in position to engage under pins 35 attached to the angle bar 19 adjacent opposite end portions of the skip, as shown in Fig. 3. If desired, however, one hook may be provided at only one side of the rig frame and will be sufficient for dumping the skip, especially where a light load is involved.

When the loaded skip is raised to the dotted line position shown in Fig. 1, the hooks 32 engage under the pins 35. Then when the vehicle reaches the point of dumping and the shuttle 4 is lowered by the hydraulic device, the forward edge of the skip toward the skid frame will be held in said elevated position which will cause the skip to swing downward about the pins 35 as a center, substantially as shown in Fig. 2. This will cause the chains 27 carrying the major portion of the load of the skip to swing about the pivots 23 to positions more nearly diagonally of the skip, as shown in Fig. 2, which will slacken the chains 26, and this swinging movement of the chains 27 and the links 25 thereof, causes the pins 21 to press upward on the latches 29, releasing the latter from engagement with the pins 30 of the door 15. This in turn releases the door for opening movement, allowing it to swing about its pivots 17, as shown in Fig. 2, and allowing the contents of the skip to be discharged therefrom by gravity.

In this way the operator of the truck may dump the skip automatically without requiring a separate operator to release the latches 29 when the truck reaches the point of dumping since these latches are opened automatically at this point by the tilting of the skip for dumping. At the same time the structure of the skip is materially simplified and the operation thereof greatly improved.

Figs. 6 to 9 show modified forms of the latching mechanism for the skip which may be used in the manner described above to hold the door closed and which will be operated in a similar fashion.

In Fig. 6, the skip 14a has a link 25a having a chain 27a pivoted at 23a to a bracket 21a. The link 25a is integral with a latch 29a that engages a pin 30a attached to the door 15a. Thus when the skip tilts for dumping, the shifting of the chain 27a will swing the link 25a and latch 29a to release the door and discharge the contents of the skip.

In Fig. 7, the skip 14b has its chain 27b pivoted to a link 25b, similar to that described above in connection with Fig. 1. However, a latch 29b is pivoted to an end of the skip 14b and normally is pressed downward by means of a spring 36 to latching engagement, being released by a flexible connection 37 extending from the upper end of the latch to the chain 27b, so that the swinging of the chain in the tilting of the skip will release the latch 29b and allow the opening of the door 15b for dumping the contents.

In the further modification shown in Figs. 8 and 9, a more secure fastening of the door is obtained. In this form, the skip 14c has its chain 27c pivotally connected at 23c with an end wall of the skip, as described above in connection with Fig. 1. However, the door 15c is latched closed by means of one or more sliding bolts 38 mounted intermediate the ends of the skip or adjacent said ends where more than one bolt is provided, and slidable through plates 39 and 40 secured respectively to the door 15c and the bottom of the skip 14c, the bolt 38 being spring-pressed to latched position by a spring 41 surrounding the same and acting thereon. The bolt 38 is connected by a flexible device 42 with an arm 43 mounted on a shaft 44 which extends across the rear of the skip where more than one latch is provided sufficiently for connection with said latch or latches and actuation thereof. Said shaft 44 has an arm 45 shown at one end thereof which arm is connected with a flexible device 46 attached to the chain 27c. Thus swinging movement of the chain during tilting of the skip will rock the shaft 44 to withdraw the sliding bolts 38 and release the door 15c for opening, permitting the discharge of the contents in the manner described above in connection with Figs. 1 to 5.

I claim:

1. In conveying equipment, the combination of a rig frame, a conveying skip container having a supporting connection at each opposite end portion thereof and having a door for the discharge of the contents of said skip container, means carried by the rig frame for supporting said skip container, and means connected with said supporting means and actuated thereby for latching said door in closed position.

2. In conveying equipment, the combination of a rig frame, a conveying skip container having a side door for the discharge of the contents of said container, said skip container having a pair of flexible devices at each opposite end thereof and connected directly with said end for supporting the container, means carried by the rig frame for engaging said end connections to support the skip container thereon, and means connected with one of said flexible devices and actuated thereby for latching the door in closed position.

3. In conveying equipment, the combination of a rig frame, a conveying skip container having a bottom, end walls and front wall, a door hinged to the end walls and extending along the rear side of said container for controlling the discharge of material therefrom, means for latching said door closed, a pair of supporting devices pivotally connected directly with each end wall, means connecting one of said supporting devices with the latching means for release of said latching means upon swinging movement of the supporting device, and means on the

rig frame for engaging the supporting devices to support the skip container.

4. In conveying equipment, the combination of a rig frame, a conveying skip container having a bottom, end walls and front wall, a door hinged to the end walls and extending along the rear side of said container for controlling the discharge of material therefrom, means for latching said door closed, a pair of flexible devices having pivotal connection directly with each end wall of the container for supporting said container, means connecting one of said flexible devices with the latching means to release said latching means upon swinging movement of the flexible device in one direction, and means on the rig frame for engaging said flexible device to support the skip container.

5. In conveying equipment, the combination of a rig frame, a conveying skip container having a bottom, end walls and front wall, a door hinged to the end walls and extending along the rear side of said container for controlling the discharge of material therefrom, means for latching said door closed, a flexible device having pivotal connection with each end wall of the container for supporting said container, means connecting said flexible device with the latching means to release said latching means upon swinging movement of the flexible device in one direction, means on the rig frame for engaging said flexible device to support the skip container, and means carried by the rig frame for tilting said skip container rearwardly for dumping.

6. In conveying equipment, the combination with an upright rig frame, of a conveying skip container having a bottom and front and end walls, a door at the rear side of said skip hinged to the end walls thereof for outward swinging movement relative thereto, latching means for said door, a flexible device pivotally connected with each end wall of the container for supporting the latter, means carried by the rig frame for engaging said flexible device and holding the skip container bearing against the upright frame, means for tilting said skip for dumping and swinging the same relative to the flexible devices, and means connecting one of the flexible devices with the latching means to release the door upon said swinging movement of the skip.

7. A skip container having a door for controlling the discharge of said container, means for latching said door closed, means connected with the skip container at transversely spaced points for supporting the same, and means connecting said supporting means at one of said points with the latching means to control the release thereof.

8. A conveying skip container comprising a body portion and a door for controlling the discharge from said body portion, means for latching said door closed, supporting devices connected with the body portion at transversely spaced points for swinging movement relative thereto, and means connecting one of the supporting devices with the latching means to release said latching means upon said swinging movement of the supporting devices.

9. A conveying skip container comprising a body portion having a bottom and front and end walls, a side door hinged to the body portion at the rear thereof, means for latching said door closed, flexible devices connected with each of the end walls at transversely spaced points for supporting the container and movable relative thereto upon tilting movement of the container for dumping, and means connecting one of the flexible devices with the latching means to release said latching means upon swinging movement of the container for dumping.

10. A conveying skip container comprising a body portion having a bottom, a side and end walls, a side door hinged to the body portion at a side thereof, means for latching said door closed, a pair of flexible devices attached directly to each end wall for supporting the container and for tilting movement of the container relative thereto, and means for connecting one of the flexible devices with the latching means and constructed for releasing said latching means upon bodily swinging movement of the container for dumping.

11. In conveying equipment, the combination of an upright skid frame, a conveying skip container having a supporting connection at each opposite end portion thereof and having a door for the discharge of the contents of the skip container, means for latching said door closed, supporting means carried by the frame for engaging the supporting connections for raising and lowering the skip container relative to the skid frame, means on the frame for tilting the skip container away from the skid frame to a dumping position upon lowering movement thereof relative to the skid frame, each of said end supporting connections including a pair of flexible elements attached at one end to the end of the container and joined together at the opposite ends thereof for supporting the container and for swinging relative thereto upon tilting of said container to a dumping position, and means connected with one of said flexible elements for releasing the latching means upon said relative swinging movement of the flexible element by tilting of the skip container to a dumping position.

12. In conveying equipment, the combination of an upright skid frame, a conveying skip container having end walls and a door for discharging the contents of the skip container, a latch pivotally connected with an end wall in position to engage the door for latching said door closed, a pair of flexible elements attached at one end thereof to each end wall and having the opposite ends of each pair joined together, supporting means carried by the frame and connected with said pairs of flexible elements for raising and lowering the skip container relative to the skid frame, means on the frame in position for engaging the skip container and tilting the same away from the skid frame to a dumping position upon lowering movement thereof relative to the skid frame, and means for connecting one of the flexible elements with the latch for releasing said latch upon said lowering of the container to a dumping position and opening the door to discharge the contents in said dumping position.

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