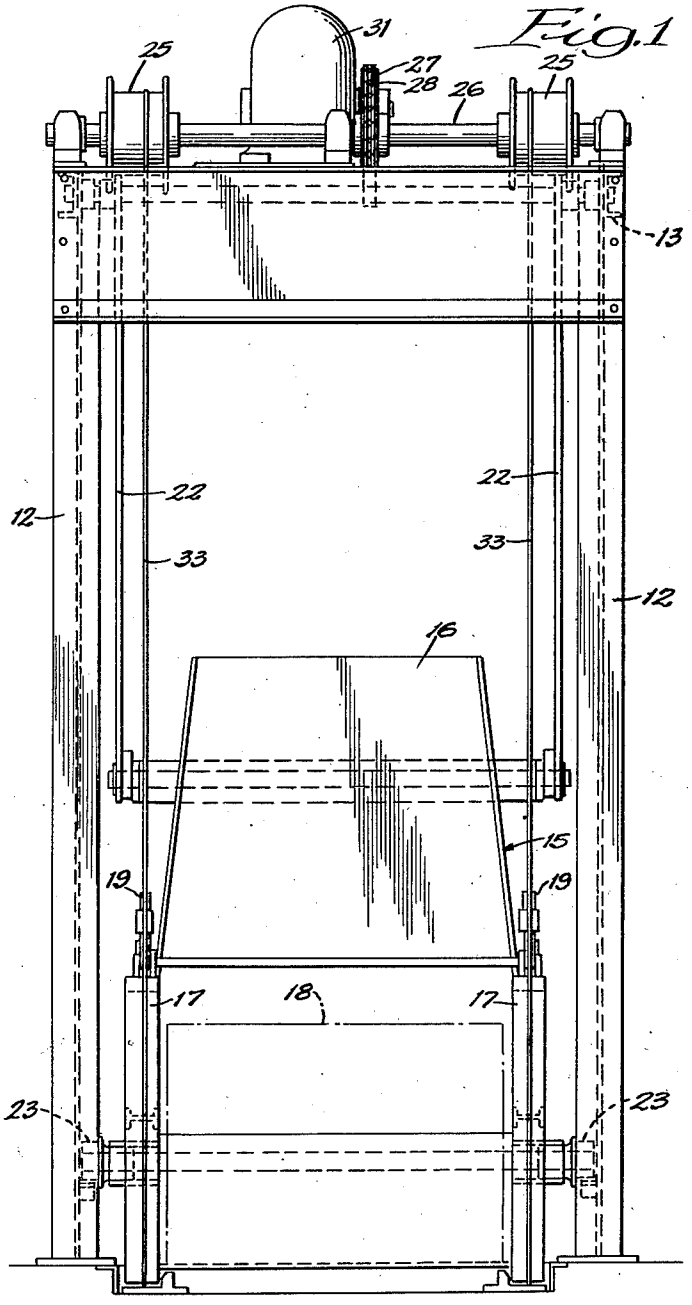
July 2, 1957 F. J. AVERY ET AL 2,797,835

LOADING APPARATUS FOR MATERIAL TREATING MACHINES

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Fig. 1



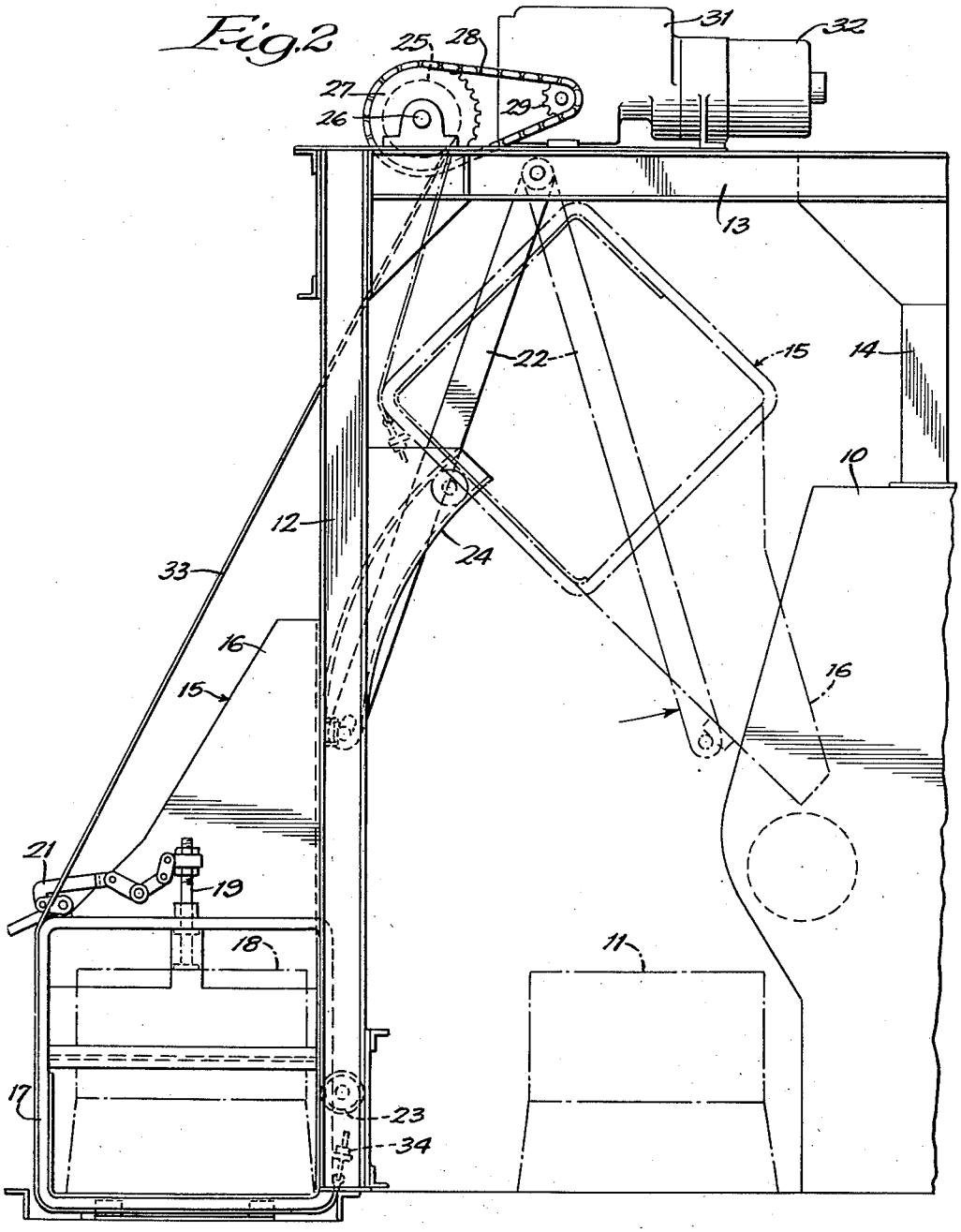
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Fig. 2



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LOADING APPARATUS FOR MATERIAL TREATING MACHINES

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This invention relates to loading apparatus and more particularly to an apparatus for loading lose material, such as castings and the like, into a receiver such as a cleaning apparatus.

In loaders for cleaning apparatus, mills and the like, it is normally desirable to maintain the space immediately in front of the apparatus clear and to position the load carrying device of the loader at floor level spaced from the cleaning apparatus in order to load the device.

It is one of the objects of the present invention to provide a loading apparatus accomplishing these purposes which is relatively simple and inexpensive to construct and which is highly efficient in use.

Another object is to provide a loading apparatus in which the load carrying device is guided in its elevating and tilting movements by guide means formed at least in part by a link pivotally connected to the device.

According to one feature of the invention, the guide link is pivoted at its upper end to an upright frame above the load carrying device and at its lower end to the top part of the load carrying device to guide it for substantially horizontal movement from a loading to a discharging position. The lower end of the device is guided for substantially vertical movement by guide tracks or the like so that the device is elevated and tilted to discharge a load.

The above and other objects and features of the invention will be more readily apparent from the following description when read in connection with the accompanying drawings in which:

Figure 1 is a front elevation of a loading apparatus embodying the invention; and

Figure 2 is a side elevation showing the loading apparatus in association with a cleaning mill to be loaded.

As best seen in Figure 2, a cleaning mill indicated generally at 10 is to be loaded with castings or the like to be cleaned through an elevated loading opening. The space immediately in front of the cleaning mill is preferably to be kept clear to receive containers or the like as indicated at 11 into which the cleaned material can be discharged.

The loading apparatus proper comprises a vertically elongated frame including a pair of side posts 12 spaced from the mill 10 and extending to a level substantially above the top of the mill. Cross beams 13 are carried by the posts and may be supported through short vertical posts 14 resting on top of the mill itself.

The material to be loaded is adapted to be carried by a load carrying device indicated generally at 15 which comprises an upper chute portion 16 open at its top end and a lower body portion 17 which may receive the load proper. The load receiving portion 17 may be in the form of an open top box but as illustrated is in the form of a frame open at its sides to receive a separate box 18 in which the material is carried. The box 18 may be inserted in the frame 17 and may be secured therein by fastening devices 19 operated to locking position through a linkage 21 to hold the box securely positioned within the frame.

The frame and box are normally positioned as shown in full lines in Figures 1 and 2 to receive a load of material to be treated and are preferably at or approximately at floor level for convenience of handling. The load carrying device is adapted to be elevated and tilted to the position shown in dot-dash lines in Figure 2 in which the end of the chute 16 extends into the loading opening of the mill and the box is raised above the loading opening and tilted so that articles therein will flow by gravity through the chute into the mill.

For guiding the box in its elevating and tilting movements, guiding means are provided for separately guiding the upper and lower ends of the box. As shown, the upper end of the box is guided by links 22 pivoted at their upper ends to the cross beams 13 and at their lower ends pivotally connected through the tubular bearing 23 to the upper end portion of the load carrying device. The links 22 normally lie in the position shown in full lines when the load carrying device is in its loading position and swing to the position shown in dot-dash lines in Figure 2 to guide the upper end of the load carrying device substantially horizontally toward the mill.

The lower end of the load carrying device is guided for generally vertical movement to the full tilted position shown in Figure 2. For this purpose the posts 12 form guide tracks having inwardly facing channels to receive guide rollers 23 carried by the lower ends of the load carrying device. At a level substantially horizontally displaced from the lower edge of the load receiving opening track extensions 24 are provided which are arcuately curved about the axis 23 when the links 22 are in their discharging position as shown in Figure 2. The track extensions 24 connect to the track portions of the posts 12 so that the follower rollers 23 will travel vertically up the posts 12 and then arcuately around the extensions 24 as the load carrying device is raised.

To raise the load carrying device from its loading to its discharging position, the beams 13 carry winches 25 which are mounted on a rotatable shaft 26. The shaft carries a sprocket 27 engaged by a chain 28 which is driven through a sprocket 29 by a gear reducer 31 and a motor 32. Cables 33 are wound over the drums 25 and extend over the front and across the bottom of the load carrying device to be secured thereto by anchors indicated at 34.

In use with the load carrying device in its loading position and with a load of material therein, the motor 32 may be energized to raise the load carrying device. When the cables 33 are first tightened they will tilt the load carrying device clockwise about the rollers 23 without raising it from the floor. Since the links 22 swing about an axis spaced above the rollers 23 some relative collapsing movement is required to accommodate the initial tilting movement. For this purpose, as shown, the links 22 are formed with elongated slots 22' at their lower ends through which they are connected to a pivot rod 23' extending through the bearing sleeve 23. As the load carrying device tilts the rod 23' will move up in the slots 22' and then will move down in the slots until it bottoms at the ends of the slots and the links become rigid in tension. Since the links are always carrying a part of the load during actual raising, the tension on the cables 33 is reduced and less power is required than would be the case if the cables were required to carry the full load.

During the actual raising movement, the followers 23 will travel vertically up the posts 12 and the links 22 will swing further to the right to their discharging position. By the time the followers 23 reach the level of the lower ends of the links 22, the end of the chute 16 will be projected into the loading opening of the mill and the lower edge of the loading device will be substantially horizontal.

As the raising movement continues, the followers **23** will travel along the arcuate tracks **24** so that the lower ends of links **22** will be held in the same position with the end of the chute still projecting into the loading opening. As the loading device is raised to its full discharging position shown in dot-dash lines in Figure 2, the material therein will fall through the chute into the mill.

After the mill has been loaded, the motor **32** can be de-energized or reversed and the loading device will return by gravity to its loading position to receive a further load of material. It will be seen that with the present apparatus the loading device is guided very accurately in a simple manner to elevate and tilt it from a loading position to a discharging position. In the discharging position, the discharge chute of the loading device is accurately positioned in the loading opening of the mill so that all of the material will be discharged into the mill with no possibility of spillage. At the same time, the space immediately in front of the mill is left clear so that the treated material removed therefrom can be picked up and carried away without interference from the loading apparatus.

While one embodiment of the invention has been shown and described in detail, it will be understood that this is for the purpose of illustration only and is not to be taken as a definition of the scope of the invention, reference being had for this purpose to the appended claims.

What is claimed is:

1. Loading apparatus comprising a vertically elongated frame having spaced substantially vertical fixed guide members, a load carrying device having a chute open at the top through which material may be discharged, follower members on the device adjacent to one end thereof engaging the guide members to be guided thereby, a link pivoted at one end on a fixed horizontal axis spaced vertically from the other end of the device and connected at its other end to the device adjacent to the other end thereof, and means to raise the loading device relative to the frame so that one end of the device will be guided by the guide members and the other end by the link to tilt the device to an unloading position.

2. Loading apparatus comprising a vertically elongated frame having spaced substantially vertical fixed guide members, a load carrying device having a chute open at the top through which material may be discharged, follower members on the device adjacent to the bottom thereof engaging the guide members to be guided thereby, a link pivoted at one end on a fixed horizontal axis spaced vertically from the other end of the device and connected at its other end pivoted to the device adjacent to the top thereof, and means to raise the loading device relative to the frame so that the lower end of the device will be guided by the guide members and the upper end of the device by the link to tilt the device to an unloading position.

3. Loading apparatus comprising a vertically elongated frame having spaced substantially vertical guide members, a load carrying device having a chute open at the top through which material may be discharged, follower members on the device adjacent to the bottom thereof engaging the guide members to be guided thereby, a link pivoted at one end on a fixed horizontal axis and at its other end pivoted to the device adjacent to the top thereof, and means to raise the loading device relative to the frame so that the lower end of the device will be guided by the guide members and the upper end of the device by the link to tilt the device to an unloading position, the guide members being curved adjacent to their upper ends in a direction toward the point of unloading of the device and extending above the connection of the link to the device.

4. Loading apparatus comprising a vertically elongated frame having spaced substantially vertical fixed guide members, a load carrying device having a chute open at the top through which material may be discharged, follower members on the device adjacent to the bottom thereof engaging the guide members to be guided thereby, a link pivoted at its upper end on a fixed horizontal axis on the frame vertically above the upper end of the device and at its lower end pivotally connected on a horizontal axis to the device adjacent to the top thereof, and means to raise the loading device relative to the frame so that the lower end of the device will be guided by the guide members and the upper end by the link to tilt the device to an unloading position.

5. Loading apparatus comprising a vertically elongated frame having spaced substantially vertical guide members, a load carrying device having a chute open at the top through which material may be discharged, follower members on the device adjacent to the bottom thereof engaging the guide members to be guided thereby, a link pivoted at its upper end on the frame above the device and at its lower end to the device adjacent to the top thereof, the guide members being arcuately curved at their upper ends about the pivotal connection between the link and the device as the parts are positioned when the upper and lower ends of the device are at the same level, the curved portions of the guide members extending above said level, and means to raise the loading device relative to the guide members.

6. Apparatus for loading material into a receiver having an elevated loading opening comprising an upright frame having vertically extending fixed guide members spaced horizontally from the loading opening, a load carrying device having an open top through which material may be discharged into the loading opening, follower means on the lower part of the loading device engaging the guide members to be guided thereby, a link pivoted at one end on a horizontal axis spaced vertically from the upper end of the device and connected at its other end to the upper end of the device to guide the upper end of the device horizontally toward the loading opening as the device is raised, and means to raise the device relative to the frame so that the lower end of the device will be guided by the guide members and the upper end by the link to tilt the device to an unloading position.

7. Apparatus for loading material into a receiver having an elevated loading opening comprising an upright frame having vertically extending fixed guide members spaced from the loading opening, a load carrying device having an open top through which material may be discharged into the loading opening, follower means on the lower part of the loading device engaging the guide members to be guided thereby, a link pivoted at its upper end on the frame above the level of the device and at its lower end to the upper part of the device to guide the upper open end of the device toward the loading opening as the device is raised and means to raise the device relative to the frame.

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