W. TRAVELL.

TRANSFER MECHANISM.

APPLICATION FILED DEC. 27, 1918.

1,333,947. Patented Mar. 16, 1920.

FIG. 1.

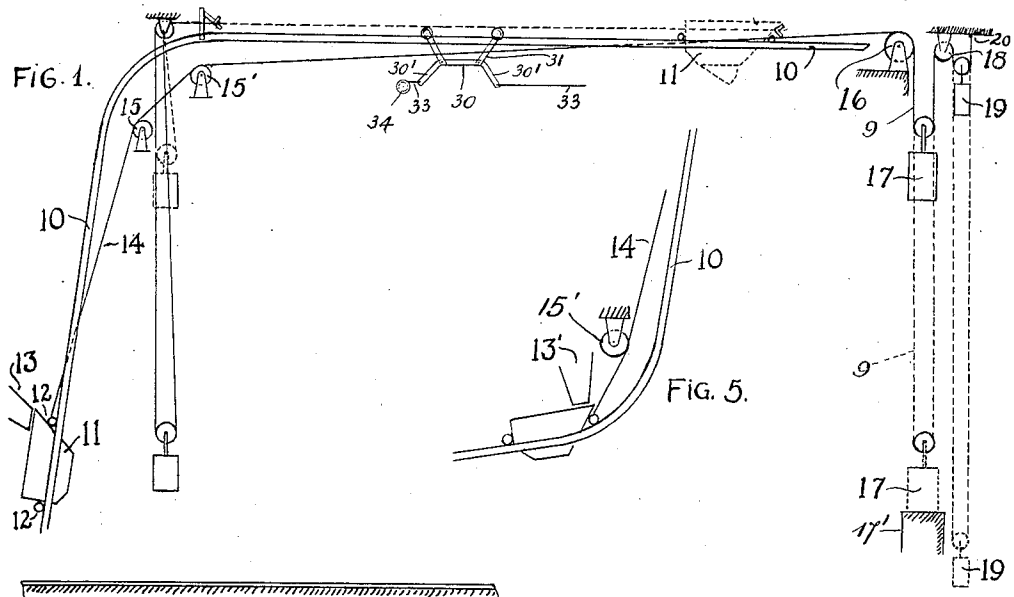


FIG. 5.

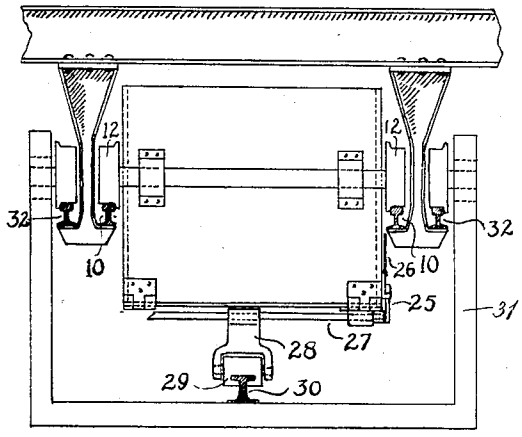


FIG. 4.

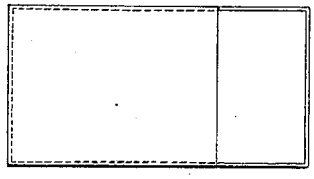


FIG. 2.

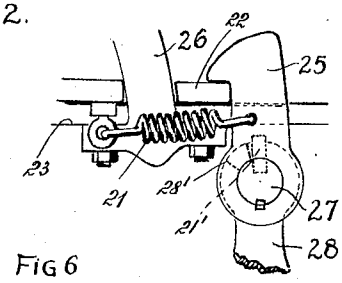
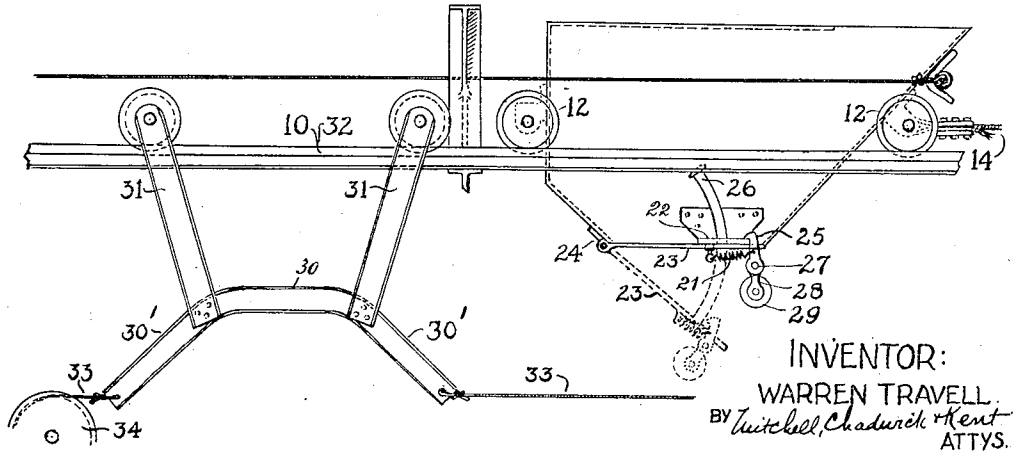


FIG 6

FIG. 3.



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TRANSFER MECHANISM.

1,333,947. Specification of Letters Patent. Patented Mar. 16, 1920.

Application filed December 27, 1918. Serial No. 268,575.

To all whom it may concern:

Be it known that I, WARREN TRAVELL, a citizen of the United States, residing at New York city, in the county of New York and State of New York, have invented new and useful Improvements in Transfer Mechanisms, of which the following is a specification.

This invention relates to improvements in transfer mechanism of the sort known as skip hoists. More particularly it relates to means by which a skip of simple and inexpensive construction may be used for raising and transporting materials and dumping them at any desired point in its horizontal travel. It is an object of the invention to provide a skip which can execute the change from vertical to horizontal tracks, without spilling its contents and without being hung on pivots, or the equivalent. It is also an object of the invention to provide such apparatus which can run initially on a horizontal way in order to be loaded at a distance from the hoist, afterward to rise on the vertical track, and then again to run on a horizontal way to a dumping point at a distance. It is another object to provide means for discharging the contents at any predetermined point in its horizontal movement and to do this automatically. and then to close the discharge, with but small expenditure of power. One form of apparatus for accomplishing the objects of the invention is illustrated in the accompanying drawings, where the skip is seen having a truck with four wheels adapted to run on two rails and having a receptacle which is completely inclosed except at the forward end of its top, considering as the top that side which is upmost when the skip is on the horizontal track. The top is oblong and at its forward end has an opening of sufficient size for the introduction of the load, as from a spout or other loading device. The bottom as portrayed has a single hinged door opening downward, with a latch for holding it closed. Means is provided for operating the door, to open it or to close it automatically, and may if desired be arranged movably on a way, beside the track, so as to operate the door at any predetermined point along the horizontal travel of the skip. The ends of the bottom are inclined downward to the door. When the skip is on the vertical track its said top becomes a side, but owing to the oblong shape and the fact that the opening for filling is at the top end of the side, the receptacle can nevertheless be filled practically full. Other details of the construction will appear hereinafter, or by reference to the accompanying drawings, in which—

Figure 1 is a side elevation showing a skip embodying the invention and the track therefor more or less diagrammatically;

Fig. 2, on an enlarged scale, is a plan of the skip when on the horizontal part of the track;

Fig. 3 is a side elevation of the skip, adjacent track and dumping apparatus;

Fig. 4 is an end elevation of apparatus shown in Fig. 3.

Fig. 5 is a diagram, in side elevation corresponding to Fig. 1, showing the track, loading chute and skip differently arranged; and Fig. 6 is a side elevation of a detail on larger scale.

Referring to the accompanying drawings, a way 10 is seen represented as a pair of rails forming a track, having hoisting and traversing portions, the former being vertical or steeply inclined and the latter being horizontal or gently inclined. The skip has a receptacle 11 with wheels 12 adapted to travel on the track; the whole being suitably positioned with respect to loading chutes 13 or 13′. A hauling rope 14 attached to the skip passes sheaves 15, 15′, to a hoisting drum 16 adapted to be operated by any suitable source of energy, thence around the sheave of a counterweight 17 hanging in a bight of the rope, over a fixed sheave 18, and around the sheave of a smaller counterweight 19 to a point 20 where it is fastened. The counterweight 17 is so arranged that it descends while the skip is ascending the hoisting part of the track, reaches a fixed stop, diagrammatically indicated as being a pedestal 17′, when the skip has reached the top of its hoist, and rests thereon while the skip is on the traverse track. During this last portion of travel of the skip the rope paid out by the drum, to the right in the drawing, passes freely around the sheave of the counterweight 17 and around the sheave 18; and its slack is taken up by descent of the counterweight 19. The latter, being less in weight, moves only when the counterweight 17 is resting on its stop, because it is held up by the heavier counterweight whenever that is hanging on the rope.

The details of construction of the skip are shown in the larger scale drawings, Figs. 2,

3 and 4, where it is seen that the receptacle for the material is closed on all sides, except at the forward end of that part which is on top when the skip is on the horizontal or traversing part of the way. In that position no contents can escape through the top. When the skip is on the hoisting part of the way that which was top has become vertical but the said opening is at the upper part thereof, and it is obvious from the drawing, Fig. 1, that nearly the whole interior space of the skip is available for holding material, notwithstanding the fact that as much as one-third of the length of its upright side may be open. In fact if that side were truly vertical the capacity for holding liquid, up to the level of the lower edge of said opening, would be about four-fifths of the total capacity. For holding earth or coal the maximum would be greater. The wall which is underneath when the skip is in its traverse position has sides that slope suitably for discharge of contents through the bottom; and has an opening at the very bottom through which the discharge may occur, this opening being closed by the door 23, hinged at 24, provided with a latch 25 for holding it closed, and a stop 26 for preventing it from swinging open too far. The latch may be of any suitable style. As portrayed it has a keeper 22 rigid on the outside of the skip, and a movable latching member 25 keyed on a shaft 27 and adapted to be engaged and held by the keeper. A spring 21 is provided for keeping the latch normally in its closed position, as is customary with latches, and the shaft has a lug 21′ by which it may be turned enough to release the latch. With these parts are associated a device for automatically controlling the bottom door. Pivoted loosely on the shaft 27 is an arm 28 having a roller 29 in line with an operating device 30 which has a cam surface 30′ facing forward and another facing backward. If the door 23 is hanging down open, and the skip is moving backward, (to the left in Fig. 3), and while so moving encounters the operating device 30, the cam will gradually close the door 23 until the latch 25 snaps into place and holds it. If the door 23 is closed and the skip is moving forward, the cam 30′ facing in the other direction engages the roller 29 and, swinging it and its arm 28 around the shaft 27, causes the lug 28′ on the arm to engage the lug 21′ on the shaft and thus to turn the shaft, and so to open the latch, allowing the door to fall open by gravity and discharge contents of the skip. Said operating device comprises a truck 31 carrying the cams 30′ and having wheels running on a track 32 parallel with and preferably consisting of a pair of rails outside of the track 10. The truck is attached to a rope 33 controlled by a windlass 34 by means of which it can be moved to any desired position on its track 32. The operation of this portion of the mechanism therefore is effected by simply drawing the skip past the door operating device 30, 31, its passing in one direction causing the door to open and its passing in the other direction causing the door to close and become fastened.

One feature contributing to the efficiency and simplicity of this automatic action is the use of a single door in the bottom instead of double doors or symmetrical openings as are customary in cars which dump through the bottom. This enables the power to be applied directly to the door for closing it, and permits a design in which the depending door does not interfere with any of the other contrivances. However, the design of door and latch may be varied in many ways, and double doors may be used if preferred.

Any suitable means may be employed for loading the skip. In the form illustrated in Fig. 1 there is a chute ordinarily delivering an automatically measured load, discharging downward and sidewise, which shows how the skip may be loaded from above notwithstanding its upmost side is closed. If, however, it be desired to load the skip from a chute discharging directly downward, or to load it from any one of a series discharging downward, the upmost side may be cut off a little at the same corner, or the track 10 may be continued horizontally from the foot of the hoisting portion under the series of chutes, a suitable sheave 15′ being provided above the hoisting rope at the corner; as illustrated in Fig. 5.

By the construction illustrated the skip will hold its load whichever way it may be tipped and whichever way it may be traveling, until the load is automatically discharged. The counterweight 17 may be great enough to more than balance the weight of the empty skip, in which case in the style shown in Fig. 1 the hoisting drum works under an approximately uniform load in whichever direction it is working and may be correspondingly small in size because so much of the weight is balanced. Material can be gathered at any elevation on the hoist, or at any distance to which the track has been extended from the foot of the hoist, and may be discharged automatically at any predetermined position along the elevated traversing portion of the way, for which the apparatus is set from time to time by moving the truck and operating device 31, 30, without it being necessary to have a man at the place where the discharge is to occur.

The invention is not limited to the specific construction herein shown, which merely illustrates one embodiment, details and ar-

rangements of which can be varied in many particulars.

The features of novelty disclosed with regard to the arrangement of track, rope, skip and counterweights form the subject of separate application for patent co-pending herewith. It is intended that the present patent shall cover, by proper expression in the appended claims, whatever features of patentable novelty exist in the disclosed construction of skip and arrangements for emptying it.

I claim as my invention:—

1. In transfer mechanism, the combination of a way having hoist and traverse portions and a skip adapted to move thereon, comprising a receptacle having its side which is upmost when the skip is on the traverse part of the way closed except that the forward end thereof is open, being at the upmost end when the skip is on the hoist part of the way; the side of the skip which is underneath when it is on the traverse part of the way being adapted to be opened for dumping.

2. In transfer mechanism, a way having hoist and traverse portions, combined with a skip comprising a receptacle adapted to move thereon and tip therewith, and being a complete inclosure except for an opening near that edge which is at the top, while it is on the hoist portion, and is forward while it is on the traverse portion.

3. In transfer mechanism, a skip for hoisting and traversing comprising a receptacle whose side which is bottom when on the traverse portion of the way is openable for dumping contents; and whose side which faces upward on the hoist is inclined to the dump when on the traverse and there constitutes a part of the bottom; and whose side which is top on the traverse is lateral on the hoist and is closed except at its upper end; whereby the skip having received material through said upper end of a side holds it notwithstanding the varied inclinations of the way.

4. In transfer mechanism, a skip for hoisting and traversing comprising a receptacle, adapted to run on a track; adapted to dump contents through its bottom when on the traverse; and completely inclosed on all sides, except that there is an opening for filling it near that edge of the skip which is forward on the traverse and upward on the hoist.

5. In transfer mechanism, the combination of a way; a skip adapted to run thereon, having a bottom arranged to swing downward for dumping; a latch holding said bottom closed, and movable to release the bottom; a device, arranged below the skip and adapted to be engaged thereby as the skip passes, adapted to release said bottom when engaged in one direction of movement and to close it when engaged in the other; and means whereby the said device is movable and may be fixed in various positions along the said skip carrying way.

6. In transfer mechanism, the combination of a skip having a bottom adapted to be opened by gravity; a lever latch adapted to hold it closed and having a joint whereby it is inoperative as a lever in one direction; and a bottom operating device comprising a body fixed adjacent to the path of said skip, adapted to engage the latch lever to trip it and to allow the bottom of the skip to open as the skip moves past in one direction; and to engage the lever inoperatively as the skip moves past said device in the other direction.

7. In transfer mechanism, the combination of rails and a skip thereon having a latched dumping bottom; a way extending beside the said rails; a truck adapted to move on said way and to be fixed in position thereon; and means on said truck to engage the said bottom of the skip to unlatch it and to close it.

8. In transfer mechanism, the combination of a way having a traverse portion; a skip having a bottom adapted to be opened by gravity; a latch on the bottom adapted to engage on the body of the skip when the bottom is raised to closed position; a horizontal pivot rod on which the latch swings, extending under the skip; an arm depending from said rod; and means whereby said arm, when engaged by a body which the skip is passing, swings idly in one direction, and on swinging in the other direction engages and moves the latch to release it, thereby dumping the skip.

9. In transfer mechanism, the combination of a way having hoist and traverse portions; a skip adapted to move thereon having a body arranged to dump through the side which is bottom when the skip is on the traverse part of the way and otherwise completely inclosed except for an opening near that edge which is upward both on the hoist part and on the traverse part of the way; a latch controlling the opening of the bottom; and a device movable along the traverse part of the way and fixable in various positions adapted to engage the latch and the bottom, releasing the latch in one direction of movement of the skip, and closing the bottom so that the latch engages and holds the bottom closed when the skip is moved past said device in the other direction.

Signed by me at New York this 6th day of April, 1918.

WARREN TRAVELL.

Witnesses:
J. WILLARD TRAVELL,
J. D. TRAVELL.