A. SUNDH.

ASH LIFT.

APPLICATION FILED AUG. 16, 1907.

950,250.

Patented Feb. 22, 1910.

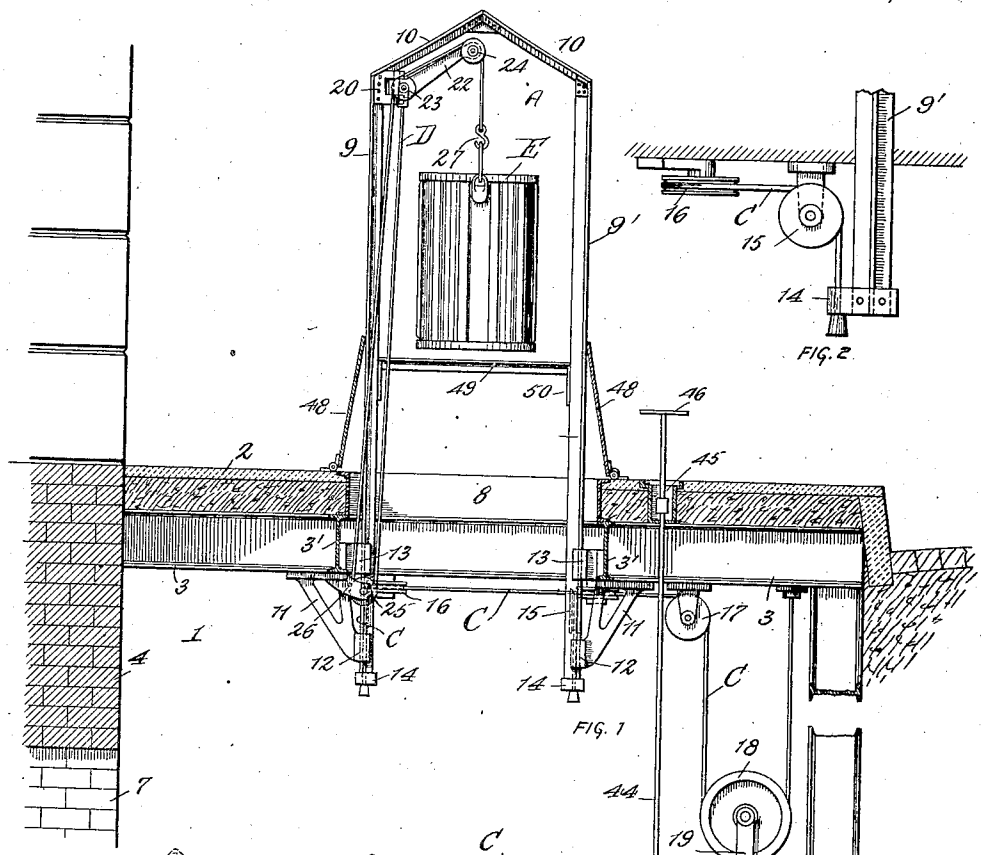

FIG. 1

FIG. 2

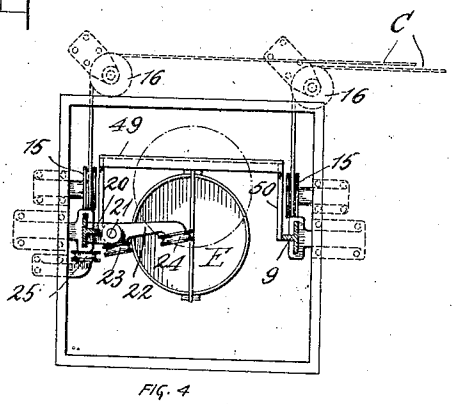

FIG. 4

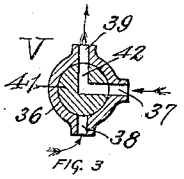

FIG. 3

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AUGUST SUNDH, OF YONKERS, NEW YORK, ASSIGNOR TO OTIS ELEVATOR COMPANY, OF JERSEY CITY, NEW JERSEY, A CORPORATION OF NEW JERSEY.

ASH-LIFT.

950,250. Specification of Letters Patent. Patented Feb. 22, 1910.

Application filed August 16, 1907. Serial No. 388,815.

To all whom it may concern:

Be it known that I, AUGUST SUNDH, a citizen of the United States, residing at Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Ash-Lifts, of which the following is a specification.

My invention relates to ash hoists adapted to raise an ash can or other receptacle from a compartment beneath a sidewalk up through an opening in the walk.

One of the objects of the invention is to provide a device of this character in which a supporting frame which carries the ash can or receptacle is movable up and down through the opening in the walk, and in which the movement of the frame causes a relative movement of the receptacle in the same direction, so that the receptacle has a greater range of movement than the supporting frame.

Other objects of the invention will appear hereinafter, the novel combinations of elements being set forth in the appended claims.

Referring to the drawing, in which is shown a construction embodying my invention, Figure 1 represents a sectional elevation of the hoisting mechanism, the sidewalk and the compartment therebeneath in which the device is installed; Fig. 2 is a detail view of a portion of the hoisting cable and direction sheaves therefor; Fig. 3 is a sectional view of the valve controlling the hydraulic motor; and Fig. 4 is a top plan view of the supporting frame and receptacle.

The hoisting device is installed in a compartment located beneath a sidewalk 2. The portion of the sidewalk 2 over the compartment 1 may be supported by a framework comprising horizontal I-beams 3 secured to the foundation wall 4 and supported at their outer ends by vertical I-beams or supports 5. These vertical supports 5 rest on the cement floor 6 of the compartment 1. The compartment communicates through a door or passageway 7 formed in the wall 4, with a basement or cellar from which the ashes are to be removed.

The hoisting device comprises a vertically movable frame A, a hydraulic motor M, cables C between the frame A and the motor, and a rope or cable D which carries a receptacle E. The supporting frame A is movable up and down through an opening 8 in the walk, from the position shown in Fig. 1 to a position entirely beneath the walk. This frame A comprises two vertical side members 9, 9′ in the form of T-irons and similarly shaped top members 10 riveted thereto and forming a rigid framework. The side members 9, 9′ are guided in their vertical movements by brackets 11 secured to the under side of the framework 3, and having guiding portions 12 embracing the side flanges of the members 9, 9′. Additional guide brackets 13 engage the members 9, 9′ some distance above the guiding portions 12, the two sets of guides 12 and 13 insuring a free vertical movement of the supporting frame without either lateral play or bending. The brackets 13 are secured to the I-beams 3′ which form part of the side walls of the opening 8.

The frame A is lifted and lowered by means of cables C. These cables are each secured at one end to a block 14, the block 14 being located at the lower ends of the members 9, 9′ and also forming stops to limit the vertical movement of the frame A. The cables C extend from the blocks 14 upwardly and over vertical direction sheaves 15, thence rearwardly to horizontal sheaves 16, from the sheaves 16 laterally to vertical sheaves 17, thence downwardly and beneath sheaves 18 and upwardly to the framework 3 where the end of the cable is secured. The direction sheaves 15, 16 and 17 are all carried by brackets secured to the framework 3. The sheaves 18 are journaled in a frame 19 which carries the counterweight W.

In the upper part of the frame A is a bracket 20 to which is connected a swinging arm 22 by a pivot 21 (Fig. 4) which is either vertical or slightly inclined with its upper end nearer the center of the frame. This arm 22, as shown in Fig. 1, extends in an upwardly inclined direction to a point about midway between the sides of the frame, and carries two direction sheaves 23 and 24 near its pivot and outer end, respectively. The rope or cable D is secured at one end to the bracket 20, or at any suitable point near the sheave 23, and extends downwardly and around a sheave 25 carried by a bracket 26 secured to the framework 3, from the sheave

25 upwardly and over the sheaves 23 and 24 and is provided at its free end with a hook 27 for the ash can E or other article.

Any convenient form of motor or other driving means may be employed for lifting and lowering the frame A, and with it the load E. In this instance I have shown a well known form of hydraulic motor M. This motor comprises a cylinder 30 having top and bottom cylinder heads 31 and 32, respectively, a piston 33 and a piston rod 34, secured at its upper end to the counterweight frame 19. The fluid for operating the motor flows to and from the cylinder 30 through a three-way valve V which communicates with the cylinder through a pipe 35 near the top of the cylinder. The valve chamber 36 has three ports or openings 37, 38, 39. The port 37 opens into the pipe 35 leading to the motor cylinder, the port 38 is connected to a source of fluid supply, and the port 39 opens into the exhaust pipe 40. The rotatable valve member 41 is provided with a passageway 42, which in the position shown in Fig. 3 connects the port 37 communicating with the motor cylinder to the exhaust port 39. The valve member 41 is rotatable through an angle of 90° to a position in which the passageway 42 connects the port 37 with the supply port 38. The valve may be operated by means of a hand lever 43 carried by a vertical rod 44 secured at its lower end to the valve member 41. The rod 44 extends upwardly into a recess 45 in the sidewalk where its upper end is squared or otherwise suitably formed to receive a removable wrench or key 46, by means of which the valve V may be controlled by a person on the sidewalk. At the lower end of the motor cylinder is a pipe 47 open to the atmosphere and permitting the free or retarded entrance and escape of air below the piston as it travels up and down.

A pair of trap doors 48, hinged on opposite sides of opening 8, are opened by the frame A as it moves upwardly, and swing down to a closed position by their own weight as the frame A is lowered beneath the walk. The top members 10 being upwardly inclined toward the center, engage the free ends of the doors first and lift them more gradually and with less pressure and less strain on the doors than if the top of the frame A were flat. Extending across the frame A is a rest or support 49 which is carried by arms 50 extending outwardly from the members 9, 9', in order to bring the support 49 out of the vertical line of travel of the receptacle E.

The operation of the hoisting device will not need any detailed explanation, in view of the above description, but will be briefly stated. Assuming that the parts are in the position shown with the carrying frame A at its upper limit of travel, and the valve V open to exhaust, the frame A will descend by its own weight. As it descends, the cable C will draw the sheaves 18 upwardly at half the speed with which the frame descends. The sheaves 18 will carry upwardly with them the counterweight W, piston rod 34 and piston 33, which latter will force the fluid out of the cylinder through the exhaust port 39. As the carrying frame A moves downwardly, the receptacle E will be moved downwardly three times as fast as the fram. This will be apparent by considering that s the frame A moves downwardly, the sheave 23 moves toward the sheave 25, shortening both leads of the cables D extending from the sheave an amount equal to the downward travel of the frame and adding double this amount to the lead extending from the sheave 24 to the receptacle A. This with the bodily movement downward of the sheave 24 gives a movement of the receptacle through three times the vertical distance that the carrying frame travels. In other words, the descent of the point 23 lets the bucket E descend a corresponding distance, and the descent of the point 24 lets it descend twice this distance additionally. As a result, the receptacle C is moved downwardly to the bottom of the compartment 1 by the time the frame A has been lowered beneath the surface of the walk. As the frame A approaches its lowered position, the doors 48 close automatically, the piston 33 reaches its upper limit of travel, and the parts come to rest without further attention. When it is again desired to elevate a can E of ashes, the valve member 41 is turned through an angle of 90° to bring the port 37 in communication with the supply port 38 and admit fluid under pressure to the cylinder above the piston 33. The piston will thus be lowered, operating through the cables C and D to elevate the parts to the position shown. The counterweight W may be sufficiently heavy to nearly balance the weight of the moving parts, so that little power is needed beyond that necessary to lift the load in the receptacle E. When the can has been elevated it may be swung outwardly, or by slackening the cable allowed to rest on the support 49. The speed with which the receptacle is lifted and lowered is under the control of the operator who may reduce the speed at will by turning the valve and throttling the fluid to a greater or less extent as it passes through the valve to and from the cylinder. The speed may also be limited by the size of the air passage 47.

I have shown and described a construction embodying my invention, but it is obvious that various changes in details of construction and arrangement of parts might be made by those skilled in the art without departing from the spirit and scope of the

invention. I wish, therefore, not to be limited to the precise construction disclosed.

What I claim as new and desire to secure by Letters Patent of the United States is:—

1. In a hoisting device, the combination with a frame, and means for lifting the frame, of a load-carrying device, a cable connected thereto and to the frame, and a fixed direction sheave for the cable mounted on a stationary support.

2. In a hoisting device, the combination with a frame, and means for lifting the frame, of a stationary support, a sheave mounted thereon, a sheave carried by the frame and located at a point above the first-named sheave, a load-carrying device, and a cable connected to the frame at a point above said first-named sheave and to the load-carrying device and engaging said sheaves.

3. In a hoisting device, the combination with a frame, a cable connected thereto, and means to operate the cable to lift and lower the frame, of a load-carrying device, a cable having stationary connection with said device and the frame, and a stationary sheave over which said last-named cable passes.

4. In combination with a sidewalk provided with an opening therethrough, and a compartment beneath the walk, of hoisting mechanism comprising a frame, means for moving the frame up and down through said opening, a load-carrying device, and means for moving it up and down through the opening simultaneously with but at a greater speed than the frame.

5. The combination with a walk provided with an opening therethrough, and a compartment beneath the walk, of a supporting frame movable up and down through the opening, and a load-carrying device connected to the frame and movable therewith at a greater speed than that of the frame.

6. The combination with a walk provided with an opening therethrough, and a compartment beneath the walk, of a supporting frame, means for moving it upwardly in said opening, a load-carrying device connected to the frame for movement therewith, and means for multiplying the movement of said device.

7. The combination with a walk provided with an opening therethrough, and a compartment beneath the walk, of a frame, means for moving it up and down through the opening, a cable connected to the frame, a direction sheave carried by the frame and with which the cable engages, and a stationary sheave located below said cable connection and direction sheave and with which the cable engages.

8. The combination with a walk provided with an opening therethrough, and a compartment beneath the walk, of a frame, means for moving the frame up and down through the opening, a load-carrying device connected to the frame for simultaneous movement therewith from a position below the frame when the frame is below the walk to a position within the frame when the frame is above the walk.

9. The combination with a walk formed with an opening therethrough, and a compartment beneath the opening, of a load-carrying device movable up and down through said opening, a motor connected thereto, and means for controlling the motor from a position either above or below the walk.

10. The combination with a walk provided with an opening therethrough, and a compartment beneath the walk, of a load-carrying device movable up and down through the opening, a hydraulic motor located in the compartment and operatively connected to the load-carrying device, a valve controlling the motor, and means within the compartment, and extending above the walk for operating the valve.

11. The combination with a walk provided with an opening therethrough, and a compartment beneath the walk, of a frame movable vertically in said opening, guide brackets secured at the sides of the opening and guiding the frame, an arm pivoted near the top of the frame for horizontal movement, sheaves carried by the arm near its pivot and outer end, respectively, a bracket located near the edge of the opening, a sheave carried thereby, a cable secured at one end near the top of the frame and engaging each of said sheaves, a load-carrying device at the free end of the cable, and a supporting member extending across the frame in position to support the load when the pivoted arm is swung outwardly from a central position.

12. The combination with a frame movable through an opening, of a movable arm or bracket connected to said frame, a receptacle suspended from said arm, and apparatus for lifting said frame and receptacle.

13. The combination with a frame movable through an opening, of a swinging arm pivoted to said frame, a connection for suspending a load from said arm, and apparatus for hoisting both the said frame and the said connection.

14. The combination with a frame, of a receptacle, an arm and connections for suspending said receptacle from said frame, and a support for the receptacle and connected to said frame.

In testimony whereof, I have signed my name to this specification in the presence of two subscribing witnesses.

AUGUST SUNDH.

Witnesses:
CHAS. M. NISSEN,
ALFRED C. BECHET.