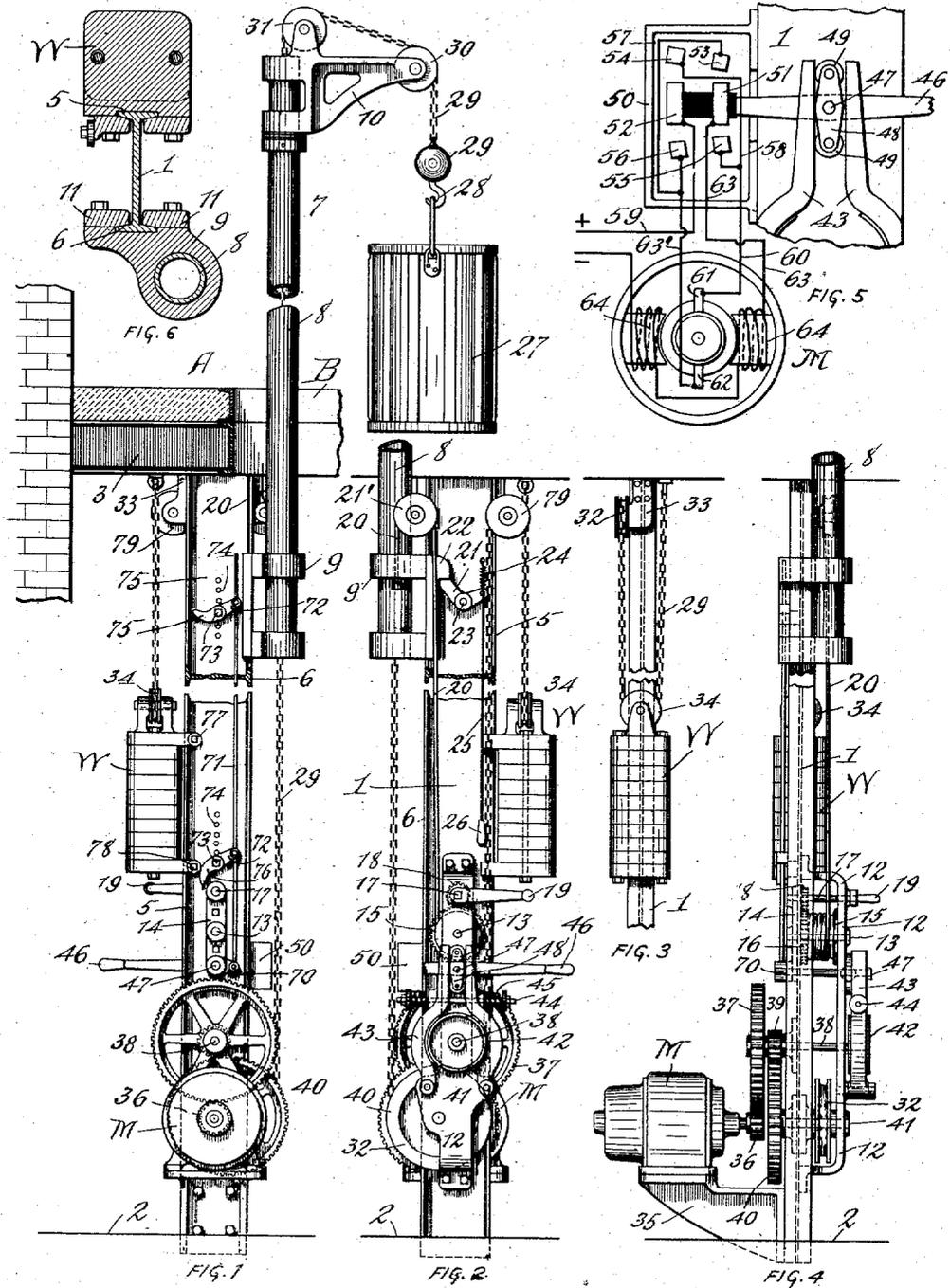


D. LARSON.
 ASH HOIST.
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ASH-HOIST.

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Specification of Letters Patent.

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To all whom it may concern:

Be it known that I, DAVID LARSON, a subject of the King of Sweden, residing at Yonkers, in the county of Westchester and State of New York, have invented a new and useful Improvement in Ash-Hoists, of which the following is a specification.

My invention relates to an improved form of hoisting device or elevator of the type known as sidewalk elevators, and is especially adapted for hoisting ashes or other articles from a cellar or basement 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 which is simple in construction and in which all the parts may be assembled before it leaves the shops, and which may be easily and quickly installed and without the employment of skilled labor.

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

Referring to the drawings, Figure 1 is an elevation showing the device installed and the parts in a position assumed while it is in use; Fig. 2 is a similar view from the opposite side, with the portion above the sidewalk broken away; Fig. 3 is a fragmentary view of the counterweight and chain; Fig. 4 is a view taken at right angles to Fig. 2; Fig. 5 is a diagrammatic view of the motor and controller; and Fig. 6 is a sectional view of the guide rails and parts in sliding engagement therewith.

The hoisting device is shown as installed beneath a sidewalk A in position for lifting ashes, or for lifting or lowering other material through a manhole or opening B in the walk. The framework comprises an I-beam 1 having its lower end embedded in the floor 2 of the cellar or basement, and its upper end secured in any suitable way to the beam 3 or other framework supporting the sidewalk. The flanges 5 and 6 of the I-beam 1 form guide rails respectively for the counterweight W and a vertically movable frame 7. The frame 7 comprises a tubular body portion 8, a lower guide-bracket 9 and an upper bracket 10. The guide bracket 9 is recessed as shown in Fig. 6 to receive the flange or guide rail 6 of the I-beam. Bolted to the inner surface of the bracket 9 are guide strips 11 which engage

the inner surface of the flange 6, and together with the body of the bracket securely hold the frame 7 in sliding contact with the guide rail 6.

Provision is made for lifting and lowering the frame 7 as follows. Bolted to one side of the beam 1 is a plate or bracket 12 which, as shown in Fig. 4, is parallel with the beam and spaced therefrom a short distance. A spindle or shaft 13 is journaled at one end in the plate 12 and extends through the beam 1 and has its opposite end journaled in a bearing plate 14 secured to the beam opposite the upper end of the plate 12. The shaft 13 carries a winding drum 15 and a gear wheel 16. Above the shafts 13 is a crank shaft 17 also journaled in the bearing plates 12 and 14. The shaft 17 has keyed thereto a pinion 18 meshing with the gear wheel 16, and a hand crank 19. A hoisting rope 20, secured at one end to the bracket 9, extends over a sheave 21 carried by a bracket secured to the upper end of the beam 1, and the opposite end of the rope is attached to the winding drum 15. When the hoisting device is not in use, the frame 7 is allowed to remain below the surface of the walk, but it can be lifted into position for use by turning the crank 19 and winding the rope 20 on the drum 15, thus lifting the frame to the position shown. The frame 7 is locked in a raised position by an arm 21 (Fig. 2) engaging beneath a cam lug or catch 22 on the bracket 9. The arm or latch 21 forms one member of a bell crank lever pivoted at 23 to the beam 1. The arm 21 is normally held in the path of travel of the cam 22 by a coil spring 24 attached to the opposite end of the lever. A cord or rod 25 is attached to the bell crank lever and extends downwardly to within convenient reach of the operator, and is provided at its lower end with a handle 26. When it is desired to lower the frame 7 the handle 26 is pulled downwardly, which releases the arm 21 from the lug or catch 22 and permits the frame to descend by its own weight, the speed of descent being controlled if desired by the crank 19. When the frame 7 is lifted the cam 22 swings the latch arm 21 outwardly, and as soon as the cam has passed beneath the catch 22 and holds the frame 7 in its lifted position. The ash can 27 or other receptacle or article to be lifted or

lowered is attached by a hook 28 to the end of the hoisting chain 29. This chain passes over pulleys 30, 31, journaled in the bracket 10, down through the tube 8 to a drive wheel 32, from the drive wheel up over a sheave 79 journaled in a bracket 33 secured to the beam 1, from the sheave 79 down and beneath a sheave 34 journaled on the top of the counterweight W, and up to the frame 3 where it is attached.

Any suitable means may be provided for operating the drive sheave 32, and in this instance I have shown an ordinary series wound direct current motor M. This motor is carried by a bracket 35 bolted to the lower end of the beam 1, and is operatively connected to the drive sheave 32 through reduction gearing comprising a pinion 36 on the motor shaft, a gear wheel 37 keyed to a shaft 38 and meshing with the pinion 36, a pinion 39 also keyed to the shaft 38 and meshing with a gear wheel 40 secured to the shaft 41 of the drive sheave 32. The shaft 38 extends through the plate 12 and carries on the outside of said plate a brake pulley 42. On opposite sides of the pulley 42 are brake levers 43 pivoted at their lower ends to the plate 12. A horizontal rod 44 passes through the brake levers and is provided with washers near its ends, between which and the levers are coil springs 45 surrounding the rod 44 and normally holding the brakes applied.

The controller lever 46 is carried by a pivot 47 (Fig. 5) and has secured at right angles thereto a short arm 48 extending above and below the lever and carrying at its opposite ends anti-friction rollers 49. The brake levers 43 extend upwardly on opposite sides of the arm 48 and bear against the rollers 49 and normally hold the controller lever in a horizontal position. The inner end of the controller lever extends into a switch box 50 secured to the beam 1, and carries within said box two insulated contacts 51, 52. Fixed contacts 53, 54 and 55, 56 are located respectively above and below the movable contacts. The contacts 53 and 56 are connected by a wire 57, and the contacts 54, 55 are connected by a wire 58.

The motor is supplied with current from any suitable source, the positive and negative mains being here designated + and -. When the lever 46 is in its central position the motor circuit is open. If now the outer end of the lever 46 is moved downwardly, the contacts 51 and 52 will be moved upwardly into contact with the fixed contacts 53 and 54, respectively. This will close a circuit through the motor as follows,—from the positive main through the wire 59, contacts 52, 54, wires 58, 60 to the upper brush 61, through the armature to lower brush 62, through wires 63', 57, contacts 53, 51, wire 63, field winding 64 to the negative main.

If the lever 46 is reversed so that the contacts 51 and 52 engage the contacts 55, 56, the circuit through the motor will be as follows,—from the positive main through wire 59, contacts 52, 56, wire 63' to the lower brush 62, through the armature to the upper brush 61, through wire 60, contacts 55, 51, wire 63, and field winding 64 to the negative main. The direction of the current through the armature is thus reversed, while it remains the same through the field winding, which will cause a reversal of the motor. If the outer end of the controlling lever 46 is moved downwardly, the direction of the motor will be such that the receptacle 27 is moved downwardly, while if the lever is moved upwardly the motor will run in the reverse direction and move the receptacle 27 upwardly. The arm 48 operates to separate the brake levers 43 and release the brakes when the lever 46 is operated in either direction, and when the lever 46 is released the springs 45 operate through the brake levers to return the controller automatically to its central position and open the motor circuit as well as apply the brakes.

Means for positively operating the controller lever 46 automatically as the receptacle 27 approaches its upper and lower limits of travel are provided as follows,—the pivot shaft 47 which carries the controller lever 46 extends through the bearing plate 12 and I-beam 1 and has secured thereto on the opposite side of the beam 1 from the lever 46 a short crank arm 70. Pivoted to the arm 70 and extending upwardly, vertically therefrom, is a rod 71 which is connected to short arms 72. These arms 72 are carried by stub shafts 73, each journaled in any one of a series of holes 74. Secured to the stub shafts 73 are upper and lower cams 75 and 76, respectively. These cams are in the path of movement of upper and lower cam engaging rollers 77 and 78 carried by the counterweight W. The series of holes 74 constitute a means for adjusting the height of the cams 75, 76, and therefore the positions of the counterweight at which the cams will be actuated.

The operation of the hoisting device may be briefly described as follows,—let it be assumed that the carrier frame 7 has been lifted to operative position in the manner already explained, and that the various parts are in the position shown, with the motor circuit open, the brakes applied and the ash can 27 in its upper position, ready to be lowered. If now the operator moves the controller lever 46 downwardly, the brake levers 43 will be moved outwardly and release the brake shoes, and a circuit will be closed through the motor which will begin to run in a direction to lower the can 27, that is, the drive sheave 32 will be rotated in a clockwise direction as viewed in Fig. 2.

A weight 29' on the end of the chain 29, with the receptacle, overbalances the weight of the chain leading up from the drive sheave, so that the receptacle is lowered and the chain kept taut. As the drive sheave rotates the counterweight W is moved upwardly at half the speed with which the receptacle is lowered. When the lever 46 is moved downwardly, the rod 71 is moved upwardly, swinging the cams 75 and 76 to a downward position. When the receptacle 27 reaches or approaches the lowermost position the roller 77 on the counterweight W engages the cam 75 and swings it upwardly, moving the rod 71 downwardly and returning the controller lever 46 to a central position. This opens the motor circuit and applies the brakes, bringing the parts to rest. When it is desired to lift the receptacle 27 the controller lever 46 is moved upwardly to again release the brakes and operate the motor in the reverse direction, at the same time swinging the cams 75, 76 upwardly. As the load reaches its upward limit of travel the roller 78 on the counterweight W moves the cam 76 downwardly and again centers the controlling lever to again bring the parts to rest. The automatic stop devices may be adjusted to operate the controller when the receptacle is at any desired depth below the sidewalks, and also at any desired height above the walk.

I have shown and described a construction embodying my invention in a practical form, but I do not wish to be limited to the exact construction disclosed, as various changes in details and arrangement of parts might obviously be made by those skilled in the art without departing from the spirit and scope of the invention.

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

1. In a hoisting device, the combination with a guide rail, of a tube, a bracket carried thereby and having a sliding connection with the guide rail, an arm carried by the tube, sheaves journaled in said arm, a flexible hoisting member engaging the sheaves and extending through the tube, and means for driving the hoisting member.

2. In a hoisting device, the combination with a vertical I-beam, of a frame slidably mounted thereon, a flexible hoisting member engaging the frame, and means carried by the I-beam for driving the hoisting member.

3. In a hoisting device, the combination with a vertical I-beam, of a frame movable longitudinally thereof, sheaves journaled in the frame, a motor supported on said I-beam, a hoisting chain engaging the sheaves, and driving connections between the motor and chain.

4. In a hoisting device, the combination of a vertical supporting member, guides extend-

ing longitudinally thereof, a frame having a sliding connection with one of the guides only, direction sheaves carried by the frame, a drive sheave on the supporting member, a counterweight connected to the other guide only, and a hoisting chain or cable associated with the direction sheaves, drive sheave and counterweight.

5. In a hoisting device, the combination of a vertical I-beam, a frame and a counterweight having a sliding connection respectively with the flanges of the I-beam, means for holding the frame in an adjusted position, a drive sheave mounted on the I-beam, and a hoisting chain or cable associated with the frame, drive sheave and counterweight.

6. In a hoisting device, the combination with a vertical support, of a frame mounted for vertical movement thereon, a cam lug carried by the frame, a latch carried by the support in the path of movement of the lug and engageable beneath said lug to hold the frame in its lifted position, and a releasing device connected to said latch and extending below the frame when the latter is in its elevated position.

7. In a hoisting device, the combination with an electric motor, a controlling lever, and a reversing switch in the motor circuits controlled by said lever, of a hoisting cable geared to the motor, a counterweight, cams operated by the counterweight at its upper and lower limits of travel, and connections between the cams and controlling lever.

8. In a hoisting device, the combination with a motor, a controlling lever, a hoisting cable, a counterweight, and driving connections between the cable and motor, of cams located in the path of travel of the counterweight, and connections between the cams and controlling lever.

9. In a hoisting device, the combination with a vertical supporting member, a hoisting cable or chain, driving means therefor, a lever controlling said driving means, and a counterweight, of cams carried by said supporting member in the path of travel of the counterweight, and a connection between the cams and controlling lever.

10. In a hoisting device, the combination with a hoisting chain, driving means therefor, and a controller for the driving means, of a vertical supporting member, a counterweight associated with the hoisting chain and slidable vertically along said member, cams pivoted to said member and extending into the path of travel of the counterweight, and operative connections between the cams and the controller.

11. In a hoisting device, the combination with a hoisting chain or cable, driving means therefor, a controller for the driving means, and a counterweight associated with the chain or cable, of cams located in the path of travel of the counterweight, operating

connections between the cams and controller, and means for adjusting the positions of the cams.

12. In an ash hoist, the combination with a vertical supporting member, a hoisting cable, and a counterweight, of the following parts supported by said member,—a frame vertically adjustable thereon, apparatus for moving the frame, a device for holding it in its lifted position, a motor, a drive sheave, reduction gearing between the motor and drive sheave, motor controlling mechanism, and brake mechanism.
13. In an ash hoist, the combination with an I-beam, of a carrier guided by one set of flanges of said I-beam, a counterweight guided by the other set of flanges of said I-beam, hoisting apparatus, and connections between the latter and both the carrier and counterweight.
14. In a hoisting device, the combination with a vertical I-beam, of a frame and a counterweight having a sliding connection therewith, a flexible driving connection between the frame and counterweight, and driving mechanism.

15. In hoisting mechanism, the combination with a motor, of a load-carrying device, driving connections between said parts, a plurality of cams, a connection between said cams for effecting their simultaneous operation, a controller for the motor operatively connected to said cams, and a device for automatically operating said cams respectively as the load-carrying device approaches its upper and lower limits of travel.

16. In hoisting mechanism, the combination with a motor, of a load-carrying device, a counterweight, a flexible driving member connecting the load-carrying device, motor and counterweight, a cam in position to be operated by the counterweight, a brake for the motor, and operating connections between said brake and cam.

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

DAVID LARSON.

Witnesses:
JOHN BELOFF,
C. F. CHYTRAUS.