Dec. 8, 1953 H. J. HULSART 2,661,816

PIT-TYPE ELECTRIC ELEVATOR

Filed Aug. 21, 1950

Fig. 1.

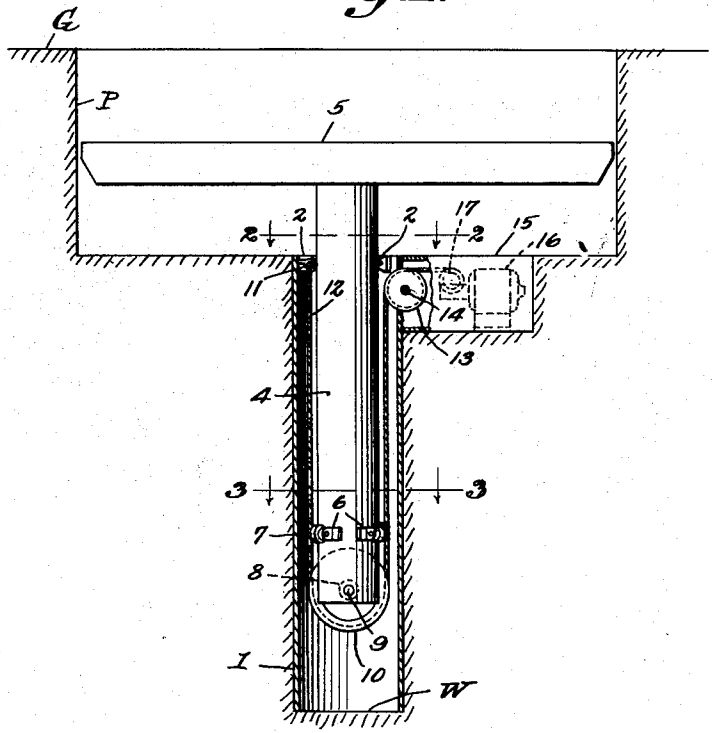


Fig. 2.

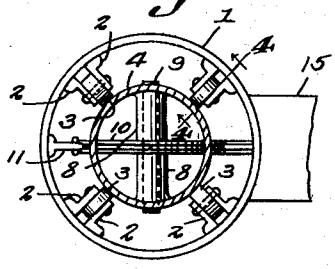


Fig. 3.

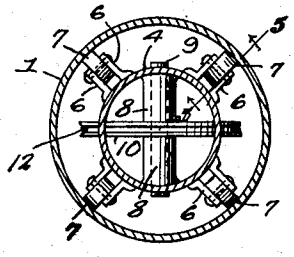


Fig. 4.

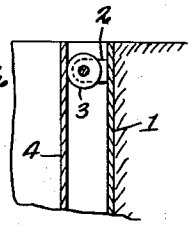
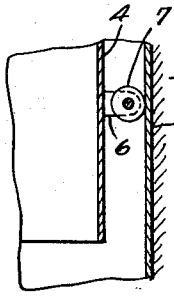


Fig. 5.



H. J. Hulsart

INVENTOR

BY C. A. Snow & Co.

ATTORNEYS.

Patented Dec. 8, 1953 2,661,816

UNITED STATES PATENT OFFICE

2,661,816

PIT-TYPE ELECTRIC ELEVATOR

Harold J. Hulsart, Tuscaloosa, Ala.

Application August 21, 1950, Serial No. 180,627

1 Claim. (Cl. 187—8.41)

1

This invention relates to a compact pit-type electric elevator for use in manufacturing plants and similar locations, for lowering materials into a pit for the purpose of keeping the top of the load at a convenient height for workers, and to enable floor trucks and skids to handle higher loads.

By way of background, it may be noted that electrically, mechanically, or hydraulically actuated elevators have been utilized in similar circumstances, but in general, have had certain disadvantages. For example, in many instances a certain amount of fixed lifting apparatus is required above the floor level. In other instances it is necessary that tubing or pipe members be machined, as in the case of hydraulic lifts, and in general, the cost of these devices has been rather high.

An important object of the present invention, accordingly, is to provide an elevator of the character described which can be manufactured at considerably less cost than other elevators, while still being adapted to support loads of the same weight as said other elevators, and without reduction of over-all efficiency.

Another important object is to provide a pit-type elevator construction of the character described which is so designed as to permit any of various conventional lifting means to be utilized therewith, as for example, a motor and winch unit, gear rack and pinion, or threaded shaft or feed screw.

Another important object is to provide a pit-type elevator of the character indicated which will, when lifted by means of a cable or chain, be capable of rotation as to its load supporting platform, to some extent when above the ground level, and which will automatically realign itself with the pit for lowering without the necessity of anti-rotating devices such as are required in connection with other type of elevators now in use for similar purposes, such as single-piston hydraulic pit-type lifts.

With the foregoing and other objects in view which will appear as the description proceeds, the invention consists of certain novel details of construction and combinations of parts hereinafter more fully described and pointed out in the claim, it being understood that changes may be made in the construction and arrangement of parts without departing from the spirit of the invention as claimed.

Referring to the drawings

Figure 1 is a side elevational view of a pit-type elevator formed in accordance with the

2

invention as it appears when mounted in a pit and ready for use.

Fig. 2 is an enlarged section on line 2—2 of Fig. 1.

Fig. 3 is an enlarged section on line 3—3 of Fig. 1.

Fig. 4 is a section on line 4—4 of Fig. 2.

Fig. 5 is a section on line 5—5 of Fig. 3.

Referring to the drawings in detail, formed in the ground surface G is a pit P in the central portion of which is dug a well W.

Sunk in the well W is a cylindrical casing 1 open at its upper end. A plurality of circumferentially spaced inwardly extending pairs of roller brackets 2 are mounted in the upper end of said casing 1 and extend radially and inwardly from the wall of the casing. Rollers 3 are carried by these brackets and comprise guide rollers rollably engaging the vertically reciprocable tubular piston 4 having up and down movement in the outer casing. A load-supporting platform 5 is mounted upon the upper end of the piston 4 within the pit P, and is adapted to support a load of selected material, not shown.

Adjacent its lower end, the piston 4 is provided with a circumferential series of spaced pairs of roller brackets 6 provided with rollers 7. The brackets 6 are secured to the exterior surface of the piston wall, and extend radially and outwardly therefrom towards the wall of the outer casing, the rollers 7 having rollable contact with the casing wall.

By reason of this arrangement, it may be noted that in any position of vertical adjustment of the piston 4, it is retained in a prescribed position within the outer casing 1.

At its lower end, the piston 4 has rigidly mounted therein the coaxial bearing sleeves 8, in which is journaled a shaft 9 on which is rotatable a pulley 10. The lower end portion would be provided with diametrically opposed vertical slots accommodating said pulley, as will be readily appreciated.

At the upper end of the casing 1 there is mounted an eye 11 in which is secured one end of a rope or cable 12, that extends downwardly in the space between the piston and the casing wall and passes around the pulley 10, the cable then passing up the space between the piston and casing wall, and being trained over a sheave 13 rotatably mounted as at 14 in a housing 15 sunk in the pit P. Mounted in said housing are an electric motor 16 and winch unit 17 used for winding and unwinding the cable 12 for elevation or lowering of the platform 5.

Although one form of lifting means is illustrated in the drawings, namely a winch means, I believe that other means for elevation or lowering of the piston can also be utilized, for example, a rack and pinion, with the pinion being mounted in the position of the sheave of the present example, and with the rack being secured vertically to the exterior surface of the piston 4. Or, a screw can be mounted upon the external surface of the piston cylinder 4, to be engaged with a follower rotated by the motor within the housing.

The cable arrangement does have the advantage, however, of permitting partial rotation of the platform 5 when it is elevated above the ground surface G, and when released after said partial rotation, the platform 5 will automatically realign itself with the pit, by the pull of the cable 12, which will have been twisted somewhat out of position when the platform was rotated. The tendency of the cable to return from the spiral position to which it would have been moved to a position in which it is fully vertical will automatically serve to realign the parts of the apparatus in the position illustrated in Fig. 1.

The device has particular important characteristics in respect to its comprising a compact pit-type electric elevator, capable of manufacture at far less cost than conventional electric or hydraulic elevators now in use.

What is claimed is:

A pit-type elevator construction comprising an outer casing adapted to be sunk into a well extending downwardly below the bottom surface of a ground pit, a plunger disposed within said casing and vertically movable up and down therewithin, guide rollers carried by the plunger for maintaining the same in proper spaced relation

to said casing, a platform carried by the upper end of said plunger and rigidly secured thereto and normally disposed within said pit below the ground level, a pulley carried by the lower end of said plunger and having its periphery extending below said plunger and beyond the opposite sides thereof, a guide sheave mounted adjacent the upper end of said casing and having its periphery projecting into said casing, a flexible cable secured to said sheave and extending around the pulley and attached to said casing adjacent the upprer end thereof, means for rotating said sheave to raise and lower said plunger and platform, the peripheral edges of said pulley and sheave being disposed in vertical alignment, spaced guides carried by said casing and engaging said plunger but permitting partial rotation of said platform when it is moved above ground level, the plunger and casing being so spaced with respect to each other and with respect to the rollers and guides as to permit said partial rotation of said platform and the proper realignment of parts as the platform is returned to normal position by rotation of said sheave.

HAROLD J. HULSART.

References Cited in the file of this patent

UNITED STATES PATENTS

Number	Name	Date
1,902,820	Ball	Mar. 28, 1933
2,137,743	Strassman	Nov. 22, 1938

FOREIGN PATENTS

Number	Country	Date
748,082	France	Apr. 10, 1933