March 2, 1954 S. P. HODGE 2,670,890

EMERGENCY ESCAPE ELEVATOR FOR DERRICKS

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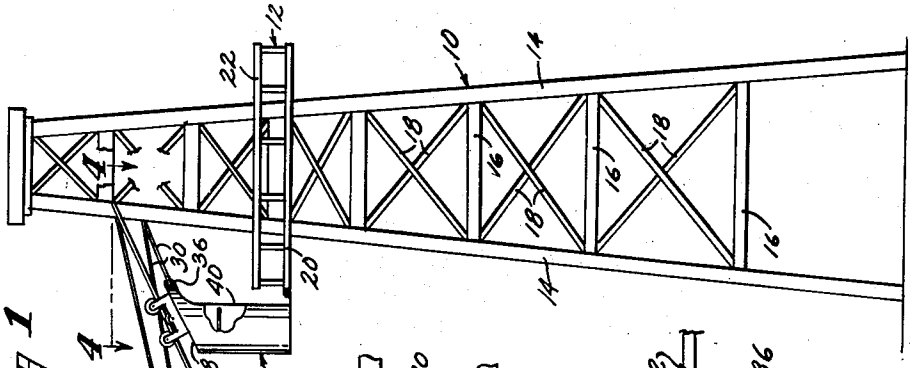


Fig 1

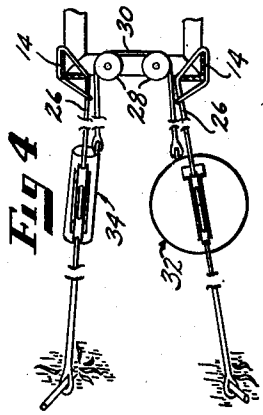


Fig 4

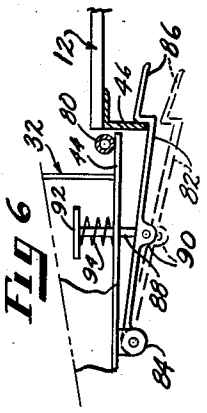


Fig 6

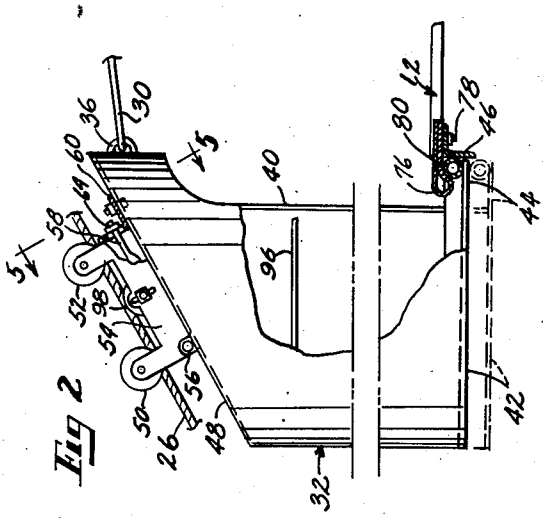


Fig 2

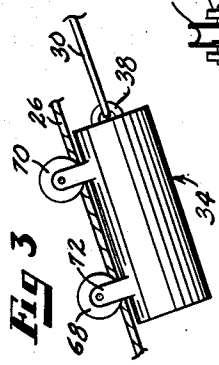


Fig 3

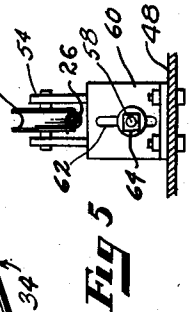


Fig 5

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EMERGENCY ESCAPE ELEVATOR FOR DERRICKS

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2 Claims. (Cl. 227—33)

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This invention relates to an emergency escape elevator for derricks and more particularly to a cable car and cable way system for the escape of derrick men or other workers from the platform of a well derrick, in case of fire or other emergency.

In the drilling of oil wells emergency conditions such as blowouts, fires, and the like sometimes arise without warning, and without sufficient time to permit persons working on the derrick to escape therefrom, resulting in death or serious injury.

It is the principal object of this invention to provide an emergency escape means for use on derricks whereby workmen may quickly leave the derrick and will be carried down to the ground at a point a considerable distance away from the well in comparative safety.

A further object of the invention is the provision of an escape elevator having cable ways which may also serve as guy means for the derrick.

Another object of the invention is to provide escape means for use on derrick structures which are automatic in operation upon the entrance of the worker into the safety car.

A further object is the provision of a safety elevator wherein the car is automatically returned to the derrick as soon as empty, and is again automatically released upon entrance of another person into the car.

A still further object of the invention is to provide a safety elevator for use on derricks, which is positive in operation, of simple design and rugged construction, and capable of withstanding the extreme conditions of exposure and hard usage to which such a structure is likely to be subjected.

The invention will best be understood from the following description, constituting a specification of the same, when taken in conjunction with the annexed drawing wherein—

Fig. 1 is an elevational view of a derrick, showing the emergency elevator applied thereto in position for immediate use;

Fig. 2 is a detail view, partly broken away and partly in section, of one form of the safety car of the elevator, showing the suspension pulleys and automatic release mechanism of the same;

Fig. 3 is a detail view showing the structure and application of the counterweight employed with the elevator;

Fig. 4 is a cross sectional view taken along the line 4—4 of Fig. 1, showing the details of the suspension system of the elevator, and how the same is secured to the derrick structure;

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Fig. 5 is a partial end elevational view of the suspension pulley arrangement whereby the safety car is suspended on the cable way, and adjusted in position thereon; and

Fig. 6 is a detail view of a modified form of release mechanism of the safety car.

Referring to the drawings in greater detail a derrick indicated at 10, of conventional construction, such as is commonly employed in the drilling of oil wells, has a platform or thribble board 12 thereon, located at a convenient height for the derrick man in carrying out the various operations during the drilling of the well. The platform 12 is usually at a considerable height above the ground, so that workers standing thereon would be unable to escape death or serious injury in the event it should become necessary to leave the platform without warning in an emergency.

The derrick 10 may conveniently be constructed with upright members 14 at each of its corners, lateral connecting members 16 at spaced intervals throughout its length and diagonal braces 18, connecting opposite ends of the lateral members 16. The platform or thribble board 12 is conveniently formed with a floor portion 20, above which extends the hand rail 22.

Cables 26 and 26 are attached to the uprights 14 of the derrick above the platform, which cables extend outwardly and downwardly from the derrick to the ground and serve as guys for the derrick as well as forming the cable way of the safety elevator system.

Intermediate the cables 26, at some convenient point from the derrick 10 guide pulleys 28 may be positioned, about which pulleys the cable 30 passes for attachment to the safety car indicated at 32, and the counterweight 34. The cable 30 is of a length to permit the safety car 32 to reach a convenient point at or near the ground for the occupant to safely leave the car, while the counterweight approaches the derrick. Any convenient means may be employed for attaching the respective ends of the cable 30 to the safety car and the counterweight, such as the eyes 36 and 38.

The safety car 32 may be of cylindrical or any other convenient shape, having an entrance opening 40 facing the platform 12 when the car is in its uppermost position, and the bottom 42 of the car is preferably formed with a projecting portion 44, which engages the downwardly projecting flange of an angle member 46 forming a part of the structure of the platform 12.

The top of the safety car, indicated at 48, may be arranged at a slope corresponding generally to the slope of the cable way 26 upon which the car is suspended, and to this sloping roof is attached the suspension means for the car. The car is suspended on the cable 26 by pulleys 50 and 52, rotatably attached to a hinged frame 54, secured to the roof of the car by a hinge 56. The frame 54 also carries a roller 98 adjustably mounted thereon for engagement beneath the cable 26 to maintain the pulleys 50 and 52 in engagement with the cable and to prevent the car from jumping off the cable way in operation.

A bolt 58 is secured to the upper end of the frame 54, which bolt extends through a slot 62 in an angle member 60 secured to the roof of the car, and this bolt is provided with a nut 64 which may be tightened against the angle plate 60. A washer 66 may be positioned beneath the nut 64 to provide a firm contact for the nut in securing the bolt firmly in position in the slot 62.

By loosening the nut 64, the upper end of the frame 54 may be adjusted by moving the bolt 58 upwardly or downwardly in the slot 62, so that the slope of the frame 54 may be adjusted about the hinge 56, to maintain the safety car 32 with its floor in a substantially horizontal position. Thus the slope of the cable 26 need not be accurately determined, but may vary considerably within a wide range, and the bottom of the safety car can be maintained at all times substantially horizontal.

The counterweight 34 is suspended from the cable way by means of pulleys 68 and 70, which are pivotally secured to the counterweight in any convenient manner, as by means of the lugs 72, so that the counterweight may move freely up and down the cable as the safety car moves in an opposite direction. The counterweight 34 may be sufficiently heavy to maintain the safety car in its uppermost position in contact with the platform 12, until a workman enters the car, whereupon the car will roll down the cable way while the counterweight will be pulled upwardly approaching the derrick.

The safety car is latched in its uppermost position in engagement with the platform 12, and the latching means is illustrated in its preferred embodiment in Figs. 1 and 2 of the drawings. The latching means may conveniently be comprised of a spring catch 76, formed by a somewhat offset loop of resilient metal secured to the horizontal flange of the angle member 46 by a bolt 78 or other convenient fastening means, so that the loop extends outwardly beyond the angle member a sufficient distance to permit a tubular frame portion 80, of the safety car to engage beneath the loop as the car comes to rest at its uppermost position. In this manner the car is secured in position in contact with the platform 12, and is maintained in readiness for immediate use by a workman, should the occasion arise.

In this form of the invention, when the workman enters the safety car through open entrance 40, his weight immediately pulls the car downwardly, releasing the frame portion 80 from beneath the latch loop 76, and the car rolls freely down the cable way under the influence of the weight of the occupant, at the same time drawing the counterweight 34 upward toward the derrick. A hand rail 96, within the car, provides a means by which the occupant can hold on while descending.

A somewhat modified form of latching mechanism is shown in Fig. 6 of the drawing, wherein a hinged latch member 82 is pivotally secured to the bottom of the car at 84, and has an offset hook-like portion 86 at its free end, which engages the downwardly extending flange of the angle member 46, when the car is in its uppermost position. The latch member 82 is urged into hooking engagement with the angle member 46 by a spring actuated bolt 88, pivoted to the latch member 82 at 90, and passing upwardly through a hole in the floor of the car. Within the car, the upper end of the bolt 88 has a foot plate 92 thereon, beneath which a coiled spring 94 is positioned, which coiled spring bears on the floor of the car to urge the bolt upwardly.

In the modified form of the invention just described, when a worker enters the car the latch mechanism may be released manually by stepping on the foot plate 92, which compresses the spring 94, and releases the latch member 82 from the angle member 46, resulting in permitting the safety car to roll down the cable way in the manner previously described, while the counterweight moves upwardly toward the derrick. The hook-like portion 86 of the latch member 82 has its outer extremity arranged at a slope, so that when the safety car approaches its upper limit this portion of the latch member will engage the downwardly extending flange of the angle member 46 to permit the latch to snap into position beneath the angle member and retain the safety car in position for immediate use.

As soon as the occupant has left the car upon reaching the ground, the counterweight 34 immediately begins to descend on the cable way returning the car to its uppermost position in contact with the platform 12 ready for immediate use by another workman if needed.

It will thus be seen that the invention provides an escape device of simple design, having few parts likely to become broken or out of order in use, and which is easily maintained at all times in condition for immediate use, thus assuring the maximum of safety for workmen on the derrick under all conditions of drilling operations.

While the invention has been described in connection with particular embodiments of the same it will be understood that many changes may be made in the form and construction of the various parts to adapt the same for particular conditions of use, without departing from the spirit of the invention, or the scope of the appended claims.

Having thus clearly shown and described the invention, what is claimed as new and desired to secure by Letters Patents is:

1. An escape device for derricks comprising a cable, which cable is secured to the upper portion of said derrick and to an anchor point a spaced distance from the base of said derrick, a safety car adapted to receive an occupant which car is mounted on said cable for movement thereon, an outwardly protruding, stationary latch member mounted on said derrick and having a downwardly projecting portion, a complementary latch member having an upstanding portion rigidly mounted on the edge of said car adjacent said derrick for complementary latching relation with said first mentioned latch member, said cable being adapted to yield under the weight of an occupant of the car to cause disengagement of said upstanding latch member from said downwardly projecting latch portion.

2. A weight actuated latch means for an

escape car for a derrick having girts within the length thereof, one of which girts has a downturned lip mounted thereon and secured thereto, a resilient cable mounted between the top of said derrick and the ground a spaced distance from the base of said derrick, said resilient cable mounting said escape car, an upturned lip formed on said escape car in position to complementarily engage said downturned lip on said derrick, said downturned lip and said upturned lip being adapted to form a latch for securing said car to said derrick, said upturned lip being adapted to move vertically downward relative to said downturned lip upon the yielding of said resilient cable when weight is applied to said car thus disengaging said lips and releasing said car from said derrick, which car moves downward on said cable to a point spaced from the base of said derrick.

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