Our present invention relates to revolving tower cranes and more particularly to an operator's cabin for such cranes.

Revolving tower cranes are usually provided with a single operator's cabin at the upper end of the crane. This arrangement has the disadvantage of unsuitable location of the cabin for many types of crane operation. It has, therefore, been proposed to provide such cranes with a plurality of cabins at various heights, yet this solution is relatively costly and inconvenient.

It is, therefore, an object of our present invention to provide a revolving tower crane with a cabin which can easily be adjusted to the most suitable height depending upon the operation of the crane.

It is another object of the present invention to provide a cabin of this character which can be easily installed in the structure of otherwise conventional tower cranes.

A further object of the present invention is to provide a crane cabin of adjustable height which can be driven by the usual hoisting means of the crane.

In accordance with the above objects we provide an operator's cabin for a revolving tower crane movable along guide rails inside the crane structure in a generally vertical direction, motion being imparted to this cabin by a suitable flexible linkage, such as a traction cable or chain, controlled from inside or outside the cabin. Positive stop means may be provided for bracing the cabin against untimely descent, preferably in combination with a safety device of the type usual in building elevators for slowing the cabin in its downward motion or for arresting it in case of rupture of the traction cable. The upward movement of the cabin to the desired elevation can be effected either by hooking the cabin to the hoist cable of the crane, in which case the cabin moves downward by its own weight upon a retraction of the locking means, or by connecting it to a cable drum driven either electrically or mechanically from a winch.

The above and other objects, features and advantages of our invention will be more readily apparent from the following description of several embodiments, reference being made to the accompanying drawings in which:

FIG. 1 is a side elevation of a revolving tower crane provided with an operator's cabin elevatable by the hoisting mechanism of the crane;

FIG. 2 is a top view of the operator's cabin, showing the guide rails and locking means thereof;

FIG. 3 is an enlarged front view of the operator's cabin;

FIG. 4 illustrates a revolving tower crane with a variable-height operator's cabin driven by a cable winch located at the bottom of the crane;

FIG. 5 shows a similar embodiment with the winch located at the top of the crane; and

FIG. 6 illustrates an embodiment with the cable fastened at the top of the crane and the winch located inside the cabin.

As shown in FIG. 1, an operator's cabin 1 is installed inside the tower structure 2 of a crane. The cabin can be moved upward and downward inside the crane structure by means of a cable 5 fastened to a hook 6 on top of cabin 1, this cable passing around rollers 4, 4' at the top of the tower and around another roller 4'' near its bottom. The end of cable 5 is provided with an eye 7 with which a hook 8 of a hoisting cable 9 of the crane is detachably linked to lift operator's cabin 1 to a desired height inside the tower structure 2. The cabin moves on rails 17 which, as shown in greater detail in FIGS. 2 and 3, are engaged by guide plates 3 connected to cabin 1, a pair of such guide plates 3 surrounding the stem of each rail 17. The cabin is provided with a crank-type stop mechanism 23 swingable in a horizontal plane and including two pairs of arms 12, one on each side of cabin 1. The arms 12 are pivoted on studs 24 and interconnected by bars 25 located inside cabin 1. A link 26 extends from each pair of ganged arms 12 to the center section of cabin 1 and is engaged by a lever 27 which can be manually operated to swing the arms 12 around their pivots 24. Platforms 10 are provided at various heights inside the crane tower 2, these platforms forming ledges 10' which the arms 12 abut from above in their swung-out position. The cabin 1 is further provided with a safety device 18 located below its bottom and formed by two levers 19 which are swingable around a pivot pin 20 fastened to the cabin 1 and bear on the rails 17 by means of friction blocks 22. The blocks 22 are pressed against the rails 17 by a spring 21 whose force, enhanced by the reaction of the cabin weight on the levers 19 when the cable 5 slackens, is sufficient to hold the cabin 1 at any desired level. The levers 19 are engaged at their upper ends by a pedal 28 by means of which the force of spring 21 can be counteracted to decrease the friction between blocks 22 and rails 17. The hoisting cable 9, passing around an idler roller 29 at the tip of crane arm 30 and around a further roller 31 above pulleys 4 and 4', is wound on a motor-driven capstan 32 whose controls, not shown, may be located in the cabin 1 along with those for a similar capstan 32' which serves to lower or raise the arm 30 via a cable 9'. The remaining parts of the crane are of conventional design.

The operating level of cabin 1 as shown in FIGS. 1, 2 and 3 can be adjusted in the following manner: with cabin 1 in the lower position illustrated in full lines in FIG. 1, hook 8 is inserted into eye 7 and the cabin 1 is raised by means of the capstan 32. When a platform 28 of desired elevation has been reached, the capstan motor is stopped and the cabin 1 is locked in its position by swinging out the arms 12 of the stop mechanism 23 into engagement with the lateral ledges 10' of the platform 10. The coupling between the cables 9 and 5 can then be unhooked. When the operator wants to descend to a different station, the arms 12 are retracted whereupon operation of the pedal 28 permits the cabin 1 to slide at a controlled speed to a lower position. The cabin can be held at any intermediate location between platforms 10 by the safety device 18 alone.

As shown in FIG. 4, the cabin 1 can be provided with its own drive by connecting one end of cable 5 to a drum 13 propelled by a winch 14, the drum being located on the upper part of the crane. The other cable end is again fastened to the hook 6 on the cabin. The winch 14 is in this case to be operated by a person standing outside the cabin. The embodiment illustrated in FIG. 5 shows the cabin 1 elevatable by a remote-controlled take-up drum 15 for the cable 5.

In FIG. 6 the winch 14 and the drum 13 are located inside the cabin 1, cable 5 being suspended by its eye 7 from a hook 6' at the upper part of the crane. It is to be understood that the capstans 32, 32', the windlass 13, 14 and the winch 15 are representative of any manual or automatic hoisting devices of the mechanical, electrical, hydraulic or other known type.
The invention as described is believed to admit of many variations deemed to be within the ability of persons skilled in the art, and the embodiments hereinabove described are therefore intended to be merely illustrative of the principles of the invention, rather than restrictive of its scope which we wish to limit only to the extent indicated in the appended claims.

We claim:

1. In a tower crane having a transportable structure, in combination, an operator's cabin, guide means extending generally vertically along the crane structure in engagement with said cabin for facilitating a raising and lowering thereof on said structure, elevated abutment means on said structure, control means for displacing said cabin along said guide means, and positive stop means on said cabin engageable with said abutment means for securing said cabin against premature descent; said stop means comprising two pairs of horizontally swingable arms having extremities projecting beyond opposite sides of said cabin in an operative position, and a linkage connected to said arms for manual operation thereof, said linkage being disposed near a wall of said cabin transverse to said sides.

2. The combination according to claim 1 wherein said abutment means comprises a plurality of platforms mounted on said structure at different levels.

3. The combination according to claim 1 wherein said guide means comprises at least one rail, said cabin being further provided with safety brake means frictionally engageable with said rail.

4. A tower crane comprising a transportable upright structure, rail means extending generally vertically along said structure, an operator's cabin slidably along said rail means in engagement therewith, first and second roller means near the top of said structure, third roller means near the bottom of said structure, a flexible elongated hoisting element passing around said first roller means and having a load-engaging end depending from said structure, a co-operating flexible elongated traction element having one end anchored to said cabin and passing around said second and third roller means, coupling means releasably linking the other end of said traction element with the load-engaging end of said hoisting element, control means connected with the other end of said hoisting element for exerting traction upon the elements so interconnected, thereby elevating said cabin, positive stop means on said cabin, and elevated abutment means engageable by said stop means for securing said cabin at a desired level independently of said control means, thereby enabling disengagement of said traction element from said hoisting element; said stop means comprising two pairs of horizontally swingable arms having extremities projecting beyond opposite sides of said cabin in an operative position, and a linkage connected to said arms for manual operation thereof, said linkage being disposed near a wall of said cabin transverse to said sides.

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