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2,500,539

HOISTING APPARATUS FOR ELEVATOR PLATFORMS

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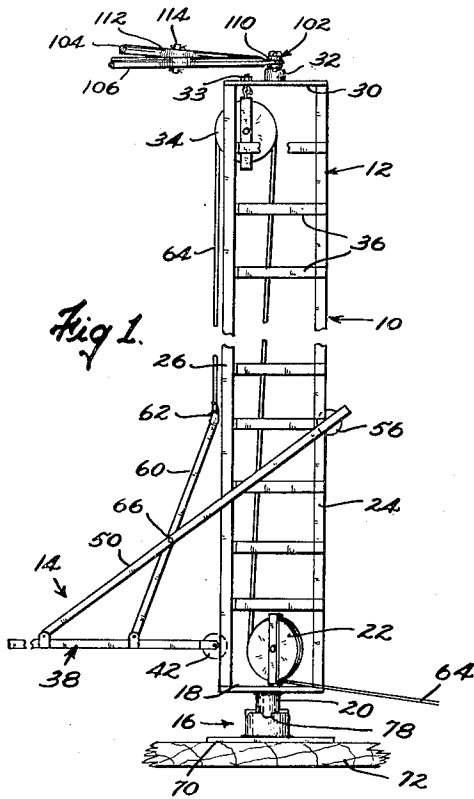


Fig. 1.

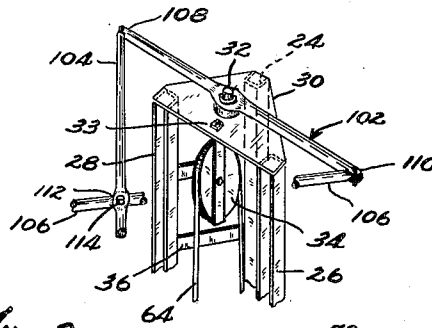


Fig. 2.

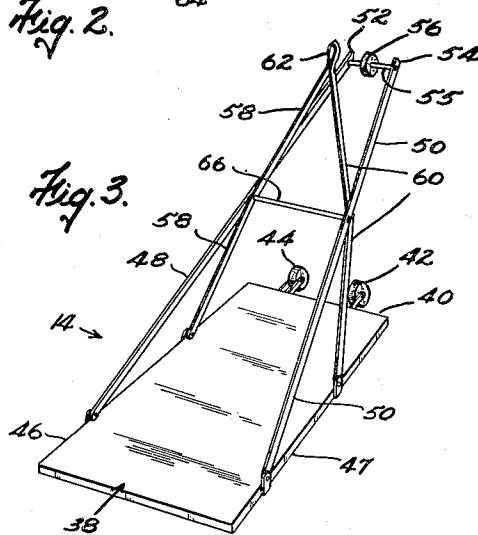


Fig. 3.

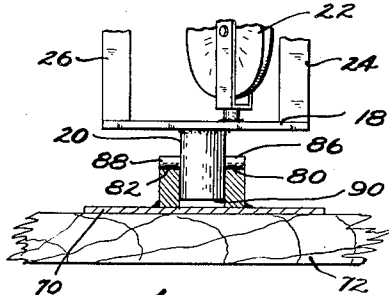


Fig. 4.

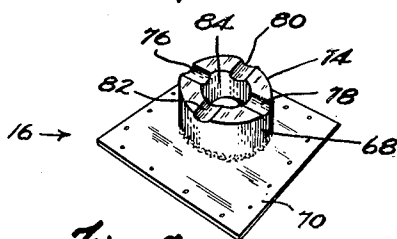


Fig. 5.

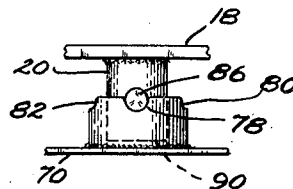


Fig. 6.

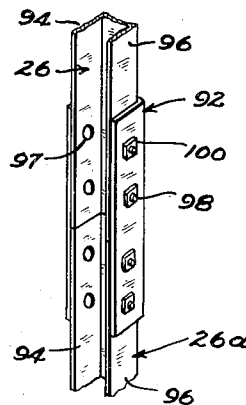


Fig. 7.

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UNITED STATES PATENT OFFICE

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HOISTING APPARATUS FOR ELEVATOR
PLATFORMS

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8 Claims. (Cl. 214—95)

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This invention relates to a hoisting apparatus and more particularly to a lightweight, portable, hoisting device adapted for use in building construction.

In the erection of a building, comprising two or more floors, a hoisting apparatus is commonly employed to lift the necessary materials and supplies to a desired height when required by the workmen. Because of the volume and weight of the material hoisted by such an apparatus, it is necessary that the apparatus be of sturdy construction. Heretofore, when an apparatus of this type was employed the erection of a frame or scaffold therefor was required which was a costly and time-consuming task. The tearing down of the frame or scaffold after completion of the building was likewise costly and time-consuming. Also, in hoisting apparatuses heretofore used, the platform therefor was moveable only in the vertical plane, thus limiting the direction from which the platform could be loaded and unloaded. In certain building designs this latter feature became very undesirable.

Thus, it is one of the objects of this invention to provide a hoisting apparatus which is of simple design and may be readily erected or torn down with considerable savings in time and cost.

It is a further object of this invention to provide a hoisting apparatus which is mounted so as to be rotatably adjustable thereby enabling the platform thereof to be loaded from one direction and unloaded from another direction, if desired, thus making the hoisting apparatus adapted for use in the construction of buildings of varied design.

It is still a further object of this invention to provide a portable hoisting apparatus which is of lightweight, yet sturdy construction, inexpensive to produce, and effective in operation.

Further and additional objects will appear from the description, accompanying drawings, and appended claims.

In accordance with one embodiment of this invention, a hoisting apparatus is provided comprising a rotatably mounted, skeletal, vertical frame, a laterally extending platform slidably mounted thereon, hoisting means for said platform, a bearing unit for seating said frame therein, and means for enabling said frame to be held in various positions of rotational adjustment. For a more complete understanding of this invention reference should now be had to the drawings wherein:

Figure 1 is a fragmentary side elevational view

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of the hoisting apparatus in its operative position.

Fig. 2 is a fragmentary, perspective view of the upper end portion of the frame showing the arrangement of the bracing members for said frame.

Fig. 3 is a perspective view of the platform.

Fig. 4 is a fragmentary side elevational view of the lower end of the frame shown seated in the bearing unit, the latter being shown in cross-section.

Fig. 5 is a perspective view of the bearing unit.

Fig. 6 is a fragmentary side elevational view of the lower end of the frame shown seated in the bearing unit.

Fig. 7 is a fragmentary, perspective view of one of the vertical supporting members of a sectional frame showing the manner of connecting the frame sections.

Referring now to the drawing, and more particularly to Fig. 1, a lightweight, portable, hoisting apparatus 10 is shown comprising a vertical, rotatably mounted, frame 12, a platform 14 laterally extending therefrom and slidably mounted thereon, and a bearing unit 16 into which the lower end of the frame is adapted to be seated.

The frame 12 in this instance comprises a base plate 18 having a depending stud 20 secured to the underside thereof by welding or any other suitable means, and disposed on the axis of rotation of said frame, a pulley 22 swivelly mounted on the upper side of said plate 18 offset from the axis of rotation, and three vertical, supporting members 24, 26 and 28, attached to the upper side of plate 18, by welding or any other suitable means, and uniformly spaced from one another and disposed symmetrically about the axis of rotation of said frame 12. Fastened to the upper end of supporting members 24, 26 and 28, is a plate 30 of the same shape and size as plate 18, having a shouldered stud 32 extending upwardly therefrom and fastened thereto by welding, or any other suitable means. The plates 18 and 30 in this instance are triangular in shape and the supporting members 24, 26 and 28 are thereto attached at the three corners of said plates. To the underside of plate 30 is fastened an eye bolt 33 from which is suspended a pulley 34. For additional support in holding the vertical supporting members, 24, 26 and 28 in their relatively spaced positions are provided a plurality of stiffening members 36. The vertical supporting members 24, 26 and 28 are channel-shaped, as shown in Fig. 2, and have the open sides of their channels facing outwardly. It is

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to be understood of course that the supporting members are not to be limited to a channel-shape cross-section but may be L-shaped or I-shaped.

Platform 14 comprises a base 38 which in this instance is rectangular in shape and assumes a laterally extending position relative to the frame 12 when in its operative positions. To the edge 40 of base 38, adjacent the frame 12, are rotatably mounted a pair of rollers 42 and 44 which are spaced apart from one another so as to engage the channels of the corresponding supporting member 26 and 28 respectively and to be guided therein upon positioning the platform on the frame. The base 38 of the platform 14 is preferably of wood and some other lightweight, rigid material capable of withstanding heavy loads. Attached to the sides 46 and 47 of the base 38 and extending rearwardly and upwardly therefrom are a pair of supporting struts 48 and 50 which embrace frame 12 and are joined at their rear ends 52 and 54 by a shaft 55 on which is rotatably mounted and centrally positioned a roller 56. Roller 56, when the platform is in its operative position rides in the channel of supporting member 24. To enable the platform 14 to engage or be disengaged from the frame 12, shaft 55 is removeable from the ends 52 and 54 of the supporting struts. Also fastened to the sides 46 and 47 of base 38 and intermediate struts 48 and 50 and pulleys 42 and 44 are a second pair of struts 58 and 60 which extend upwardly from base 38 in an oblique manner as seen in Fig. 1 and have their upper ends joined together on the opposite side of the frame from that for the roller 56, to form a loop 62, which is engaged by hoisting cable 64. As shown in Fig. 3, a spacer rod 66 is provided for holding struts 48, 50, 58, and 60 in their spaced relationship. It is to be noted that with the type platform 14 shown in Fig. 3, the danger of the platform becoming disengaged from the supporting members is entirely eliminated because when a load is placed on the base 38, the rollers 42, 44 and 56 are caused to press against the supporting members of the frame.

The bearing unit 16 in which the dependent stud 20 of frame 12 is seated when in its operative position, comprises a bearing sleeve 68, a plate 70 welded to the lower end of said sleeve, and a supporting base 72 on which is bolted or riveted plate 70. Sleeve 68 has a deformed upper end 74 which is provided with pairs of diametrically opposed notches 76—78 and 80—82. The number of pairs of notches may be varied dependent upon the number of positions of rotational adjustment desired. The aperture 84 of sleeve 68 receives the depending stud 20 of frame 12. Depending stud 20 is provided with a pair of transversely extending, load-bearing lugs 86 and 88, which slidably contact the upper deformed end 74 of sleeve 68. The lugs are diametrically opposed to one another and are set back from the free end 90 of depending stud 20, a distance less than the longitudinal dimension of sleeve 68; thus, the weight of the frame and platform are supported by these lugs. When the frame 12 is manually rotated, for example 90° clockwise from the position shown in Figs. 1 and 4, the lugs 86 and 88 are caused to slide into notches 76—78 respectively as shown in Fig. 6. The shape of the notches are such that the lugs will be readily seated therein and will not tend to be unseated until the frame is manually moved by the operator to another position of rotational adjustment.

The hoisting means for platform 14 comprises

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a hoisting cable 64, a pulley 34 secured to eye bolt 33, which is fastened to the underside of the upper plate 30, a second pulley 22 rotatably mounted on the upper side of the bottom plate 18, and a power winch (not shown) for regulating and controlling the movement of the cable 64 over said pulleys. In certain instances it might be desirable to employ two hoisting apparatuses with the platforms thereof so arranged that when one goes up the other goes down, thus each acting as a counterbalance for the other.

Where the construction of the building is of a height greater than two stories, it is necessary that the frame 12 be in sections so that when the apparatus is disassembled the frame sections will be of such length that they may be readily handled for transporting on a truck or some other similar type vehicle to another location. The manner of connecting the frame sections is shown in Fig. 7, wherein the supporting member 26 with the base plate 18 removed and supporting member 26a with the upper plate removed are brought into an end-to-end relation and are held in such position by a channel-shaped connecting member 92, which embraces the closed sides of the supporting members and is bolted to the sides 94 and 96 of said members. The bolt holes 97 in the sides 94 and 96 of the supporting members are countersunk from the inside; thus the bolts 98 are placed in the holes 97 with the threaded portions of the bolts extending outwardly and are engaged by nuts 100 on the outside of the connecting member 92. With this arrangement of the bolts, no interference with the operation of the roller 42 on the supporting member 26 and 26a is encountered. A similar construction is followed for the other supporting members 24 and 28.

Cooperating with the shouldered stud 32 which extends upwardly from the upper plate 30 of frame 12, are a plurality of bracing members 102, 104, and 106 which hold the frame 12 in a spaced relationship with the side of the building under construction (not shown). Bracing member 102 is a rod, preferably metal, which is pivotally mounted at its center on the shouldered stud 32 and is pivotally connected at its ends 108 and 110 to bracing members 104 and 106, respectively. Bracing members 104 and 106 extend rearwardly from frame 12 and are fastened to the adjacent building under construction or any other suitable, adjacent supporting structure. The bracing members 104 and 106 cross each other at a point 112 intermediate the supporting structure and the frame 12 and are fastened together at that point by a pin 114. With this arrangement of bracing members, the frame 12 is more readily held in a substantially vertical position. In order that the apparatus be portable and readily handled by the operators thereof, it is preferred that it be constructed of some lightweight, sturdy material such as aluminum.

Thus, it will be seen that a hoisting apparatus has been provided which is simple in design and may be readily erected or torn down with suitable savings in time and cost. Also, a hoisting apparatus has been provided which enables the platform to be loaded and unloaded from various positions of rotational adjustment of the frame. Also, the apparatus, as provided, is lightweight, yet sturdy in construction, effective in operation, inexpensive to produce, and portable.

While a particular embodiment of this invention is shown above, it will be understood, of course, that the invention is not to be limited

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thereto since many modifications may be made and it is contemplated therefore by the appended claims to cover any such modifications as fall within the true spirit and scope of this invention.

I claim:

1. In a hoisting apparatus, the combination of a rotatably mounted vertical frame, a platform mounted on said frame for relative vertical movement thereon, hoisting means for said platform, a bearing unit for said frame, and means independent of said hoisting means for holding said frame in various positions of rotational adjustment.

2. In a hoisting apparatus, the combination of a rotatable, vertically extending, skeletal frame, a laterally extending platform slidably mounted on said frame, hoisting means for said platform, a bearing unit on which said frame is disengageably mounted, and means for yieldingly holding said frame in various positions of rotational adjustment.

3. In a hoisting apparatus, the combination of a rotatable disengageably mounted vertical frame, a platform mounted for vertical movement relative to said frame, hoisting means for said platform, a bearing unit for said frame, and means provided on said bearing unit and independent of said hoisting means for holding said frame in various positions of rotational adjustment, said frame comprising a base plate, a depending stud fastened thereto, a plurality of vertical supporting members fastened to said plate and arranged in a substantially symmetrical relation about the axis of rotation of said frame, and a top plate fastened to the upper end of said supporting members and having a vertically extending stud adapted to be pivotally embraced by brace members.

4. In a hoisting apparatus, the combination of a rotatably mounted vertical frame, a platform mounted for vertical movement relative to said frame, hoisting means for said platform, a bearing unit for said frame, and means for holding said frame in various positions of rotational adjustment, said platform comprising a base member, a pair of rollers rotatably mounted on the edge of said base member and contacting said frame, a pair of rearwardly extending struts fastened to the outer portion of said base member and angularly disposed with reference thereto, said struts adapted to embrace said frame, a roller rotatably

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mounted on the free ends of said struts and contacting said frame, and a second pair of upwardly extending struts fastened to said base intermediate said first mentioned pair of struts and pair of rollers and having the upper free ends thereof joined together and fastened to the hoisting means.

5. The apparatus claimed in claim 4 in which the roller mounted on said embraceable struts is removable.

6. In a hoisting apparatus, the combination of a rotatably mounted vertical frame, a platform mounted for vertical movement relative to said frame, hoisting means for said platform, a bearing unit for said frame, and means for holding said frame in various positions of rotational adjustment, said bearing unit comprising a plate member, a sleeve member having the lower end thereof fastened to said plate member and having the upper end thereof provided with a plurality of pairs of radially extending notches disposed symmetrically about the axis of rotation of said frame.

7. In a hoisting apparatus, the combination of a swivelly mounted, vertical frame having a depending stud fastened at the lower end thereof on the axis of rotation of said frame, a platform slidably mounted thereon, hoisting means for said platform, a bearing unit for said frame comprising a rigid sleeve having the upper end thereof provided with a plurality of radially extending notches disposed about the axis of rotation of said frame, and load-bearing lugs on said depending stud adapted to engage the notches in said sleeve.

8. The apparatus claimed in claim 7 in which the distance the load-bearing lugs are spaced from the lower end of said depending stud is less than the longitudinal dimension of said sleeve.

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