Sept. 8, 1970 W. GREENHALGH 3,527,008

INSTANTERECT CONSTRUCTION DEVICE

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FIG. 1.

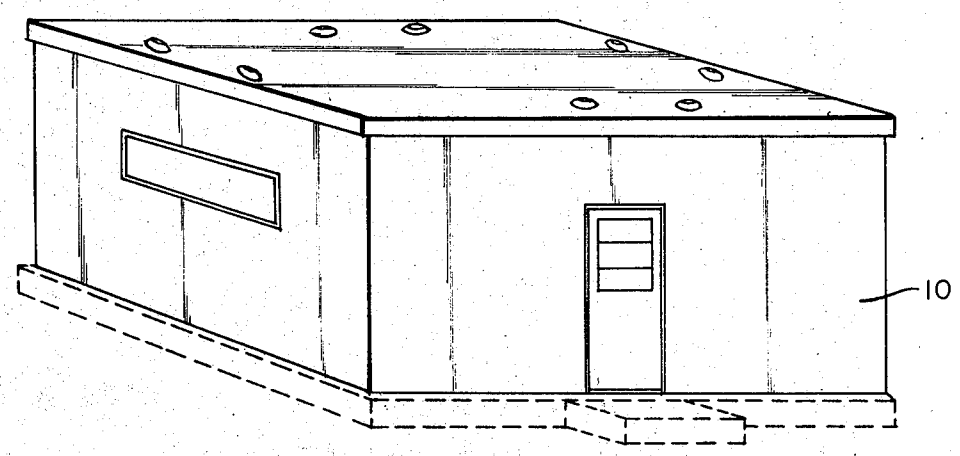
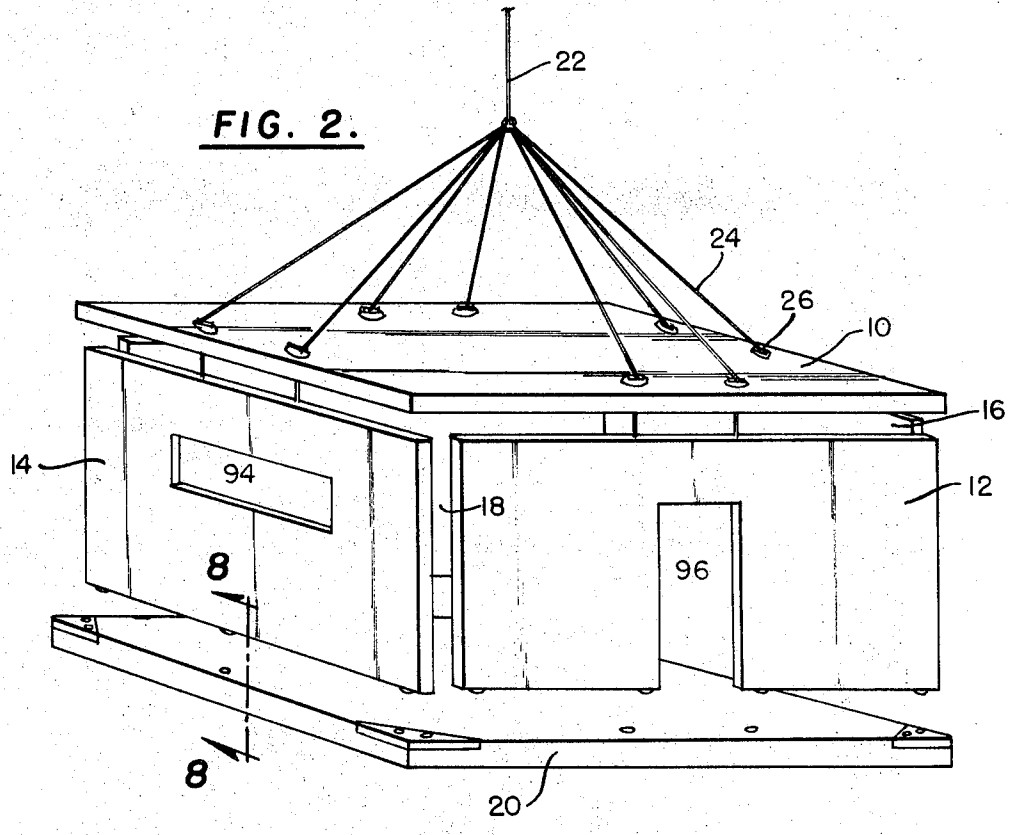


FIG. 2.



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FIG. 3.

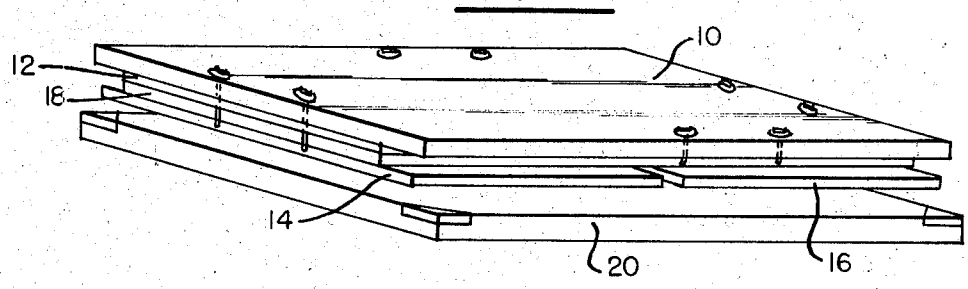


FIG. 4.

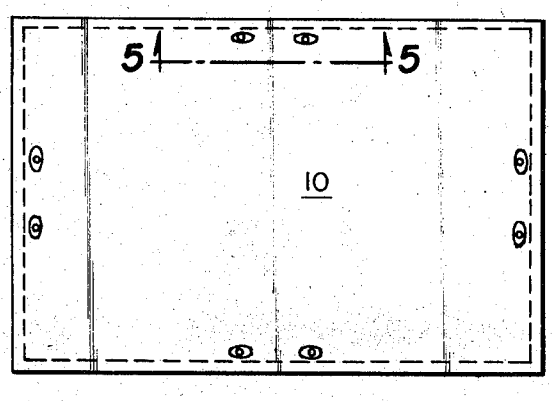
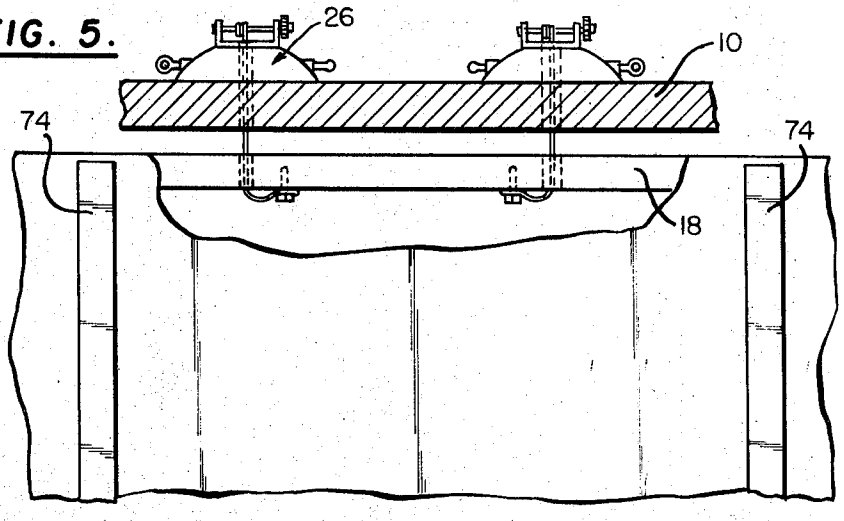


FIG. 5.



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FIG. 6.

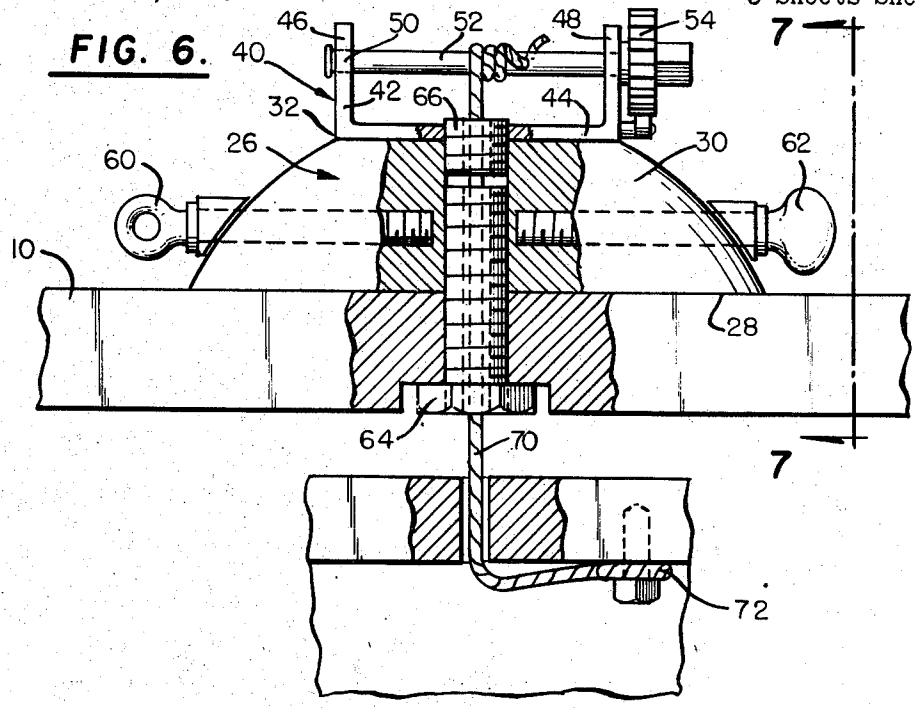


FIG. 7.

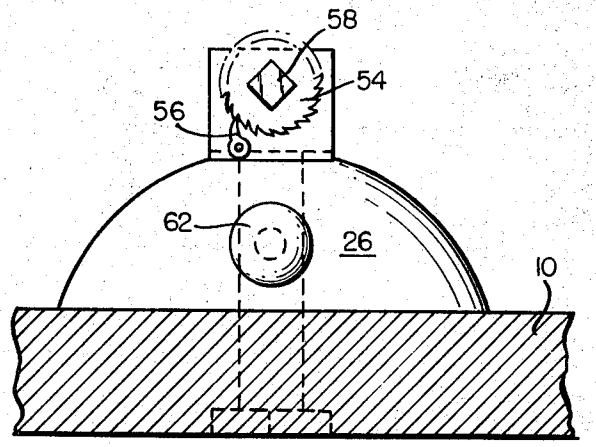
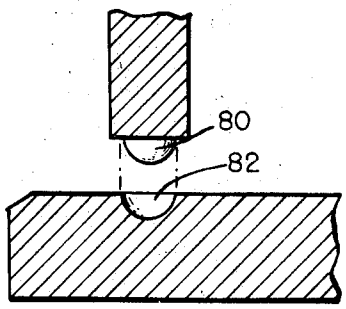


FIG. 8.



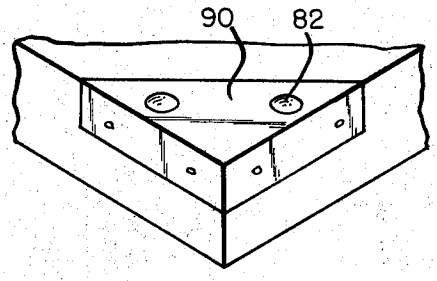


FIG. 9.

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United States Patent Office 3,527,008
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3,527,008

INSTANTERECT CONSTRUCTION DEVICE

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Continuation-in-part of application Ser. No. 626,572, Mar. 28, 1967. This application Mar. 28, 1969, Ser. No. 811,566
Int. Cl. B66c 1/10; E04g 21/14
U.S. Cl. 52—749 3 Claims

ABSTRACT OF THE DISCLOSURE

A device to be used in the erection or disassembling of buildings or building frames formed of individual panels, the device including a plurality of winch units which are detachably secured to a roof or ceiling panel and are used to raise or lower individual wall panels to a uniform height after they have been raised to non-uniform heights as a result of raising them from a prepared package lying on a floor or foundation, or to raise or lower the vertical panels in an existing structure to non-uniform heights such that the vertical panels can be swung to horizontal positions, in a desired sequence to form a collapsible structure suitable for collapsing and packaging for removal to another site for erection again.

This is a continuation-in-part of application Ser. No. 626,572, filed Mar. 28, 1967, and now abandoned.

This invention relates to means to mechanically assist in a practical and efficient manner in the erection of buildings or other structures from prepared packages in which the building panels are disposed in stacked horizontal array. The array may include wall panels and a roof or ceiling panel, and a floor panel, base or foundation.

More particularly, it relates to means which permit the erection of a room from a package of prefabricated panels or the dismantling of a previously erected structure in a simple, inexpensive and practical manner.

One object of the invention is to provide a means for erecting buildings from one or more packages in which the walls, ceiling and floor panels necessary to form a room or a portion of a room, or more than one room of a building, assembled in a compact flat package, are shipped to or fabricated at a building site and then the individual components are raised in sequence so as to hang in the same configuration they will have in the completed room or building. After suitably adjusting the position of the individual panels, they are bolted together or otherwise secured to one another to form the desired structure, or one or more of the panels may be securely fastened to a structure already standing, so as to add on to such a structure.

Still another object of this present invention is to permit each originally horizontal wall panel, within the compacted package, to gradually swing pivotally from one end until it becomes vertical. Each panel is permitted to swing in a controlled manner in correct sequence until all are in approximate position after which time the invention provides means to adjust the relative heights of the panels to bring them all into their proper positions to be fastened by any suitable conventional means. Thus the building is quickly erected at the site on arrival, by erecting at least one entire room in a matter of minutes.

Still another object is to provide a new means to load and unload a garage, or a summer cottage, or like structures onto a truck, trailer, train or other means of transportation, and to provide means for facilitate erection of the desired structure on arrival at the site, rapidly, efficiently and easily.

Still additional objects, benefits, and advantages of the invention will become apparent and evident from the description which follows and from the drawings forming a part of said description, in which:

FIG. 1 is a view in perspective showing a structure after it has been erected by means of the device of the present invention;

FIG. 2 is a view showing one stage in placing the structure of FIG. 1 on a base, or removing it from a base;

FIG. 3 is a view in perspective showing the structure of FIG. 1 in compact form, i.e. before it is erected;

FIG. 4 is a top plan view of the structure of FIG. 3;

FIG. 5 is a view, partially in section, taken along plane 5—5 of FIG. 4;

FIG. 6 is a more detailed view of the structure shown in FIG. 5;

FIG. 7 is a view, partly in section, taken on plane 7—7 of FIG. 6;

FIG. 8 is a view taken on plane 8—8 of FIG. 2; and

FIG. 9 is a view in perspective of one kind of corner brace.

In the description which follows, the term "panels" will be used to designate not only a finished, completed wall, but also to designate a wall assembly consisting of only the beams, joists and bracing and any electrical wiring or plumbing which may have been placed in said framing.

Further, it should also be noted that the structure may involve less than an entire enclosure. For example, a package could include only two or three of the walls present in a complete room.

Briefly, in accordance with this invention, panels are prepared comprising walls, ceiling or roof and floor, base or foundation. The foundation panel, if present, is placed and then the remaining panels are placed on top of the base using pads of rubber or Masonite to prevent the panels from marking one another, to make a shipping load. One or more of the removable winches of the present invention is attached to each panel, except the floor or base panel. The assembled group of panels is taken directly to the site and the panels are raised by a hoist to approximately the desired configuration. Then the individual winches are utilized to bring the panels into the correct position for final assembly and fastening into a rigid structure.

The structure shown in FIGS. 1 and 2 represents a one room building which could be a garage if a larger front door was provided. The structure includes a floor or support **20**, a front wall panel **12**, a rear wall panel **18**, and two sidewall panels **14**, **16**. When the assembled package includes a floor panel this should be placed first, but in many instances the base or foundation will be in place at the site and will not be a part of the package.

The roof or ceiling **10** carries the means whereby the several other building components are connected to a hoist or lifting means **22** at the building site by cables **24**, as shown in FIG. 2.

In the embodiment shown in FIG. 2, a pair of lifting devices **26** are secured to the top surface of panel **10** for each vertical panel which is to be erected. The device and its manner of use is shown in greater detail in FIGS. 5, 6 and 7.

The panels may be protected from injury incidental to their rubbing against one another during erection by means of bumpers **74** of Masonite, rubber or other cushioning means.

Each device **26** comprises a truncated hemisphere portion **30**, preferably a metal casting having a base **28** adapted to be secured to roof or ceiling panel **10** by welding, bolting or other known means, and having a flattened top surface **32**. The flat top is adapted to support a small winch **40**.

Winch **40** comprises a channel shaped frame **42** which

includes a base plate **44** resting on flat **32** of casting **30** and vertical arms **46** and **48** provided with bores **50** to receive the winch axle **52**. A reversible ratchet **54** and pawl **56** and winding key **58** at one end of axle **52** complete the winch structure.

Casting **30** is tapped to receive four different threaded members, as best seen in FIG. 6, namely: a horizontal lifting eye **60** entering a threaded passage in hemisphere **30** from one side; a horizontal snubber pin **62** entering another tapped passage in hemisphere **30**; a vertical wood lag bolt screw **64** entering hemisphere **30** through its underside and securing it to panel **10**; and a threaded stud **66** extending downwardly through a threaded bore in winch base **44** and into the top portion of casting **30** whereby it holds winch **40** in place. Bolts **64** and **66** are each provided with a central bore adapted to receive a short line or cable **70** one end of which is secured to a wall panel as at **72** and the other end of which is wrapped around axle **52**, which may have a bore through which the line may pass in order to hold it in place more firmly.

FIG. 8 illustrates one form of positioning means which may be provided for assisting in the proper location of vertical panels with reference to horizontal panels. As many balls **80** and sockets **82** as desired may be provided and when, after erection of one unit and removal of the winch and its accessories, hemisphere **30** may serve as the balls, to engage sockets in the vertical panels erected above panel **10**.

In FIG. 9, one form of carrier brace is shown wherein depressions may assist in location of the panels. Brace **90** is placed at the intersection of any two vertical panels and nailed to them to brace the corner and cause it to remain at the proper angle.

It will be understood that a suitable number of openings **94** and **96** are provided for windows and doors to be installed before or after erection of the building.

Erection of the building is believed to be apparent from the foregoing. After the package has been prepared at the factory, it is shipped to a building site and lowered onto a prepared foundation or merely onto a level piece of ground. In the prepared package devices **26**, winches **40** and lines **70** have been connected to panels **12**, **14**, **16** and **18**, as indicated in FIGS. 3 and 5.

Lines **24** from a hoist **22** are connected preferably to lifting eyes **60** and, if desired, one or more turns is taken around snubber pins **62**. As hoist **22** is raised, the individual walls begin to unfold, in sequence, from the collapsed package of FIG. 3, until they assume the position shown in FIG. 2, the walls being protected from injury by bumpers **74**. Each wall panel is, of course, hanging at a different height below panel **10**. By means of a wrench, key **58** is turned, and axle **52** is therefore rotated, so as to raise (or lower) the panels so that they can be secured to panel **10** and then the unit can be lowered onto floor **20**, where balls **80** move into depressions **82** in corner braces or elsewhere in floor **20**, and then the panels are secured to floor **20**. Token joinings may only be needed at this time and more permanent joinings may be made later.

After erection has been effected, cables **24** are disconnected and then winch **40** is removed by unscrewing bolts **64** and **66**, then pins **60** and **62** are also removed and all of these are stored awaiting the time the building is to be dismantled. At that time, they are reassembled, the panels are disconnected from the floor **20** and ceiling **10** and reassembled into the package of FIG. 3, by reversing the erection procedure.

That is, buildings already assembled and erected can be disconnected and compacted into one package, ready to be placed at another location, or shipped while compacted and then stacked individually or with others, or re-erected instantly by means of the derive of this invention.

The use of the device in this operation is the reverse procedure to that just described. The devices are affixed to the top section of component parts of the building. Then the hoist engages the sling hooks. Then the hoisting is tightened slightly. Then the floor is separated from the walls or partitions.

The cables are then engaged in pairs to the top of all vertical sections, with enough slack in each to allow for folding upwards, one under the other, as will be in the required sequence for re-erecting.

The walls are then separated at the corners and from the roof or ceiling. Ropes are then attached by some simple positive means to the bottom of each section and then draped over the opposite side snubber. When the rope is tightened and pulled over the snubber until the bottom of the section is brought to a horizontal position, then it is secured onto the snubber or winch, if such is used in place of the snubber.

By bringing each section horizontally suspended on one end by the cables and at the other by rope to the snubber all sections may be folded in sequence. When the cables and ropes bring all the sections into line as a package the hoist lowers to the floor component part and all is made into a compact package to be removed to storage or re-erected elsewhere.

It will also be apparent that when buildings have been erected by the present means, they may then be placed in multiples in adjoining rows, squares, oblongs or any desired planned design, or by means of the device they may be stacked on top of each other, exactly above each other, or staggered so that a multiple room building will be obtained.

It will be readily appreciated that once the winch **40** lifting eye **60** and snubber pin **62** have been detached from casting **30**, the casting itself may serve as the positioning means for the next package of panels. To this end the casting may be detached from the erected panel and moved to a more suitable location where it will be available to receive a depression in the panel to be erected on the existing structure.

It should also be noted that the panels may be fabricated at the same time that the package is being prepared, i.e. they are not required to be fabricated before they are brought to the package making location. Furthermore, it is even possible to pour panels at the package making site, e.g. from cement or plaster mixes, with suitable reinforcement, the individual panels being separated by removable dividers which constitute part of the pouring forms in this mode of procedure.

Having now described a prefered embodiment of this invention, it is not intended that it be limited, except as may be required by the appended claims.

I claim:

1. A construction device comprising:

a truncated hemispherical member having a flat base portion adapted to be secured to one edge of a building panel which is to be moved to a vertical position from a horizontal position in erecting a building or from a vertical position to a horizontal position in dismantling a building, said hemispherical member having a planar top surface adapted to receive a winch member and also having at least one vertical bore extending from said flat top to said flat base;

a winch detachably secured to the flat top surface of said hemispherical member; and

means for securing said winch to said member, said means including an axial bore through which a line may be passed from said winch to the panel to be erected or dismantled.

2. The construction device of claim **1** wherein the truncated hemispherical member has two transverse bores parallel to the base; a snubber pin removably inserted into one of said bores; and a lifting eye removably inserted into the other of said bores.

3. The construction device of claim 2 including a pair of fittings adapted to bear against the spherical surface of said hemisphere and one of said pair of fittings being supported by said snubber pin and the other being supported by said lifting eye.

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U.S. Cl. X.R.

52—122; 294—89