

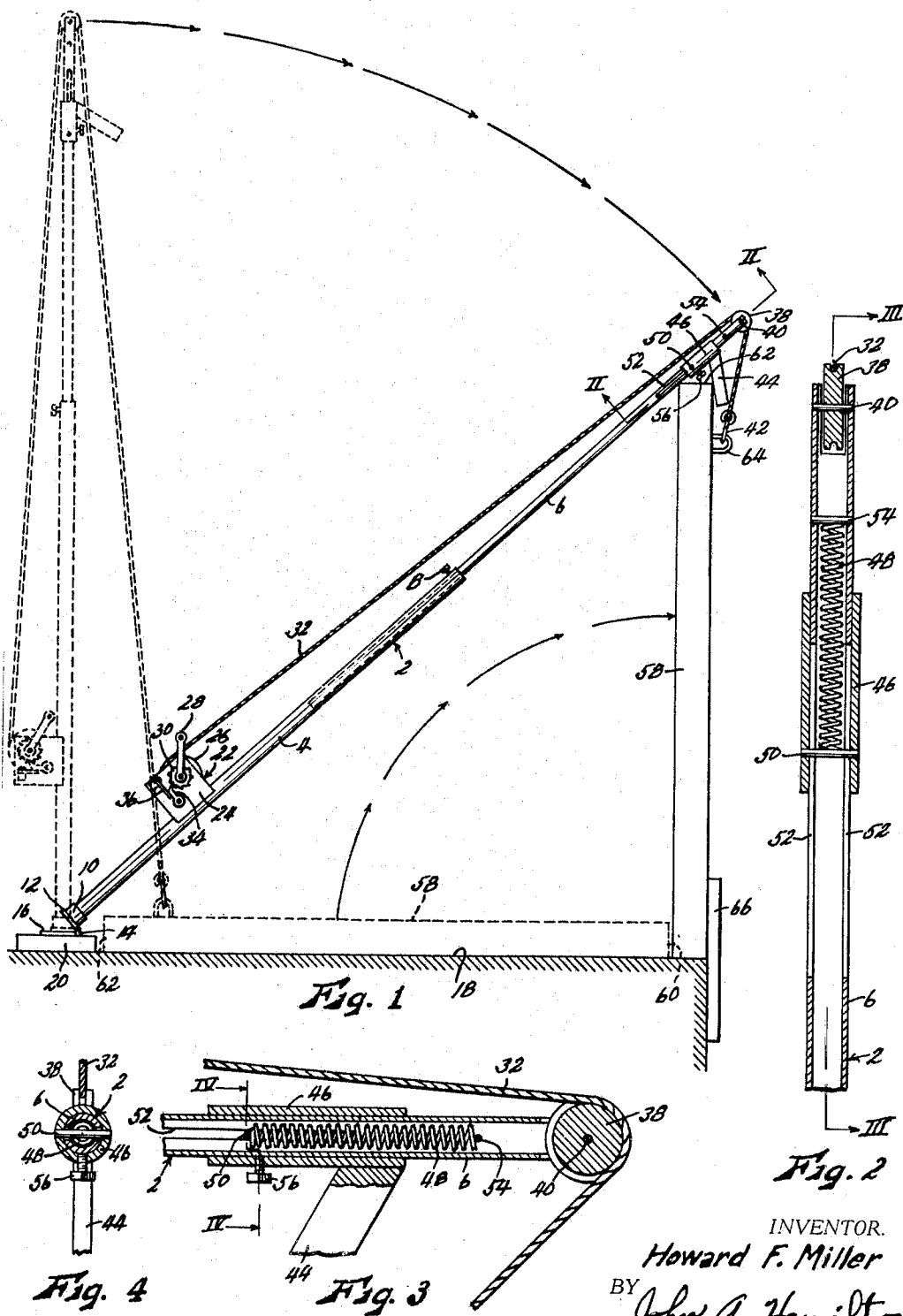
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WALL JACK

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WALL JACK

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## ABSTRACT OF THE DISCLOSURE

A wall jack consisting of an elongated boom adapted to be freely pivotally attached to a floor adjacent the edge of a horizontally laid-out wall section which is to be lifted to position said wall section vertically, for movement toward the eventual vertical position of said wall, a cable winch carried by said boom and having a cable trained over a pulley at the upper end of said boom for attachment at its free end to the upper edge portion of said wall, and a stop member carried by said boom adjacent its upper end and projecting laterally therefrom in its direction of pivotal movement, said stop member being movable along said boom and being resiliently biased in a downward direction with respect thereto.

This invention relates to new and useful improvements in construction tools or implements, and has particular reference to a jack or hoist for lifting pre-fabricated wall sections into final position.

The construction of residences and other buildings from prefabricated sections or panels is of course already quite common, and is becoming more widely practiced as time goes on. In placing a pre-fabricated wall section in place, it is usually laid horizontally on the base floor of the structure, with its eventual lower edge in approximately the desired position, and its opposite edge then pivotally lifted to place said wall section in its desired vertical position. Such wall sections are often quite heavy, particularly longer sections, so that lifting of the wall manually often requires a crew of several men. This of course renders the process troublesome as well as expensive.

The primary object of the present invention is therefore the provision of a jack or hoist which will permit a single human operator to perform the entire operation rapidly and efficiently.

Another object is the provision of a wall jack of the character described having novel means for performing very fine adjustments in final positioning of the wall section to assure that it is placed in a precisely vertical position.

Other objects are simplicity and economy of construction, efficiency and dependability of operation, ease and convenience of usage, and convenience of handling, storage and transportation thereof.

The invention may be summarized as the provision of a wall jack consisting of an elongated boom of adjustable length adapted to be pivoted to the base floor structure adjacent the eventual upper edge of a wall section which is horizontally laid out as described, for movement toward the eventual vertical position of said wall section, a cable winch carried by said boom adjacent the lower end thereof and having a cable trained over a pulley at the upper end of the boom to be attached at its free end to said wall section adjacent the eventual upper edge thereof, whereby said wall section is pivotally raised and said boom pivots to rest on the upper edge of said wall section as it is elevated, and a stop member projecting laterally from the upper end portion of said boom in its direction of movement, said wall section being drawn against said stop by said cable as said wall section approaches its vertical position, said stop being movable longitudinally along said

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boom and being yieldably biased in a downward direction thereon.

With the above described objects in view, as well as other objects which will appear in the course of the specification, reference will be had to the accompanying drawing wherein:

FIG. 1 is a side elevational view of a wall jack embodying the present invention, shown in operative relationship to a wall section to be lifted, the parts being shown at the beginning of the lifting operation in dotted lines, at the completion of the lifting operation in solid lines,

FIG. 2 is an enlarged, fragmentary sectional view taken on line II—II of FIG. 1, with parts left in elevation,

FIG. 3 is a fragmentary sectional view taken on line III—III of FIG. 2, with parts left in elevation, and

FIG. 4 is a fragmentary sectional view taken on line IV—IV of FIG. 3.

Like reference numerals apply to similar parts throughout the several views, and the numeral 2 applies generally to the boom forming the central element of the jack. Said boom is tubular, consisting of a lower section 4 and an upper section 6 telescoped slidably into the lower section and fixable therein by a set screw 8. This permits adjustable variation in the length of the boom, and also permits disassembly thereof for convenience of storage and transportation. At its lower end, lower section 4 is fixed in a socket 10 which is in turn fixed to one leaf 12 of a hinge 14 having an axis transverse to the boom. The other leaf 16 of said hinge is adapted to be affixed by any suitable means such as screws or nails not shown, to the base floor structure 18 of a building, or to a plank 20 or the like affixed to said floor. Thus the boom can pivot freely to the right from a vertical position, as viewed in FIG. 1, but not to the left.

Affixed to lower boom section 4, adjacent its lower end, is a cable winch 22 including a frame 24, a cable drum 26 rotatably mounted in said frame and manually driven by a crank 28, a ratchet wheel 30 rotatable with said crank, a cable 32 wound on said drum, and a dog 34 pivoted on frame 24 and engaging ratchet wheel 30 releasably to prevent rotation of drum 26 in a direction to pay out cable 32 therefrom. Said dog is normally held in engagement with the ratchet wheel by a spring 36, but may be manually released. Cable 32 extends from drum 26 to the upper end of the boom, where it is trained around a pulley 38 rotatably carried by said boom on an axle 40, the axis of said pulley being parallel with that of hinge 14, and a hook 42 is attached to the free end of said cable.

A stop arm 44 projects laterally from upper section 6 of the boom, adjacent pulley 38, in the same direction that said boom pivots from vertical. Said arm is affixed to a sleeve 46 which is slidably mounted on boom section 6, whereby said arm is rendered movable longitudinally of said boom. Said arm is biased downwardly relative to the boom by a helical compression spring 48 carried axially in boom section 6. Said spring abuts at its lower end against a pin 50 fixed diametrically in sleeve 46, and extending through slots 52 formed longitudinally in boom section 6, and at its upper end against a pin 54 affixed diametrically in boom section 6. The length of slots 52 of course determines the limits of movement of arm 44 relative to the boom. The sleeve may be fixed on the boom when desired by means of set screw 56.

In use, a pre-fabricated wall section 58 is laid flat and horizontally on the base floor structure 18 of a building under construction, with the edge 60 of said wall section which will eventually be its lower edge approximately in its eventual position. The boom 2 of the wall jack is then positioned vertically with its lower end adjacent the edge 62 of the wall section which will eventually be its upper edge, and the plate 16 of hinge 14 is affixed either to floor 18 or to a support plank 20 affixed to the floor, by means

of screws, nails or the like, not shown, so that said boom can pivot freely toward the eventual vertical position of the wall. Winch cable 32 is then paid out till hook 42 can be attached to wall section 58 at or adjacent edge 62 thereof. This connection may be made in any suitable manner, such as by engaging said hook in a staple 64 driven into the wall section, as shown, or by wrapping cable 32 about any convenient element of the wall section itself if such is available for this purpose, and engaging hook 42 about its own cable. If wall section 58 is quite long in a horizontal direction, two or more jacks as shown may be used at spaced apart points along the length thereof. The length of the boom should be adjusted, by loosening set screw 8 and sliding section 6 in section 4, so that when wall section 58 is vertical and the boom is pivoted to rest on the upper edge thereof, as shown in solid lines in FIG. 1, said wall will be disposed closely adjacent pulley 38. This adjustment need not be precise.

Then, with boom 2 still vertically disposed, winch 22 is operated by turning crank 28 to reel cable 32 on drum 26, whereby upper edge 62 of the wall section is raised, pivoting said wall section on its lower edge 60. It will of course be understood that winch 22 may have a gear drive interposed between crank 28 and drum 26, in order to provide any mechanical advantage which may be necessitated by the weight of the wall sections to be raised. When the edge 62 of the wall section has been raised only slightly, the tension of cable 32 will cause the boom to pivot on hinge 14 toward the eventual vertical position of the wall, until it rests against upper edge 62 of the wall, said wall thereafter supporting and moving slidably against said boom. For this reason, the lower edge of the boom is left smooth and unobstructed. Any possible tendency of the lower edge 60 of the wall to slip or slide outwardly (to the right as viewed in FIG. 1) during the lifting operation may be defeated by means of a vertical stop board 66 nailed to the edge of base floor structure 18 and projecting thereabove.

As the wall approaches its final vertical position, its upper edge engages stop arm 44 and is pulled thereagainst by cable 32, forcing said arm toward pulley 38 against the biasing force of spring 48. At this time the weight of the wall is substantially balanced on its lower edge, and therefore has little tendency to cause the wall to fall in either direction, and its upper edge is subjected to opposite but balanced horizontal forces by arm 44 and cable 32, arm 44 tending to pivot the wall inwardly and cable 32 tending to pivot it outwardly. Therefore, by paying out or reeling in cable 32 from drum 26 carefully while checking the inclination of the wall with a level or plumb bob, said wall may be positioned with great accuracy in a precisely vertical position. When the adjustment is completed, set screw 56 may be tightened to hold the wall rigidly in position until it can be structurally united to the building. Also, under some conditions it may be desirable to leave set screw 56 tight to prevent any movement of arm 44 relative to the boom. This may be done, for example, when using the jack repeatedly on a

series of wall sections all of the same height so that a pre-set position of the arm will function with satisfactory accuracy, and with greater speed, on all of them, or when the eventual final position of a wall section is pre-determined not by precise vertical positioning thereof, but by its relationship to other wall sections or structural elements already installed, so that great accuracy by the jack itself is not required. However, even under these circumstances, the ease of accurate placement of the wall section provided by the resilient yieldability of arm 44 is a distinct advantage. As previously mentioned, accurate adjustment of the length of the boom by means of set screw 8 is not necessary. The only requirement is that this adjustment be sufficiently close that the final position of the upper edge of the wall section be within the range of movement of arm 44 relative to the boom.

While I have shown and described a specific embodiment of my invention, it will be readily apparent that many minor changes of structure and operation could be made without departing from the spirit of the invention.

What I claim as new and desire to protect by Letters Patent is:

1. A wall jack comprising:

- (a) an elongated boom,
- (b) hinge means at the lower end of said boom adapted to connect said boom to a fixed base for pivotal movement on a horizontal axis from a vertical position,
- (c) a pulley carried rotatably at the upper end of said boom on an axis parallel to the axis of said hinge means,
- (d) a cable winch carried by said boom adjacent the lower end thereof, and including a cable extending therefrom and trained over said pulley for attachment at its free end to a wall panel to be elevated,
- (e) a stop arm projecting laterally from said boom adjacent the upper end thereof, in the direction of pivotal movement of said boom from a vertical position, said stop arm being freely movable along said boom longitudinally of the latter, and
- (f) means biasing said stop arm yieldably toward the lower end of said boom.

2. A wall jack as recited in claim 1 with the addition of means whereby said stop arm may be fixed rigidly on said boom, at any position in its range of movement thereon, against the pressure of said biasing means.

3. A wall jack as recited in claim 2 wherein said boom is variably adjustable in length.

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