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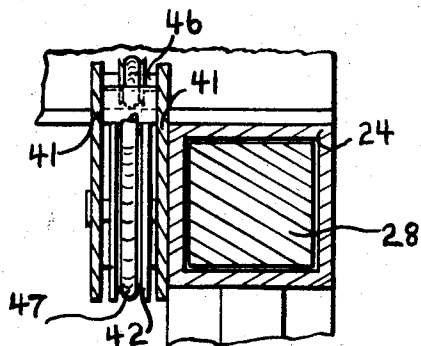


Fig 2

INVENTOR.
Herbert J. Neher
BY *Jennings & Barton*
Attorneys

Jan. 27, 1959

H. J. NEHER

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APPARATUS FOR LIFTING STACKS OF BRICKS AND THE LIKE

Filed Aug. 25, 1955

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Fig 6

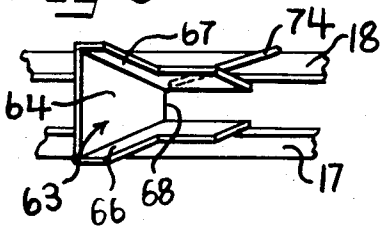


Fig 3

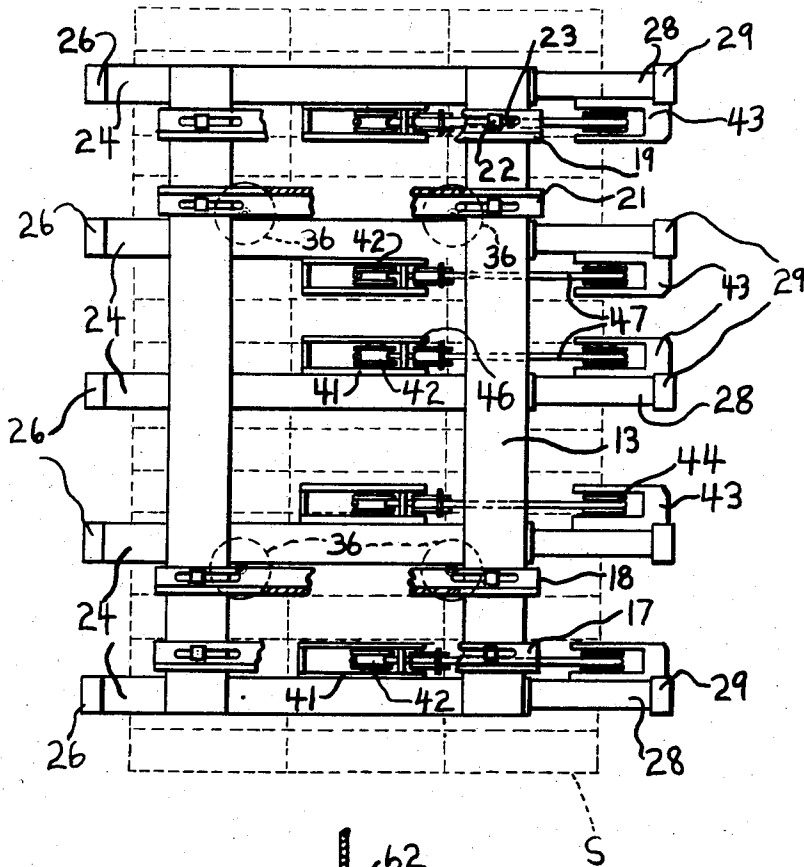
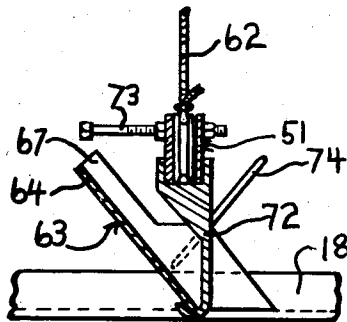


Fig 5



INVENTOR.
Herbert J. Neher
BY *Jennings & Carter*
Attorneys

Jan. 27, 1959

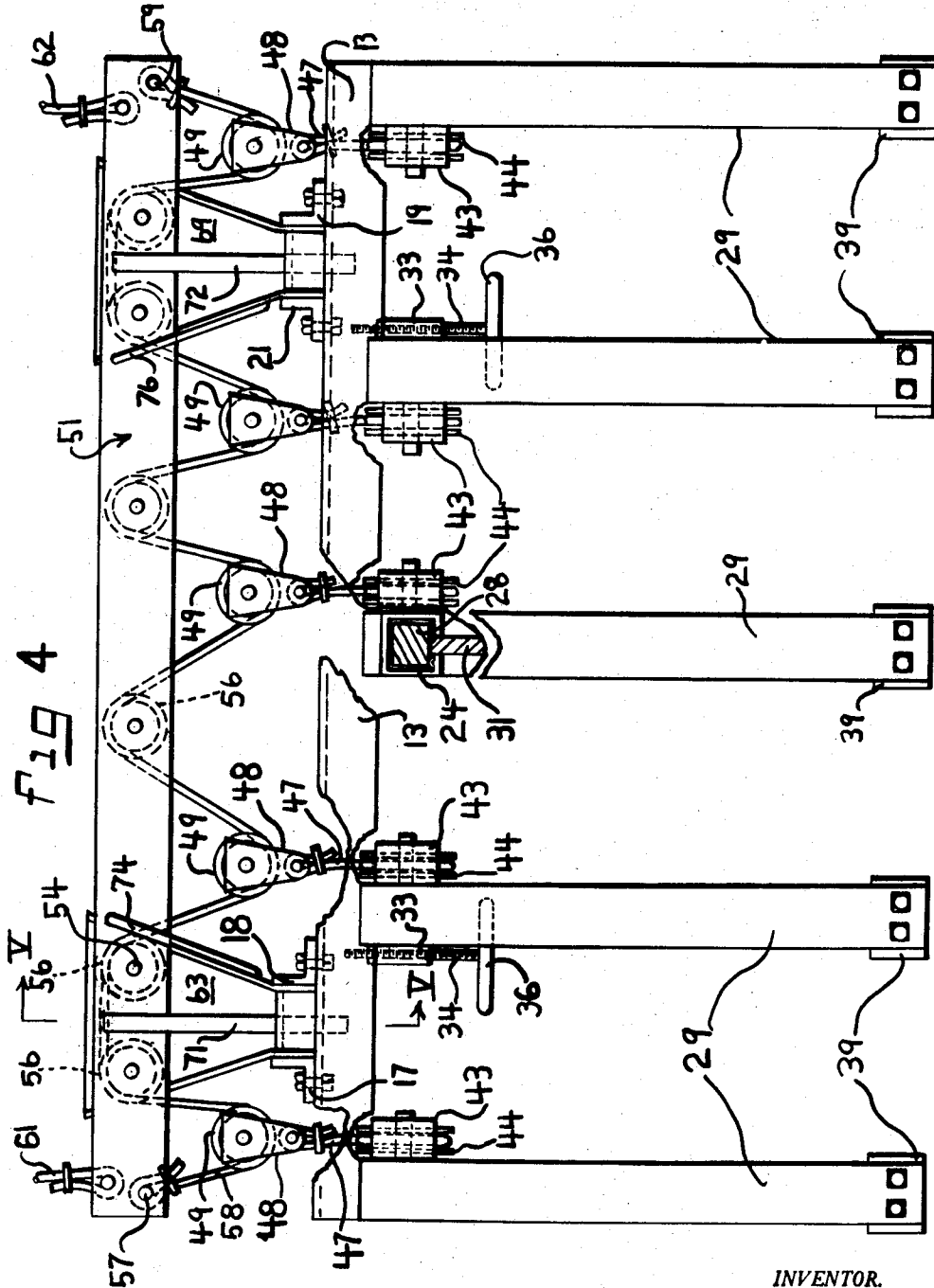
H. J. NEHER

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INVENTOR.

BY *Herbert J. Neher*
Jennings & Carter
Attorneys

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APPARATUS FOR LIFTING STACKS OF BRICKS AND THE LIKE

Herbert J. Neher, Decatur, Ala.

Application August 25, 1955, Serial No. 530,545

4 Claims. (Cl. 294—63)

This invention relates to apparatus for lifting stacks of bricks and the like and is an improvement over the apparatus described and claimed in my Patent No. 2,668,731, issued Feb. 9, 1954, and entitled "Apparatus For Lifting Stacks of Bricks and the Like."

An object of my invention is to provide apparatus for lifting stacks of bricks and the like which shall include improved means associated with the gripping elements of the apparatus which cause the same to move evenly and concomitantly into clamping engagement with the stack.

Another object of my invention is to provide apparatus of the character designated which shall include a vertically movable equalizing bar together with improved means holding the equalizing bar in lowered position relative to the stack while the apparatus is being lifted off the stack.

Further objects of my invention are to provide apparatus of the character designated which shall be simple of construction, economical of manufacture and shall be particularly adapted for use under the rugged conditions encountered around brick yards.

Briefly my improved apparatus comprises a main frame adapted to be positioned over the stack to be lifted. Secured to one side of the main frame are a plurality of horizontal tubular members having vertical gripping members extending downwardly along one side of the stack. Telescoping within the tubular members are elongated horizontal members having vertical gripping members secured to the outer ends thereof and projecting downwardly along the other side of the stack. Connected to each of the tubular members is one end of a cable which passes around a sheave mounted on the elongated member and then around a sheave mounted on the tubular member. Independently movable sheave blocks are connected to the other ends of the cables. Connected to the sheave blocks by means of a flexible member is a vertically movable equalizing bar which is adapted, upon upward movement, to clamp the stack and subsequent thereto lift the entire apparatus and the stack. Mounted on the equalizing bar is a hold-down hook member which is biased to a position to engage a portion of the main frame whereby upward movement of the equalizing bar relative to the main frame is limited until the hook member is released.

Apparatus illustrating features of my invention is shown in the accompanying drawings forming a part of this application, in which:

Fig. 1 is an end elevational view, partly broken away and in section;

Fig. 2 is a sectional view taken along the line II—II of Fig. 1;

Fig. 3 is a plan view taken generally along the line III—III of Fig. 1 and showing the stack of bricks in dotted lines;

Fig. 4 is a side elevational view, parts being broken away and in section;

Fig. 5 is a fragmental sectional view taken generally along the line V—V of Fig. 4; and

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Fig. 6 is a fragmental plan view showing the means for engaging the hook member and holding the same in lowered position.

Referring now to the drawings for a better understanding of my invention, I show a main frame 10 having angle side members 11 and 12 at one side and angle side members 13 and 14 at the other side thereof. The angle side members have inwardly extending horizontal legs, as shown in Fig. 1, with the vertical legs thereof secured to each other by any suitable means, such as by bolts 16. Connecting the side members at one end of the frame 10 are transverse angles 17 and 18 and connecting the side members at the other end of frame 10 are transverse angles 19 and 21. The transverse angles are secured to the angle side members by means of bolts 22 which pass through openings in the horizontal legs of the side frame members 11 and 13 and through elongated openings 23 provided in the transverse angle members, whereby the width of the main frame may be adjusted.

Extending transversely beneath the main frame 10 and secured rigidly thereto by any suitable means, such as by welding is a plurality of tubular members 24. As shown in Figs. 1 and 3, the ends of the tubular members 24 project outwardly of one side of the main frame and have secured to the outer end thereof downwardly and inwardly extending gripping arms 26. As shown in Fig. 2, the tubular members 24 are rectangular in shape, as viewed in transverse cross section and are braced at their juncture with the gripping arms 26 by gusset plates 27.

Telescoping within the tubular members 24 are elongated members 28 having downwardly and inwardly extending gripping arms 29 secured to the outer ends thereof. Gusset plates 31 are provided at the juncture of the elongated members 28 with the gripping arms 29. The elongated members 28 are also rectangular, as viewed in transverse cross section whereby there is no rotation of the member 28 relative to the tubular member 24. Positioned within the tubular members 24 inwardly of the elongated members 28 are compression springs 32 which urge the tubular members 24 and the elongated members 28 away from each other.

Mounted at the sides of two of the tubular members 24 adjacent the corners of the main frame 10 are vertically extending sleeve members 33 which are threaded internally for receiving threaded members 34. Mounted at the lower end of the threaded members 34 are disc-like plate members 36 which are in position to engage the upper surface of the stack of bricks, indicated at S, when the apparatus is lowered onto the stack, as shown at Figs. 1 and 3. The disc members 36 are adjusted whereby the lower ends of the gripping arms 26 and 29 are spaced a slight distance from the supporting surface for the bricks, indicated at 37, when the disc members are in engagement with the upper surface of the stack S.

The lower ends of the gripping arms 26 are bent inwardly as at 38 whereby only the lower edges thereof engage the lower course of bricks at the side of the stack. Suitable resilient gripping elements 39 are provided at the lower ends of the gripping arms 29 in position to engage the lower course of bricks, as shown in Fig. 1. The resilient gripping elements 39 together with the compression springs 32 provide resilient gripping means for engaging the lower course of bricks at each side of the stack whereby the stack is gripped firmly between the gripping arms 26 and 29.

Mounted at the sides of the tubular members 24 are sheave blocks 41 which carry sheaves 42. Mounted at the sides of the elongated members 28 in alignment with the sheave blocks 41 are sheave blocks 43 which carry sheaves 44. Secured to each of the sheave blocks 41

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by means of a pin 46 is one end of a cable 47. The cables 47 pass around the sheaves 44 mounted on the elongated members 28 and then around the sheaves 42 mounted on the tubular members 24, as best seen in Fig. 1. Connected to the other ends of the cables 47 are sheave blocks 48 which carry sheaves 49.

Positioned above the main frame 10 and the sheaves 49 is an equalizing bar 51 which comprises parallel spaced apart bars 52 and 53 connected by a plurality of bolts 54. Mounted for rotation on the bolts 54 are sheaves 56. Each sheave 56 is so spaced longitudinally of the equalizing bar 51 as to lie approximately midway between a subjacent pair of the sheaves 49. Secured to a pin 57 passing between the bars 52 and 53 is one end of a flexible member 58, such as a cable or wire rope. As shown in Fig. 4, the flexible member 58 is threaded alternately under the sheaves 49 and over the sheaves 56 and finally is secured to a pin 59 at the opposite end of the equalizing bar 51. Connected to the ends of the equalizing bar 51 are cable members 61 and 62 which are connected to a suitable form of lifting apparatus, not shown, such as a lift truck or the like.

As shown in Fig. 4, a pair of sheaves 56 are mounted directly above the transverse angles 17—18 and 19—21 whereby the cable 58 travels in a horizontal direction over the transverse angles. Mounted between the transverse angles 17 and 18 by any suitable means, such as by welding, is a downwardly sloping trough-like member 63 having a bottom wall 64 and upwardly flaring side walls 66 and 67. The bottom wall 64 of the trough-like member is cut away as at 68 to provide a bottomless lower portion for the trough. In like manner, mounted between the transverse angles 19 and 21 is a downwardly sloping trough 69 which is identical in construction to the trough 63. Mounted adjacent the ends of the equalizing bar 51 between the pairs of sheaves 56 are downwardly projecting hook members 71 and 72. As shown in Fig. 5, the hooks 71 and 72 engage beneath the lower edge or cut-away portion of the bottom wall 64 thereby limiting upward movement of the equalizing bar relative to the main frame until the hook is disengaged. The trough-like members 63 and 69 being beneath the hook members 71 and 72 serve as guides for the hook members whereby they move into proper engagement with the cut-away portion of the bottom wall 64. That is, due to the fact that the hook members 71 and 72 are supported by flexible members and are adapted to swing relative to the sheave blocks 48, the trough-like members guide the hook members downwardly whereby they engage the cut-away portion 68 of the bottom wall, thus eliminating the necessity of providing manual means for this operation.

To disengage the hook members 71 and 72 from the trough-like members 63 and 69, an outwardly projecting handle member 73 is mounted on the equalizing bar, as shown at Fig. 5. To prevent the equalizing bar 51 from falling off the forward end of the trough-like members 63 and 69, I provide outwardly and upwardly extending guide members 74 and 76 at the sides 67 of the trough-like members. As shown in Fig. 5, the guide members 74 and 76 form with the trough-like members 63 and 69 V-like supports for the equalizing bar.

From the foregoing description, the operation of my improved apparatus will be readily understood. To lift a stack of bricks or the like, the apparatus is positioned over the stack S with the gripping arms 26 and 29 at opposite sides of the stack. With the apparatus thus positioned, the springs 32 hold the gripping arms in spaced relation to the sides of the stack and the disc-like members 36 engage the upper surface of the stack to hold the lower ends of the gripping arms 26 and 29 in the spaced-relation to the supporting surface 37. The handle member 73 is moved downwardly to disengage the hook members 71 and 72 from the trough-like members 63 and 69 and the equalizing bar 51 is lifted by applying a lifting force to the cables 61 and 62. This lifts all of

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the sheave blocks 48 in unison through the medium of cable 58, thus pulling each of the cables 47 about the sheaves 42 and 44 and causing the elongated members 28 to move inwardly relative to the tubular members 24. As the elongated member 28 and tubular member 24 move inwardly toward each other, the gripping arms 26 and 29 engage the lower course of bricks at the sides of the stack S. Upon further upward movement of the equalizing bar 51, the stack of bricks is lifted off the supporting surface 37.

To remove the apparatus from the stack of bricks after the same has been moved to the desired location, the apparatus is lowered onto the supporting surface 37. Upon further lowering the equalizing bar, it moves downward relative to the main frame 10 thereby providing slack in the cable 47. The compression spring 32 then moves the gripping arms 26 and 29 away from each other and out of engagement with the sides of the stack S. As the equalizing bar 51 is lowered, the hook members 71 and 72 slide down the bottom 64 of the trough-like members 63 and 69 until they engage beneath the cut-away portion 68 thereof. The guide members 74 and 76, together with the trough-like members, provide means for retaining the equalizing bar on the trough-like member when the same is moved to fully lowered position. Upon lifting the equalizing bar 51, the hook members 71 and 72 being in engagement with the lower edge of the bottom wall 64 limit upward movement of the equalizing bar relative to the main frame 10. With the equalizing bar thus locked in this position the cable 47 is not pulled about the sheaves 42 and 44 as the equalizing bar is raised. Accordingly, the gripping arms 26 and 29 remain out of engagement with the stack S, thus permitting the entire apparatus to be raised off the supporting surface 37. The apparatus is then ready to be placed about another stack S.

From the foregoing, it will be apparent that I have devised improved apparatus for handling stacks of bricks and similar objects which is simple of construction and is especially adapted for use in transporting stacks of bricks from place to place in a yard or placing the same in a vehicle. By providing cable means associated with each set of telescoping members, equal pressure is applied by each of the gripping elements, thus effectively gripping the stack for lifting the same. Also, by providing hook members on the equalizing bar which engage the lower edge of the downwardly sloping bottom wall of the trough-like member, the equalizing bar is effectively locked in lowered position, whereby it cannot move relative to the main frame until it is manually released by the operating handle. Furthermore, by providing guide members which together with the trough-like members form V-shaped retaining means for the equalizing bar, there is no possibility of the equalizing bar falling out of operating position.

While I have shown my invention in but one form, it will be obvious to those skilled in the art that it is not so limited, but is susceptible of various changes and modifications without departing from the spirit thereof, and I desire, therefore, that only such limitations shall be placed thereupon as are specifically set forth in the appended claims.

What I claim is:

1. In apparatus for lifting a stack of bricks and the like, a main frame adapted to be positioned over the stack of bricks, parallel horizontal tubular members secured to said main frame and having outer ends adapted to extend beyond one side of the stack, downwardly and inwardly directed gripper arms secured to the outer ends of said tubular members and adapted to contact the bricks on one side of the lower course, a horizontally extending member fitting slidably in each of said tubular members and having an outer end adapted to extend beyond a side of the stack opposite said one side, gripper arms similar to the first named ones secured to the outer

ends of the slidable members opposite said first mentioned gripper arms and adapted to contact bricks on the opposite side of the lower course, a sheave mounted on a horizontal axis on each of said tubular members, a second sheave mounted on each of said slidable members outwardly of said tubular members with the second sheaves being equally spaced from the gripper arms on the slidable members, a cable connected at one end to each of said tubular members and passing around said second sheave and then around the first mentioned sheave, a sheave block positioned over each tubular member to which the other end of said cable is connected, an equalizing bar mounted for movement in a vertical plane above the sheave blocks, sheaves mounted on the equalizing bar, a second cable having its ends secured to the equalizing bar and passing alternately under the sheaves in the blocks and over the sheaves on the equalizing bar, means for lifting the equalizing bar thereby to move the sheave blocks upwardly and move the tubular members and the horizontally extending members inwardly of the stack toward each other thereby moving the gripping arms into contact with the sides of the lower course of bricks, releasable hold-down means carried by said equalizing bar adapted to engage the main frame and limit movement of the equalizing bar relative to the main frame when said equalizing bar is lifted, and means mounted on said equalizing bar to release said hold-down means.

2. Apparatus as defined in claim 1 in which the hold-down means comprises a downwardly sloping trough secured to the main frame and a hook member mounted adjacent each end of the equalizing bar and biased to a position to engage a portion of said trough thereby limiting upward movement of the equalizing bar relative to the main frame until the hold-down means is released.

3. In stack lifting apparatus, a main frame adapted to be positioned over the stack, sets of inwardly movable gripping arms suspended from the main frame and adapted to be disposed on opposite sides of the stack to extend upwardly above the stack, means adapted to move said arms into contact with the stack comprising parallel horizontal tubular members secured to the main frame and to the gripping arms at one side of the stack, a horizontally slidable member telescoping within each of said tubular members and secured to a gripping arm at the other side of the stack, a sheave mounted on each of said tubular members, a second sheave mounted on each of

said slidable members outwardly of said tubular members and spaced horizontally from the sheave on said tubular member with the second sheaves being equally spaced from the gripper arms on the slidable members, a cable secured at one end to each of said tubular members and passing around said second sheave and then around the first mentioned sheave, an equalizing bar disposed above the arms, sheaves mounted on the equalizing bar, a sheave block connected to the other end of each of said cables, sheaves mounted on the sheave blocks, another cable having its ends anchored adjacent the ends of said equalizing bar and passing alternately under the sheaves of the blocks and over the sheaves of the equalizing bar, means to lift the equalizing bar whereby upon upward movement of the blocks the tubular members and the slidable members move inwardly of the stack toward each other and the gripping arms move into engagement with the sides of the stack, releasable hold-down means carried by said equalizing bar to engage the main frame and limit upward movement of the equalizing bar relative to the main frame when the equalizing bar is lifted, and means mounted on said equalizing bar to release said hold-down means.

4. Apparatus as defined in claim 3 in which the hold-down means comprises hooks mounted on the equalizing bar, and downwardly sloping trough-like members mounted on the main frame beneath said hooks, the bottom walls of said trough-like member being cut away adjacent the lower ends thereof whereby said hooks engage the lower edges of said bottom walls when the equalizing bar is lowered relative to the main frame, and means mounted on the equalizing bar for tilting said hooks whereby they disengage said lower edges.

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