Dec. 1, 1959 M. R. CHRISTIAN ET AL 2,914,812

METAL JACK FOR DOOR FRAMES AND THE LIKE

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FIG. 1.

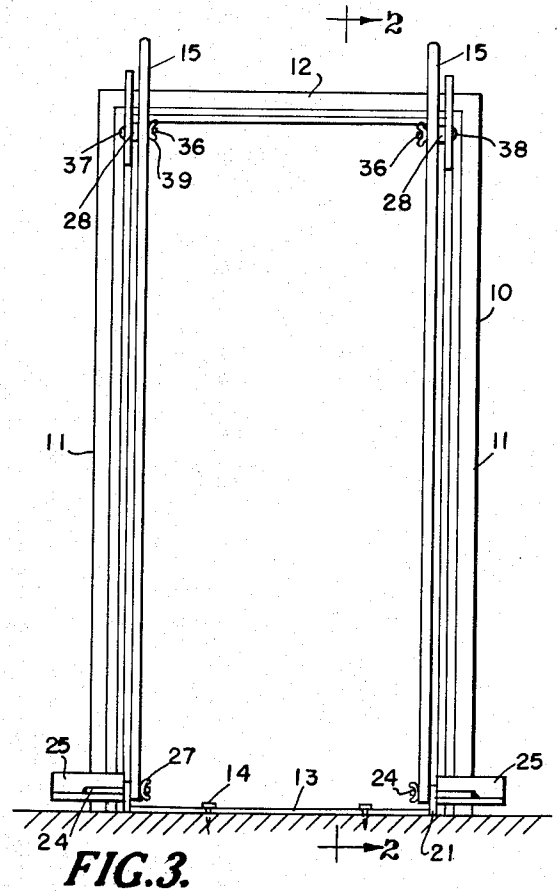


FIG. 2.

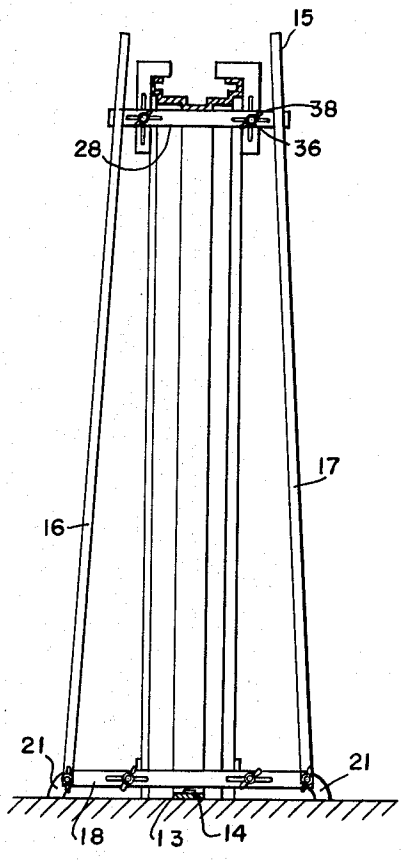


FIG. 3.

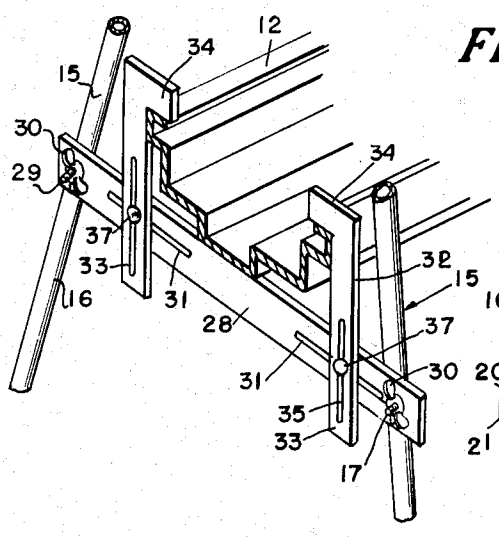
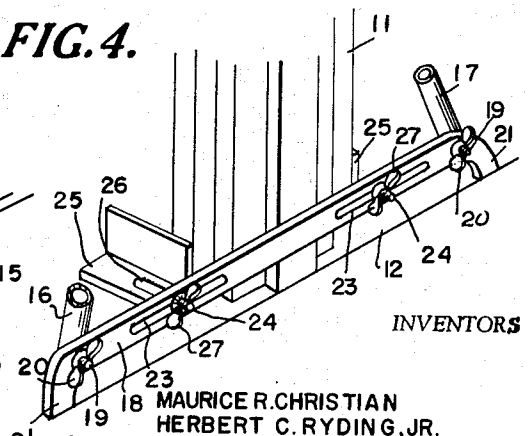


FIG. 4.



INVENTORS
MAURICE R. CHRISTIAN
HERBERT C. RYDING, JR.
BY
Cushman Darby & Cushman
ATTORNEYS

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FIG.5.

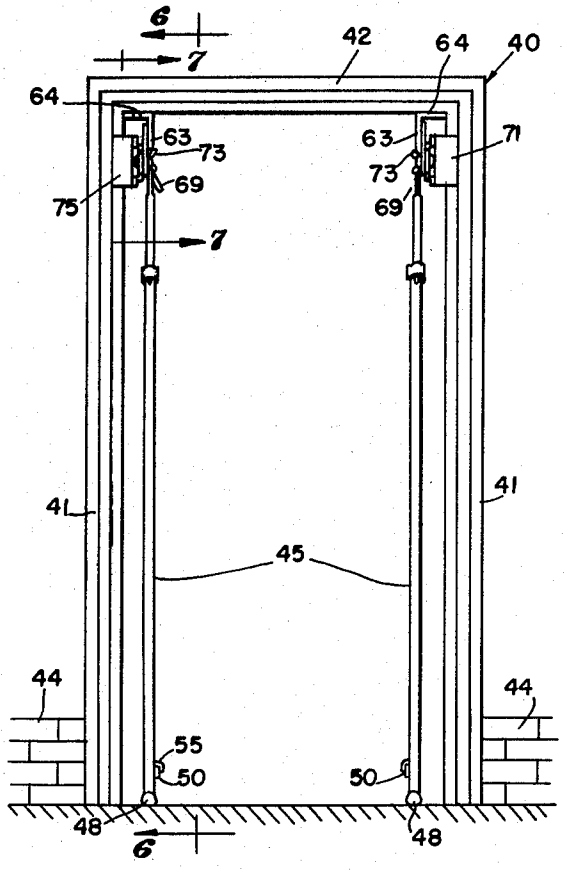


FIG.6.

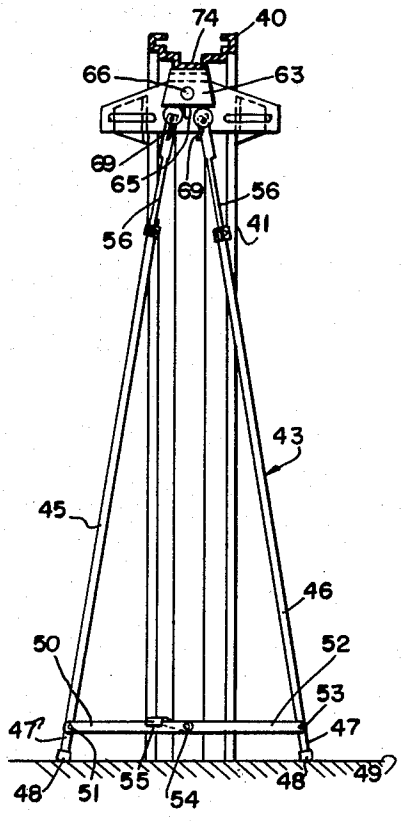


FIG.7.

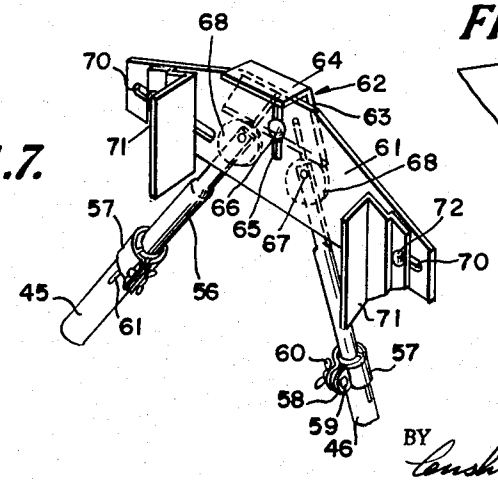
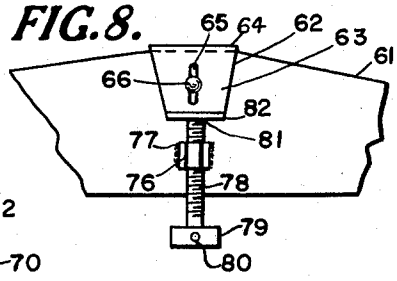


FIG.8.



INVENTORS

MAURICE R. CHRISTIAN

HERBERT C. RYDING, JR.

BY Cushman Darby & Cushman

ATTORNEYS

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METAL JACK FOR DOOR FRAMES AND THE LIKE

Maurice R. Christian and Herbert C. Ryding, Jr., Birmingham, Ala.

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7 Claims. (Cl. 20—.5)

This invention relates to a portable knock down type metal door or window frame bracing jack for adequately bracing and holding a metal frame in proper alignment with a concrete base or similar type floor slab during the time required to erect the masonry or brick walls to a predetermined height relative to the height of the frame.

It is a well known fact that, after a metal door frame has been anchored to a concrete base or floor slab, the installing of the bracing has always been a slow, clumsy, awkward, and expensive operation. Seldom will two carpenters perform the task in the same manner. In most instances and where a number of frames are involved and are to be set and braced to the same floor slab, the frame heights and widths will vary as will the side jambs and head or transom configurations. It is not uncommon to encounter head jambs with widely fluctuating face trim depths and many where the front and rear faces of the trim may vary several inches. The width and height of the door openings together with the number of doors to be swung within any one frame and the fact that frames vary in shape and some frames carry side lights or a combination of both side lights and transoms, present a serious problem for wood bracing and for these reasons the industry has never taken time out to do anything about it but complain. The labor and bracing cost of wood on large jobs runs to an appallingly high figure and is proportionally expensive on small jobs. Moreover, the bracing lumber involved after being used a few times usually is discarded and ends in the scrap pile.

Accordingly, an important object of the present invention is to provide a simple, efficient, compact, and economical portable metal knock down type door or window frame bracing jack assembly for firmly bracing and holding in perfect alignment metal frames used in constructing masonry walls in commercial, school, and industrial types of buildings. The jack assembly maintains the frame in a fixed position relative to a concrete or similar type floor base during the interval involved in laying or erecting the masonry walls to a predetermined height along the side jambs of the frame, and is provided with means for quickly disengaging the jack from the frame without stopping the masons or interrupting other workmen.

Another object of the invention is to provide a pair of spaced bracing jacks for engaging the transom of a metal door frame adjacent the corners thereof and which also releasably engages the side jambs. The metal frame may be of any suitable size or configuration, and of conventional depth when used with entrance assemblies, whether a single frame or a multi opening frame or a plain cased opening frame. Each bracing jack has means for quickly disengaging the same from the head or transom portion of the metal frame and for moving it either into or out from the frame opening at a minimum expenditure of time, effort, and cost, and without interfering with the erecting of the masonry wall.

A further object is to provide means for adequately

and securely bracing an extra wide frame for multiple opening doors or windows, such as where the extreme span might cause deflection and the horizontal head or transom member to sag.

Another object of this invention is to eliminate the use of wood bracing material and the nails required therewith.

A further object of this invention is the employment with the jack of two vertically inclined bracing members adjustably positioned adjacent opposite sides of each jamb to provide a front brace and a rear brace, connected at their lower ends to a transverse base, and at their upper ends to a cross member bracing adjustable clamping means for releasably engaging the horizontal head and side jambs of the frame.

Other objects and advantages of the invention will become apparent from the following description when taken in conjunction with the accompanying claims and drawings.

Referring to the drawings, wherein are shown several preferred embodiments the invention may assume:

Figure 1 is a front view of a door frame showing a pair of improved bracing jacks associated therewith;

Figure 2 is a sectional view taken substantially along the line 2—2 of Figure 1;

Figure 3 is a detailed perspective view of a jack assembly showing the horizontal head or transom portion of the frame in section;

Figure 4 is a detailed perspective view of the lower end portion of one of the jack assemblies showing its releasable connection with a side jamb of the metal frame;

Figure 5 is a view similar to Figure 1 of a modification;

Figure 6 is a sectional view taken substantially along the line 6—6 of Figure 5;

Figure 7 is a detailed sectional view taken substantially along the line 7—7 of Figure 5, with the frame removed; and

Figure 8 is a detailed perspective view of a further modification showing the cams replaced by an adjustable bolt and nut assembly.

Referring to the drawings, 10 indicates a door or window frame fabricated of metal, such as sheet steel, aluminum, or the like, and provided with the usual spaced side jambs 11 and horizontal head or transom portion 12. The metal frame 10 may be of any suitable size and configuration, such as particularly shown in Figure 2. It will, of course, be manifest that the frame 10 may assume various other shapes, depending upon the opening or entrance assembly with which it is to be associated. The lower ends of the spaced side jambs 11 may be connected by a transversely disposed flat metal plate 13 (Fig. 1) secured to the concrete floor or slab 9 in any suitable manner, such as by the bolts 14.

In order to adequately brace and hold the metal frame 10 in correct alignment with the concrete floor 9, during the time interval required to erect the masonry walls in abutment with the spaced side jambs 11 of the frame, a longitudinally spaced pair of portable knock down bracing jacks 15 are arranged to be associated with the metal frame adjacent the corners thereof. Each of the bracing jack assemblies 15 includes a front inclined rod or upright 16 and a spaced rearwardly inclined rod or upright 17 disposed on opposite sides of each of the side jambs 11 and which are connected together at their lower ends by a transverse bar or member 18 (Fig. 4) by the threaded studs or bolts 19 that extend outwardly from each of the uprights 16 and 17 and through openings in the bar 18 so as to be detachably connected thereto by the wing nuts 20. The transverse bar 18 is spaced above the floor or base 9 and has its ends bent downwardly to form the foot members 21 that engage

the floor on opposite sides of the jamb 11, so that each bar 18 makes only limited contact with the floor 9 at the ends thereof in order to avoid high spots in the flooring due to the uneven floating or trowelling when forming the concrete floor base or slab 9.

It will be noted that the lower end of each of the inclined bracing rods 16 and 17 is connected to the cross bar or member 18, at points adjacent the ends thereof. The cross bar 18 is also provided with longitudinally spaced elongated slots 23 which receive the threaded studs or bolts 24 welded to longitudinally spaced angulated clamping members 25 as at 26. The bolts 24 extend through aligned slots 23 and are arranged to be clamped thereto by the wing nuts 27. Thus it will be seen that the clamping members 25 may be moved longitudinally relative to the rod 18 so as to engage opposite sides of a jamb 11 in order to firmly maintain the latter in a fixed position during the initial erecting of the masonry wall, and until the wall is built up to a predetermined height, such as approximately two-thirds of the door frame height.

The opposite or upper end portions of the inclined bracing rods 16 and 17 (Fig. 3) are connected to a transverse bar or strap 28, by the threaded studs or bolts 29 which extend outwardly from the rods 16 and 17 and through aligned openings in the bar 28, so as to be clamped thereto by the wing nuts 30. The transverse bar 28 is also formed with longitudinally spaced elongated openings or slots 31 (Fig. 3). Vertical disposed substantially L-shaped retaining bars or members 32 are each preferably formed with a long vertical arm 33 and a short horizontal arm 34. The arms 34 extend inwardly towards each other and are arranged to overlap and engage the adjacent sides of the head section or transom portion 12 of the frame when the parts are assembled (Fig. 3). The frame 10 may be a standard frame or any other suitable type with which the head section 12 is associated. Each of the vertical arms 33 has an elongated slot 35 which intersects an adjacent horizontal arm 31 and is adjustably connected thereto by the threaded bolts 36, the head 37 of which engages the side of the arm 33 so that the bolt 36 has its threaded shank extending outwardly from the opposite side of the bar 28 in order to be clamped thereto by a wing nut or the like 39 (Fig. 1). Each of the vertical arms engages the adjacent side of the transverse head portion 12 of the frame, and is of such a length as to extend below the bar 28 so as to be both vertically and laterally adjustable relative to the head 12 of the frame 10.

When the wall is built up to the desired height, the bracing jack assembly can be quickly disengaged from the door frame and dismantled at a minimum expenditure of time, effort, and cost, without stopping or interfering with the masons, their assistants, or other craftsmen. The jack assembly may then be moved for similar service for erecting another door or window frame.

Thus, it will be seen that simple, efficient, and positive jack means are provided for quickly and effectively holding and bracing the metal door frame 10 to a concrete or similar type floor base or slab 9, which includes associating with each of the side jambs 11 of the frame, a jack assembly that extends transversely of the frame adjacent the floor and which is provided with a front inclined member or upright 16 and a rearwardly inclined upright 17 that is detachably connected to the lower cross bar or brace 18 which serves to maintain the arms or legs 16 and 17 in their extended position, and which can be readily dismantled upon withdrawing the wing nuts 20 from the bolts 19. The cross bar 18 is also adjustably connected to an adjacent side jamb 11 by the angulated clamping plates 25 (Fig. 4), that may be releasably moved into firm engagement with opposite sides of an adjacent jamb 11. Additionally, the upper ends of the inclined arms 16 and 17 detachably support the cross bar 28 which is adjustable so as to engage the head or transom bar 12 of the frame in order to brace and hold the transom bar in a fixed position until the side walls are erected to approximately two-thirds of the height of the frame 10.

In the modified form of the invention shown in Figures 5, 6, and 7, the metal door frame 40 has the spaced side jambs 41 which are connected at their upper ends by the head or transom bar 42, and may be of any desired shape and size, as particularly shown in Figure 6. Associated with each of the side jambs 41 and extending transversely of the door frame is a knock down or readily dismantleable bracing jack assembly 43. A pair of these assemblies is provided so as to support the transom bar 42 at spaced points and adjacent the jambs 41 so as to insure the door frame being maintained firmly in a fixed position as the masonry walls 44 are being erected and until the wall reaches a predetermined height, such as a height approximately two-thirds of the height of the frame 40, at which point the jack assembly can be quickly disengaged from the door frame without stopping or interfering with the erecting of the wall or disrupting the progress of the workmen.

Each of the jack assemblies 43 includes a front inclined tubular rod or upright 45 and a rear inclined tubular rod or upright 46 which converge upwardly from their lower end portions 47, and are positioned on opposite sides of the jamb 41 to provide a pair of substantially A-shaped supporting frames. The ends of the portions 47 may be provided with rubber caps or shoes 48 that engage the floor or base 49 so as to prevent accidental slipping of each of the jacks when the parts are assembled. The front and rear bars 45 and 46 are connected adjacent their lower ends by a sectional brace including an arm 50 pivoted as at 51 to the front bar 45, and a coacting transverse bar 52 pivoted as at 53, to the rear bar 46. The inner ends of the bars 50 and 52 to overlap and are pivotally connected as at 54 (Fig. 6), so as to be collapsible when the sections 50 and 52 are raised upwardly about their pivots 51 and 53, respectively. One of the arms, such as the arm 52, may be provided with a bent flange portion 55 that overlaps the adjacent portion of the arm 50 so as to constitute a stop for limiting the downward movement of the arm 52 in order to maintain them in a fixed horizontal position, and also to hold the arms 50 and 52 in their extended position (Fig. 6), but allow the sections 50 and 52 to fold upwardly to collapse and fold into a compact shape for storing or when in transit.

Each of the tubular arms 45 and 46 at their upper ends is arranged to receive a telescopic rod or leg 56 which may be adjustably secured thereto by a clamp 57 having the spaced parallel arms 58 provided with aligned openings for receiving a threaded bolt 59 to which is connected a wing nut or the like 60. In order to impart desired resiliency to the upper end of each of the tubular members 45 and 46 each may be formed with a slit 61 which is embraced by the clamping member when the parts are assembled. A cross head or plate 61 (Fig. 7) is positioned adjacent the underside of the transom head or head section 40 and one of the jambs 41 and is provided with a vertically adjustable angulated member or plate 62 having a depending vertical arm 63 and a laterally horizontal arm 64 preferably shaped as particularly shown in Figure 7, and which is positioned so that the horizontal arm 64 engages the underside of the transom bar 40 of the door frame, in order to brace and support the same during the initial erection of the masonry wall along the jambs 41, and until the height of the masonry reaches approximately two-thirds of the height of the frame 40.

The plate 61 has a vertical slot 65 to which is slidably connected a retaining bolt 66 that is secured to the vertical arm 63 of the member 62 so as to allow vertical movement of the member 62 relative to the plate 61. The axial adjustable arms or legs 56 at their upper ends

are connected to the plate 61 by the spaced bolts 67 rotatably connected to the plate 61. Each of the bolts 67 has fixed or keyed thereto a cam 68 that engages the underside of the vertical arm 63 of the member 62, so as to control the vertical movement thereof. Each of the bolts 67 is provided with a manually operating handle 69 (Fig. 6) so that rotation of the cams 68 by operation of the handles 69, will move the member 62 either into or out of engagement with the underside of the transom bar 40.

The plate or cross head 61 has adjacent opposite ends thereof transversely aligned elongated slots 70 (Fig. 7) to which are adjustably connected the vertically disposed angle plates 71, by the threaded bolts 72 so as to be longitudinally adjustable relative to the plate 61 so as to engage the side jambs 41, and be releasably maintained in a fixed position by the wing nuts 73 (Fig. 5) that are detachably connected to the bolts 72. Thus, it will be seen that, when the parts are assembled, as particularly shown in Figures 5 and 6, the end or corner portions of the head 42 of the frame 40 are engaged by the spaced horizontal arms 64 of the member 62 which are moved and maintained in engagement with the adjacent undersurface 74 (Fig. 6), by the manual adjustment of the cams 68. At the same time, each of the jambs 41 is engaged on its front and rear surfaces by the adjustable plates 71 (Fig. 5) which are moved into engagement with the adjacent sides of the jamb and are maintained in a fixed position relative thereto by the bolts 72 and their associated jamb nuts 73.

Thus, it will be seen that, when each of the bracing jack assemblies 43 is in engagement with the head 42 and jambs 41 of the door frame, the plate 62 will exert an upward force on the frame at the corners thereof by reason of the moving and maintaining of the plate by the cams 63 into firm supporting engagement with the head 42. This upward pressure in turn applies a downward force on the substantially A-shaped frame 43 and the adjustable legs 45 and 46 which cause the rubber caps to firmly engage the concrete slab 49 so as to insure the jack assemblies being properly held in a firm fixed position. Moreover, the firm engagement of the angle plates 71 with the jambs 41 coact with the plate 64 to insure proper rigidity so as to accurately and firmly brace and hold in perfect plumb alignment the door frame 40.

The jack assembly is portable and may be readily assembled or dismantled at a minimum expenditure of time, effort, and cost, and may with equal facility be used for bracing and supporting window frames and entrance assemblies. Moreover, the jack may efficiently be substituted for wood bracing which is generally discarded after once being used. The jack assembly further accommodates itself to any size of metal door or window frame and may be associated with the various types and profiles of such frames which heretofore has presented a difficult problem when such bracing has been formed of lumber.

In the modified form of the invention shown in Figure 8, the cams shown in Figure 7 have been replaced by an adjustable bolt and nut assembly including welding a threaded nut 76 to the outer surface of the plate 61 as at 77 below and in spaced alignment with an angulated member 62, for the purpose of receiving a threaded bolt 78 having an enlarged head 79 at its lower end which may be provided with an opening 80 for receiving a suitable turning tool (not shown). The opposite or upper end 81 of the bolt 78 is arranged to abut a lateral flange 82 formed on the lower end of the plate 62 so as to move and maintain the plate 62 in adjustable engagement with the head or transom 42 of the door frame.

It will be understood that the forms of the invention shown are merely illustrative and that such changes may be made as come within the scope of the following claims.

We claim:

1. A jack of the class described, including spaced upwardly converging supporting legs, a cross head, means detachably connecting the cross head to the upper end portions of said legs, spaced angulated members, each of said members having a horizontal arm and a vertically depending arm engageable with adjacent sides of a frame to maintain the same in a fixed position, means for adjusting vertically each of said angulated members relative to said cross head, and means for adjusting longitudinally each of the angulated members relative to the cross head.

2. In combination with a frame of the class described having a transom head and side jambs, a bracing jack for maintaining the frame in a fixed position while laying a masonry wall adjacent the side jambs, said jack including a front upright and a rear upright positioned on opposite sides of the frame, a base extending transversely through the frame and connected to said uprights adjacent the lower ends thereof, spaced movable clamping means connected to said base and engageable with opposite sides of a side jamb of the frame to maintain the latter in a fixed position, a cross member connected to the upper end portion of the uprights, and means connected to the cross member and engageable with the frame to brace and maintain the latter in proper alignment during the interval the masonry wall is being erected and until the wall is built to a predetermined height.

3. In combination with a frame of the class described having a transom head and side jambs, a bracing jack for maintaining the frame in a fixed position while laying a masonry wall adjacent the side jambs, said jack including a front upright and a rear upright positioned on opposite sides of the frame, a base extending transversely through the frame and connected to said uprights adjacent the lower ends thereof, spaced longitudinally movable clamping members connected to said base and engageable with opposite sides of a side jamb of the frame to maintain the latter in a fixed position, a cross member connected to the upper end portions of the uprights, and releasable clamping members adjustably connected to the cross member and engageable with the transom head and side jambs of the frame for maintaining the latter in proper alignment during the interval the masonry wall is being erected and until the wall is built up to a predetermined height.

4. In combination with a frame of the class described having a transom head and side jambs, a bracing jack for maintaining the frame in a fixed position while laying a masonry wall adjacent the side jambs, said jack including a front upright and a rear upright positioned on opposite sides of the frame, a base extending transversely through the frame and connected to said uprights adjacent the lower ends thereof, spaced movable clamping means connected to said base and engageable with the opposite sides of a side jamb of the frame to maintain the latter in a fixed position, a cross member connected to the upper end portion of the uprights, a pair of longitudinally spaced L-shaped members releasably engageable with the transom head, means for adjustably connecting each of said L-shaped members to said cross member so as to brace and hold the frame in proper alignment during the interval the masonry wall is being erected and until the wall is built up to a predetermined height.

5. In combination with a metal frame of the class described having a transom head and side jambs, longitudinally spaced portable knock down bracing jacks for maintaining the frame in a fixed position while erecting a masonry wall adjacent the sides of the frame, each of said jacks including an inclined front upright, an inclined rear upright, a spacer member connected to the front and rear uprights adjacent the lower ends thereof, a cross member connected to the upper ends of the uprights, and each jack having spaced clamping means connected to said cross member and arranged to be releasably con-

nected to the transom head and a side jamb adjacent the corner thereof to maintain the frame in a fixed position during the erection of a masonry wall and until the wall is built up to a predetermined height.

6. In combination with a metal frame of the class described, having a transom head and side jambs, longitudinally spaced portable knock down bracing jacks for maintaining the frame in a fixed position while laying a masonry wall adjacent the sides of a frame, each of said jacks including an inclined front upright, an inclined rear upright, a spacer member connected to the front and rear uprights adjacent the lower end thereof, means for detachably connecting said spacer member to said uprights, a cross member connected to the upper ends of the uprights, vertically disposed spaced L-shaped members, means for adjustably connecting each of said L-shaped members to said cross member, said L-shaped members being movable into releasable engagement with the transom head so as to maintain the same in a fixed position during the erection of a masonry wall and until the wall is built up to a predetermined height.

7. In combination with a metal frame of the class described having a transom head and side jambs, longitudinally spaced portable knock down bracing jacks for maintaining the frame in a fixed position while erecting a masonry wall adjacent the sides of the frame, each of said jacks including an inclined front upright, an inclined rear upright, a spacer member connected to the front and rear uprights adjacent the lower ends thereof, a cross member connected to the upper ends of said uprights, vertically disposed spaced L-shaped members, means for adjustably connecting each of said L-shaped members to said cross member, said L-shaped members being movable into releasable engagement with the transom head so as to maintain the same in a fixed position during the erection of a masonry wall and until the wall is built up to a predetermined height.

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