Aug. 10, 1965 R. J. SNAPP 3,199,206

DOOR FRAME PROFILE GAUGE

Filed Feb. 19, 1963 2 Sheets-Sheet 1

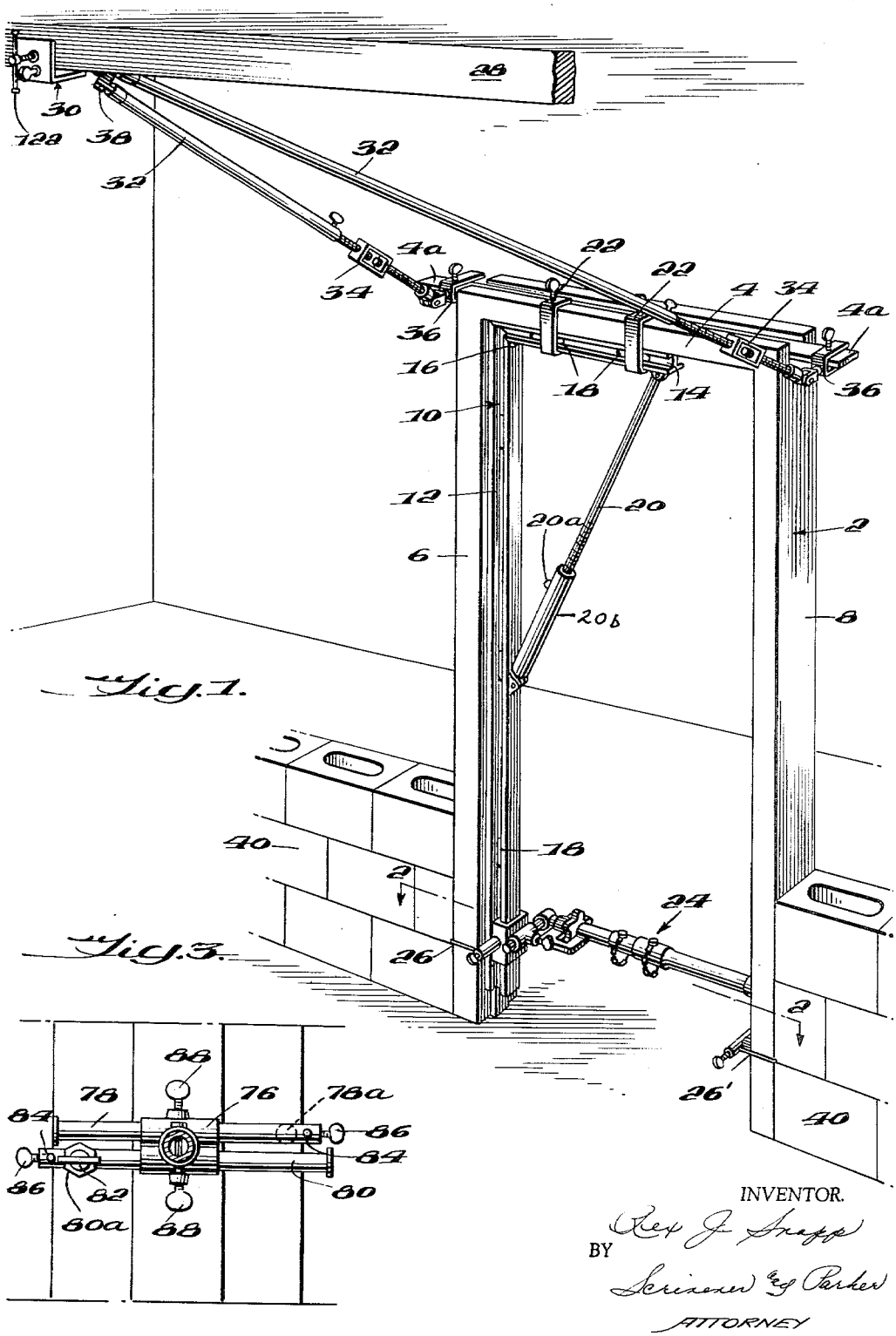


Fig. 1.

Fig. 3.

INVENTOR.

BY Roy J. Snapp

Scrivener & Parker

ATTORNEY

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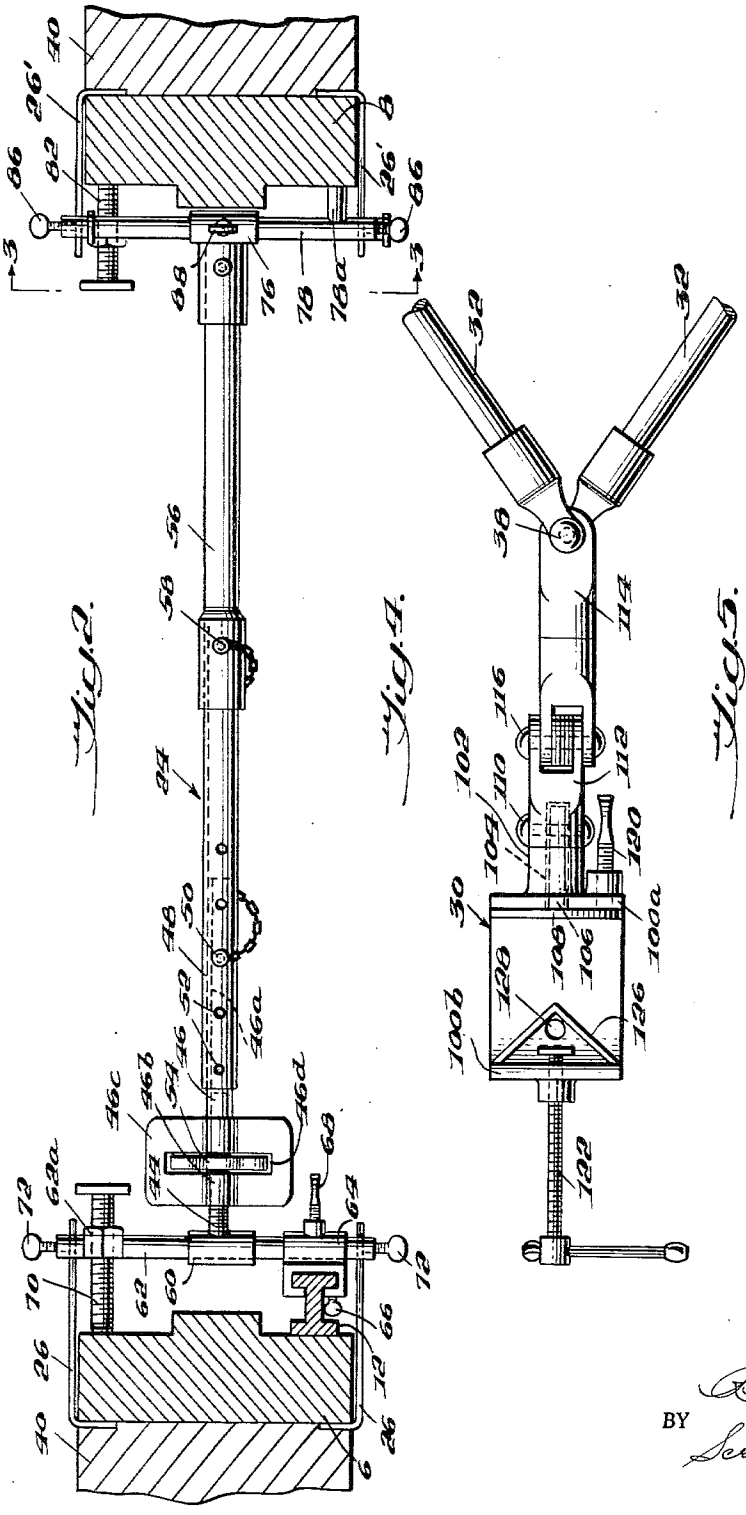


Fig. 2.

Fig. 4.

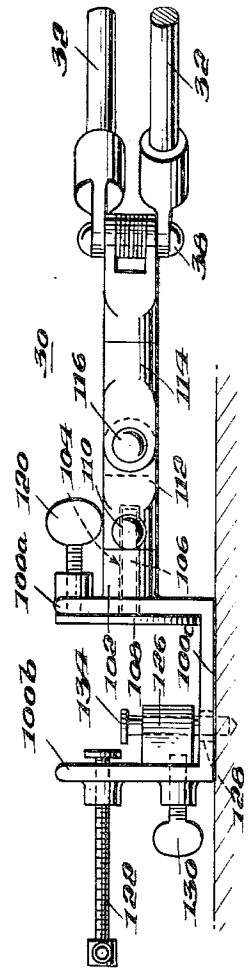


Fig. 5.

INVENTOR.
Ray J. Snapp
BY
Serjeeson & Parker
ATTORNEY

United States Patent Office

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DOOR FRAME PROFILE GAUGE

Rex J. Snapp, 1914 University Blvd., Lima, Ohio

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This invention relates generally to spacer bar means operable in combination with profile gauge means to properly orient the jamb and header members of a door frame, and more particularly to means for aligning a door frame and for supporting the same in an aligned, plumb condition during the construction of a wall about the frame.

In my prior U.S. Patent No. 2,973,584 of Mar. 7, 1961, I have disclosed profile gauge means for orienting a door frame jamb at a 90° angle relative to a horizontal header member. While alignment of the door frame is readily achieved by the use of the profile gauge means, it has been found in actual practice that unless some means are provided for supporting the components in their properly oriented positions, the frame is often inadvertently knocked out of alignment during this installation in a building. Furthermore, when the jambs are slightly warped or distorted, it is difficult to produce incremental changes in the spacing between the free ends of the jambs indicated as being necessary by the profile gauge means. Moreover, when a masonry wall or the like is to be constructed in situ about an aligned door frame, it is difficult to support the frame in a plumbed position without interfering with passage of personnel through the frame.

Accordingly an object of the present invention is to provide spacer bar means operable in combination with profile gauge means for properly orienting the jamb and header members of a door frame.

A more specific object of the invention is to provide first means for properly orienting the members of a door frame and for temporarily maintaining the same in their oriented positions, and second means for supporting the aligned frame in a vertical plumb condition during the construction of a wall in situ thereabout.

A further object of the invention is to provide spacer bar means affording coarse and fine adjustment of the spacing between the free ends of the jambs of a door frame. In accordance with an important feature of the invention, the spacer bar means cooperate with profile gauge means to position at least one of the door jambs at an angle of 90° relative to a horizontal header member and to maintain proper orientation of the door frame members during installation of the frame in a building.

Still another object of the invention is to provide adjustable length bracing means for connecting the upper portion of a door frame to a fixed support, said bracing means being adjustable to plumb the frame. According to an important feature of the invention, the bracing means include novel swivel bracket means which are adjustable to fixed angular positions permitting simple connection of the bracing means to a stationary support.

A more specific object of the invention is to provide swivel bracket means comprising a U-shaped member connectable to a fixed support, a first member rotatably connected at one end to said fixed support, a second member pivotally connected at one end to the other end of said first member, at least one third member pivotally connected to the other end of said second member for pivotal movement about an axis normal to the pivotal connection

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between said first and second members, and means for locking said first member against rotation relative to said U-shaped member. According to the invention, a pair of said third members are provided which are adjustable in length and which are hingedly connected to opposite ends of the header member of the frame.

Other objects and advantages of the invention will become apparent from a study of the following specification when considered in conjunction with the accompanying drawing in which:

FIG. 1 is a perspective view of the door frame positioning means of the present invention;

FIG. 2 is a sectional view taken along line 2—2 of FIG. 1;

FIG. 3 is a sectional view taken along line 3—3 of FIG. 2; and

FIGS. 4 and 5 are plan and side elevation views, respectively, of the swivel bracket means of FIG. 1.

Referring more particularly to FIG. 1, the wooden or metal door frame 2 includes a horizontal header 4 and a pair of vertical jambs 6 and 8. Arranged within the door frame is a profile gauge 10 similar to that disclosed in the aforementioned patent. Gauge 10 includes vertical and horizontal arms 12 and 14, respectively, which are pivotally connected by hinge means 16. Each of the arms is of I-beam cross sectional configuration and is provided with vertical and horizontal spirit level means 18. Variable length brace member 20 is pivotally connected at each end to the respective arms and is provided with indicia for indicating when the angle between the pivotally connected arms exactly equals 90°. Horizontal arm 14 is secured to header 4 by a pair of C-clamps 22. A thumb set screw 20*a*, threaded through a wall of arm 20*b*, has an end adapted to abut tightly against a portion of the arm 20 extending in arm 20*b* to lock the brace at a desired selected length by preventing relative movement between the arms.

Arranged horizontally between the lower ends of the door frame jambs is a generally H-shaped adjustable-length spacer bar 24. At one end, the spacer bar is slideably connected to vertical gauge arm 12 for vertical movement relative thereto. The other end of the spacer bar abuts the adjacent surface of jamb 8. The ends of the spacer bar are secured to jambs 6 and 8 by L-shaped tie wires or rods 26 and 26', respectively, which extend behind the jambs and are secured at their free ends to horizontal transverse portions of the spacer bar.

The upper end of the door frame is connected to fixed support 28 (which is illustrated in FIG. 1 as being a ceiling beam) by swivel bracket 30 and a pair of variable-length brace legs 32. Each of these legs includes telescopic sections permitting "coarse" length adjustment, and a turnbuckle 34 affording "fine" adjustment. At one end, each of the rods is pivotally connected to a C-clamp 36 which is secured to horizontal header extension 4*a*. The other ends of the rods are pivotally connected to swivel bracket 30 by pivot shaft 38. After alignment and plumbing of the door frame, the masonry walls 40 are constructed about the frame as shown.

Referring now to FIGS. 2 and 3, the spacer bar means 24 includes three telescopically-arranged longitudinally-adjustable sections or elements 44, 46 and 48. "Coarse" and "fine" adjustment means are provided for longitudinally adjusting tubular element 46 relative to tubular element 48 and threaded rod 44, respectively. "Coarse"

adjustment is afforded by a locking pin 50 which extends through one of the longitudinally spaced openings 52 in element 48 and into a corresponding opening in the adjacent end of element 46. At its other end, element 46 includes a pair of longitudinally spaced sections 46*a* and 46*b* which are rigidly connected by bridging flanges 46*c*. Arranged in opening 46*d* between the sections is a knurled adjusting nut 54 which is threadably mounted upon rod 44. Since nut 54 is prevented from longitudinal movement relative to element 46, rotation of the nut effects "fine" longitudinal adjustment between rod 44 and element 46. The other end of tubular element 48 extends into a corresponding bore in cylindrical element 56 and is removably secured thereto by locking pin 58. To prevent loss, pins 50 and 58 are chained to elements 48 and 56, respectively.

Welded transversely to the free end of threaded rod 44 is a sleeve 60 which slideably receives horizontal rod 62. Rod 62 extends at one end through a bore in a bracket 64 that is connected for vertical sliding movement upon vertical gauge arm 12. Lock screws 66 and 68 rigidly secure bracket 64 to arm 12 and rod 62, respectively. Threadably mounted in a bore in enlarged portion 62*a* of rod 62 is a stabilizing bolt 70. Bolt 70 extends longitudinally of the spacer bar and is adjustable to engage an adjacent surface of door jamb 6. The free ends of the L-shaped tie rods 26 are locked in corresponding openings in rod 62 and bracket 64 by lock screws 72.

Welded to the other end of element 56 is a transverse sleeve member 76 provided with a first bore which slideably receives horizontal rod 78. Rod 78 is provided with a rigid right-angled extension 78*a* that is adapted to engage a vertical surface of door frame jamb 8. Sleeve member 76 is provided with a parallel second bore which slideably receives horizontal rod 80 (FIG. 3). Stabilizing bolt 82, which is threadably mounted in a bore in enlarged portion 80*a* of rod 80, extends longitudinally of the spacer bar and is adjustable to engage an adjacent surface of jamb 8. The free ends of L-shaped tie wires 26′ extend through openings 84 in rods 78 and 80 and are secured therein by lock screws 86. Rods 78 and 80 are secured in their respective bores in sleeve member 76 by lock screws 88.

Referring now to FIGS. 4 and 5, the swivel bracket 30 comprises a rigid U-shaped element 100 to one wall 100*a* of which is welded a cylinder 102. Rotatably mounted in bore 104, which extends longitudinally through the cylinder and through wall 100*a*, is a shaft 106 which is secured at one end to cylindrical disk 108. The other end of the shaft is secured by pin means 110, within an axial bore in cylinder member 112. Member 112 is bifurcated at its free end and is pivotally connected to the bifurcated portion of a second cylinder 114 by pivot pin 116. Brace rods 32 are pivotally connected to the free end of cylinder 114 by pivot pin 38 that is normal to both pivot pin 116 and the longitudinal axis of cylinder 114. It is apparent that legs 32, pivots 38 and 116, cylinders 114 and 112, shaft 106 and disk 108 may be rotated as a unit about the axis of bore 104. Lock screw 120, which is threadably mounted in wall 100*a*, cooperates with disk 108 to lock the unit in any desired angular position relative to element 100. When the unit is so locked, cylinder 114 is freely pivotable about the axis of pin 116, and legs 32 are freely pivotable about the axis of pin 38. Bolt 122, which is threadably mounted in opposed wall 100*b*, is adjustable to secure the swivel bracket means to a fixed support positioned between the parallel walls as shown in FIG. 1.

Alternate means for securing the swivel bracket to a fixed support are provided which include a V-shaped angle iron element 126 the extremities of which are welded to wall 100*b* above an opening 128 provided in the base of member 100. Lock screw 130 is threadably mounted in wall 100*b* and is adapted to extend between the legs of V-shaped member 126. Thus to secure the swivel bracket

to a fixed support (for example, the ground or a floor surface as shown in FIG. 5), lower base surface 100*c* is seated upon the support, a spike, bolt or other securing element 134 is inserted downwardly through member 126, through opening 128 and into the support, and screw 130 is rotated to clamp securing means 134 against V-shaped member 126.

OPERATION

Assume that an interior masonry wall is to be constructed about door frame 2, and that a door is to be hinged subsequently to jamb 6.

Door frame 2 is arranged at the desired location and is supported by the foot portions of jambs 6 and 8. Horizontal gauge arm 14 is clamped to header 4 by C-clamps 22, and arm 12 extends downwardly adjacent jamb 6. With lock screw 120 released, swivel bracket 30 is clamped to ceiling beam 28 (at a location which is preferably contained in a vertical plane passing transversely through the center of the door frame), and the free ends of brace rods 32 are clamped to header extension 4*a* by C-clamps 36. Lock screw 120 is now tightened to secure disk 108, shaft 106 and member 112 against rotation relative to U-shaped member 100. By appropriate telescopic and turnbuckle adjustment, the lengths of brace rods 32 are adjusted to plumb the door frame. With screws 66 and 68 released, bracket 64 is slid upwardly upon the lower end of gauge arm 12, rod 62 is adjusted until bolt 70 is opposite the jamb, and bolt 70 is adjusted to cause rod 62 to be parallel with the jamb. Tie rods 26 are mounted behind jamb 6 at a desired elevation (corresponding with the contemplated height of a course of the bricks or cinder block of the masonry wall to be constructed), bracket 64 is secured to arm 12 by screw 66, screw 68 is tightened, and the extremities of the tie wires are secured in the corresponding openings in the spacer bar device by screw 72.

With locking pin 50 removed, and with screws 88 released, the other end of spacer bar 24 is similarly secured to jamb 8. By appropriate adjustment of rods 78 and 80, rod extension 78*a* is caused to engage jamb 8, and bolt 82 is adjusted to also engage the jamb and maintain rods 78 and 80 parallel thereto. With the spacer bar device maintained horizontal, tie wires 26′ are secured to jamb 8 by screws 86, and screws 88 are tightened to secure rods 78 and 80 in their respective bores in sleeve member 76. Elements 44, 46 and 48 are adjusted longitudinally until the opening in element 46 is opposite one of the coarse adjustment openings 52 in element 48, whereupon pin 50 is inserted to prevent relative longitudinal movement between elements 46 and 48. By appropriate fine adjustment of nut 54, jamb 6 is displaced relative to jamb 8 until member 20 of gauge 10 indicates jamb 6 to be exactly normal to header 4. Header 4 is maintained level by appropriate movement of jamb 8. If necessary, turnbuckles 34 may be adjusted for final plumbing of the door frame. The masonry interior wall 40 is now constructed around the door frame. When the level of the wall approaches the upper portion of the frame, screws 72 and 86 are loosened to release the tie wires, pin 50 is removed, screw 66 is loosened and spacer bar 24 is collapsed and removed. The tie wires are removed from the masonry or their protruding portions are cut off adjacent the surfaces of wall 40. Evidence of the use of the tie rods is covered with mortar. Clamps 22 and 36 are released to disconnect gauge 10 and brace rods 32, respectively, from the door frame, and the construction of the wall is completed.

Referring again to FIG. 1, it will be noted that because of the location of the spacer bar device adjacent the lower portion of the frame, and because of the mounting of the profile gauge adjacent an upper corner, the passage through the door frame is relatively unobstructed. This offers the advantage that workmen can pass freely

through the braced frame while the wall **40** is under construction.

If it should be desired to check the orientation of jamb **8** relative to header **4**, clamps **22** and screws **72** and **86** are released, pin **50** is removed, and the spacer bar and profile gauge are removed from the frame, rotated 180° about a vertical axis, and are connected to the frame with the profile gauge in the upper right hand corner.

As a result of the use of the spacer bar and bracing means of the present invention, the time required for plumbing the frame and for aligning its components is greatly reduced. Because of the adjustability of rods **62**, **78** and **80** and of stabilizing bolts **70** and **82**, the spacer bar may be connected to jambs of varying widths and cross-sectional configurations. The swivel bracket means permits connection of the upper portion of the frame to many types of ceiling or floor supports, and the triangulation afforded by the pivotally connected legs **32** rigidly stabilizes the frame in a plumb position during construction of the wall. The fine and coarse means for adjusting the lengths of the brace legs **32** permit ready connection to a fixed support at a point offset from the center of the door frame.

While in accordance with the provisions of the Patent Statutes the preferred embodiment has been illustrated and described, it will be apparent to those skilled in the art that changes may be made in the apparatus described without deviating from the invention set forth in the following claims.

What is claimed is:

1. Profile gauge means for setting door frames having a horizontal header and a pair of parallel spaced vertical jambs, comprising

a horizontal gauge arm adapted for removable connection in contiguous parallel engagement with the lower surface of the door frame header;

a vertical gauge arm pivotally connected at its upper end with one end of said horizontal gauge arm for contiguous parallel engagement with the inner surface of one jamb of the door frame, at least one of said gauge arms including spirit level means;

indicator means connected between said gauge arms for indicating when said arms are arranged to define an angle of 90 degrees;

horizontal adjustable-length spacer bar means adapted for insertion between said door jambs, one end of said spacer bar means being slidably connected with said vertical gauge arm for vertical sliding movement relative thereto, and said spacer bar means including at least two coaxially-arranged longitudinally-adjustable sections;

releasable means carried by said one end of said spacer bar means for preventing vertical movement of said one spacer bar end relative to said vertical gauge arm;

means for releasably connecting the ends of said spacer bar means with the associated door jambs, respectively, whereby said vertical gauge arm is rigidly maintained in engagement with said one door jamb;

and screw thread means for effecting accurate longitudinal displacement of said spacer bar sections in either direction relative to each other, whereby the spacing between the lower ends of said door jambs may be accurately varied and the desired right-angled arrangement of said vertical and horizontal gauge arms may be achieved.

2. Profile gauge means for setting door frames having a horizontal header and a pair of parallel spaced vertical jambs, comprising

a horizontal gauge arm adapted for removable connection in contiguous parallel engagement with the lower surface of the door frame header;

a vertical gauge arm pivotally connected at its upper end with one end of said horizontal gauge arm for contiguous parallel engagement with the inner surface of one jamb of the door frame, at least one of said gauge arms including spirit level means;

adjustable-length indicating means connected between said gauge arms for indicating when said arms are arranged to define an angle of 90 degrees;

horizontal adjustable-length spacer bar means adapted for insertion between said door jambs, one end of said spacer bar means being slidably connected with said vertical gauge arm for vertical sliding movement relative thereto, said spacer bar means including first and second telescopic sections and a third section arranged for longitudinal adjustment relative to said first and second sections;

releasable means carried by said one end of said spacer bar means for preventing vertical movement of said one spacer bar end relative to said vertical gauge arm;

means for releasably connecting the ends of said spacer bar means with the associated door jambs, respectively, whereby said vertical gauge arm is rigidly maintained in engagement with said one door jamb;

screw thread means for effecting accurate longitudinal displacement of said third spacer bar section in either direction relative to one of said first and second sections;

and quick-release means for connecting said first spacer bar section at predetermined given positions of adjustment relative to said second section, one of said first and second sections including a plurality of longitudinally spaced apertures, and lock pin means connected with the other of said first and second sections for insertion within one of said apertures to lock said first and second telescopic sections against longitudinal displacement relative to each other.

3. Profile gauge means for setting door frames having a horizontal header and a pair of parallel spaced vertical jambs, comprising

a horizontal gauge arm adapted for removable connection in contiguous parallel engagement with the lower surface of the door frame header;

a vertical gauge arm pivotally connected at its upper end with one end of said horizontal gauge arm for contiguous parallel engagement with the inner surface of one jamb of the door frame, at least one of said gauge arms including spirit level means;

adjustable-length indicating means connected between said gauge arms for indicating when said arms are arranged to define an angle of 90 degrees;

horizontal adjustable-length spacer bar means adapted for insertion between said door jambs, said spacer bar means including first and second telescopic sections and a third section coaxial with and arranged for longitudinal adjustment relative to said first and second sections, one of said sections carrying at one end of said spacer bar means a horizontal extension normal to the common axis of said sections, bracket means carried by said extension slidably connecting said spacer bar means for vertical sliding movement relative to said vertical gauge arm, and stabilizing bolt means carried by said extension for longitudinal adjustment relative to said spacer bar means, said stabilizing bolt means being arranged to abut the jamb engaged by said vertical gauge arm;

releasable means carried by said bracket means for engagement with said vertical gauge arm to prevent vertical sliding movement of said one end of the spacer bar means relative thereto;

means for releasably connecting the ends of said spacer bar means with the associated door jambs, respectively, whereby said vertical gauge arm is rigidly

maintained in engagement with said one door jamb;

screw thread means for effecting accurate longitudinal displacement of said third spacer bar section in either direction relative to one of said first and second sections;

and quick release means for connecting said first spacer bar section at predetermined given positions of adjustment relative to said second section.

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ISAAC LISANN, *Primary Examiner.*