

July 29, 1969

F. N. STEFAN ET AL
DOOR HANDLING APPARATUS

3,458,056

Filed June 24, 1968

4 Sheets-Sheet 1

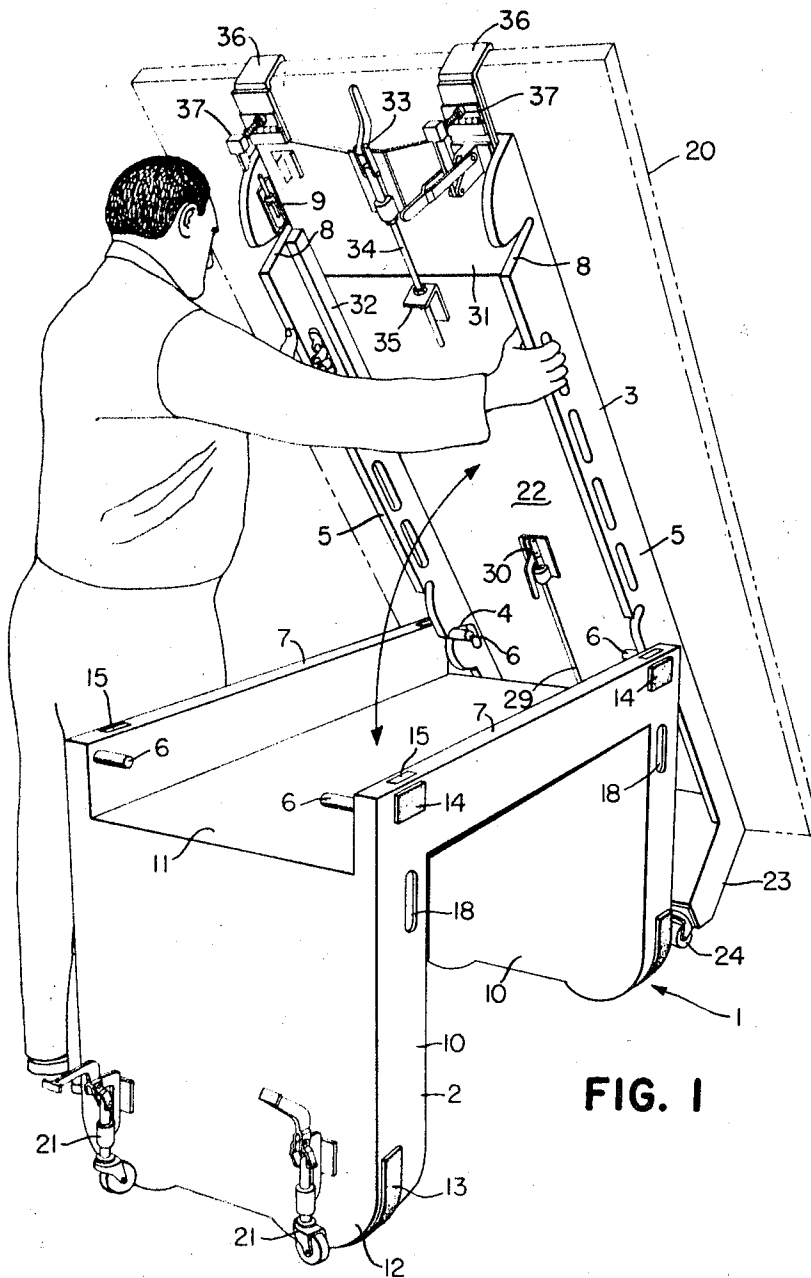


FIG. 1

INVENTORS
FRANK N. STEFAN
JAMES L. HARKINS
BY
Amilliken
ATTORNEY

July 29, 1969

F. N. STEFAN ET AL
DOOR HANDLING APPARATUS

3,458,056

Filed June 24, 1968

4 Sheets-Sheet 2

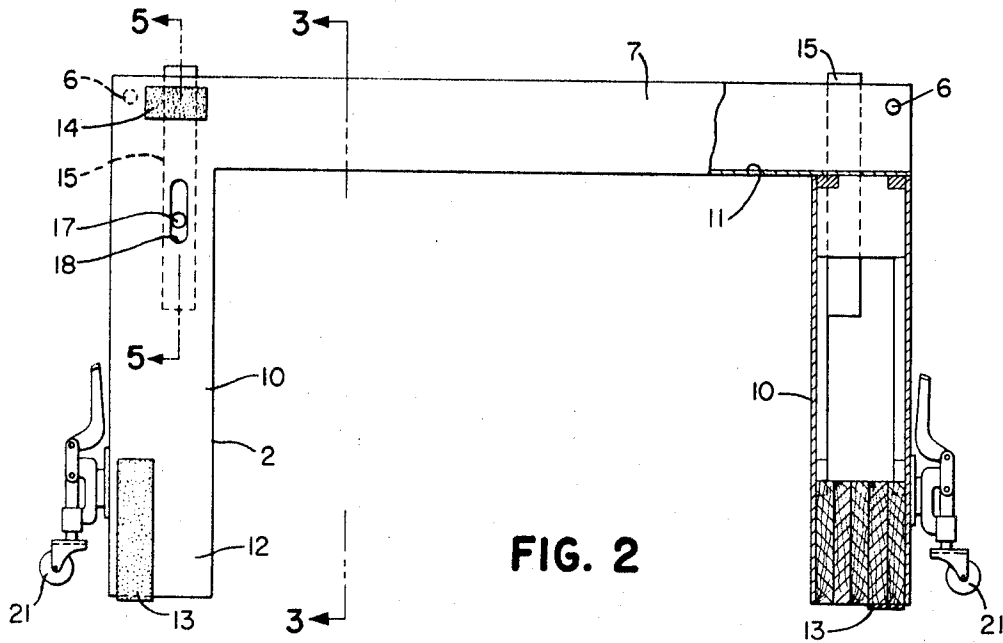


FIG. 2

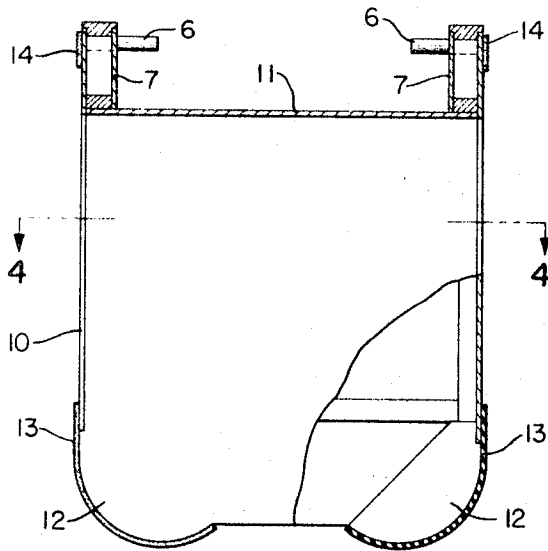


FIG. 3

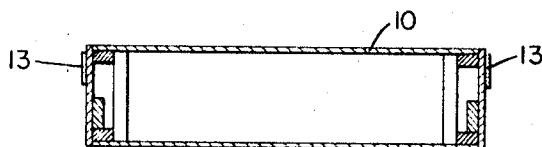


FIG. 4

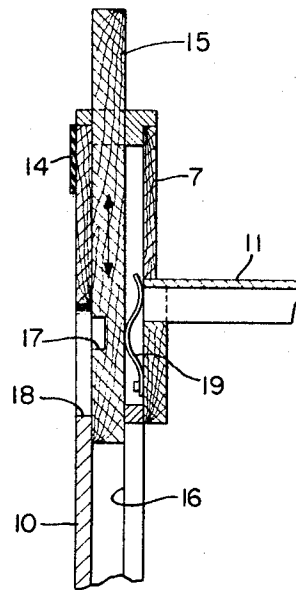


FIG. 5

INVENTORS
FRANK N. STEFAN
JAMES L. HARKINS
BY
J. Milliken
ATTORNEY

July 29, 1969

F. N. STEFAN ET AL
DOOR HANDLING APPARATUS

3,458,056

Filed June 24, 1968

4 Sheets-Sheet 3

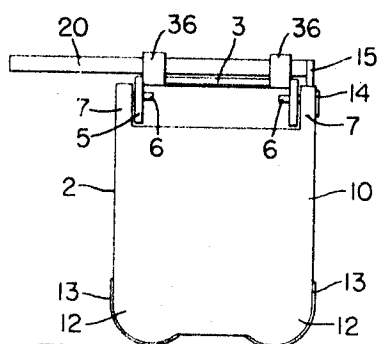


FIG. 7

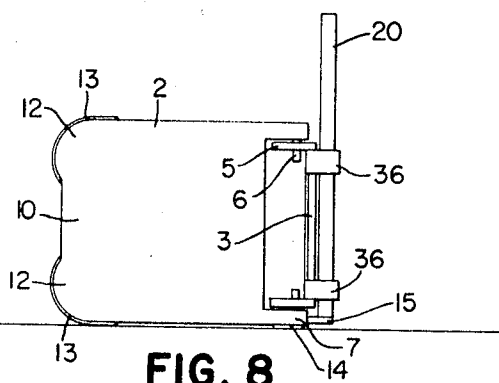


FIG. 8

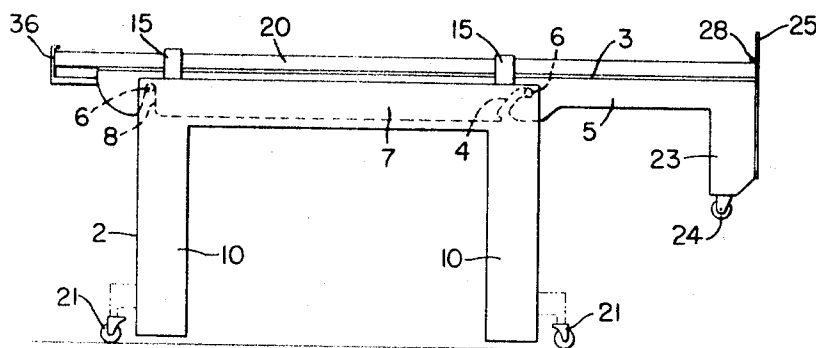


FIG. 6

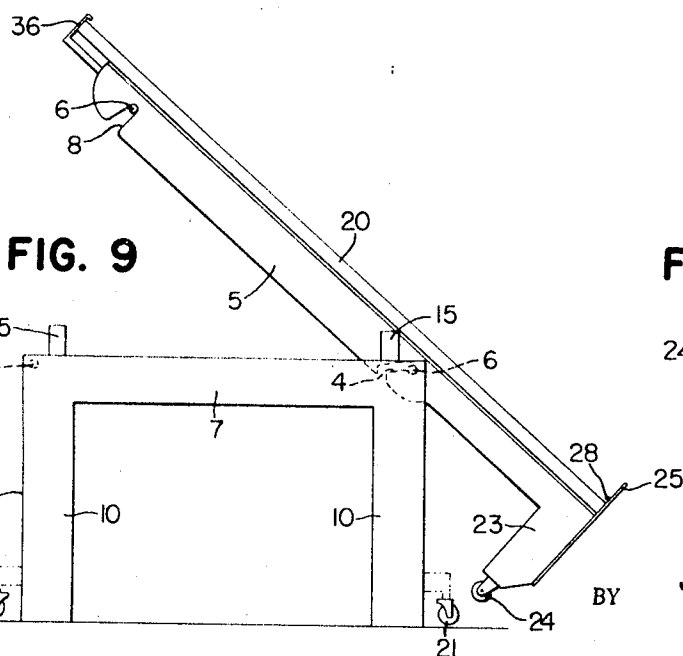


FIG. 9

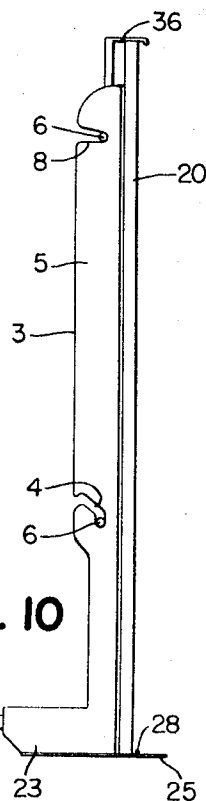


FIG. 10

INVENTORS
FRANK N. STEFAN
JAMES L. HARKINS

BY

Armstrong

ATTORNEY

July 29, 1969

F. N. STEFAN ET AL

3,458,056

DOOR HANDLING APPARATUS

Filed June 24, 1968

4 Sheets-Sheet 4

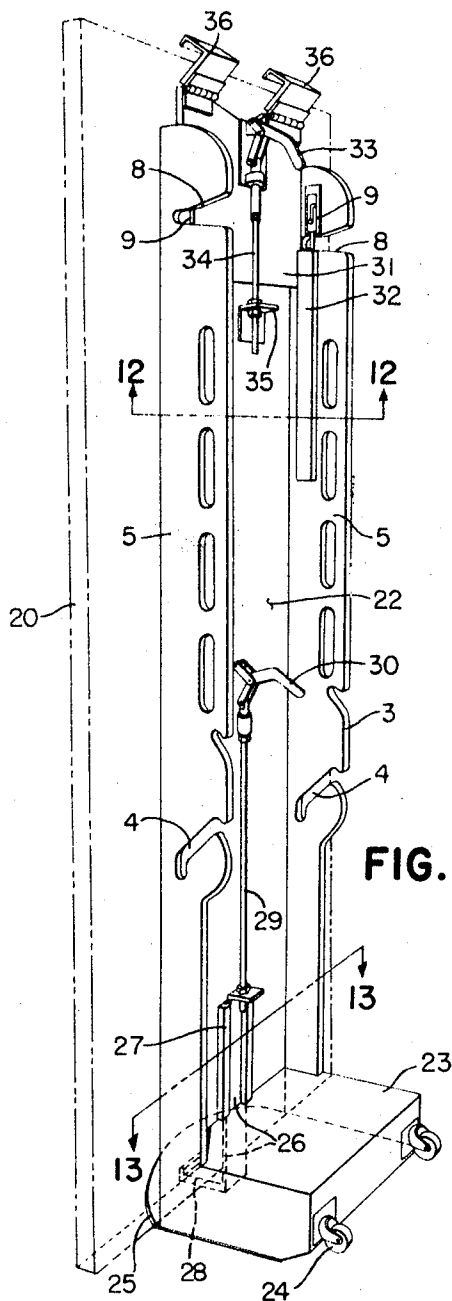


FIG. 11

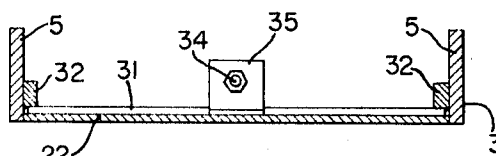


FIG. 12

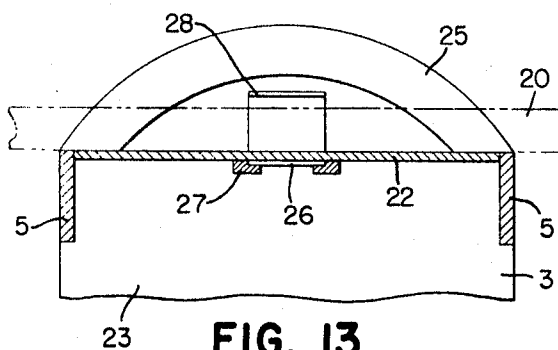


FIG. 13

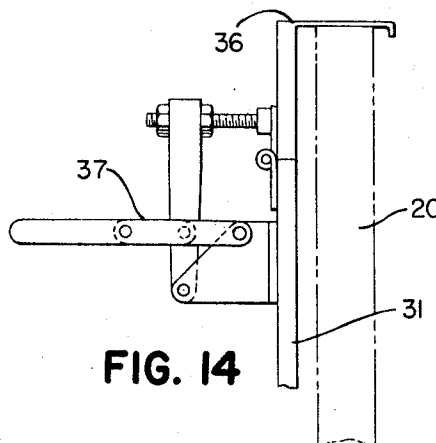
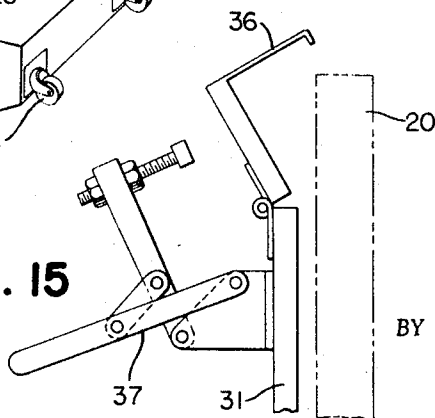


FIG. 14

FIG. 15



INVENTORS
FRANK N. STEFAN
JAMES L. HARKINS

BY

J. Milliken

ATTORNEY

1

3,458,056

DOOR HANDLING APPARATUS

Frank N. Stefan, Akron, and James L. Harkins, Cuyahoga Falls, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio, a corporation of Ohio
Filed June 24, 1968, Ser. No. 739,448
Int. Cl. B25j 5/00

U.S. Cl. 214—1

7 Claims

ABSTRACT OF THE DISCLOSURE

A work table-type device for supporting a door during machining of hinge and lock recesses and during the hanging of the door in an opening. This device has a casted base member with a door-retaining dolly pivotally attached to the base member in such manner as to support a door horizontally in a plane parallel to the floor. The bottom of the base is contoured to permit both the base and the dolly, when locked together, to be tilted on either side to stand the door on one of its edges so that hinge or lock recesses may be machined in the opposite edge. When the base and dolly are returned to an upright position, the dolly, with the door fastened thereto, may be removed from the base and wheeled to the location where the door will be hung and then stood on end to support the door in proper alignment with the opening in which it will be hung.

This invention relates to a work table-type device for supporting a door during machining of hinge and lock recesses and during the hanging of the door in an opening. The device will permit the door and the fixture to be tipped on its side for machining the door edges and will permit the door to be stood on its end and raised and lowered to position it in the opening.

Objects of the invention

The primary object of the invention is to provide a device to facilitate the handling of heavy wooden doors such as those frequently used in industrial or commercial buildings and which are of sufficient weight that they are extremely difficult for one individual to handle when machining hinge and lock openings and when aligning with a door opening in which they are to be hung.

Another object of the invention is to provide an apparatus in which the door supporting portion is separable from the remainder of the apparatus when it is desired to move the door from the location in which the edges are machined to the location where the door will be hung in the opening.

These and other objects of the invention will become more fully apparent as the description proceeds in the following specification and the appended drawings.

Brief description of the drawings

In the drawings:

FIGURE 1 is a perspective view of a complete assembly of the invention with a door clamped thereon and showing the manner in which the dolly may be tilted for removal from the base member;

FIGURE 2 shows a side view of the base member with a portion broken away to show the inner structure thereof;

FIGURE 3 is a cross-sectional view of the base shown in FIGURE 2 taken on line 3—3 of FIGURE 2;

FIGURE 4 is a cross-sectional view of the base taken on line 4—4 of FIGURE 3;

FIGURE 5 is an enlarged fragmentary cross-sectional view of the door edge stop taken on line 5—5 of FIGURE 2;

FIGURE 6 is a simplified side view of the assembled

2

apparatus of the invention with the dolly locked horizontally on the base;

FIGURE 7 is an end view of the assembly shown in FIGURE 6;

FIGURE 8 shows an end view similar to FIGURE 7 but with the entire assembly tilted over on its side;

FIGURE 9 is a simplified side view of the assembly shown in FIGURE 6 but showing the dolly tilted over the end of the base in a position similar to that shown in FIGURE 1 in preparation for removing the dolly from the base;

FIGURE 10 shows a simplified side view of the dolly after it has been removed from the base and has been stood on end in the position for supporting a door adjacent an opening in which it will be hung;

FIGURE 11 is a detailed perspective view showing a door supported in a vertical position by a dolly stood on end similar to that shown in FIGURE 10;

FIGURE 12 is a cross-sectional view taken on line 12—12 of FIGURE 11 showing the manner in which the sliding clamp support is assembled on the dolly;

FIGURE 13 is a fragmentary cross-sectional view taken on line 13—13 of FIGURE 11 showing the manner in which the foot clamp is slidably attached to the dolly;

FIGURE 14 shows a side view of one of the door top retaining clamps in a closed position; and

FIGURE 15 shows the clamp of FIGURE 14 in an open position.

Preferred embodiments of the invention

Referring now to FIGURE 1 of the drawings, the overall assembly of the door handling apparatus is indicated generally by the numeral 1. It is made up of two basic parts, one of which is the base 2, and the other is the dolly 3. The dolly 3 is pivotally attached to the base 2 by slots 4 in side rails 5 of the dolly 3 which engage pivot pins 6 extending inwardly from each upwardly projecting side 7 of the base 2. Each end of the base 2 is identical to the opposite end and hence each end has a pair of pivot pins 6. For this reason, the dolly 3 may be pivotally mounted on either end of the base 2 and then lowered into position until slots 8 in the opposite end of the dolly from the slots 4 engage a pair of the pivot pins 6 on the opposite end of the base 2 from those engaged by the slots 4. Sliding bolts 9 are provided on the dolly 3 adjacent each of the slots 8 to engage the pins 6 when the dolly 3 is lowered into the horizontal position and lock the dolly 3 securely to the base 2. FIGURE 6 shows the dolly locked in the horizontal position described above.

The base 2 is shown in greater detail in FIGURES 2 through 5. In the interest of brevity, the entire structural details of the base 2 will not be described herein but only the parts which are essential to the operation of the base in its intended use. In the embodiment shown herein, the base is constructed in a manner well-known to any skilled carpenter and involves the use of internal wooden frame members covered by sheet plywood to produce a neat appearing construction. It should be obvious, however, that the internal structure of the base is not a part of the invention, but is merely a means of providing one form of the structure having the desired external shape to perform the required functions. A similar result could be achieved by building the device out of a metal framework, or out of plastic or out of any other suitable material. Essentially, the base 2 consists of two leg members 10 at each end of a horizontal bed portion 11 which includes the previously mentioned upwardly projecting sides 7. Each lower corner of the leg member 10 has a rounded portion 12 which is designed to permit the base 2 to be easily tipped over on its side. A rubber bumper pad 13 is located on each of the rounded portions 12. An additional bumper pad 14 is located above each leg portion

on the outer face of the sides 7 of the base 2. Both the bumper pads 13 and 14 cushion the base 2 and prevent it from skidding or marring the floor when it is used in either an upright position or when tilted on its side.

Referring now to FIGURES 2 and 5, a sliding door edge stop 15 is mounted on each end of both of the sides 7 and extends into a hollow portion 16 of each of the leg members 10. Each of the stops 15 has a round hole 17 in register with a slotted hole 18 in the outer cover of each leg member 10. Bearing against the stop 15 is a flat spring 19 which holds the stop 15 in whatever position it may be moved. When the stop 15 is not in use, it normally is enclosed completely within the side 7 and the leg 10. Whenever the stops 15 are needed to hold a door in position when the entire assembly is to be tipped on its side, one need only insert their finger in the hole 17 and slide the stop upwardly until it protrudes a sufficient distance from the side 7 to engage the edge of a door.

FIGURES 6 and 7 show the stops 15 raised on one side of the base 2 to engage one side of a door 20 so that it will not slide sideways when the entire assembly 1 is tipped over on its side, as shown in FIGURE 8. It will be understood that in order to tip the assembly over to the opposite side from that shown in FIGURE 8, it will be first necessary to return the assembly 1 to an upright position such as that shown in FIGURE 7, retract the door stops 15 on one side of the base 2, move the door 20 over in such a position that the stops 15 on the opposite side can then be extended to engage the other edge of the door and support it when the assembly 1 is tipped in the opposite direction. In order to facilitate moving the entire assembly, from the one location to another, retractable casters 21 are provided on each of the legs 10 near the rounded portion 12. When the casters 21 are not in use, they are retracted to permit the base 2 to rest on the bottom of the leg members 10. In normal practice, the apparatus, with a door mounted thereon, would first be tipped to one side to permit machining of hinge recesses on one door edge and then tipped over to the opposite side to permit machining of the lock recesses on the opposite edge of the door.

After the machining operations have been completed, the entire assembly 1 is placed in an upright position, the sliding bolts 9 released and the dolly 3 tilted upward about the pivot pins 6 as shown in FIGURES 1 and 9 so that the dolly 3 may be separated from the base 2 and may be wheeled to the location where the door will be hung.

In order to better understand the use of the dolly 3 after it is separated from the base 2, it will now be described in greater detail. The dolly 3 has a rectangular main body portion 22, with the previously mentioned side rails 5 extending downwardly from each longitudinal edge thereof. The side rails 5 are provided with a plurality of elongated hand grip slots 5a to permit easier handling of the dolly 3. Extending at right angles from one end of the dolly 3 is a leg member 23 which carries a pair of casters 24 on which the dolly may be moved. A U-shaped metal shoe 25 is attached to the lower side of the leg member 23 as shown in FIGURE 11. The curved portion of the shoe 25 extends outwardly from the side of the dolly on which the door is mounted and protects the leg member 23 and the lower edge of the door 20 when the dolly 3 is stood on end. In addition to the shoe 25, Teflon glides or other suitable devices may be attached to the bottom of the shoe to permit the dolly 3 to be slid about when standing on its end. A foot clamp 26 is slidably mounted in a guide track 27 for sliding longitudinal movement with respect to the body portion 22. The foot clamp 26 has an integral leg 28 which extends in the opposite direction from the leg member 23 to support the bottom edge of the door. The foot clamp 26 is adjustably connected by a bar 29 to a lever and toggle-type clamp 30. At the upper end of the dolly 3, a sliding clamp support 31 is held in sliding relationship to the body portion

22 by a pair of guide strips 32, one of which is located on the inside of each of the side rails 5 as may be seen in FIGURES 11 and 12. The clamp support 31 is moved longitudinally with respect to the body member 22 by a clamp device 33 which operates in a similar manner to the clamp 30 which moves foot clamp 26. The clamp 33 is fastened to the support 31 and moves with it when actuated by movement of the clamp lever acting upon a bar 34 which is adjustably connected to a bracket 35 fastened to the body portion 22. At the top of the clamp support 31, are a pair of L-shaped brackets 36 which are hinged to the support 31 in such manner that they can engage the top of the door as shown in FIGURE 14 when held in place by retaining clamps 37, or upon release of the retaining clamps 37, they can be opened as shown in FIGURE 15 to release the top of the door so that it may be raised and lowered with respect to the door opening for alignment therewith.

In order to clamp the door in position on the dolly 3, it is placed against the body portion 22 with the lower edge of the door resting on the leg 28 of the foot clamp 26 as shown in FIGURES 11 and 13. The L-shaped brackets 36 are moved into the closed position as shown in FIGURE 14 and the operating levers of clamps 30 and 33 are moved away from each other thereby causing the brackets 36 and the foot clamp 26 to move toward each other and firmly grip the top and bottom edges of the door. In order to release the door, the clamp levers are moved in the opposite direction.

Once a door has been transported on the dolly 3 to an opening in which it will be hung, the dolly is stood on end and positioned adjacent the opening. The clamp 33 is moved to a position which will move the clamp support upwardly and release the grip of the brackets 36 on the top edge of the door. The retaining clamps 37 are then released, as shown in FIGURE 11, and the brackets 36 open up to permit the door to be raised by movement of the foot clamp which is actuated by moving the operating lever of the clamp 30 thus the door can be easily held at any desired height with respect to the opening. In order to properly align the hinges after the door has been hung, the foot clamp 26 is lowered and the dolly 3 slid away from the door.

Although the particular clamping arrangement and the means of raising and lowering the door has been shown herein for the purpose of illustrating the invention, it will be obvious that various other means of clamping the door on the dolly and raising and lowering the door may be used without departing from the scope of this invention. It should also be understood that both the dolly and the base may be made out of any number of different materials and may utilize various design changes in outward appearance without departing from the overall principle of the combination of a movable base to which a door-retaining dolly may be fastened and then tilted in such manner as to stand the door on one or more of its side edges for machining and then after machining, removing the dolly from the base and using it to transport the door and position it in the door opening.

Various changes can be made in the illustrative embodiments shown herein without departing from the scope of the invention.

What is claimed is:

1. An apparatus for supporting a door during machining of hinge and lock recesses and during the handling of the door in an opening comprising:

(A) a floor engaging base having the bottom thereof contoured to permit the base to be easily tipped on either of its sides;

(B) a wheeled dolly for supporting a door pivotally and removably mounted on the base in such manner as to hold a door in a substantially horizontal position;

(C) door retaining means on the dolly for removably securing the door to the dolly; and

5

(D) lock means for removably fastening the dolly to the base in such manner that the base and the dolly with a door fastened thereto can be manually tipped as a unit on either side to stand the door first on one edge and then on the other to facilitate machining of the respective edges of the door and then upon completion of the machining and the return of the base to an upright position, the release of the lock means will permit the dolly to be tilted over the end of the base and removed as a separate door supporting member to transport the door independently of the base to the location where it is to be hung in an opening.

2. A door supporting apparatus as claimed in claim 1 wherein the dolly has a flat end portion which permits it to stand on end and support the door in a vertical position adjacent the opening where it is to be hung and wherein the dolly has a means to raise and lower the door to position it at the proper height for alignment in the door opening.

3. A door supporting apparatus as claimed in claim 2 wherein the door retaining means is a top and bottom clamp means for gripping the top and bottom edges of the door and wherein the top clamp means may be opened and swung away from the door to permit it to be raised with respect to the dolly for alignment in the opening.

4. A door supporting apparatus as claimed in claim 3 wherein the lower clamp means holding the door on the

6

dolly is also the means for raising and lowering the door when the top clamp means is opened.

5. A door supporting apparatus as claimed in claim 1 wherein the base has retractable casters which, when extended, permit the base to be easily moved from one location to another.

6. A door supporting apparatus as claimed in claim 1 wherein the base has a stop means for engaging the side edges of a door mounted on the apparatus to prevent the door from sliding sideways on the dolly when the entire assembly is tipped on its side.

7. A door supporting apparatus as claimed in claim 1 wherein the major parts of the apparatus are made of wood.

References Cited

UNITED STATES PATENTS

2,503,388 4/1950 Hedlund ----- 214—1

FOREIGN PATENTS

645,153 10/1950 Great Britain.

GERALD M. FORLENZA, Primary Examiner

FRANK E. WERNER, Assistant Examiner

U.S. Cl. X.R.

214—501; 269—55