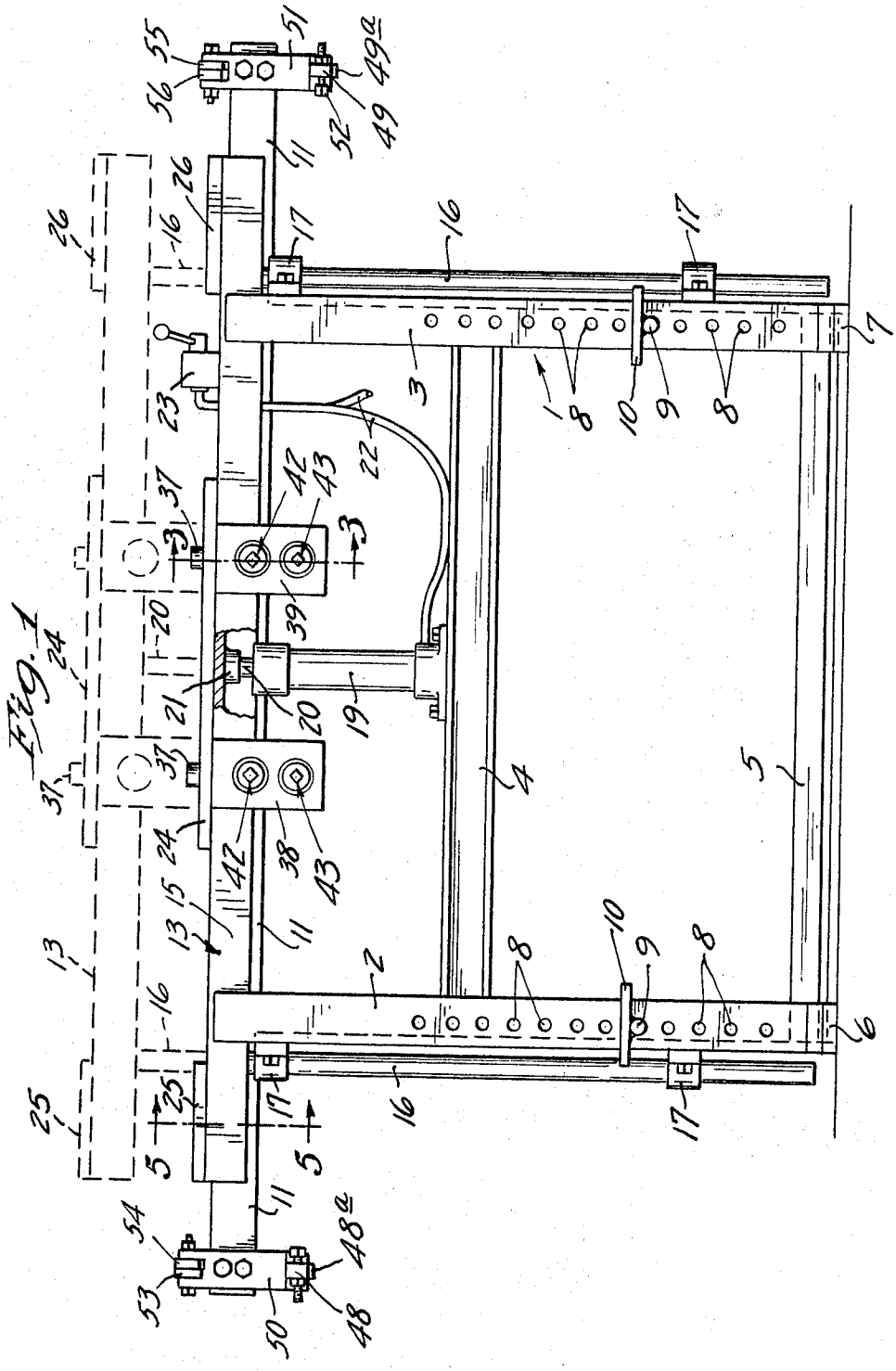
Aug. 16, 1966 F. F. PFEIFER 3,266,536

FIXTURE FOR MACHINING DOORS AND DOOR FRAME MEMBERS

Filed July 9, 1963 3 Sheets-Sheet 1



Aug. 16, 1966 F. F. PFEIFER 3,266,536

FIXTURE FOR MACHINING DOORS AND DOOR FRAME MEMBERS

Filed July 9, 1963 3 Sheets-Sheet 2

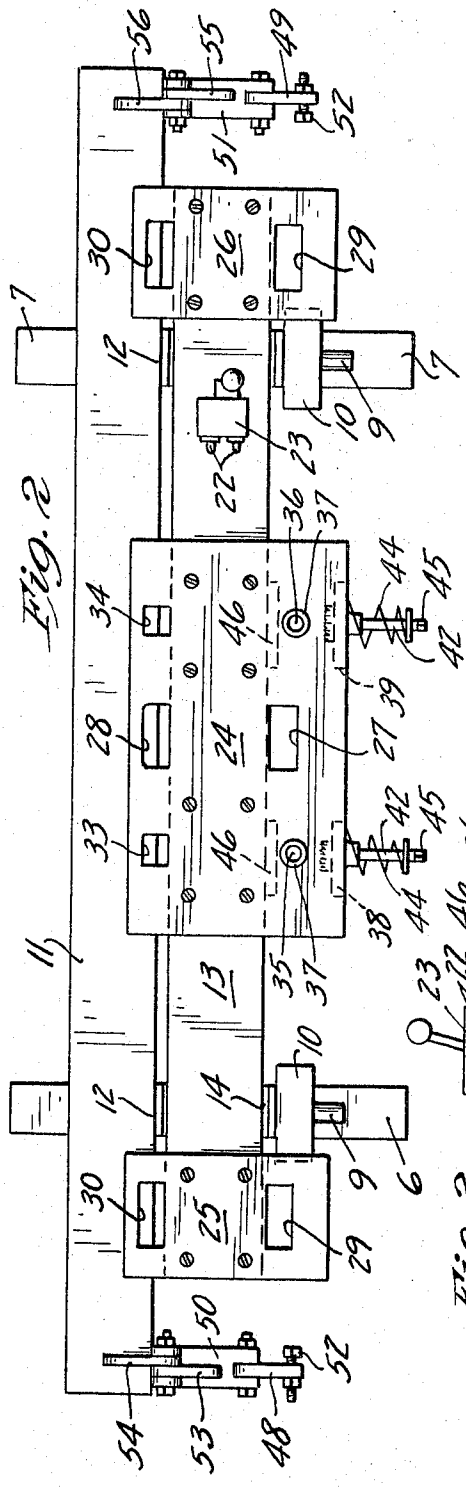


Fig. 2

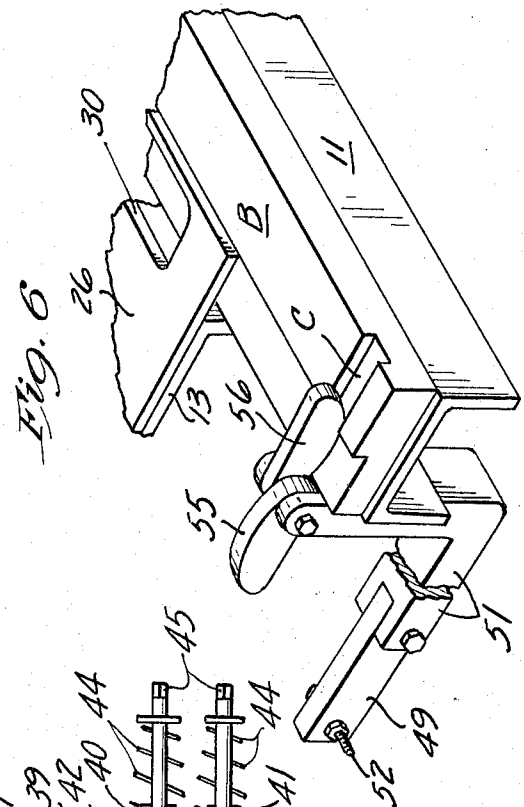


Fig. 6

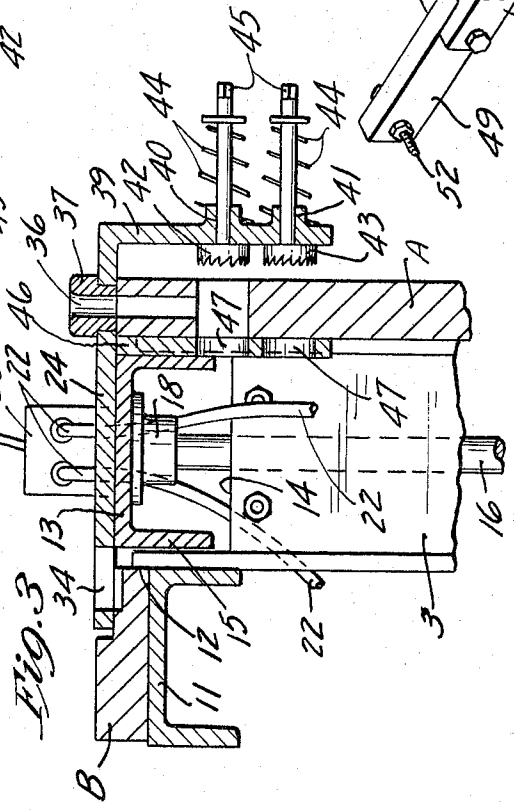


Fig. 3

Aug. 16, 1966 F. F. PFEIFER 3,266,536

FIXTURE FOR MACHINING DOORS AND DOOR FRAME MEMBERS

Filed July 9, 1963 3 Sheets-Sheet 3

Fig. 4

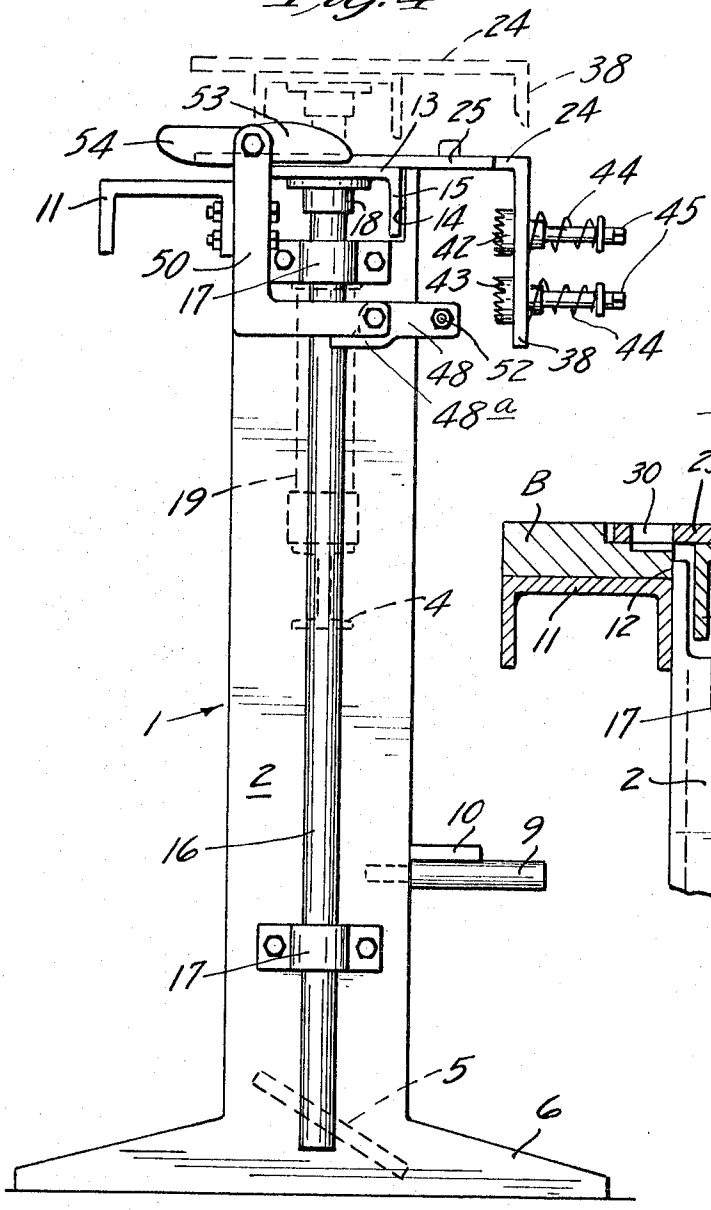
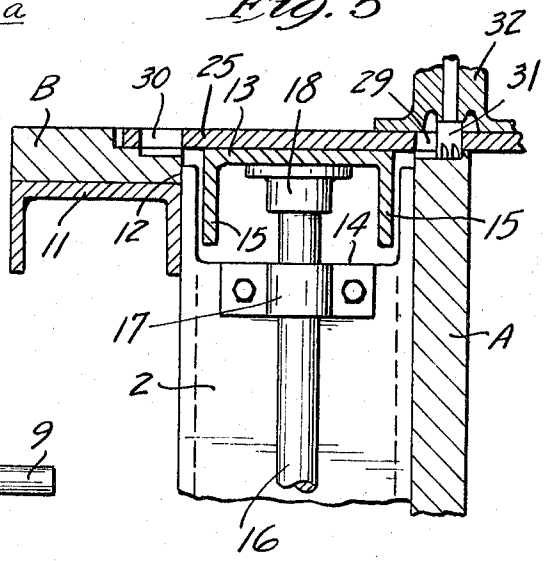


Fig. 5



United States Patent Office 3,266,536 Patented August 16, 1966

3,266,536

FIXTURE FOR MACHINING DOORS AND DOOR FRAME MEMBERS

Fred F. Pfeifer, Box 14, Liberty Lake, Wash.

Filed July 9, 1963, Ser. No. 293,716
7 Claims. (Cl. 144—3)

My invention relates generally to jigs and fixtures, and more particularly to fixtures utilized in the machining of doors and cooperating door frames.

More specifically, my invention involves a fixture for holding doors and cooperating door frame members whereby the same may be provided with cooperating hinge receiving recesses, latch and strike mounting recesses or holes, and the like, so as to facilitate the production of pre-assembled doors and door frames which may be installed as complete units in roughed out wall openings.

An important object of my invention is the provision of a fixture, as set forth, which includes means for securely holding a door and a cooperating door frame member in predetermined positions relative to each other, and having template openings through which the door and door frame member may be mortised or otherwise machined to provide cooperating hinge receiving recesses, whereby, when hinges are fixed to the door and frame member, the door will be properly hung in the door frame.

Another object of my invention is the provision of a fixture which will accommodate doors and door frames of various dimensions with a minimum of adjustment of the fixture.

Still another object of my invention is the provision of novel gauge elements for accurately locating a door and a cooperating door frame member relative to each other in a direction longitudinally thereof, whereby the door, when hinged to the door frame member, will have correct working clearance with cooperating portions of the door frame, such as the lintel thereof.

Another object of my invention is the provision of template means whereby various types of latch openings may be cut into a door mounted in the fixture.

Yet another object of my invention is the provision of a fixture which is equally adapted to machining of right hand or left hand doors and cooperating door frame members.

Another object of my invention is the provision of a fixture which is relatively simple and inexpensive to produce, which is highly accurate and efficient in operation, and which is rugged in construction and durable in use.

The above, and still further highly important objects and advantages of my invention, will become apparent from the following detailed specification, appended claims and attached drawings.

Referring to the drawings, which illustrate the invention, and in which like reference characters indicate like parts throughout the several views:

FIG. 1 is a view in front elevation of a fixture produced in accordance with my invention, some parts being broken away and some parts being shown in section;

FIG. 2 is a top plan view;

FIG. 3 is an enlarged fragmentary section taken on the line 3—3 of FIG. 1;

FIG. 4 is an enlarged view in end elevation as seen from the left with respect to FIG. 1;

FIG. 5 is an enlarged fragmentary view in section, taken on the line 5—5 of FIG. 1; and

FIG. 6 is a fragmentary view in perspective of one end portion of the fixture.

In the preferred embodiment of my invention illustrated, an upright, generally rectangular frame is indicated in its entirety by the numeral **1**, and comprises, a pair of spaced vertical legs **2** and **3**, and upper and lower cross frame members **4** and **5**, respectively. The legs **2** and **3** are preferably in the nature of structural steel channels, the upper cross frame member **4** being in the nature of an I beam and the lower member **5** being made from structural plate, and welded or otherwise rigidly secured at their opposite ends to the legs **2** and **3**. The legs **2** and **3** are supported in upright positions by respective base members or feet **6** and **7** rigidly secured to their respective legs.

With reference to FIG. 1, it will be seen that the front surfaces of the legs **2** and **3** are drilled to provide a plurality of vertically spaced apertures **8** for selective reception of door supporting pins or the like **9**. The pins **9** are provided with plate-like flanges **10** that are adapted to engage a lower longitudinal edge of a door, indicated by the reference character A, when the door is placed on said flanges **10** in face to face engagement with the front surfaces of the legs **2** and **3**, the door A extending longitudinally of the frame structure **1**.

Bolted or otherwise rigidly secured to the rear surfaces of the legs **2** and **3** and adjacent their upper ends, is a horizontally disposed shelf **11** which is adapted to support a door frame member or jamb B. As shown in FIGS. 3 and 5, one longitudinal edge of the frame member B is located laterally relative to the door A by being placed in engagement with the rear surfaces of the legs **2** and **3** above the shelf **11**, as indicated at **12**.

A horizontally disposed elongated mounting beam **13**, preferably of structural steel channel extends longitudinally of the frame **1** in overlying relationship to the upper ends of the legs **2** and **3**. The beam **13** is of less transverse width than that of the legs **2** and **3** from the front to the back surfaces thereof, and the upper ends of the legs **2** and **3** are notched, or recessed, as at **14**, to admit the depending flanges **15** of the beam **13**, see particularly FIGS. 3–5. The beam **13** is provided with a pair of depending guide rods **16** which are slidably mounted in suitable bearings **17** bolted to the legs **2** and **3**. The upper ends of the rods **16** are rigidly mounted in anchoring flanges **18** secured to the beam **13**.

Means for imparting upward door and door jamb releasing movement to the mounting beam **13**, and parts carried thereby, comprises a conventional fluid pressure operated cylinder **19** and a cooperating piston plunger rod **20**. The cylinder **19** is vertically disposed with its lower end resting on and anchored to the cross frame member **4**, the plunger rod **20** extending axially from the upper end of the cylinder **19** and having its upper end anchored in a socket **21** fast on the lower surface of the mounting beam **13**. Fluid, such as air, under pressure, is introduced to the lower end of the cylinder **19** from a suitable source, not shown, through a conduit **22** in which is interposed a conventional control valve **23**. The valve **23** may be any one of several well known types which may be operated to selectively introduce air under pressure to the cylinder, and to permit escape of air from the cylinder to atmosphere. It will be appreciated that, if desired, the fluid system may be hydraulic as well as pneumatic. Release of air from the cylinder **19** will permit the mounting beam and parts carried thereby to descend, under action of gravity, toward its lower limit of movement. Preferably, and as shown, the valve **23** is bolted or otherwise rigidly secured to the mounting beam **13** to be convenient to the operator.

Rigidly secured to the top surface of the mounting beam **13** at its central portion is an intermediate template **24**. A pair of outer templates **25** and **26** are likewise secured to the top surface of the beam **13** at the opposite end portions thereof, all of said templates projecting laterally outwardly of the opposite sides of the beam **13** to overlie upper longitudinal edge portions of a door A supported by the pins **9** and portions of a door frame member B on the shelf **11**. With reference particularly to

FIG. 2, it will be seen that the intermediate template 24 is provided with a pair of cooperating generally rectangular apertures 27 and 28, and the outer templates have like pairs of cooperating apertures 29 and 30. The apertures 27 and 29 overlie the upper longitudinal edge of the door A, the cooperating apertures 28 and 30 overlying portions of the door frame member B. The apertures 27–30 are adapted to guide a cutting tool, such as a conventional router bit 31 mounted in a power driven router, shown fragmentarily in FIG. 5, and indicated at 32. The apertures 27–30 are utilized in the machining of cooperating recesses in the door A and door frame member B, which recesses receive opposite wings or plates of hinges or butts, not shown. In some instances where the doors are of relatively light weight, and only two hinges are required, the apertures 27 and 28 are not used. However, in the case of heavier outside doors, where three hinges are required, all apertures 27–30 are utilized.

The intermediate template 24 is further provided with a pair of longitudinally spaced generally rectangular apertures 33 and 34 which overlie the door frame member B, and a pair of similarly spaced holes 35 and 36, defined by drill bushings 37 mounted in the template 24 and which overlie the edge of the door A. In addition, see FIGS. 1 and 3–5, the template 24 is provided with depending flanges 38 and 39 having vertically spaced pairs of holes 40 and 41, respectively, extending therethrough on horizontal axes which intersect the vertical axes of the holes 35 and 36, respectively. As will hereinafter appear, the apertures 33 and 34 are used in machining of strike receiving apertures in door frame members, whereas the holes 36 and 37 are used to guide boring tools, not shown, for boring latch receiving openings in the door A.

A pair of boring bits 42 and 43 are mounted in the holes 40 and 41, respectively, and are used selectively in boring for back set mounting of door locks. The bits 42 and 43 are yieldingly urged away from the door A by coil compression springs 44 and have outer ends 45 adapted to be gripped by suitable bit rotating means, not shown. A pair of bracing flanges 46 depend from the template 24 and have front surfaces in the plane of the front surfaces of the legs 2 and 3 whereby to back up the adjacent portion of the door A when any one of the boring bits 42 and 43 are used. It will be noted that the flanges 46 are provided with clearance holes 47 for entry of the bits 42 and 43 aligned therewith.

For the purpose of accurately locating the various apertures and holes in the templates 24–26 relative to the door and frame members to properly dispose the hinge recesses, strike receiving recesses and latch mounting holes in the work, I provide gauge means now to be described. A pair of stop members 48 and 49 are pivotally mounted on the forwardly projecting portions of respective ones of a pair of mounting brackets 50 and 51 rigidly secured to opposite end portions of the shelf 11, for independent swinging movements into and out of the plane of the door A and adjacent opposite ends thereof. The outer free end portions of the stop members 48 and 49 are provided with lock nut equipped adjustable stop screws 52 for selectively engaging an opposite end of a door A to properly locate the door relative to the templates 24–26 longitudinally of the door. The stop members 48 and 49 are further provided with lugs 48a and 49a which engage their respective brackets 50 and 51 to limit pivotal movements of the stop members in one direction. A pair of stop members 53 and 54 are pivotally mounted on the upwardly projecting portion of the bracket 50 for movements between inoperative positions forwardly of the shelf 11 and operative positions overlying the top surface of the shelf 11. A like pair of stop members 55 and 56 are similarly mounted on the bracket 51. The stop members 48 and 49 are used selectively, depending upon the hand of the door to be machined. This is also true of the pairs of stop members 53–56. The stop members 48 and 49 are used to engage the end of the door A that is intended as the upper end thereof. The stop members 53 and 54 are used selectively, as are the stop members 55 and 56, depending upon the type of door frame member intended for use with a given door. The stop members 53 and 54 are so located relative to the stop member 48, in a direction longitudinally of the fixture, that when the machining operation is completed and the door hinged to the frame member, a working clearance of approximately one-eighth inch will exist between the top of the door on an overlying horizontal door frame member properly assembled with the hinge equipped frame member B.

In operation, the door supporting pins 9 are set in the proper holes 8 to support a door slab of given width, the valve 23 is actuated to cause the cylinder 19 to raise the beam 13, and the door slab A mounted on the flanges 10 with a predetermined end of the door slab A in engagement with a selected one of the stop members 48 and 49. While the beam 13 is raised, a cooperating door frame member B is placed on the shelf 11 with a predetermined end portion thereof being engaged by a selected one of the stop members 53–56. As shown in FIG. 6, one form of frame member or jamb B is grooved, as indicated at C, to receive a stop strip of the top frame member, not shown, and either stop member 54 or 56, placed in the groove C, will properly locate the frame member B longitudinally relative to the door A.

With the door slab A and frame member B properly placed, the valve 23 is manipulated to permit the beam 13 to descend until the templates rest upon the upper longitudinal edge of the door A and on the frame member B. The weight of the beam 13 and templates 24–26 is sufficient to firmly hold the door A and frame member B in place, while the router is employed in the several apertures 27–30 to machine hinge receiving recesses in the door A and frame member B. Upon completion of this operation, the valve 23 is operated to cause the cylinder 19 to raise the beam 13, the door A is inverted so that the lower longitudinal edge is uppermost, the frame member B is removed from the shelf 11, and an opposite frame member placed thereon. The beam 13 is again lowered and a given one of the openings 33 and 34 utilized in the machining of a strike receiving recess in the door frame member. The door A is then drilled through corresponding holes 35 or 36 and by a selected one of the bits 42 or 43 to provide for latch receiving openings. The door and frame member are then removed from the fixture and are ready for complete assembly prior to mounting of the assembly in a roughed-out opening.

By machining doors and door frames as above described, prior to setting the frames in the roughed-out opening, I have been enabled to effect a considerable savings in time and effort in providing a finished structure, and have been able to achieve a high degree of accuracy in assembly of doors in their cooperating frames. The members 24, 25 and 26 perform the dual function of work-holding pressure plates and templates for machining the workpieces, thus providing for an inexpensive, yet highly efficient structure.

While I have shown and described a commercial embodiment of my fixture, it will be understood that the same is capable of modification, and that modification may be made without departure from the spirit and scope of the invention as defined in the claims.

What I claim is:

1. A fixture for machining doors and door frame members therefor, said fixture comprising a frame structure including a pair of generally vertically disposed legs having aligned front surfaces and aligned rear surfaces parallel to said front surfaces and a generally horizontal shelf disposed adjacent the tops of said legs, door supporting elements on said leg for supporting a door in face to face engagement with said front surfaces with one of the longitudinal edges of said door uppermost, said shelf being adapted to support a door frame member with one longitudinal

edge of said door frame member in engagement with said rear surfaces of said legs, template means defining apertures for guiding a tool for machining cooperating hinge plate receiving recesses in said door and door frame member, a generally horizontally disposed beam overlying the upper ends of said legs and extending in a direction parallel to the longitudinal dimensions of a door and door frame member supported on said door supporting elements and shelf respectively, said template means being carried by said beam, a pair of generally vertically extending guide rods depending from said beam and one each being connected to a different one of said legs for generally vertical sliding movements relative to said legs to alternately clamp and release a door and door frame supported by said supporting elements and shelf, and power operated means for imparting upward movement to said beam.

2. The structure defined in claim 1 in which said beam is of a transverse dimension less than that of said legs, the upper ends of said legs defining upwardly opening recesses for reception of said beam whereby to permit downward movement of said beam between the uppermost edge of the door mounted on said door supporting elements and the door frame member on said shelf, whereby said template means is movable into overlying clamping engagement with said door and door frame element.

3. The structure defined in claim 2 in which said template means comprises a plurality of template elements mounted on said beam in longitudinally spaced relationship, one of said template elements having apertures therein for guiding tools for machining latch receiving recesses in said door and a cooperating strike receiving recess in said door frame member, said one of the template elements including a depending flange adapted to be disposed adjacent one side surface of a door supported on said frame, and in further combination with boring means mounted in said flange for movements toward and away from said door.

4. The structure defined in claim 1 in further combination with gauge means mounted on said frame structure, said gauge means engaging adjacent end portions of said door and door frame member to dispose the same in operative relationship longitudinally of each other.

5. The structure defined in claim 4 in which said gauge means comprise a pair of stop members each operatively pivotally mounted on said shelf for movement into and out of the plane of the door on said supporting elements

for selective engagement with opposite ends of said door, and pairs of other stop members operatively pivotally mounted on opposite end portions of said shelf for selective engagement with opposite end portions of a door frame member on said shelf, each of said other stop members of said pairs thereof being adapted to engage the end portion of a different type of door frame member.

6. The structure defined in claim 1 in which said legs define a plurality of vertically spaced apertures through the front surfaces thereof, said supporting elements comprising door engaging pins received in selected ones of said apertures, whereby to support doors of various widths and having said uppermost edge of a selected door at a level with the top surface of a door frame member on said shelf.

7. A fixture for machining doors and door frame members therefor, said fixture comprising a frame structure including a pair of generally vertically disposed legs having aligned front surfaces and aligned rear surfaces parallel to said front surfaces and a generally horizontal shelf disposed adjacent the tops of said legs, door supporting elements on said legs for supporting a door in face to face engagement with said front surfaces with one of the longitudinal edges of said door uppermost, said shelf being adapted to support a door frame member with one longitudinal edge of said door frame member in engagement with said rear surfaces of said legs, template means defining apertures for guiding a tool for machining cooperating hinge plate receiving recesses in said door and door frame member, mounting means including guide elements on said frame structure and cooperating elements associated with said template means mounting and guiding said template means for generally vertical movements toward and away from said supporting elements, and shelf to alternately clamp and release a door and door frame member supported by said supporting elements and shelf, and power operated means for imparting movement to said template mounting means in at least one direction of movement thereof.

References Cited by the Examiner

UNITED STATES PATENTS

2,778,121	1/1957	Guerrant	144—27 X
2,945,520	7/1960	Grubb	144—27

WILLIAM W. DYER, JR., *Primary Examiner.*

W. D. BRAY, *Assistant Examiner.*