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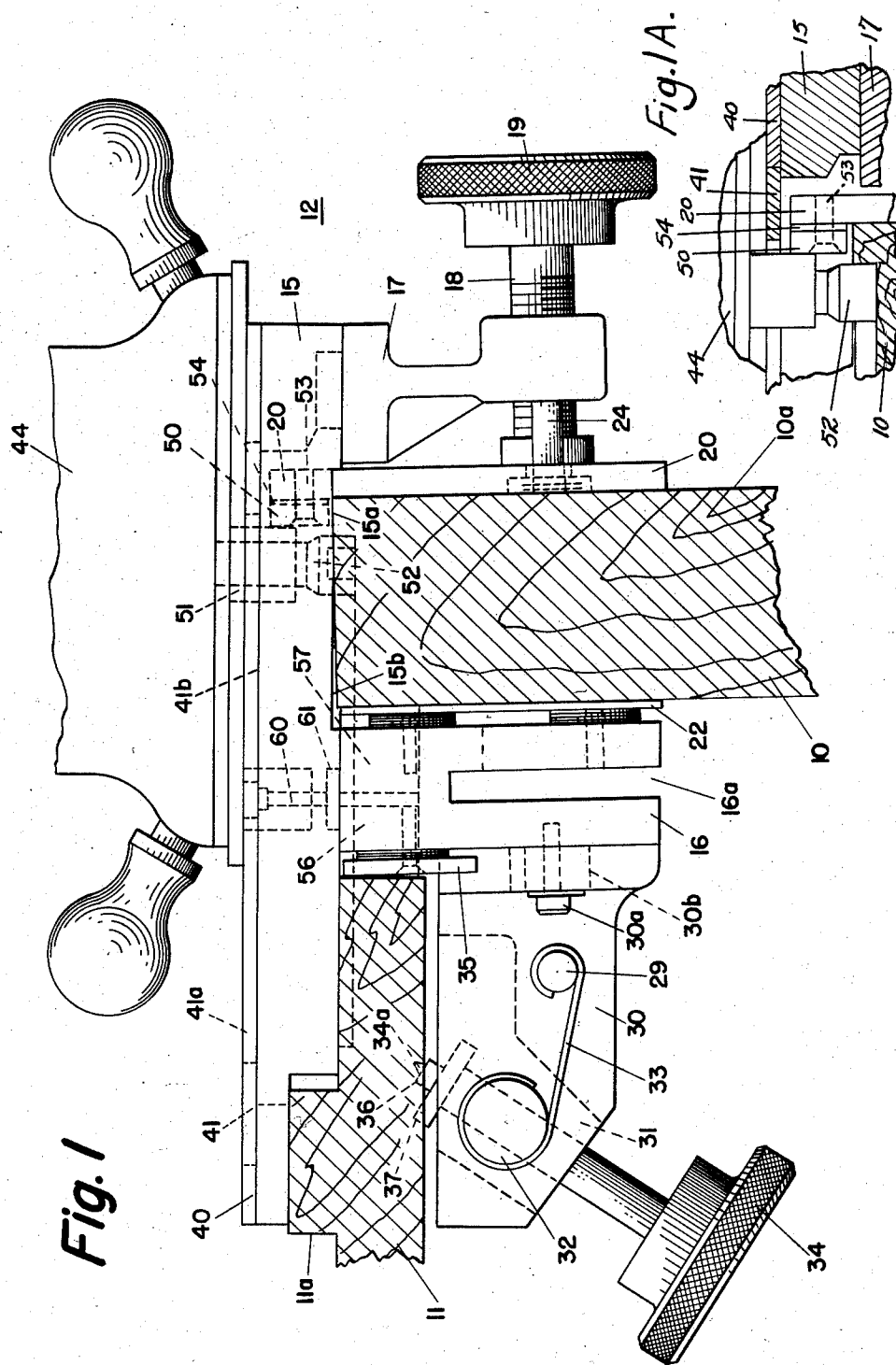
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APPARATUS FOR ROUTING HINGE SEATS

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2 Sheets-Sheet 1



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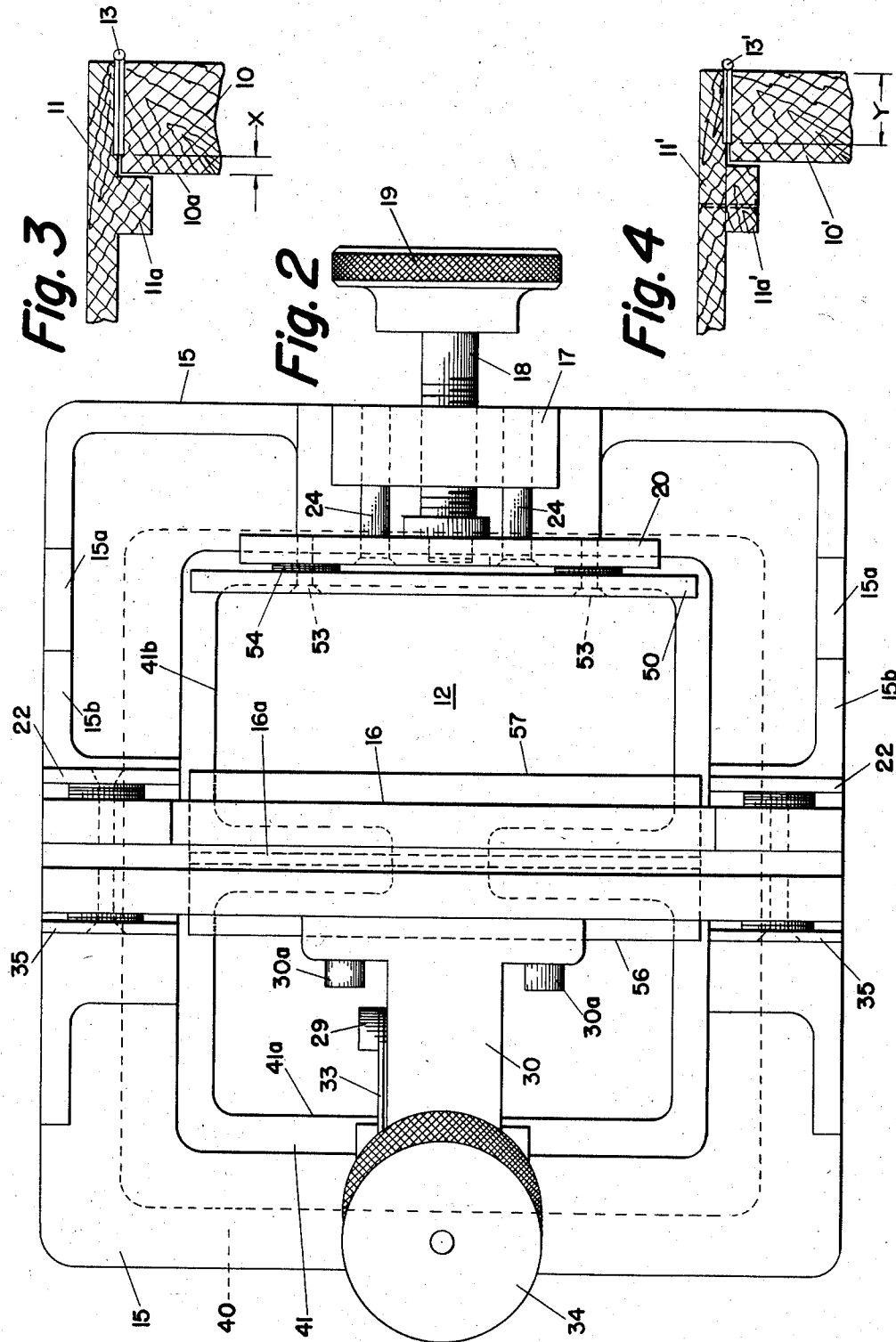
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APPARATUS FOR ROUTING HINGE SEATS

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6 Claims. (Cl. 33—197)

This invention relates to an improvement in the wood-working apparatus disclosed in United States Letters Patent No. 2,801,655 granted upon my copending application, Serial No. 455,890, filed September 14, 1954, and has for an object the provision of an improved apparatus for routing hinge seats in a door and jamb wherein the jamb is of the type having an integral stop.

In doors of the interior type the customary practice is to use flat jambs for the doors and to nail or otherwise secure the door stops to the jambs in the required position as determined when the door has been hung on its hinges. With this type of installation the width of the hinge seat or recess is controlled by a template as disclosed in my aforesaid copending application and the distance between the rear of the hinge seat and the face of the door which is adjacent the door stop will vary depending upon variations in the width of the doors. As pointed out in my aforesaid copending application, under present manufacturing conditions doors no longer run true to size but vary in thickness from one-sixteenth of an inch to one-eighth of an inch from end to end, particularly in regard to veneer doors. The present invention is particularly related to exterior doors or doors of the type wherein the jambs with which they are assembled have integral stops. In this type of jamb the stop is milled or otherwise cut from the jamb material rather than being a separate member attached to the jamb as is the case with interior doors.

As the position of the door stop of an exterior type door is fixed with respect to the edge of the jamb, it is an object of the present invention to route the hinge seats in the edge of the door in manner such that the distance between the rear of the hinge seat and the face of the door adjacent the door stop is controlled.

In accordance with the invention there is provided woodworking apparatus for controlling the movement of a routing tool relative to a piece of work to maintain a predetermined dimension between an edge of the work and an adjacent edge of the recess to be cut by the routing tool. Such apparatus includes a stationary locating surface against which a piece of work is adapted to be held and a template carrier associated with the stationary locating surface and adapted to overlie the work piece. A template is disposed on the carrier in predetermined position relative to the stationary surface and having an opening to limit the movement of the routing tool lengthwise of the work piece for controlling the longitudinal dimension of the recess. Beneath the template there is disposed movable means to limit the extent movement of the routing tool transversely of the work in one direction only to prevent the routing tool from moving closer to the aforesaid edge of the work within the aforesaid predetermined dimension.

For a more detailed disclosure of the invention and for further objects and advantages thereof, reference is to be had to the following description taken in conjunction with the accompanying drawings, in which:

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Fig. 1 is an elevational view of an embodiment of the invention;

Fig. 1A is a fractional elevation view in section of a portion of the embodiment shown in Fig. 1;

Fig. 2 is a bottom plan view of the embodiment shown in Fig. 1; and

Figs. 3 and 4 are fractional views showing in section an exterior door installation and an interior door installation respectively.

The present invention is applicable to routing hinge seats in a jamb and a door, whether the door be a left-hand door or a right-hand door. Left-hand and right-hand doors are terms which refer to the swing of the door as explained in my aforesaid copending application.

In general a plurality of template assemblies will be employed with respect to routing or cutting hinge seats in a door 10 and a jamb 11 angularly related to each other so that their hinge receiving surfaces will be substantially in a common plane. However, for purposes of explanation and since all of the template assemblies are of the same construction, only one assembly 12, Figs. 1 and 2, will be described herein. It is to be understood, of course, that two or three assemblies may be concurrently used as disclosed in my aforesaid copending application where three template assemblies have been illustrated at spaced locations along a jig frame assembly, such locations being predetermined for the proper position of the hinge seats to be routed in the edge of the door.

As pointed out above the present invention is particularly directed to the routing of hinge seats in doors for installation with jambs of the type having an integral door stop. As may be seen in Fig. 3 the jamb 11 has an integral stop 11a and the spacing between the edge of the jamb and the stop is fixed. In order to avoid any binding between the door 10 and the stop 11a it is the purpose of the present invention to hold the dimension X constant, i. e. the dimension between the rear of the hinge seat and the face of the door adjacent the stop, during a routing operation. In this manner the overall width of the hinge seat may vary with variations in thickness of the door 10. However, such variations will not impair the fit of the door with respect to the stop 11a. To accomplish the foregoing, the face 10a of the door 10 adapted to be installed adjacent the stop 11a is placed against a locating surface and another locating surface engages the opposite face of the door 10. A cutting tool such as a router is moved over the edge of the door to make a hinge seat in it and the movement of the cutting tool is blocked transversely of the edge of the door to control the width of the hinge seat with reference to the face of the door adapted to be assembled adjacent the stop 11a. In this manner a predetermined dimension X is maintained between that face of the door and the rear of the hinge seat to provide uniform clearance between the door 10 and the stop 11a when in assembled relation regardless of non-uniform thickness of doors.

This arrangement differs from that shown in my aforesaid copending application. In the aforesaid application the width of the hinge seat illustrated by dimension Y in Fig. 4 was controlled by the template of the template assemblies. As can be seen from Fig. 4 any variation in thickness of door 10' will require a corresponding movement in the position of stop member 11a' of jamb 11'. Since the stop member 11a' is separate from jamb 11' it may be installed in the required position depending upon the thickness of door 10'. Thus as long as separate door stopping 11a', such as generally employed on interior doors, is used the width of the hinge seat, dimension Y, Fig. 4, may be controlled and it is still possible to avoid binding between the door and the door stop

even with non-uniform thickness of doors. However, when the door stop is integral with the jamb as shown in Fig. 3 and the doors run non-uniform in thickness there is a likelihood that binding will result when the door 10 is hung on its hinges 13 unless dimension X is controlled as set forth in accordance with the present invention.

Referring to Fig. 1 the template assembly 12 is provided with a frame or carrier 15 adapted to extend over the hinge receiving edge of the door 10 as well as the hinge receiving surface of the jamb 11. In the normal routing position the carrier 15 will lie in a substantially horizontal plane parallel to the plane of the jamb whereas the normal plane of the door will be substantially perpendicular to this plane and thus lie in a substantially vertical plane, as illustrated in Fig. 1. Each of the template carriers 15 includes a downwardly extending section 16 adapted to space the door 10 and the jamb 11 from each other during the routing operation. In order to clamp the template assembly 12 to the door 10 there is provided a second downwardly extending section 17 preferably provided with a threaded opening through which extends the threaded clamping member 18. The threaded member 18 is adapted to be rotated by means of a knob 19. The inner end of member 18 is provided with a plate or pad 20 which is adapted to move against one face 10a of the door 10 and clamp the opposite face of the door 10 against door locating surface 22, 22, Figs. 1 and 2. To prevent the clamping pad 20 from rotating from adjustment of clamping screw 18 the pad 20 is provided with a pair of spaced guide pins 24 that slide in openings in section 17 during the clamping operation.

To adapt the template assembly 12 for use in either square-edge doors or bevel-edge doors, the clamping surfaces of members 22 and 20 are parallel to each other and are disposed at an angle slightly greater than a right angle with respect to the upper surface of the template frame 15. The aforementioned angle is approximately 93.5°, the 3.5° corresponding to the taper on the finished hinge seats from the open end of the hinge seat to the rear. The taper is provided to prevent the door from becoming "hinge bound," all as more fully described in my aforesaid patent application. The under surface of frame 15 at each end is provided with adjacent locating surfaces 15a and 15b to engage the hinge receiving edge of the door. The surface 15a is at right angles to locating surface 22 and cooperates with it to locate a square-edge door. The surface 15b locates a bevel-edge door in similar manner as more fully described in Schwarzer Patent No. 2,605,790 assigned to me.

After the template assembly has been secured to the edge of door 10 by tightening the knob 19 of the clamping screw, the jamb 11 is ready to be clamped in position relative to the door 10. Depending from the bottom of the template carrier 15 and projecting outwardly from downwardly extending section 16 is a jamb bracket 30 having an opening 31 extending therethrough in a diagonal direction with respect to the carrier 15. A pivotal supporting member 32 extends transversely of the opening 31 with its axis substantially parallel to the normally horizontal plane of the template frame or carrier 15. Pivotal member 32 is provided with an internally threaded opening through which a clamping member 34 is screwed. The clamping member 34 is adapted to engage the under side of jamb 11 to force it upwardly so that the upper surface of the jamb 11 will engage the lower surface of frame 15 as in Fig. 1, and also to move the forward edge, or hinge seat edge of the jamb against the locating surface 35, Fig. 2. It will be noted in Fig. 1 that the frame 15 has been cut away at the left-hand side to permit the integral jamb stop 11a to project above the bottom of frame 15. The pivotal support 32 is spring-biased as by a spring member 33, one end of which engages the pivotal support 32 and the opposite end of which engages a pin 29 extending from member 30.

The novel features of the jamb clamp per se are claimed in my aforesaid copending application. The jamb clamp 34 eliminates the necessity of making any separate adjustments to correct for differences in jamb widths.

When the jamb 11 is inserted in the space below frame 15 and above bracket member 30, the point 34a in clamp 34 first will engage the under-surface of jamb 11, followed by cam surface 36 to move the upper surface of the jamb against the bottom of template frame 15. The point 34a penetrates the jamb surface and acts as a pilot or guide for cam surface 36 preventing the latter from "rolling" the jamb lengthwise of the jig when the knob of clamp 34 is turned to tighten the clamp on the jamb. Due to the oblique angle formed between the plane of template frame 15 and the axis of clamping member 34 the jamb 11 is diagonally moved upward and over until it engages the bottom of template frame 15. Upon further inward adjustment of clamp 34 and with the second cam surface 37 now engaging the under-surface of the jamb 11, the jamb 11 will be moved horizontally to the right, as shown in Fig. 1, against the locating surface 35, 35. The amount of horizontal movement will be generally relatively small, such for example, in the order of 1/16" to 1/8", since the jamb 11 will ordinarily be inserted almost into its proper position by the operator before he tightens the clamping member 34. The action of the clamping member 34 is such that after engagement of pin 34a and cam surface 36 with the under-side of jamb 11 there will be a slight clockwise rotation of clamp 34 about its pivotal support 32 as viewed in Fig. 1 accompanied by engagement of the second cam surface 37 with the under-side of jamb 11. As a result of the foregoing action the hinge receiving edge of jamb 11 will be forced tightly against the bottom of template frame 15 and jamb locating surfaces 35, 35.

When a change is made in the thickness of the jamb stock in the order of 1/4" or more it is preferable to make a corresponding change in the position of jamb bracket 30 relative to the template frame 15. To accomplish this the jamb bracket 30 is provided with a pair of slots 30b through which extend lock screws 30a, the latter locking the jamb bracket to member 16 at the selected position.

The template frame 15 is provided with a top plate 40 having an opening therein to receive the template 41, the latter having a cut-out including two side openings interconnected by another opening to guide a routing tool 44, Fig. 1, during the routing of the hinge seats. The hinge seat opening 41a forms one of the side openings of the cut-out and the opening 41b forms the other side opening of the cut-out. The openings 41a and 41b are interconnected by a narrow passage or area between the openings which corresponds to the spacing between the door 10 and jamb 11, Fig. 1. The opening 41a corresponds to the hinge seat to be routed in the hinge receiving surface of jamb 11. The opening 41b has a somewhat greater width than opening 41a the purpose of which will now be described.

As previously pointed out this invention is particularly applicable to routing hinge seats in doors and jambs wherein the jambs are of the type having a fixed or integral stop member as illustrated in Figs. 1 and 3. For that reason the dimension between the face of the door adapted to be installed adjacent the stop 11a and the rear of the hinge seat in the door, dimension X, Fig. 3, should be maintained uniform regardless of any irregularity or non-uniformity in the thickness of the door 10. To accomplish the foregoing the movable member 20, Figs. 1 and 1A, is provided with a gauge member 50 which is adapted to extend beneath the template 41 but above the hinge receiving edge of the door for engaging the collar 51 surrounding the cutting tool 52 of the router 44. The gauge member 50 is adjustably mounted on member 20 as by screws 53 and shim washers 54. With this arrangement it is possible to vary the amount of material remain-

ing between the hinge seat and the edge of the door after the routing operation, i. e. to vary the dimension X, Fig. 3. From the foregoing description it will be seen that the length of the hinge seat in the door 10 is controlled by the opening 41b in the template 41 while the width of the hinge seat is controlled by means of the gauge or guide member 50 carried by the movable clamping member 20 beneath the template 41. The gauge member 50 limits the transverse movement of the cutting tool in one direction only.

As the door and jamb are in spaced relation during the routing operation supporting blocks 56 and 57, preferably of wood, are provided to engage the corresponding edges of the jamb and door into which the hinge seats are to be routed. The blocks 56 and 57 engage the outer edges of the jamb and door to prevent these edges from being chipped or splintered during the routing operation. Since the blocks 56 and 57 are constructed from wood or other relatively soft material, they do not damage the cutter blade 52 of the router 44. The blocks 56 and 57 are held in place beneath the template carrier 15 by means of spaced screws 60, the bottoms of which are provided with pads 61 as shown in Fig. 1.

As previously mentioned, only one template assembly 12 has been illustrated. However, a series may be employed as described in my aforesaid copending application. The template assemblies are provided with an opening 16a in member 16 in order that they may be mounted on a frame adapted to extend lengthwise of the door. Such frame enables the operator to maintain the various template assemblies in predetermined spaced relation during assembly and disassembly of the templates on succeeding doors and jambs.

While there has been described a preferred embodiment of the invention, it will be understood that further modifications may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. Woodworking apparatus for controlling the movement of a routing tool relative to a piece of work to maintain a predetermined dimension between an edge of the work and an adjacent edge of the recess to be cut by the routing tool comprising a stationary locating surface against which a piece of work is adapted to be held, a template carrier associated with said stationary locating surface and adapted to overlie the work piece, a template disposed on said carrier in predetermined position relative to said stationary surface and having an opening to limit the movement of the routing tool lengthwise of the work piece for controlling the longitudinal dimension of the recess, and movable means beneath said template comprising a member for clamping the work against said stationary surface and a gauge member movable with adjustment of said clamping member to limit the extent of movement of the routing tool transversely of the work in one direction only to prevent the routing tool from moving closer to said edge of the work than said predetermined dimension.

2. Woodworking apparatus for controlling the movement of a routing tool relative to a piece of work to maintain a predetermined dimension between an edge of the work and an adjacent edge of the recess to be cut by the routing tool comprising a stationary locating surface against which a piece of work is adapted to be held, a template carrier associated with said stationary locating surface and adapted to overlie the work piece, a template disposed on said carrier in predetermined position relative to said stationary surface and having an opening to limit the movement of the routing tool lengthwise of the work piece for controlling the longitudinal dimension of

the recess, movable means beneath said template to limit the extent of movement of the routing tool transversely of the work in one direction only to prevent the routing tool from moving closer to said edge of the work than said predetermined dimension, a second locating surface against which another piece of work is adapted to be held, and means for clamping a piece of work against said second locating surface and beneath said template carrier, said template having interconnected openings adapted to guide the movement of the routing tool with respect to both pieces of work.

3. Woodworking apparatus for guiding the movement of a routing tool during the routing of hinge seats in a door adapted for installation with a jamb having an integral stop comprising a template carrier including a template adapted to overlie the edge of a door, a locating surface disposed beneath said template carrier in predetermined relation with respect to said template and against which a face of the door is adapted to be positioned, movable means for clamping the door against said locating surface, and gauge means carried by said movable means for controlling the width of the hinge seat with reference to the other face of the door adapted to be installed adjacent the stop whereby a predetermined dimension is maintained between said last-named face of the door and the rear of the hinge seat to provide uniform clearance between the door and stop when in assembled relation regardless of non-uniform thickness of doors.

4. Woodworking apparatus according to claim 3 wherein said movable means comprises a threaded member having a plate at one end adapted to engage said last-named face of the door and opposed to said locating surface, and means for rotating said threaded member without rotating said plate to move said plate into and out of clamping relation with the door.

5. Woodworking apparatus according to claim 3 wherein said locating surface is disposed intermediate the edges of said template carrier, a second locating surface in spaced relation to said first-named surface, means for clamping a jamb against said second locating surface, said template being adapted to overlie both the door and the jamb, and said template having interconnecting openings adapted to guide the movement of the routing tool with respect to both the jamb and the door for cutting hinge seats therein.

6. Woodworking apparatus for guiding the movement of a cutting tool relative to the edge of a door during the installation of hinge seats therein comprising template means adapted to overlie the hinge seat receiving edge of the door, a stationary surface disposed beneath said template means against which a face of the door is adapted to be positioned with respect to said template means, the open front end of the hinge seat being adapted to be adjacent said first-named door face, movable means for clamping said first-named door face against said stationary surface, and gauge means movable concurrently with adjustment of said movable means for controlling the width of the hinge seat with reference to the other face of the door whereby a predetermined dimension is maintained between said last-named face of the door and the rear of the hinge seat to provide a uniform thickness of uncut material between the rear of the hinge seat and said last-named face of the door regardless of non-uniform thickness of doors.

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