

**Aug. 31, 1954**

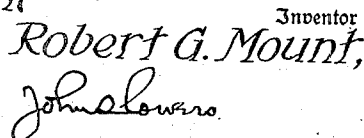
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**2,687,753**

TOOL FOR USE IN GAUGING AND FORMING BUTT HINGE RECESSES

Filed March 21, 1952

2 Sheets-Sheet 1



Attorney

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2 Sheets-Sheet 2

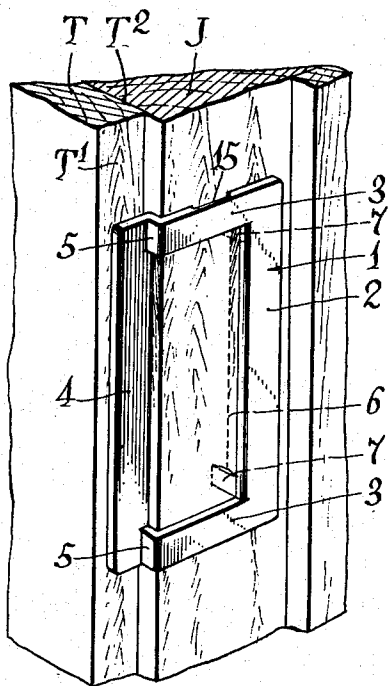


FIG. 9.

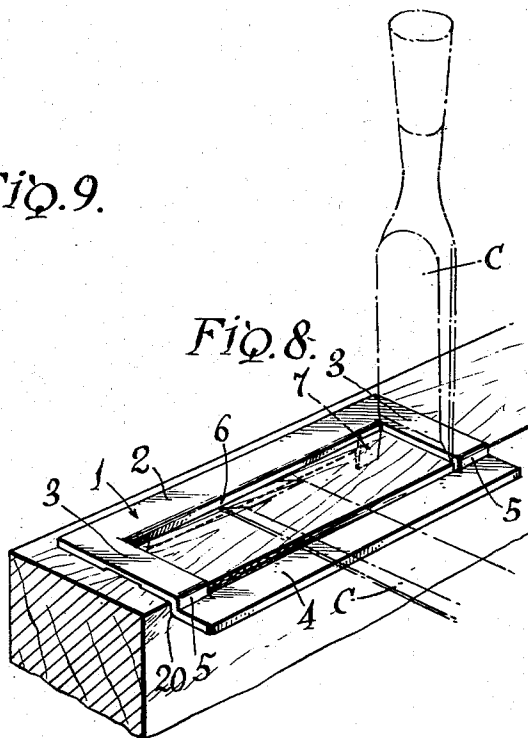


FIG. 8.

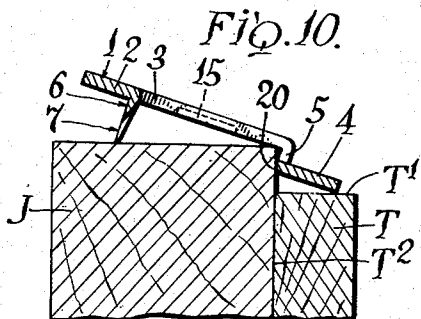


FIG. 10.

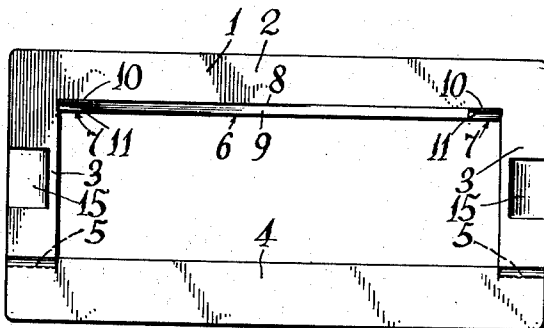
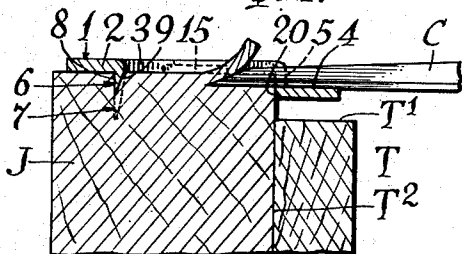


FIG. 11.



## UNITED STATES PATENT OFFICE

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TOOL FOR USE IN GAUGING AND FORMING  
BUTT HINGE RECESSES

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3 Claims. (Cl. 144-27)

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This invention relates to improvements in hinge applying tools.

The principal object is to provide a tool of integral character which may be used in connection with both the door and the door jamb (to which the usual trim has been applied) and which, as positioned for use, serves the function of a butt hinge gage for the determination of the area, outline and depth of the recess in which a leaf of the hinge is to be accurately fitted and secured and in addition cooperates in a supporting and guiding capacity with the chisel used for cutting such recess.

A further object is to provide a tool of such construction that the work of gaging and cutting the recess for a hinge leaf may be accomplished with marked facility, in minimum time, with minimum effort, and with optimum accuracy.

A further object is to provide a tool having the capacity stated and which may be economically fashioned as an integer.

A tool in accordance with the invention may be made in either of two species. In the species preferred, the tool, having provision for its initial accurate location with respect to the door or door jamb, is brought into operative position by a guided rectilinear hammer-effected movement limited by the engagement of its body uniformly with the adjacent face of the work (door or jamb) and which, by virtue of structural characteristics of the tool, results in its connection to the work stably and securely during the cutting of the recess yet in a manner such that when the recess has been completed it may be quickly and easily removed. In the other species the tool, likewise having provision for its initial accurate location with respect to the door or door jamb, is brought into operative position by a hammer-effected guided canting or tilting movement with like results of secure and stable attachment to the work and ease of removal. In both species no score marks are left outside of the recess for the hinge leaf.

Both species are illustrated in the drawings wherein Figures 1 to 6 show the preferred species and Figures 8 to 12 show the alternative species, Figure 7 showing the recess as cut by aid of either species.

Figure 1 is a perspective view wherein the tool is shown as positioned upon the edge face of the door and as attached to the door in readiness for the cutting of the recess.

Figure 2 is a perspective view wherein the tool is shown positioned upon the face of the door jamb and as attached to the door jamb in readiness for the cutting of the recess.

Figure 3 is a cross sectional view on the line

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3-3 of Figure 1, the tool being shown in its attached position in full lines and being shown in its initial position in broken lines.

Figure 4 is a horizontal sectional view on the line 4-4 of Figure 2.

Figure 5 is a fragmentary perspective view showing details of the wood penetrating and securing features of the tool.

Figure 6 is a perspective view of the tool looking at the inner face thereof, that is to say, in a position reverse to the position in Figure 1, and showing an alternative variation of the wood penetrating features.

Figure 7 is a sectional perspective view of the door showing details of the recess as cut by a chisel in connection with the use of the tool.

Figure 8 is a perspective view, similar to Figure 1 wherein the tool is of the alternative species.

Figure 9 is a perspective view of the tool shown in Figure 8 as positioned and secured upon the door jamb.

Figure 10 is a cross sectional view of the tool as initially located.

Figure 11 is a view similar to Figure 10 but showing the tool in its operative position.

Figure 12 is a plan view of the tool as inverted from its position as shown in Figure 8, that is to say, a plan view looking at the inner face of the tool.

In both species the tool includes a frame 1 which determines the area and delimits the areal outline of the recess to be cut and which has as its elements a flat longitudinal bar 2, which may be called a rear bar, flat side bars 3 coplanar and integral with the bar 2 and projecting in normal relation from the ends thereof, a flat longitudinal bar 4, parallel to the bar 2, which may be called a front bar and is located in a plane parallel to the plane of the bars 2 and 3 but offset therefrom, and relatively short integral connections 5 extending from the front ends of the bars 3 and occupying a common plane normal to the plane of the bars 3 and 4. The offsetting connections 5 provide shoulders which in both species are utilized for the accurate positioning of the tool by their contacting engagement with the face of the door or jamb normal to the face in which the recess is to be cut and to which the recess opens and for the planar location of the bar 4 in accordance with the depth of the recess to be cut.

In both species the rear bar 2 is provided along its front edge with a knife element 6 which penetrates the wood to an extent which may accord with the depth of the recess and with a fastening or holding element which insures the stable attachment of the tool to the work during the recess cutting operation and is in the form of one

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or more lugs 7. Two lugs 7 severally adjacent the bars 2 are shown in Figure 1 and a single lug 7 located centrally of the bar 2 is shown in Figure 6.

The faces of the knife element 6 taper to an edge, the rear face 8 being in a plane normal to the plane of the bar 2 and the front face 9 being in a rearwardly and downwardly inclined plane. The lug or lugs 7 which constitute the securing element of the tool are of appropriately greater depth than the knife element 6 and have faces which similarly taper to an edge, their rear faces 10 being in a plane normal to the bar 2 and common to the rear face 8 of the knife element 6 and their front faces 11 being in a rearwardly and downwardly inclined plane which has a less degree of inclination from the bar 2 than the face 9. The lugs 7 constitute securing wedges, being tightly engaged wedge-wise with the wood stock and, during the recess cutting operations, preventing any displacement of the tool.

The hammer blows by which the tool is applied to the work are delivered upon the bar 2. As a safeguard against distortion the bar 2 may be reinforced by an overlying section 12 as shown in Figure 5, the section 12 being preferably integral with the bar 2 and positioned in functional relation upon it by a folding operation followed by a securing operation such as spot welding or riveting. The bar 4 may be provided with a central coplanar projection 13 which serves as a handle and also for the support of the tool in the joiner's kit, the projection 13 having an opening 14 by which the tool may be hung upon a hook.

In the operative position of the tool the bars 2 and 3 rest upon the face of the work. When the recess R has been cut the tool may be readily removed. In aid of such removal the bars 3 may be formed on their inner faces with shallow recesses 15 to receive the end of a suitable implement by which the tool may be pried from the work.

When the tool is applied to the work as shown in Figure 1 the bars 3 serve as guides for the chisel C in making end cuts which provide the end walls R' of the recess R, the chisel being held preferably with its flat face positioned against the inner edge face of a bar 3. The rear wall R<sup>2</sup> is formed by the knife element 6 which penetrates the wood as shown in Figures 3 and 4.

After the end cuts are made the recess is completed by horizontal strokes of the chisel, the bar 4 serving as a chisel support and guide. In order that the chisel may be stably and effectively guided whereby to insure movement of its cutting edge in a plane parallel to the face of the work upon which the tool rests, the bar 4 is made of substantial width between its front and rear edges, a width of the order of a half inch being preferred, thereby to provide a relatively extensive flat supporting surface for the chisel. In cutting the recess the chisel is positioned horizontally with its flat face in uniform contact with the outer face of the bar 4, as best shown in Figure 11, and, by a series of horizontal strokes, removes the material delimited by the end cuts and the cut made by the knife element 6. In the horizontal stroke of the chisel it is not necessary or desirable that its edge be brought into contact with the faces 9 and 11. The joiner will readily determine the proper extent of the chisel strokes which are terminated short of contact with the faces 9 and 11 but quite near them, the material thus severed being readily pulled away from the

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wall R<sup>2</sup>. It will be noted that the extent of the shoulders 5 between the bars 3 and 4 is such as to locate the bar 4 with its chisel supporting face substantially co-planar with the cutting edge of the knife element 6 and in a plane exactly parallel to the plane of the face of the work in which the recess is cut. Thereby accuracy is insured in the depth of the recess and its supporting face will be even, smooth and accurately planar. It follows that the hinge leaf will be accurately fitted and securely attached.

In the species shown in Figures 1 to 6 the tool is initially positioned with its bars 2 and 3 located above and spaced from the face of the work in which the recess is to be cut and in a plane parallel to such face. This initial positioning is shown in broken lines in Figure 3, the tool being supported at such time by the lug or lugs 7 which rest upon the surface of the work. The plane of the bars 2 and 3 in parallel relation to the plane of the work is maintained by a projection (or projections) 16 which extends for a suitable distance below the bar 4 and from its inner edge, the inner face 17 of the projection being in a plane normal to the plane of the bar 4 and being in contact with the face of the work normal to the face in which the recess is to be cut and to which the recess is open at its front. In Figures 1 and 2 the projection 16 is shown in broken lines as extending continuously between points coincident with the inner ends of the offsetting shoulders 5, the engagement of the face 17 of the projection with the adjoining face of the work giving the tool lateral support which prevents its canting and which insures that its movement under the hammer blows toward and upon the work, and with its knife element 6 and its lug 7 penetrating the work, will be of rectilinear character.

The use of the tool of the form shown in Figure 1 for gaging and cutting a recess R in the door jamb J is shown in Figures 2 and 4, the jamb carrying the usual trim T, the edge T' of which is offset back of the face of the jamb in which the recess is to be cut. The trim T is a part separate from the jamb and is secured to it in any suitable manner, usually by nails. With the trim thus secured there is a very narrow interstice between it and the adjoining face of the jamb, this interstice being sufficiently indicated in Figure 2 by the line T<sup>2</sup>.

In order that the tool of the form shown in Figure 1 may be used for cutting a recess R in the door jamb provision is made whereby the trim T will not present an obstruction to the projection 16 in the rectilinear movement of the tool from its initial position to its operative position. This provision consists in grinding the outer face 18 of the projection 16 in tapering relation to the face 17 whereby the two faces will meet along a relatively sharp edge 19, the grinding being such that the thickness of the projection 16 is materially reduced from the thickness which it originally had in the tool blank as produced in manufacture by the punching and cutting operation. Thereby the projection 16 will readily enter the interstice between the trim T and the jamb J. The thinness of the projection 16 is such that it penetrates the interstice without marring effect. It is, moreover, to be noted that the portion of the interstice which is penetrated by the projection 16 will in any event not be seen because it will be covered by a hinge leaf.

In the alternative variation shown in Figure 6,

instead of the single continuous projection 16 shown in Figures 1 and 2, two relatively short projections 16 are provided, these being located at each end of the tool in adjacency to the offsetting shoulders 5. The two projections 16 of Figure 6 have the same characteristics as the projection 16 shown in Figures 1 and 2 and are similarly ground to a suitable degree of taper and thinness.

The principal difference of the species shown in Figures 8 to 12 from the species shown in Figures 1 to 6 is that the projection or projections 16 are omitted and the movement of the tool under the hammer blows from its initial position to its operative position is a canting movement. In Figure 8 the tool of the second species is shown in its operative position for the cutting of a recess in the edge face of the door. In Figures 9 and 11 the tool is shown in its operative position for cutting a recess in the face of a jamb. In Figure 10 the tool is shown in its initial position upon the jamb, the initial positioning of the tool when used for cutting a recess in the door being similar.

In the initial position of the tool as shown in Figure 10 the lugs 7 rest upon the face of the work and the inner and lower longitudinal corner edge 20 of the bar 4 rests against the face of the work normal to the face in which the recess is to be cut, the bars 2 and 3 being in a plane which is inclined forwardly and downwardly. When the hammer blows are applied to the bar 2 the movement of the tool toward the work is a canting or tilting movement in which the corner edge 20 of the bar 4 bears upon the adjacent face of the work and serves as a fulcrum. The movement of the tool toward the work is limited by the engagement of the inner faces of the bars 2 and 3 with the face of the work at which time the knife element 6 and the lugs 7 will have penetrated the work to the permissible extent. The manner of the use of the tool of the species shown in Figures 8 to 12 is the same as above described.

In manufacturing the tool is produced as a blank by a cutting and punching operation, all of its parts being in coplanar relation. A folding operation is then employed to produce the shoulders 5 and to effect the offsetting of the bar 4. If the bar 2 is to be reinforced in the manner shown in Figure 5 a folding operation is employed to position the section 12 upon the bar 2, the section 12 being thereupon suitably secured as by spot welding or riveting. A folding operation is also employed to position the knife element 6 and the lug 7 to project normally from the inner longitudinal edge of the bar 2 and, if the projection or projections 16 be employed, a folding operation is used to cause the projections to extend normally from the bar 4. The knife element 6 is then ground to produce the tapering face 9 and the lugs 7 are ground to produce the tapering faces 11. If the projection or projections 16 are employed they are ground to reduce their thickness and to produce the tapering faces 18. The blank is also operated upon to produce the recess 15 in the bars 3. The manufacturing procedure is extremely simple with the result that the finished tool may be produced with the greatest economy.

It will, of course, be understood that the tools will be made and arranged in sizes which will accord with the various standard dimensions of the hinge leaves and that the joiner will carry a number of tools of varying sizes to enable the selection of a tool which will be appropriate for

the dimensions of the particular hinge to be fitted.

I claim:

1. A tool for use in gaging and forming butt hinge recesses in the form of a frame having integrally connected parts comprising a flat rear bar, flat side bars coplanar with the rear bar and projecting from the ends thereof in normal relation thereto, a flat front bar parallel to the rear bar and offset from the side bars in a plane parallel to the common plane of the side bars and the rear bar, connections extending from the front ends of the side bars and occupying a common plane normal to the plane of the side bars and the front bar, the connections carrying and offsetting the front bar and providing shoulders to bear during the cutting of the recess against the face of the work normal to the face in which the recess is to be cut, the rear and side bars bearing upon the face of the work during the cutting of the recess, a knife element extending from the front edge of the rear bar and having a rear face in a plane normal to the plane of the rear bar and a tapering front face which meets the rear face along an edge, the knife element determining the depth of the recess, the inner edge faces of the side bars providing guides for a chisel to be used for making end cuts in connection with the formation of the recess, and a fastening element for the tool which consists of a lug extending from the front edge of the rear bar, of greater depth than the knife element and having a rear face in a plane normal to the plane of the rear bar and a tapering front face which meets the rear face along an edge, the front face of the lug having a less degree of inclination than the front face of the knife element, the lug being adapted by hammer blows applied to the rear bar for tight wedge-wise engagement with the wood stock of the work, thereby to prevent displacement of the tool during the cutting of the recess, the shoulder providing connections being of an extent between the side bars and the front bar to insure the location of the front bar in a plane which accords with the depth of the recess to be cut and is parallel to the plane of the face of the work in which the recess is to be cut, the front bar being of a width between its front and rear edges to provide a relatively extensive flat supporting and guiding surface for uniform contacting engagement by the flat side of the chisel by which the stock within the space delimited by the rear and side bars may be cut away to complete the recess, said supporting and guiding surface and the edge of the knife element being substantially in a common plane.

2. A tool as set forth in claim 1 wherein the front bar carries along its rear edge a projection having a rear face normal to the plane of the front bar and a front face tapering to meet the rear face along an edge.

3. A tool as set forth in claim 1 wherein the side bars are provided on their inner faces with recesses to receive the end of an implement by which the tool may be pried from the work when the cutting of the recess has been completed.

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