Aug. 27, 1957 C. DI MANNO 2,804,106

MORTISING TOOL PROVIDED WITH DOOR JAMB CLEARANCE COMPENSATING MEANS

Filed Aug. 17, 1954

3 Sheets-Sheet 1

Fig. 1.

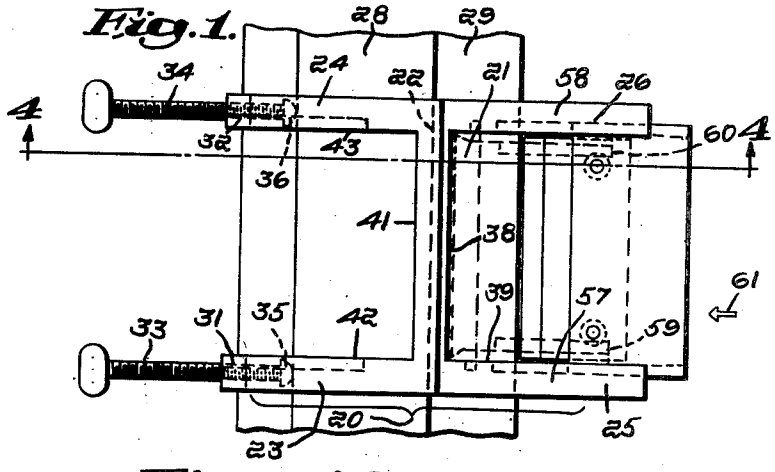

Fig. 2.

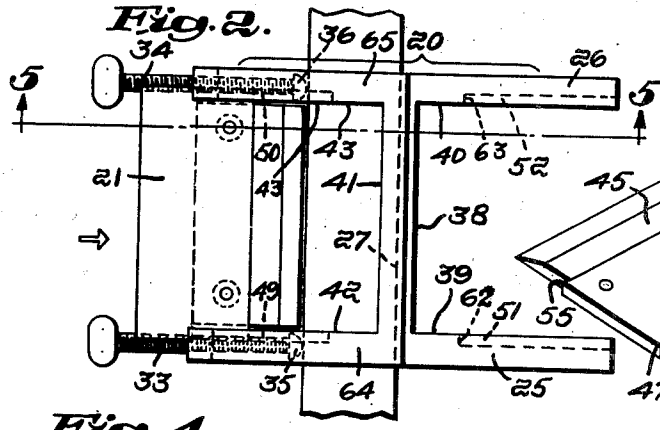

Fig. 3.

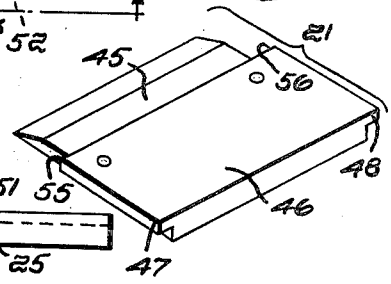

Fig. 4.

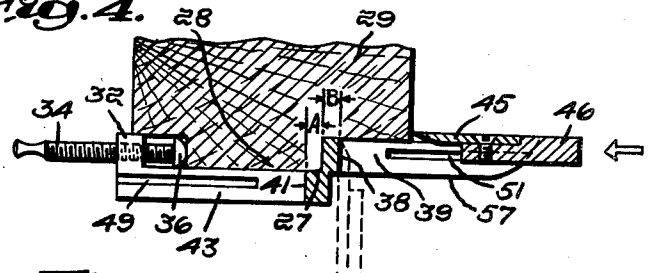

Fig. 5.

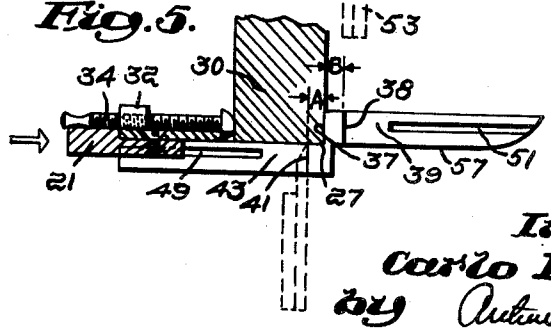

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Fig. 6.

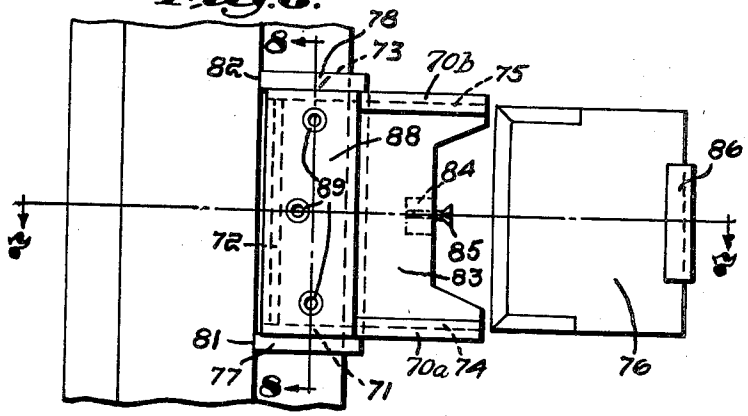

Fig. 8.

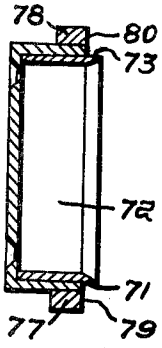

Fig. 7.

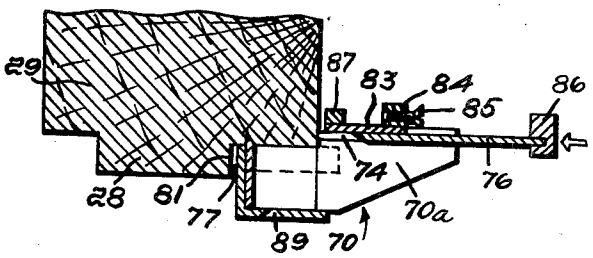

Fig. 9.

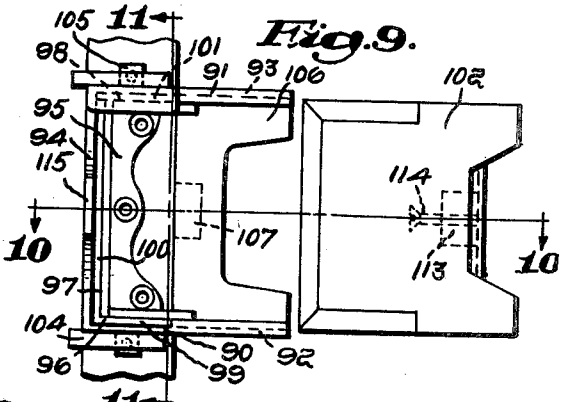

Fig. 11.

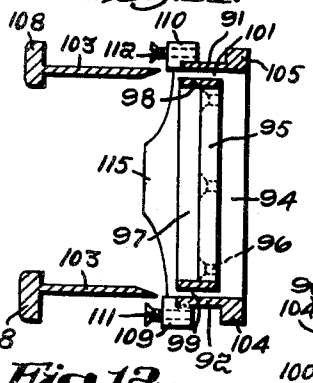

Fig. 10.

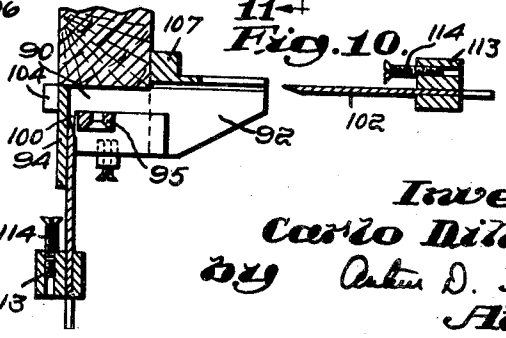

Fig. 12.

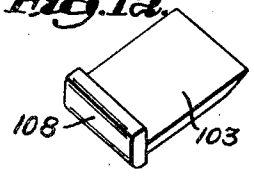

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Fig. 13.

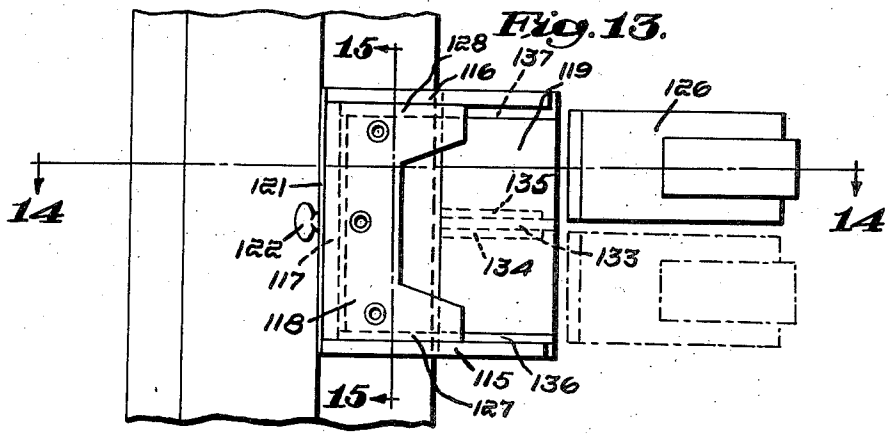


Fig. 14.

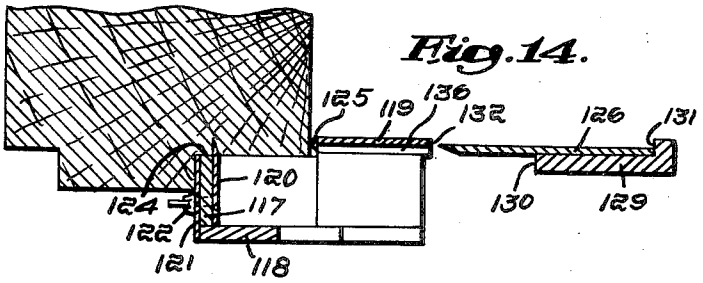


Fig. 15.

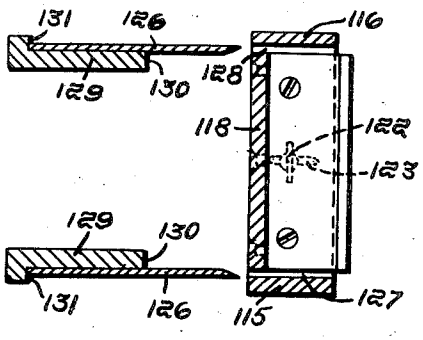
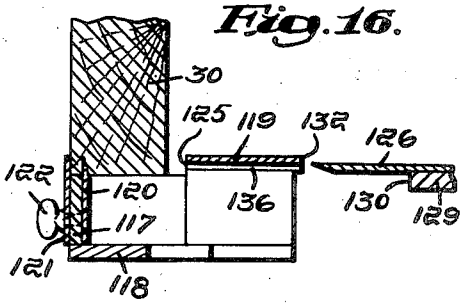


Fig. 16.



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2,804,106

MORTISING TOOL PROVIDED WITH DOOR JAMB CLEARANCE COMPENSATING MEANS

Carlo Di Manno, Greenbush, Mass.

Application August 17, 1954, Serial No. 450,287

15 Claims. (Cl. 144—27)

This invention relates to carpentry tools and more particularly to tools employed to cut mortises in doors and door jambs for receiving the leaves of hinges.

The operation of setting door butts by hand, as it is usually done, is time consuming and requires considerable skill on the part of the carpenter in order to produce an accurate, neat appearing job. The carpenter first marks out in pencil the outline of the area which is to be cut out to receive the leaf of the hinge, then cuts the wood along the outline, and finally clips away the wood in the outlined area to the desired depth. This procedure is followed in making mortises on both the door and the door jamb. In laying out the jamb mortise it is necessary to calculate the width of the mortise so that there will be clearance between the face of the door and the rabbet, preferably about 1/16 in. Furthermore, the depth of the mortise must be just enough to permit the hinge leaves to lie flush with the jamb and the edge of the door. If the hinges are set too deep, the door will bind. It is difficult to make a perfectly flat even cut with a hand chisel. The wood tends to split along the line of the grain, which may slant with respect to the edge of the door or frame. The splinters also tend to extend beyond the desired outline, unless the carpenter works slowly and with care.

The general object of this invention is to provide a hand tool which will cut mortises quickly and accurately to the exact size and depth to fit a standard door butt, which eliminates the labor of laying out the borders of the mortises, which minimizes the danger of splitting the wood beyond the desired outline, which automatically spaces the jamb mortise the proper distance from the rabbet to allow clearance for the door, and which is sufficiently simple and compact so that it can be conveniently carried in a tool box. Other advantages of the device will be apparent from the following description.

In the drawing illustrating the invention:

Fig. 1 is a plan view of one form of a tool constructed according to the invention, shown in position for use on a door jamb;

Fig. 2 is a similar view of the tool in position for use on a door;

Fig. 3 is a perspective view of the cutting knife used with the tool;

Fig. 4 is a cross-section taken along line **4—4** of Fig. 1;

Fig. 5 is a cross-section taken along line **5—5** of Fig. 2;

Fig. 6 is a plan view of another form of the tool, shown as applied to a door jamb;

Fig. 7 is a cross-section taken along line **7—7** of Fig. 6;

Fig. 8 is a cross-section taken along line **8—8** of Fig. 6;

Fig. 9 is a plan view of still another form of the tool, shown as applied to a door;

Fig. 10 is a cross-section taken along line **10—10** of Fig. 9;

Fig. 11 is a cross-section taken along line **11—11** of Fig. 9;

Fig. 12 is a perspective view of one of the cutting knives used with the tool of Fig. 9;

Fig. 13 is a plan view of still another form of the tool, shown as applied to a door jamb;

Fig. 14 is a cross-section taken along line **14—14** of Fig. 13;

Fig. 15 is a cross-section taken along line **15—15** of Fig. 13; and

Fig. 16 is a cross-section similar to Fig. 14, showing the tool as applied to a door.

The tool illustrated in Figs. 1–5 consists of an H-shaped frame, indicated generally by the numeral **20**, and a cooperating knife **21**. The frame has a central cross bar **22**, to which are connected legs **23** and **24** which serve as outline guides for the door mortise, and legs **25** and **26** which serve as outline guides for the jamb mortise. The legs **25** and **26** are offset to the rear of legs **23** and **24**, and cross bar **22** has a longitudinal groove **27** which receives either edge of the rabbet **28** of the jamb **29**, as in Figs. 1 and 4, or the edge of the door **30**, as in Figs. 2 and 5.

The legs **23** and **24** carry rearwardly extending lugs **31** and **32** in which are threaded a pair of thumb screws **33** and **34**, preferably tipped with rubber buttons **35** and **36**. Groove **27** has a flat side face **37** which engages one side of the door or rabbet, as the case may be, and buttons **35** and **36** are brought up tight by means of the screws against the other side of the door or rabbet to clamp the tool in place. The extreme right hand face **38** of bar **22**, together with the inner faces **39** and **40** of legs **25** and **26**, serves as an outline guide for a jamb mortise. Similarly the extreme left hand face **41** of bar **22**, together with the inner faces **42** and **43** of legs **23** and **24**, serves as an outline guide for a door mortise.

The cutting knife **21** consists of a blade **45** attached to a holder **46** which has projecting margins **47** and **48**. Arms **23** and **24** have slots **49** and **50**, and arms **25** and **26** have similar slots **51** and **52**, which slidably receive the margins **47** and **48** of the knife holder.

To use the tool for cutting a mortise on a door jamb the device is first clamped on the rabbet as shown in Figs. 1 and 4. The carpenter needs to locate, by measurement, only the height at which the hinge is to be set and align one of the surfaces **39** or **40** with the bottom or top, as the case may be, of the area to be cut out to receive the hinge. The knife **21** is then placed with its back to face **38**, in the position shown in full lines in Fig. 1, and hammered into the jamb. As shown by the dotted outline **53** of the knife in Fig. 4, the front corners **55** and **56** of the projecting margins **47** and **48** of the knife holder engage the front faces **57** and **58**, when the blade has penetrated to the correct depth and serve as stops. The knife is then moved successively to the positions shown by the dotted outlines **59** and **60** in Fig. 1 and hammered in to cut the top and bottom outlines of the mortise. The margins **47** and **48** of the holder are then engaged in slots **51** and **52**, respectively, and the knife is hammered in the direction of the arrows **61** (Fig. 1) to undercut the material in the mortise area and complete the mortise. The corners **55** and **56** of the holder engage the ends **62** and **63** of slots **51** and **52**, respectively, when the knife edge is even with face **38**, and thus serve as stops to limit the cut to the exact width desired.

To cut a mortise on a door, the tool is clamped to the door **30**, as illustrated in Fig. 2 and 5. The knife is placed with its back to each of the three guide surfaces **41**, **42** and **43**, and hammered in to form the outline of the mortise, the front faces **64** and **65** serving as stops for the corners **55** and **56** in cutting the jamb mortise, the margins **47** and **48** of the holder are then engaged in slots **50** and **49** respectively and the knife hammered in to perform the undercut. These slots also stop short of the cross bar **22** so as to limit the travel of the knife to the desired area.

It will be noted in Fig. 5 that the mortise cut on the door **30** is spaced from the right hand edge of the door by the distance between surfaces **37** and **41**, which will be referred to as dimension A. In Fig. 4, it will be noted that the mortise cut on the jamb **29** is spaced from the rabbet **28** by the distance between faces **37** and **36** which will be referred to as dimension B. The latter dimension on the tool is made larger than dimension A, preferably about 1/16 in. greater. The correct clearance between the door and the rabbet, when the door is hung, is thus ensured.

This form of tool is simple and flat enough so that several tools corresponding to the most used standard door sizes can be readily carried in a tool box. The tool, therefore, need not be made adjustable. This simple construction results in a saving, and the lack of adjustability is to some extent an advantage, as errors due to faulty adjustment are eliminated.

The form of tool shown in Figs. 6, 7 and 8 consists in general of a box **70**, in which three stationary knives **71**, **72** and **73** are mounted, and which has slots **74** and **75** for slidably receiving a knife **76**. The box carries blocks **77** and **78** on its sides. These blocks have rear surfaces **79** and **80** which, when the blades **71**, **72** and **73** have been driven into the wood, engage the jamb, or door, as the case may be, and serve as stops to limit the depth of the cut. The blocks also have end faces **81** and **82** which butt against the rabbet **28** when the tool is used on a jamb, to space the mortise from the rabbet. The box has a rear wall **83**, running between the side wall projections **70***a* and **70***b* in which slots **74** and **75** are located. A block **84** carrying a screw **85** is mounted on the rear of wall **83**. The knife **76** carries a bar **86** which engages the head of screw **85** when the mortise has been under cut to the desired width. The screw can be adjusted to compensate for shortening of the knife when it is sharpened.

To use the tool on a jamb, the box is laid against the jamb with the end surfaces **81** and **82** of blocks **77** and **78** engaging the edge of the rabbet. The box is then hammered to drive the three stationary blades into the jamb, forming the outline of the mortise. The knife **76** is then engaged in the slots **74** and **75** and hammered in to perform the undercut. The tool is used on a door in much the same manner. The wall **83** carries a bar **87** which engages the edge of the door to establish the width of the mortise. This block is so located with respect to the blade **72** as to produce a mortise slightly wider than the jamb mortise which is gauged by engaging blocks **77** and **78** with the rabbet. The front wall **88** of the box may be provided with holes **89** for locating the holes for the hinge screws. After the mortise is cut, the box is turned over and fitted into the mortise and marks made in any usual way through holes **89**.

In the form shown in Figs. 9 to 11 the box for gauging the mortise consists of side walls **90** and **91** with extending legs **92** and **93**, an end wall **94**, and a cross bar **95** mounted between the side walls **96**, **97**, and **98** which, with the three walls of the box, form open slots **99**, **100**, and **101**. Two knives are used with this box, a broad knife **102**, and a narrow knife **103**. The side walls carry blocks **104** and **105** which butt aganist the rabbet when the tool is used on a jamb, in the same manner as blocks **77** and **78** in the form shown in Figs. 6 to 8. The rear plate **106** carries a block **107** which engages the edge of the door **30** when the tool is used on a door, as shown in Fig. 10. The small knife **103** is inserted in succession in slots **99** and **101**, and hammered in to cut the top and bottom outlines of the mortise. The small knife is provided with a projecting back bar **108**. Mounted on walls **91** and **92** are blocks **109** and **110** carrying screws **111** and **112** respectively. These screws engage bar **108** when knife **103** has penetrated to the correct depth. The large knife is inserted in slot **100** to cut the side outline of the mortise. This knife carries a block **113** in which

is mounted a screw **114**. Wall **94** has a projection **115** which engages this screw to stop the knife at the correct depth. When the knife is used to perform the undercut, screw **114** engages block **107** and serves to stop the knife at the correct width. All the screws **111**, **112**, and **114** can be adjusted to compensate for shortening of the knives as they are sharpened.

The tool in the form shown in Figs. 13–16 again consists of a box having side walls **115** and **116** and end wall **117**, a front plate **118** and a rear wall **119**. A stationary knife **120** is attached to the end wall. A movable plate **121** is also attached to end wall **117** by means of a thumb screw **122** running in a slot **123** in the plate. When the tool is used on a jamb the plate is adjusted flush with edge **124** of wall **117** and provides the extra clearance spacing between the mortise and the rabbet, as shown in Fig. 14. When the tool is used on a door, plate **121** is moved to the rear to engage one side of the door while edge **125** of wall **119** engages the other, as shown in Fig. 16. A single narrow, movable knife **126** is used with this device. Knife **120** is first hammered in to cut the side outline of the mortise and seat the tool. Plate **118** is provided with slots **127** and **128**. Knife **126** is inserted in each of these slots in succession and hammered in to cut the top and bottom outlines. Knife **126** carries a block **129** having an edge **130** which engages the face of plate **118** when the knife has penetrated to the correct depth. This block also overhangs the knife to the rear, and has an edge **131**, which engages the edge **132** of rear wall **119** as a stop, when the knife is used to perform the undercut. Rear wall **119** has a central partition **133** which has grooves **134** and **135**. Walls **115** and **116** also have grooves **136** and **137**. Knife **126** is engaged in grooves **135** and **137** and hammered in to under cut about one half of the area, and then engaged in grooves **134** and **136** and hammered in to under cut the rest of the area. The small strip of wood in the middle which is not directly engaged by the knife will ordinarily split away smoothly.

In all its forms this tool enables a carpenter to cut perfect mortises with a minimum exercise of skill, and without making time consuming measurements and layouts. The clearance between the door and rabbet is automatically provided. Furthermore the tool is sufficiently simple and compact so that it can be easily carried in a hand tool box.

What is claimed is:

1. A tool, for cutting corresponding hinge mortises on a door and a jamb of the type having a rabbet projecting so as to overlap the door when the latter is closed, comprising: a guide frame adapted to engage the member to be cut and to define the desired outline of the mortise; means on said frame for engaging the edge of a door to establish the width of the mortise; means on said frame for engaging the rabbet of a door jamb, said rabbet engaging means being so disposed in fixed relationship with respect to said door engaging means as to space the jamb mortise from the rabbet by sufficient distance to provide a predetermined clearance between the rabbet and the door when the latter is hung and closed; and a knife slidably engageable with said frame to perform the undercut of the mortise, said frame having means for guiding the knife to undercut at a desired depth.

2. A tool as described in claim 1, said frame having a pair of parallel grooves, and said knife having a pair of parallel margins slidably received in said grooves.

3. A tool as described in claim 1, said frame having a stop member, and said knife having a cooperating stop member, the stop members being adapted to limit the travel of the knife to undercut only the area within the confines of the mortise outline.

4. A tool, for cutting corresponding hinge mortises on a door and jamb, comprising: a generally H-shaped frame having a central cross-bar, a first pair of legs extending to one side of the cross-bar, and a second pair of legs ex-

tending to the other side of the side of the cross-bar, each pair of legs having opposing parallel surfaces, and said cross-bar having a first and a second flat surface, the first forming, with the opposing surfaces of the first pair of legs, an outline guide for the door mortise, and the second forming, with the opposing surfaces of the second pair of legs, an outline guide for the jamb mortise; a knife slidably received on either pair of legs to undercut the mortise; and an offset portion on said bar having a flat face disposed parallel to said first and second bar surfaces and adapted to engage either the edge of a door or the edge of a jamb rabbet, said flat face being disposed further from said first surface than from said second surface by a distance suitable for producing a predetermined clearance between the rabbet and the door when the latter is hung.

5. A tool as described in claim 4, said first pair of legs carrying a pair of screws adapted to engage the edge of a jamb rabbet or door opposite that engaged by said flat face to clamp the tool in place.

6. A tool as described in claim 4, each of said legs having a slot along its guiding surface, and said knife having projecting margins slidably engageable in the slots of either pair of legs, said slots terminating short of the cross-bar and said margins having corners engageable with the ends of the slots to limit the travel of the knife to under cut only the area within the confines of the mortise outline.

7. A tool as described in claim 4, said knife having a flat back, engageable with any of the surface forming the outline guides, and side projections, and said legs and cross bar having front faces engageable by said projections to limit, the depth of the mortise when the knife is used to cut the outline.

8. A tool, for cutting corresponding hinge mortises on a door and a jamb, comprising: a box having two parallel side walls, connected by an end wall, and a rear opening; stationary knife blades attached to said side and end walls and projecting through said rear opening, said blades being arranged to cut the outline of a mortise; blocks mounted on said end walls having rear faces engageable with the door or jamb to limit the depth of the outline cut by said blades, said blocks also having end faces adapted to engage the rabbet of a jamb to establish the space of the jamb mortise therefrom to allow clearance between one rabbet and the door when the latter is hung; a bar mounted parallel to said end wall on the opposite side of the rear opening and adapted to engage the edge of a door to establish the width of the mortise; and a movable knife slidably engageable with said side walls in a plane perpendicular to said stationary knives said movable knife being adapted to perform the under cut of the mortise.

9. A tool as described in claim 8, said movable knife carrying a projection, and the box having a screw with a head engageable by said projection, said screw constituting an adjustable stop to limit the undercut performed by the movable knife to the area outlined by the stationary knives.

10. A tool, for cutting corresponding hinge mortises on a door and a jamb, comprising: a box having two parallel side walls, connected by an end wall, and a rear opening; a plate mounted on said box and partially overlying said rear opening, said plate having three edges disposed parallel to said side and end walls, and forming therewith a continuous slot adapted to serve as an outline guide for the mortise; blocks mounted on said side walls, said blocks having end faces engageable with a jamb rabbet to space the jamb mortise therefrom and provide clearance between the rabbet and the door when the latter is hung; a cross-piece mounted parallel to said end wall on the opposite side of said opening, said cross-piece being engageable with the edge of a door to establish the width of the door mortise; a first movable knife slidably engageable in said slot alongside of either of said side walls and adaptable to cut the top and bottom outlines of the mortise; and a second movable knife, wider than the first, said second knife being slidably engageable in said slot to cut the side margin of the mortise, and also slidably receivable between said side walls to undercut the mortise.

11. A tool as described in claim 10, said first knife having a projection and said side walls having screws mounted thereon to engage said projection and serve as adjustable stops to limit the depth of the outline cut, said second knife having a screw mounted thereon, said end wall having a projection adapted to engage said last named screw and serve as a stop to limit the depth of the outline cut and said cross-piece also having a projection adapted to engage said last named screw and serve as a stop to limit the width of the undercut.

12. A tool, for cutting corresponding hinge mortises on a door and a jamb, comprising: a box having two parallel side walls, connected by an end wall, and a rear opening; a front plate overlying said rear opening, having slots alongside said end walls; a stationary knife mounted on said end wall and projecting through said opening; a back plate connecting said side walls to one side of said opening, said back plate having an edge adapted to engage the edge of a door and establish the width of the mortise; a partition centrally mounted on said back plate, having grooves on either side running parallel to said side walls, the latter also having grooves; a movable knife slidably engageable with either groove of the partition and the groove of the adjacent side wall to perform part of the undercut of the mortise, said movable knife being also slidably engageable in said slots to perform the top and bottom outline cuts of the mortise; and an end plate attached to said end wall and adapted to engage the rabbet of a door jam, said end plate being of a thickness corresponding to the desired clearance between the jamb and the door when the latter is hung.

13. A tool as described in claim 12, said back plate being slidable on said end wall in a direction perpendicular to the rear opening, to engage the edge of the door opposite that engaged by the back plate when the tool is used on a door.

14. A tool as described in claim 12, said movable knife having a first projection adapted to engage the back plate to limit the width of the undercut, and a second projection adapted to engage the front plate and limit the depth of the cut when the knife is used to cut the top and bottom outlines of the mortise.

15. A tool for cutting corresponding hinge mortises on a door and a jamb of the type having a rabbet projecting so as to overlap the door when the latter is closed, comprising: a frame having a cross-bar and legs extending therefrom and defining therewith the outline of the mortise; means on said cross-bar for engaging either the edge of a door or the edge of a jamb, and providing with said frame a fixed spacing device for producing a predetermined clearance between the rabbet and the door when the latter is hung; and a knife slidably engageable with said frame to perform the undercut of the mortise, said frame having means for guiding the knife to undercut at a desired depth.

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