

March 31, 1953

E. L. SCHLAGE
REBORING JIG

2,633,040

Filed Jan. 7, 1952

2 SHEETS—SHEET 1

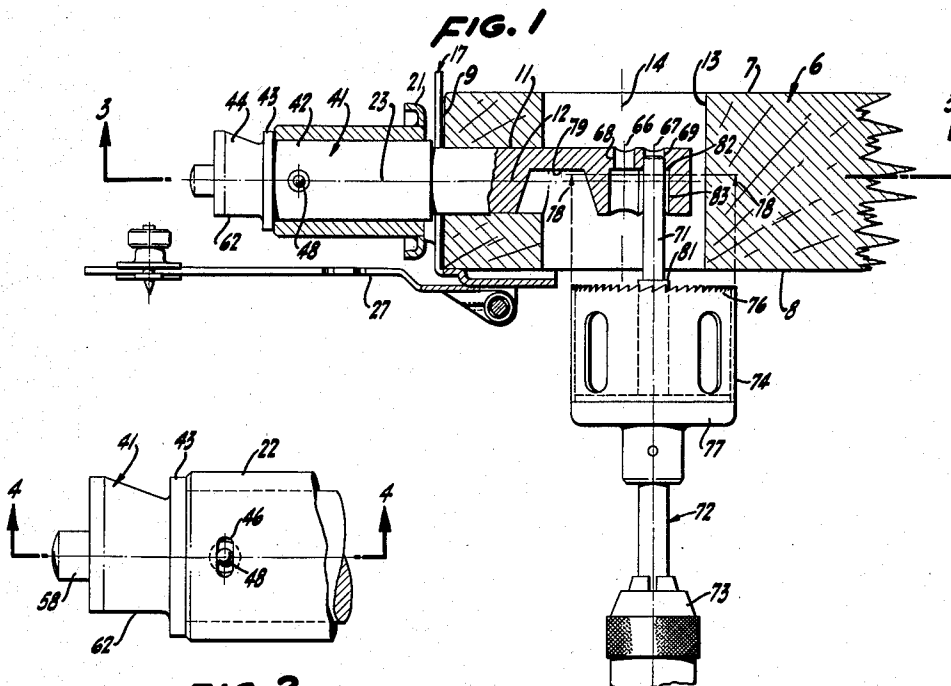


FIG. 2

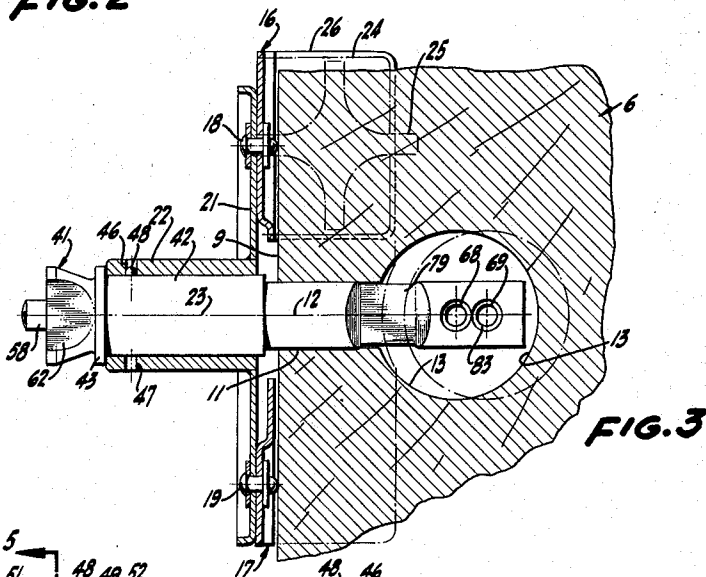
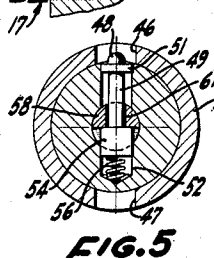
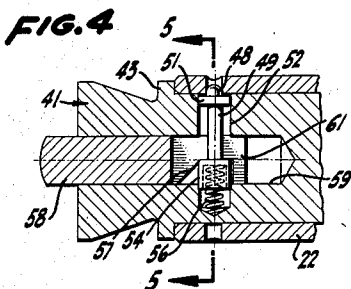


FIG. 3



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2 SHEETS—SHEET 2

FIG. 7

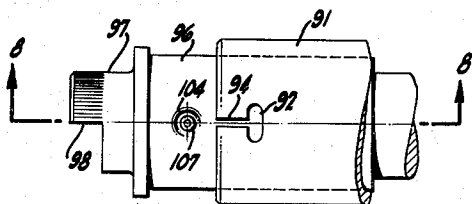


FIG. 6

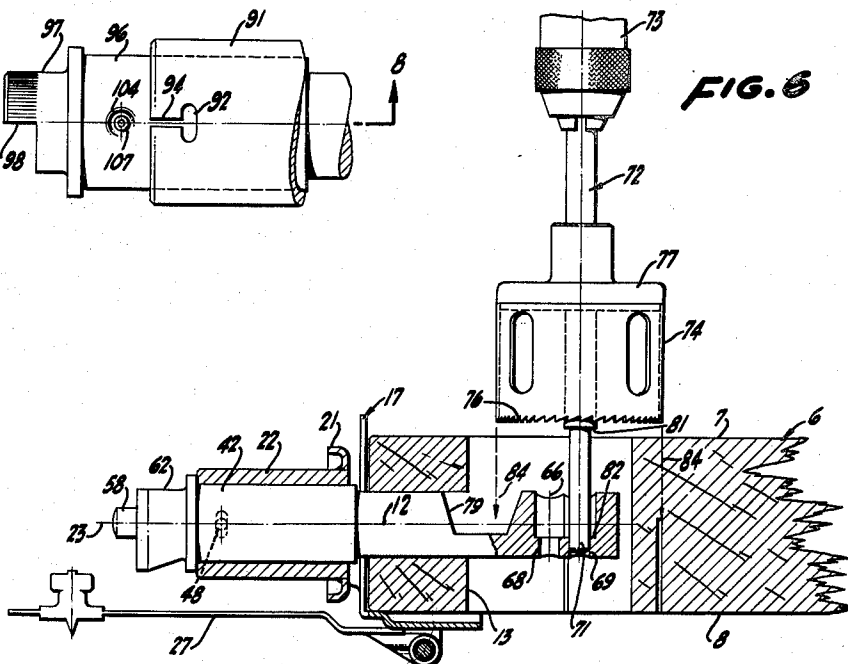


FIG. 8

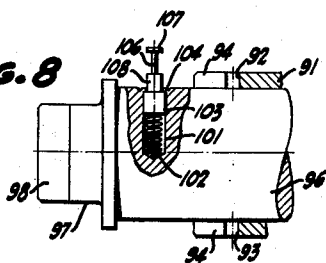


FIG. 9

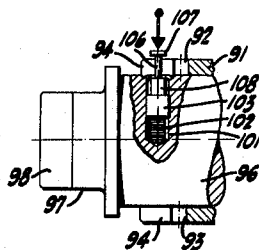
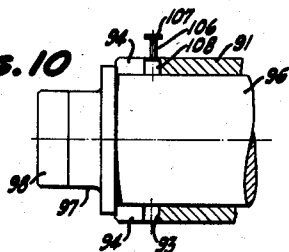


FIG. 10



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REBORING JIG

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Application January 7, 1952, Serial No. 265,241

12 Claims. (Cl. 77—62)

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My invention relates to tools especially designed for the installation of tubular or cylindrical locks in doors. In many lock installations, the door panel is initially bored from its edge with a horizontal circular cylindrical hole and is also bored through from one side face of the door to the other (or from both faces toward the center) with an intersecting or through hole having a horizontal axis in the same plane as the edge-bored hole. The distance from the edge of the door to the axis of the through hole is referred to as the backset distance and that dimension varies with different locks. It happens frequently that a lock initially installed in a door is for some reason later on to be replaced with a lock having a somewhat different backset. The installation of the different lock cannot be accomplished easily or at all with the usual boring tools, since the pilot or lead thread on the usual boring bit has no material into which to engage. Furthermore, it is difficult to cut a true and straight circular cylindrical hole in a door panel if a somewhat displaced hole already exists in the panel.

It is therefore an object of my invention to provide a reboring jig effective for use in providing a second slightly offset hole through a door panel having its axis displaced from the axis of a hole previously existing through the panel.

Another object of my invention is to provide a reboring jig which can be used to enlarge a hole of the same backset.

Another object of my invention is to provide a reboring tool which can be utilized in connection with other special tools for use in lock mounting.

A still further object of my invention is to provide a reboring tool effective to leave a substantially circular cylindrical hole through the door panel.

Another object of my invention is to provide a reboring jig which can readily be utilized without special techniques or instruction by the customary workmen who install locks.

A still further object of my invention is in general to provide a tool useful in the installation of locks in doors, particularly after the door has already had one lock installed therein.

A still further object of my invention is in general to improve reboring jigs.

Other objects, together with the foregoing, are attained in the embodiment of my invention described in the accompanying description and illustrated in the accompanying drawings in which

Figure 1 is for the most part a cross section on a general horizontal plane through a door panel and through a reboring jig of my invention

mounted thereon, some portions being shown in plan and parts of the door panel being broken away to reduce the size of the figure.

Figure 2 is a view to an enlarged scale showing in plan the mechanism for orienting the edge bore guide.

Figure 3 is a cross section the plane of which is indicated by the line 3—3 of Figure 1.

Figure 4 is a cross section, the plane of which is indicated by the line 4—4 of Figure 2.

Figure 5 is a cross section, the plane of which is indicated by the line 5—5 of Figure 4.

Figure 6 is a view in cross section quite similar to Figure 1 but showing the reboring tool in use on the opposite side of the door panel.

Figure 7 is a plan to an enlarged scale of a modified form of edge bore guide mechanism comparable to the showing in Figure 2.

Figure 8 is a cross section the plane of which is for the most part indicated by the line 8—8 of Figure 7.

Figure 9 is a cross section comparable to Figure 8 but showing the parts in a different relative location.

Figure 10 is a view comparable to Figures 8 and 9 but showing the parts in a still different relative location.

While the reboring jig of my invention can be incorporated in a number of different ways depending in part on the particular environment in which it is to be utilized and depending also upon other engineering factors, it has been successfully incorporated substantially as shown herein for use in connection with a door panel

6 of wood or comparable material. The panel 6 is defined by a side face 7, another side face 8, and an end or edge face 9. The panel 6 has previously been provided with an edge bore or hole 11 circular cylindrical in contour and symmetrical about a longitudinal axis 12 disposed in a horizontal plane. The axis 12 is also perpendicular to the edge 9 of the bore providing that edge is not beveled. In some instances a bevel is provided but in all cases the axis 12 is substantially parallel to the vertical planes defining the door side faces 7 and 8. Also, due to a previous lock installation, the door panel 6 is provided with a cross bore or hole 13 circular cylindrical in contour, and usually is considerably larger than the bore 11. The hole 13 is symmetrical about an axis 14 in the same horizontal plane as the axis 12 and at right angles thereto, being also perpendicular to the planes of the faces 7 and 8. In accordance with my invention, there is provided a mechanism for utilizing

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ing the edge bore 11 as a partial guide and for providing an additional, displaced cross bore from one side of the door to the other.

Since the thickness of different door panels varies and even changes from time to time, though the nominal thickness may be the same, I provide a structure which includes an upper clamp plate 16 and a lower clamp plate 17 (shown in phantom in Figure 3) the two clamp plates being designed firmly to grip the opposite faces 7 and 8 of the door. The clamp plates are connected by pivot pins 18 and 19 to a lever 21 carrying a circular cylindrical sleeve 22 designed to have its axis 23 coincide with the axis 12 of the edge bore. A suitable thumb wheel 25 operates a clamping pad 24 against an extension 26 of the lower clamp member 17, to grip the door. A structure of this general type also provided with a marking device 27 is disclosed in my copending application, Serial No. 185,018, filed September 15, 1950 and entitled Boring Jig. Much of the boring jig structure is not consequential in connection with the present mechanism yet part of it is utilized with the present structure.

I provide an arrangement for operating with the clamping device to serve as a mounting and guiding member. The tube 22 is made to serve as a support for a centering plug 41 introduced therein. The plug 41 is provided with a locating portion 42 having a close sliding fit within the barrel 22. It is also provided with a stop flange 43 and a grip portion 44. It is intended that the member 41 be oriented in either one of two particular ways with respect to the mounting structure. For that reason, the tube 22 is provided at diametrically opposite points with slightly elongated slots 46 and 47 into which a spring pressed detent 48 can project.

As especially shown in Figures 4 and 5, the detent 48 is disposed at the end of a pin 49 having a shoulder 51 thereon slidable in a cross bore 52. The rod 49 adjacent its innermost end is provided with an enlarged cup 54 encompassing part of an extension spring 56 seated in the bottom of the bore 52. Designed to cooperate with the cup 54 is a cam surface 57 on a plunger 58 coaxially disposed to slide in an end bore 59 within the plug 41 and also having an elongated slot 61 cut therein so that the member 58 can straddle the rod 49 with the cam portion or surface 57 in engagement with the cup 54.

In the ordinary action of this device, the spring 56 projects the detent 48 and forces the cup 54 against the cam surface 57 to expel or project the plunger 58 until the end of the cam surface 57 contacts the cup to serve as a stop. However, when the operator depresses the plunger 58, the cam surface 57 depresses the cup 54 to compress the spring 56 and simultaneously withdraws the detent button 48 within the cross bore 52 so that then the plug 41 is axially movable out of the sleeve 22 and is also freely rotatable therein.

Since the slot 46 and the slot 47 are circumferentially elongated slightly, the projected detent 48 while restricting the axial movement of the plug 41 does permit slight rotary oscillation of the plug in either of two positions depending upon whether the detent button is within the upper slot 46 or the lower slot 47. To serve as an indication of the orientation of the plug 41, the hand grip portion 44 is provided with a flat 62 on one side only. With this arrangement, the plug 41 can be put into the sleeve 22 in either of two substantially diametrically opposite positions in a set position axially but with a slight

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accommodation in a rotary or circumferential direction.

When the plug is so installed, it projects through the bore 11 and extends farther into the previously existing cross bore 13 in the door. Depending upon the back set of the particular new lock to be installed, it is desirable to provide a new cross bore having either an axis 66 or an axis 67 displaced therefrom. For that reason, the plug 41 is provided with a cross passageway 68 corresponding to the axis 66 and a cross passageway 69 corresponding to the axis 67. These cross passageways are arranged with their axes in the same horizontal plane as the axis 12 and at right angles or perpendicular thereto.

Designed to operate in either of the passageways 68 or 69 is a pilot rod 71 extending from a cutting tool designed to be rotated by means of a chuck 73 of any standard kind. Included in the tool 72 is an annular saw blade 74 having teeth 76 on the leading edge thereof and connected to the rod 71 by a driving plate and hub 77. When the chuck 73 is revolved in the appropriate direction and is simultaneously advanced with the pilot rod 71 within the guide passage 69, for example, the saw teeth 76 cut a kerf in the material of the door panel 6 beginning with the side face 8. The kerf is crescent shaped or arcuate and intersects the previously cut bore. However, the saw is not deflected from its proper location because as it advances it is continually guided by the rod 71 in the plug 41.

The saw 74 is continually rotated and advanced until such time as it is at or slightly past the central plane of the door. To accommodate such motion, as indicated by the arrows 78 in Figure 1, the plug 41 is provided with a cut out or relieved slot 79 affording adequate clearance for the rotating saw blade. But so that the saw cannot be advanced too far and dull its teeth by contact with the metal plug 41, the guide rod 71 at an appropriate axial location is enlarged to form a shoulder 81 engageable with a comparable shoulder 82 formed by a counterbore 83 in the plug. Thus, when the saw 74 has been turned and advanced to an appropriate extent, the shoulder 81 abuts the shoulder 82 and no further advancement can be made. At that time the saw is backed off and the rod 71 is removed from engagement with the guide 41 leaving a partially severed crescent shaped block of door material.

The user then depresses the thumb button 58 and rotates the guide 41 a half turn as indicated by the flat 62. The button 58 is then released and snaps into position. Just as in the first utilization of the structure, the guide rod then projects into the cross bore 13 but with the passageways 68 and 69 facing in the opposite direction. The saw 74 is then moved to the opposite side of the door adjacent the face 7 as shown in Figure 6, the pilot rod 71 is put through the guide passage 69, and the saw is again rotated and advanced against the door face. If it should happen that the door face is not exactly planar or is not exactly at right angles to the position of the guide plug 41, the initial contact of the saw teeth with the material of the door is sufficient to cause a slight rotation of the guide plug 41, permitted by the circumferential clearance in the slots 46, and 47, so that the cut begins at an appropriate axial attitude.

The chuck 73 is rotated and the saw then cuts in the direction of the arrows 84 into the door panel from the face 7 until such time as the saw cut merges with the previously made cut or until

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such time as the shoulders 81 and 82 again come into abutment. When that occurs, the saw is withdrawn, the completely severed crescent shaped block of material is likewise withdrawn, and the new hole is completed.

After the saw has been withdrawn, the guide plug 41 is extracted from the remaining clamp structure 16 and 17 or the entire mechanism is removed from the door.

Upon the installation of the new lock, the various parts thereof are appropriately accommodated in the correct location. It is quite customary to provide roses or escutcheons of sufficient area or extent to overlies or cover the eccentric portion of the cross hole 13 not needed for the new lock location.

In some instances it is preferred to provide a slightly variant form of guide sleeve and guide plug. As especially shown in Figures 7 to 10 inclusive, in this case the guide sleeve 91 is provided on opposite diameters with a pair of circumferential slots 92 and 93 each of which is connected by a longitudinal cut 94 with the edge of the sleeve 91. Adapted to be snugly received in the sleeve is a guide plug 96 having a thumb turn 97 at one end thereof formed with a cutaway portion 98 to serve as an indicator of orientation. Located in the guide plug 96 in a cross bore 101 is a coil spring 102 seated in the bore and pressing against an enlarged plunger 103 slidable in the bore yet prevented from escaping by staked portions 104. A reduced pin 106 extends from the plunger 103 and terminates in an enlarged head 107.

In the use of this particular structure, for initial engagement the user depresses the pin 106 by pressure against the head 107 and compresses the spring 102 until the pin 106 passes axially or lengthwise through the selected connecting slot 94, and into the circumferential slot 92. The pin then being released, the spring 102 projects the pin until the intermediate body 103 thereof fits snugly in an axial direction within the slot 92. Since the slot 92 is elongated, there is some circumferential adjustment permitted but the axial location is fixed. When the guide plug is to be located substantially 180 degrees away, in its other position, the user depresses the pin 106, withdraws the plug slightly until the pin is outside of the sleeve 91, rotates the plug to register with the slot 94 and then repeats the previous operation until the pin 106 has passed through the other slot 93 and has sprung into final location, as shown in Figure 10.

What is claimed is:

1. A reboring jig for use on a door panel comprising a clamp engageable with said door panel, a guide sleeve on said clamp, a plug bearing within said sleeve and extending into a cross hole in said door panel, said plug having a cross passageway therein, a rotatable rod bearing in said passageway, and a cutting tool on said rod.

2. A reboring jig for use on a door panel comprising means for engaging said door panel, a guide sleeve on said clamp, a plug bearing within said sleeve and extending into a cross hole in said door panel, said plug having a cross passageway therein, a rod rotatably bearing in said passageway, and a circular saw blade mounted on said rod for engagement with said door panel.

3. A reboring jig for use on a door panel comprising means extending into a cross hole in said door panel and defining a cross passageway therein, a rod rotatably bearing in said passageway, and a circular saw blade mounted on said rod for engagement with said door panel.

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4. A reboring jig for use on a door panel comprising a plug extending into a cross hole in said door panel and defining a cross passageway therein, means for clamping said plug to said door panel, a rod rotatably bearing in said passageway, and a rotatable cutting tool on said rod for engagement with said door panel.

5. A reboring jig for use on a door panel comprising a guide sleeve, means for fastening said guide sleeve with respect to said door panel, a plug bearing within said sleeve in either of two selected positions, a rotatable cutting tool, and a rod on said tool engageable with said plug in either of said positions.

6. A reboring jig for use on a door panel comprising a guide sleeve, means for fastening said guide sleeve to said door panel, a plug rotatable within said sleeve between two selected positions, a cutting tool, and means on said tool for supporting said tool on said plug in either of said selected positions.

7. A reboring jig for use on a door panel comprising a guide, means for positioning said guide on said door panel, a plug receivable in said guide and adapted to extend into a cross hole in said door panel, a cutting tool, and means on said tool for supporting said tool on said plug.

8. A reboring jig for use with a door panel having an edge hole intersecting a cross hole comprising a plug adapted to extend through said edge hole into said cross hole, means forming a cross passageway on said plug, a cutting tool, and means on said cutting tool rotatable and slidable within said cross passageway.

9. A reboring jig for use with a door panel comprising a lever, a guide sleeve on said lever, means engaging the sides of said door panel for clamping said lever over the edge of said door panel, a plug having a passageway therein and rotatable in said guide sleeve, means for holding said plug against rotation in said guide sleeve, a circular saw, and a rod disposed axially of said saw and adapted to be disposed in said passageway.

10. A reboring jig comprising a circular cylindrical plug having a cross passageway through one end thereof, a rod rotatable and slidable in said passageway, and a cutting tool on said rod extending toward said plug, there being a cut away portion of said plug to afford clearance for said tool.

11. A reboring jig comprising a circular cylindrical plug having a cross passageway through one end thereof, a rod rotatable and slidable in said passageway, a cutting tool on said rod extending toward said plug, there being a cut away portion of said plug to afford clearance for said tool, and a shoulder on said rod engageable with said plug to stop movement of said tool toward said plug.

12. A reboring jig for use with a door panel having an edge hole and an intersecting through hole comprising a clamp, means for gripping said clamp to the sides of said door panel, a guide sleeve on said clamp disposed substantially coaxially with said edge hole, a plug disposable in said guide sleeve and adapted to extend through said edge hole into said through hole, means for holding said plug against axial movement in said guide sleeve and for holding said plug against substantial rotation within said guide sleeve, said plug having a cross passageway through one end thereof, a rod adapted to extend into said through hole and slidably and rotatably disposed in said cross passageway, a cutting tool on said rod ex-

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tending toward said plug, there being a cut away portion of said plug to afford clearance for said tool, and a shoulder on said rod engageable with said plug to stop movement of said tool toward said plug.

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