

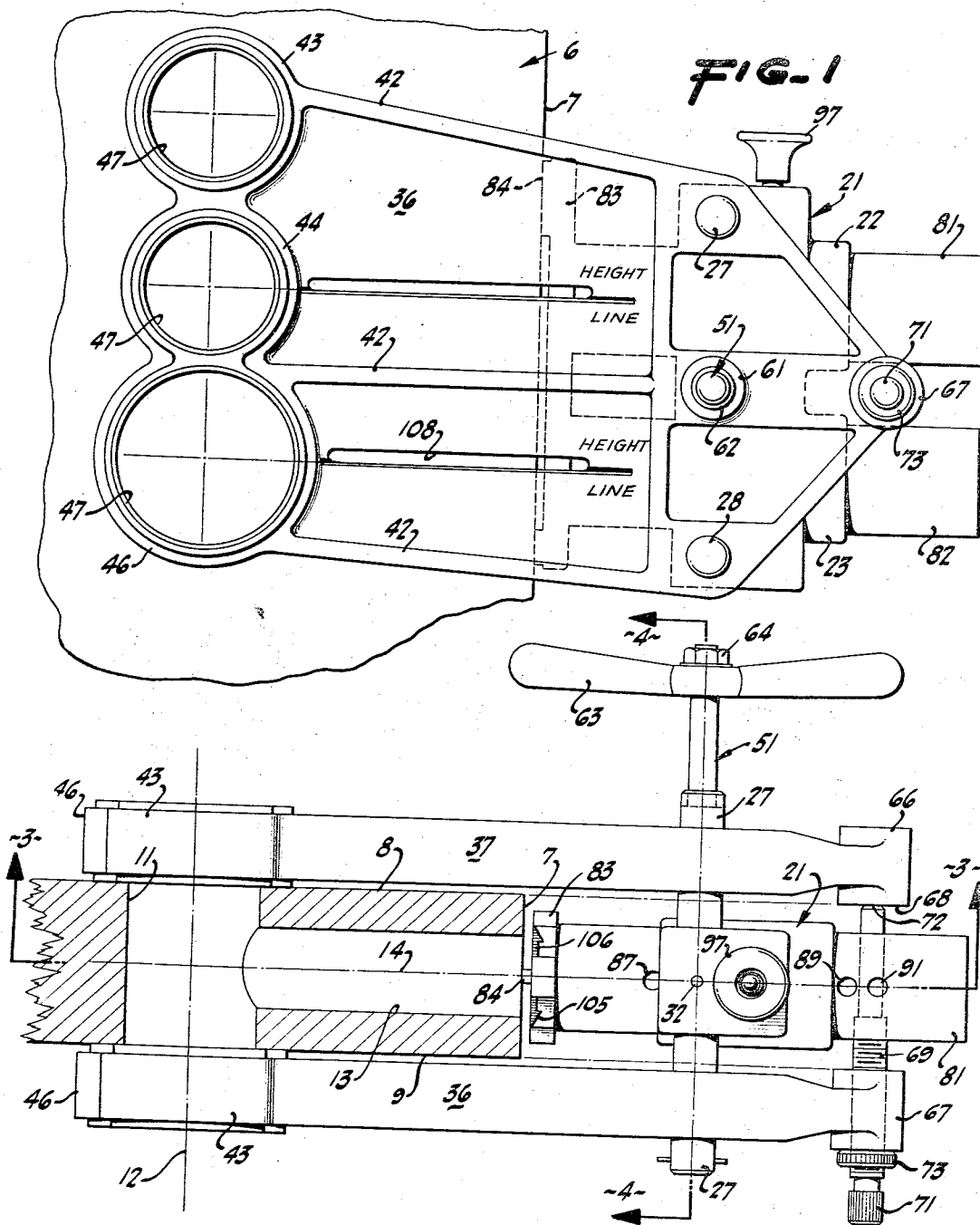
**Aug. 29, 1967**

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BORING JIG FOR DOOR LOCKS

3,338,277

Filed May 6, 1966

2 Sheets-Sheet 1



**FIG-2**

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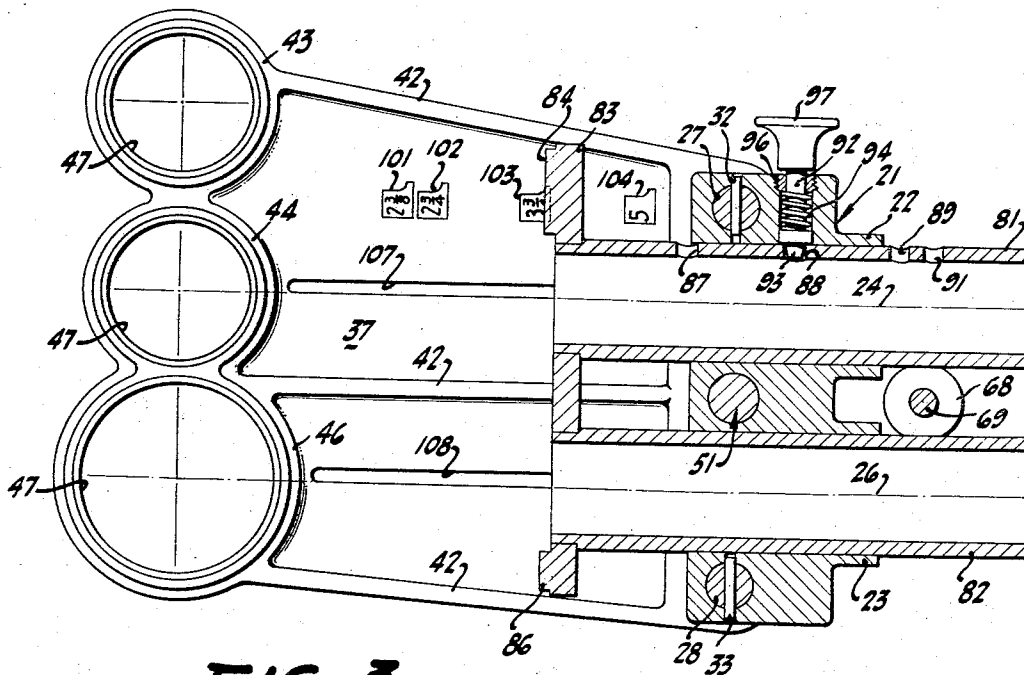


FIG-3

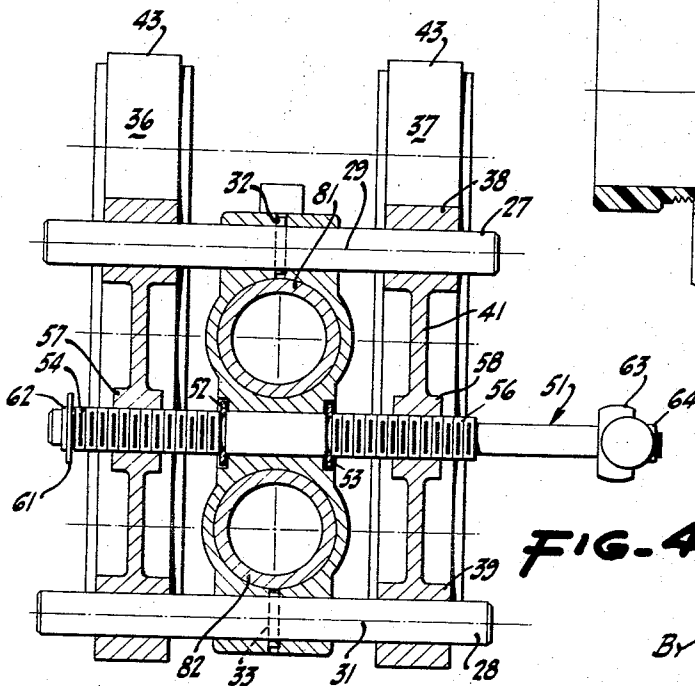


FIG-4

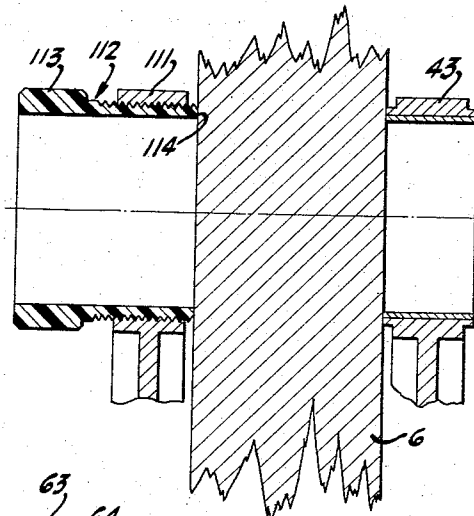


FIG-5

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## BORING JIG FOR DOOR LOCKS

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Filed May 6, 1966, Ser. No. 548,255

6 Claims. (Cl. 144-27)

### ABSTRACT OF THE DISCLOSURE

A boring jig for door locks has a central frame carrying clamp plates with circular tool guides for engaging opposite faces of a door. The clamp plates are equally moved in opposite directions from the central frame by a loosely fitting screw shaft and may pivot slightly about a separate fulcrum. Boring sleeves slidable in the central frame carry an abutment plate engageable with the door edge to locate the circular tool guides at selected distances from the door edge.

Our invention relates to tools particularly adapted for use by an artisan in preparing a door for the installation of a door lock thereon.

At the present time many door locks are made for installation in a door simply by the provision of one transverse hole extending through the door panel and another intersecting hole extending inwardly from the door edge. Other locks employ a number of intersecting holes arranged in various combinations, some passing transversely through the door panel and others extending inwardly from the door edge. It is important in preparing a door for lock installation that the holes be accurately bored at the appropriate locations with the appropriate angles of intersection and with the appropriate spacing so that the lock can be simply mounted with little or no additional fitting or labor. Doors on which the locks are installed may vary in thickness not only from door to door for constructional or architectural reasons, but also from time to time since the material of the door may change in dimensions. The installation of locks can be made at different arbitrary or selected locations particularly with respect to height and to the amount of backset or distance of the rotational axis of the door knob or spindle from the door edge.

It is therefore an object of the invention to provide a single tool which can be utilized by an ordinary workman on any of the normally encountered doors and which also will permit the preparation of the door for the reception of any one of a large number of locks of different constructional design.

Another object of the invention is to provide a boring jig for door locks that will accommodate many of the boring or cutting tools now available.

Another object of the invention is to provide a boring jig for door locks that can be easily and accurately mounted on any door panel normally encountered and will firmly and rigidly stay in place until removed.

Another object of the invention is to provide a boring jig which can be so closely engaged with the door as to avoid tearing or splintering by the cutting tools in the event the door is of material which is otherwise subject to that action.

A further object of the invention is to provide a boring jig which is relatively light and easy to handle and can be manufactured economically.

A further object of the invention is to provide a boring jig which is easily set on the job to accommodate the particular door encountered and to provide for the installation of the particular lock to be utilized.

A further object of the invention is in general to improve boring jigs for door locks.

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

5 FIGURE 1 is a side elevation of the boring jig for door locks mounted on a door being prepared for the reception of a door lock;

FIGURE 2 is a plan of the mechanism of FIGURE 1, the door being disclosed in cross section on a horizontal plane;

10 FIGURE 3 is a view in cross section, the plane of section being indicated by the line 3-3 of FIGURE 2;

FIGURE 4 is a view in cross section, the plane of section being indicated by the line 4-4 of FIGURE 2; and

15 FIGURE 5 is a detail showing a modification of one portion of the boring jig mechanism.

In most instances, locks are installed on doors already hung, and references to directions herein assume that condition, but some locks are factory installed or machine installed on doors prior to hanging and in various attitudes. The present tool is also useful in that environment.

While it can be embodied in a number of different practical forms, the boring jig in accordance with this invention has been particularly made, as shown herein, 25 especially for use in connection with a door panel 6. This panel includes an upright stile having an edge surface 7 which may be at right angles to the side surfaces 8 and 9 or may be beveled or inclined with respect thereto. The surfaces 8 and 9 are usually parallel to each other and 30 are a predetermined, nominal distance apart. This distance varies from a relatively close spacing in thin doors to a relatively wide spacing for thick doors. The material of the panel 6 is ordinarily, wood although metal doors and composite doors are sometimes encountered. One of the 35 purposes of the boring jig is to assist in the boring in the panel of a transverse, horizontal bore 11 of relatively large diameter. The bore 11 is circular about a transverse axis 12 extending at right angles to the planes of the surfaces 8 and 9. The bore 11 extends clear through the door 40 panel and at a median location is intersected by a bore 13 of relatively smaller diameter. The bore 13 is circular cylindrical about an axis 14 that intersects the axis 12 at right angles. The bore 13 extends horizontally inwardly from the edge 7 to its intersection with the bore 11. This 45 is the simplest boring job. Others may require a number of transverse bores, a number of edge bores, or both.

Pursuant to the invention, there is provided a boring 50 jig for the lock to be installed in the door and since this lock may be one which is relatively simple, having but a single cross bore and a single edge bore, or may be a complex one, having a plurality of cross bores and a plurality of edge bores, the preferred form of jig is arranged to accommodate any of these locks so that the workman can use any one or more of the portions of the jig, as required.

For this reason, the boring jig is provided with a central frame 21 conveniently of cast metal configured to define a pair of boring guides 22 and 23. These guides are circular cylindrical in interior configuration and are sym- 60 metrical about a pair of parallel axes 24 and 26 arranged horizontally in a central, vertical plane coinciding with the axis 14.

Located in the central frame 21 is a pair of support spindles 27 and 28. These are horizontal rods extending 65 with their axes 29 and 31 parallel to each other and normal to the central plane of the device. The rods extend about equal distances on opposite sides of the central plane. The support spindles are fixed in position by fastening pins 32 and 33.

70 Designed to slide transversely on the support spindles is a pair of clamp plates 36 and 37. These plates are substantially identical so that the description of one applies

equally to the other. Each of the plates includes a pair of bosses 38 and 39 arranged for sliding movement on the spindles 27 and 28. The bosses are connected by a central web 41 having reinforcing ribs 42 therein. At some distance from the bosses 38 and 39 the web 41 is expanded vertically to provide integral rings 43, 44 and 46 defining circular cylindrical, tool guide apertures 47 transversely aligned with each other. The tool guides 47 are of appropriate diameter to receive, locate and guide cutting or boring tools of the customary sort designed to produce the bores in the door panel.

In order that the clamp plates 36 and 37 can be appropriately moved approximately symmetrically on either side of the central plane and always in approximate parallelism with each other, an appropriate driving means is provided. For that reason, there is centrally journaled in the central frame 21 a screw shaft 51 mounted for rotation in the central frame and confined against axial translation by lock rings 52 and 53. The screw shaft 51 on either side of its central portion is provided with oppositely handed threads 54 and 56. These threads are respectively engaged with the threaded interior of bosses 57 and 58 incorporated in the clamp plates 36 and 37.

One end of the screw shaft has a stop washer 61 held thereon by a snap ring 62 and the other end of the screw shaft is extended and receives a handle 63 secured in position by a nut 64 so that the screw shaft can be manually rotated in either direction within the central frame. When the screw shaft is so rotated, the threads 54 and 56 of opposite hand move the clamp plates simultaneously either toward each other or away from each other in equal amounts with respect to the central plane of the device. However, the fit between the threads and on the support spindles is relatively loose so that the clamp plates need not always be exactly parallel to each other, but may swing slightly to converge or diverge, as viewed in FIGURE 2.

In order that the clamp plates may be effectively and properly clamped on the door by a sort of lever action, means are provided for limiting the approaching movement of the clamp plates.

While both of the clamp plates have bosses 66 and 67, the boss 66 is left solid in order to afford an abutment surface 68, but the boss 67 is threaded to receive a screw 69 having a thumb turn 71 at one end. The other end of the screw has a flat surface 72 designed to abut with the surface 68. A clamp ring 73 is put on the threads of the screw 69. The position of the screw 69 is variable or adjustable so that the distance between the facing surfaces of the bosses 66 and 67 can be stopped in a spaced position approximately or exactly equivalent to the door thickness. Then when the handle 63 is properly rotated, the clamp plates 36 and 37 are moved toward each other until such time as the surfaces 68 and 72 come into contact. Further turning movement of the handle then causes the guide plates slightly to pivot or cock about a vertical axis at the end of the screw 69 as a fulcrum and to shift slightly on the support spindles and on the relatively loose threads of the screw shaft 51. The slight looseness of the fit of the spindles and of the screw shaft also allows some pivoting or cocking about a horizontal axis so that any slight lack of parallelism in the door surfaces 8 and 9 is immaterial. This causes all of the rings 43, 44 and 46 substantially simultaneously to come into contact with and to be firmly squeezed against the surfaces 8 and 9 of the door. Once an appropriate setting for a particular series of doors has been fixed by the screw 69, the lock ring 73 can be set or jammed so that no further tampering with this adjustment is necessary.

The reverse rotation of the handle 63 frees the binding in the screw shaft threads and releases the boring jig by separating the clamp plates 36 and 37 from each other.

Means are provided for guiding the tool or tools that make one or both of the bores extending in from the edge of the door. For that reason, within the boring guides 22

and 23 a pair of substantially similar boring sleeves 81 and 82 are reciprocally mounted. The circular cylindrical sleeves 81 and 82 have the same axes 24 and 26 as do the boring guides 22 and 23. The sleeves 81 and 82 are at one end joined by an abutment plate 83 having linear stops 84 and 86 thereon designed to abut the central portion of the edge 7 of the door. The boring sleeves are moved simultaneously and by hand to and fro along their axes and with respect to the central frame.

The position of the boring sleeves depends upon the amount of backset. The boring sleeve 81 has a plurality of apertures 87, 88, 89 and 91 therein designed to receive a spring pin 92 slidably mounted in the central frame. The pin 92 has a projecting cone point 93 for interengagement in the various openings 87, 88, 89 and 91 and is provided with a spring 94 for urging the parts into interengagement. The spring 94 is releasably held in position by a screw sleeve 96 threaded into the central frame. The upper end of the pin 92 carries a finger button 97 so that the pin can be temporarily retracted from the openings by compression of the spring 94. When the button 97 is lifted, the boring sleeves can be moved approximately into any one of the desired positions. When the pin 92 is released, it engages into the subjacent one of the holes such as 87 and then holds the parts in accurate position with the abutment plate 83 in appropriate dimensional relationship with the cross axes 12 of the rings 43, 44 and 46. Conveniently, indicia 101, 102, 103 and 104 are marked on or cast into the interior surface of the clamp plates so that indices 105 and 106 on the abutment plate will indicate by their proximity each of the particular settings or backsets of the boring jig.

To assist in positioning the boring jig initially at the proper height, each of the clamp plates is provided with a pair of linear, elongated openings 107 and 108 there-through so that a scribe line or a pencil mark on the door at the desired height can be readily seen and will serve as an appropriate guide for the initial vertical positioning of the boring jig. Indicia, not shown, can be placed on the clamp plates to aid in selecting the proper opening 107 or 108 for a particular size or design of lock.

In the use of this structure, after a height line is provided on the door the adjusting screw 69 is set at the door thickness, the boring sleeves 81 and 82 are set at the desired backset value as indicated by the indicia 101, etc., and the boring jig is then positioned around the door panel 6. The handle 63 is then rotated to tighten the clamp plates against the sides of the door, the final movement urging the rings 43, 44 and 46 into very firm engagement with the door surfaces. Appropriate cutting tools are then guided within the selected ones of the rings 43, 44 and 46 to provide the cross bores necessary for the particular lock unit being installed. Then appropriate cutting or boring tools are traversed through one or both of the sleeves 81 and 82 also to provide the proper bores from the door edge. During these operations, the parts of the jig are close enough to the surface of the door so that splinters are not likely to result. Following this operation, the handle 63 is rotated in the reverse direction sufficiently releasing the clamp plates and the boring jig is then removed for subsequent use.

In some instances it is desired to clamp one or more of the rings 43, 44 and 46 extra tightly against the surface of the door, particularly to avoid splintering if the door is bored from one side only. As particularly shown in FIGURE 5, in this instance one set of the clamp rings such as 43 is not disturbed, but the opposite set of clamp rings such as 111 is bored out and is threaded to receive a sleeve 112. An irregular rim 113 assists in manual rotation of the sleeve 112 in and with respect to the ring 111. In this instance after the boring jig has been brought very nearly into place, the operator turns the roughened portion 113 and thus drives the advancing edge 114 of the ring into ex-

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extremely firm engagement with the door, perhaps slightly deforming the wood. Then the boring tool in traversing the door, even just one side, cannot break splinters when it emerges from the other side. It is preferred that the member 112 be of reasonably soft, plastic material so that a cutting tool engaging it, after having passed through the door, is not dulled.

What is claimed is:

1. A boring jig for door locks comprising a central frame, means included in said central frame and defining at least one boring guide arranged with its axis in a central plane, a pair of support spindles, means for mounting said support spindles in said central frame and to extend from opposite sides thereof parallel to each other and normal to said central plane, a pair of clamp plates disposed on opposite sides of said frame and slidably and loosely mounted on said support spindles leaving play therebetween, means included in each of said clamp plates and defining one or more tool guides in alignment with the corresponding tool guides of the other of said clamp plates, a screw shaft having oppositely threaded ends loosely engaging said clamp plates leaving play between said screw shaft and said clamp plates, means for mounting said screw shaft in said central frame solely for rotation therein, means for rotating said screw shaft, and means projecting from one of said clamp plates on the opposite side of said screw shaft from said tool guides and adapted to abut a portion of the other of said clamp plates on the opposite side of said screw shaft from said tool guides and serving as a fulcrum to cause said tool guides to approach each other and to take up said play when said screw shaft is tightened following said abutment.

2. A boring jig as in claim 1 and including boring sleeves reciprocally mounted in said boring guides, an abutment plate secured to said boring sleeves, and means for releasably holding said boring sleeves in any one of several reciprocated positions in said boring guides.

3. A boring jig as in claim 2 and including means on said abutment plate and at least one of said clamp plates

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for indicating the position of said boring sleeves in said boring guides.

4. A boring jig as in claim 1 in which at least one of said tool guides is provided with a sleeve mounted to move toward and away from an opposite one of said tool guides.

5. A boring jig as in claim 1 in which at least one of said tool guides has an edge adapted to project from said tool guide toward the opposite tool guide.

6. A boring jig for door locks comprising a central frame having a boring guide therein extending along a longitudinal axis, a pair of clamp plates disposed on opposite sides of said central frame, means on each of said clamp plates defining a tool guide, said tool guides being in alignment on a transverse axis, boring sleeves disposed in said boring guides and reciprocable therein in the direction of said longitudinal axis, an abutment plate engaging said guide sleeves and located between one end of said central frame and said tool guides, and means interengageable with said central frame and at least one of said guide sleeves for holding said abutment plate at any one of several distances from said end of said central frame.

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