

March 3, 1936.

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DOOR DRILL JIG

Filed Feb. 13, 1932

2 Sheets-Sheet 1

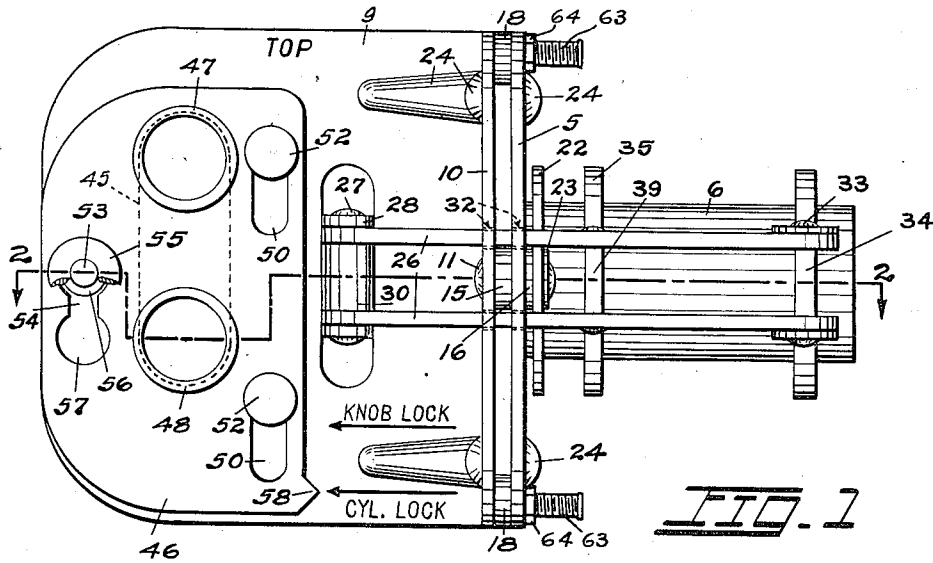


FIG. 1

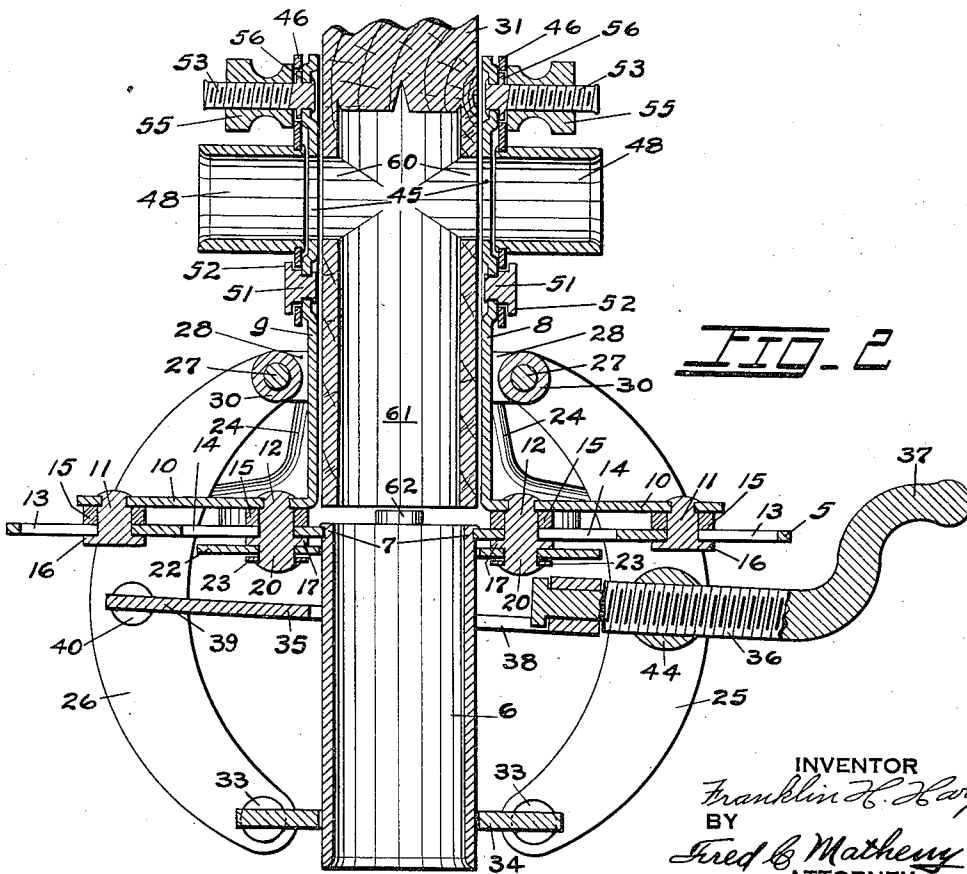


FIG. 2

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2 Sheets-Sheet 2

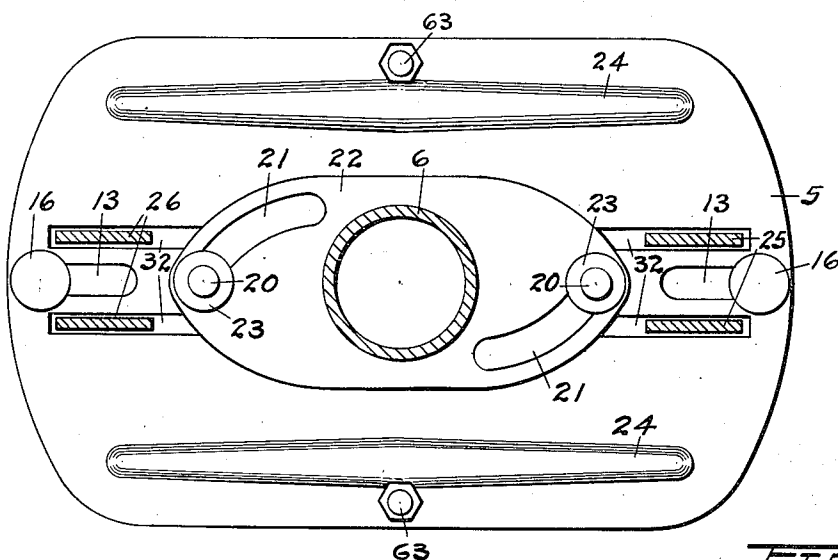


FIG. 3

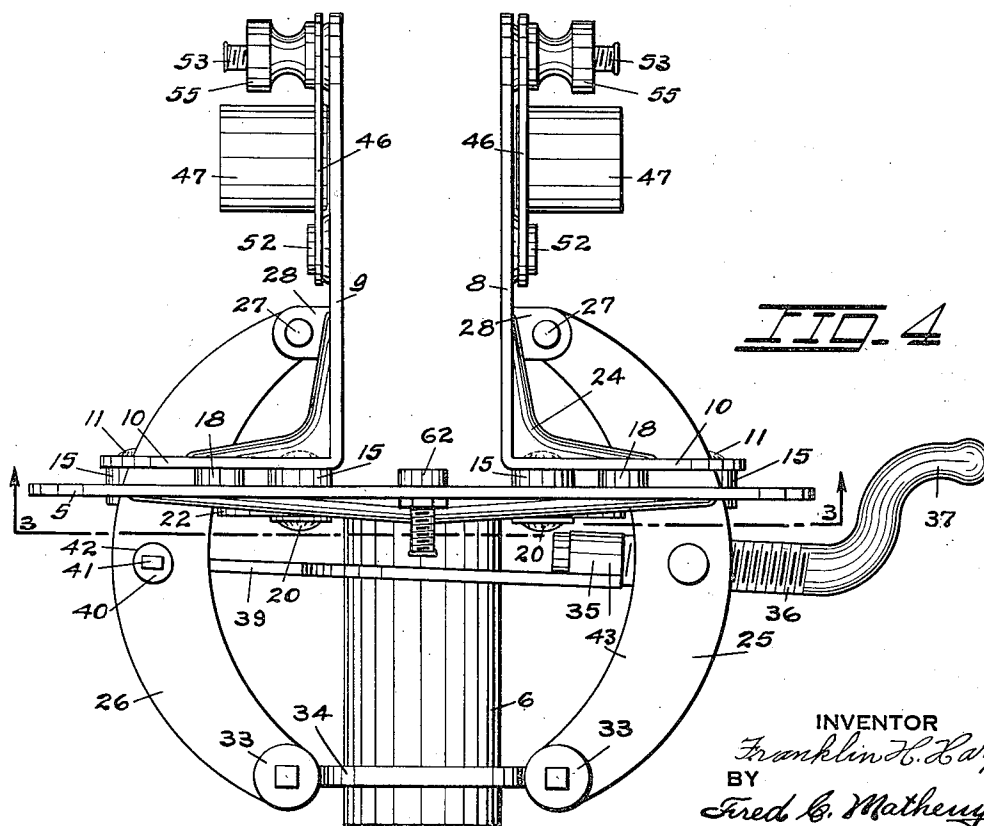


FIG. 4

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DOOR DRILL JIG

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6 Claims. (Cl. 77—62)

My invention relates to door drill jigs for use in boring holes in wooden doors in which locks are to be installed and the primary objects of my invention are to provide a door drill jig of this nature which will greatly expedite and speed up the work of lock installation and which will make possible the accurate placement and alignment of the holes thereby insuring a proper and correct installation of the lock with the result that the lock will operate more satisfactorily and efficiently and will wear longer than it would if improperly installed.

The door drill jig is especially adapted for use in connection with the installation of tubular locks and latches in which the lock or latch mechanism is contained within a tubular housing or a housing of a shape and size capable of being inserted into a cylindrical hole, as differentiated from the type of locks which require a rectangular mortise opening in the edge of the door for their reception. The so called tubular locks are quickly and easily installed by boring two intersecting holes, one in the edge of the door and the other crosswise through the door from one side to the other and then assembling the lock or latch mechanism and the operating means therefor in these two intersecting holes. In some of these installations the transverse hole is elongated by boring two transverse holes close together and removing the wood which is left between these holes. This tubular lock type of installation is much more quickly and easily made than is the type of installation which requires a mortise opening to be made in the front edge of the door but in the tubular lock type of installation it is essential that the intersecting holes be accurately positioned relative to each other and accurately and straightly bored to insure a good fit and efficient operation of the lock or latch mechanism. When these intersecting holes are bored without a jig or gauge they must first be located by hand, which takes time and labor and is liable to be inaccurately done, and they must then be bored by hand and without any mechanical means to guide the bit, which often results in the holes being inaccurately aligned and not being bored straight and true and in the correct relative positions. If the holes are inaccurately bored the lock will not assemble correctly in said holes and the several parts of the lock will not be correctly aligned thus tending to produce unsatisfactory operation and excess wear of the lock and further tending to shorten the useful life of the same.

My door drill jig saves the time and labor of marking out the holes and insures a correct rela-

tive positioning and alignment of the holes thus overcoming all of the difficulties hereinbefore pointed out.

Further objects of my invention are to provide a door drill jig of this nature which is simple, strong and durable in construction, which is not expensive to manufacture, which is reliable and efficient in operation, which has no detachable or removable parts to become displaced or lost and which is adjustable to doors of variable thickness within the limits ordinarily used in building construction.

A further object is to provide a door drill jig having two spaced apart clamping plates which are always held in substantially parallel position, together with mechanism for exerting a pressure directly against the sides of said clamping plates in such a manner that they will be forced squarely and firmly against the sides of a door.

A further object is to provide adjustable bit guide means on the said clamping plates whereby a bit may be guided for boring one or more holes in the correct position crosswise of the door to facilitate the installation of locks of different types.

Other objects are to provide means for spacing the clamping plates a short distance away from the main plate on which they are mounted to thereby prevent the wedging of wood chips therebetween; to provide means for accurately positioning the door drill jig on doors which have beveled front edges; to provide means for utilizing the reaction of the clamping pressure to support the outer end of the main bit guide when the device is in use; to provide novel and efficient means for compelling an equal and opposite movement of the clamping plates at all times; to provide efficient screw operated means for moving and for exerting a clamping pressure on said clamping plates and to construct a device of this nature in which friction and wear are reduced to a minimum.

Other and more specific objects will be apparent from the following description taken in connection with the accompanying drawings.

In the drawings, Fig. 1 is a side elevation of a door drill jig constructed in accordance with my invention.

Fig. 2 is a sectional view of the same substantially on broken line 2—2 of Fig. 1, a fragment of a door in which holes have been bored being shown.

Fig. 3 is a view partly in section and partly in elevation of the same substantially on broken line 3—3 of Fig. 4.

Fig. 4 is a plan view looking down on the top of the device.

Like reference numerals designate like parts throughout the several views.

Referring to the drawings, 5 designates a main frame plate and 6 designates a tubular bit guide fixedly mounted in the central portion of the main frame plate 5 and extending forwardly therefrom. The inner end of the bit guide 6 is preferably of reduced external diameter to form a shoulder and is secured within a suitable hole in the main frame plate 5 by riveting as indicated at 7 in Fig. 2.

8 and 9 are two clamping plates of duplicate construction which are movably connected with the main frame plate 5 and extend outwardly at substantially right angles therefrom on the side opposite to the tubular bit guide 6. The clamping plates 8 and 9 each have a base portion 10 disposed in a plane at substantially right angles to the clamping plates and substantially parallel to, but spaced a short distance from, the main plate 8. Each base portion 10 is provided with two studs 11 and 12 which are rigidly secured to the base portions, as by riveting and project through transverse slots 13 and 14 respectively in the main frame plate. The studs 11 and 12 each have spacer blocks 15 thereon which maintain the base members 10 in spaced relation from the main frame plate 5. These spacers 15 are preferably made of brass whereby they afford less frictional resistance to movement relative to the main plate 5 which is usually made of iron or steel. The studs 11 have flat heads 16 positioned on the front side of the main frame plate 5 and the studs 12 have annular flanges 17 positioned similarly to the heads 16. The heads 16 and annular flanges 17 secure the base portions 10 to the main frame plate 5 but afford enough clearance to permit free movement of the studs 11 and 12 lengthwise of the slots 13 and 14 to thereby allow the clamping plates 8 and 9 to be moved toward and away from each other. Other studs 18, positioned near the top and bottom edges of the base portions 10, Fig. 1, cooperate with the block members 15 in maintaining the spaced relation between the base members 10 and main frame plate 5. These studs 18 are also of material having a low coefficient of friction as respects the material of the surface against which they bear.

The two studs 12 have extensions 20 projecting beyond the annular flanges 17 and extending through two cam slots 21 in an equalizer plate 22 which is rotatably mounted on the tubular bit guide 6. Washers 23 are secured on the ends of the stud extensions 20, as by riveting, thereby forming heads which prevent the displacement of the stud extensions relative to the equalizer plate. The slots 21, best shown in Fig. 3, are preferably curved and extend from a point near the tubular bit guide 6 to a point at a substantial distance therefrom. The difference between the distance of the inner ends of said slots 21 and the outer ends of said slots 21 from the center of the tubular bit guide 6 is essentially enough to allow the required amount of movement of the clamping plates 8 and 9. These slots are not radial but otherwise the exact shape and positioning of the slots may be varied. The clamping plates 8 and 9 being thus interconnected with each other, it will be apparent that said two clamping plates will be compelled to move simultaneously and in opposite directions and that said two clamping plates will always be maintained at equal distances from the central axis of the tubular bit

guide 6. Obviously any tendency to move one of the clamping plates 8 or 9 will always tend to rotate the equalizer plate 22 and move the other clamping plate an equal amount in an opposite direction thus always keeping the tubular bit guide 6 centralized between the two clamping plates.

The several plates are preferably formed by stamping, and corrugations 24 are stamped, preferably in the corners of the clamping plates 8 and 9 and across the face of the main frame plate 10 to give greater strength and rigidity to said plates.

Two pairs of curved link members 25 and 26 respectively are provided for moving the respective clamping plates 8 and 9 and for exerting a pressure on said clamping plates 8 and 9. The link members 25 and 26 are connected at one end with the respective clamping plates 8 and 9 by pivots 27 which extend through outwardly punched ears 28 on said clamping plates. Spacer sleeves 30 are provided on the pivots 27 between the two links of each pair. It will be noted that the point of connection of the links 25 and 26 with the respective clamping plates is a substantial distance from the front edge of the door 31 so that the pressure of said links will be exerted squarely against the sides of the door when the plates are clamped thereon.

The links 25 and 26 extend forwardly from the pivots 27 through slots 32 in the base portions 10 and in the main frame plate 5 and are pivotally connected at their forward ends as shown at 33 with a washer plate 34 which fits closely but slidably over the outer end of the tubular bit guide 6. The washer plate 34 serves as a means for tying together the forward ends of the two pairs of links 25 and 26 and for holding said forward link ends always at the same distance apart. When the clamping plates are clamped against the sides of a door the pressures exerted by the outer ends of the links 25 and 26 on the washer plate 34 will be balanced and said washer plate will be firmly held in a fixed position and will serve as a fixed support for the outer end of the tubular bit guide 6 thus tending to support said bit guide against side stresses or bending forces which might be applied thereto by means of a bit or boring tool which is operatively disposed within said bit guide 6.

The links 25 and 26, and the clamping plates which are connected with said links, are moved toward and away from each other by means of a yoke 35 and screw 36 having a crank handle 37 formed on its outer end. The yoke 35 has an elongated slot 38 which fits over the tubular bit guide 6 and allows lengthwise movement of said yoke. The end of the yoke shown at the left in Figs. 2 and 4 has a tongue portion 39 which extends between the two links 26 and is pivotally connected with each said link 26 respectively by pivot means, preferably comprising a disc member 40 which is secured on an integral rectangular stud 41 on the tongue 39 and is positioned within a suitable circular hole 42 in the link member 26. The pivotal connection of the ends of links 25 and 26 with the washer plate 34 is similar to the pivotal connection formed by parts 39, 40 and 41, just described. The end of the yoke shown at the right in Figs. 2 and 4 is connected by a clip 43 with the reduced end portion of the screw 36. The screw 36 is threaded through a nut member 44 which is pivotally mounted between the two links 25. Due to the construction just described it will be

apparent that rotation of the screw 36 in one direction will move the links 25 and 26 apart and spread the clamping plates 8 and 9 while rotation of said screw in the opposite direction will draw the links 25 and 26 together and clamp the plates tightly against the sides of a door.

Each clamping plate 8 and 9 is provided, near the end farthest removed from the main frame plate 6 with bit guide means for guiding a smaller bit in the boring of transverse holes. These two bit guide means are duplicated and the following description is applicable to either one. Each clamping plate 8 and 9 has a vertical slot 45 near the rear end thereof. A bit guide plate 46 is adjustably mounted on the outer side of each clamping plate 8 and 9 and is provided with two outwardly projecting tubular bit guides 47 and 48 disposed one above the other and adapted to register with the slot 45. The forward edge of each bit guide plate 46 has two vertical slots 50 therein through which extend rivet studs 51. The rivet studs 51 are fixedly riveted in the clamping plates and have heads 52 allowing ample working clearance for the plates 46 but preventing removal of the same. These studs permit vertical movement of the plates 46 but prevent disc-alignment of the same. A screw stud 53 rigid in the clamping plate projects outwardly through another vertical slot 54 located near the rearmost edge of the plate 46 and has a thumb nut 55 thereon. The screw stud 53 has an enlarged base portion 56, Figs. 1 and 2, which fits into enlarged end portions 57 in the slot 54 and holds the plate 46 in either of two positions, namely at the limit of its upward or at the limit of its downward movement. This insures correct positioning of the plate 46 for either of two operative boring positions. To move the plate 46 the thumb nut 55 is loosened, the rear edge of the plate 46 is moved away from the adjacent clamping plate far enough to clear the enlarged base 56 of the screw 53 and the plate 46 is moved from one operative position to the other as may be desired. To guide the user in positioning the plate 46 an indicator point 58 is provided on said plate for registration with a suitable mark on the adjacent clamping plate as shown in Fig. 1, and the clamping plate is preferably marked to indicate the type of lock for which the plate 46 is set, as "Knob lock" and "Cyl. lock". If a knob lock is to be installed the plates 46 are moved to their uppermost positions thus bringing the lowermost bit guide 48 into alignment with the axis of the tubular bit guide 6 and allowing one transverse hole 60 to be bored exactly intersecting a hole 61 which is bored by the insertion of a larger bit through the bit guide 6, as shown in Fig. 2. For this uppermost position of the bit guide plates 46 it will be noted that it will only be possible to bore one hole due to the fact that the upper bit guide member 47 on each plate 46 will be above the top end of the adjacent slot 45 and aligned with a metal part of the adjacent clamping plate 8 or 9 thus precluding the wrong insertion of a bit and the possible marring or spoiling of a door.

When the door is to be bored for the reception of a cylinder lock the plates 46 are adjusted to the lowermost position shown in Fig. 1, thus bringing both of the tubular bit guides 47 and 48 in alignment with the adjacent slots 45 and allowing two transverse holes to be bored in correct position to define the ends of the transverse opening which is required. The wood remaining between these holes may then be quickly and eas-

ily removed leaving the desired opening. The transverse holes are each preferably bored from both sides of the door inwardly. This avoids damaging the door as may occur if the bit is allowed to break through the wood and also avoids damaging the bit.

To insure accurate positioning of this drill jig on doors which have their front edges beveled I provide two positioning lugs 62 located near the upper and lower edges respectively of the main frame plate 5 and protruding inwardly therefrom in the common plane which passes through the axis of the tubular bit guide 6 whereby said positioning lugs will always be in the medial plane of the door and will position the jig by engagement with the beveled edge of a door half way between the planes of the two sides of said door. These positioning lugs 62 are preferably adjustable so that the distance from the transverse holes to the front edge of the door, commonly called the back set, may be varied. I have shown the positioning lugs 62 rigid with the ends of screw shanks 63 which screw through the main frame plate 5 and locked in position by lock nuts 64. The ends of the screw shanks 63 are preferably expanded to prevent complete removal of the nuts 64. The ends of the screw studs 53 are preferably similarly expanded. To prevent this door drill jig from being applied to the door up side down I prefer to mark the several plates with the word "Top" as shown in Fig. 1.

In the use of this door drill jig, the clamping plates 8 and 9 are spread apart far enough to receive therebetween the edge of a door which is to be bored for the reception of a lock or latch. The device is positioned at the desired location vertically and the positioning lugs pressed against the edge of the door. The screw 36 is then turned and the clamping plates 8 and 9 clamped tightly against the sides of the door thus rigidly securing the jig to the door. Bits of suitable size are then inserted through the several tubular bit guides and the holes bored to the desired depth. The bits preferably fit the guides snugly so that they will be accurately positioned and guided by the guides. It will be noted that the tubular bit guide 6 which guides the boring of the larger hole from the front edge of the door inwardly is relatively long for purposes of greater accuracy. The bits used are preferably marked to indicate the proper depth of the several holes. The spacing of the base portions 10 from the main frame plate 5 prevents cuttings and shavings from becoming wedged between these two parts and insures smooth and easy operation of the clamping plates. Sufficient clearance and freedom of movement is provided between the plates 46 and the respective clamping plates 8 and 9 so that shavings or chips of wood may be easily removed from between these parts in the event they tend to collect therebetween.

The foregoing description and accompanying drawings clearly disclose a preferred embodiment of my invention, but it will be understood that this disclosure is merely illustrative and that such changes in the invention may be made as are fairly within the scope and spirit of the following claims.

I claim:

1. In a door drill jig of the class described, a main plate, two clamping plates mounted on said main plate for movement toward and away from each other, means for pressing said clamping plates against the sides of a door, bit guide means, two

plate members positioned on the outer sides of the respective clamping plates and supporting said bit guide means, each plate member having an upright slot therein which has a narrower medial portion and larger circular end portions, a stud screw on each clamping plate extending outwardly through the slot in the adjacent plate member, the diameter of said clamping screw being less than the narrower medial portion of said slot, and a stud portion at the base of each screw of slightly smaller diameter than the circular end portions of said slot arranged to enter said circular end portions of said slot whereby the bit guide means on each plate member may be selectively positioned and held in two different operative positions on said clamping plates.

2. In a door drill jig of the class described, a clamping plate having a slot therein, a bit guide plate secured to the outer side of said clamping plate, and adjustable over said slot into two positions, and two tubular bit guides on said bit guide plate both of said bit guides registering with said slot in one position of said bit guide plate and only one of said bit guides registering with said slot and the other of said bit guides being opposite a solid portion of said clamping plate in the other position of said bit guide plate, whereby use of one of said bit guides will be blocked for the last mentioned position of said bit guide plate.

3. In a door drill jig of the class described, a relatively flat main plate having two transverse guide slots, a tubular bit guide mounted on said main plate and extending outwardly from one side thereof, two parallel clamping plates extending outwardly from the side of said main plate opposite said bit guide, a base member on each of said clamping plates disposed substantially parallel with said main plate, guide means rigid with said base members and movable in said guide slots, equalizer means connected with said clamping plates compelling equal and opposite movement of said two clamping plates, link members pivotally connected with each of said clamping plates and extending through said main plate on opposite sides of said tubular bit guide, means pivotally supporting the forward ends of said link members and tension exerting means positioned at the front side of said main plate and interconnecting the two link means on opposite sides of said tubular guide member.

4. In a door drill jig of the class described, a relatively flat main plate having two transverse guide slots and having other slots above and below each of said guide slots, a tubular bit guide mounted on said main plate and extending outwardly from one side thereof, two parallel clamping plates extending outwardly from the side of said main plate opposite said bit guide, a slotted base member on each of said clamping plates disposed substantially parallel with said main plate, studs rigid with said base member and movable in said guide slots, equalizer means rotatably mounted on said bit guide and having two similarly shaped cams for the reception of said studs, link members pivotally connected with each of said clamping plates and extending through the slots in said base members and said main plate on opposite sides of said tubular bit

guide, means pivotally supporting the forward ends of said link members, and clamping means interconnecting said link members.

5. In a door drill jig of the class described, a relatively flat main plate having two transverse guide slots and having other slots above and below each of said guide slots, a tubular bit guide mounted on said main plate and extending outwardly from one side thereof, two parallel clamping plates extending outwardly from the side of said main plate opposite said bit guide, a base member on each of said clamping plates disposed substantially parallel with said main plate and having slots therein, guide and securing means rigid with said base members and movable in said guide slots, an equalizer rotatably mounted on said bit guide and having two similarly shaped cam slots therein for the reception of the guide means on said base members to thereby compel equal and opposite movement of said two clamping plates, link members pivotally connected with each of said clamping plates and extending through the slots in said base members and said main plate on opposite sides of said tubular bit guide, a yoke slotted to fit over said tubular bit guide and pivotally connected at one end with the link means at one side of said bit guide, screw means connecting the links at the other side of said bit guide with the other end of said yoke, a washer plate slidable on the outer end of said bit guide, the forward ends of said links being pivotally connected with said washer plate.

6. In a door drill jig of the class described, a relatively flat main plate having two transverse guide slots and having other slots above and below each of said guide slots, a tubular bit guide mounted on said main plate and extending outwardly from one side thereof, two parallel clamping plates extending outwardly from the side of said main plate opposite said bit guide, a slotted base member on each of said clamping plates disposed substantially parallel with said main plate and slightly spaced therefrom, spacer means between said main plate and said base members and securing means rigid with said base members and movable in said guide slots, an equalizer rotatably mounted on said bit guide and having two similarly shaped cam slots therein for the reception of the guide means on said base members, to thereby compel equal and opposite movement of said two clamping plates, a pair of curved link members pivotally connected with each of said clamping plates and extending through the slots in said base members and said main plate said two pairs of links being disposed on opposite sides of said tubular bit guide, a yoke slotted to fit over said tubular bit guide and pivotally connected at one end with the links at one side of said bit guide, screw means connecting the links at the other side of said bit guide with the other end of said yoke, a washer plate slidable on the outer end of said bit guide, the forward ends of said pair of curved links being pivotally connected with said washer plate and vertically adjustable bit guide means carried by said clamping plates.

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