Nov. 26, 1957 W. B. ZERN 2,814,219

WOODWORKING BORING JIG

Filed Nov. 24, 1954 2 Sheets-Sheet 1

Fig. 1

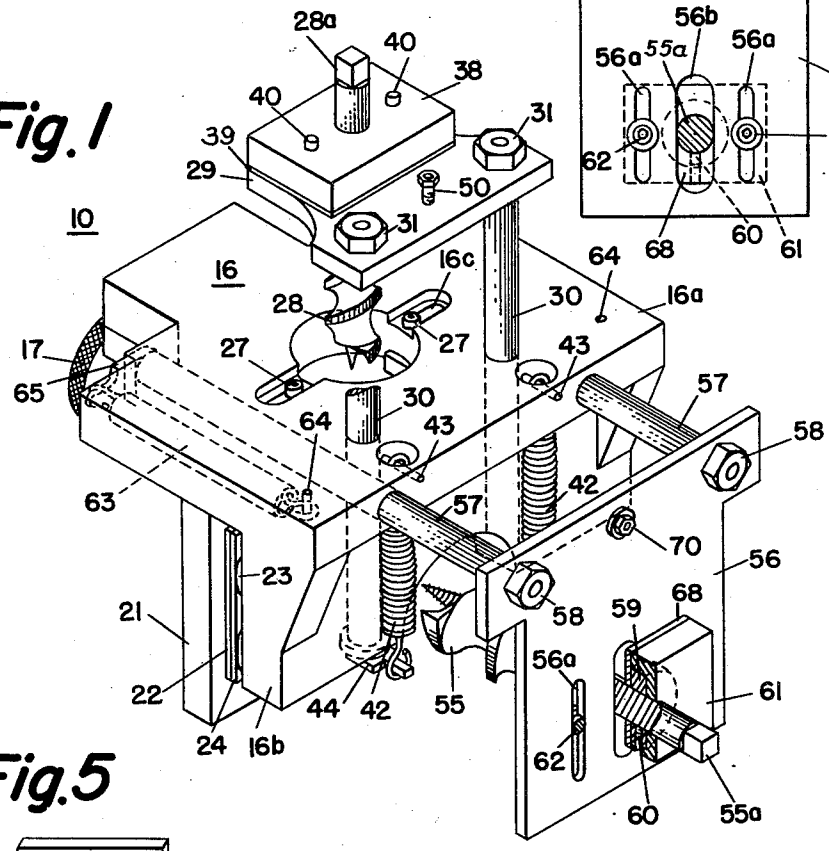

Fig. 4

Fig. 5

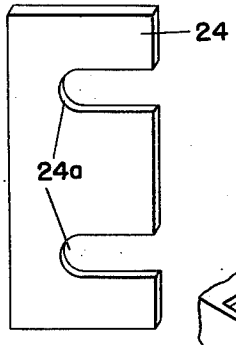

Fig. 6

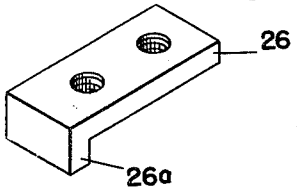

Fig. 7

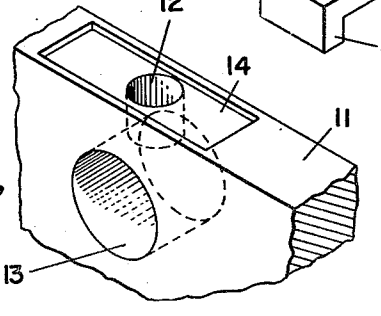

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Fig. 2

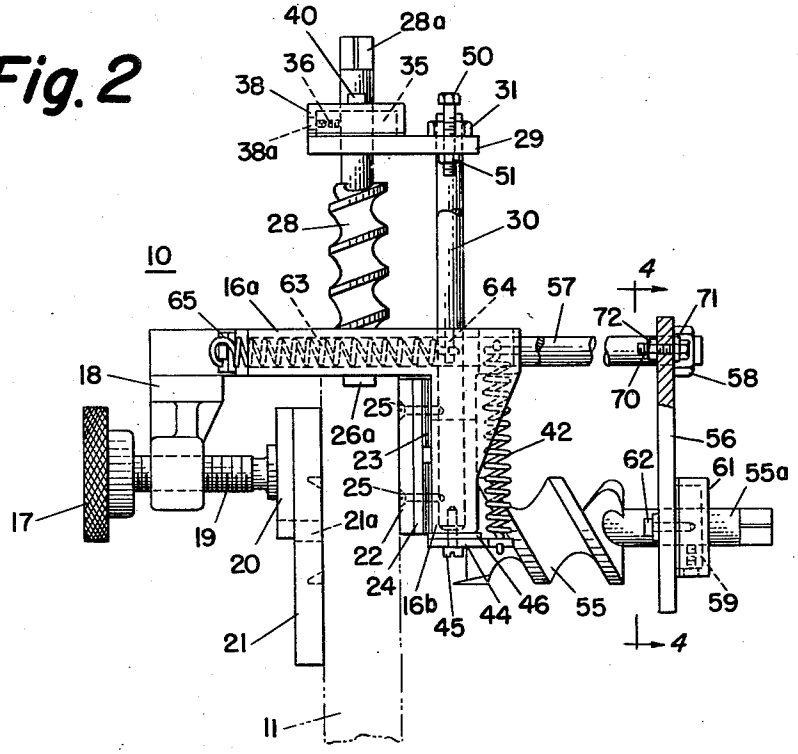
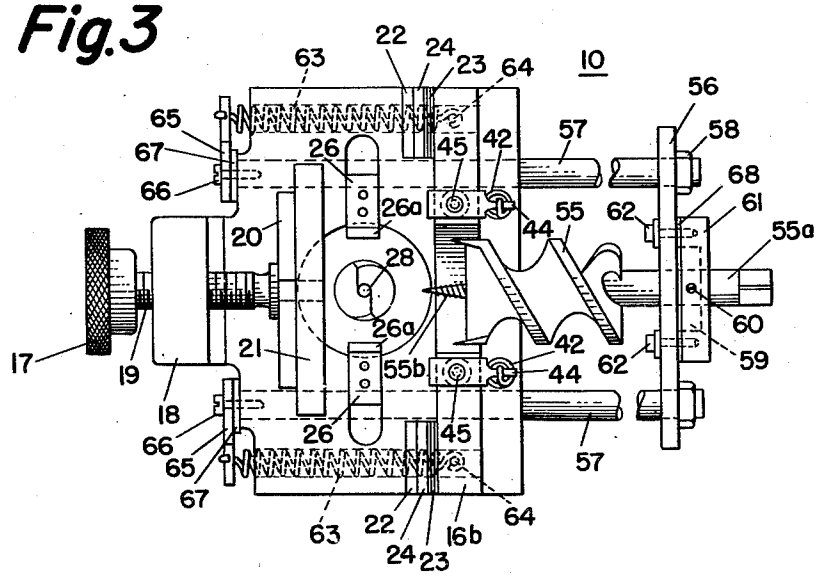


Fig. 3



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2,814,219

WOODWORKING BORING JIG

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Application November 24, 1954, Serial No. 471,021
5 Claims. (Cl. 77—62)

This invention relates to woodworking boring jigs and has for an object the provision of an improved adjustable boring jig for quickly and accurately boring the necessary holes in a door to receive the door lock and knob spindle.

More particularly, the present invention provides a readily adjustable, portable and lightweight woodworking boring jog of relatively simple construction whereby holes may be drilled in the edge of the door and adjacent face thereof at right angles to each other to receive respectively a tubular lock and associated knob spindle. The drill bits form a part of the boring jig and are adapted for automatic quick release and return to their original positions at the completion of each boring operation.

In order properly to install locks of tubular construction it is necessary that the recesses in the door be drilled at right angles to each other and that the recess in the edge of the door be properly centered. Various devices have been utilized in the past to assist workmen in drilling these holes. However, they have left much to be desired in the way of providing a woodworking apparatus that can be attached to the door and the required holes drilled, whereby the entire operation can be completed within only a few seconds. The apparatus forming the present invention, by reason of its novel construction, insures that the jig may be fitted to the door and the necessary holes drilled in the door at the correct location and at the required angular relationship even by an unskilled workman and in a minimum amount of time.

It is common practice today to provide doors in more than one standard size thickness, two of such standard sizes being 1⅜" thick doors and 1¾" thick doors. It is also common practice to use more than one size of tubular lock depending upon the particular installation. The novel construction of the present invention permits the jig to be adjusted for a change from a 1⅜" door setup to a 1¾" door setup, and vice versa, and to adjust the jig for any lock size in less than a minute. The novel jig is particularly adapted for use with an electric drill, and the complete boring operations may be completed within about fifteen seconds.

The invention in one form provides a portable boring jig for boring recesses in a door to receive a tubular lock and spindle including a body member having two sections thereof disposed at right angles to each other. The sections are adapted to be clamped in overlying relation respectively with the edge of the door and an adjacent face thereof. Each of the body sections carries a movable bearing platform, the latter being adapted to support a rotatable drill bit. The bearing platforms are guided for movement solely in directions at right angles to each other to maintain a right-angular relationship between the drill bits and the respective edge and face of the door. The bearing platforms are biased to their outermost positions with the drill bits disengaged from the door, and adjustable means are provided for limiting the inner movement of the bearing platform to control the drilling depth of the drill bits.

For a more detailed description of the invention and for further objects and advantages thereof, reference is to be had to the following description taken in conjunction with the accompanying drawings, in which:

Fig. 1 is a perspective view of one embodiment of the invention with a portion thereof illustrated in section;

Fig. 2 is an end elevation of the embodiment shown in Fig. 1 with the apparatus mounted on a door preparatory to drilling the holes therein, the door being shown in phantom;

Fig. 3 is a bottom view of the embodiment shown in Fig. 2;

Fig. 4 is a fractional view taken along the lines 4—4 in Fig. 2;

Figs. 5 and 6 are views on enlarged scale showing certain details of the invention; and

Fig. 7 is a fractional view of a door with the holes shown therein as bored by the apparatus shown in Figs. 1–3.

Referring to the drawings, there is illustrated in Figs. 1–3 a novel woodworking boring jig **10** adapted for quickly and accurately boring holes, such as holes **12** and **13**, Fig. 7, at right angles to each other in the edge and adjacent face of a door **11**. As shown in Fig. 7, the hole **12** drilled in the edge of the door **11** is adapted to receive a tubular lock, and the hole **13** drilled through the face of the door **11** is adapted to receive the spindle for the door knob. While this invention is applicable for use in connection with tubular locks in general, a specific example of a tubular lock set adapted for this type installation and available commercially is Corbin Model A 810.

It will be noted in Fig. 7 that the door **11** is provided with a recess **14** in the edge thereof, said recess **14** being adapted to receive a lock plate that normally surrounds the tubular portion of the lock. This recess **14** may be cut in the edge of the door by hand or by means of a lock jig such as described and claimed in my Patent No. 2,605,791.

The present lock-boring jig **10** comprises a body member **16** having two sections **16***a* and **16***b* disposed at right angles with respect to each other, with section **16***a* adapted to overlie the edge of the door, and section **16***b* adapted to extend along the adjacent face of the door in the manner illustrated in Fig. 2. The body member **16** preferably is cast in one piece, and section **16***a* thereof is adapted to have a clamping device **17** depend therefrom as by means of a bracket **18**. The clamping device **17** includes a threaded member **19** that extends through a threaded portion of bracket **18**. At the inner end of threaded member **19** there is a pressure plate **20** covered with a face plate **21**, the latter preferably formed from a non-metallic material such as pressed wood, plastic or the like. The clamping device **17** is adapted to press the door **11** against the spaced locating members **22** which are carried by the lower section **16***b* of body member **16**. In order to adjust the jig **10** for use on doors of different thickness, the locating member **22** may be adjusted to different positions relative to their supporting section **16***b* by inserting or withdrawing one or more of the shim washers **23** or the spacer plate **24**.

As previously described, the most common doors are supplied in 1⅜" thickness and 1¾" thickness. In order to provide for ready adjustment of the jig to either of the two thicknesses of door, the spacer plate **24** preferably is formed from 3/16" thick material, this dimension being one-half the difference between 1⅜" and 1¾", and thus by either inserting or removing the spacer plate **24**, the jig will be correctly adjusted for the selected door thickness. As shown in Fig. 5, the spacer **24** is provided with a pair of open-end slots **24***a* to permit the spacer **24** to be readily inserted or removed from its supported position between locating blocks **22** and section **16***b*. Each locating block **22** and associated spacer **24** and shim washers **23**, Fig. 3, may be secured to section **16***b* of body member **16** as by a pair of screws **25**, Fig. 2. A corresponding adjustment is made of the clamping device **17**, and thus the center line of the hole to be drilled in the edge of the door **11** will be properly centered with respect to the edge of the door.

The drill 28 is adapted to drill the hole 12 in the edge of door 11. The drill 28 is supported for movement in an axial direction by a movable bearing platform 29 which is carried by a pair of spaced rods 30 that reciprocate within a pair of openings drilled through the section 16*a* of body member 16. The bearing platform 29 is secured to the upper ends of rods 30 as by nuts 31. The drill bit 28 is provided with a cylindrical bearing 35 that is attached to the drill bit shank by means of a set screw 36. The bearing 35 is adapted to rotate within a cavity in bearing housing 38, the latter being secured to the platform 29 as by screws 40. It will be noted in Fig. 2 that there is an opening 38*a* provided in the edge of bearing housing 38 adapted for alignment with the set screw 36. The set screw 36 is slightly shorter than the depth of the threaded opening in the bearing member 35 so that the set screw 36 will not interfere with rotation of bearing 35 and the drill bit 28. The opening 38*a* permits the set screw 36 to be adjusted on the shank of the drill bit 28 without removing the screws 40 from the bearing retainer 38. By reason of this novel construction of the bearing and bearing retainer, it will be noted that different drill bits having the same size shank may be quickly inserted and removed with a minimum amount of adjustment. Thus, a change from one size of drill bit to another to drill different sizes of holes for corresponding sizes of tubular locks may be accomplished with a minimum amount of delay.

The bearing platform 29 is biased to its outermost position, as illustrated in Figs. 1 and 2, by means of a pair of springs 42. The springs 42 have been illustrated in the form of tension springs with one end thereof being secured to the body member 16 as by pins 43, and the other end of the springs 42 being connected to the lower ends of rods 30 by means of bracket members 44. The bracket members 44 preferably are secured to rods 30 by means of screws 45, and the bracket members 44 are spaced from the body member 16 by means of shock washers 46 which preferably are formed of rubber, leather or other suitable shock absorbing material. The springs 42 normally hold the drill bit 28 above the edge of door 11, and when the drill bit 28 engages the door 11 the springs 42 are elongated with increasing penetration of drill bit 28.

To limit the depth of penetration of drill bit 28, the platform 29 is provided with adjustable stop means 50, Fig. 1, that is adapted to engage the upper surface of body member 16 and thus prevent further downward or inner movement of bearing platform 29 and the drill bit 28 carried thereby. When the adjustable stop 50 engages the body member 16 further rotation of the drill bit 28 breaks it from the bottom of hole 12 in door 11 and the drill bit 28 will be withdrawn from hole 12 out of engagement with door 11 by the automatic action of springs 42. The shock washers 46 act as shock absorbers upon return of the bearing platform 29 to its original outermost position.

The adjustable stop 50 has been illustrated as a threaded bolt extending through a tapped hole in platform 29. To lock the bolt in place after it has been properly adjusted there is provided a lock nut 51, Fig. 2.

The drill bit 28 may be of any of the standard commercial forms with the shank end 28*a* thereof being adapted to receive either a hand-operated drill or an electric drill. For maximum efficiency, it is preferable to use an electric drill with the chuck thereof provided with a socket type adapter that will slidably receive shank end 28*a* of the drill bit 28 and cause the latter to rotate without slipping. By using an electric drill and socket type adapter, the holes may be drilled into the door in about fifteen seconds and a door can be prepared and drilled and ready for the lock in about 30 seconds. This unit time requirement is much smaller than for any equipment of the prior art and thus permits a substantial saving in labor costs.

It will be noted that the guide rods 30 extend all the way through section 16*b* of body 16. By reason of this construction, and since the openings into which rods 30 extend are of only slightly larger diameter than the rods 30, it is assured that the bearing platform 29 and associated drill bit 28 will be properly supported during the complete boring operation and will move solely in a direction at right angles to section 16*a* of body 16 and a second drill bit 55, as now to be described.

The drill bit 55 is adapted to bore the hole 13 through the face of door 11 and at right angles to hole 12, Fig. 7. The drill bit 55, Figs. 1–3, is rotatably carried by a bearing platform 56 which, in turn, is carried by a pair of rods 57 inserted in a corresponding pair of openings extending through section 16*a* of body member 16. The bearing platform 56 is secured to the outer ends of rods 57 by means of screws 58. The drill bit 55 is provided with a removable cylindrical bearing 59 adapted to be secured to the shank of drill bit 55 by means of a set screw 60. The bearing 59 is located within a chamber in the bearing housing 61 which is adjustably secured to bearing platform 56 by means of a pair of screws 62. As may be seen in Fig. 4, the bearing platform 56 is provided with a pair of slots 56*a* for receiving the screws 62 and a third slot 56*b* through which the shank of drill bit 55 extends. The slots 56*a* and 56*b* permit the drill bit and its associated bearing housing 61 to be adjusted vertically as illustrated in Figs. 1, 2 and 4, this adjustment being desirable in order to adapt the lock-boring jig 10 for use in connection with different size locks. On locks of different sizes the knob spindle is located a different distance from the edge of the door, and thus by raising or lowering the position of drill bit 55, the latter may be adjusted to the desired location for drilling the hole 13, Fig. 7, for the knob spindle while maintaining the axial location of the right angular relationship between the drill bits.

The bearing platform 56 and associated drill bit 55 are biased to their outermost position as shown in Figs. 2 and 3 by means of tension springs 63. One end of each of the springs 63 is pinned to body member 16 by means of pins 64, and the opposite ends of the springs 63 are carried by brackets 65 which, in turn, are secured to the inner ends of rods 57 as by screws 66. Shock washers 67 are provided for rods 57 in manner similar to shock washers 46 described above.

It will be noted that the construction of the bearing platform 56 and its associated parts are very similar to bearing platform 29 and its associated parts as described above. The principal difference in the constructions illustrated is the adjustable slot arrangement provided on bearing platform 56. This arrangement, while it may be provided on bearing platform 29 by way of modification, is not required on bearing platform 29 since the necessary adjustment for doors of different thickness is provided in the preferred embodiment illustrated by means of the removable shims 23 and spacer 24, as previously described.

In order to keep dirt and other foreign matter from coming into contact with bearing 59 by way of slot 56*b*, a thin plate 68 is inserted between bearing platform 56 and the bearing retainer 61 with the openings through plates 68 being only large enough to receive the shank 55*a* of drill bit 55 and the threaded ends of screws 62, Fig. 4. A similar plate 39 may be provided under bearing retainer 38.

In manner previously described, the shank end 55*a* of drill bit 55 may have attached thereto either a hand drill or an electric drill for performing the boring operation. As the drill bit 55 penetrates the door 11 the spring 63 will be elongated until the adjustable stop 70 carried by platform 56 engages the body member 16, Figs. 1 and 2. Since it is necessary that drill bit 55 bore entirely through the door 11, the pressure plate 20 of clamping device 17 is provided with a face plate 21 of pressed wood or other suitable material that will not damage the tip 55*b*

of drill bit 55. The stop 70 controls the drilling depth of drill bit 55 in manner similar to the stop 50 described above in connection with drill bit 28. When a change is made in the thickness of the doors being operated on, such as a change from 1⅜" doors to 1¾" doors, it is necessary to change the drilling depth of drill bit 55. As previously described, when such change is made, the spacer 24 which is 3/16" thick is removed from its location between member 22 and section 16*a* of body member 16. In order to simplify the adjustment of drill bit 55, there may be provided a spacer member also of 3/16" thickness, on the adjustable stop member 70. Thus, by loosening lock nut 72 and turning member 70 until there is room between the washer 71 and platform 56 to receive a 3/16" spacer, the drill bit 55 will be correctly adjusted for drilling the hole 13 through the door 11 when the latter has a thickness of 1¾" instead of 1⅜". By inserting the 3/16" thick spacer between the head of member 70 and the outside surface of platform 56 the drill bit 55 is permitted to move 3/16" further toward face plate 21. This permits the drill bit 55 to pass all the way through the door, since the door is always centered with respect to the vertical drill bit 28 when the lock-boring jig is first assembled onto the edge of the door. The point 55*b* of drill bit 55 is adapted to be received in the recess 21*a* of face plate 21.

While it is believed that the operation of the boring jig 10 is clear from the foregoing description, the operation thereof will now be briefly summarized. The boring jig 10 is placed on the edge of the door 11 and is moved lengthwise thereof until the locating blocks 26, Fig. 6, engage the lock plate recess 14, Fig. 7. The locating blocks 26 are provided with a projection 26*a* that is adapted to engage the opposite ends of the lock plate recess 14. The locating blocks 26 are carried by the body member 16 and are secured thereto by means of screws 27, Fig. 1, that are adapted to extend through slots 16*c* in the body member 16.

After the locating blocks 26 have been adjusted with respect to the lock plate recess 14, the clamping member 17 is tightened, thus locking boring jig 10 onto the edge of the door 11 in its proper position preparatory to drilling the hole 12 for the tubular lock and the hole 13 for the lock spindle. With the boring jig 10 now in its proper position on the door 11, all that is necessary is to apply the electric drill or equivalent to the shank ends of the drill bits 28 and 55 to drill first one hole and then the other. It has been found that this drilling operation can be completely performed within a matter of about fifteen seconds. By reason of the relatively long supports for the guide rods 30 and 57 and by reason of the novel bearing construction for the drill bits 28 and 55, the boring jig 10 permits holes 12 and 13 to be bored accurately at right angles to each other and in a minimum amount of time without regard to the skill of the operator.

While the invention has been described in connection with doors that have previously been provided with lock plate seats, such as recess 14, Fig. 7, it is to be understood that this invention is equally applicable for use on doors that have not first been provided with lock plate recesses. To adapt the boring jig 10 for use on doors of the latter type, the locating blocks 26 may be turned over so that the projections 26*a* extend upwardly toward the section 16*a* of body member 16 and do not extend therebelow. Thus the locating blocks 26 merely rest upon the edge of the door 11 and do not extend into the edge of the door.

While there has been described a preferred embodiment of the invention, it will be understood that further modifications may be made without departing from the spirit and scope of the invention as set forth in the appended claims.

What is claimed is:

1. A portable woodworking jig for boring recesses in a door or the like comprising a body member, clamping means for clamping said body member in overlying relation with the edge of a door and an adjacent face thereof, a movable bearing platform carried by said body member and supporting a rotatable drill bit for movement in an axial direction with said supporting bearing platform, adjustable means carried by said body member and cooperating with said clamping means to center the edge surface of the door with the axis of said drill bit, means for guiding said bearing platform for movement solely in direction at substantially right angles to the edge of the door, means for biasing said bearing platform to its outermost position with said drill bit disengaged from said door, and adjustable means for limiting the inner movement of said bearing platform to control the drilling depth of said drill bit.

2. A portable woodworking jig for boring recesses in a door to receive a tubular lock and spindle comprising a body member, clamping means for clamping said body member in overlying relation with the edge of a door and an adjacent face thereof, a pair of movable bearing platforms carried by said body member, bearing means carried by each of said platforms and each supporting a rotatable drill bit for movement in an axial direction with its respective supporting bearing platform, means for guiding said bearing platforms for movement solely in directions at right angles to each other to maintain right angular relationship between the drill bits and the respective edge and face of the door, means for biasing said bearing platforms to their outermost position with said drill bits disengaged from said door, and adjustable means for limiting the inner movement of said bearing platforms to control the drilling depth of said drill bits.

3. A portable woodworking jig according to claim 2 wherein said bearing means includes a bearing member removably secured to the shank of the drill bit whereby different drill bits may be substituted.

4. A portable woodworking jig according to claim 2 including means for changing the axial location of at least one of said drill bits while maintaining said right angular relationship between said drill bits.

5. A portable boring jig for boring recesses in a door to receive a tubular lock and spindle comprising a body member having two sections thereof disposed at right angles to each other, clamping means for clamping said sections in overlying relation respectively with the edge of a door and an adjacent face thereof, a pair of movable bearing platforms, one of said bearing platforms being carried by each of said sections, bearing means carried by each of said platforms and adapted to support a rotatable bit for movement in an axial direction with its respective supporting bearing platform, said bearing means for each drill bit comprising a cylindrical bearing having an opening extending axially therethrough to receive the shank of the drill bit, a housing for said bearing, means for securing said housing to its respective movable platform, adjustable means for removably securing said cylindrical bearing to the shank of the drill bit whereby different drill bits may be substituted, means for guiding said bearing platforms for movement solely in directions at right angles to each other to maintain right angular relationship between the drill bits and the respective edge and face of the door, means for biasing said bearing platforms to their outermost positions with said drill bits disengaged from said door, and adjustable means for limiting the inner movement of said bearing platforms to control the drilling depth of said drill bits.

References Cited in the file of this patent

UNITED STATES PATENTS

310,710	Nichols	Jan. 13, 1885
891,606	Doldt et al.	June 23, 1908
1,919,900	Moller	July 25, 1933
2,426,124	Skwierawski	Aug. 19, 1947