Oct. 12, 1948. N. M. MARSILIUS 2,451,035

JIG

Filed Sept. 20, 1945 2 Sheets-Sheet 1

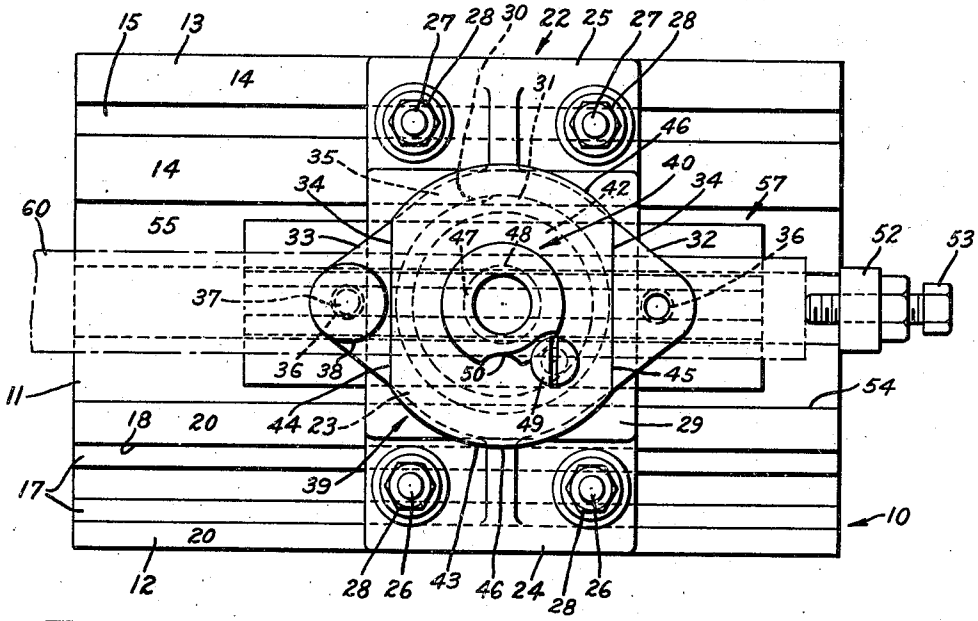


Fig. 1

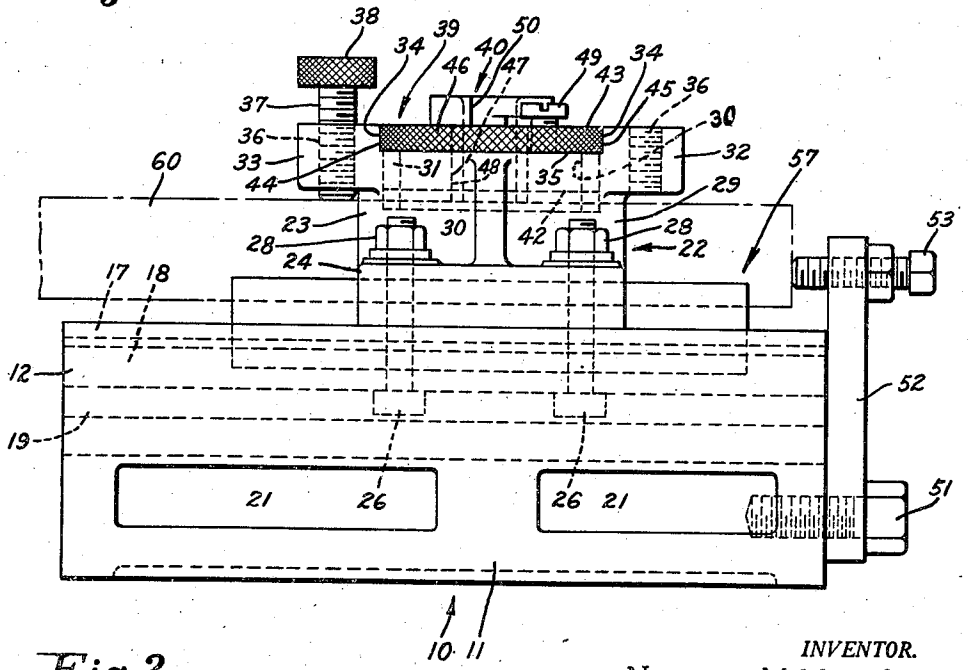


Fig. 2

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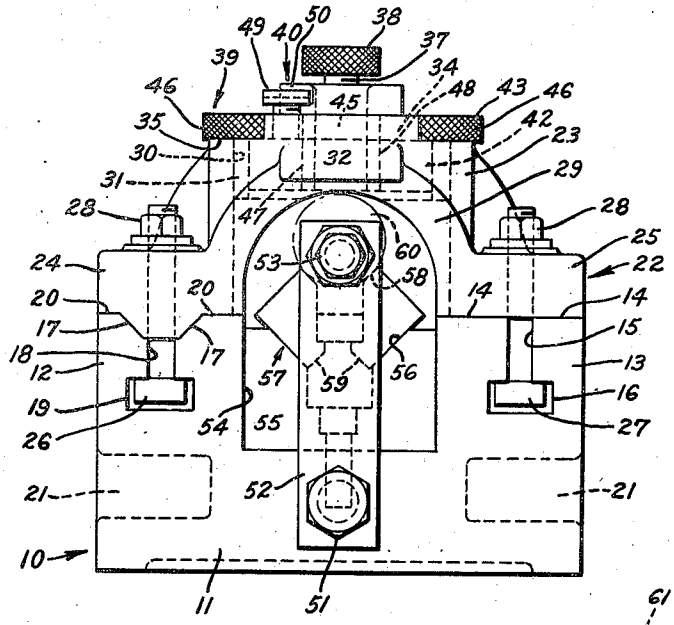


Fig. 3

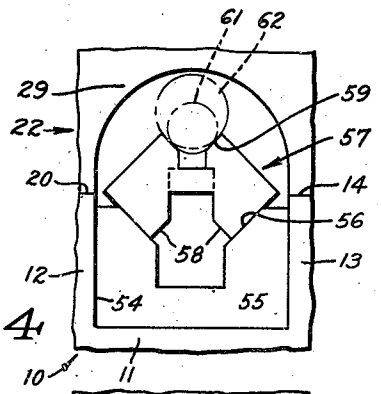


Fig. 4

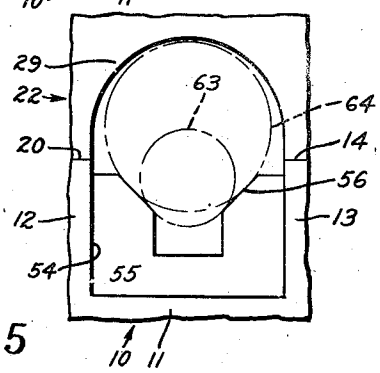


Fig. 5

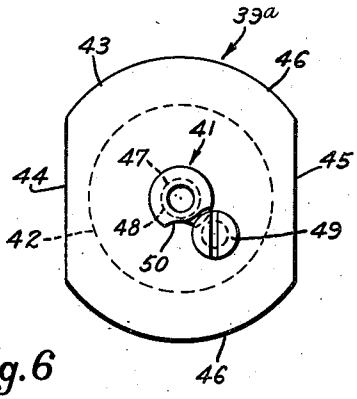


Fig. 6

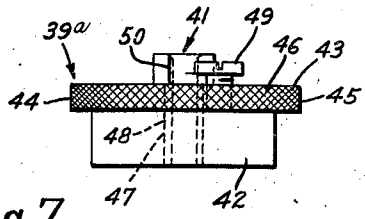


Fig. 7

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JIG

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7 Claims. (Cl. 77—62)

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This invention relates to new and useful improvements in jigs and has particular relation to a jig for use when drilling and reaming holes in round stock.

The objects and advantages of the invention will become apparent from a consideration of the following detailed description taken in connection with the accompanying drawings wherein a satisfactory embodiment of the invention is shown. However, it is to be understood that the invention is not limited to the details disclosed but includes all such variations and modifications as fall within the spirit of the invention and the scope of the appended claims.

In the drawings:

Fig. 1 is a top plan view of the jig of the invention;

Fig. 2 is a side elevational view thereof;

Fig. 3 is an end elevational view thereof;

Fig. 4 is a detailed elevational view showing the removable V-block of the jig in a reverse position as compared with Fig. 3;

Fig. 5 is a similar view but with the removable V-block omitted;

Fig. 6 is a top plan view of the slip bushing employed; and

Fig. 7 is a side elevational view of such bushing.

Referring in detail to the drawings the jig of the invention is shown as comprising a base generally designated 10 including a support engaging portion 11 and side walls of portions 12 and 13. These walls or portions 12 and 13 are relatively heavy and together with the support engaging portion 11 comprise the base which is substantially U-shaped in end elevation as shown in Fig. 3. The upper surface 14 of wall 13 is flat but is provided with an elongated slot 15 comprising the stem portion of a T-slot, the head portion of which is designated 16.

Extending longitudinally of the upper edge of wall 12 is a V-way 17 through the bottom of which enters the stem portion 18 of a T-slot, the head of which is designated 19. At each side of V-way 17 the upper surface of wall 12 provides a flat surface 20. Base 10 may, through its side edges, be cored out as at 21 for the reception of clamping bolts or the like by means of which the base may be secured on a support.

Mounted on the base for adjustment longitudinally therealong is a saddle-like member or device generally designated 22 including a body portion 23 and foot-like portions 24 and 25 disposed on the walls 12 and 13 respectively of the base 10. T-bolts 26 and 27 operating in the T-slots of the

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respective walls of the base pass through the respective foot portions 24 and 25 of the saddle-like device. At their upper ends such bolts are provided with nuts 28 adapted to be loosened to permit of adjustment of the saddle on the base and to be tightened to secure the saddle in adjusted position.

As the lower surface of foot portion 24 includes a V-shaped rib entering the V-groove 17 the saddle-like device is guided in its movements over the base and is always properly centered when clamped in position. Also, the engaging surfaces of the walls 12 and 13 and the foot portions 24 and 25 provide for tight clamping of the device 22 in adjusted position.

Body 23 of the saddle includes an arched or curved portion 29 as well as a cylindrical portion having an opening 30 therethrough and which is shown as containing or mounting a short sleeve or ring-like filler 31. At a pair of opposite edges the body 23 includes lugs 32 and 33 respectively, which lugs have flat oppositely facing edges or surfaces 34 parallel with the axis of the opening 30. The lugs 32 and 33 extend somewhat above the remainder of the upper surface 35 of the body 23 as probably best shown in Fig. 2. Each of the lugs 32 and 33 is provided with a tapped opening 36 for the reception of a clamping screw 37, the head 38 of which may be knurled as shown.

Body 23 is adapted to receive any one of a series of master slip bushings, the outer diameters of which are equal but which have varying diameters of openings to receive various sizes of standard slip renewable bushings. For example, a master slip bushing generally designated 39 in the drawings is adapted to receive a standard slip renewable bushing 40 (Figs. 1, 2 and 3) while a master slip bushing 39a is adapted to receive a smaller size of standard slip renewable bushing 41 (Figs. 6 and 7).

According to the invention the body 23 is adapted to selectively receive or mount a series of these master slip bushings and the same are designed to receive and mount various sizes of standard slip renewable bushings. For example, a master slip bushing may be provided to mount standard slip renewable bushings numbered from 105 through 108. Another master slip bushing may be adapted to receive standard slip renewable bushings numbered from 109 through 112 while another master slip bushing will be adapted to mount standard slip renewable bushings numbered 113 to 116 inclusive, etc.

The master slip bushings each comprise a cylindrical body 42 adapted to be received within

the sleeves 31, when the latter is used, and a head 43. Such head will have flat sides or edges 44 and 45 to engage with the flat edges 34 of the lugs 32 and 33 of body 23 and the bushing heads may be knurled on their other edges as at 46. Centrally through the head of each master slip bushing is an opening 47 of a given diameter and which diameter is the same as that of the outside diameter of the tubular portion 48 of a known range of standard slip renewable bushings.

In addition to the above, the head 43 of each master slip bushing will be provided with a standard screw 49 normally provided for securing a standard slip renewable bushing in place. The standard slip renewable bushings have arcuate notches 50 in the edges of their head or flange portions and when the screws 49 are loosened and the standard slip renewable bushings turned to dispose such notches in registry with the screw heads the standard slip renewable bushings may be lifted out. Thereafter a new standard slip bushing is placed in the master slip bushing and turned to carry its notches 50 away from the head of screw 49 and thereafter the screw is tightened to hold the standard slip bushing in place. This matter of the standard slip bushings per se is not part of the present invention since they represent standard construction.

A machine screw or bolt 51 is used to hold a finger or plate 52 in place at one end of the base 10. This finger or plate extends upward substantially midway between the walls 12 and 13 of base 10. Threaded through the upper end of the finger 52 is a stop bolt 53 adapted to be adjusted as will more fully appear.

Within an elongated way 54 formed between the base walls 12 and 13 is located an elongated V-block 55 having a V-groove 56 opening through its upper side. As shown in Figs. 1–4 this block 55 mounts a block 57 generally square in transverse section but having a V-groove 58 of one size opening through one corner and having a V-groove 59 of smaller size opening through the diametrically opposite corner.

When using the jig of the invention the block 57 is used or removed from the jig depending on the size of the work to be drilled, reamed or the like. Additionally, where the block 57 is used it will be positioned as in Fig. 3 when the range of work is of one diameter and in a reverse position as shown in Fig. 4 when the range of work is of smaller diameter. For work of a greater diameter the block 57 is removed and the work is mounted in the V-slot 56 of the block 55 as in Fig. 5.

Assuming the work to be of the diameter of bar 60, block 57 is mounted on the block 55 with the V-way 58 disposed upwardly and the bar 60 is partly received in such V-way and is centered therein. The arm 52 may be in place and the screw 53 adjusted so that the work 60 is moved forwardly through the groove 58 until its leading end engages the inner end of screw 53.

This screw is set in position when a series of bars or work pieces are to be drilled, reamed, or the like, at a given point from their forward ends. Screw or screws 37 may now be tightened down against the work. At this time it is assumed that the device 22 is in the desired position of adjustment along the base 10.

Now a master slip bushing 39 of the proper size is mounted in the body 23 of the device 22 with the flat edges 44 and 45 of the bushing head against the flat edges 34 of the lugs or extensions 32 and 33 of body 23. In this way the master slip bushing is correctly positioned and it is also positioned by engagement of its head portion with the upper surface 35 of the body.

A standard slip renewable bushing 40 of the proper size is mounted on or by the master slip bushing 39 and is held in place by the small screw 49. It will be understood that at this time the entire jig is mounted on the bed of a drill press, or the like, and now the work 60 being properly positioned is drilled, reamed, or the like. Since opening 30 is centered with way 54 it is centered with the groove of the work receiving V-block. The bushings are concentric. Therefore, the drill, reaming tool or the like will be properly guided and the work properly located.

The V-groove 58 of block 57 will serve to mount the work within certain limits of diameter and when the work is of a smaller diameter said block is reversed and its groove 59 is adapted to receive work varying in diameter from that of part 61 to that of part 62 as shown in Fig. 4. Where the work is of larger diameter the block 57 is entirely removed from the jig. Block 55 is adapted to receive work varying in diameter from that of bar 63 to that of bar 64 as shown in Fig. 5.

The stop device 52 and screw 53 may be swung to an out of the way position on loosening of the screw 51 or the structure may be entirely removed from the base. Also, on loosening of the nuts 28 the entire saddle-like device 22 may be adjusted longitudinally of the base and thereafter such nuts are tightened to secure the parts in adjusted position. The master slip bushings 39 cannot be improperly mounted on the body 23 and any one of such bushings may be readily removed and a bushing of different size used to replace it.

Also, standard slip renewable bushing 40 may be replaced by other sizes and within certain limits such replacement or exchanges may be accomplished without the necessity of changing the master slip bushing already mounted in the body 23 of the saddle device 22. While a screw 37 may be mounted in each of the tapped openings 36 it will be understood that one work clamp screw may be omitted where such is desired. These clamp screws serve to hold the work firmly in the V-block (either 55 or 57) and the V-groove centers the work with respect to the standard slip bushings or guides 40, 41, etc.

Having thus set forth the nature of my invention, what I claim is:

1. In a jig of the character described, a base including a support engaging portion and a pair of spaced upstanding walls defining a way, a V-block in said way, a saddle-like device including a portion spanning said way and a pair of foot portions disposed on the upper edges of said walls, means for securing said foot portions to said walls and to thus secure said saddle-like device in adjusted position on said base, means on said saddle-like device and adjustable to clamp work against said V-block, said saddle-like device having an opening therethrough in alignment with the groove of said V-block, a master slip bushing adapted to be removably and concentrically received in said opening, and said master slip bushing including a head having an opening therethrough for the reception of a standard slip renewable bushing.

2. In a jig of the character described, a base including a pair of spaced upstanding walls defining a way between them, a V-block in said way, a saddle-like device including a portion spanning said way and a pair of portions disposed on the

upper edges of said walls, means for securing said portions to said walls and thus to secure said saddle-like device in adjusted position on said base, a screw carried by said saddle-like device and threadable therethrough to clamp work against said V-block, said saddle-like device having an opening therethrough in alignment with the groove of said V-block, a master slip bushing adapted to be removably and concentrically received in said opening, and said master slip bushing including a head having an opening therethrough for the reception of a standard slip renewable bushing.

3. In a jig of the character described, a base including a support engaging portion and a pair of spaced upstanding walls defining opposite sides of a way, a V-block in said way, a saddle-like device including a body spanning said way and a pair of foot portions disposed on the upper edges of said walls, one of said walls having a V-groove in its upper edge, one of said foot portions having a V-rib entering said V-groove for guiding and locating of the saddle-like device on said walls, means for securing said foot portions to said walls and thus to secure said saddle-like device in adjusted position on said base, means on said saddle-like device and adjustable to clamp work against said V-block, said body having an opening therethrough in alignment with the groove of said V-block, a master slip bushing adapted to be removably and concentrically received in said opening, and said master slip bushing including a head having an opening therethrough for the reception of a standard slip renewable bushing.

4. In a jig of the character described, a base including a support engaging portion and a pair of spaced upstanding walls defining opposite sides of a way, a V-block in said way, a saddle-like device including a body spanning said way and a pair of foot portions disposed on the upper edges of said walls, one of said walls having a V-groove in its upper edge, one of said foot portions having a V-rib entering said V-groove for guiding and locating of the saddle-like device on said walls, T-slots opening through the upper edges of each of said walls, T-bolts in said slots and passing through said foot portions, nuts on said T-bolts for tightening said foot portions against said walls to secure said saddle-like device in adjusted position on said base, means on said saddle-like device and adjustable to clamp work against said V-block, said body having an opening therethrough in alignment with the groove of said V-block, a master slip bushing adapted to be removably and concentrically received in said opening, and said master slip bushing including a head having an opening therethrough for the reception of a standard slip renewable bushing.

5. In a jig of the character described, a base including a support engaging portion and a pair of spaced upstanding walls defining opposite sides of a way, a V-block in said way, a saddle-like device including a body spanning said way and a pair of foot portions disposed on the upper edges of said walls, one of said walls having a V-groove in its upper edge, one of said foot portions having a V-rib entering said V-groove for guiding and locating of the saddle-like device on said walls, T-slots opening through the upper edges of each of said walls, T-bolts in said slots and passing through said foot portions, nuts on said T-bolts for tightening said foot portions against said

walls to secure said saddle-like device in adjusted position on said base, a screw carried by said saddle-like device and adjustable therethrough to engage and clamp work against said V-block, said body having an opening therethrough in alignment with the groove of said V-block, a master slip bushing adapted to be removably and concentrically received in said opening, and said master slip bushing including a head having an opening therethrough for the reception of a standard slip renewable bushing.

6. In a jig of the character described, a base having a way therein, a V-block in said way, a saddle-like device on said base and including a body spanning said way, said body of said saddle-like device having an opening therethrough for the mounting of a drill bushing, a second block having conjugate V-surfaces adapted to be selectively and removably received in the V-groove of said V-block, a V-groove of one size in one of said conjugate V-surfaces, a V-groove of another size in the other of said conjugate surfaces, said V-grooves of said second block located along a transverse axis common to said conjugate V-surfaces, and said V-grooves and said conjugate V-surfaces located parallel to each other in direction longitudinally of said second block.

7. In a jig of the character described, a base including a support engaging portion and a pair of spaced upstanding parallel walls defining an elongated way, a V-block in and movable in said way in directions longitiudinally thereof, a saddle-like device including a body spanning said way and having a bushing receiving opening therethrough in alignment with the longitudinal center of the groove of said V-block, a pair of foot portions located one on each side of the body of said saddle-like device and disposed on the upper edges of said walls, a V-groove in the upper edge of one of said walls and extending longitudinally thereof in parallel relation to the groove of said V-block, a V-rib on one of said foot portions and located in said V-groove in the upper edge of said wall, securing means for clamping said foot portions against the upper edges of said walls whereby on tightening of said means said V-groove in the upper edge of one wall and said V-rib coact to center said saddle-like device on said base with said bushing receiving opening in accurate alignment with the longitudinal center of the groove of said V-block at any selected position along said wall.

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