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2,934,829

POSITIONING LOCATOR

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FIG. 1.

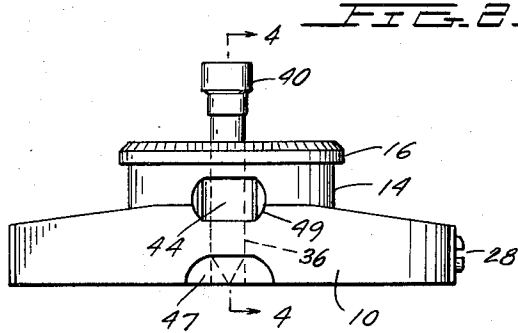
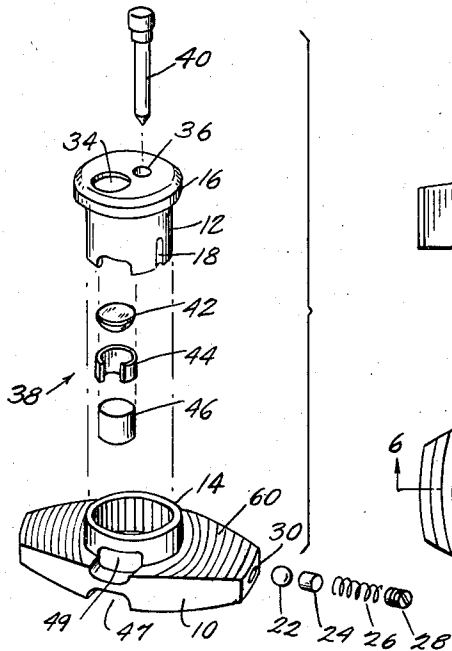


FIG. 3.

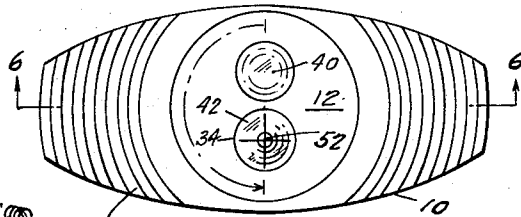


FIG. 4.

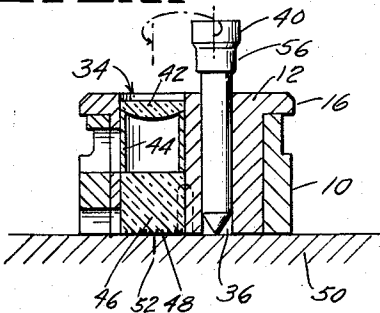


FIG. 5.

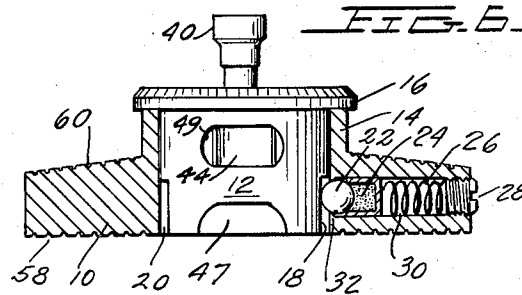


FIG. 6.

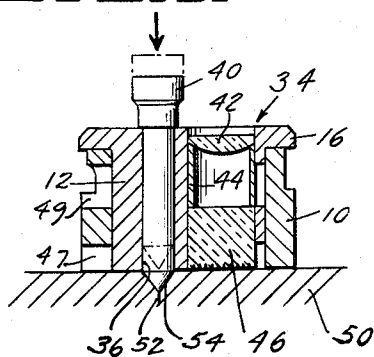
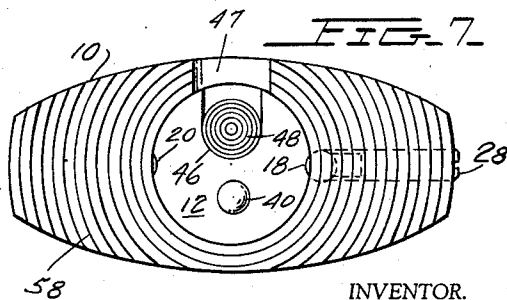


FIG. 7.



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2,934,829

POSITIONING LOCATOR

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6 Claims. (Cl. 33—189)

My invention relates to a novel structure for automatically positioning a punch member in a precisely located position.

It is very often necessary that a punch member be accurately positioned to make an indentation in a piece of material which is to be mechanically worked, as by a drill. In the past, it has been necessary first to locate the position at which the drill is to be placed, and then attempt manually to place a punch at this precise area and cause an indentation which will guide the drill. However, it is not always possible to exactly position the punch member.

My invention is principally directed to a means for permitting a highly accurate selection of the point which is to be punched, which is followed by the automatic positioning of the punch member at this precise point.

A preferred embodiment of my invention is comprised of a frame member which carries a rotatable turret. The turret contains an axial sighting member and an axially-movable punch member, whose centers lie along the same diameter of the turret and are radially displaced from the center of the turret by the same distance. Thus, the sighting member is first used to accurately locate the position at which the punch is to be placed. The turret is then rotated by 180° so that the exact center of the punch member carried by the turret is positioned exactly at the point indicated by the sighting member, and the punch member may then be struck by a hammer or mallet to make the pre-indentation necessary in the subsequent machine operation.

Accordingly, a primary object of my invention is to provide a novel structure for accurately locating a punch.

Another object of my invention is to provide a novel structure which permits the accurate location of a point to be punched, and thereafter automatically allows the positioning of a punch member in that precise point.

A further object of my invention is to provide a novel compact and inexpensive structure which will automatically permit a punch at some precise point on a work material after that point is visually accurately determined.

These and other objects of my invention will become apparent from the following description when taken in connection with the drawings, in which:

Figure 1 is an exploded perspective view of my novel position locator.

Figure 2 is a side view of the assembled position locator of Figure 1.

Figure 3 is a top view of the position locator of Figures 1 and 2.

Figure 4 is a cross-sectional view of Figure 2 taken across the lines 4—4.

Figure 5 is similar to Figure 4, but shows the turret member rotated by 180° to bring the punch center at the point originally occupied by the sight center.

Figure 6 is a cross-sectional view of Figure 3 taken across the lines 6—6.

Figure 7 is a bottom view of the assembled position locator of Figures 1 and 2.

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Referring now to the figures, my novel position locator is formed of a frame member 10 which receives a turret member 12 in a centrally positioned aperture which extends completely through frame 10. The frame is provided with an extending collar 14 which receives a flange 16 of turret 12 to prevent the turret from completely passing through the frame 10 and also to accurately position the lower end of turret 12 slightly above (0.003 inch) the lower surface of frame 10, as seen in Figures 4, 5 and 6.

If desired, the inner surface of the opening in the frame 10 for receiving turret 12 may be grooved to receive chips or dirt and thus prevent gauling of the inner surface.

The turret 12 may be positioned in either of two positions with respect to the frame 10 where the two positions are 180° displaced from one another. This is achieved by slotting the interior surface of turret 12 by slots 18 and 20, as is best seen in Figures 1, 6 and 7. Slots 18 and 20 then cooperate with a ball 22 which, as is shown in Figures 1 and 6, is carried by a lubricating member or grease cup 24 which receives a spring biasing means 26, the outer end of which is secured by screw 28 which is threaded into frame 10. Accordingly, the positioning means for accurately positioning turret 12 in either of two positions 180° displaced from one another is completely carried within the cylindrical opening 30 of the frame 10. It will be noted in Figure 6 that the interior portion of opening 30 has a shoulder portion 32 which prevents the escape of ball 22 when the turret 12 is removed from frame 10.

It will be apparent that turret 12 may now be rotated from its position of Figure 6 by applying a predetermined force to turret 12 which is sufficient to cam ball 22 to the right, and when notch 20 assumes the position of notch 18 shown in Figure 6, ball 22 will snap into the notch 20 and hold the turret 12 in that 180° angularly displaced position.

While I have described the invention for a turret rotatable by 180°, it will be apparent from the foregoing that this is not absolutely necessary. By way of example, if the sighting means and punching means are displaced by 90°, then the turret need only be rotatable between positions 90° displaced from one another.

The turret is then formed with two apertures 34 and 36 which respectively receive a sighting means 38 and a punch means 40. The sighting means is formed of a lens 42, a spring clip 44 and a locator 46 where the locator 46 may be a plastic circular body, the lower surface of which contains a reticule such as a series of concentric grooves 48, as is best seen in Figure 7.

It will be noted that the assembly of members 42, 44 and 46 are retained in their position by a force fit and the lens 42 is held at a proper spacing with respect to the bottom of locator body 46 by clip 44 to get some desired magnification.

It will be further noted that the assembly of members 42, 44 and 46 could be a single transparent member having a reticule at its lower surface and a convex shape at its upper end to serve the purpose of the lens.

As has been previously noted, the turret bottom is slightly higher than the frame bottom. This will prevent the reticule from being scratched when the frame is put on top of a surface. However, to keep parallax to a minimum, the spacing should be as small as possible.

It will be seen that frame 10 has two windows 47 and 49. These windows operate to admit light to the sighting means 42—46 when it is positioned adjacent these windows.

The relative positions of apertures 34 and 36 of turret 12 are such that the center line of each of the apertures lies on the same diameter of turret 12 and these center

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lines are radially displaced from the center line of turret 12 by an equal amount. Accordingly, when the turret is rotated by the 180° determined by slots 18 and 20, it will be apparent that the center of punch 40 will assume the position of the present center of sighting means 38.

The operation of my novel position locator will now be apparent, and is particularly understood with reference to Figures 3, 4 and 5. In Figures 4 and 5, the assembled position locator is shown as being positioned with respect to a piece of work material 50. It is desired that a particular point of member 50 receive an indentation, for example, for initially guiding the position of the bit of a drill. This position is first located, as seen in Figure 3, by a pair of crossed lines 52 which are drawn on the work piece 50 of Figures 4 and 5. The intersection of these lines, which accurately indicates the position at which a hole is to be drilled, is then centered through the use of the circular grooves 48 (Figure 7) so that the innermost circular groove has the point at which the punch is to be made in its center. It is to be noted that instead of grooves 48, the bottom of sighting member 46 could have crossed lines which intersect at the center of member 46.

The frame 10 is then held firmly in position, and the turret 12 is rotated by grasping flange 16 and turning the turret until the turret is rotated exactly 180°, as is indicated by the ball 22 engaging slot 20, and the turret is now in the position of Figure 5. Since the center line of punch 40 is on the same center of sighting member 46, it is apparent that the center of punch 40 is precisely located at the point at which the punch is to be made. The punch may then be tapped by a hammer, as indicated by the arrow in Figure 5, so as to form the depression 54 of Figure 5 in work material 50 at the precise point which was to receive the punch.

It will be noted that punch 40 has an extending shoulder 56 which will prevent a depression of punch 40 beyond the lower surface of frame 10 by an undesirable amount.

Since the application for my novel tool is often in an environment where there may be machine oil and metal chips on the surface of the member which is to receive the punch, I have found it desirable to form the bottom surface of frame 10 with annular grooves indicated by annular grooves 58 in Figures 6 and 7. The purpose of these grooves is to reduce the contact area between the bottom surface of frame 10 and the work material whereby a greater pressure will be applied to frame 10 for the same amount of holding force, and, furthermore, since the grooves will be able to receive the dirt or other foreign matter when the frame 10 is applied to the work piece, a flush connection is made between the frame 10 and the work piece.

Furthermore, the person using the tool may well have machine oil on his hands so that the tool will be slippery. For this purpose, the upper surfaces of frame 10 may be grooved by grooves 60 to permit a firmer grip on the frame.

Although I have described preferred embodiments of my novel invention, many variations and modifications will now be obvious to those skilled in the art, and I prefer therefore to be limited not by the specific disclosure herein but only by the appended claims.

I claim:

1. A position locator for a punch; said position locator comprising an elongated frame member having a flat surface for engaging the surface of a work member to receive a pre-positioned punch; said frame having an elongated cylindrical aperture therein for receiving a cylindrical turret member having a center line perpendicular to the bottom surface of said frame; said cylindrical turret member being rotatable with respect to said frame member between a first and second position 180° displaced with respect to one another; said turret member carrying an elongated sighting means and said punch means; said

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elongated sight means including cylindrical sighting means having an axis parallel to said axis of said cylindrical turret; said punch means being an elongated cylindrical member having an axis parallel to said axis of said cylindrical turret; said axis of said sighting means and said axis of said punch means lying on a same diameter of said cylindrical turret; said axis of said sighting means and said axis of said punch means being radially displaced from said axis of said cylindrical turret means by an equal distance.

2. A position locator for a punch; said position locator comprising an elongated frame member having a flat surface for engaging the surface of a work member to receive a pre-positioned punch; said frame having an elongated cylindrical aperture therein for receiving a cylindrical turret member having a center line perpendicular to the bottom surface of said frame; said cylindrical turret member being rotatable with respect to said frame member between a first and second position 180° displaced with respect to one another; said turret member carrying an elongated sighting means and said punch means; said elongated sight means including cylindrical sighting means having an axis parallel to said axis of said cylindrical turret; said punch means being an elongated cylindrical member having an axis parallel to said axis of said cylindrical turret; said axis of said sighting means and said axis of said punch means lying on a same diameter of said cylindrical turret; said axis of said sighting means and said axis of said punch means being radially displaced from said axis of said cylindrical turret means by an equal distance; said axis of said sighting means being positionable over a predetermined position of said work member when said frame engages said work member; said cylindrical turret means thereafter being rotatable by 180° to precisely position said axis of said punch means at said precisely located point initially located by said axis of said sighting means.

3. A position locator for a punch; said position locator comprising an elongated frame member having a flat surface for engaging the surface of a work member to receive a pre-positioned punch; said frame having an elongated cylindrical aperture therein for receiving a cylindrical turret member having a center line perpendicular to the bottom surface of said frame; said cylindrical turret member being rotatable with respect to said frame member between a first and second position 180° displaced with respect to one another; said turret member carrying an elongated sighting means and said punch means; said elongated sight means including cylindrical sighting means having an axis parallel to said axis of said cylindrical turret; said punch means being an elongated cylindrical member having an axis parallel to said axis of said cylindrical turret; said axis of said sighting means and said axis of said punch means lying on a same diameter of said cylindrical turret; said axis of said sighting means and said axis of said punch means being radially displaced from said axis of said cylindrical turret means by an equal distance; said frame having an aperture therein perpendicular to the center line of said cylindrical turret; said aperture containing a biased ball means adjacently positioned with respect to said cylindrical turret means; said turret means containing a first and second indentation positioned on a same diameter and on opposite sides of said cylindrical turret; said ball means being engageable with respect to either of said first or second slots to thereby accurately position said turret means in either of two 180° opposed positions.

4. A position locator for a punch; said position locator comprising an elongated frame member having a flat surface for engaging the surface of a work member to receive a pre-positioned punch; said frame having an elongated cylindrical aperture therein for receiving a cylindrical turret member having a center line perpendicular to the bottom surface of said frame; said cylindrical turret

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member being rotatable with respect to said frame member between a first and second position 180° displaced with respect to one another; said turret member carrying an elongated sighting means and said punch means; said elongated sight means including cylindrical sighting means having an axis parallel to said axis of said cylindrical turret; said punch means being an elongated cylindrical member having an axis parallel to said axis of said cylindrical turret; said axis of said sighting means and said axis of said punch means lying on a same diameter of said cylindrical turret; said axis of said sighting means and said axis of said punch means being radially displaced from said axis of said cylindrical turret means by an equal distance; said frame having an aperture therein perpendicular to the center line of said cylindrical turret; said aperture containing a biased ball means adjacently positioned with respect to said cylindrical turret means; said turret means containing a first and second indentation positioned on a same diameter and on opposite sides of said cylindrical turret; said ball means being engageable with respect to either of said first or second slots to thereby accurately position said turret means in either of two 180° opposed positions; said axis of said sighting means being positionable over a predetermined position of said work member when said frame engages said work member; said cylindrical turret means thereafter being rotatable by 180° to precisely position said axis of said punch means at said precisely located point initially located by said axis of said sighting means.

5. A position locator for a punch; said position locator comprising an elongated frame member having a flat surface for engaging the surface of a work member to receive a pre-positioned punch; said frame having an elongated cylindrical aperture therein for receiving a cylindrical turret member having a center line perpendicular to the bottom surface of said frame; said cylindrical turret member being rotatable with respect to said frame member between a first and second position; said turret member carrying an elongated sighting means and said punch means; said elongated sight means including sighting means having an axis parallel to said axis of said cylindrical turret; said punch means being an elongated cylindrical member having an axis parallel to said axis

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of said cylindrical turret; said axis of said sighting means and said axis of said punch means being radially displaced from said axis of said cylindrical turret means by an equal distance; said sighting member being in a predetermined position when said turret is in said first position; said punch being moved to said predetermined position when said turret is moved to said second position.

6. A position locator for a punch; said position locator comprising an elongated frame member having a flat surface for engaging the surface of a work member to receive a pre-positioned punch; said frame having an elongated cylindrical aperture therein for receiving a cylindrical turret member having a center line perpendicular to the bottom surface of said frame; said cylindrical turret member being rotatable with respect to said frame member between a first and second position; said turret member carrying an elongated sighting means and said punch means; said elongated sight means including sighting means having an axis parallel to said axis of said cylindrical turret; said punch means being an elongated cylindrical member having an axis parallel to said axis of said cylindrical turret; said axis of said sighting means and said axis of said punch means being radially displaced from said axis of said cylindrical turret means by an equal distance; said sighting member being in a predetermined position when said turret is in said first position; said punch being moved to said predetermined position when said turret is moved to said second position; said frame having an aperture therein perpendicular to the center line of said cylindrical turret; said aperture containing a biased ball means adjacently positioned with respect to said cylindrical turret means; said turret means containing a first and second indentation on the outer surface thereof; said ball means being engageable with respect to either of said first or second slots to thereby accurately position said turret means in either of said first or second positions.

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