Dec. 5, 1944. G. WAHNISH ET AL 2,364,497

CENTERING DEVICE

Filed Aug. 23, 1943

Fig. 1

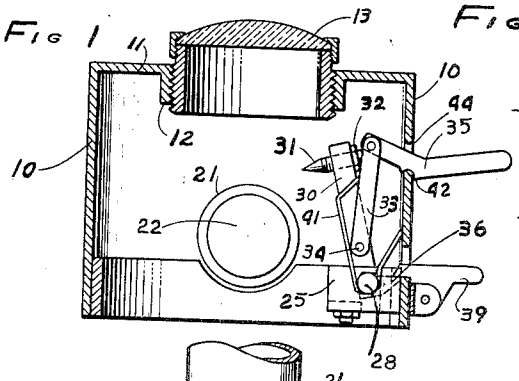


Fig. 2

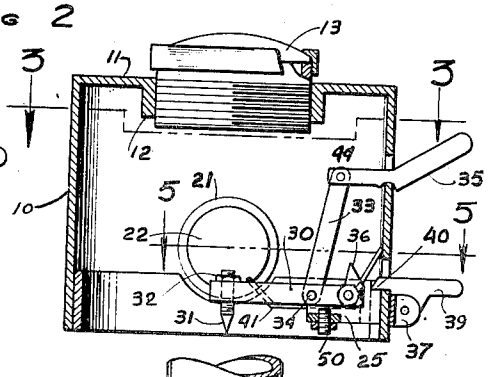


Fig. 3

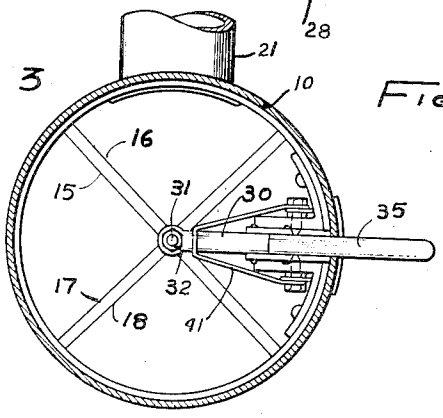


Fig. 4

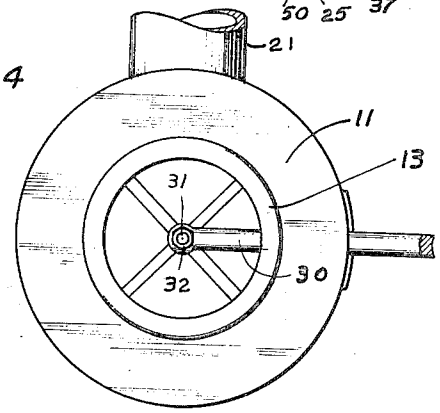


Fig. 5

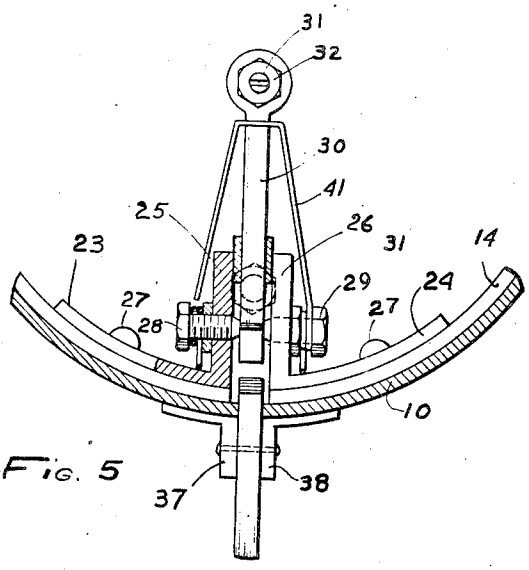
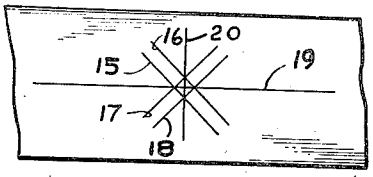


Fig. 6



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Patented Dec. 5, 1944 2,364,497

UNITED STATES PATENT OFFICE

2,364,497

CENTERING DEVICE

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Los Angeles, Calif.

Application August 23, 1943, Serial No. 499,720

1 Claim. (Cl. 33—189)

Our invention relates generally to apparatus for accurately locating and marking a point on a piece of material upon which work is to be done, and it is the major object of our invention to provide a centering tool which will accomplish such marking more accurately and easily than heretofore possible.

The conventional method of locating a point on a flat surface is to scribe a pair of lines thereon at right angles to each other and then to take a prick punch and make a slight mark at the intersection of the two lines. This is usually followed by enlarging the mark with a center punch so that when the piece is subsequently drilled the machinist will have no trouble in centering his drill over the mark. The principal difficulty encountered in this conventional system is the accurate location of the exact center or intersection of the two scribed lines since the lines of necessity have substantial thickness and it is virtually impossible to locate the exact center of their intersection by eye. Numerous devices have been advanced for accomplishing this purpose, but so far as we are aware, none has proved satisfactory.

By using the device of our invention, this difficulty is easily overcome, and in addition the work is adequately illuminated so that the operator is assisted in lining up the centering tool.

Another object of our invention is to provide a centering device which is simple and economical to manufacture and which will be easy to use.

A further object of our invention is to provide a centering device in which the centering pin or hammer may be quickly and easily adjusted, and when once adjusted will stay in adjustment even when subjected to comparatively rough usage.

These and other objects and advantages of our invention will become apparent from the following description of a preferred form thereof and from the accompanying drawing in which:

Fig. 1 is a vertical section of one form of our device with the hammer in retracted position,

Fig. 2 is a vertical section similar to Fig. 1 but showing the hammer in extended or punching position,

Fig. 3 is a horizontal section taken on the line 3—3 of Fig. 2,

Fig. 4 is a top plan view corresponding to Fig. 2,

Fig. 5 is an enlarged fragmentary horizontal section corresponding to Fig. 3, and

Fig. 6 is a diagrammatic illustration of one way of using our device.

Referring now to the drawing, the numeral 10 indicates a housing provided with a cover plate 11 having an axial aperture therein provided with a downturned circular flange 12. The housing is preferably cylindrical as shown but may be of any suitable shape and of solid or skeleton construction. A suitable magnifying eyepiece 13 is threaded into the flange 12 and is adjustable therein so as to focus on a plane flush with the bottom edge of the cylindrical housing 10. In the lower portion of the housing 10 we provide a ring 14 which may be pressed into the housing or secured thereto by suitable means, which ring carries two pairs of parallel cross-hairs substantially flush with the base of the housing 10 and preferably at right angles to each other. The cross-hairs of one pair are indicated by numerals 15 and 16 while those of the other pair are indicated by the numerals 17 and 18, the hairs in each pair being spaced a convenient distance apart, such for example as ⅛ of an inch, so that at the center of the housing they will form a small square. This relationship of the cross-hairs is best seen in Fig. 6 wherein they are illustrated as locating the center of the intersection of two scribed lines 19 and 20.

The housing 10 preferably has a tubular handle 21 extending horizontally from an opening in one side thereof, and a small electric lamp 22 is mounted in the open end of the handle 21 at its point of connection with the housing. The lamp may be illuminated by a storage battery (not shown), located in the extending tubular portion of the handle 21 or by any other suitable means, a switch (not shown) being provided for closing the lamp circuit as desired. It will be apparent that when the lamp 22 is lighted, it will illuminate the entire inside of the housing 10 and the workpiece upon which the housing with its associated cross-hairs is placed, so as to facilitate positioning the cross-hairs.

A pair of substantially L-shaped brackets having curved base portions 23 and 24 and extending arm portions 25 and 26, respectively, are fastened to the inside of the housing 10 by any convenient means such as screws 27, the arm portions 25 and 26 of the brackets extending inwardly in parallel relationship toward the center of the housing. A pair of adjustable bearing screws 28 and 29 extend through the sides of the arms 25 and 26 in opposed relationship and pivotally support a hammer arm 30 by means of a pivot pin 31 extending laterally through the hammer arm and adapted to be held between the bearing faces of the screws 28 and 29. The hammer 30 carries a prick punch 31 in its forward

end, the punch being adjustable vertically of the hammer arm by means of a lock nut 32.

A link 33 is pivotally connected at its lower end to the hammer arm 30 and at its upper end to a lever arm 35 which extends through an opening in the housing 10. The rear end of the hammer arm 30 is provided with an angular extension 36 which assumes a vertical position when the hammer is horizontal and a horizontal position when the hammer is in vertical position.

Pivotally supported in a pair of outwardly extending ears 37 and 38 attached to the outside of the housing 10 and aligned with the hammer 30 is a spring latch 39 whose forward end 40 extends inwardly through an opening in the housing 10 and is adapted to engage the extension 36 when it is in horizontal position and thus retain the hammer and prick punch in the retracted position shown in Fig. 1.

The hammer and prick punch are operated by spring means of any suitable design such for example as the snap spring 41 illustrated herein which is generally V-shaped with its base overlying the hammer 30 and its free ends 42 bearing against the inside of the housing 10 after having been coiled around the bearing screws 28 and 29. The spring 41 is so disposed as to continually urge the hammer 30 downwardly from its retracted position shown in Fig. 1 to its extended punching position shown in Fig. 2. Consequently when the latch 39 is released, the hammer 30 and punch 31 are rotated downwardly by the spring 41 with considerable force and rapidity. The hammer 30 is of such length that the punch 31 is exactly centered with respect to the aperture defined at the center of the cross-hairs by their intersection and consequently once the cross-hairs have been suitably positioned, the hammer will automatically cause a mark to be made by the punch at the exact center required. If desired, the lever 35 may be provided with a clamping recess 42 adapted to seat on the upper edge of the housing wall forming the base of the aperture 44 through which the lever arm 35 extends.

In the operation of our device, the lines 19 and 20 are first scribed on the workpiece in the usual manner and the housing is placed on the workpiece over the intersection of the scribed lines. The light 32 is then turned on to illuminate the interior of the housing and the workpiece, and the housing is moved about until the intersection of the lines 19 and 20 is in the middle of the square formed by the intersection of the cross-hairs. This positioning is facilitated by orienting the housing in such a way that the lines 19 and 20 bi-sect the angles formed by the intersection of the cross-hairs as seen best in Fig. 6. It is a relatively simple procedure to position the instrument so that the cross-hairs assume this position with respect to the scribed lines and when this condition is obtained, the center of the intersection of the scribed lines automatically falls beneath the center of the cross-hairs. With the device in this position, the latch 39 is tripped, allowing the spring 41 to rotate the hammer 30 rapidly downwardly until the punch 31 strikes the workpiece and makes a mark thereon. The hammer is then retracted by moving the lever arm 35 downwardly until the extension 36 is engaged by the latch 39 to cock the hammer in position for the next marking operation.

To protect the hammer and punch against damage due to an inadvertent release thereof, we provide an adjustable set screw 50 in the bracket arms 25 and 26 to limit the movement of the hammer in its downward travel. The set screw 50 may also be used to insure that the hammer 30 is in a truly horizontal position at the moment of impact, this adjustment being correlative with adjustment of the prick punch 31 vertically. While the ideal striking position is with the punch 31 in a truly vertical position, the effective length of the hammer 30 may be varied somewhat by varying the vertical position of the punch 31 so that it will strike the work before the hammer reaches a full horizontal position. This shortens the stroke and is equivalent to moving the punch outwardly along the hammer 30 to vary its position with respect to the cross-hairs. By adjustment of the bearing screws 28 and 29, the lateral position of the hammer 30 and the punch 31 may be varied to assure proper alignment with respect to the junction of the cross-hairs.

It will be apparent that if desired, the cross-hairs may be replaced by intersecting radial ribs having an aperture at their center through which the punch will pass. In some instances this may be advisable, but as a general rule it is easier to align the cross-hairs than it is to estimate the exact center of a circular aperture. It will be apparent, of course, that the magnifying eyepiece 13 facilitates the proper positioning of the device, and that if further accuracy is desired, a second pair of cross-hairs or a spider with an axial aperture may be positioned immediately below the eyepiece so as to insure vertical alignment of the sights with the lower cross-hairs.

While the form of our invention herein shown and described in detail is fully capable of attaining the objects and providing the advantages hereinbefore stated, it is to be understood that it is merely illustrative of our invention as defined in the appended claim and we do not mean to be limited to the precise form or proportions herein shown.

We claim:

A centering device which includes: a housing; intersecting cross-hairs mounted in the base of said housing and defining a centering aperture; a magnifying eyepiece mounted in the upper portion of said housing and aligned with said aperture; a punch rotatably mounted in said housing and adapted when released to strike through said aperture; means for holding said punch in retracted position; and spring means for rotating said punch when said retracting means is released.

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