May 2, 1950 L. B. FULLER 2,506,498

SPECIMEN HOLDER FOR COMPARATORS

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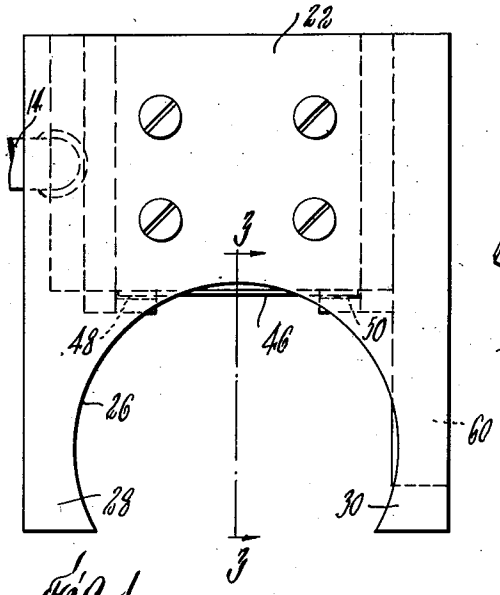


Fig. 1.

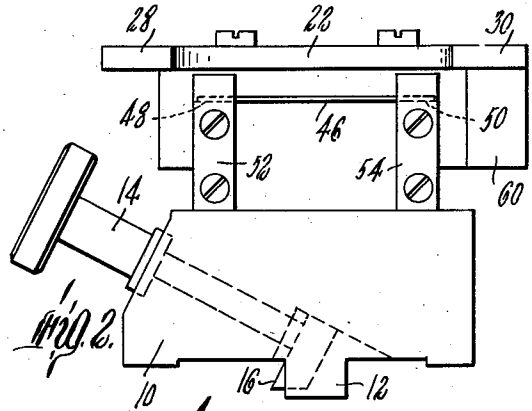


Fig. 2.

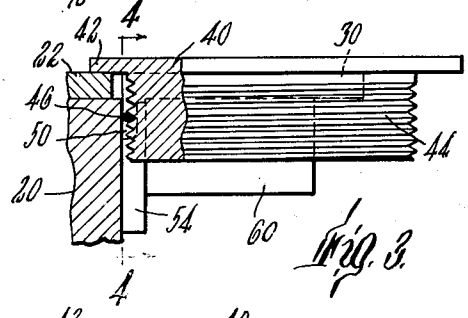


Fig. 3.

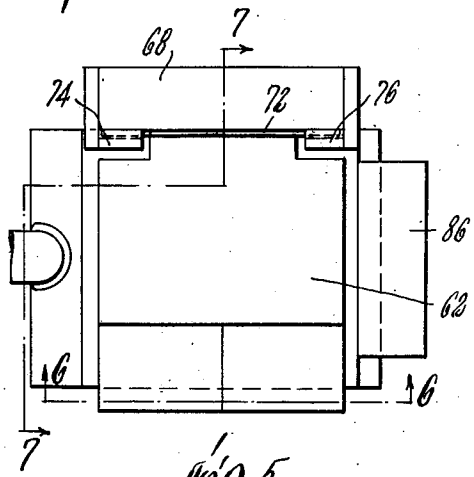


Fig. 5.

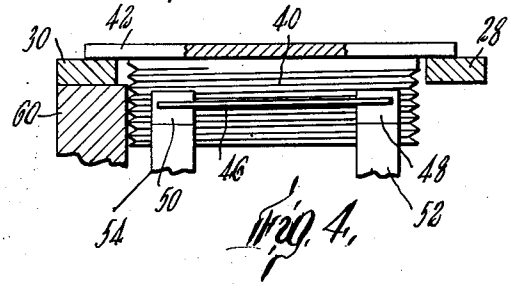


Fig. 4.

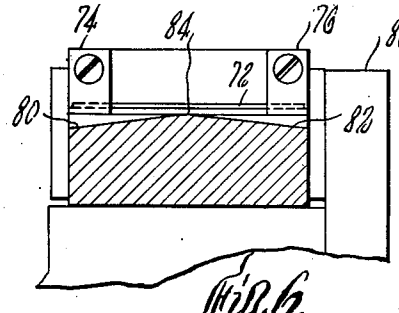


Fig. 6.

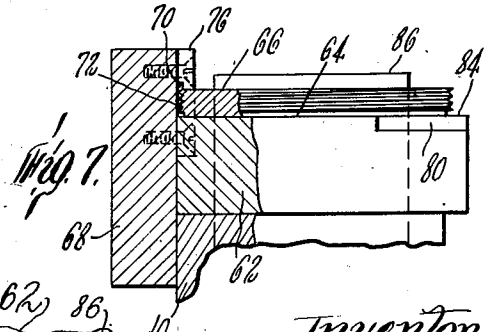


Fig. 7.

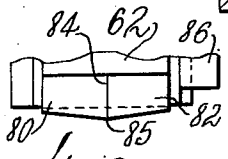


Fig. 8.

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SPECIMEN HOLDER FOR COMPARATORS

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Application February 28, 1946, Serial No. 650,911

5 Claims. (Cl. 88—24)

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This invention relates to a device for supporting on the table of a comparator, such as that described and illustrated in the Hartness and Porter Patent No. 1,703,933, granted March 5, 1929, a screw threaded specimen having a relatively short thread. For example, the threaded portion of an ordinary spark plug or a screw plug for an oil drum may be supported on a device such as is hereinafter described for examination of its screw thread. In objects of this kind in which the axial length of the screw thread is short, the matter of lead error is not important.

It is therefore an object of the present invention to provide a supporting device for objects having short screw threads, the support being such that the object can be quickly and easily located in a predetermined position wherein the thread portion to be tested by comparison with a standard thread contour on a chart which forms a part of the comparator is in proper focus with respect to the lens system by which a shadow outline of the thread is thrown on the chart.

For a more complete understanding of the invention, reference may be had to the following description of certain embodiments thereof and to the drawing, of which:

Figure 1 is a plan view of a device embodying the invention;

Figure 2 is a side elevation of the same;

Figure 3 is a section on the line 3—3 of Figure 1;

Figure 4 is a section on the line 4—4 of Figure 3;

Figure 5 is a plan view of a modified form of the invention;

Figure 6 is a section on the line 6—6 of Figure 5;

Figure 7 is a fragmentary section on the line 7—7 of Figure 5.

Figure 8 is a fragmentary plan view of a modified form of the invention.

The device illustrated in Figures 1 to 4 comprises a standard base block 14 such as is customarily used for supporting devices employed on comparators of the kind referred to. This base is provided with a bottom lug 12 adapted to enter a transverse undercut slot in the table of the comparator, a bolt and nut device generally indicated at 14 being employed to move a locking lug 16 so as to bind the support firmly in adjusted position on the comparator table.

Secured upon the top of the base block 10 is a superstructure comprising a substantial upper block 20 on top of which is secured a plate 22

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having a plane upper surface. The plate 22 projects beyond one side of the block 20, the projecting portion having a recess or aperture 26 defining a pair of horns 28 and 30 of sufficient length to extend substantially more than half the diameter of a workpiece. The aperture 26 is curved to receive easily a work piece such as the flanged screw plug 40 illustrated in Figure 3. The flange 42 of the screw plug is adapted to rest upon and be supported by the plate 22. It is desirable that the thread portion indicated at 44 in Figure 3 be accurately located in line with a collimated beam of light which is projected tangentially thereto and is thrown on the screen or chart (not shown) for comparison with a printed thread contour on the chart as described and illustrated in Patent No. 1,703,933, hereinbefore referred to. Since it is desirable to obtain an accurate observation of the pitch diameter of the thread member and since the extreme diameter of the threaded member is not reliably related to the pitch diameter, a pitch rod or wire 46 is supported against the side wall of the upper block 20 so as to be freely movable up and down, the end portions of this rod or wire being disposed in vertical slots 48 and 50 for this purpose. The slots 48 and 50 are formed by suitable notches in the upper portions of narrow vertical blocks 52 and 54 which are secured against the side face of the block 20. When a specimen is placed upon the support for testing, it is moved laterally against the rod 46 to press the wire into one of the thread valleys wherein it engages the flanks of the thread at the pitch diameter, the wire also being pressed against the side face of the block 20 which is a vertical plane of reference. In examining a threaded object, the size of the rod employed should be such as will permit the rod to enter a thread valley and to touch the flanks thereof simultaneously at the pitch diameter of the thread. The work piece is then manually rotated so as to cause the shadow image of the thread which is projected on the chart to move up or down until it merges with the contour printed on the chart. An accurate comparison can then be made by observation.

In order to assure accurate focus of the observed thread elements, a back stop member 60 is provided, this member being a substantial block which is secured firmly to the rear face of the block 22 and which projects laterally therefrom beneath the horn 30. This block extends out beyond the center of the work piece, as indicated in Figure 1, so that it provides a back stop for the work piece which will insure that the thread

elements which lie in the beam of light will be in focus.

The form of the invention illustrated in Figures 5, 6, and 7 is similar in principle to the support hereinbefore described but is modified for use in testing work pieces which have no flange by which they may be supported. Upon the base block 10 is mounted an upper block 62 which has a plane upper surface 64 on which the work piece 66 may rest. A side block 68 is secured to one side of the block 62, this block rising above the top of the block 62 so as to provide a vertical plane of reference 70 against which may be pressed a pitch rod or wire 72. This pitch rod is vertically movable, the end portions thereof being disposed in recesses in vertical blocks 74 and 76. The portion of the upper block 62 remote from the side block 68 is beveled on its upper surface from a center line to the front and rear edges as at 80 and 82 leaving a central ridge 84 flush with the plane upper surface 64. This ridge 84 furnishes a horizontal line exactly in the plane of focus of the optical system so that a sharp shadow image of the ridge is thrown on the chart. A suitably placed horizontal line on the chart may be employed in connection with the shadow image of the ridge 84 to facilitate adjusting the holder to receive specimens for examination. If desired, a similar vertical ridge 85 can be formed on the end face of the block 62 by similar bevels as indicated in Figure 8, this ridge resulting in a sharply focussed vertical shadow image on the chart to be made to coincide with a vertical line of reference on the chart. A back stop 86 is provided for engagement by the work piece to focus the thread elements properly for projection of the shadow image on the chart.

The operation of this modified form of the support is similar to that hereinbefore described. The work piece 66 is placed upon the supporting surface 64 and is pushed laterally against the pitch rod 72 and also rearwardly against the back stop 86. The work piece is then manually rotated until the shadow image advances up or down sufficiently to coincide as nearly as possible with the printed contour on the chart.

I claim:

1. A holder for a screw threaded object to be examined, comprising a base, a superstructure on said base having three plane surfaces perpendicular to one another for simultaneous engagement by a work piece to determine a definite position of reference for work pieces to be examined, a rod of a size to enter a thread valley of an object to be examined and to engage the thread flanks approximately at the pitch diameter of the thread, and means for holding said rod loosely against one of said surfaces.

2. A holder for a screw threaded object to be examined, comprising a base, a superstructure on said base having a plane vertical wall surface, a supporting member projecting horizontally from said wall and having a plane horizontal surface on which a work piece can rest, a rod of a size to enter a thread valley of an object to be examined and to engage the thread flanks approximately at the pitch diameter of the thread, means loosely supporting said rod against said vertical wall surface, and a back stop member projecting from said wall and having a plane vertical surface which is perpendicular to the other two plane surfaces and is arranged for engagement by the thread crests of a work piece supported by the holder for examination.

3. A holder for a flanged screw threaded object to be examined, comprising a base, a block secured on said base having a vertical plane wall surface on one side thereof, a rod of a size to enter a thread valley of an object to be examined and to engage the thread flanks approximately at the pitch diameter of the thread, means for loosely supporting said rod against said surface, a supporting plate secured on the top of said block with spaced elements projecting beyond said side of the block to receive the flange of an object to be supported for examination, and a back stop member projecting from said block beneath one of said spaced elements for engagement by the thread of an object supported by said spaced elements.

4. A holder for a screw-threaded object to be examined, comprising a base, a superstructure on said base having a horizontal surface on which said object is supported and two mutually perpendicular vertical surfaces arranged to cooperate with said supporting surface to determine a definite position for said object, a rod having a diameter so related to the dimensions of the screw thread of said object that it can enter a thread groove tangentially and engage the flanks thereof at approximately the pitch diameter of the thread, and means for supporting said rod loosely in an approximately horizontal position against one of said vertical surfaces, whereby when an object to be examined is supported on said horizontal surface and is pressed laterally against said rod, the rod bears against the adjacent vertical surface and the flanks of a thread valley and assumes the helix angle of the thread.

5. A method of mounting on a comparator a screw-threaded object to be examined, said method comprising resting said object on a horizontal surface of reference with its axis of rotation perpendicular to said surface, pressing the object laterally toward a vertical surface of reference, interposing between the screw thread and the said vertical reference surface a cylindrical rod which is free to move vertically through a limited range and which is of a size to engage the sides of a thread valley at the pitch diameter of the object, and rotating the object until one of the thread turns is at a point diametrically opposite from the point of contact when said rod is at a predetermined distance from said horizontal surface of reference, whereby the diametrically opposite thread is in observing position.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,745,523	Beardsley	Feb. 4, 1930
1,745,537	Hartness	Feb. 4, 1930
1,761,260	Gallasch	June 3, 1950