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SCREW THREAD GAUGING DEVICE

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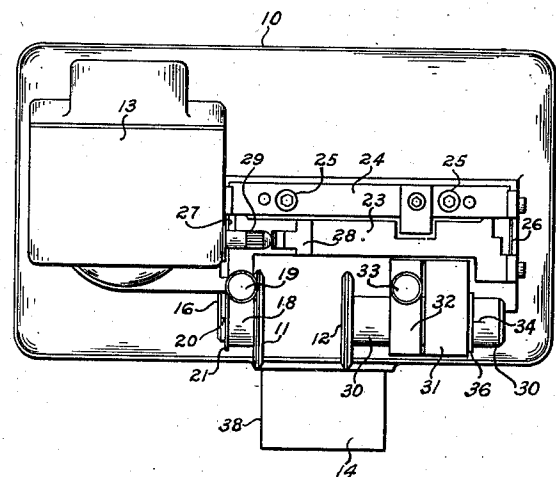


Fig-1

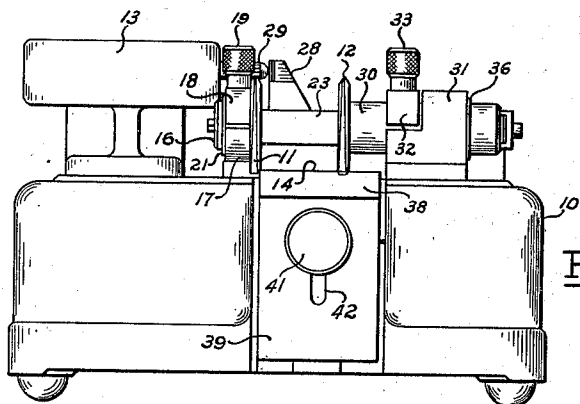


Fig-2

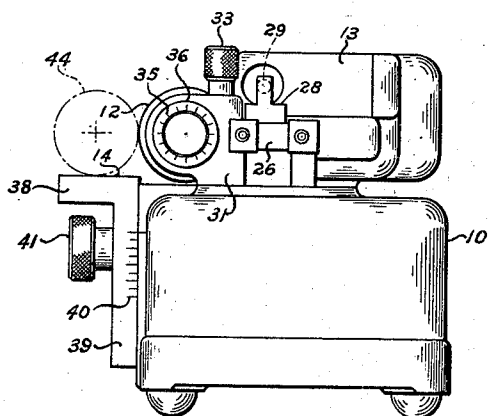


Fig-3

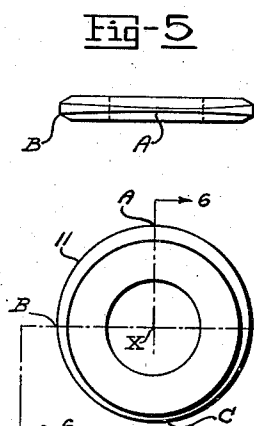


Fig-4

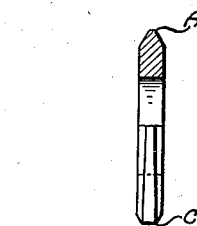


Fig-6

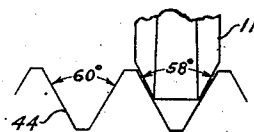


Fig-7

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SCREW-THREAD GAUGING DEVICE

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2 Claims. (Cl. 33—199)

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This invention relates to thread gauging devices and more particularly to devices for gauging the thread lead or pitch distance.

One object of the invention is the provision of a thread gauging instrument having work engaging members formed to properly interfit threads of different sizes, such members being rotatably adjustable to bring different portions of different shapes into position for engagement with the workpiece.

Another object is the provision of a thread gauge having rotatably adjustable work engaging members which have peripheral portions of truncated V-cross-sectional form, the amount of truncation increasing annularly in gradual progression from a minimum amount to a maximum amount so that, in a predetermined range of sizes, workpieces of different diameters on an adjustable work holder can be accurately gauged.

Other objects and advantages of the invention will be apparent from the following description, the appended claims and the accompanying drawing, in which,

Fig. 1 is a top plan view of a thread gauging instrument embodying the present invention;

Fig. 2 is a side elevation of the gauging instrument;

Fig. 3 is an end view of the gauging instrument;

Fig. 4 is a detail of one of the work engaging members;

Fig. 5 is an end view of the work engaging member;

Fig. 6 is a section of the line 6—6 of Fig. 4; and

Fig. 7 is an enlarged detail showing inter-engagement of the work and the work engaging member 11.

Referring more particularly to the drawing, in which like parts have been given the same reference numerals in the several views, 10 designates a support or base which carries a pair of work engaging members 11 and 12 adapted to interfit with the threads on workpieces to be gauged. These members are relatively movable, and their relative positions are shown by a suitable gauge 13 that operates electrical switches or control an indicator. This instrument may be of the character shown in Patent 2,392,301, issued January 8, 1946. The workpieces to be gauged are applied to a work holder or table 14 and pressed against the two work engaging members, in the gauging operation.

The work engaging member 11 comprises a rotatably adjustable disc the peripheral portion of which is of truncated V shape in radial cross-section, see Figs. 4, 5, and 6. The inclined sides

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of the V are adapted to engage and interfit with the side surfaces of the threads of workpieces of different sizes. This disc is secured, preferably in a permanent manner, to a shaft portion 16 which is arranged in a ring 17. This ring includes a lower section and a removable cap 18. The cap is secured in place by a thumb screw 19 threaded in the lower portion of the ring to securely clamp the shaft portion 16 in position. When the thumb screw 19 is loosened the shaft portion 16 can be rotated and the thumb screw then tightened to hold the work engaging member in its proper position of adjustment.

The shaft section 16 is provided with an index mark 20 that cooperates with a series of radial markings 35 on the flat outer side of a disc 21 which is fixed to the base portion of the ring. The markings show the position of the shaft section in its annular setting. The base portion of the ring 17 is carried by a spring supported bar 23 that extends in front of a carrying bar 24 secured by suitable screws 25 to the top of the base 10. A pair of straight parallel spring blades 26 and 27 are fixed at their forward ends to the ends of the bar 23 and are secured at their other ends to the bar 24. These blades carry the bar 23 for parallel movement in a direction parallel to the axis of the shaft 16, or in other words parallel to the axis of the workpiece, when the latter is in position to be gauged. A short post 28 is fixed on the bar 23 and bears against the plunger 29 of the gauge 13. As will be apparent, the positioning of the work engaging member 11, which is positioned by the workpiece, will correspondingly position the bar 23, the post 28, and the plunger 29.

The work engaging member 12 also comprises a disc identical in construction to the disc of the work engaging member 11. It is securely fixed on a longer shaft portion 30 which extends through a stationary ring 31 the main portion of which is secured to the upper part of the base 10. A removable cap portion 32 normally held in clamping position against the shaft 30 by a thumb screw 33 serves to fix the work engaging member 12 on the base 10. The shaft portion 30 is long enough so that the disc-like work engaging portion can be adjusted towards and from the work engaging member 11 to accommodate workpieces of different lengths. The shaft portion 30 has an index mark 34 that cooperates with radially extending marks 35 on a graduated disc 36 fixed to the body portion of the ring 31. The radially extending markings 35 on the disc 36 and on the disc 21 are similar. The rotational setting of the work engaging member 12 can thus be readily determined,

and readily made to agree with the setting of the member 11.

The thread grooves of workpieces having many threads per inch are quite small, whereas workpieces having only four or five threads per inch, for example, are very much larger and will receive a very much wider finger or part. The peripheral portions of the work engaging members 11 and 12 are so formed that they will accommodate threads of any size in a predetermined size range. Thus, as shown in Fig. 4, the work engaging member 11 has a periphery that provides a truncated V-shaped cross-section with the amount of truncation increasing annularly in a gradual progression from a minimum amount to a maximum amount. Preferably the inclined peripheral sides of this member are each generated by a straight line in the rotation of the member 11 about the axis X, which corresponds to the axis of the shaft portion to which this portion is secured. The flat periphery is ground eccentrically to the axis X, so the amount of truncation changes. The angle of the inclined sides of the member 11 is about 2 degrees less than the angle included between the standard thread angle of the workpiece 44 so that only the outer portions of the work engaging member will contact the threads and the point of contact will be at the pitch diameter. At the point A the amount of truncation is a minimum, the work engaging member at that point being adapted for engagement with a workpiece having many threads per inch, its shape being sharp enough to reach into the small threads of the workpiece so as to be in firm engagement at the pitch diameter. At point B the truncation is greater, while at C the amount of truncation is a maximum and there the work engaging member can interfit with the pitch diameter portions of threads of comparatively large size.

It will be understood that the thumb screws 19 and 33 can readily be loosened and the work engaging members rotated corresponding amounts by observing the indications on the shaft portions and on the graduated discs 21 and 36 so that the proper portions of the work engaging members are presented towards the work position.

The table 14 provides a work supporting projection 38 and a vertically adjustable side plate 39 having suitable graduations 40. A fastening screw 41 extending through the slot 42 in the side plate threads into the base 10 to secure the work holder in its desired position. Properly adjusted, the work holder carries the work, illustrated in dash lines in Fig. 3, so that the work axis lines up in the same plane with the axes of the work engaging members and with the central portions of the spring blades 26. The thrust of the work is therefore neither above nor below the spring blades. This obviates any tendency for a twisting action on the spring blades 26 and 27.

In setting up the gauge a master thread may be applied to the work engaging members 11 and 12 after they have been adjusted so that they are far enough apart to give an adequate check, and after they have been rotatably adjusted to present the proper portions of their peripheries to the work. The reading on the gauge 13 is noted when this master is applied. When the workpiece to be checked is then applied to the work engaging members, the reading on the gauge 13 can be noted to see whether or not the pitch of the thread is within the required tolerance. If desired, instead of using a master in setting up the relative spacing of the members 11 and 12,

they may be set by Johansson blocks applied between those members after previously determining the exact allowance that must be made for the width of the disc portion of the work engaging members.

A high degree of care is unnecessary in setting the table 14 in its proper position to accommodate a thread workpiece of a particular size or diameter, for the relative spacing between the members 11 and 12 will not be affected if the axis of the workpiece is a little above or a little below the horizontal plane of the centers of the work engaging members. The annular setting of the work engaging members 11 and 12 is not sensitive and need not be determined with great accuracy, for small errors in the rotational positioning of the members 11 and 12 will not affect the relative spacing between those members. However, this rotational adjustment which brings differently formed V-shaped sections into position for engagement with the workpiece permits the gauge to very conveniently accommodate workpieces having any number of threads within the range of the instrument regardless of the pitch diameter of the threads. For example, exact checks can be made on a workpiece of one inch diameter with 20 threads per inch, and on workpieces of 1/2 inch diameter with 8 threads per inch, and in each instance the proper engagement along the pitch diameters of the threads gauged.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention defined in the appended claims.

What is claimed is:

1. In a thread gauging instrument, a work engaging member formed to interfit with threads of any size in a predetermined size range, said member comprising a rotatably adjustable circular disc having its periphery of truncated V-cross-sectional form with the amount of truncation increasing annularly in gradual progression from a minimum amount to a maximum amount.

2. In a thread gauging instrument, a work engaging member formed to interfit at the pitch diameter only with threads of any size in a predetermined size range, said member comprising a rotatably adjustable circular disc having its periphery of truncated V-cross-sectional form with the amount of truncation increasing annularly in gradual progression from a minimum amount to a maximum amount, the angle included between the sides of the V being slightly less than the included angle of the standard thread form to be checked.

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REFERENCES CITED

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

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2,392,301	Aller	Jan. 8, 1946

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Number	Country	Date
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555,893	Great Britain	1943