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MICROMETER ADJUSTED SINE BAR

Filed May 21, 1962

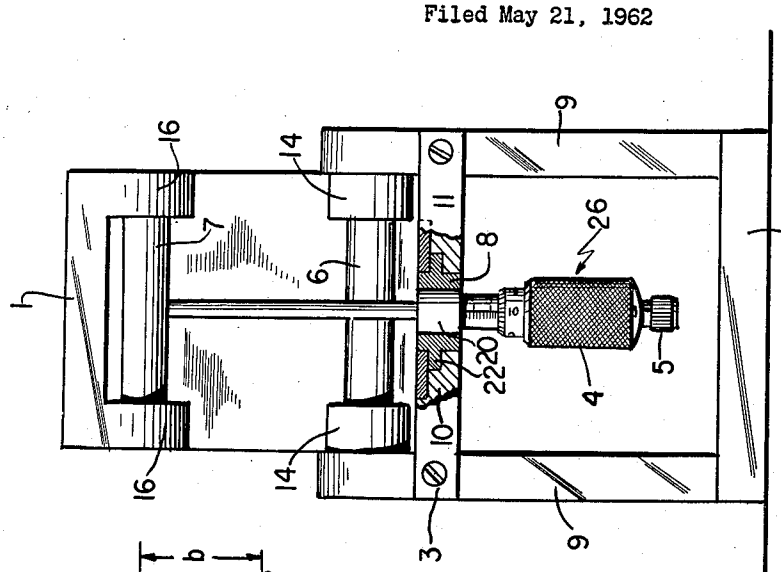


Fig. 2

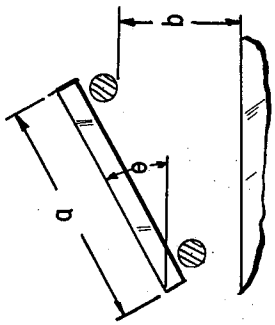


Fig. 3

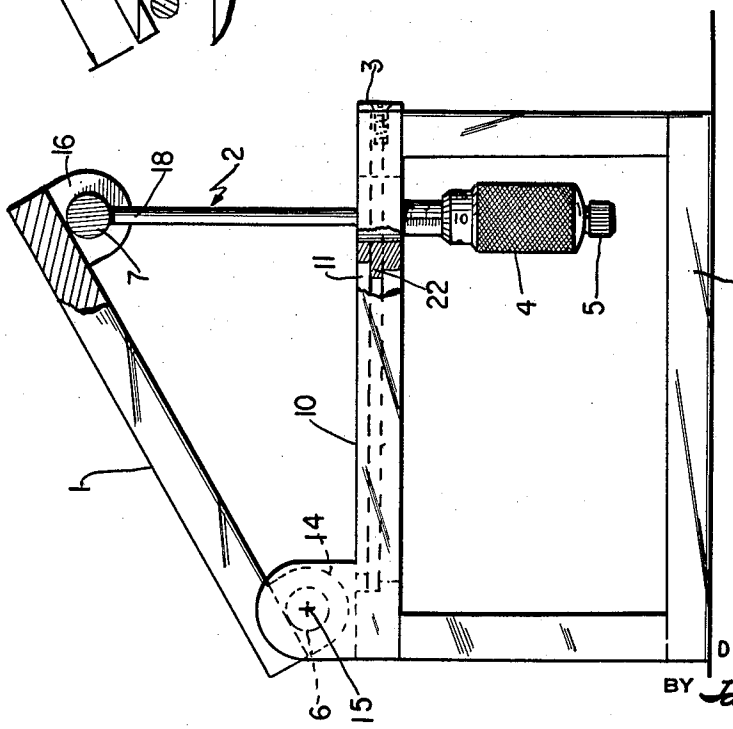


Fig. 1

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MICROMETER ADJUSTED SINE BAR

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This invention relates to precision measuring instruments in general and to a micrometer adjusted sine bar in particular.

An important object of the present invention is to provide a new and improved sine bar for use on metal working tools such as lather, milling machines, planers, shapers, grinders and the like, and to permit testing or inspecting of all kinds of machine work.

Another important object of the invention is to provide an improved sine bar employing a micrometer spindle to accurately establish the leg opposite the angle required to be obtained.

Yet another object of the invention is to provide an improved sine bar employing micrometer spindles of different sizes to vary the necessary lengths of the leg opposite the angle required to be obtained.

Still another object of the invention is to provide an improved sine bar which is simple in construction and manufacture, while of dependable accuracy.

A further object of the invention is to provide a micrometer adjusted bar which may be readily used by those skilled in the art without any previous special instruction.

These and other important objects of the invention will become apparent from the following description when taken in connection with the accompanying drawing illustrating a preferred embodiment of the invention.

It should be understood, however, that these are given by way of illustration and not of limitation, and that various changes in the details, form and arrangements of the parts may be made without departing from the scope of the invention.

In the drawing:

FIG. 1 is a front elevational view, partly in section, of the sine bar;

FIG. 2 is a side elevational view, partly in section, of the sine bar; and

FIG. 3 is a diagrammatic representation of the method of obtaining a desired angle by using the improved sine bar.

Referring now to the drawing in detail, the sine bar according to the invention comprises a longitudinally extending horizontal base **12**, supporting pillars **9**, and a horizontal slide plate **10**, terminating on one end in a pair of upwardly extending, oppositely disposed lugs **14**, provided with aligned circular openings serving as bearings for the swivel post **6** integrally secured to plate **1**, one end of which is thereby pivotable about an axis **15**. The other end of the plate **1** is provided with extensions or lugs **16**, between which is secured a transversely extending fixed post **7** adapted to be supported on the end **18** of spindle **2**. This spindle is vertically displaceable, at a right angle to slide plate **10** in a collar **20** and is also movable horizontally by means of a micrometer support slide **8** in which collar **20** is secured. A horizontal movement of the spindle is effected by means of a micrometer support slide **8** formed with flanges **22** slidable in longitudinally extending slots **24** formed between hold down plates **11** and slide plates **10**. The micrometer device, generally indicated by the numeral **26**, is of known construction and is so calibrated that it permits an accuracy to tenths ($\frac{1}{10,000}$) of an inch in the displacement

of spindle 2, which is better than necessary for 90% of machine shop work.

To use the device according to the invention, the work is held on plate 1 by suitable means, well known in the art. The micrometer spindle **2** is raised to the predetermined height required and slid along slide plate **10**, while the end **18** of the spindle is in contact with and supports fixed post **7**. It will be appreciated that plate **1** will thus assume an angle with the horizontal surface of slide plate **10** which is determined from the following trigonometric equation. In any right triangle ABC, sin $\theta=b/a$, since "a" is known and so is sin θ from the trigonometric tables. For a given angle the bar is to be set to a sin $\theta=b$. This simple computation provides the numerical setting for the micrometer spindle. Sine bars are made standard with $a=5$, 10, 20, for easy computation. In FIG. 3 there is given a diagrammatic representation of the method of employing the device using the above calculation.

Spindles of various lengths may be used to allow for desired heights of the side b of the triangle.

What I claim and desire to secure by Letters Patent of the United States is:

1. A sine bar comprising in combination, a planar member, horizontal support means having an axis on which one end of said member is pivoted, micrometer means for presetting the other end of said member at a predetermined distance from said support to form a desired angle between said member and said support, said other end being displaceable in a circular path about said axis, said micrometer means being slidable on said horizontal support means.

2. A sine bar comprising, in combination, a horizontally extending base, a pair of pillars extending upwardly from said base, a fixed horizontal slide plate mounted on said pillars, a pair of spaced lugs integral with one end of said plate, said lugs having circular openings aligned with one another, a cylindrical swivel post pivotable about a central axis in said openings, a movable plate having one end secured to said swivel post, a fixed cylindrical post secured to the opposite end of said movable plate parallel to said swivel post, said opposite end being displaceable in a circular path about said axis, a vertically adjustable micrometer spindle for supporting said fixed post at a predetermined height from said slide plate, said spindle being slidable laterally on said slide plate.

3. A sine bar comprising, in combination, a horizontally extending base, a pair of pillars extending upwardly from said base, a fixed horizontal slide plate mounted on said pillars, a pair of spaced lugs integral with one end of said plate, said lugs having circular openings aligned with one another, a cylindrical swivel post pivotable in said openings, a movable plate having one end secured to said swivel post, a fixed cylindrical post secured to the opposite end of said movable plate parallel to said swivel post, said opposite end being displaceable in a circular path about said axis, a micrometer support slide displaceable on said fixed horizontal slide plate, a vertically displaceable spindle for supporting said fixed post, said spindle extending through said micrometer support slide, and micrometer means for presetting said spindle to a desired length.

4. A sine bar comprising, in combination, a horizontally extending base, a pair of pillars extending upwardly from said base, a fixed horizontal slide member mounted on said pillars, said slide member having a pair of spaced longitudinal slots, a pair of spaced lugs integral with one end of said member, said lugs having circular openings aligned with one another, a cylindrical swivel post pivotable about a central axis in said openings, a movable plate having one end secured to said swivel post, a fixed cylindrical post secured to the opposite end of said movable

plate parallel to said swivel post, said opposite end being displaceable in a circular path about said axis, a vertically adjustable spindle for supporting said fixed post at a predetermined height from said slide member, said spindle being displaceable laterally on said slide member in said slots and micrometer means calibrated in fractions of an inch for presetting said spindle to a desired length.

5. A sine bar comprising, in combination, a horizontally extending base, a pair of pillars extending upwardly from said base, support means mounted on said pillars, a pair of spaced lugs integral with one end of said support means, said lugs having circular openings aligned with one another, a cylindrical swivel post pivotable about a central axis in said openings, a movable plate having one end secured to said swivel post, a fixed cylindrical post secured to the opposite end of said movable plate parallel to said swivel post, said opposite end being displaceable in a circular path about said axis, said support means comprising a horizontal slide plate, a pair of spaced hold down plates forming with said slide plate longitudinal

grooves, a micrometer spindle support slide displaceable in said grooves, a collar secured in said slide, a vertically adjustable spindle mounted on said collar for vertically displacing said fixed post and micrometer means calibrated in fractions of an inch for presetting said spindle to a desired length.

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