Sept. 30, 1952 M. RABATINE 2,611,971

DIVIDING PROTRACTOR

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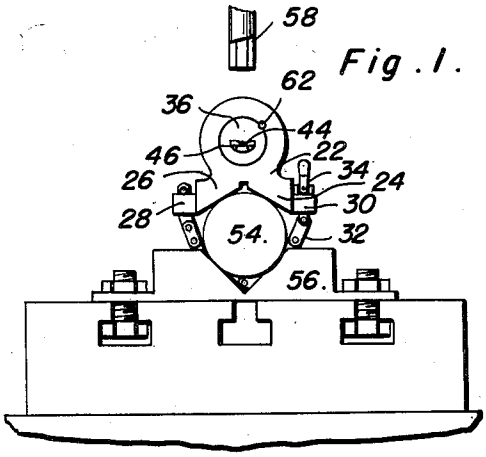


Fig. 1.

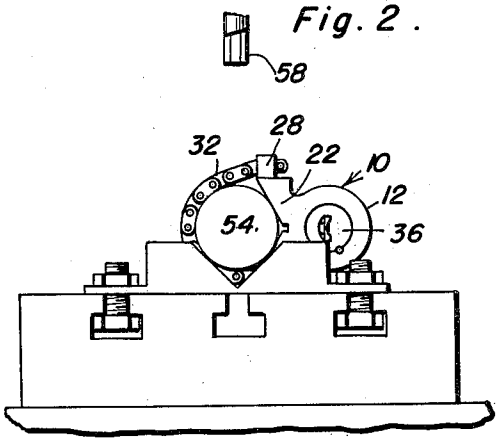


Fig. 2.

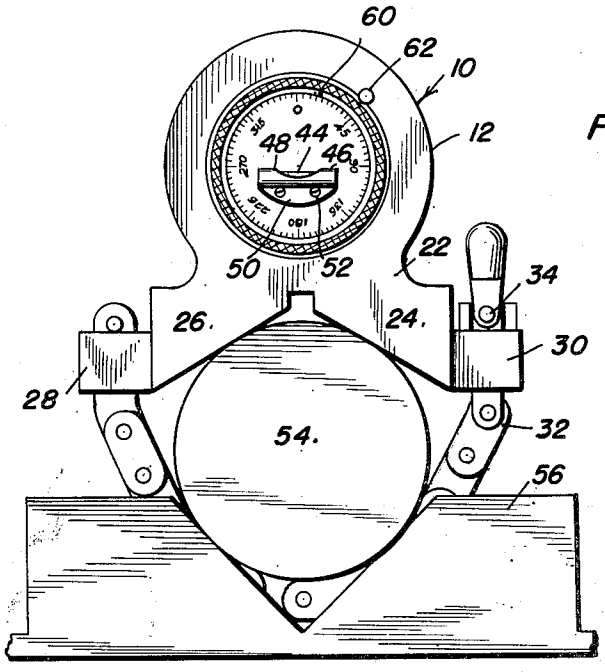


Fig. 3.

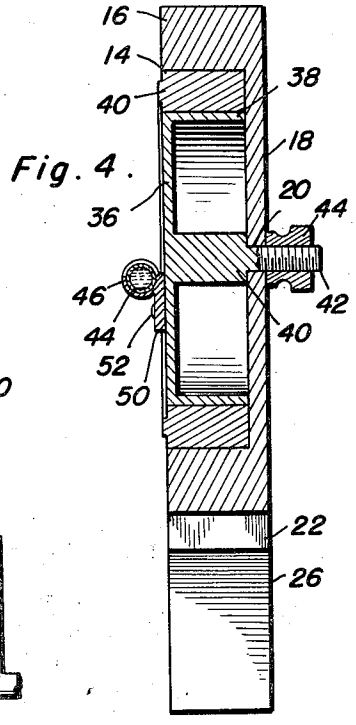


Fig. 4.

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DIVIDING PROTRACTOR

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2 Claims. (Cl. 33—207)

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This invention relates to a device adapted for use in performing successive operations on a work piece and has for its primary object to enable a workman to accurately and conveniently determine the correct distance between and angular relation between working points on a work piece.

Another important object of this invention is to provide a measuring instrument adapted for attachment to a round work piece, such as an axle, shaft, or the like, the instrument allowing the operator to form properly positioned cuts or shapes in the work piece and enabling the operator to determine the proper number of degrees and distances from various working points on the work piece.

Another important object of this invention is to provide a dividing protractor that may be easily attached to shafts of various diameters and which is graduated in degrees and minutes and employs a precision level to enable successive cuts to be made in a work piece at exactly the proper and accurate number of degrees from the first cut.

These and ancillary objects and meritorious features to become more fully apparent upon a perusal of the following description are attained by this invention, a preferred embodiment of which is set forth in the following description and illustrated in the accompanying drawing, wherein:

Figure 1 is a front elevational view of this invention, showing the same in operative association with a round or circular work piece for properly aligning a section thereof with a tool in the machining process or cutting, squaring or drilling the work piece;

Figure 2 is a view similar to Figure 1, showing the dividing protractor and shaft in a position substantially at an angle of ninety degrees to the position of Figure 1 for aligning a second point with the tool;

Figure 3 is an enlarged elevational view of this invention; and

Figure 4 is a vertical sectional view taken through the body portion of the device, as seen in Figure 3.

This invention, generally designated by the reference numeral 10, comprises a circular body section 12 having a central annular recess 14 disposed in the front wall 16 thereof. The back or bottom wall 18 closes off the recess and is centrally apertured, as at 20, for a purpose to be later described.

A saddle plate 22 comprising a pair of opposed,

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downwardly and outwardly inclined blocks 24 and 26 is provided and extends integrally from the periphery of the body section. Lateral extensions 28 and 30 are offset from the blocks and disposed in opposite directions for accommodating a flexible connecting means 32. The extensions are suitably apertured so that one end of the flexible connecting means is fixed or anchored in the extension 28, while the opposite end is adjustably or slidably disposed in the extension 30. Suitable locking means 34 is provided at the adjustable end of the connecting means for locking the same in the desired position.

A circular plate 36 is rotatably mounted in the recess 14 and has an extending annular flange 38 disposed in the recess. A spindle 40 extends from a center point of the inner surface of the plate and terminates in a coaxially reduced, exteriorly threaded end 42 which is disposed through the aperture 20 in the back wall 18 of the body. A knurled locking member 44 is rotatably received on the threaded end 42 of the spindle and functions to lock the plate in the desired position. The outer surface or face of the plate 36 is suitably graduated, forming a 360° dial, the degrees being disposed adjacent the edge of the plate, as seen in Figure 3. An annular ring or band 40 is concentrically disposed about the side wall 38 of the graduated plate 36 and is rotatably received within the recess 14 in rotating engagement with the side wall thereof. A set screw or similar locking device is disposed in the body section, adjacent the recess 14 and functions to lock the ring in adjusted positions with respect to the circular protractor plate 36.

The dial setting ring is provided with a coinciding point 60, inscribed with a zero mark. The zero point is adapted to coincide with the degrees inscribed on the face of the plate 36. A level gauge 44 is disposed in a tubular casing or housing 46 having a cut away portion or section 48 to expose the gauge. The casing is provided with an extending flange 50 which is fixed or secured to the face of the plate 36 by means of screws 52 or other securing means.

In operation, a circular or round work piece, such as a shaft or axle 54, is cradled or disposed in supporting blocks 56 having V-shaped recesses therein for accommodating the work piece. A tool 58, shown in Figures 1 and 2, with the operating mechanism for the tool not shown, is adapted to perform successive operations on the work piece, such as cutting keyways, squaring the shaft or drilling the shaft. In carrying out the successive operations, the dividing protractor

is securely attached to the shaft, at a point which does not interfere with the revolving of the shaft or with the tool **58**. The protractor is secured to the shaft through the medium of the flexible connecting means **32**, which may be a chain, strap or other suitable means, which will prevent the protractor from assuming axial independent movement on the shaft. The flexible connecting means secures the protractor on the shaft in a fixed position and prevents independent rotation of the protractor on the shaft.

The machining process, of course, is adapted to proceed the entire length of the shaft. For example, once the dividing protractor is fastened to the shaft, its position will not be changed, as all adjustments are thereafter made with the graduated dial, the dial setting ring and the precision level gauge. When applying the protractor to the work piece, it is not necessary to set the protractor in any particular position at the initial cut. The graduated face of the protractor is rotated the necessary number of degrees from whatever starting point is selected to mark the successive points. Thus, for example, after the first keyway or hole is cut or the shaft squared or such other operation performed, the protractor is positioned to line up the next point, assuming that the next point to be drilled or the next keyway to be cut is at an angle of ninety degrees around the shaft. The shaft has been rotated, as shown in Figure 2, and by the use of the level and the movable graduated surface **36** of the protractor, the exact ninety degrees can be established and the shaft will then be locked in place and the cutting tool will perform the operation in exactly the right point. If the next cut is to be made at an angle of 180°, the shaft will again be rotated and the protractor will then be positioned upside down, in opposite placement from that shown in Figure 1. Successive operations would then be carried on in a similar manner.

It is to be particularly noted that the initial application of the dividing protractor requires no amount of skill, tools or unnecessary expenditure of time. The protractor is merely fastened on the shaft, the dial is loosened through the medium of the knurled locking nut and the dial is rotated until the level gauge shows the correct point. The dial is then locked through the medium of the knurled nut and the ring locking device **62** is unloosened, to enable the dial setting ring to be rotated. The dial setting ring is then turned, until the zero point **60** registers or coincides with the zero on the dial **36**, at which point the set screw **62** is tightened to lock the ring in the adjusted position.

The dial plate **36**, prior to the second cutting or squaring operation, is turned ninety degrees for the cutting of the second keyway or the like. The level on the face thereof is employed at each operation to determine when the shaft is in the proper position for the next cut.

Of course the same procedure applies if the shaft is being drilled, bored, reamed, or otherwise shaped or formed.

In this respect, it is to be apparent that various changes in form and function of this device may be carried out within the spirit of this invention and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A measuring instrument for marking working parts on a rotatable work piece, said measuring instrument comprising a circular body section having a central circular recess in one side, a saddle plate integrally formed with said body, lateral extension plates on said saddle plate, flexible connecting means carried by said extension plates for locking the body on the work piece, a circular protractor having a peripheral flange rotatably mounted in said recess, a complementary annular ring surrounding the peripheral flange of said protractor and received in said recess for rotation about said protractor, said ring having a zero point thereon for selectively registering with indicia on said protractor, means carried by said body and engaging the ring to retain the latter in a selected rotated position, and means operatively connected to said protractor for retaining ahe protractor in a selected rotated position with respect to the zero point on said ring.

2. In a measuring instrument for marking working parts on a rotatable work piece, a circular body section having a central circular recess in its front side and a central aperture in its back side entering said recess, a circular protractor having a peripheral flange received in said recess for rotation therein, said protractor including a flat outer indicia bearing face and a spirit level supported on said indicia bearing face, a spindle extending from the inner face of said protractor and engaging the inner wall of the recess about said aperture, said spindle including a reduced externally threaded extension projecting through said aperture, a nut located behind the body section and threaded on said extension, an annular ring surrounding the peripheral flange of said protractor and received in said recess for rotation about said protractor, said ring having a zero point thereon for selectively registering with indicia on said protractor, and means supported by the body section engaging the ring to retain the ring in a selected rotated position relative to said protractor.

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