

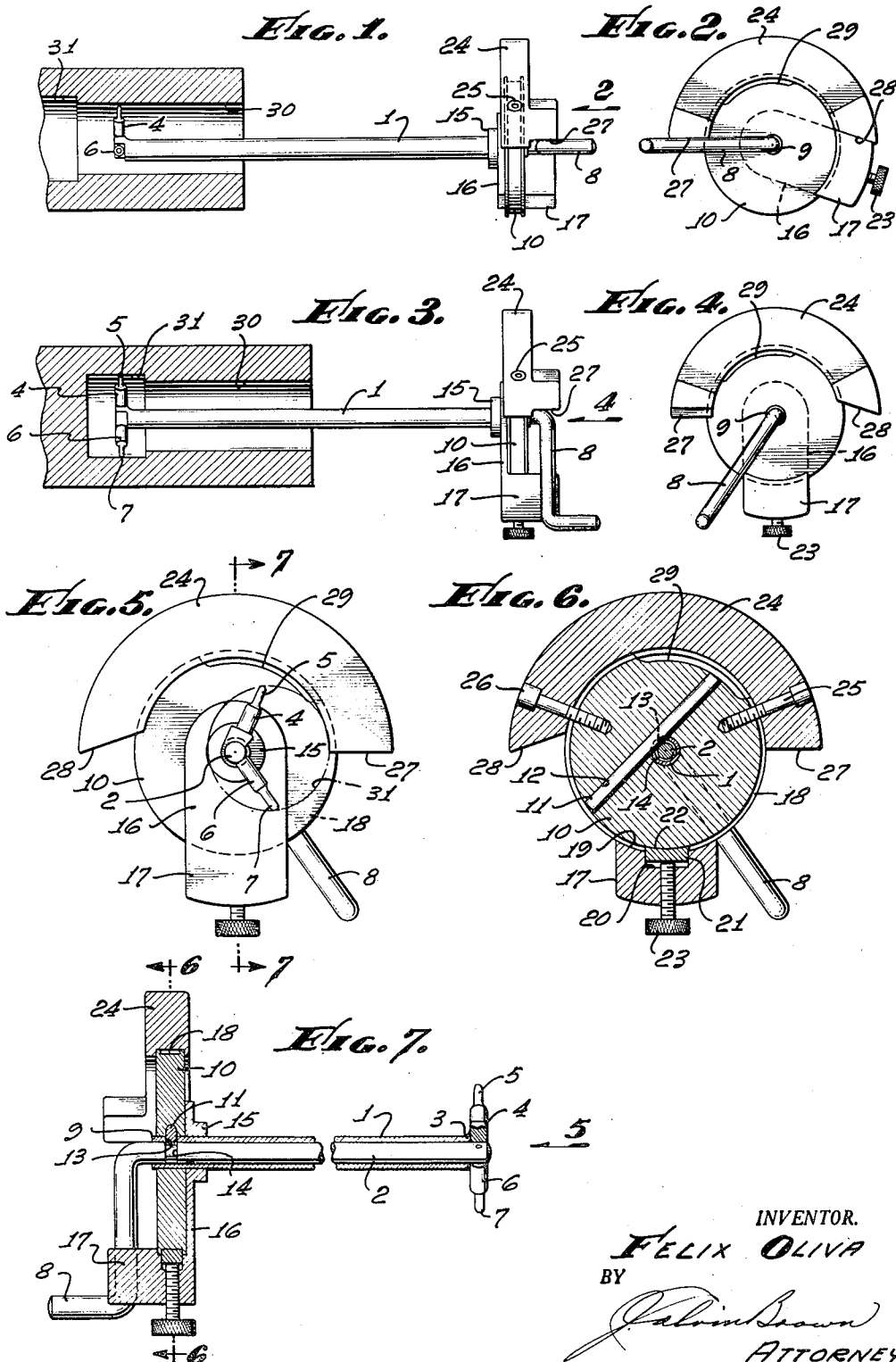
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STEM CALIPER

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STEM CALIPER

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5 Claims. (Cl. 33—143)

The present invention relates to measuring devices of the type which readily measure the diameters of holes, the depth of grooves, and in fact any type of opening generally, as well as measuring recesses, grooves, or undercuts, such as may occur in the walls of holes or bores.

An object of the invention is the provision of a simple, inexpensive, foolproof device so constructed and arranged as to readily enter a recess or cavity to measure the same, and which is then contractible for removal from the cavity, followed by again operating the device to give the exact dimension of the recess or cavity.

The present invention is so constructed as to be rugged, capable of rough handling, and still productive of accurate measurements.

Other objects and advantages of the invention will suggest themselves to those, such as machinists, tool makers, who have use for a device of this character.

In the drawing:

Figure 1 is a side elevation of the measuring device shown partly within a bore provided with an enlarged inner recess, the diameter of which recess is to be measured by the device,

Figure 2 is an end elevation looking in the direction of the arrow 2 of Figure 1,

Figure 3 is a view similar to Figure 1, the arms of the tool engaging the wall bounding an inner recess or cavity,

Figure 4 is an end elevation of the device shown in Figure 3, and looking in the direction of the arrow 4,

Figure 5 is an end elevation of the measuring device looking in the direction of the arrow 5 of Figure 7,

Figure 6 is a sectional view on the line 6—6 of Figure 7, and

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

Referring now with particularity to the drawing, and specifically to Figures 6 and 7, I provide an elongated tube or sleeve 1, within which is a rod or tube 2, and which rod or tube extends beyond the ends of tube 1. The outermost end 3 of tube 1 carries a radial arm 4 formed with a reduced diameter work-engaging portion 5. The outermost end of rod 2 is provided with an arm 6, having a work-engaging portion 7, and each arm has the same radial length. The rod 2 is so formed as to have a crank arm, designated generally as 8, whereby the rod 2 may be rotated to thereby rotate the arm 6 relative to arm 4. Carried by the tube 1 adjacent its end 9 is a disk 10, with disk is secured to the tube 1 by means of a pin 11 passed through bore 12 in the said disk. As shown in Figure 6, the bore 12 is along a chord of said disk. As shown in Figure 6, the bore 12 is so positioned relative to tube 1 and rod 2 that when the pin 11 is inserted in said bore, the pin will pass through a notch 13 in the sleeve and be received within an annular groove 14 of rod 2. In this manner, rod 2 may rotate within tube 1, while relative longitudinal movement therebetween is prevented. An enlarged boss 15 is loosely carried on the sleeve or tube 1 and depending from said boss is a plate 16 carrying an offset en-

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larged block 17. This offset enlarged block 17 extends toward the crank 8 so as to limit rotation of the crank, as hereinafter set forth. The disk 10 has its circular edge provided with an annular groove 18. The block 17 has its edge adjacent the circular edge of the disk curved as shown in Figure 6, at 19, to conform to the curvature of the disk and said disk is provided with a recess opening inwardly of the block from said curved edge 19, as shown at 20, and within said recess is confined a shoe 21 which is received within the annular groove 18. This shoe has a curved foot 22 conforming to the curvature of the annular groove. A screw 23 is passed through a threaded opening in the block 17 for engagement with the shoe 21 for forcing the shoe into tight engagement with the said disk. Any type of head may be provided for the screw.

Secured to the disk 10 is an annular sector 24, the inner curved edge of said annular sector conforming to the curvature of the disk, there being means, such as screws 25 and 26 radially passed through bores of the sector and tapped within the disk. The arc of the sector is such as to have two abutments or stops at 27 and 28, the space between said stops covering an arc of 180° or greater.

The said disk 10 is provided with a cut-away portion 29 adjacent the rim of said disk. This cut-away portion is for the purpose of allowing the disk to be removed from the remaining parts of the device, as hereinafter set forth in the statement of the operation.

The operation, uses and advantages of the device are as follows:

The operator of the device grasps the annular sector in one hand, releases screw 23 so that shoe 21 may move freely within the annular groove 18, followed by rotation of the crank 8 to revolve arm 6 to a position adjacent arm 4. The operator then inserts the arms in the bore 30 of the work until the said arms reach the recess or cavity 31, the diameter of which is to be measured. The operator holds the tube 1 as near central or axial of the bore 30 as is possible. After the arms 4 and 6 have entered the cavity, as shown in Figure 3, the crank arm 8 is rotated so as to cause a swinging of the arm 6 away from arm 4, to bring the work-engaging portions 5 and 7 into engagement with the wall of the cavity or recess 31, see Figure 5. The block 17 is then moved into engagement with the crank arm whereupon the screw 23 is rotated to force the shoe 21 into locking engagement with the disk 10. The crank arm is then rotated to cause approach of the two arms 4 and 6, and permit withdrawal of the tool from cavity or recess 31 and the bore 30. Thereafter, the crank arm is rotated to a position adjacent the stop block 17 which spreads the arms to the position assumed thereby when within the recess or cavity 31. The operator, by means of a micrometer, calipers, or other device, determines the spacing between the ends of the work-engaging portions 5 and 7 of the arms 4 and 6, thus determining the exact dimension of the cavity or recess.

The annular sector 24, in addition to being a convenient member to be grasped by the operator, provides end stops 27 and 28 for limiting swinging movement of the crank arm and the stop block 17.

It is within the purview of the present invention to provide arms including the work-engaging portions of various radial lengths so as to accommodate the present tool to the measurement of very small or very large recesses or cavities.

In the event it is desired to disassemble the device, the screws 25 and 26 may be removed, the shoe 21 released from its pressure engagement therewith, with the disk then rotated until the cut-out 29 reaches the shoe, which

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cut-out will permit the disk to be separated from tube 1 when pin 11 is removed from bore 12.

Any worn parts of the device are readily replaceable as all parts may be easily disassembled.

I claim:

1. A gauge of the character disclosed, including a pair of elongated telescopic members, the outer ends of which are provided with laterally projecting work-engaging arms lying in the same plane, one member of said pair provided with a crank arm, a disk secured to the other member of said pair and positioned transverse of said member, a swing block rotatably carried on one member of said elongated pair of members and adapted to lie in the path of movement of the crank arm to limit rotative movement thereof, and a braking means for said swing block releasably engaging the periphery of said disk, said crank arm when rotated in one direction, causing approach of the laterally projecting work-engaging arms and when moved in a second direction, causing separation between said arms, the said swing block limiting said separation.

2. In a device of the character disclosed, an elongated rod provided at one end with a crank arm, a laterally projecting work-engaging arm carried by the opposite end of said rod, a sleeve on said rod, one end of which is

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provided with a laterally projecting work-engaging arm contiguous to the work-engaging arm on said rod, a disk secured at the opposite end of said sleeve, a stop block swingingly mounted on said sleeve adjacent the said disk, and lock means between the said disk and said stop block for adjusting the position of said stop block relative to the disk, the said stop block adapted to engage the crank arm to limit its rotation in one direction.

5 3. The device as set forth in claim 2, and an annular sector carried on the rim of said disk, the spacing between ends of the sector being substantially 180° apart, and one end of said sector forming an abutment for engaging the crank arm to limit its rotation in one direction.

10 4. The device as set forth in claim 2, characterized in that means is provided permitting relative rotation between the sleeve and the said rod while preventing coaxial movement therebetween.

15 5. The device as set forth in claim 1, characterized in that the said braking means between the said disk and the said swing block includes a shoe for reception within an annular groove in the rim of said disk, and screws means passed through the said swing block engaging said shoe.

No references cited.