No. 715,445. Patented Dec. 9, 1902.

I. A. WHITE.

CENTERING GAGE.

Application filed Mar. 15, 1902.

(No Model.)

Fig. 1.

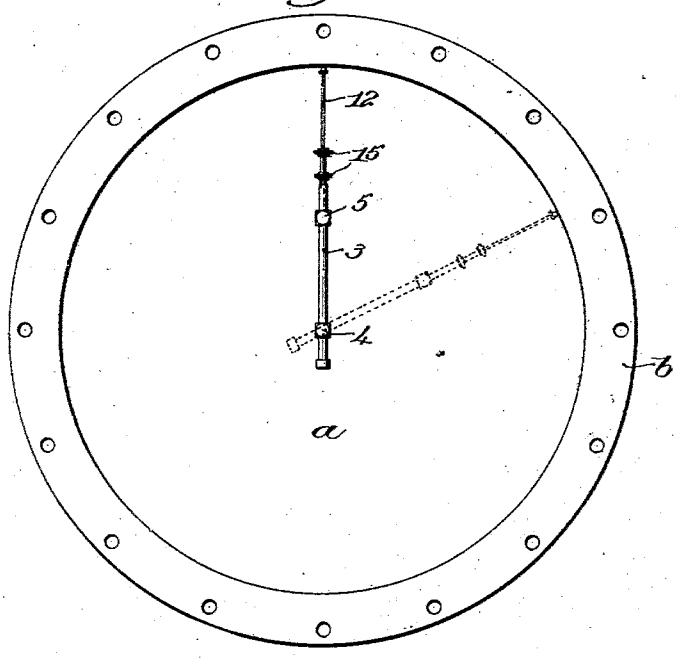


Fig. 2.

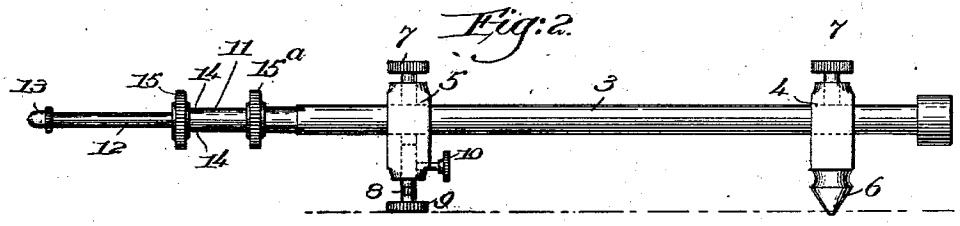
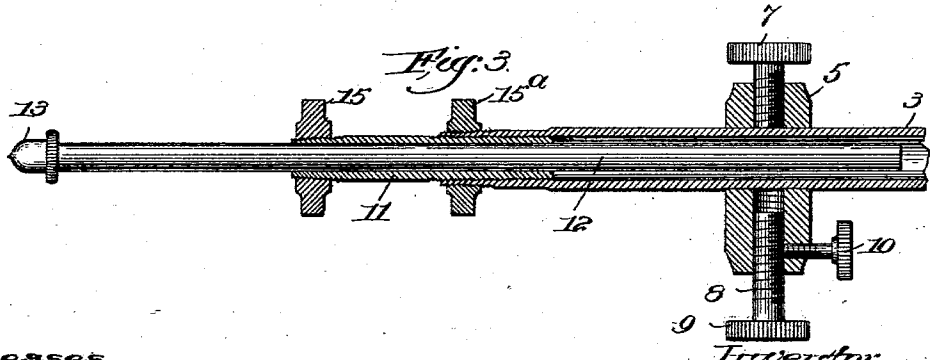


Fig. 3.



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UNITED STATES PATENT OFFICE.

IRVING A. WHITE, OF KEENE, NEW HAMPSHIRE.

CENTERING-GAGE.

SPECIFICATION forming part of Letters Patent No. 715,445, dated December 9, 1902.

Application filed March 15, 1902. Serial No. 98,388. (No model.)

To all whom it may concern:

Be it known that I, IRVING A. WHITE, a citizen of the United States, residing at Keene, in the county of Cheshire and State of New Hampshire, have invented an Improvement in Centering-Gages, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention has for its object to provide a gage which is especially adapted for centering a body within a cylindrical inclosure—as, for example, a piston within a cylinder; and the invention comprises certain novel features which will be hereinafter more fully described, and pointed out in the claims.

Figure 1 is an end view of a cylinder, showing the manner in which my gage is used for centering a piston therein. Fig. 2 is an elevation of my improved gage; and Fig. 3 is a central sectional view, on an enlarged scale, of one end of the gage.

The gage comprises a suitable body portion 3, which is preferably tubular and which has adjustably mounted thereon blocks 4 and 5, the block 4 being a centering-block and carrying a conical center 6, which projects at right angles to the length of the body, and the block 5 being a guide-block or rest which is adapted to engage the face of the device being centered and to hold the body of the gage with its length substantially perpendicular to its axis of rotation.

The blocks 4 and 5 are held in any desired or adjusted position upon the body by means of ordinary set-screws 7. The block 5 is preferably adjustable, so that the distance of the body from the face of the device being centered may be adjusted, and for this purpose the set-block has an adjustable foot portion, shown as a set-screw 8, having a head 9 adapted to rest upon the work, as is shown in dotted lines, Fig. 2. By turning the screw one way or the other the body of the gage may be lifted or brought nearer the work, as desired, and preferably a stud or clamping-screw 10 will be employed to hold the foot portion in adjusted position.

One end of the body 3 carries an adjusting-sleeve 11, which in this embodiment of my invention is shown as being screw-threaded into the end of the body.

An extension body member or arm 12 projects through and is supported by the adjusting-sleeve, said member having at one end a head 13, which is adapted to engage the interior of the cylinder, as will be presently described.

Suitable means are provided for clamping the extension member to the adjusting-sleeve and also for clamping the adjusting-sleeve to the body 3, and as one convenient way of accomplishing this I have shown the ends of the adjusting-sleeve and the body, respectively, as being slitted, as at 14, and provided with tapering screw-threaded portions which coöperate with clamping-nuts 15 15^{a}. When the said clamping-nuts are backed off, the split end portions of the sleeve and the body expand sufficiently so as to allow of the extension member 12 being adjusted longitudinally of the sleeve and the sleeve adjusted in the body, and when the desired adjustment is made these parts may be clamped in position by turning up the clamping-nuts, as will be obvious.

In centering a piston *a* within a cylinder *b* or any body within a cylindrical inclosure the center 6 will be placed in the center of the piston or body to be centered, as shown in Fig. 1, and the rest or guide-block 5 will be adjusted longitudinally of the body until it is brought into a position to rest against a zone of the body having a smooth surface. (See dotted lines, Fig. 2.) The clamping-nut 15 will be loosened to allow of the extension member 12 being drawn out until the head 13 thereof engages the inner wall of the cylinder *b*. The clamping-nut will then be tightened to lock the member 12 in its adjusted position, and the gage will be turned about the center 6, as indicated in dotted lines, Fig. 1.

If the piston or body *a* is properly centered within the cylinder, the head 13 will contact with the inner wall of the cylinder during the entire sweep of the gage; but if the piston is eccentrically situated the path of movement of the end of the head will be eccentric to the interior wall of the cylinder, and consequently the head will lose its contact with the wall when the gage has made a partial revolution. After making a half-revolution the amount of eccentricity may be determined

by loosening the clamping-nut 15ª and adjusting the sleeve 11 to bring the head 13 again against the wall of the cylinder. If a piston is being centered and it is found that it is eccentrically placed, the piston-rings may be adjusted to bring the piston more nearly into its central position, when a second test may be made, as described above.

By employing the adjusting-sleeve 11 I can make accurate and fine adjustments of the distances between the head 13 and the center 6, for after the member 12 has been extended to approximately the right distance and has then been clamped to the sleeve the fine extra adjustment may be accomplished by loosening the nut 15ª and then turning the sleeve, the screw-threaded engagement between the sleeve and body serving to advance or retract the sleeve, according to the direction of its turning movement, and because the sleeve is clamped to the extension member by the nut 15 said member is advanced or retracted with the sleeve.

While I have herein shown one mechanism embodying my invention, I do not wish to be limited in all details to the construction shown, as various changes may be made without departing from the spirit of my invention.

Having described my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A centering-gage having a tubular body provided with a center, a guide or rest mounted directly upon the body and serving to maintain the latter substantially perpendicular to the axis of rotation, an extension member having a telescopic connection with the body of the gage, and an adjusting device to positively adjust the extension member longitudinally of the body in either direction.

2. A centering-gage having a tubular body provided with a center, an adjustable guide or rest slidably mounted on the body and serving to maintain the latter with its length perpendicular to the axis of rotation, means to secure the guide in any adjusted position, an extension member having a telescopic connection with the body of the gage, and means to positively adjust the extension member longitudinally of the body.

3. A centering-gage having a hollow body, a center block adjustably mounted thereon and having a center at right angles to the length of the body, a guide-block or rest also adjustably mounted on the body, said guide-block or rest being adjustable to vary the distance of the gage from the surface against which it rests, an extension member having telescopic connection with the body and adapted to have its end engage the surface whose curvature is to be tested, and means to positively adjust said extension member longitudinally of the body.

4. A centering-gage having a tubular body, an extension member having a telescopic connection with said body, an adjusting-sleeve through which said extension member passes, said sleeve having a screw-threaded engagement with one end of the body, means to clamp the extension member to the sleeve in any desired position, and means to clamp the sleeve to the body, the said sleeve providing means for positively adjusting the extension member longitudinally of the body in either direction.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

IRVING A. WHITE.

Witnesses:
H. M. HAINES,
U. S. MADDEN.