E. J. BRYANT AND C. G. JOHNSON.

RING THREAD GAUGE.

APPLICATION FILED MAR. 1, 1919.

1,433,528. Patented Oct. 31, 1922.

Fig. 1.

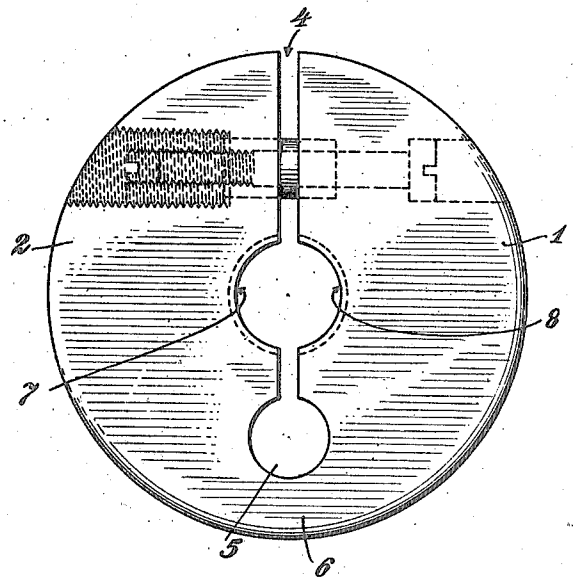


Fig. 2.

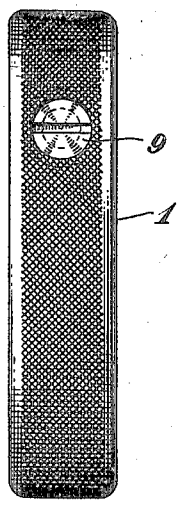


Fig. 3.

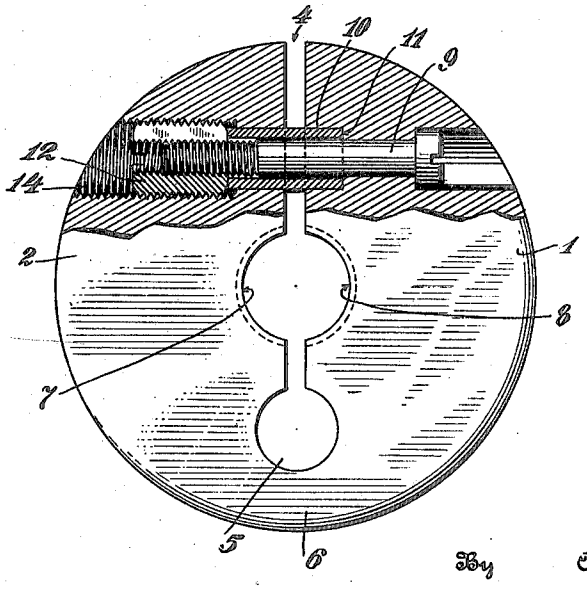
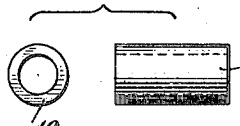


Fig. 4



Fig. 5.



Elmer J. Bryant
Charles G. Johnson
Inventors

By Attorney George Rauney

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UNITED STATES PATENT OFFICE.

ELMER J. BRYANT AND CHARLES G. JOHNSON, OF WOONSOCKET, RHODE ISLAND, ASSIGNOR TO THE TAFT-PEIRCE MANUFACTURING COMPANY, OF WOONSOCKET, RHODE ISLAND, A CORPORATION OF RHODE ISLAND.

RING THREAD GAUGE.

Application filed March 1, 1919. Serial No. 280,094.

To all whom it may concern:

Be it known that we, ELMER J. BRYANT and CHARLES G. JOHNSON, citizens of the United States, residing at Woonsocket, in the county of Providence, State of Rhode Island, have invented certain new and useful Improvements in Ring Thread Gauges, of which the following is a specification.

This invention relates broadly to small tools and more particularly to gauges.

The principal object of the present invention is a ring thread gauge of the adjustable type and with adjustment devices constructed to produce the desired adjustments with the minimum distortion and the maximum rigidity when the adjustment is completed.

Another object of the present invention is a ring thread gauge as specified wherein the adjustment members are constructed in such manner as to localize both the limiting and the adjusting forces to one place on the gauge thereby avoiding distortion and unequal stresses.

A still further object of the present invention is a gauge of the character specified and wherein the limiting and the adjusting devices are arranged coaxially in such manner that forces resulting from the action of these members are substantially co-linear forces.

A still further and important object of the present invention is a ring thread gauge of the character specified wherein the clamping and adjusting mechanism is substantially a unitary structure adapted to be adjusted and locked upon itself in such manner as to obviate distortion of the jaws of the gauge.

This invention possesses many other and advantageous features some of which, together with the foregoing, will be set out more at length in the following description wherein will be outlined in full that form of the invention which we have selected for illustration in the drawings accompanying and forming a part of the present specification.

In the drawings and specification we have described only the preferred form of our generic invention and it is to be understood that we do not limit ourselves to such form because our invention may be embodied in a multiplicity of forms each being a species of our invention, it being understood by the claims succeeding the description of our invention that we desire to cover the invention in whatsoever form it may be embodied or practiced.

Figure 1 is an enlarged plan view of one form of our invention.

Figure 2 is a side view of our invention.

Figure 3 is a detail view showing a portion of the device in section to more clearly illustrate the adjusting arrangement.

Figure 4 is a detail view of the clamping nut.

Figure 5 is a detail view of the locking sleeve.

Gauges which are used in the manufacture of standard devices necessarily are subjected to a great deal of wear and particularly is this true with reference to the gauging of certain materials, for example aluminum. Materials such as aluminum appear to carry very hard crystals which very quickly cut or wear the faces of the gauges so that the gauges quickly become distorted and the dimensions enlarge beyond the limits of tolerance so that the gauge can no longer be used for the purpose intended. Excessive wear is particularly noticeable upon thread gauges which necessarily require considerable movement or engagement with the work in order to apply the gauge. With a thread gauge it is necessary that the gauge be run down upon the threads being tested, which requires several rotative movements of the gauge, whereas an ordinary cylinder guage would be subjected to considerably less wear than is the thread gauge since such a gauge merely slips over the work, rather than being in extended engagement therewith.

It is extremely important in the manufacture of standard threads that the gauges be maintained strictly within the limits of tolerance. To obviate replacement of gauges due to this rapid wear various types of adjustable gauges have been developed, the general form comprising a rigid body cut in such manner as to provide a plurality of spring segments with a clamp screw bolt member for drawing the segments together and an independently located screw bolt stop member for limiting the drawing movement. The fact that the

stop is applied at one part of the jaw and the clamp screw is applied at a different part of the jaw causes the action of these members to operate as power and fulcrum members and produces a lever action which may gradually change the set of the gauge after it is once adjusted. Furthermore, since the stop for limiting the movement of the jaws and the clamp which holds the jaws to the limit set are operative at different points, there is also a tendency of the forces set up to distort the gauge and thereby destroy its accuracy to the extent of the distortion.

The gauge comprising the present invention overcomes the difficulties of the known art by arranging the clamping screw and the limiting stop in such manner that the forces produced are co-linear and are applied to the same part of the gauge so that all lever action is obviated and there is no tendency to distort the gauge since the several forces are applied substantially to one part of the gauge. This arrangement also facilitates manufacturing the gauge in that the metal of the gauge is substantially uniform in each jaw and any distortion due to aging of the metal is substantially uniform. Furthermore, the arrangement is simple and very compact so that when an adjustment is once made, the adjustment is rigid and secure. There being but one fastening member for both the limiting device and the clamp screw, the liability of parts to work loose and thereby change the set of the gauge is also minimized.

Referring now more especially to the form we have chosen as illustrative of our invention, the gauge comprises a journal portion which may be divided into wings 1 and 2 by means of a slot 4 which may terminate in a suitable opening 5 to produce spring metal as at 6 so that adjustment of the jaws may be facilitated. Preferably the gauge faces 7 and 8 are provided in the central portion of the wings 1 and 2 and are substantially concentric to the edges of the gauge so that the metal around the gauge faces is substantially uniform.

Adjacent the free end of the wings 1 and 2 the gauge is drilled to provide an opening through which a clamp screw 9 is adapted to extend. A limit sleeve 10 is constructed to fit over the clamp screw 9 and to be seated against the shoulder 11. This limit sleeve 10 extends into the opposite wing and is adapted to abut against the clamp nut 12 which preferably is slotted. The threaded end of the clamp screw 9 tightly fits the locking nut 12 so that it tends to expand this member and clamp the same against rotation in the threaded opening 14.

When the parts are set in the adjusted position just described it will be noted that the clamp screw 9 is under tension and comprises a tension member, while the sleeve 10 is under compression and comprises a compression member. Thus when the gauge is adjusted the tension and compression members are concentric, which produces a balancing of the adjustment forces in a manner that is very desirable and is substantially necessary to provide stable conditions in the gauge.

By the foregoing construction it will be seen that the clamp nut 12 may be adjusted by meanns of a suitable tool such as a screw driver so that the clamp nut is slightly moved away from the end of the locking sleeve 10. The clamp screw 9 is then tightened by driving this screw into the lock nut 12 until the jaws 1 and 2 are drawn together sufficiently to tightly clamp the limit sleeve 10 between the lock nut 12 and the shoulder 11 at which time the adjustment is completed.

As previously explained, it is to be noted that the forces established by this adjustment are linear forces and are all localized in such manner that there is no tendency to distort the gauge after it is once set.

Having described our invention, what we claim is:

1. A device of the character described comprising a piece of resilient material having a gauge face formed in the middle portion of said piece in such manner that the material is substantially uniform around the gauge face, said piece being provided with a slot extending across said gauge face in such manner that the sides of the gauge face may be displaced by expanding or contracting the slot, in combination with adjustable means for expanding or contracting said slot and comprising a compression member and a tension member arranged to have a common axis.

2. A device of the character described comprising a substantially circular piece of resilient material having a gauge face formed in the middle portion of said piece in such manner that the material is substantially uniform around the gauge face, said piece being provided with a slot extending across said gauge face in such manner that the sides of the gauge face may be displaced by expanding or contracting the slot, said slot terminating in a circular opening, in combination with adjustable means for expanding or contracting said slot and comprising a compression member and a tension member arranged to have a common axis and with said tension member adapted to be clamped rigidly when the gauge is adjusted.

3. A device of the character described comprising a piece of resilient material having a gauge face formed in the middle of said piece, said piece being provided with a slot extending across said gauge face

in such manner that the sides of the gauge face may be displaced by adjusting the width of the slot, in combination with adjustable means for adjusting said slot and comprising a tubular compression member, and a tension member mounted within and slidable through said tubular compression member.

4. A device of the character described comprising a piece of resilient material having a gauge face formed in the middle of said piece, said piece being provided with a slot extending across said gauge face in such manner that the sides of the gauge face may be displaced by adjusting the width of the slot, in combination with adjustable means for adjusting said slot and comprising a tubular compression member, a tension member mounted within and slidable during adjustment through said tubular compression member, and an adjustable abutment for the compression member.

5. A thread gauge comprising a body having a pair of wing portions which carry a part of a gauge face, resilient material connecting said wing portions in such manner as to provide a slot severing a portion of the gauge face, in combination with adjustable means for said wing portions, said adjustable means comprising a stub screw extending through a smooth opening in one wing portion and extending into an opening in the other wing portion, said last mentioned wing portion being provided with screw threads, a screw threaded nut adapted to cooperate with the threads in said wing portion and with threads on said stub screw to permit said stub screw to be rotated for adjustment and to permit said nut to lock said stub screw in adjusted position.

6. A device of the character described having a pair of wing portions each carrying a part of a gauge face, resilient material connecting said wing portions, in combination with adjustable means for said wing portions, said adjustable means comprising a stub screw extending from one wing portion to the other, a tubular stop member around said screw, and an adjustment nut with which said stub screw is adapted to be engaged.

7. A device of the character described comprising a gauge member formed with a pair of wing portions, resilient material connecting said wing portions, in combination with adjustable means for controlling the relation between said wing portions, said adjustable means comprising a tension screw and a stop member, said tension screw and stop member being constructed to establish co-linear forces to obviate distortion of the gauge.

8. A device of the character described comprising a gauge member formed with a pair of wing portions, resilient material connecting said wing portions, in combination with adjustable means for controlling the relation between said wing portions, said adjustable means comprising a tension screw and a stop member, an abutment for said stop member, said tension screw and said stop member being constructed to establish co-linear forces to obviate distortion of the gauge when said stop is clamped against said abutment.

9. A ring thread gauge comprising a substantially circular body portion, with a gauge surface in the middle of said body portion, said gauge surface being bisected by a slot in the body portion of the gauge and dividing the same into wings, a tension screw extending across said wings, and a nut with which said tension screw engages, and a tubular stop adapted to be engaged by said nut and comprising a rigid abutment against which said nut is adapted to be seated by said tension screw.

10. A ring thread gauge comprising a substantially circular body portion with a gauge surface in the middle of said body portion, said gauge surface being bisected by a slot in the body portion of the gauge and dividing the same into wings, a tension screw extending across said wings, and a nut with which said tension screw engages, and a tubular stop around the tension screw and adapted to be engaged by said nut and comprising a rigid abutment against which said nut is adapted to be seated by said tension screw in such manner as to avoid side stresses on the gauge.

11. A thread gauge of the character specified comprising a substantially circular body portion having a gauge face formed in the middle of said body portion, said body portion being slotted across the gauge face in such manner as to provide a pair of resilient wings, an adjustment screw extending between said wings, and at substantially right angles to the plane of the slot, a lock nut with which said adjustment screw is adapted to engage, said lock nut being slotted and being adapted to be expanded by said adjustment screw in such manner as to lock said nut against rotation.

12. A thread gauge of the character specified comprising a substantially circular body portion provided with gauge faces formed in the middle of said body portion, said body portion being slotted in such manner as to provide resilient wings, an adjustment screw extending between said wings, a lock nut with which said adjustment screw is adapted to engage, said lock nut being slotted and being adapted to be expanded by said adjustment screw in such manner as to lock said nut against rotation, and a rigid stop against which said nut is adapted to be drawn by said screw.

13. A thread gauge comprising in com-

bination a body portion formed into resilient wings by being intersected by a slot, said body portion being provided with gauge faces on each side of said slot, and adjustment means extending across said slot, said adjustment means comprising a tension member and a compression member adapted to establish substantially co-linear forces thereby obviating distortion of the said gauge.

14. A gauge comprising adjustable portions provided with gauge faces, one of said portions being provided with a smooth surfaced opening and the other of said portions being provided with a screw threaded opening, a bolt extending through said openings and being carried by the portion provided with the smooth opening therein, a stop collar surrounding a portion of said bolt, and a lock nut provided with both exterior and interior threads, with the exterior threads engaging the threads in said threaded opening and the interior threads engaging the threads on said bolt whereby the gauge faces may be adjusted by the setting of said nut in said portion and by operating said bolt to draw said nut against said collar and placing said collar under compression between the nut and the portion carrying the bolt.

15. A gauge comprising adjustable members each provided with a portion of a gauge surface thereon, said members being provided with axially aligned openings, a shoulder formed upon one of said members, a bolt extending through the said openings and joining said members, a collar surrounding said bolt and adapted to be seated against said shoulder, a nut threaded both exteriorly and interiorly, threads provided in the opening of one of said members, said nut being adapted to be screwed into said member and adjusted therein, and said bolt being adapted to be screwed into said nut to draw said nut against the end of said collar and clamp the collar against said shoulder whereby said members are rigidly and securely held in adjusted positions.

16. A thread gauge comprising a body portion comprising a pair of adjustable members carrying portions of a gauge surface, said members being provided with openings and with the opening in one of said members being screw threaded, a bolt, a stop collar around said bolt and adapted to abut against one of said members, a nut threaded upon both the exterior and interior and adapted to be screwed onto said screw threads in said opening and the interior threads of said nut adapted to receive the threaded end of said bolt in such manner that when said nut is adjusted in said opening said bolt operates to clamp the collar between the nut and the member carrying the bolt, thereby securely holding said members in predetermined adjusted positions.

17. An adjustable thread gauge comprising a body portion provided with adjustable members carrying gauge faces, said members having axially aligned openings with one of said openings being screw threaded, the opening through the other member being of different diameters in different portions to provide opposed abutment shoulders, a bolt having a shouldered head adapted to cooperate with one abutment shoulder, a stop collar around said bolt and being adapted to cooperate with the other abutment shoulder, a nut screw threaded both exteriorly and interiorly and being adapted to be adjustable on the screw threads in said member and to receive the screw threaded end of said bolt to clamp said collar between said nut and said last mentioned shoulder.

18. A thread gauge comprising a body portion provided with a plurality of jaws adapted to be adjustable, said jaws carrying gauge surfaces and being provided with axially aligned openings, a portion of one of said openings being screw threaded a bolt extending through said openings and being provided with a head, a shoulder provided in one of said openings and against which said head is adapted to be seated, a nut threaded exteriorly and interiorly and adapted to be adjusted in said screw threaded opening, said bolt being adapted to be screw threaded into said nut to cause said nut to draw the jaw in which it is seated toward the jaw against which the head of the bolt seats and stop means for limiting said drawing movement.

19. The combination in a female gauge, of an adjustable split body having an interior gauge surface adapted to contact with parts to be gauged, and two exteriorly threaded alined screws provided respectively at their opposite outer ends with means whereby they may be turned, one screw being adapted to separate the ends of the body adjacent the split and thereby increase the effective size of the gauge and the other screw being adapted to draw together the said ends of the body and thereby reduce the effective size of the gauge.

20. The combination in a female gauge, of an adjustable split cylindrical body provided with alined apertures therein adjacent the split and having an interior gauge surface adapted to contact with parts to be gauged, and two alined screws located in the said apertures and within the cylindrical outline of the body, one screw having a central aperture having screw threads therein and being adapted to separate the ends of the body adjacent the split and thereby increase the effective size of the gauge and the other screw extending into the aperture in the first screw and being adapted to draw together the said ends of the body and thereby reduce the effective size of the gauge.

21. The combination in a female gauge, of an adjustable split body having an interior gauge surface adapted to contact with parts to be gauged, two alined screws, one adapted to separate the ends of the body adjacent the split and thereby increase the effective size of the gauge and the other adapted to draw together the said ends of the body and thereby reduce the effective size of the gauge, and a sleeve surrrounding one screw and seated in apertures in the said ends of the body for holding them against relative transverse movement.

22. The combination in a female gauge, of an adjustable split body having an interior gauge surface adapted to contact with parts to be gauged, a sleeve seated in apertures in the ends of the body adjacent the split for holding them against relative transverse movement, and two alined screws, one bearing against the sleeve and adapted to separate the said ends of the body and thereby increase the effective size of the gauge and the other extending through the sleeve and adapted to draw together the said ends of the body and thereby reduce the effective size of the gauge.

23. The combination in a female gauge, of an adjustable split cylindrical body provided with alined apertures therein adjacent the split and having an interior gauge surface adapted to contact with parts to be gauged, a sleeve seated in said apertures for holding the gauge ends against relative transverse movement, and two alined screws located in the said apertures and within the cylindrical outline of the body and provided respectively at their opposite outer ends with means whereby they may be turned, one screw having a central threaded aperture and bearing against the sleeve to separate the said ends of the body and thereby increase the effective size of the gauge and the other screw being threaded into the aperture in the first screw and being adapted to draw together the said ends of the body and thereby reduce the effective size of the gauge.

ELMER J. BRYANT.
CHARLES G. JOHNSON.