March 26, 1929. J. E. BAINES ET AL 1,706,513

SIZING PLUG

Filed Oct. 18, 1926 4 Sheets-Sheet 1

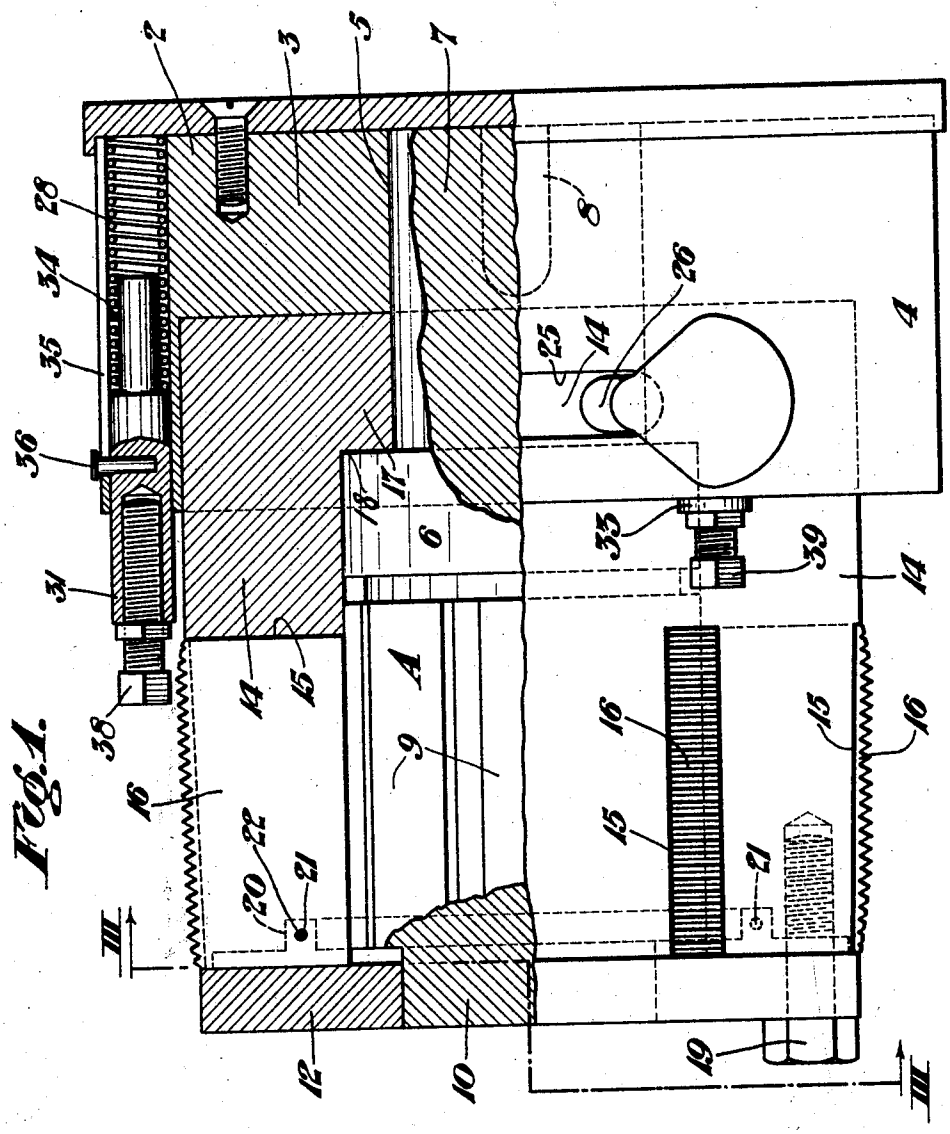


Fig. 1.

Witnesses:
Edwin Ruebt

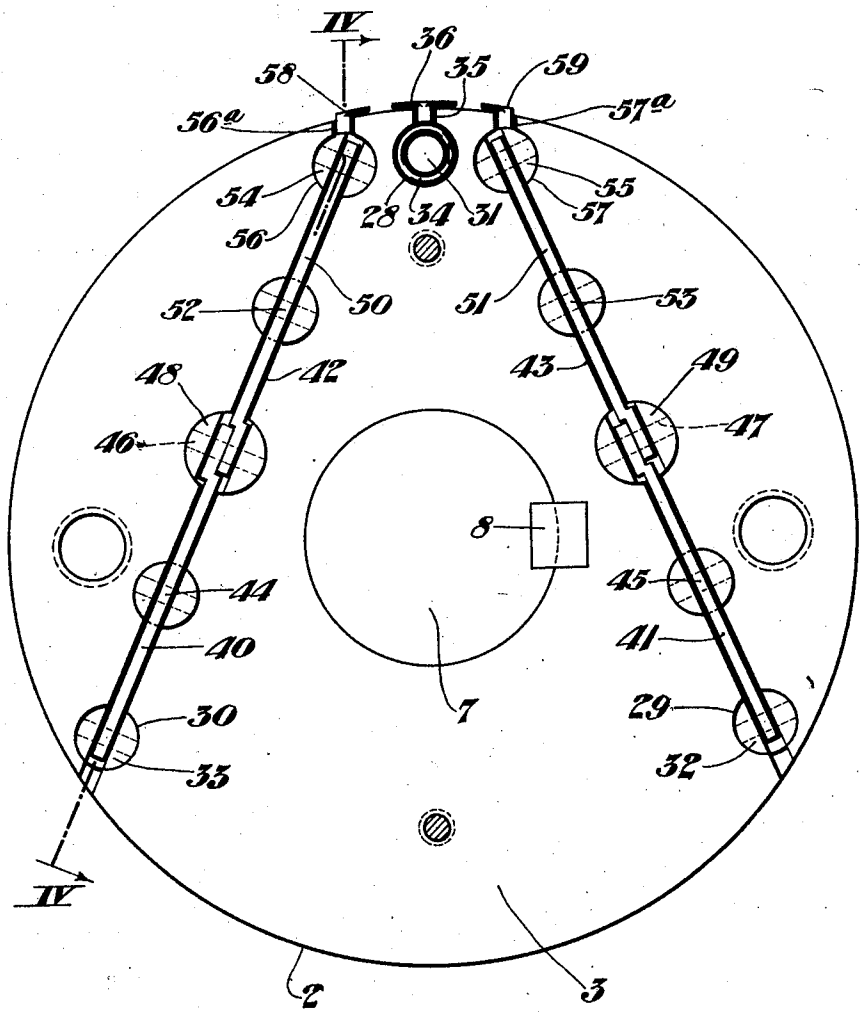
Inventors:
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SIZING PLUG

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Fig. 2.



Witnesses:
Edwin Trueb

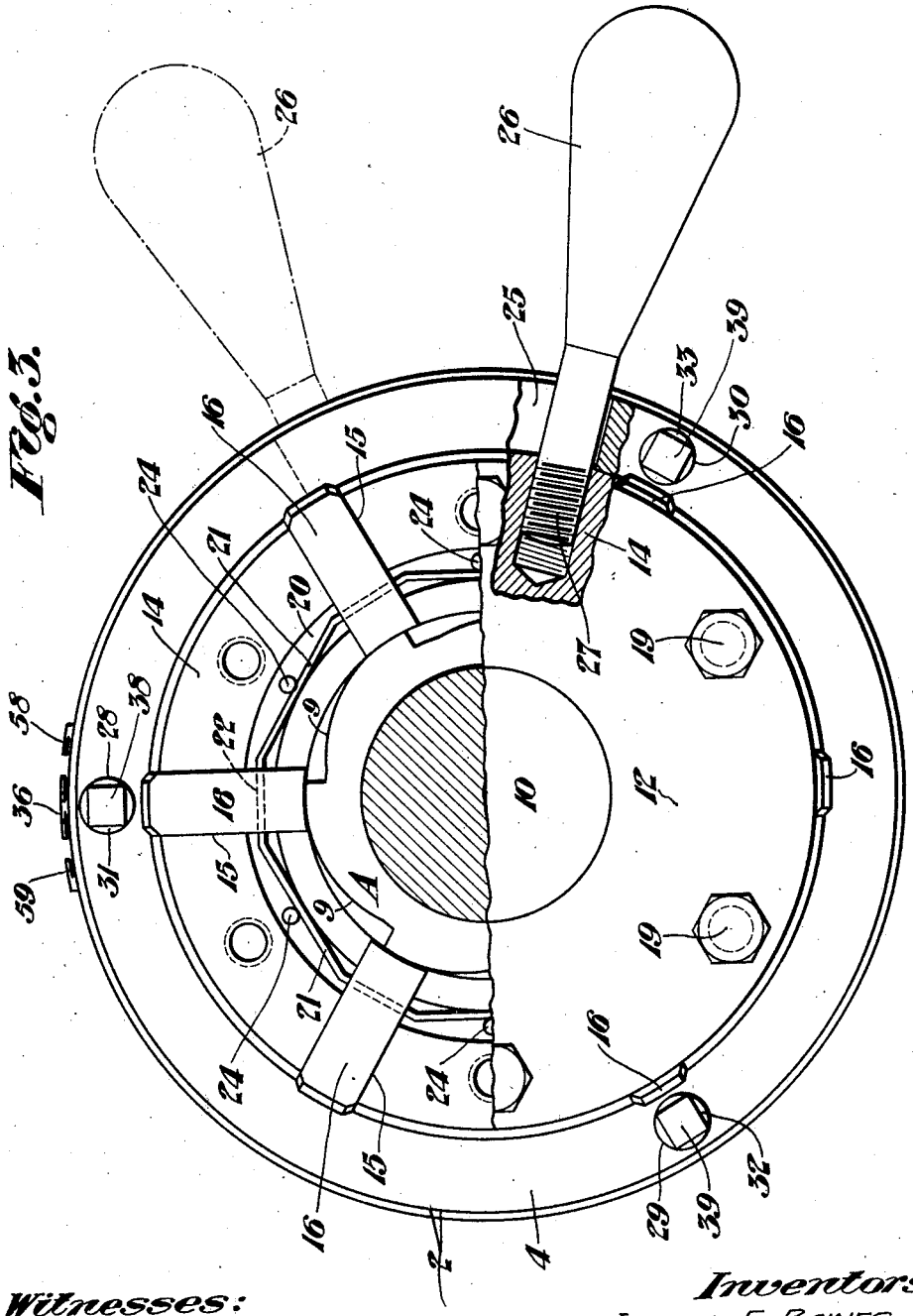
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March 26, 1929. J. E. BAINES ET AL 1,706,513

SIZING PLUG

Filed Oct. 18, 1926 4 Sheets-Sheet 3.

Fig. 3.



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March 26, 1929. J. E. BAINES ET AL 1,706,513

SIZING PLUG

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Fig. 4.

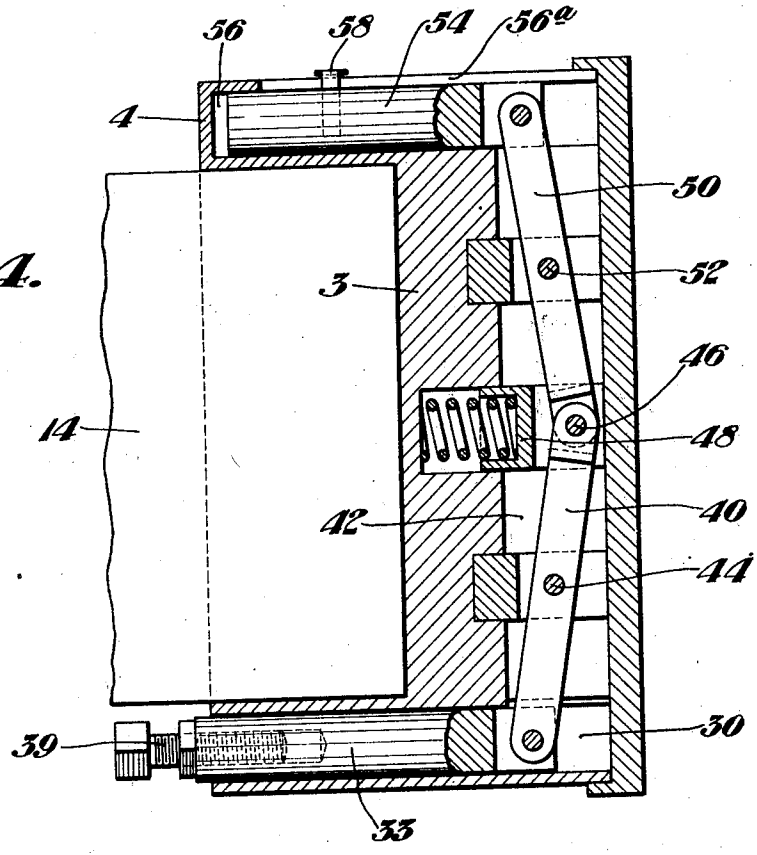
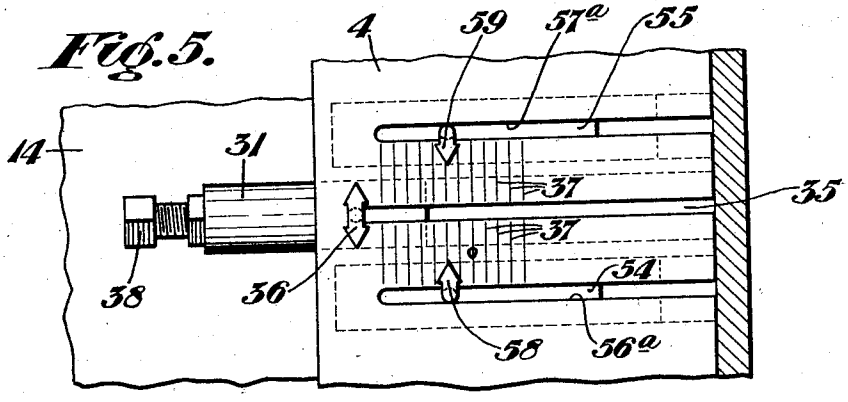


Fig. 5.



Witnesses:

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their Attorney.

Patented Mar. 26, 1929. 1,706,513

UNITED STATES PATENT OFFICE.

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SIZING PLUG.

Application filed October 18, 1926. Serial No. 142,343.

This invention relates to sizing plugs, and while not limited thereto, relates particularly to sizing plugs for gaging threaded pipe couplings and other internally threaded articles, and has for one of its objects the provision of a quick acting plug which may be collapsed for movement into and out of the article being gaged without the necessity of threading the article thereon.

Another object is to provide gaging and indicating means on the plug for indicating the amount the article is oversize or undersize in terms of threads or turns necessary to fit the article to the gage or plug.

A further object is to provide a sizing plug of the class described with means for indicating whether or not the end face of the article being gaged is square or true. That is, whether said face extends at 90 degrees to the longitudinal center line of the article.

In the drawings:

Figure 1 is a side elevation, partly in section, of a sizing plug embodying this invention.

Figure 2 is a rear end view, with the cover plate removed.

Figure 3 is a front end view, partly in section.

Figure 4 is a sectional view taken on the line IV—IV of Figure 2.

Figure 5 is a fragmentary elevation showing the indicators.

Referring more particularly to the drawings, the numeral 2 designates the holder as a whole which is composed of a head portion 3 and peripheral flange portion 4. The head portion 3 is provided with a centrally arranged aperture 5 in which a cam member A is secured.

The cam member A comprises a body portion 6, and a reduced stem portion 7 adapted to project into the aperture 5 and to be secured therein by a key 8. The body portion 6 is cut away at spaced intervals around its periphery to form cam faces 9. The forward end of the body portion 6 of the cam member is reduced to form a bearing projection 10 on which a cap plate 12 is mounted.

A hollow cylindrical segment carrier 14 is mounted around the cam member, and is provided with a plurality of longitudinal slots 15 in which the segments 16 are mounted. The rear end of the carrier 14 is provided with a bearing flange 17 which projects inwardly around the stem 7 and against the shoulder 18.

The cap plate 12 is secured to the forward end of the carrier 14 by bolts 19 so as to support the forward end of the carrier.

The forward end of the carrier 14 is provided with a slot or groove 20 to receive a segment retracting spring 21.

The segments 16 are drilled to provide holes 22 through which the spring wire 21 is passed. The wire 21 is passed through the holes 22 in the segments 16 and around the groove or slot 20 and is held under tension between each of the segments by pins 24.

The carrier 14 is adapted to be rotated relative to the cam member in order to move the segments across the cam faces 9. Therefore, the holder 2 is slotted as at 25 and a handle 26 projects through the slot and is threaded into the carrier as at 27.

In operation the handle 26 will be moved counterclockwise, as viewed in Figure 3, to move the carrier 14 and segments 16 in the same direction, so that the segments will be positioned over the low parts of the cam faces 9, and the springs 21 will retract the segments into collapsed position.

With the segments 16 collapsed or retracted, a coupling or other article to be threaded is slipped readily over the segments, and the handle 26 is moved in a clockwise direction, as viewed in Figure 3, to move the segment carrier 14 and segments 16, so that the segments 16 are forced onto the high parts of the cam faces 9 and thereby extended or expanded to engaged the threads of the article to be gaged.

After the segments are expanded the article is rotated a few turns to screw it home.

From the above it will be readily appreciated that the time necessary to gage an internally threaded coupling is greatly reduced from that necessarily consumed by threading the article over the one-piece or rigid plugs heretofore used.

The head 3 and flange 4 of the holder are apertured at spaced points to form sockets 28, 29 and 30, for the reception of gage plungers 31, 32 and 33 respectively, which are mounted for reciprocation in said sockets.

The plunger 31 is normally held in extended position by a coil spring 34 and is of slightly greater length than the plungers

32 and 33. The socket 28 is slotted at 35 and an indicator-hand 36 is mounted in the plunger and projects through the slot 35 to cooperate with the indicia 37 to indicate the movement of the plunger 31. The plunger 31 is provided with an adjustable contact screw 38 adapted to be adjusted in or out to engage various lengths of articles being gaged.

The plungers 32 and 33 are each shorter than the plunger 31 and are provided with adjustable contact screws 39. The plungers 32 and 33 are pivotally connected at their upper ends to one end of rocking levers 40 and 41, respectively, which extend transversely of the head 3 in slots 42 and 43. The levers 40 and 41 are fulcrumed at their centers at 44 and 45, respectively, and have their other ends pivotally connected to pins 46 and 47, respectively, carried by spring pressed plungers 48 and 49, respectively. Other rocking levers 50 and 51, which are of equal length with the levers 40 and 41, have one end pivotally connected to the pins 46 and 47, respectively, and are fulcrumed at their centers as at 52 and 53, respectively, in the slots 42 and 43, and have their other ends pivotally connected to the upper ends of indicator plungers or rods 54 and 55, respectively. The rods 54 and 55 are mounted in sockets 56 and 57, respectively, formed close to and parallel with and on the opposite sides of the socket 28. The rods 54 and 55 are provided with indicator-hands 58 and 59, respectively, which extend through slots 56^a and 57^a in the walls of the sockets 56 and 57 and cooperate with the indicia 37 to indicate the movement of the plungers 32 and 33. The levers 40, 41 and 50 and 51 being of equal length and each being fulcrumed at their centers, the movement of the plungers 32 and 33 will be reproduced exactly by the indicator plungers or rods 54 and 55.

In operation, the contact screws 38 and 39 are adjusted so that they will be engaged by the end of the article to be gaged when the article is slipped over the segments 16. That is, the article to be engaged is adapted to be positioned on the plug so that two or three turns are all that are necessary to screw it home, and the contact screws 38 and 39 should be adjusted to the proper position so that the article being gaged will engage and move the plunger 31 rearwardly until its indicator-hand 36 is in line with the hands 58 and 59 of the indicator rods when the article contacts with the contact screws of all three plungers.

When the article engages all the contact screws 38 and 39, the segments 16 should be expanded and the article screwed home. When the article is screwed home on the segments, the hands 35, 58 and 59 should point to zero. If the article is under or oversize, the position of the indicator-hands will indicate the amount of size in terms of turns which the spaced indicia 37 indicates.

The constant plungers also serve to indicate the trueness of the face of the coupling or other article being gaged. If the article is faced off on the end so that it is perfectly square or at 90 degrees with the center line, then the three indicator-hands 35, 58 and 59 will move in unison. But, should the end of the coupling be faced off other than true, then the plungers 31, 32 and 33 will move in and out and this movement will be shown by the indicator-hands 35, 58 and 59 and notify the operator so that the article may be rejected.

While we have shown and described one specific embodiment of our invention, it will be understood that we do not wish to be limited thereto, since various modifications may be made without departing from the scope of our invention as defined in the appended claims.

We claim:

1. A sizing gage for gaging threaded pipe couplings and other internally threaded articles comprising a plug body, a plurality of segment members mounted in said body and movable diametrically thereof, said segment members being adapted to be retracted into said body to permit the article being gaged to be moved onto or taken off said plug and to be extended to engage the article, means for retracting and extending said segments, gaging plungers mounted in said plug and adapted to engage the end face of the article being gaged, and indicating means operable by said plungers.

2. A sizing gage for gaging threaded pipe couplings and other internally threaded articles comprising a plug body, a plurality of segment members mounted in said body and movable diametrically thereof, said segment members being adapted to be retracted into said body to permit the article being gaged to be moved onto or taken off said plug and to be extended to engage the article, means for retracting and extending said segments, the article to be gaged being adapted to be mounted on the extended segments, a gaging plunger mounted in said plug and extending into the path of the articles mounted on said segments, said plunger being adapted to be engaged by the end of the article being gaged and to be forced into said plug as the article is screwed home, and an indicator adapted to be operated by said plunger to indicate the amount the article being gaged is over or under size in terms of turns or threads necessary to fit the article to the plug.

3. A sizing gage for gaging threaded pipe couplings and other internally threaded articles comprising a plug body, a plurality

of segment members mounted in said body and movable diametrically thereof, said segment members being adapted to be retracted into said body to permit the article being gaged to be moved onto or taken off said plug and to be extended to engage the article, means for retracting and extending said segments, the article to be gaged being adapted to be mounted on the extended segments, a gaging plunger mounted in said plug and extending into the path of the articles mounted on said segments, said plunger being adapted to be engaged by the end of the article being gaged and to be forced into said plug as the article is screwed home, and an indicator adapted to be operated by said plunger to indicate the amount the article being gaged is over or under size in terms of turns or threads necessary to fit the article to the plug, other plungers at spaced intervals around said plug also adapted to engage the end face of the article being gaged, and indicators adapted to be operated by said last named plungers, and all of said plungers being adapted to provide a uniform movement of said indicators if the end face of the article being gaged is square or true and to indicate by non-uniform movement when the end face of the article is not square or true.

4. A sizing gage plug for gaging threaded pipe couplings and other internally threaded articles comprising a holder, a cam member fixedly mounted within said holder, a segment carrying sleeve mounted around said cam member, said segment carrying sleeve being adapted to rotate relative to said cam member, a plurality of cam faces on said cam member, a plurality of thread segments mounted in slots in said segment carrying sleeve and adapted to engage said cam faces, spring means for normally holding said segments against said cam faces, and means for rotating said segment carrying sleeve relative to said cam to move said segments over said cam faces to extend and retract said segments.

5. A sizing gage plug for gaging threaded pipe couplings and other internally threaded articles comprising, in combination, a cylindrical holder, a segment carrying member within said holder, segments mounted in said holder, means for retracting and extending said segments to permit the article being gaged to be mounted on or taken off said plug and to gage said article respectively, said plug being adapted to have the article being gaged screwed home thereon after said segments are extended, a gaging plunger mounted in said holder and extending into the path of the articles mounted on said segments, said plunger being adapted to be engaged by the end of the article being gaged and to be moved rearwardly as the article is screwed home, and an indicator adapted to be operated by said plunger to indicate the amount the article being gaged is over or under size in terms of turns or threads necessary to fit the article to the plug.

6. A sizing gage plug for gaging threaded pipe couplings and other internally threaded articles comprising, in combination, a cylindrical holder, a segment carrying member within said holder, segments mounted in said holder, means for retracting and extending said segments to permit the article being gaged to be mounted on or taken off said plug and to gage said article respectively, said plug being adapted to have the article being gaged screwed home thereon after said segments are extended, a gaging plunger mounted in said holder and extending into the path of the articles mounted on said segments, said plunger being adapted to be engaged by the end of the article being gaged and to be moved rearwardly as the article is screwed home, and an indicator adapted to be operated by said plunger to indicate the amount the article being gaged is over or under size in terms of turns or threads necessary to fit the article to the plug, other plungers at spaced intervals around said holder also adapted to engage the end face of the article being gaged, and indicators adapted to be operated by said last named plungers, all of said plungers being adapted to provide a uniform movement of said indicators if the end face of the article being gaged is square or true and to indicate by non-uniform movement when the end face of the article is not square or true.

In testimony whereof, we have hereunto signed our names.

JOSEPH E. BAINES.
JACOB P. BOSLE.