Jan. 16, 1945. W. F. ALLER ET AL 2,367,255

GAUGING DEVICE

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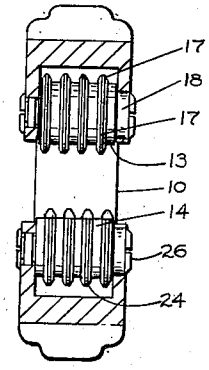


Fig. 2

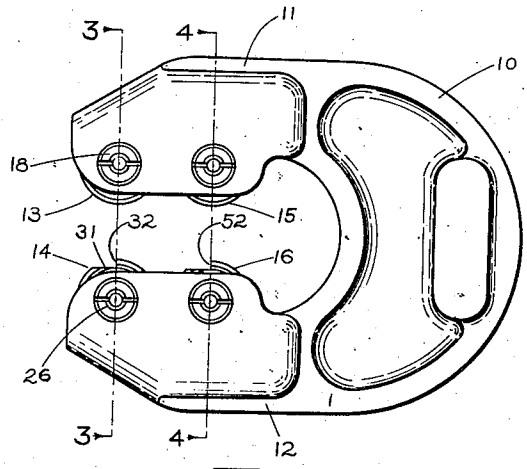


Fig. 1

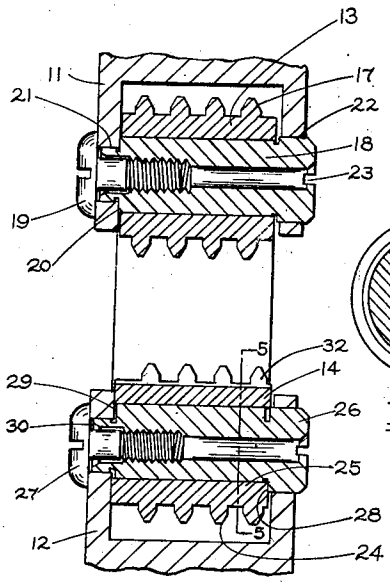


Fig. 3

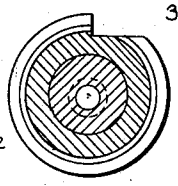


Fig. 5

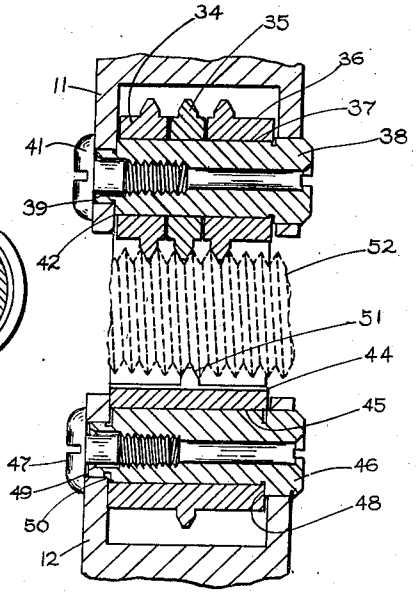


Fig. 4

INVENTOR.
W. F. Aller
L. J. Schulze
BY Edward J. Norf
atty.

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GAUGING DEVICE

Willis Fay Aller and Louis J. Schulze, Dayton, Ohio, assignors to The Sheffield Corporation, Dayton, Ohio, a corporation of Ohio

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4 Claims. (Cl. 33—199)

This invention relates to thread gauges.

One object of the invention is the provision of a thread snap gauge incorporating a pair of "go" gauging members arranged for relative adjustment on a plurality of spaced arms of a supporting body, and by means of which both the diameter and pitch of the thread is gauged to determine that the thread will enter a nut of predetermined construction, and also incorporating a pair of "no go" gauging devices which gauge only the diameter of the thread to make sure that the diameter is sufficiently large, one of the "no go" devices and one of the "go" members having annularly extending formed portions adapted for cooperation with adjacent sides of the thread and provided with recesses interrupting the annular continuity of the formed portions so that a visual comparison may be obtained of the thread surfaces with respect to the sides of the formed portion.

Another object of the invention is the provision of a thread snap gauge incorporating a stationary notched annularly ribbed thread gauging member which is stationary in a gauging operation and arranged for cooperation with an opposite roller to check a diametrical measurement of the thread.

Another object of the invention is the provision of a thread snap gauge having a pair of "no go" gauging devices for measuring diameter only, one of these devices having only a single rib or formed portion cooperating with the thread to be gauged, while the other comprises a plurality of relatively rotatable collars arranged for limited axial relative movement to accommodate themselves to threads of slightly different pitch and thus avoid the influence of pitch on the diametrical measurement of the thread.

Another object of the invention is the provision of a thread snap gauge having "go" and "no go" gauging pairs of stationary and rotatable devices, a gauging device of each pair being supported for eccentric adjustment by a simple and cheap arrangement requiring a minimum of parts.

Other objects and advantages of the invention will be apparent from the following description, the appended claims, and the accompanying drawing, in which:

Fig. 1 is a side elevation of a thread snap gauge embodying the present invention;

Fig. 2 is a sectional view taken on the line 3—3 of Fig. 1 without cutting through the gauging devices;

Fig. 3 is a section on the line 3—3 of Fig. 1, on an enlarged scale;

Fig. 4 is a section on the line 4—4 of Fig. 1; and

Fig. 5 is a section on the line 5—5 of Fig. 3.

Referring more particularly to the drawing, in which the same reference numerals have been used to designate like parts in the several views, 10 designates the body member of a thread snap gauge by means of which threads may be checked to determine if they are of the proper size, both as to thread diameter and pitch. The body is provided with a pair of spaced arms 11 and 12, connected by the main body portion which is adapted to be grasped in the hand or to be held in a suitable fixed support. The spaced arms 11 and 12 are preferably U shaped in cross section as will be apparent from Fig. 2.

The arms 11 and 12 carry a pair of "go" gauging members 13 and 14 and a pair of "no go" gauging devices 15 and 16, the first pair mentioned being adapted to gauge both pitch and thread diameter to determine if the thread will enter a nut of predetermined construction, while the "no go" gauging devices are for checking the diameter quite independent of pitch, to make sure that the thread diameter is large enough so that the thread will not be loose in the nut.

The "go" gauging member 13 comprises a roller having a body portion provided with a series of formed portions 17 arranged for coaction with a pair of adjacent surfaces on the thread to be gauged. As shown, these formed portions are annular ribs each rib being formed to enter the thread groove, the rib spacing being such as to correspond to or be a multiple of the thread pitch. The roller 13 is adapted for free rotation on a pin 18 which is secured to the arm 11 by the bolt 19. The head of the bolt bears against an outer side portion of the arm 11 and is threaded into the pin, drawing the shoulder 20 of the pin against the arm 11 as shown in Fig. 3. At opposite ends of the pin are cylindrical bearing portions 21 and 22 which fit into cylindrical passages in the arm. Bearing portion 21 has an axial length slightly less than the width of that portion of the arm in which it is mounted so that the pin will be clamped tightly against the arm. The end of the pin opposite to the bolt is preferably provided with a screw driver slot 23 to facilitate fixing the pin in the arm.

The opposing "go" member 14 is also provided with a series of ribs 24 integral with or fixed to the sleeve portion 25 which has a running fit on the pin 26, see Fig. 3. The opposite ends of the pin 26 fit into passages in the opposite por-

tions of the arm 12. At one end of the pin 26 where it fits in the arm 12 there is a shoulder 28 which clamps against one end of the sleeve 25 and holds the other end of the sleeve against the opposite end of the arm 12 so that the sleeve is held against rotation in a gauging operation. At 29 and 30 there is sufficient clearance to insure an adequate clamping action of both the pin and the sleeve and hold all the parts against relative movement in any direction when the bolt 27 is tight.

The ribbed sleeve 25 is provided with an axially extending recess or groove 31 which extends through the annular ribs so that the ribs are cut away at one side of a plane extending through the axis of the gauging member 13 and 14. This provides a substantially radial plane surface 32 facing away from the handle portion of the body member so the operator can have a visual check on the threads of the part to be gauged and see how the threads contact with the ribs on the gauging member 14 in the gauging plane extending through the center of the threaded part gauged. While the gauging member 14 does not rotate in a gauging operation and there is thus some small relative friction and wear on this part; since the cooperating gauging member 13 is freely rotatable, the operator is enabled to hold the thread as he inserts it between the "go" gauging members so that it bears against the roller 13 and then it need not contact at all with the stationary gauging member 14 unless the thread to be gauged is oversize and will not pass between the two gauging members. If some wear eventually does take place on the gauging portions of the member 14, the notch 31 may be extended deeper and the sleeve 25 so turned as to bring a new portion of the ribs into effective operation.

One of the gauging members of the "go" pair is eccentrically adjustable to vary the distance between these two gauging members, and as shown, it is the stationary gauging member 14 which is given this eccentric adjustment. For this purpose the supporting or bearing portions at the ends of the pin 26 are arranged concentric to one another but eccentric to the axis of the sleeve 25 and when the bolt 27 is loosened, the pin can be turned to the proper position. It is then tightened in this position, with the sleeve 25 held so that the cut back surface 32 is substantially in the plane defined by the axes of the two gauging members.

If the thread to be gauged passes between the two "go" gauging members there is assurance that the thread diameter and the thread pitch are such as to permit the thread to enter a standard nut of the required dimensions, and to make sure that the thread satisfies some minimum diameter requirement it is then moved further to see whether or not it will go between the "no go" gauging devices. The "no go" gauging device 15 comprises a plurality of independent sleeves or collars 34, 35 and 36 which are all freely rotatable on the bearing portion 37 of pin 38, the opposite ends of the pin bearing in opposite side portions of the arm 11 as shown in Fig. 4. The axial length of these individual sleeves is such that some limited axial freedom of motion is provided with respect to one another and with respect to the pin 38 so that the sleeves can accommodate themselves to some limited extent, preferably less than one hundredth of an inch or so, to the thread pitch. Suitable axial clearance is provided at 39 so that when the bolt 41 is tightened in the threads of the pin, the shoulder 42 of the pin will be clamped against the adjacent part of the arm 11, holding the pin in a desired position. Each one of the three individual sleeves is provided with a single formed portion, such as a rib, each coacting with a pair of adjacent surfaces on the thread, as will be apparent from the drawing.

The opposing gauging device 16 comprises a sleeve 44 fitted with adequate operating clearance on the cylindrical portion 45 of pin 46. The pin 46 has opposite end portions that can rotate in the arm 12 when the bolt 47 is loose, but by tightening the bolt the larger end of the pin bears at its shoulder portion 48 on the end of the sleeve and clamps the sleeve at its other end to the arm 12, as there is sufficient axial clearance at 49 and 50 so that this clamping action will be assured. The sleeve as well as the pin will thus be held against rotation in the gauging operation.

The sleeve 44 has a single formed portion for cooperation with adjacent thread surfaces, this formed portion, as shown, being an annular rib 51 the annular continuity of which is interrupted by a recess or groove 52 which provides for visual inspection by the operator substantially in a diametrical plane where the measurement is made. The view which the operator has of the thread and the gauging portion of the rib 51 is substantially the same as that indicated in Fig. 4, in which the thread to be gauged is indicated in dotted lines at 52.

One of the "no go" gauging devices is eccentrically adjustable for variation in its positioning, and as shown, the ends of the pin 46 are concentric to one another but eccentric to the bearing portion of the pin between those ends. Thus by loosening the bolt 47 the pin can be turned until the desired spacing from the opposing gauging device 15 is obtained and the bolt is then tightened.

The two gauging devices which are nonrotatable in a gauging operation, that is, the nonrotatable and eccentrically adjustable "go" gauging device and the nonrotatable and eccentrically adjustable "no go" gauging device, are arranged on the same arm so that the operator can hold the thread upwardly as viewed in Fig. 1 or in other words towards the rotatable members and relieve the nonrotatable members from frictional contact with the thread except where the thread will not pass by.

As will now be apparent, the construction is very simple, embodying a comparatively few parts which can be readily made and easily assembled to provide a desired range of adjustment. The arrangement of the several gauging devices gives a very long life without undue wear and therefore with great accuracy or reliability. The effective diameter of the thread is very accurately gauged by the "no go" gauging devices as they are not at all effected by the pitch of the thread.

While the form of apparatus herein described constitutes a preferred embodiment of the invention, it is to be understood that the invention is not limited to this precise form of apparatus, and that changes may be made therein without departing from the scope of the invention which is defined in the appended claims.

What is claimed is:

1. A thread snap gauge comprising a body having a pair of spaced arms, a pin carried by one of said arms, a plurality of individual sleeves mounted for free rotation on said pin and free

for individual limited axial movement thereon, each sleeve having a single annularly extending rib, a second pin carried by the other arm and held by said body at a fixed space from the first named pin, gauging means on said second pin and comprising only a single annularly extending rib, said gauging means having a recess extending parallel to the pin axis to provide a substantially radial surface extending through said rib and means for securing said gauging means to said other arm to prevent its rotation in a gauging operation and with said radial surface arranged substantially in the plane defined by the axis of said sleeves and the axis of said second pin.

2. A thread snap gauge comprising a body having a pair of spaced arms, a pin carried by one of said arms, a plurality of individual sleeves mounted for free rotation on said pin and free for individual limited axial movement thereon, each sleeve having a single annularly extending rib, a second pin having an eccentric end portion rotatably adjustable in the other arm about an axis having a fixed spacing from the axis of said first named pin, gauging means on said second pin for gauging diameter only and comprising only a single annularly extending rib, said gauging means having a recess extending parallel to the pin axis to provide a substantially radial surface extending through said rib and means for securing said gauging means to said other arm to prevent its rotation in a gauging operation.

3. A thread snap gauge comprising a body having a pair of spaced arms, a pin carried by one of said arms, a plurality of individual sleeves mounted for free rotation on said pin and free for individual limtied axial movement thereon, each sleeve having a single annularly extending formed portion for coaction with a pair of successive threaded surfaces on a thread to be gauged, a second pin carried by the other arm, means fixing said second pin against rotation, gauging means on said second pin and comprising only a single annularly extending formed portion for coaction with a pair of successive threaded surfaces on a thread to be gauged, said gauging means having a recess extending parallel to the pin axis to provide a substantially radial surface extending through said formed portion, means for clamping a side of said gauging means to prevent its rotation in a gauging operation, and means for eccentrically adjusting one of said pins to vary the spacing between the sleeves and the gauging means.

4. A thread snap gauge comprising a body having a pair of spaced arms, a pair of "go" gauging members mounted one on each arm, one of said gauging members comprising a roller having a series of annular ribs and a pin fixed against rotation on an arm and rotatably supporting said roller for rotation about a fixed axis, the other gauging member comprising a sleeve having a series of annular ribs and a pin having eccentric end portions adjustably supported on the other arm for variation of the spacing between the two gauging members and clamping said sleeve to such other arm in fixed position, said sleeve having a recess extending parallel to the sleeve axis and providing a substantially radial surface extending substantially in a plane through the axis of the roller and of the sleeve, a pair of "no go" gauging devices arranged one on each of said arms one of which comprises a pin mounted at its end portions on one of said arms and a series of individual collars rotatable on the pin and each provided with a single annularly extending formed portion for coaction with a pair of adjacent thread surfaces on a thread to be gauged, said collars being free for very limited axial movement with respect to one another and with respect to the pin, and the other "no go" gauging device comprising a fixed eccentrically adjustable gauging member having one annularly extending formed portion for coaction with a pair of adjacent thread surfaces on the thread to be gauged, and having a recess interrupting the annular continuity of said formed portion at one side of a plane substantially through the axes of the "no go" gauging devices.

WILLIS FAY ALLER.
LOUIS J. SCHULZE.