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C. M. POND

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SCREW THREAD GAUGE

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Fig. 2.

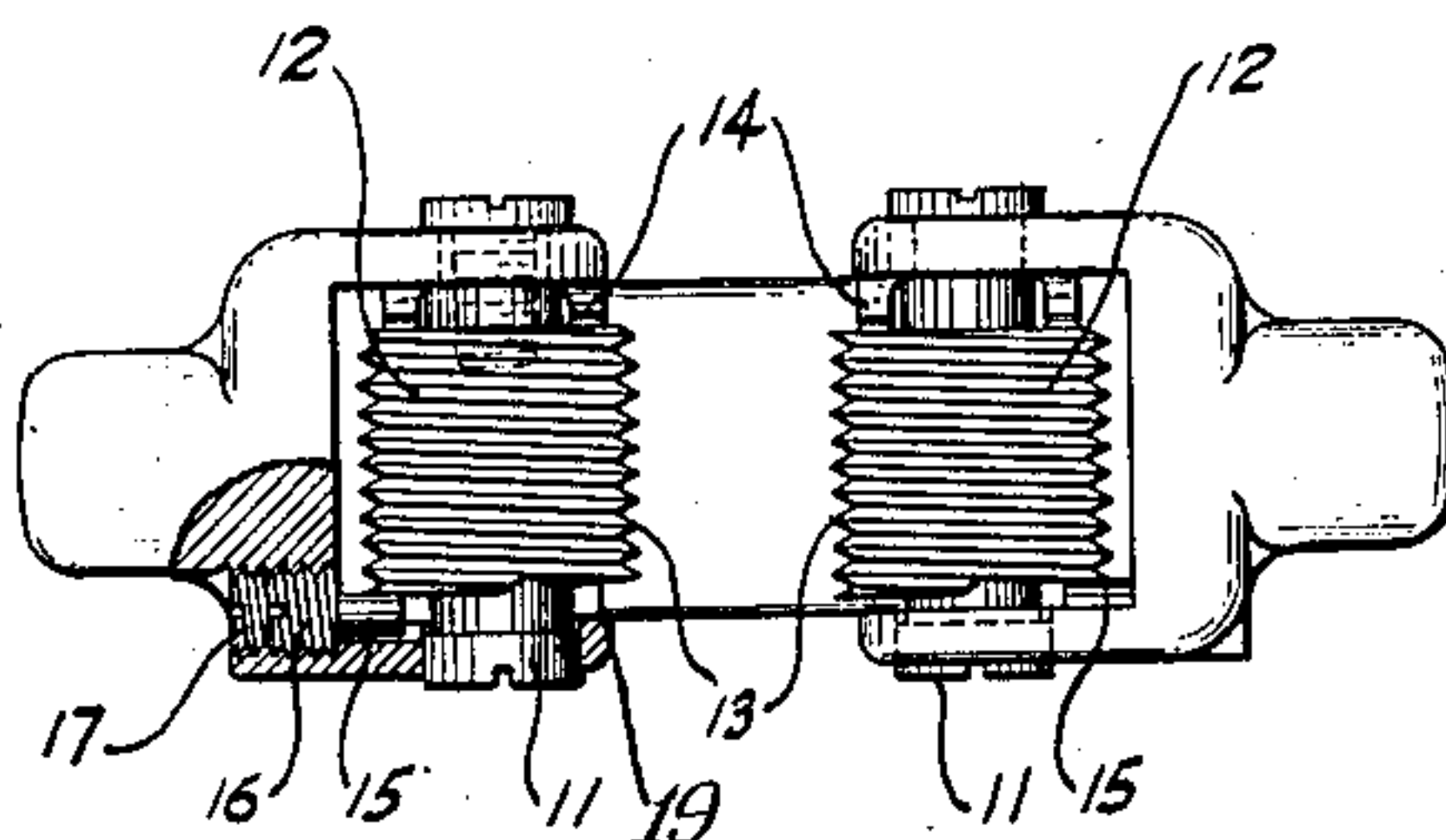


Fig. 1.

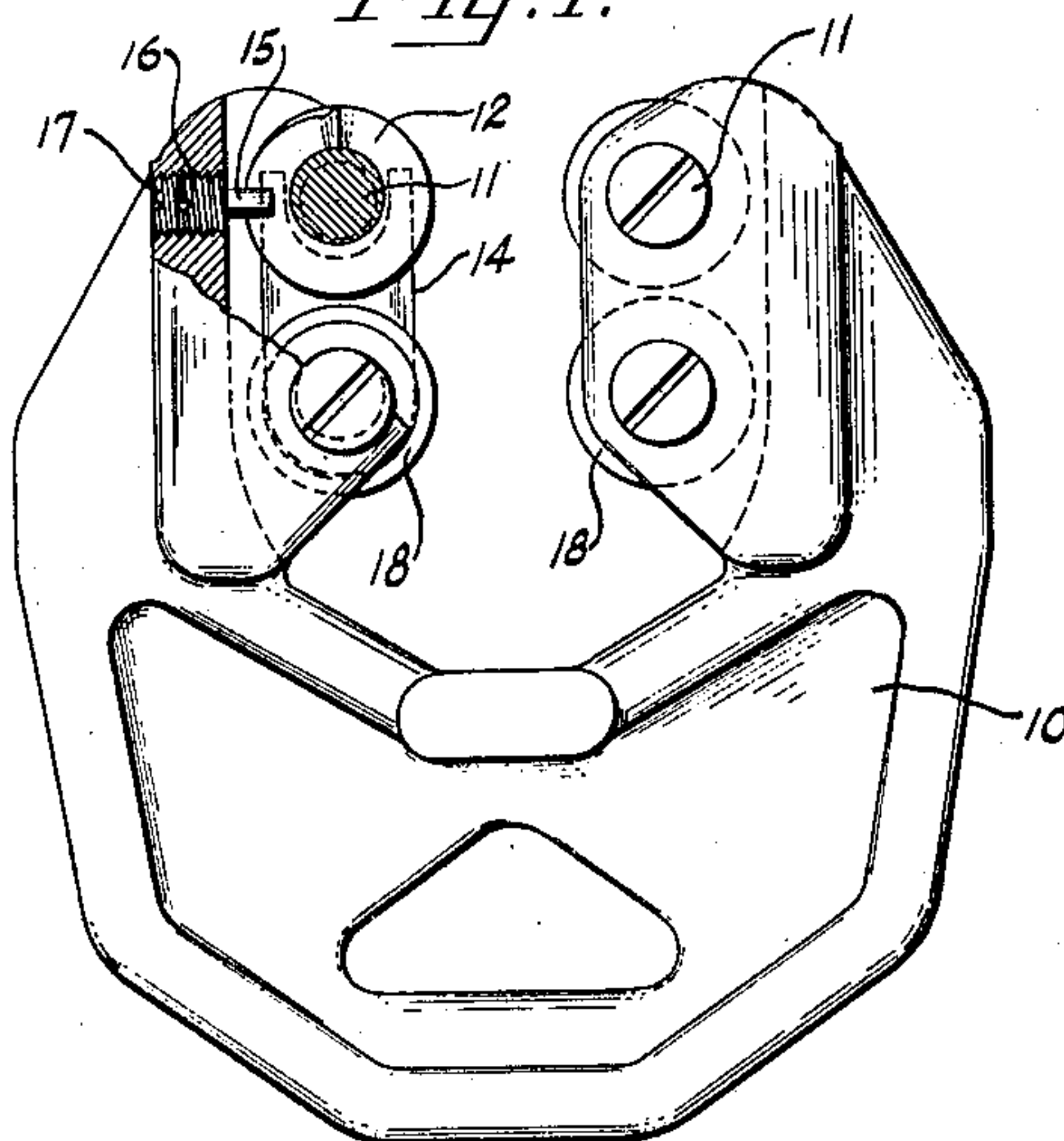


Fig. 3.

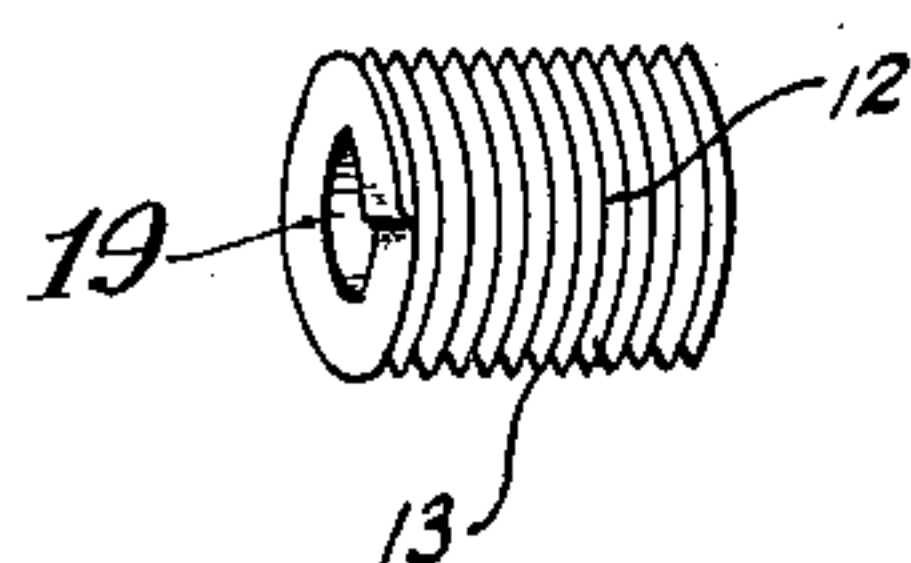
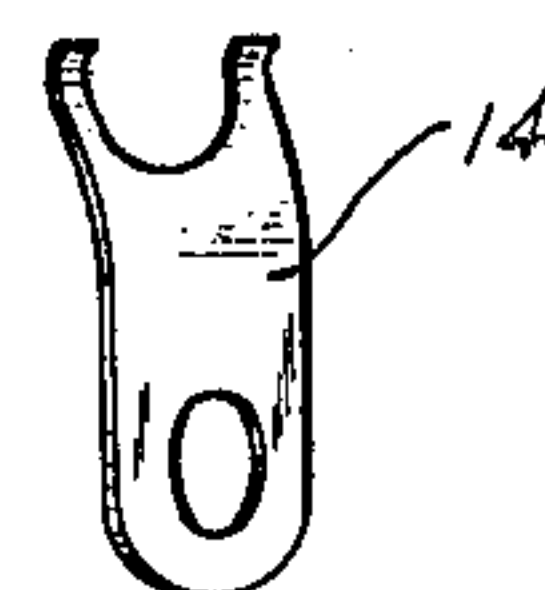


Fig. 4.



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SCREW THREAD GAUGE

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6 Claims. (Cl. 33—199)

This invention relates to screw thread gauges and particularly to a gauge for testing screw threads having freely rotatable rolls forming the gauging elements which are provided with screw threads on their work engaging surfaces.

An object of the present invention is to provide freely rotatable rolls in a screw thread snap gauge having threaded portions upon their cylindrical outer surfaces which form the gauging elements of the rolls, these screw threads having the same lead as the screw threads to be gauged but being of the opposite hand.

Another object of the invention is to provide means to vary the axial position of the rotatable rollers so that in any rotative position they will properly contact with screw threads being gauged, each rotative position having a definite axial position.

And finally it is an object of the invention to provide cam means preferably formed upon one end of the rolls and engaging an abutment on the gauge frame whereby the rolls as they are rotated will be axially moved an amount determined by the lead of the threaded portions of the rolls and thus maintained in proper screw thread engaging positions.

A feature which enables me to accomplish the above named objects is that a positioning pin is mounted in the gauge frame which engages an end face of a roll and a spring forces the roll axially so that its face engages this pin, the end face of the roll engaging the pin being provided with a helicoidal surface corresponding in lead to that of the threads formed upon its cylindrical surface.

With the above and other objects in view my invention includes the features of construction and operation set forth in the following specification and illustrated in the accompanying drawing.

In the accompanying drawing annexed hereto and forming a part of this specification, I have shown my invention embodied in a screw thread gauge of the type shown in patent to Johnson, No. 1,660,335 dated February 28, 1928, but it will be understood that the invention can be otherwise embodied and that the drawing is not to be construed as defining or limiting the scope of the invention, the claims appended to the specification being relied upon for that purpose.

In the drawing:

Figure 1 is a side elevation of a complete gauge partly broken away to more clearly show a part of the construction.

Fig. 2 is an end view of the gauge looking di-

rectly toward the gauging surfaces of the rollers.

Fig. 3 is an oblique view of one of the threaded rolls forming a work engaging member and showing the cam surface upon one end face; and

Fig. 4 is an isometric view of a roll engaging spring.

In the above mentioned drawing I have shown but one embodiment of the invention which is now deemed preferable but it is to be understood that changes and modifications may be made within the scope of the appended claims without departing from the spirit of the invention.

Briefly and in its preferred aspect, my invention may include the following principal parts: First, a generally U-shaped frame having rolls mounted transversely within the opposite arms, one or more pairs of rolls being in opposed relation to each other; second, supporting means for rotatably supporting the rolls in position, these means preferably permitting adjustment to vary the distance apart of opposing rolls; third, abutments in the frame controlling the axial positions of the rolls and preferably adjustable so that these positions may be accurately determined; fourth, spring means resiliently holding the rolls against their abutments; and fifth, cam means on the end face of the rolls, engaging its abutment, preferably in the form of a helicoidal surface, corresponding in lead to the lead of the screw threads on the rolls so that as the rolls are rotated by engagement with work pieces being tested the position of the work engaging surfaces of the rolls will always be correctly disposed.

Referring more in detail to the figures of the drawing, I provide a U-shaped frame 10 of the same general type as that shown and described in the above mentioned patent to Johnson. Within the opposite arms of this frame 10 are mounted transverse pins 11 preferably having eccentric portions such as are clearly shown and described in the above-mentioned Johnson patent. Upon this eccentric portion threaded work engaging rolls 12 may be mounted for free rotation. As the construction of the pin 11 and its eccentric portion is or may be similar to that described in the above mentioned patent, further description is not thought to be necessary. It will be noted, however, that the rolls 12 in the present invention have upon their outer cylindrical surfaces screw threads 13 extending throughout their length. These screw threads 13 have the same lead as the screw threads to

be tested, but have their helix of the opposite hand. The gauge shown in Fig. 2 having left-hand threads is therefore designed particularly for gauging right-hand threads.

5 As rotation of the threaded roll 12 would vary the position of the grooves and ridges forming the part of the threads 13 directly engaging the screw threads being tested, means are provided for maintaining these positions correctly for any
10 rotative position assumed by the rolls. For that purpose springs 14 of generally flat leaf form engage one end of a roll 12 and force it axially toward the opposite face of the frame 10. Limiting the movement of the rolls in this direction
15 is an abutment 15, the position of which may be slightly varied so that the rolls 12 for any one rotative position may be correctly determined. As shown in Figs. 1 and 2, this abutment 15 comprises a pin formed on the inner end of a short
20 screw threaded member 16 threaded into a side of the frame 10 so that the inwardly extending pin portion 15 thereof engages an end face of a roll 12. Preferably and as shown, this pin 15 is formed somewhat eccentrically relative to the
25 axis of the member 16 so that by rotating the screw 16 the position of the pin will be slightly varied axially of the roll 12. In any adjusted position the screw 16 may be locked by a short check screw 17 bearing upon the outer end of
30 the screw 16.

On the end face of each of the rolls 12 engaging this abutment 15 is formed a helicoidal surface 19 corresponding in lead and direction with
35 the screw threads 13 on the outer cylindrical surface of the rolls. The pins 15 at all times engage these helicoidal surfaces 19 so that in any rotative position of the rolls 12 the positions of the ridges and grooves do not vary axially and when a roll 12 is correctly adjusted for one
40 rotative position it will be correct for all rotative positions.

In operation the pins 11 supporting a pair of rolls 12 are adjusted for the proper distance apart
45 for gauging a particular size and type of screw threads and the pins 15 are so adjusted that the threads upon the rolls 12 will properly intermesh with corresponding grooves and ridges of the screw threads being tested. Thus adjusted the
50 rolls 12 may rotate due to engagement of the work being tested during the gauging operation but in any rotative position of the rolls 12 they will be in proper mating relation for engagement with screw threads being tested.

55 In Fig. 1 a supplementary pair of rolls 18 is shown which may be provided with gauging surfaces for testing a diameter or other function not requiring screw threads on its surface.

What I claim is:

1. A screw thread gauge comprising in combination, a U-shaped frame, opposed screw threaded rolls rotatably supported in opposite
5 arms of said frame, means to adjust the distance apart of said rolls, and means to cause axial movement of said rolls in timed relation to their rotation.

2. A screw thread gauge comprising in combination, a frame, opposed screw threaded rolls
10 rotatably supported in said frame, means to set said rolls for predetermined gauging dimensions, resilient means normally holding said rolls toward one axial position, said rolls having a helicoidal surface at one end and means on said
15 frame engaging said helicoidal surface whereby said rolls are caused to move axially as they are rotated.

3. A screw thread gauge comprising in combination, a frame, opposed gauging elements sup-
20 ported within said frame one of which elements is a screw threaded roll rotatably mounted in said frame and having screw threads on its outer cylindrical surface of the same lead as the screw threads to be tested, said rolls having a helicoidal
25 surface on one end, resilient means forcing said rolls in one direction, and means engaging said surface and coacting with said resilient means causing said roll to move axially in accordance
30 with its lead as it is rotated.

4. A screw thread gauge comprising in combination, a frame, opposed gauging elements
35 within said frame one of which elements is a screw threaded roll, means to support said roll for rotation about its axis, means to adjust the axial position of said roll, and means to cause axial movement of said roll in accordance with the lead of its screw threads as the roll is rotated.

5. A screw thread gauge comprising in combination, a frame, opposed gauging elements
40 within said frame, one of which elements is a screw threaded roll having the same lead as the screw threads to be gauged and being freely rotatable about its axis, a spring engaging one end and normally forcing said roll axially in one
45 direction, and a pin engaging the opposite end of said roll for limiting said movement, the end face of said roll engaging said pin having a helicoidal surface corresponding in lead to the screw threads on said roll whereby rotation of said roll forces
50 said roll axially and maintains the screw threads on the roll in correct gauging position.

6. A screw thread caliper gauge comprising a frame, a pair of opposing, screw threaded, freely
55 rotatable gauge rollers in said frame, one of said rollers being axially displaceable and spring-controlled.

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