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PATENT SPECIFICATION

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PROVISIONAL SPECIFICATION

Improvements in or relating to Linear Dimension Gauges

I, ARTHUR CAPP, of 112, Belmont Road, North-Heath, Erith, Kent, a British subject, do hereby declare the nature of this invention to be as follows:—

5 This invention relates to linear dimension gauges of the kind comprising a body portion and a relatively movable spring-pressed feeler or finger operatively connected to an indicator needle or its
10 equivalent through the intermediary of an oscillatable lever, the body portion being arranged to be supported or moved so that the feeler or finger is at a pre-determined fixed distance from a datum
15 point or path, so that the feeler or finger, when located upon or moved over a surface of the body to be gauged, is deflected by any deviation of the surface from the fixed distance and thus indicates
20 the extent of such deviation on a scale associated with the needle.

According to the principal feature of invention the oscillatory movement of the lever referred to hereinbefore is arranged
25 to effect a rotary movement of needle or its equivalent through the intermediary of a relatively rigid helix of wire or other suitable material cooperating with a pin or projection extending substantially at
30 right angles from the rotary shaft to which the needle or its equivalent is secured.

In order that the nature of the invention may be readily understood a preferred embodiment thereof will now be
35 described in which the lever is rotatably mounted at its outer end on a fixed horizontal pivot at one end of the body portion of gauge, the feeler or finger being
40 secured to this end of the lever, the other or inner end of the lever having rigidly secured thereto a relatively rigid helix of piano wire. This helix is secured to the
45 underside of the lever with its axis substantially vertical and extending axially through the helix is a rotary shaft carried in bearings in the body portion and
having secured thereto at its upper end
50 with a graduated circular dial located under a glass cover in a circular casing secured to the body portion of the gauge.

A pin or projection extends substan-

tially at right angles from the shaft and the helix is normally held in contact with
55 the said pin or projection by a spring acting upon the lever.

In use deflections of the feeler or finger will cause corresponding deflections of the lever in a vertical plane about the fixed
60 horizontal pivot thereof under the control of the spring acting on the lever, and the corresponding deflections of the helix substantially in the direction of its axis will, owing to the helix cooperating with a
65 cam-like action on the pin or projection on the shaft carrying the needle, cause corresponding rotary deflections of the needle with respect to the scale.

The helix and the major portion of the lever as well as the spring acting thereon
70 are housed in a recess in the body portion behind a sliding cover plate. The feeler or finger is of relatively short length as compared with the length of the lever.

In order that the gauge may be readily used with the scale in a convenient position for reading whether the nature of the work necessitates the gauge being operated
75 by a downward or an upward pressure on the outer end of the feeler or finger, arrangements may be provided for reversing the action of the spring on the lever. The spring is preferably a small
80 blade or wire spring secured at one end to the lever at a point adjacent to its outer end and secured at its other end to a rotary disc in the recess in the body portion. This rotary disc may be rotated through
85 an angle limited by a stop by means of a small lever on the outside of the body portion so as to cause the spring to exert either an upward or a downward pressure
90 on the lever. Thus when the gauge is being used to test the upper surface of a body the spring is adjusted by means of the small lever and rotary disc to exert
95 an upward pressure on the lever, while when the gauge is being used to test the lower surface of a body the spring is
100 adjusted by the same means so as to exert a downward pressure on the lever, it not being necessary to reverse the gauge as a whole which would render reading of the
105 scale somewhat difficult.

It will be evident that the invention is

not limited to the particular construction and arrangement of the parts hereinbefore described by way of example which may be varied as desired to suit particular requirements without exceeding the scope of the invention.

Dated this 20th day of January, 1936.

COPE & CO.,

Agents for the Applicant,

65, Victoria Street, London, S.W.1.

COMPLETE SPECIFICATION

Improvements in or relating to Linear Dimension Gauges

I, ARTHUR CAPP, of 112, Belmont Road, North-Heath, Erith, Kent, a subject of the King of Great Britain, do hereby declare the nature of this invention and in what manner the same is to be performed, to be particularly described and ascertained in and by the following statement:—

This invention relates to linear dimension gauges of the kind comprising a body portion and a relatively movable spring-pressed feeler or finger operatively connected to an indicator needle or its equivalent through the intermediary of an oscillatable lever, the body portion being arranged to be supported or moved so that the feeler or finger is at predetermined fixed distance from a datum point or path, so that the feeler or finger, when located upon or moved over a surface of the body to be gauged, is deflected by any deviation of the surface from the fixed distance and thus indicates the extent of such deviation on a scale associated with the needle.

In a gauge of this general kind it has hitherto been proposed operatively to connect the feeler or finger to the indicator needle or its equivalent through the intermediary of an oscillatable lever having at one end a tooth which engages in a helical groove in the spindle of the indicator needle or its equivalent, the feeler or finger being pivotally mounted upon the lever at the other or fulcrum end thereof and adapted to be secured thereto in different relatively fixed positions.

When the operative connection between the finger or feeler and the indicator needle is dependent upon the engagement of a tooth or projection in a helical groove it may occur that this connection fails if the feeler or finger is subjected to a rapid displacement or shock during use which may cause the tooth to be disengaged from the helical groove and the present invention is concerned with improving the reliability of the operative connection between the finger or feeler and the indicator needle or its equivalent.

According to the present invention the oscillatory movement of the lever referred to hereinbefore is arranged to effect a

rotary movement of the needle or its equivalent through the intermediary of a relatively rigid helix of wire or other suitable material cooperating with a pin or projection extending substantially at right angles from the rotary shaft to which the needle or its equivalent is secured.

In order that the invention may be readily understood an embodiment thereof will now be described, by way of example, with reference to the accompanying drawings in which:—

Figure 1 is a plan view of the device from below,

Figure 2 is a side elevational view of the device with the cover plate removed so as to expose the internal mechanism, and,

Figure 3 is a sectional view illustrating a detail of the device.

Referring now to the drawings, the device comprises a lever rotatably mounted at its outer end on a fixed horizontal pivot 2 at one end of the body portion 3 of gauge, the feeler or finger 4 being secured to this end of the lever 1, the other or inner end of the lever having rigidly secured thereto a relatively rigid helix 5 of piano wire. This helix 5 is secured to the underside of the lever with its axis substantially vertical and extending axially through the helix is a rotary shaft 6 carried in bearings in the body portion 3 and having secured thereto at its upper end a needle or the equivalent cooperating with a graduated circular dial (not shown in the drawings) located under a glass cover 7 in a circular casing 8 secured to the body portion 3 of the gauge.

A pin or projection 9 extends substantially at right angles from the shaft 6 and the helix is normally held in its uppermost position (Figure 2) by a spring 10 acting upon the lever 1, the pin or projection 9 being held in contact with the helix by a light spring tending to rotate the shaft 6 in a clockwise direction as viewed from below (Figure 1).

In use deflections of the feeler or finger 4 will cause corresponding deflections of the lever 1 in a vertical plane about the fixed horizontal pivot 2 thereof under the control of the spring 10 acting on the

lever 1, and the corresponding deflections of the helix 5 substantially in the direction of its axis will, owing to the helix cooperating with the pin or projection 9 on the shaft 6 carrying the needle, cause corresponding rotary deflections of the needle with respect to the scale.

The helix 5 and the major portion of the lever 1 as well as the spring acting thereon are housed in a recess 11 in the body portion 3 behind a sliding cover plate which is not shown in the drawings. The feeler or finger 4 is of relatively short length as compared with the length of the lever 1 and is preferably secured to the lever as shown in detail in Figure 3 in such a manner as to be readily removable. The inner end 12 of the feeler or finger 4 whereby the latter is secured to the lever is substantially hemi-spherical, the fixed horizontal pivot 2 being arranged to project into an axial recess 13 in the flat surface 14 of this end 12 of the feeler or finger, the flat surface 14 being held in frictional contact with the outer end of the lever 1 by means of a spring clip 15 carried by the lever and cooperating with the hemi-spherical surface of the inner end 12 of the feeler or finger 4. The spring clip 15 is mounted on the lever 1 in such a manner as to be capable of rotation about a horizontal axis 16 out of engagement with the hemi-spherical end 12 of the feeler or finger 4 so as to permit of its ready removal. This method of attachment of the feeler or finger 4 to the lever 1 enables fingers having outer ends of different shapes suitable for different kinds of work to be readily attached to the lever 1 as and when required, whilst the inclination of the feeler or finger to the lever may be varied as required bearing in mind that the feeler or finger is held in frictional contact only with the lever. The scale may be graduated in one thousandths parts of an inch and the lengths of the feeler or finger 4 and the lever 1 and pitch of the helix 6 may be so selected that a complete revolution of the needle corresponds to twenty-five one thousandths parts of one inch.

In order that the needle may be readily set to the zero position on the scale, the casing 8 together with the scale contained therein may be arranged to be rotatable with respect to the needle and body portion 3 of the gauge about the axis of rotation of the shaft 6 and the needle.

In order that the gauge may be readily used with the scale in a convenient position for reading whether the nature of the work necessitates the gauge being operated by a downward or an upward pressure on the outer end of the feeler or finger, arrangements are provided for reversing

the action of the spring 10 on the lever 1. The spring 10 is preferably a small blade or wire spring secured at one end 17 to the lever 1 at a point adjacent to the outer end of the lever and secured at its other end to a rotary disc 18 in the recess 11 in the body portion 3. This rotary disc 18 may be rotated through an angle limited by stop 19 by means of a small lever 20 on the outside of the body portion 3 so as to cause the spring 10 to exert either an upward or a downward pressure on the lever 20. Thus when the gauge is being used to test the upper surface of a body the spring 10 is adjusted by means of the small lever 20 and rotary disc 18 to exert an upward pressure on the lever 1 (Figure 2), while when the gauge is being used to test the lower surface of a body the spring 10 is adjusted by rotating the disc 18 in an anti-clockwise direction from the position shown in Figure 2 so as to exert a downward pressure on the lever 1, it not being necessary to reverse the gauge as a whole which would render reading of the scale somewhat difficult.

In the case of the helix of wire cooperating with a projection instead of a pin, the projection may extend helically around the rotary shaft, the pitch of the helix of wire being substantially equal to that of the helical projection.

Having now particularly described and ascertained the nature of my said invention and in what manner the same is to be performed, I declare that what I claim is:—

1. A linear dimension gauge of the kind described comprising a body portion and a relatively movable spring-pressed feeler or finger operatively connected to an indicator needle or its equivalent through the intermediary of an oscillatable lever, in which the oscillatory movement of the lever is arranged to effect a rotary movement of the needle or its equivalent through the intermediary of a relatively rigid helix of wire or other suitable material cooperating with a pin or projection extending substantially at right angles from the rotary shaft to which the needle or its equivalent is secured, for the purpose specified.

2. A linear dimension gauge as claimed in claim 1, in which the feeler or finger is arranged to be held in frictional contact with the lever, substantially as and for the purpose specified.

3. A linear dimension gauge as claimed in claim 1, in which the feeler is acted upon by a spring through the intermediary of the lever, this spring being adapted to be adjusted so as to exert as required either an upward or downward pressure on the lever, substantially as

and for the purpose specified.

4. A linear dimension gauge as claimed in Claim 1, in which the pin or projection is held in contact with the helix by a light spring, substantially as described.

5. A linear dimension gauge as claimed in claim 1, in which the needle cooperates with a scale in a casing the latter of which together with the scale is arranged to be rotatable with respect to the needle and body portion of the gauge about the axis of rotation of the shaft and needle, for the purpose specified.

6. A linear dimension gauge as claimed

in Claim 1, in which the helix of wire co-operates with a projection extending helically around the rotary shaft, the pitch of the helix of wire being substantially equal to that of the helical projection.

7. A linear dimension gauge constructed and arranged to be operated substantially as described with reference to the accompanying drawings.

Dated this 31st day of December, 1936.

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[This Drawing is a reproduction of the Original on a reduced scale.]

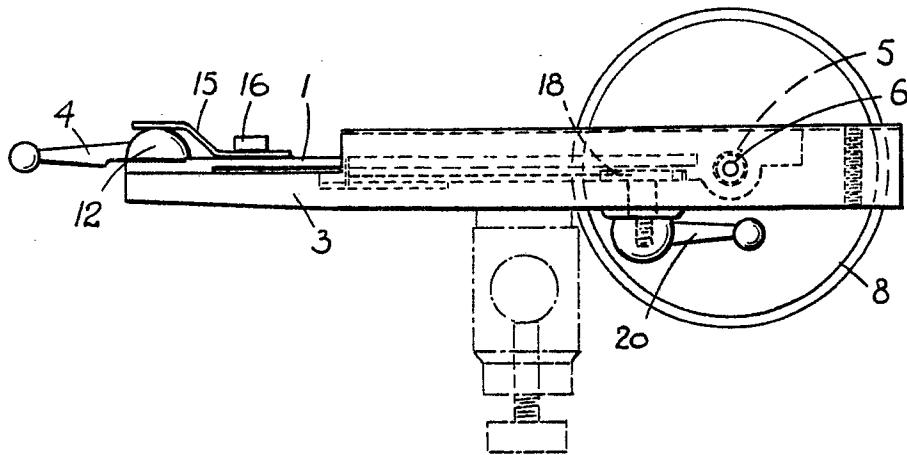


Fig. 1.

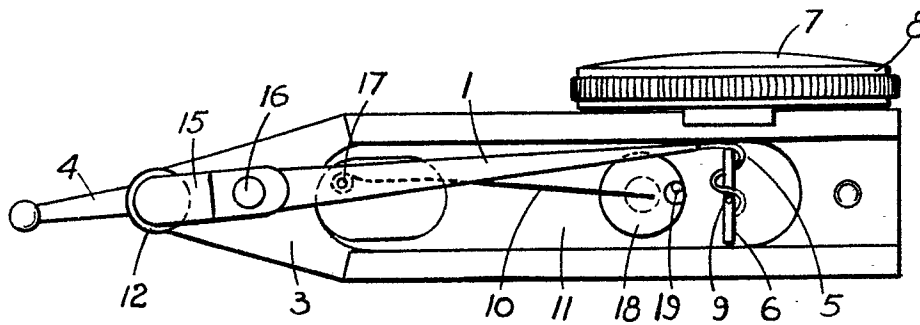


Fig. 2.

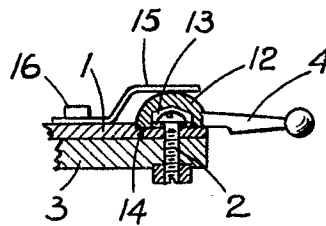


Fig. 3.