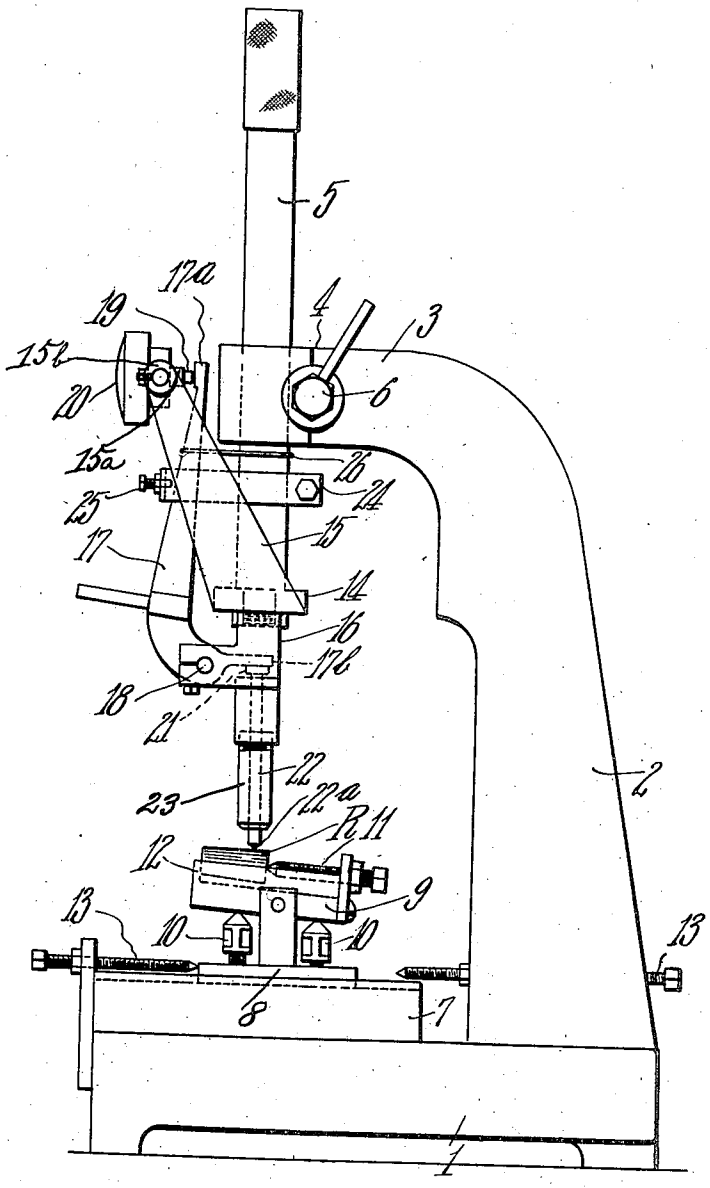
I. F. WOODROW.

GAUGE.

APPLICATION FILED SEPT. 30, 1918.

1,422,161.

Patented July 11, 1922.



INVENTOR.

I. F. Woodrow.

BY Lewis O. Hutchinson.

ATTORNEY.

UNITED STATES PATENT OFFICE.

IRVIN FLINN WOODROW, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR, BY MESNE ASSIGNMENTS, TO STANDARD STEEL AND BEARINGS INCORPORATED, OF WILMINGTON, DELAWARE, A CORPORATION OF DELAWARE.

GAUGE.

1,422,161. Specification of Letters Patent. Patented July 11, 1922.

Application filed September 30, 1918. Serial No. 256,315.

To all whom it may concern:

Be it known that I, IRVIN F. WOODROW, a citizen of the United States, residing at West Philadelphia, county of Philadelphia and State of Pennsylvania, have invented a certain new and useful Improvement in Gauges, of which the following is of such an exact, clear, and full description, as to enable one skilled in the art to make and use the same.

My invention relates to gauges and more especially to a device for determining in a speedy and efficient manner whether or not the angle of taper on a roller such as that used in a taper roller bearing is correct or not and which can also be used to gauge the outside diameter of a roller of this character.

A further object of the invention is the provision of a gauging device in the operation of which the possibility of inaccurate gauging due to the human element, is prevented. This is accomplished by making use of a positive means for operating the plunger the strength of which is constant. In this way the unequal pressures always present when the contacts are operated by hand, are overcome.

The device is illustrated in the single figure of the drawings which is a side elevation of the gauge and to which reference is made by the usual reference characters.

The gauge consists of a base 1 having a vertical arm 2 the upper end 3 of which is turned horizontally and overhangs the base. The end 3 is split at 4, which split extends into an opening for the supporting rod 5, a clamp screw 6 extending over the split end and serving to contract the supporting rod opening to clamp said supporting rod in place.

Carried by the base 1 and attached thereto in any suitable manner, is a bed 7. A plate 8 having a dove-tail tongue and groove connection with the bed 7 is slidably mounted on said bed and a work holder is pivotally mounted on said plate, the work holder comprising a block 9 having a groove, preferably V-shaped, thereon. Suitable set screws 10 are provided on the plate 8 by means of which the work holder may be set at any desired angle. A set screw 11 is carried by the work holder at one end and extends longitudinally of the groove. The opposite end of the groove forms a permanent stop 12. Set screws 13 are provided to adjust and limit the path of reciprocatory movement of the plate 8.

Attached to the lower end of the rod 5 is the indicator carrier 14 having an arm 15 having an aperture in the upper end thereof through which extends the arm 15^a of an indicator, and which is held in place by the set screw 15^b. Supported from the bottom of the carrier 14 is the hanger 16 in which the operating lever 17 is pivotally mounted on the pin 18. The end 17^a of the arm of this lever bears against the plunger 19 of the indicator 20 and the end of the arm 17^b bears against the head 21 of the pin 22 which is mounted for reciprocation in the lower part of the hanger 16. A guide 23 for the pin 22 projects below the hanger and is attached thereto in any suitable manner. In the lower end of the pin 22, is set a diamond point 22^a which is adapted to contact with the member to be gauged.

Attached to the rod 5 is a clamp 24 which carries the set screw 25, the purpose of which is to limit the outward throw of the lever 17. Connecting the lever 17 and the rod 5 is any suitable resilient means 26 such for example as an elastic band or a contractile spring.

The length of the arm 17^a is a multiple of the arm 17^b, the purpose of which is to give a finer and more accurate reading on the scale of the indicator.

In using my device to gauge the angle of taper of a member the work holder 9 is set at such an angle that when a member to be engaged is placed therein, the line of contact between the surface of the member and the diamond point will be exactly at right angles to the axis of the pin 22 if the angle of taper of the member is correct. Having the work holder set in this position the lever 17 is operated by taking hold of the handle provided thereon for the purpose, and pulling, downward thereon, thus disengaging the end 17 from the head 21 of the pin 22, thereby allowing the latter to be raised by the insertion of a roll R in the V groove between the set screw 11 and the stop 12. The lever is then released and the resilient means 26 pulls the lever in such a way as to force the dia-

mond point into contact with the member to be engaged. Next the plate 8 and with it the work holder and the work is reciprocated. If the angle of the work or member is correct there will be no variation in the reading scale.

By use of the resilient means 26, the force tending to press the diamond point into contact with the work is always the same. This does away with the possibility of inaccurate gauging which is always present when the diamond point is pressed down by an operator. The force used by the operator is never twice exactly alike, nor is the force used by different operators, ever exactly the same.

To use this device to gauge the outside diameter of either a cylinderical or tapered roller, the set screws 13 are so placed as to prevent reciprocation of the plate 8. The roller is then inserted in the same way and the lever released and a reading of the scale of the indicator is taken.

If desired, this device can be used as a combined gauge to determine the outside diameter and the angle of taper of the roller. To do this the roller is inserted in the V block and a reading taken for the diameter and then the plate is reciprocated and the indicator observed to determine the accuracy of the angle of taper.

It is, of course, understood that the particular device shown and described in the present application illustrates merely a preferred form of construction and arrangement of parts, which, it has been found, will successfully carry out the principles of my invention, and that various changes and modifications of details may easily be made without departing from the spirit of my invention as defined in the appended claims.

I claim as my invention:

1. In a device of the character described, a base, a plate reciprocatively mounted thereon, a holder pivotally mounted on said plate, and a contact element supported in position to engage an article carried by said holder.

2. In a device of the character described, a base, a plate reciprocatively mounted thereon, a holder pivotally mounted on said plate, a contact element supported in position to engage an article carried by said holder, and an indicator operatively associated with said contact element.

3. In a device of the character described, a base, a plate reciprocatively mounted thereon, a holder pivotally mounted on said plate, means to adjust said holder, and a contact element supported in position to engage an article carried by said holder.

4. In a device of the character described, a base, a plate reciprocatively mounted thereon, a holder pivotally mounted on said plate, means to adjust said holder, a contact element supported in position to engage an article carried by said holder, and an indicator operatively associated with said contact element.

5. In a device of the character described, a base, a plate reciprocatively mounted thereon, a holder pivotally mounted on said plate, means to adjust said holder, means to vary the range or stroke of reciprocation of said plate, and a contact element supported in position to engage an article carried by said holder.

6. In a device of the character described, a base, a plate reciprocatively mounted thereon, means to vary the range or stroke of reciprocation of said plate, a holder pivotally mounted on said plate, means to adjust the position of said holder, a support, a contact element movably mounted on said support in position to engage an article carried by said holder, an indicator, and movable means engaging said contact element and operatively associated with said indicator.

7. In a device of the character described, a base, a plate reciprocatively mounted thereon, means to vary the range or stroke of reciprocation of said plate, a holder pivotally mounted on said plate, means to adjust the position of said holder, a support, a contact element movably mounted on said support in position to engage an article carried by said holder, an indicator, and a lever pivotally mounted on said support, said lever having one arm adapted to engage said contact element and the other arm operatively associated with said indicator.

8. In a device of the character described, a base, a plate reciprocatively mounted thereon, means to vary the range or stroke of reciprocation of said plate, a holder pivotally mounted on said plate, means to adjust the position of said holder, a support, a contact element movably mounted on said support in position to engage an article carried by said holder, an indicator, and a lever, one of the arms of which is a multiple of the other, said lever being pivotally mounted on the support with the short arm in engagement with said contact element and the long arm operatively associated with said indicator.

9. In a device of the character described, a base, a plate reciprocatively mounted thereon, means to vary the range or stroke of reciprocation of said plate, a holder pivotally mounted on said plate, means to adjust the position of said holder, a support, a member carried by said support, and adjustable relative to said base, a contact element movably mounted on said member in position to engage an article carried by said holder, an indicator carried by said member, and means on said member operatively associated with said contact element and said indicator.

10. In a device of the character described, a base, a plate reciprocatively mounted

thereon, a holder pivotally mounted on said plate, a contact element supported in position to engage an article carried by said holder, and means for exerting uniform pressure on said contact member.

11. In a device of the character described, a base, a plate reciprocatively mounted thereon, a holder pivotally mounted on said plate, a contact element supported in position to engage an article carried by said holder, and means including a resilient member for exerting uniform pressure on said contact member.

12. In a measuring device, a support and a holder adjustable relatively to each other, a contact element mounted in said support and adapted to engage an article carried by said holder, an indicator carried by said support, a bell crank lever pivotally mounted on said support, said lever engaging the contact means and being adapted to operate said indicator, and a constant tension means to operate said lever.

13. In a measuring device, a support and a holder adjustable relatively to each other, a contact element reciprocatively mounted in said support and adapted to engage an article carried by said holder, an indicator carried by said support, a lever pivotally mounted on said support, one arm of which lever engages the contact element and the other arm of which operates the indicator and means for actuating said lever.

14. In a device of the character described, a holder, a support adjustable relative thereto, a contact element carried by said support and adapted to engage an article in said holder, means for actuating said contact element including a lever pivoted to the support and in contact with said element, and a constant tension means operatively associated with said lever and said support.

15. In a device of the character described, a holder, a support adjustable relative thereto, a carrier attached thereto, a hanger supported by said carrier, a contact rod reciprocatively mounted in said hanger, an indicator supported by said carrier, and a bell crank lever pivotally attached to said hanger and operatively associated with said rod and said indicator.

16. In a device of the character described, a bed, a holder reciprocatively mounted thereon, a support on said bed, a carrier attached to said support, a hanger supported by said carrier, a contact rod reciprocatively mounted in said hanger, an indicator supported by said carrier, and a bell crank lever pivotally attached to said hanger and operatively associated with said rod and said indicator.

17. In a device of the character described, a bed, a holder thereon, a support, contact means carried by said support and adapted to engage an article supported by said holder, constant tension means for operating said contact means, and means for varying the position of the contact means and the work holder relative to each other.

18. In a gaging device, means for supporting an article to be gaged comprising a bed, a reciprocating plate thereon, a holder pivotally mounted on said plate, and means to adjust the position of said holder.

19. In a gaging device, means for supporting an article to be gaged comprising a bed, a reciprocating plate thereon, a holder pivotally mounted on said plate, and set screws carried by said plate and contacting with the ends of said holder to maintain said holder in proper position.

20. In a gaging device, means for supporting an article to be gaged comprising a bed, a reciprocating plate thereon, a holder pivotally mounted on said plate, set screws carried by said plate and contacting with the ends of said holder to maintain said holder in proper position, and means to vary the range or stroke of reciprocation of said plate.

IRVIN FLINN WOODROW.