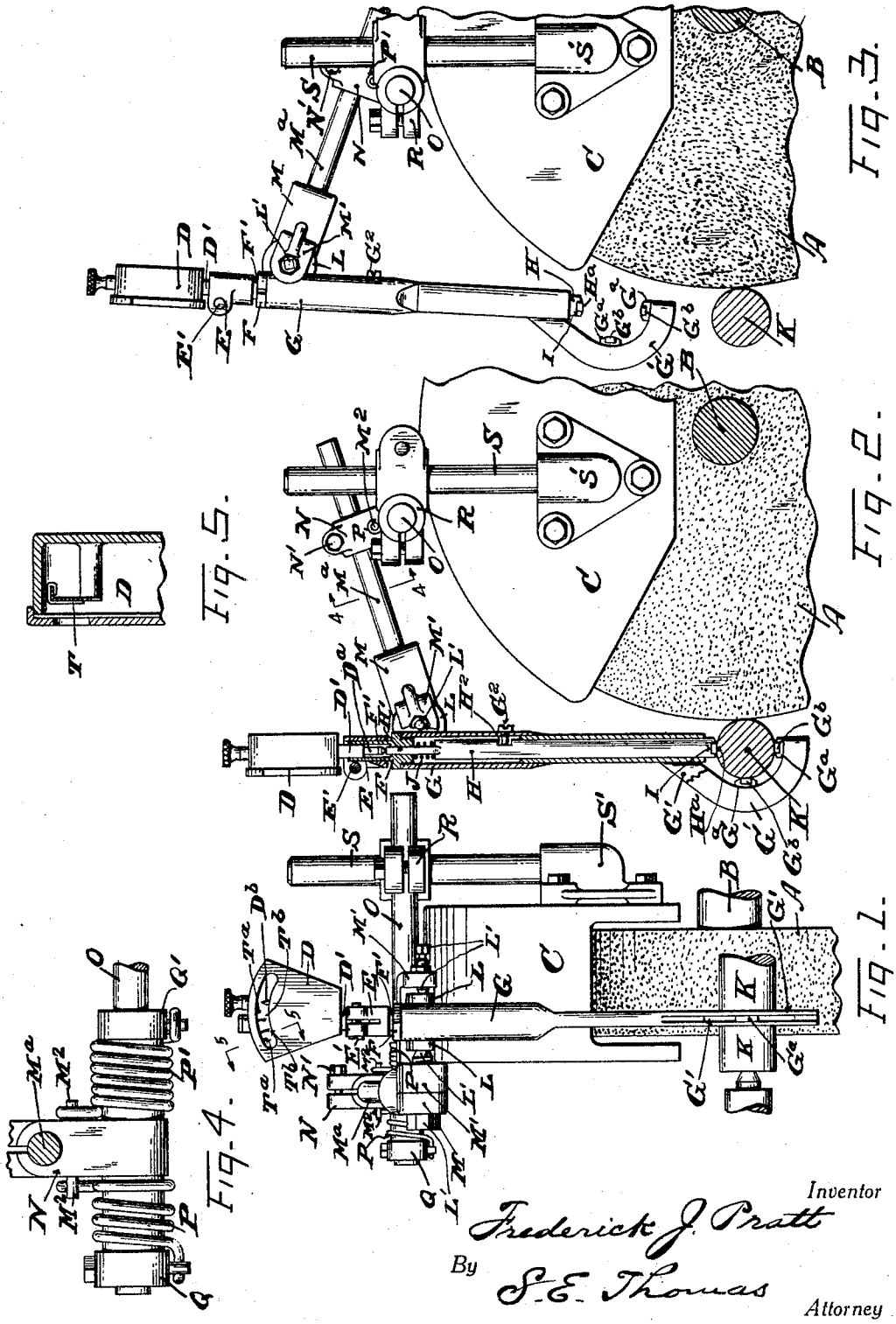
Dec. 13, 1932. F. J. PRATT 1,890,827

GRINDING GAUGE

Filed Dec. 13, 1930



Inventor
Frederick J. Pratt
By S. E. Thomas
Attorney

Patented Dec. 13, 1932 1,890,827

UNITED STATES PATENT OFFICE

FREDERICK JACKSON PRATT, OF FERNDALE, MICHIGAN

GRINDING GAUGE

Application filed December 13, 1930. Serial No. 502,170.

This invention relates to a gauge for measuring shafts, spindles or cylindrical elements while subjected to a grinding or cutting operation to reduce the work to a predetermined size.

The primary object of the present invention is to supply a simple inexpensive device which will automatically indicate to the operator the progress made in grinding the work to size and furnish accurate measurements of diameter the entire length of the element being ground.

A further object of the invention is to speed up production by avoiding stoppage of the grinding machine to take measurements.

A further object of the invention is to so mount the device that it may maintain a proper relation to the article ground throughout the grinding period.

A further object of the invention is to provide means for supporting the gauge whereby it may be swung out of the way to remove or replace the article being ground.

A further object of the invention is to provide accurate measurements while insuring against appreciable wear of the stylus and other contact points traversing the periphery of the work, thus reducing the cost over devices employing gem stones for a like purpose.

In carrying the foregoing into effect, a movable bar—supporting a stylus consisting of a small block of tungsten carbide, is sleeved in a tubular housing having an arcuate extension at its lower end partially surrounding the work to be calipered.

Projecting inwardly from the arcuate extension of the tubular housing is a short stationary arm supporting a small block of tungsten carbide with a convex edge in opposing relation to the stylus at the end of the movable bar, which upon adjusting the device to the work are diametrically opposed with respect to the work piece. Projecting also inwardly from the arcuate extension is another short stationary arm suporting a like block of tungsten carbide having a convex edge at right angles to those previously referred to and adapted to medially intersect a line drawn between the first mentioned block and the automatically movable stylus.

The edge of the several small blocks of tungsten carbide contacting with and traversing the work may be concave or other form but preferably have a convex edge thus providing a limited area of contact and insuring greater accuracy of measurement.

With the foregoing and other objects in view which will appear as the description proceeds, the invention further resides in the combination and arrangement of parts and in the details of construction hereinafter described and claimed, it being understood that changes may be made in the precise embodiment of the invention herein shown without departing from the spirit of the same.

In the drawing accompanying this specification:

Figure 1 is a front elevation of the device supported from the guard hood of a grinding wheel, a fragment of the grinding wheel being shown, also a short section of a shaft—the work being ground.

Figure 2 is a side elevation partly in vertical section showing the device suspended from a bracket attached to the guard hood of a grinding wheel and applied to the work, or element being ground.

Figure 3 is a similar view showing the device raised, or released for the removal of the work—or introduction of another element to be ground.

Figure 4 is a sectional elevation, taken on or about line 4—4 of Figure 2, of a portion of the supporting bracket.

Figure 5 is a fragmentary cross-sectional view of a detail of the indicating gauge taken on or about line 5—5 of Figure 1.

Referring now to the letters of reference placed upon the drawing:

A denotes a grinding wheel, B its supporting shaft and C the hood or wheel guard of the grinding machine,—not shown.

D indicates a dial indicator of well known construction, having a downwardly extending collar D^1 supported in a split bracket E fitted with a clamping bolt E^1 to secure the bracket upon a fitting F.

The fitting F has an upstanding collar F^1

to receive the split bracket E and is screwed in the upper end of a depending sleeve G housing a vertically movable bar H, which cooperating with the rod D^a actuates the swinging pointer D^b of the dial indicator. The vertically movable bar H at its lower end is provided with a block of tungsten carbide I. J is a spring sleeved on an extension H^1 of the vertically movable bar H bearing against the fitting F at one end and at the other end upon the movable bar H, thus maintaining the stylus H^a in yieldable contact with the work K.

The depending tubular housing G, inclosing the bar H, is provided with an arcuate lateral extension consisting of a pair of flat tines G^1 G^1 spaced apart to receive a pair of short inwardly extending arms G^a G^a one of which is positioned below and in longitudinal alignment with the movable bar H, while the other extends at right angles thereto.

The inner ends of the arms G^a G^a are each fitted with a slightly arched or convex block of tungsten carbide G^b serving as contact points which bear upon and traverse the surface of the work as the latter is rotated in contact with the yieldable stylus. The arms G^a G^a in the present embodiment are rigidly secured to the arcuate lateral extension of the housing sleeve G,—they may however be adjustably secured thereto if desired. G^2 denotes a screw extending through the wall of the housing G into the path of the vertically movable bar H, recessed as indicated at H^2, to receive the end of the screw, which upon contacting with the shoulder of the bar H, at either end of the recessed portion H^2, serves to limit further movement of the bar.

L indicates a lug integral with the tubular housing G, extending transversely of the longitudinal axis of the latter and bored to receive the tapering ends of a pair of bolts L^1, L^1 projecting inwardly from a yoke-shaped arm M^1 of a bracket M, to receive the lug L,—free to swing upon the ends of the bolts.

Projecting from the bracket M is a rod M^a secured in a split bracket N,—fitted with a clamping bolt N^1, in turn sleeved upon a shaft O. Mounted on the sleeve of the bracket N are springs P, P^1 each of which engage a transverse pin M^2 extending through the split arm of the bracket and at their opposite ends to pins projecting from the respective collars Q, Q^1 secured to the shaft O which is in turn gripped by a bifurcated arm R, secured upon an upright post S rising from a bracket S^1, bolted to the side wall of the guard hood C covering the grinding wheel.

Manually slidable upon the graduated segment of the dial indicator is a spider frame T, see Figure 5, having a plurality of radial arms, the outer arms T^a T^a indicating the extreme tolerance, or variations allowed from exact measurement of the finished work, indicated as between the arms T^b T^b, see Figure 1.

Having now pointed out the several parts by reference letters, the construction and operation of the parts will be readily understood.

A master element, template, or model is first set up in the grinding machine by which the accuracy of the work is checked and the grinding gauge properly adjusted in relation thereto. The arcuate lateral extension G^1 G^1 of the tubular housing G is then manually withdrawn from the master element and under the urge of the spring P^1— which also serves to yieldingly maintain the arc-shaped blocks carried by the arms G^a G^a in contact with the work while traversing the latter—lifts the device out of the way of the operator, the spring P serving as a shock absorber to quiet the vibration of the device should the operator accidentally or carelessly release the gauge upon withdrawing it from the work.

The device is thus supported in its raised position by the spring P^1—Figure 3—until the work to be ground to size is properly mounted in the grinding machine, whereupon it is returned to former calipering position—Figure 1—in relation to the work.

The work at this time being "over size" the swinging pointer of the dial will so indicate upon the graduated segment of the dial. Immediately after starting the grinding wheel, the operator may follow the gradual attrition of the work to predetermined size. Upon the swinging pointer of the dial indicator occupying a position between the fingers T^a, T^a,—indicating the extreme tolerance allowed,—or the fingers T^b T^b, indicating the exact measurement, the grinding operation is stopped,—the gauge is then manually removed from the work as previously described,—to be followed by the mounting of a new element to be ground to "size".

Having thus described my invention what I claim is:

In a device for measuring rotating elements while grinding to size; a depending sleeve having a lateral, substantially arc-shaped extension, adapted to partially encircle the work element as it is ground to size; a transverse lug integral with the sleeve; a rod fitted with a yoke-shaped bracket, pivoted to the transverse lug of the sleeve; a shaft; a split bracket fitted to the shaft adapted to support said rod; a pair of springs coiled upon the shaft. respectively engaged at one end of the shaft and at their opposite ends to the split bracket, whereby the depending sleeve may be yieldingly supported and its vibrating movement checked; a post and means for securing the post to the frame of a grinding machine; a clamping member secured to the post for supporting the shaft;

a movable rod housed in the depending sleeve and projecting through its lower end; a stylus fitted to the end of said rod formed of relatively hard metal; means for yieldingly forcing said rod to the limit of its movement in one direction; a dial indicator actuated by the movement of said rod; and a plurality of contact plates, adapted to bear upon the work element as it is ground to size, supported in the lateral substantially arc-shaped extension of the depending sleeve.

In testimony whereof, I sign this specification.

FREDERICK JACKSON PRATT.