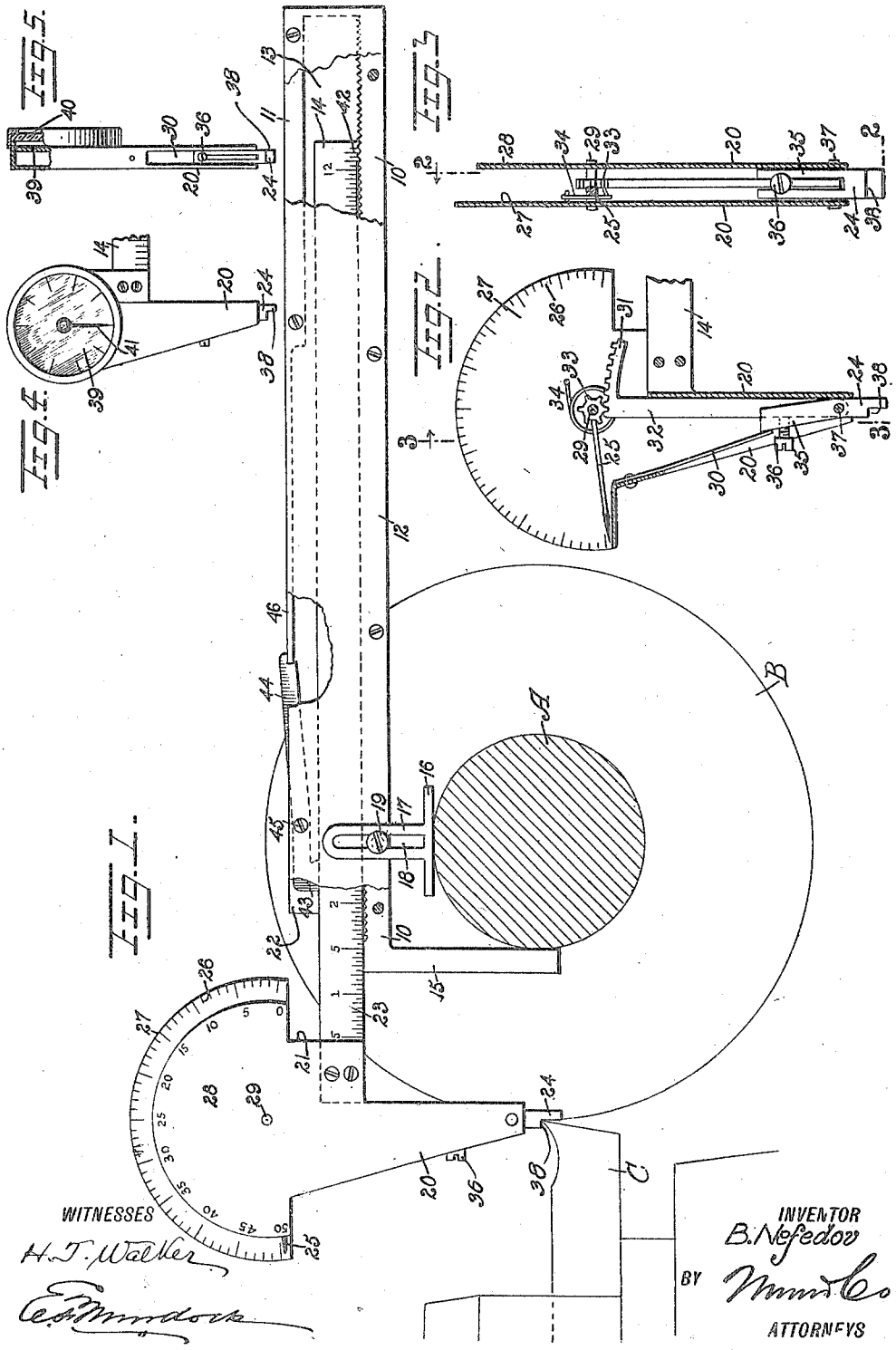
B. NEFEDOV.

CUT GAGE FOR MACHINE TOOLS.

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WITNESSES

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CUT-GAGE FOR MACHINE-TOOLS.

1,283,868. Specification of Letters Patent. Patented Nov. 5, 1918.

Application filed May 15, 1917. Serial No. 168,637.

To all whom it may concern:

Be it known that I, BASIL NEFEDOV, a citizen of Russia, and a resident of the city of New York, borough of Brooklyn, in the county of Kings and State of New York, have invented a new and Improved Cut-Gage for Machine-Tools, of which the following is a full, clear, and exact description.

Among the principal objects which the present invention has in view are: To furnish means for accurately disposing the lathe cutting tool to the work to be performed thereby; to indicate optically the extent of movement of said tool; to rapidly adjust said tool to the work required; to avoid overcutting by said tool; and to simplify the construction of the gage for setting the tool.

Drawings.

Figure 1 is a side view of a gage constructed and arranged in accordance with the present invention, showing in conjunction therewith a fragment of a lathe center pin, a tool table and cutter therein, and an end view of work being turned, all of the parts being shown in their coöperative relation;

Fig. 2 is a vertical section of a micrometric mechanism with which the gage is provided, the section being taken as on the line 2—2 in Fig. 3;

Fig. 3 is a vertical section of the same, the section being taken as on the line 3—3 of Fig. 2;

Fig. 4 is a side view of a modified form of the micrometric mechanism employed in the present gage;

Fig. 5 is an extreme edge view of the same.

Description.

As seen in the drawings, the gage herein disclosed has a relatively stationary member, a relatively movable member, and means for determining accurately the relative disposition of the two members. The stationary member comprises a handle bar which is composed primarily of framing ribs 10 and 11, and side plates 12 and 13 therefor. The ribs 10 and 11 and side plates 12 and 13 form a pocket wherein moves the reach bar 14 of the movable member above mentioned.

Rigidly connected with or integrally formed from the framing rib 10, is a surface gage arm 15. The arm 15 is preferably extended in perpendicular relation to the rib 10 and the handle member of which said rib forms a part. Both longitudinal edges of the arm 15 are finished. The outer edge of said arm is used for engaging the center pin A of a lathe by which the work B is supported. The diameter of the pin A is constant and ascertained.

To support the tool so that the ends of the arms 15 and 24 and the center of the pin A are in line, there is provided an adjustable rest embodying a plate 16 and a slotted standard 17. Through the slot 18 of the standard 17 passes a set screw 19, the threads whereof engage the threads in a tapped hole formed in the plate 12 and rib 10. The screw 19 when set up clamps the standard 17 to hold the plate 16 fixed relatively to the plate 12.

When the reach bar 14 is fully retracted, the inner edge of the gage arm 20 rests firmly against the inner edge of the gage arm 15. In this position, the edges 21 of the side plates forming the arm 20 rest in contact with the edges 22 of the side plates 12 forming the handle of the gage. Also in this position the zero line of the scale 23 coincides with the inner edges of the arms 15 and 20 when abutted, but it will be observed that the short arm 24 is spaced apart from the inner edge of the arm 15, and that the pointer 25 is disposed at the point marked "50" on the scale 26 with which the dial 27 is furnished.

For convenience of construction, the numerals to be read on the scale 26 are inscribed on the face plate 28, which is spaced apart from the dial 27. Between the plate 28 and the dial 27, the pointer 25 swings on its shaft 29.

As seen best in Fig. 2 of the drawings, the shaft 29 is held by a flat spring 30 in its retracted position where the pointer 25 is removed from zero. From this position the shaft is rotated to swing the pointer 25 toward the zero end of the scale by means of a toothed quadrant 31, which is mounted at the end of a long arm 32.

The spring 34 operates to rotate the shaft 29 and pinion 33 to carry the pointer 25 toward the position on the dial marked "O". If unrestrained by the greater strength of

the spring 30, the spring 34 performs this function, moving the arm 32 and quadrant 31 in consonance therewith.

The arm 32 is engaged by the lever 35 and screw 36. The lever 35 is pivoted on a shaft 37 between the side plates of the gage arm 20. The short end 24 of the said lever extends below the arm 20. The end of the short arm 24 is cut away to form a notch 38 into which the cutting edge of a tool C is placed when set. The short abutment forming the upper wall of the notch 38 is disposed at about the level of the center of the pin A and the work C. This arrangement provides for setting the cutting tool at the most desired point of operation thereof.

The screw 36, as shown best in Fig. 3 of the drawings, is mounted in a tapped recess in the side of the bifurcated members of the lever 35. The end of the screw 36 bears against the forward edge of the arm 32. The spring 30 under all conditions tends to hold the arm 32 in its fully retracted position. It is obvious that as the screw 36 is advanced, the long arm of the lever 35 is rocked and the short arm 24 is moved toward the inner edge of the arm 20, to compensate for any wear on the contact end of said short arm.

The scale 23 is divided into a series of major divisions, which divisions are indicated by ordinals "1," "2," &c., as seen best in Fig. 1 of the drawings, the last of said ordinals being the figure "12" near the end of the bar 14. The spaces or divisions are preferably divided into tenths, and the numerals "5" on the scale indicate five-tenths of the various spaces. From this it is obvious that the zero point on the scale 23 is coincident with the inner edge of the arm 20.

The reach bar is normally held in adjusted position by the toothed segment 42 at the end thereof, which engages the teeth formed on the inner edge of the framing rib 10. The bar 14 is held in engagement with the teeth of the rib 10 by the pressure of the head 43 of a rocking lever 44. The lever 44 is pivoted on the pivot screw 45 and is normally rocked to depress the head 43 by a spring 46. The tail end of the lever 44 extends above the side plates 12 of the handle of the tool sufficient to permit the operator depressing the same. By depressing the lever 44, the head 43 is lifted sufficiently to permit the reach bar to be raised out of engagement with the rack teeth of the rib 10. When thus disposed, the reach bar may be drawn out to any desired distance and set with reference to the scale 23.

In the modified form of the invention shown in Figs. 4 and 5 of the drawings, a circular dial 39 is substituted for the semicircular dial 27. The dial 39 is covered by a transparent crystal 40 to protect the pointer 41. The operation of the pointer 41 in all respects is similar to the operation of the pointer 25.

Operation.

The operation of the herein-disclosed gage is as follows: The operator knowing the diameter of the center pin A deducts this from the ascertained diameter of the finished product. The sizes of the divisions on the scale 23 of the reach bar 14 are actually one-half of those indicated by the markings. Thus the necessity of dividing the diameters to obtain the radii of the center pin and the finished product is avoided.

The difference between the diameters above noted having been ascertained, the reach bar 14 is so adjusted that the mark on the scale 23 corresponding to said difference registers with the edges 22 of the plates 20. To move the bar 14, the lever 44 is depressed to release the said bar from engagement with the teeth of the frame piece 10. The bar having been adjusted, the lever 44 is released to permit the spring 46 to depress the said reach bar for engagement thereof by the teeth in said frame piece.

It will be remembered that the short arm 24 of the lever 35 is normally held back from the plane of the edge of the arm 20. When this short arm 24 is moved to coincide with the edge of the arm 20, the lever 35 will be rocked to permit the arm 32 to be moved by the pinion 33 and spring 34 until the pointer 25 or 41, as the case may be, rests opposite the zero indication on the dial 27 or 39. The movements of the pointers 25 and 41 are magnified to such an extent that every slight movement of the short arm 24 produces a relatively large movement of said pointers. As a result of this construction, the mechanic is enabled to determine the position of the pointer of the cutter C with reference to the measurement of the finished product upon which he is working. As an example, if the gage is set and the scale 26 represents divisions of the inch, the operation would be as follows: The gage would be disposed on the center pin A adjacent the tool stock of a lathe. The plate 16 having been adjusted so that the notch 38 is properly disposed, the back of the arm 15 is drawn against the side of the pin A. The cutting tool C is then advanced until the cutting edge rests within the notch 38 of the short arm 24. At this point a relatively coarse cut could be made, and the mechanic could advance the tool C until the pointer 25 registers with the calibration on the scale 26 indicated by the numeral "20." Succeeding cuts would be measured by advancing the cutter C, the advance being disclosed by the movement of the pointer 25. It is obvious that as the set of the tool C approaches the final cut, which

would be when the pointer reaches the calibration mark "O," the movement of the said cutter could be very minute and the chances of overcutting the product be minimized, if not totally eliminated.

Claims.

1. An apparatus as characterized comprising coöperative gage members; a reach bar fixedly attached to one of said members and slidably connected with the other member, said reach bar having calibrated scales for indicating the adjustment of said gage members; a responsively yielding member pivoted on one of said gage members and normally held in advance of the position assumed by it in correspondence with the position indicated on said reach bar; and means operatively connected with said yielding member for micrometrically indicating the movement of said yielding member.

2. An apparatus as characterized comprising a plurality of separable gage members adapted for disposition between a cutting tool and a work-holding member; a calibrated gage operatively connected with said separable members for indicating the desired working position of said cutting tool; movement-magnifying indicating means structurally incorporated with one of said gage members for interposition between said gage member and said cutting tool; and means for yieldingly holding said indicating means in the path of said cutting tool.

3. An apparatus as characterized comprising a stationary gage member; a gage member movable relatively to said stationary gage member; extension bars, one mounted on each of said members for engaging the center pin of a machine tool and a cutting tool thereof, respectively; means for locking said members in adjusted relation; and a movement-multiplying indicator mounted on one of said gage members for registering its relation to the other of said gage members, said indicator being adapted to be engaged by said cutting tool for movement of said indicator while being advanced to the working position of said tool.

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Copies of this patent may be obtained for five cents each, by addressing the "Commissioner of Patents, Washington, D. C."