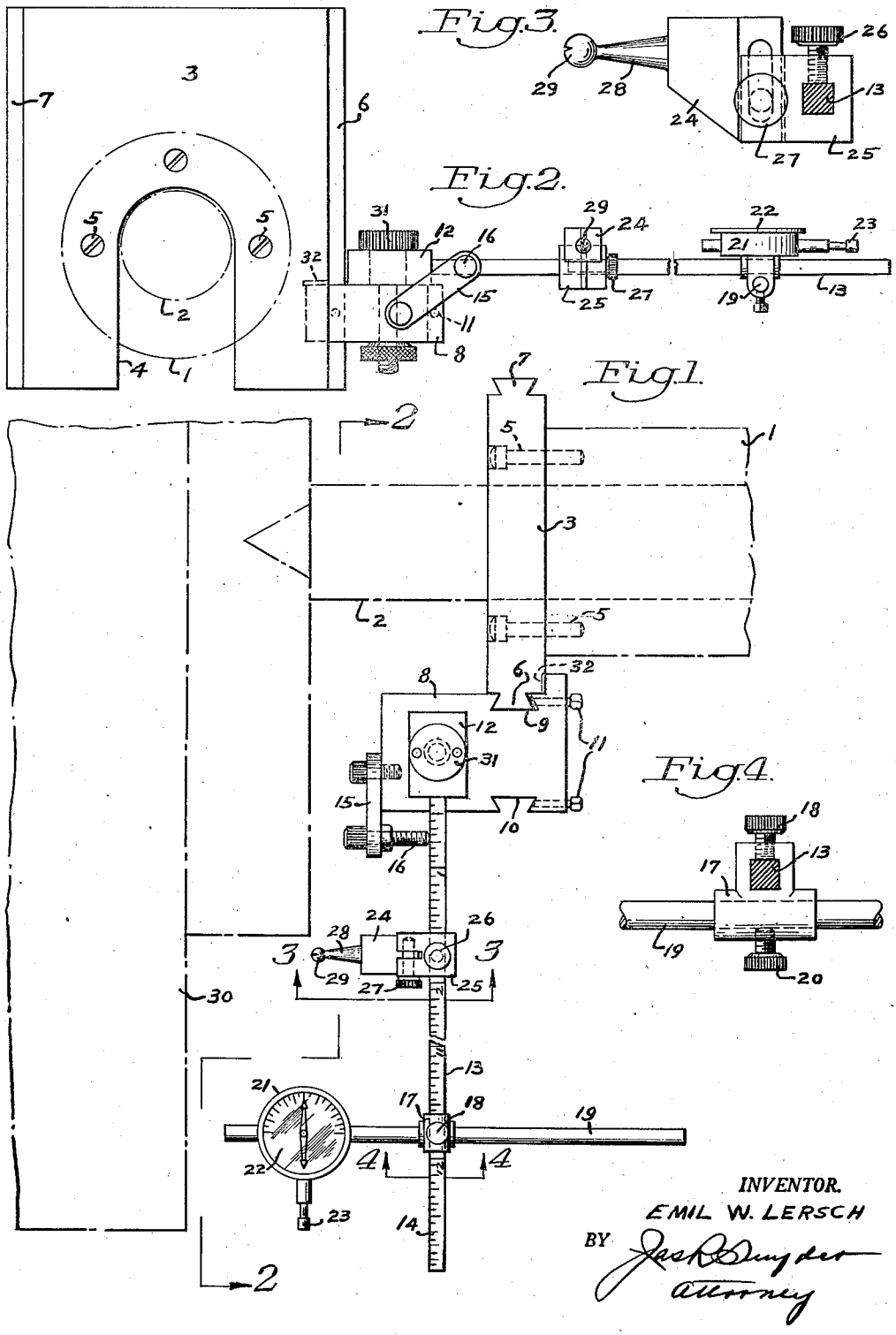
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GAUGE

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GAUGE

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1 Claim. (Cl. 33—185)

This invention relates to a gauge, and while primarily designed and intended for being attached to an engine lathe, and employed for readily and accurately determining and indicating the exact position of the point of the cutting tool to turn a predetermined outside diameter on plain, cylindrical, parallel, duplication work, it will be obvious that the gauge may be employed for any other purposes wherein it is found to be applicable.

Important objects and advantages of the invention are to provide a gauge of the character described, which embodies a dial indicator operable for accurately indicating and determining the exact position of the cutting tool for turning a predetermined diameter, which obviates the necessity of the frequent calipering operations now required on diameter turning work, which may be readily attached to a lathe already constructed as well as form a component part of a new lathe structure, which may be successfully employed by anyone of ordinary mechanical skill, which will facilitate and expedite diameter turning operations, which is simple in its construction and arrangement, durable and efficient in its use, accurate, compact, and comparatively economical in its manufacture, installation, maintenance, and use.

With the foregoing and other objects in view which will appear as the description proceeds, the invention resides in the novel construction, combination, and arrangement of parts herein specifically described and illustrated in the accompanying drawing, but it is to be understood that the latter is merely illustrative of an embodiment of the invention, and that the actual needs of practice and manufacture may require certain mechanical variations from the embodiment shown. It is, therefore, not intended to limit the invention to the disclosure thereof herein illustrated, but rather to define such limitations to the scope of the claim hereunto appended.

In the drawing wherein like numerals of reference designate corresponding parts throughout the several views:

Figure 1 is a top plan view of a gauge constructed and applied to a lathe in accordance with the invention.

Figure 2 is an inner side elevational view thereof.

Figure 3 is a sectional view on line 3—3, Figure 1.

Figure 4 is a similar view on line 4—4, Figure 1.

Referring in detail to the drawing 1 represents the tailstock of an engine lathe. The tailstock carries the dead-center tail spindle 2, which latter engages and supports one end of the work 30 to be turned in the lathe. The tailstock and spindle are of the conventional construction and arrangement now in common use and well known in the art to which the invention appertains.

A rigid, substantially rectangularly-shaped attaching plate 3 is fixedly mounted, in the vertical edgewise position, against the inner end of the tailstock 1, and is formed with a vertically disposed recess 4, which is open at its lower end to straddle the tail spindle 2. The attaching plate is securely fixed in position by a plurality of screws 5, which extend through the attaching plate and engage in the inner end of the tailstock. Each side edge of the attaching plate is formed with a vertically extending dovetail tenon, respectively indicated at 6 and 7.

A horizontally flatwise disposed, rectangularly-shaped, adjusting block 8 is adapted for connection with either side edge of the attaching plate 3. The side edges of the adjusting block are formed with dovetail mortises, respectively indicated at 9 and 10, which latter extend vertically across said side edges, respectively, in opposed relation to each other, and are adapted for interengagement with respective tenons 6 and 7 of the attaching plate.

In work of large diameters, the adjusting block 8 is connected with the tenon 6 at the forward edge of the attaching plate 3, as shown in Figures 1 and 2, and in work of small diameters the adjusting block is connected with the tenon 7 at the rearward edge of the attaching plate.

The adjusting block 8 is vertically adjustable on its connection with the attaching plate 3, and may be rigidly secured in the adjusted position by means of set screws 11, which latter are threadedly engaged in the adjusting block and projectable into the mortises 9 and 10 to engage respective tenons 6 and 7 of the attaching plate.

A flat swing head 12 is pivotally mounted on the top of the adjusting block 8 by means of a pivot bolt 31, which latter may be adjusted for securing the swing head against movement on the adjusting block. An elongated supporting arm 13, having its rearward end fixed in the swing head, extends horizontally forward from the latter. The supporting arm is preferably square in transverse section, and has its top face provided with a graduated length scale 14.

A holding bar 15 is secured against the inner end of the adjusting block 8, and carries an adjusting screw 16, which latter is so adjusted that,

when the inner side of the supporting arm 13 abuts against the free end thereof, the said supporting arm will be disposed forwardly exactly at right angles with respect to the axis of the tail spindle 2. It will be apparent, that the position of the adjusting screw 16 does not prevent the supporting arm from being swung in the outward direction, but does prevent the supporting arm from shifting inwardly beyond the exact right angular position relative to the axis of the tail spindle. The adjusting screw 16 allows accurate adjustment of the supporting arm regardless of minor inaccuracies in the connections of the associated elements.

The supporting arm 13 extends through a cross-clamp 17, which latter is longitudinally adjustable on the former, and carries a locking screw 18 for securing said cross-clamp in the adjusted position on the supporting arm.

An elongated cross-arm 19 extends through and is supported and longitudinally adjustable in the cross-clamp 17. The cross-arm is disposed accurately horizontal at right angles with respect to the supporting arm 13 and parallel to the axis of the tail spindle 2. The cross-arm may be secured in the adjusted position in the cross-clamp by means of a locking screw 20, which is carried by and engaged in said cross-clamp.

A dial indicator 21, of any suitable conventional construction and operable to measure and indicate one one-thousandths of an inch, is fixed in position on the cross-arm 19 adjacent to the inner end of the latter. The dial indicator is positioned horizontally flatwise, with the dial 22 thereof being disposed upwardly for convenient observation, and with its contact point 23 projecting horizontally in the forward direction from the dial indicator, as clearly shown in Figure 1.

A diameter lead 24 is mounted for vertical adjustment on a clamping member 25 and carries a locking screw 27 for securing same in the adjusting position. The clamping member is adjustably mounted on the supporting arm 13, and is positioned between the swing head 12 and the cross-clamp 17. The clamping member carries a locking screw 26 for securing same in the adjusted position on the supporting arm.

The diameter lead 24 includes an integrally formed, inwardly disposed finger 28, which carries a nicked measuring tip 29 at the free inner end thereof. While adjusting or setting the improved gauge to accurately determine the proper position of the indicator contact point 23 relatively to the axis of the tail spindle 2, the measuring tip 29 is disposed in exact horizontal alignment with said contact point 23.

In practice, the improved gauge is accurately adjusted on the lathe to position the indicator contact point 23 at such exact distance from the axis of the tail spindle 2, that said contact point 23 may be employed subsequently to indicate the exact spot to which the cutting tool should be set to turn the work 30 to an accurate predetermined diameter. Proper adjustment of the gauge is greatly facilitated by the use of the diameter lead 24, which latter is intended for infrequent adjustment and to be secured in position on the supporting arm 13 at an accurate predetermined distance, less than the radius of the work, from the axis of the tail spindle 2. After such adjustment of the diameter lead 24, the indicator contact point 23 is more conveniently adjusted from measurements taken from the measuring tip 29, of the diameter lead, as said measuring tip is more readily accessible for accurate measuring purposes than the tail spindle 2, particularly if a piece of work is engaged and supported by the latter.

To facilitate the adjustment of the adjusting block 8 on its connection with attaching plate 3, the outer face of the latter is provided with a mark nick 32, which indicates the position of the adjusting block when the indicator contact point 23 is in exact horizontal alignment with the axis of the tail spindle 2.

As shown in Figure 1, the dial indicator 21 is preferably positioned to dispose the contact point 23 thereof in convenient proximity to the work 30 at the right hand end of the latter. By such arrangement, the operator may readily employ the contact point 23 to test the accuracy of the position of the cutting tool to finish turning the predetermined diameter, while the dial 22 of the indicator 21 will function to indicate if any variation from the finished predetermined diameter is within the tolerance allowance. It will be evident that, such use of the improved gauge entirely eliminates the need of the frequent calipering operations now required for accurate diameter turning work.

As herein stated, the improved gauge is primarily intended for use in connection with turning outside diameters on cylindrical duplication work, in which the initial adjustment of the gauge need never be altered until such alteration is required to adapt the gauge to work differing from the duplication work.

In work embodying parts to be turned of varying diameters, suitable special attachments may be mounted in position on the supporting arm 13 to indicate or mark the location of the cutting tool for turning the various predetermined diameters. Further, the principle of the invention may be embodied in a portable, hand-supported gauge structure embodying suitable means for centering the latter relatively to the axis of the tail spindle 2.

The present invention provides a most efficient device of its kind, which may be inexpensively manufactured, and economically and successfully employed for the purposes and in the manner herein set forth.

What I claim is:

A tool setting gauge for a lathe including a cutting tool, comprising the combination of a flat attaching plate secured in the vertical position to the inner end of the tailstock of the lathe, an adjusting block adapted for adjustable interengaging connection with either side edge of said plate, a horizontally disposed supporting arm having a shiftable connection with said block and extending forwardly from the latter, means carried by said block and being adjustable for limiting the shiftable movement of said supporting arm, a cross clamp longitudinally adjustable on said supporting arm, a cross-arm longitudinally adjustable in said cross-clamp, a dial indicator including a contact point carried by said cross-arm, and a diameter lead adjustably mounted on said supporting arm and being disposed between said cross-clamp and said adjusting block, the adjustment of said cross-clamp on said supporting arm and the adjustment of said cross-arm in cross-clamp allowing the positioning of the contact point of said dial indicator to indicate the position of the cutting tool for turning work to a predetermined diameter.

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