Nov. 15, 1949 L. T. RAIBLE 2,488,237

DIAL INDICATOR FOR LATHES AND THE LIKE

Filed May 20, 1944

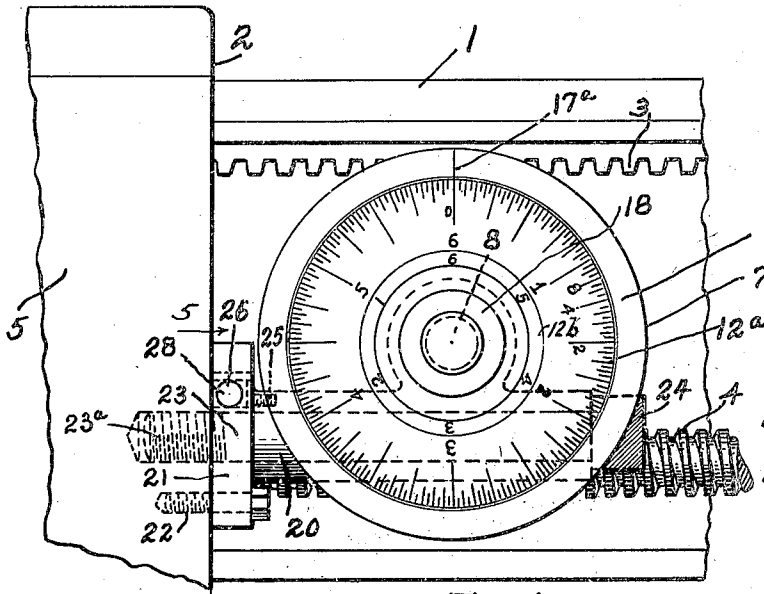


Fig. 1.

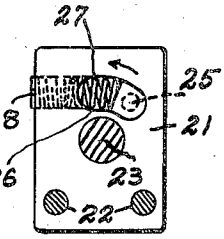


Fig. 5.

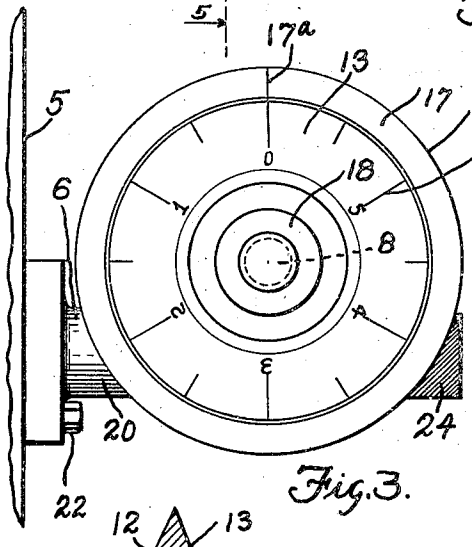


Fig. 3.

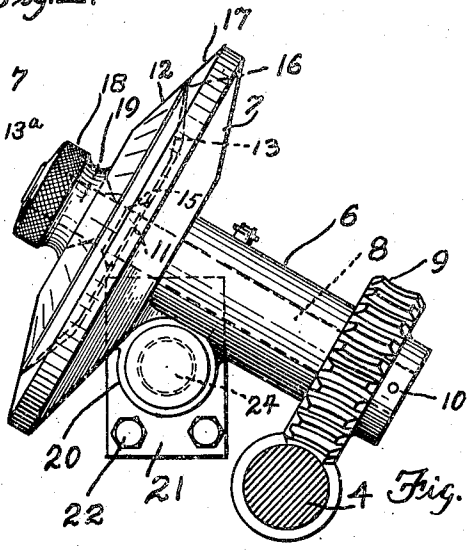


Fig. 2.

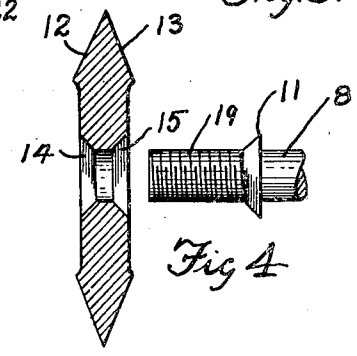


Fig 4

LOUIS THOMAS RAIBLE.
INVENTOR.

BY Allen & Allen
Attorneys

Patented Nov. 15, 1949 2,488,237

UNITED STATES PATENT OFFICE

2,488,237

DIAL INDICATOR FOR LATHES AND THE LIKE

Louis Thomas Raible, Cincinnati, Ohio

Application May 20, 1944, Serial No. 536,524

5 Claims. (Cl. 33—125)

1

It has been suggested to operate a dial for indicating the length of travel of a carriage in a lathe, by the use of a pinion engaging the lathe lead screw for purpose of operating the dial. My present invention relates to improvements in such constructions.

One object of my invention is to provide a device in which the dial itself is readily reversible, so that when the lathe carriage is operating by hand traverse, and the lead screw is not used, one dial face can be used, but when the lathe carriage is being driven by the lead screw, as for example in thread cutting, the other dial face can be used, thus providing readily readable calibrations for the type of operation used. In this connection it is my object to provide for a very simple mounting permitting adjustment of the indicating dial to zero, at the start of an operation.

Another object of my invention is to provide for a mounting of the device on the apron of a lathe so that the contact of the operating worm wheel or pinion with the lead screw can be adjusted and preferably so that the worm wheel is resiliently pressed against the lead screw. In this connection my device also provides for lifting the worm wheel entirely out of contact and locking the device in that position.

The above objects and other structural and operative advantages to be noted, I accomplish by that certain construction and arrangement of parts of which an example will be illustrated and described. The novelty inherent therein will be set forth in the appended claims to which reference is hereby made.

In the drawings:

Figure 1 is a front elevation showing my device with the dial face exposed used where the lead screw is not being rotated during the operation.

Figure 2 is a side elevation of the parts shown in Figure 1, saving the lathe carriage parts.

Figure 3 is an illustration in front elevation showing the other dial face in use, as for thread cutting.

Figure 4 is a section of the dial illustrating also the mode of mounting thereof.

Figure 5 is a detail on line 5—5 of Figure 1 showing the mounting plate and spring device.

I have illustrated the device as mounted on a lathe, which may of course, be of any type, and the machine can be of any type having a travelling carriage and a lead screw optionally used for operating the carriage. Thus I indicate a lathe bed at 1, a carriage at 2, the rack for use in hand feed at 3, and the lead screw for carriage feed at 4. The dial device is mounted on the

2

apron 5 of the carriage, where it overhangs the bed adjacent to the location of the lead screw.

The device includes a sleeve bearing 6, terminating in a conical shaped mounting base 7. These two parts may be in a single casting. A shaft 8 is journaled in the sleeve, and has at one end pinned thereto, and bearing against the end of the sleeve, a worm wheel 9. As indicated the wheel is held in place by a pin 10 passing through its collar and through the shaft.

The inner end of the shaft where it projects from the sleeve portion into the mounting base, is provided with a collar 11 which is finished as a conical bearing for the dial member. The collar prevents endwise movement of the shaft in one direction and with the worm wheel prevents its endwise movement in the other.

The mounting head is dished to receive the dial, which has two frusto-conical faces 12 and 13, and two seats 14 and 15 to engage the conical bearing on the collar 11. A ledge 16 in the dished portion of the mounting head engages and supports the margin of the dial in either of its positions, so that its edge is substantially in the plane of the beveled edge 17 of the mounting head.

There is a thumb nut 18 which engages the threaded end 19 of the shaft 8, which head bears on the dial and holds the dial in place on its bearing against the collar 11. As so constructed the thumb nut can be removed, and the dial face which it is desired to employ can be turned uppermost, and adjusted to zero indication, whereupon the thumb nut is tightened down. Also loosening the thumb nut will permit adjustment of the dial at the beginning of any operation. The dial face 12 as indicated, is calibrated in micrometer readings as at 12*a* and the dial face 13 is calibrated in readings suitable for use in cutting threads, as indicated at 13*a*. A zero mark 17*a* is formed in the beveled face of the mounting head. The calibrations will also preferably be arranged in direct and reverse, so that feeding in both directions of the table can be indicated and read. This is shown at 12*b* in Figure 1.

For mounting the device there is attached to or formed as part of the same casting, a sleeve member 20 at right angle (in this instance) to the sleeve portion 6. Mounted on the edge of the apron of the lathe is a mounting plate 21, with suitable holes thereon for receiving mounting bolts 22.

A shaft 23 passes through the sleeve 20, and is provided with a head 24 for manipulating it, this head bearing against one end of the sleeve. The other end of this shaft is threaded as at 23*a*,

and passes through a hole in the mounting plate. The sleeve portion **20** bears against the mounting plate at its other end, and also has a stud **25** mounted on its ends which projects through a curved slot **26** in the mounting plate. A spring **27** is held in the mounting plate and its tension may be adjusted by a set screw **28** which closes the hole in which the spring is mounted. The spring bears against the stud **25** on the sleeve portion **20**.

As so constructed, the device when mounted can be located so that the worm wheel bears against the lead screw of the lathe. When the lathe carriage travels along, the lead screw serves as a rack and causes the worm wheel to rotate, and its rotations are communicated to the dial. When the lead screw is operating, there is a compound effect on the worm wheel caused by the rotation of the shaft and the movement of the carriage, with the result of giving a different movement to the dial per increment of movement of the carriage. It is thus desirable to set the face of the dial outermost which serves for the type of operation with or without the lead screw.

The mounting of the device includes the engagement with the threaded end of the shaft **23**, of a hole in the lathe carriage. Thus when the shaft is turned in tightly, the position of the device on the shaft **23** is fixed. When the shaft is turned in loosely, the device can tilt on the shaft **23**. The spring device and stud are so arranged that the spring will press the device to a position tilted to bring the worm wheel into contact with the lead screw. Thus there is a spring pressed or resilient engagement for the drive of the indicator, which automatically takes up for wear of parts and does not require a careful preliminary adjustment.

When it is desired to lock the device out of operation with the head of the shaft **23** turned away from clamping position, the device is tilted back out of worm wheel engaging position and the head is then tightened down. This locks the gear **9** out of contact position. When in use the head of the shaft **23** is loosened permitting the device to swing to position, held by the spring **27**, of worm wheel engagement.

It will be evident that the requirements for differently organized machine tools will be different, and that the particular mechanical details of my device, while simple, sturdy and convenient, are not necessary for accomplishment of the novel purpose now illustrated by an example of my structure.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent is:

1. A dial indicator for machine tool carriage travel which comprises a dial, a mounting shaft for the dial, means for journalling said shaft, said means including an indexing point for the dial, a gear on the shaft for engagement with the machine tool lead screw, said dial having its opposite faces differently calibrated, and means for removably mounting the dial on the said mounting shaft so as to present the desired face, said dial being frusto-conical in shape with its opposed conical edges calibrated differently, and a dished head mounted on the journal means in which head said dial is seated, and means for removably mounting the dial on the mounting shaft.

2. A dial indicator for machine tool carriage travel which comprises a dial, a mounting shaft for the dial, means for journalling said shaft, a gear on the shaft for engagement with the machine tool lead screw, said dial having its opposite faces differently calibrated, and means for removably mounting the dial on the said mounting shaft so as to present the desired face, said dial being frusto-conical in shape with its opposed conical edges calibrated differently, and a dished head mounted on the journal means in which head said dial is seated, the means for removably mounting the dial on the mounting shaft comprising a conical bearing on the shaft, and a double conical seat in the dial where it is mounted over the shaft, and a thumb nut threaded on the end of the shaft and bearing against the dial.

3. A dial indicator for machine tool carriage travel which comprises a dial, a mounting shaft for the dial, means for journalling said shaft, a gear on the shaft for engagement with a machine tool lead screw, and means for mounting the device on the carriage of the machine tool comprising a transverse journal in the journaling means, a shaft therein, said last-named shaft having a threaded end which engages in the said carriage, and having a head thereon which abuts the journal whereby the journal can be clamped to the carriage.

4. A dial indicator for machine tool carriage travel which comprises a dial, a mounting shaft for the dial, means for journalling said shaft, a gear on the shaft for engagement with a machine tool lead screw, and means for mounting the device on the carriage of the machine tool comprising a transverse journal in the journaling means, a shaft therein, said shaft having a threaded end which engages in the said carriage, and having a head thereon which abuts the journal whereby the journal can be clamped to the carriage or rocked on its shaft to adjust the position of the device, and a mounting plate secured on the said carriage and pin and slot connection between the said journal and the plate, and spring means located in the slot to bear on the pin element of said connection arranged to resiliently press the journal toward a position of engagement of the gear with the lead screw.

5. A dial indicator for machine tool carriage travel which comprises a dial, a mounting shaft for the dial, means for journalling said shaft, a gear on the shaft for engagement with a machine tool lead screw, and means for mounting the device pivotally on the machine tool carriage, and for locking the device out of operative position, said mounting including a spring means arranged to press the device into a pivotal position of gear engagement with the lead screw when free from its locked position.

LOUIS THOMAS RAIBLE.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
281,283	Mershon	July 17, 1883
435,012	Calkins	Aug. 26, 1890
997,648	Cavanagh et al.	July 11, 1911
1,383,340	Robbins et al.	July 5, 1921
1,855,700	Wieser	Apr. 26, 1932

FOREIGN PATENTS

Number	Country	Date
528,665	France	Aug. 23, 1921