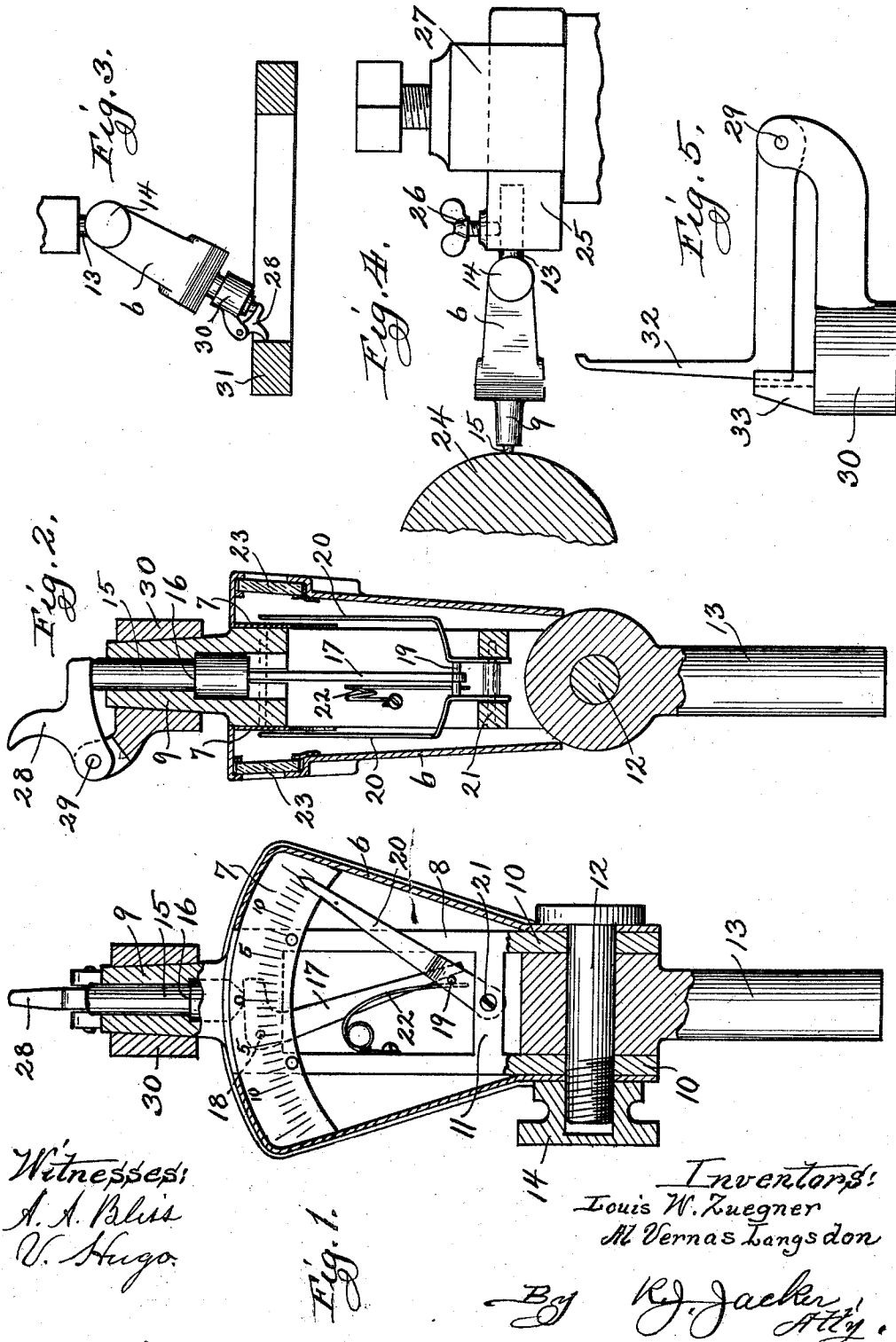


L. W. ZUEGNER & AL VERNAS LANGSDON.
 UNIVERSAL TEST INDICATOR.
 APPLICATION FILED FEB. 21, 1908.

1,019,400.

Patented Mar. 5, 1912.



Witnesses:
 A. A. Palis
 U. Hugo.

Inventors:
 Louis W. Zuegner
 Al Vernas Langsdon

By R. J. Jacker
 Atty.

UNITED STATES PATENT OFFICE.

LOUIS W. ZUEGNER AND AL VERNAS LANGSDON, OF CHICAGO, ILLINOIS.

UNIVERSAL TEST-INDICATOR.

1,019,400.

Specification of Letters Patent.

Patented Mar. 5, 1912.

Application filed February 21, 1908. Serial No. 417,218.

To all whom it may concern:

Be it known that we, LOUIS W. ZUEGNER and AL VERNAS LANGSDON, citizens of the United States, and residing at Chicago, in the county of Cook and State of Illinois, have jointly invented a new and useful Universal Test-Indicator, of which the following is a specification.

Our invention relates to indicators having a multiple of levers whereby the distance measured is enlarged on the indicator and the objects of our improvements are, first to center a piece of work on a milling machine or similar machine; second, to provide an adjustable hinge on the indicator; third, to provide a detachable pivoted bell crank lever on the indicator; fourth, to make a simple and durable device and other objects to become apparent from the description to follow:

This invention is designed to be used to indicate when a piece of work is properly centered or running true in a machine, such, for example as a milling machine, a lathe, a planer etc. With indicators heretofore made it was a difficult undertaking to accurately center a piece of work, and sometimes was practically impossible to do so. By the use of our invention such undertaking becomes a simple operation and can be done quickly and accurately.

It is capable of being used on any kind of a metal working machine where accurate work is required on account of its novel construction.

It is customary for accurate work to true up the machine itself before starting to do any work and by the use of our invention much time and labor is saved in doing this class of work.

The device consists of a casing which is adjustably mounted on a pivot secured on a shank capable of being clamped in a chuck or similar device. The end of the casing remote from the pivot is provided with a projecting round tapering stem which is provided with a concentric longitudinal hole, into which is slidably mounted a pin having one end projecting slightly outside the end of the stem. The other end of this pin engages the short arm of a bell crank lever whose remaining long arm engages an indicating arm. A sleeve having a tapering hole arranged to fit over the tapering stem is provided with a pivoted bell crank lever arranged to have one of its free

arms engage the projecting end of the pin above referred to.

To describe our invention so that others versed in the art to which it pertains, may make and use the same, we have illustrated it on the accompanying sheet of drawing, forming a part of this specification, in which:

Figure 1, is a longitudinal central section through a device embodying our invention shown partly in elevation; Fig. 2, is a similar view taken at right angles to Fig. 1; Fig. 3, is a view of the device as usual on a milling machine; Fig. 4, is a view of the device as used on a lathe and Fig. 5, is a detail of a modified form of a bell crank lever used on the device.

Similar reference characters refer to similar parts throughout the several views.

The casing 6 is preferably made in the shape of a segment to accommodate the two graduated indicator scales 7, one exposed on either side of the casing. The main frame 8 is preferably made of one piece of forging provided at one end with the round tapering stem 9, and at the other end with the lugs 10, which are joined together by the cross bar 11. The ends of the lugs 10 are provided with concentric perforations through which a bolt 12 passes. The bolt 12 also passes through a perforation in one end of a round shank piece 13 which is fitted between the lugs 10. The bolt 12 is provided with a head on one end and a thumb nut 14 on the other end, whereby the shank 13 can be tightly clamped in any desired angle to the frame 8. The casing 6 is preferably made of sheet metal and its ends are conveniently perforated to permit the bolt 12 to pass through and thus be tightly secured to the frame 8 by said bolt 12. The stem 9 is provided with a concentric hole into which is slidably fitted a pin 15 provided with a shoulder 16 to prevent it from falling out of said hole. The outer end of the pin 15 extends slightly beyond the end of the stem 9 and is preferably rounded. The inner end of the pin is also rounded and engages the short arm of the bell crank lever 17 pivoted in frame 8 at 18. The long arm of the bell crank lever 17 engages the pin 19 which connects the two indicator hands 20 pivoted to the cross piece 11 at 21. A spring 22 engaging the pin 19 normally holds the hands 20 in their unmoved position, and the free ends of the hands 20 are

so positioned as to cooperate with the scales 7. The casing 6 is provided with openings to expose to view the scales 7 and these openings may be closed by glass as shown at 23.

5 The device as thus far described is complete to be used as shown in Fig. 4, 24 being the piece of work which is turned true and is to be properly centered in the lathe not shown. The shank 13 is secured in the block 10 25 by any convenient means as the set screw 26, and the block 25 is made to fit in the ordinary tool post 27.

In operation the piece of work 24 is centered as near as possible "by eye." The tool 15 post is carefully manipulated so as to have the outer end of the pin 15 engage the work 24 and be depressed thereby sufficiently to move the hand 20 to the zero mark on the scales 7. The work is then turned slowly 20 once around and by observing the movement of the hands 20 as they vary from the zero mark to one side or the other it indicates that the work 24 is more or less out of true. The relative lengths of the two arms of the 25 bell crank lever 17 and the distance of the pin 19 from the pivot 21 is preferably such that the hands 20 indicate a movement of one thirty-second of an inch on the scales 7 when the pin 15 is moved one thousandth of 30 an inch.

It is often desired to center a hole with the spindle or other part in a machine and for this purpose we provide a bell crank lever 28, pivoted at 29 to a sleeve 30 provided 35 with a tapering hole to fit snugly over the tapering stem 9. One arm of the bell crank lever 28 is arranged to engage the end of pin 15 and the other arm to engage the piece of work 31 as shown in Fig. 3. Both arms 40 of the bell crank lever 28 are preferably of equal length so that the pin 15 will be moved by one arm the same distance that the other arm is moved by the piece of work. When the piece of work 31 has a large hole 45 to be centered the frame 8 is swung about the bolt 12 as a pivot so as to bring the free arm of the bell crank lever 28 into contact with the peripheral surface of the hole so as to move the indicating hands 20 against 50 the tension of spring 22 until they are at the zero mark on the scale 7. When the indicator is secured to the spindle or other part and thus adjusted the thumb nut 14 is tightened up and the operation of centering 55 the piece of work 31 is proceeded with as above described; but the spindle may turn instead of the work. The shank 13 being provided concentrically opposite to the pin 15 permits the indicator to be secured in a 60 spindle or chuck and turned about with the spindle as for instance would be the case when truing up the table on a drill press.

When it is desired to reach into a deep hole the extra long bell crank lever 32 shown in Fig. 5, is used. To steady and guide said 65 lever the grooved lug 33 is provided on the sleeve 30.

Having thus fully described our invention what we claim as new and desire to secure by Letters Patent of the United States is: 70

1. In an indicator, a suitable open frame provided with a perforation in one end and two extending lugs at the other end, a bell crank lever pivoted to said frame near the perforated end, a pin slidably mounted in 75 said perforation engaging the short arm of said bell crank lever, an indicator arm pivoted to said frame near said lugs provided with a pin or shoulder near its pivotal point with which the long arm of said bell 80 crank lever is in constant engagement, a graduated scale with which the free end of said indicator arm cooperates, and a shank pivotally secured between said two lugs.

2. In an indicator, a suitable open frame 85 provided with a perforation in one end and two extending lugs at the other end, a bell crank lever pivoted to said frame near the perforated end, a pin slidably mounted in said perforation engaging the short arm of 90 said bell crank lever, an indicator arm pivoted to said frame near said lugs provided with a pin or shoulder near its pivotal point with which the long arm of said bell crank lever is in constant engagement, a gradu- 95 ated scale with which the free end of said indicator arm cooperates, and a shank pivotally secured between said two lugs and an outer casing inclosing said frame, bell crank lever, indicator arm and scale, provided with 100 an opening to expose to view said scale.

3. In an indicator, a suitable open frame provided with a perforation in one end and an extending lug at the other end, a bell crank lever pivoted to said frame near the 105 perforated end, a pin slidably mounted in said perforation engaging the short arm of said bell crank lever, an indicator arm pivoted to said frame near said lug provided with a pin or shoulder near its pivotal point 110 with which the long arm of said bell crank lever is in constant engagement, a graduated scale with which the free end of said indicator arm cooperates and a shank pivotally secured to said lug.

LOUIS W. ZUEGNER.
AL VERNAS LANGSDON.

Witnesses:

R. J. JACKER,
MILTON LENOIR,
T. J. PELLEGRIN,
C. J. GIBBS.

It is hereby certified that in Letters Patent No. 1,019,400, granted March 5, 1912, upon the application of Louis W. Zuegner and Al Vernas Langsdon, of Chicago, Illinois, for an improvement in "Universal Test-Indicators," an error appears in the printed specification requiring correction as follows: Page 2, signatures to the specification, for "Louis W. Zuegner. Al Vernas Langsdon. Witnesses: R. J. Jacker, Milton Lenoir, T. J. Pellegrin, C. J. Gibbs." read *Louis W. Zuegner. Chicago, Ill. January 27th, 1908. Witnesses: R. J. Jacker, Milton Lenoir. Al Vernas Langsdon. Pasadena, Calif. February 8th 1908. Witnesses: T. J. Pellegrin, C. J. Gibbs.*; and that the said Letters Patent should be read with this correction therein that the same may conform to the record of the case in the Patent Office.

Signed and sealed this 16th day of April, A. D., 1912.

[SEAL.]

C. C. BILLINGS,
Acting Commissioner of Patents.