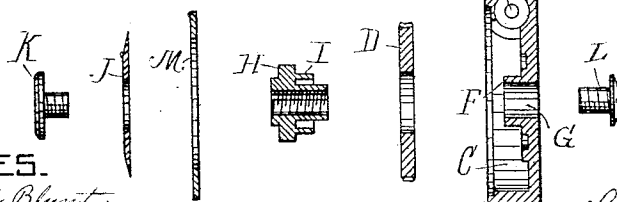
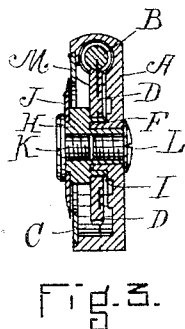
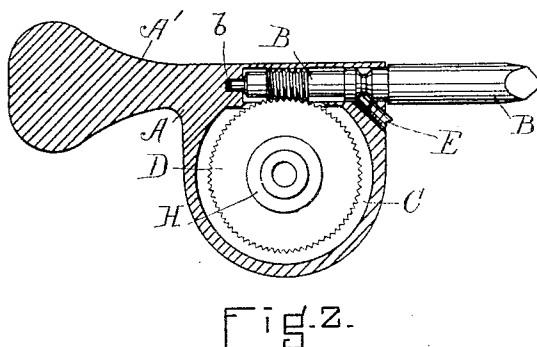
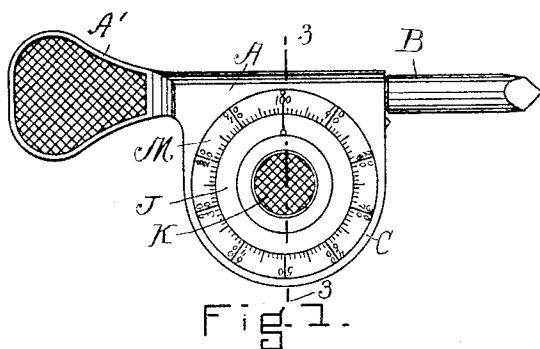


(No Model.)

L. S. STARRETT.
SPEED INDICATOR.

No. 580,432.

Patented Apr. 13, 1897.



WITNESSES.

Matthew M. Blunt

Samuel P. Thrasher

INVENTOR.

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ATT'Y.

UNITED STATES PATENT OFFICE.

LAROE S. STARRETT, OF ATHOL, MASSACHUSETTS.

SPEED-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 580,432, dated April 13, 1897.

Application filed May 20, 1895. Serial No. 549,922. (No model.)

To all whom it may concern:

Be it known that I, LAROE S. STARRETT, of Athol, in the county of Worcester and State of Massachusetts, have invented certain new and useful Improvements in Speed-Indicators, of which the following, taken in connection with the accompanying drawings, is a specification.

My invention relates to that class of speed-indicators in which the gearing is protected by an inclosing case through the end of which a spindle protrudes to come into frictional contact with the end of a rotary shaft the speed of which is to be ascertained.

My invention is embodied in an indicator having a flat case or body recessed cylindrically to receive, endwise, the threaded end of the rotatable spindle, and also flatwise to admit the worm-gear meshing with the spindle-threads, such recessed body having integral with it a central annular flange around which said gear revolves, in combination with an internally-threaded rotatable hub formed with a sleeve to surround said flange and fit between it and the worm gear-wheel, which the margin of said hub overlaps. A stationary graduating-ring and a rotatable indicating-disk carried by said hub are combined with said parts and with two short rotatable screws engaging the interior of said hub, one acting to hold the hub in working position and the other serving to bind the rotatable disk to the hub for use or to loosen it temporarily, so that said disk may be set back or forward freely when desired to quickly adjust it with relation to the zero or starting point on the graduating-ring without the necessity of doing this slowly by revolving the spindle. The flat head of this latter screw is scored or milled, so that pressure of the thumb thereon will loosen and tighten the screw when desired, or it may be nicked to receive a screw-driver. A small protuberance on the disk enables the operator to know by the sense of feeling when one complete revolution of the disk, or one hundred turns of the shaft being tested, have been made. A like protuberance on the ring may help to locate the zero-point. A small disk of antifriction material placed in the extreme inner end of the spindle-cavity serves as an end bearing to prevent frictional heating of

the integral handle when testing a shaft running at high speed.

In the drawings, Figure 1 is a plan of my instrument complete. Fig. 2 is a longitudinal section through the case, showing the spindle, worm-gear, and hub in place. Fig. 3 is a transverse section on line 3 3 of Fig. 1. Fig. 4 shows detached and in like section the several parts represented in Fig. 3.

A is the body or case of the indicator, formed with a deep perforation in its end opposite the integral handle A' to receive the metallic spindle B and with a broad lateral recess C, in which the worm gear-wheel D revolves, being engaged edgewise by the threaded portion of the spindle, as in Fig. 2. An obliquely-set screw E enters a peripheral notch in the spindle and holds it in place. The inner end of the spindle is reduced in diameter and set in a corresponding socket; and a disk of frictionless material b, Fig. 2, placed in said socket forms a bearing for the spindle in its endwise pressure, which prevents heating from friction at high speed.

Centrally in the recess C is a raised annular flange F, surrounding an axial opening G, Fig. 4. A rotatable hub H has a tubular extension running through this opening and a sleeve I concentric therewith, said parts fitting loosely inside and outside of the flange F for free rotation. The worm gear-wheel D is shrunk on and firmly secured to sleeve I, the margin of the hub H also overlapping the side of said wheel, so that they revolve together. (See Fig. 3.) The hub H may be formed in one with the worm gear-wheel D, but the manufacture is facilitated by making them separate, as shown.

J is the indicating-disk, mounted upon the outer end of the hub H, which has a shoulder to receive it, as in Figs. 3 and 4. In its ordinary working position the disk is secured to revolve with the hub by the screw K, which engages the internal threads of the hub and presses, by its broad flat head, upon the outer face of the disk. I score, mill, nick, or otherwise roughen the screw-head, so that pressure of the thumb thereon with a rotary movement will turn the screw, or a screw-driver may be used. This peculiarity of the screw, disk, and hub causes them all to turn together when the screw is tightened and the spindle rotated,

and also permits setting the disk back or forward quickly without rotating the spindle, when desired, after slackening the screw pressure. Another screw L engages the outer end
5 of the threaded hub and by its overlapping head holds the parts in proper position in the case.

M is the graduated ring, fixed in an annular shoulder of the case and marked off in one
10 hundred subdivisions, each denoting one revolution of the spindle. This ring adjoins the rotary disk J, and each is provided with a small protuberance N or other indicating-mark for convenience in adjusting the start-
15 ing-point of the disk at the zero-point of the ring. This protuberance on the rotary disk gives, by the sense of feeling, to the operator, whose thumb rests lightly thereon and whose eye is on the face of the watch, notice when
20 the disk has completed one rotation, indicating one hundred revolutions of the shaft. The ring M has its graduations numbered progressively both from left to right and from right to left, so as to count regularly with
25 either direction of rotation.

It is obvious that the graduated ring M may have a smaller central opening and the indicating-disk be correspondingly reduced in diameter, leaving simply a projecting pointer
30 extending therefrom to traverse or reach to the graduations on the ring.

In my Letters Patent No. 557,446, dated March 31, 1896, application filed simultaneously herewith, I have described and shown
35 an instrument in many respects similar to the one herein set forth, but having peculiar features, as therein claimed, particularly a sup-

plementary disk for counting successive hundreds of shaft-revolutions.

I claim as my invention—

1. In a speed-indicator, the case A C having a central opening through its flat body, the hub H located in said opening and threaded internally, and the gear-wheel D firmly affixed to said hub, in combination with the gradu-
45 ated ring M fixed to the case, the rotary indicator J mounted on the hub, and the screw K engaging the internal threads of the hub and having a broad head overlapping part of the indicating-disk and externally roughened
50 so as to tighten or loosen the disk when desired, substantially as set forth.

2. The recessed case A C, the threaded spindle B and worm gear-wheel D engaging each other therein, and the annular flange F integral with said case, in combination with the internally-threaded hub H having a tubular portion extending through the case within said flange, and a sleeve I surrounding said flange and forming a seat on which the wheel
60 D is secured, and with the fixed ring M and rotatable indicating-disk J having protuberances N, and the screws K and L engaging the threads of the hub, substantially as set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, on this 22d day of April, A. D. 1895.

LAROE S. STARRETT.

Witnesses:

CHARLES G. KEYES,
A. H. SPENCER.