(No Model.)

L. S. STARRETT.

SPEED MEASURE.

No. 557,446. Patented Mar. 31, 1896.

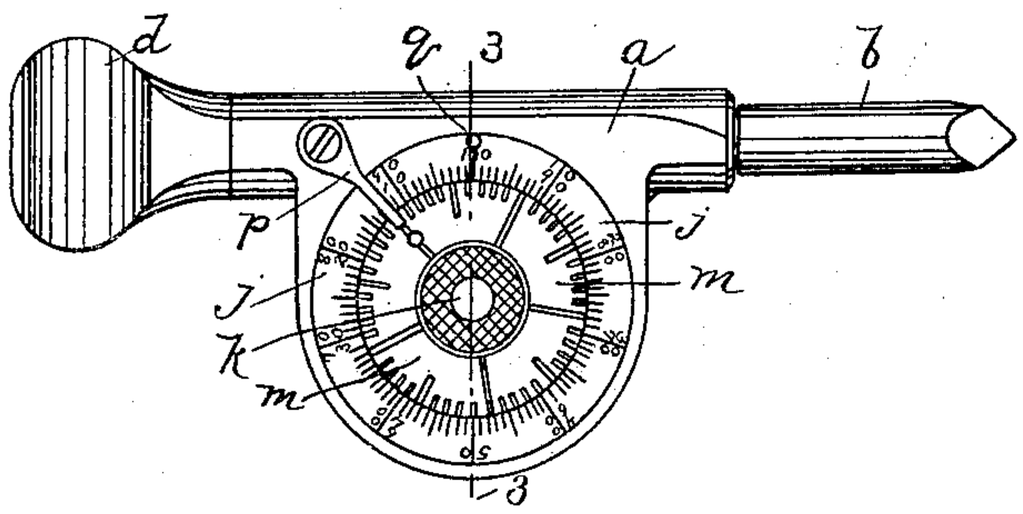

Fig. 1.

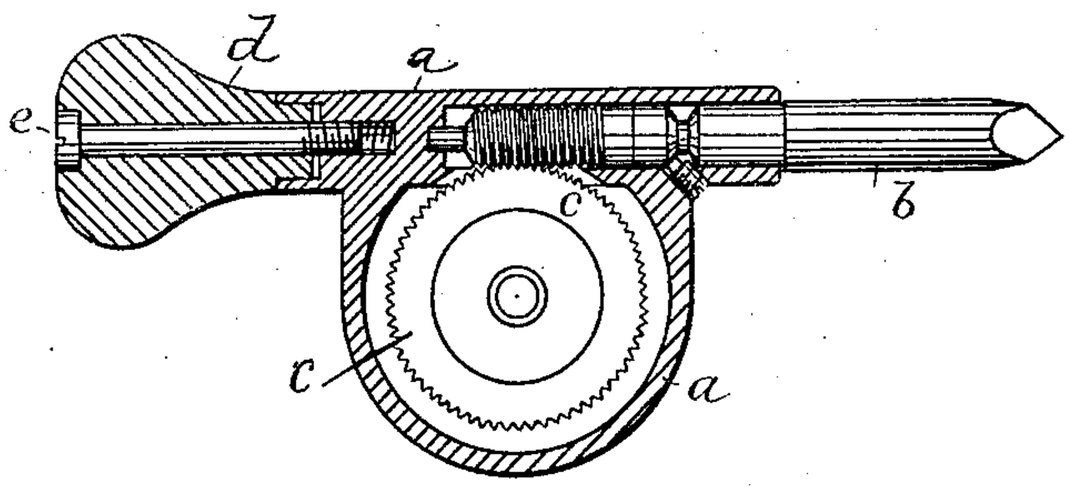

Fig. 2.

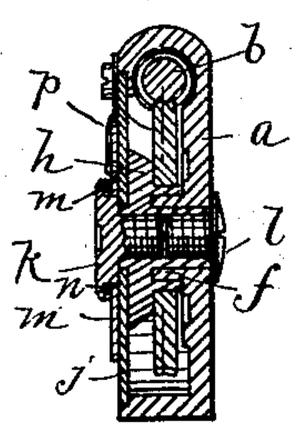

Fig. 3.

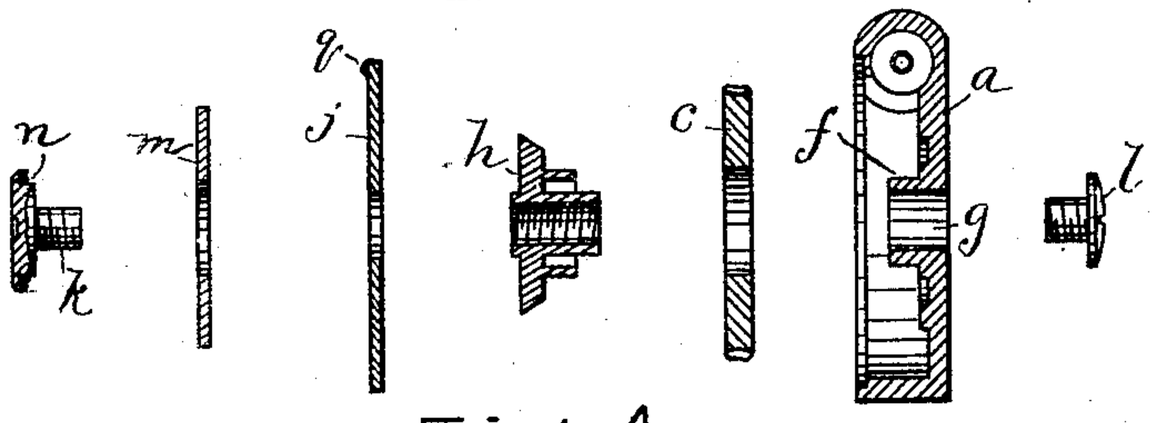

Fig. 4.

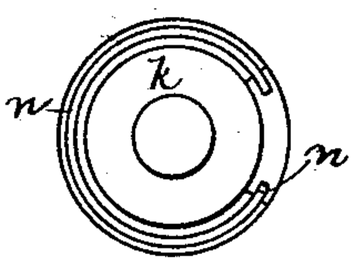

Fig. 5.

WITNESSES.

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LAROY S. STARRETT, OF ATHOL, MASSACHUSETTS.

SPEED-MEASURE.

SPECIFICATION forming part of Letters Patent No. 557,446, dated March 31, 1896.

Application filed May 20, 1895. Serial No. 549,923. (No model.)

To all whom it may concern:

Be it known that I, LAROY 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.

The object of my invention is to provide an improved speed-indicator adapted to denote, by means of a rotatable graduated disk, the speed of rotation of a given shaft, against the end of which the spindle of the instrument is pressed, and also to automatically indicate by additional devices the number of complete rotations of said disk, and hence the number of hundreds of revolutions of the shaft being tested.

My present invention is embodied in an indicator having a flattened body or case inclosing a worm gear-wheel engaging edgewise with the threaded portion of a spindle, inserted endwise in the barrel of said case and held therein free to rotate when the outer end of the spindle is pressed against the axial portion of a revolving shaft. The worm gear-wheel is shrunk onto a rotatable hub, which has a tubular portion extending through a central aperture in the side of the case and an annular sleeve concentric with said portion and inclosing a circular flange or wall integral with the case and surrounding said aperture. A rotating graduated disk, which closes the front of the case, is mounted upon the outer face of the hub in a shoulder formed to receive it, and it is held firmly to the hub for use by means of a broad-headed screw pressing thereon, such screw engaging internal threads in said hub, so that the disk revolves with the hub, the gear, and the spindle, and its graduations and figures indicate the number of revolutions of the shaft up to one hundred. To count automatically the number of complete rotations of said disk—that is, the number of hundreds of revolutions of the shaft—a smaller supplementary disk is provided on top of the first one with well-defined notches in its face near its periphery, with which in succession the free end of a spring-finger secured to the case engages with sufficient force to hold it from rotation. The larger disk has, however, a protuberance which, in passing under, lifts the spring-finger out of engagement with the notch and permits the notched disk to be carried forward one point, the finger engaging the next notch and holding as before. The screw-head is roughened to be turned by pressure of the thumb, and a friction-spring under the screw-head causes the disks to revolve together when the spring-finger is raised.

In the drawings, Figure 1 is a side view of my indicator complete; and Fig. 2, a longitudinal section through the case and handle, showing the spindle, worm-gear, and hub in working position. Fig. 3 is a transverse section through the instrument on the line 3 3 of Fig. 1. Fig. 4 shows, detached in section, most of the parts as seen in Fig. 3. Fig. 5 is an enlarged view of the under side of the clamping-screw and its friction-spring.

The case *a* is a flat casting with a cylindrical perforation or barrel to receive the spindle *b*, and a broad recess to inclose the worm gear-wheel *c*, which meshes with the threaded part of the spindle. A wooden or other suitable handle *d* is attached to the case or body by a screw *e*. The case has a central aperture *g* through it surrounded by a raised circular flange *f*. This aperture and flange constitute the bearing for the worm-gear *c*.

The hub *h* (best shown in Fig. 4) is internally threaded and has a tubular extension running through the aperture *g*. Outside of and concentric with said tubular portion is a shoulder or sleeve upon which the gear-wheel *c* is firmly secured, so that they revolve together. The raised flange *f* of the case fits in between the sleeve and the tubular part of the hub, as seen in Fig. 3. The graduated disk *j* is subdivided into one hundred equal parts and numbered both to the right and left in tens. This disk is fixed upon the outer face of the hub by means of a clamp-screw *k* to press it thereon, the threaded stem of the screw engaging the threads in the axial cavity of the hub. Another screw *l* enters the other end of said cavity and its head overlaps the adjacent wall of the case, thus holding the hub in place. Both screws revolve with the disk *j* and spindle *b* when the instrument is in use.

Outside of and upon the disk *j* is a smaller

supplementary disk *m* having an enlarged central aperture, so that the screw-head *k* does not bear directly upon it. The under side of the screw-head is cut away or grooved marginally, and a curved wire spring *n* is located therein. (See Fig. 5.) This spring bears upon the disk *m* so as to revolve it frictionally when desired. The face of this disk is, however, quite deeply notched marginally and a spring-finger *p* is secured to the case, as in Fig. 1, its tip engaging laterally in such notches with sufficient power to keep the disk *m* ordinarily from rotation.

The larger disk *j* makes one complete revolution with every one hundred turns of the spindle. I form near its margin a small protuberance *q*, which, in passing under the spring-finger *p*, raises its tip out of the notch in disk *m* and allows said disk to move forward to the extent of one notch by the frictional action of the curved spring *n;* but as soon as the protuberance *q* passes beneath the finger *p* the tip of the finger descends into the next notch and holds the disk *m* stationary during one hundred turns of the spindle and until the disk *j* has completed another of its revolutions. It will thus be seen that the smaller disk indicates automatically the number of hundreds of revolutions made by the shaft, while the larger one shows one hundred revolutions or less.

The notched disk *m* has an indicating-mark of suitable form to denote the starting-point of rotation, preferably a protuberance corresponding to that on the disk *j*. I provide for setting the disks with these points adjacent, if desired, without the slow process of turning the spindle until they come together. I roughen the outer end of the screw *k*, so that it may be turned by pressure of the thumb thereon and a partial rotary movement. Half a turn backward loosens the screw so that both disks may be turned freely and set as desired for a new test. Then the screw is tightened and the instrument is ready for use.

In another application, signed by me simultaneously herewith, I have described and shown an instrument in many respects similar to the one herein set forth, but having the graduations on a stationary ring with a smaller rotary disk indicating the shaft rotations, without counting the successive hundreds automatically.

I claim as my invention—

The case *a* with threaded spindle and worm gear-wheel engaging therein, the hub *h* fixed to said wheel and having its bearing in the aperture *g*, and the rotary graduated disk *j* adapted to be fixed to said hub by the screw *k* and having a protuberance *q*, in combination with the smaller notched disk *m* overlapping the inner portion of said disk *j*, the spring-finger *p* fixed to the case engaging with such notches and adapted to be raised by the passage of said protuberance, and with the friction-spring *n* held marginally beneath the head of screw *k* to move the disk *m* frictionally when said finger is raised, 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.

LAROY S. STARRETT.

Witnesses:
CHARLES G. KEYES,
A. H. SPENCER.