(No Model.)

3 Sheets—Sheet 1

H. S. LIVINGSTON.

CYCLOMETER.

No. 259,562. Patented June 13, 1882.

Fig. 2.

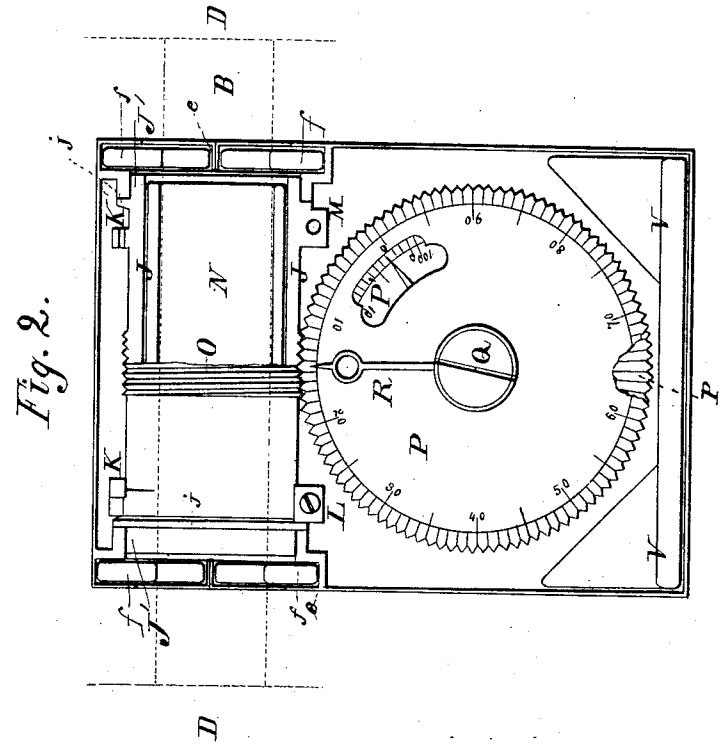
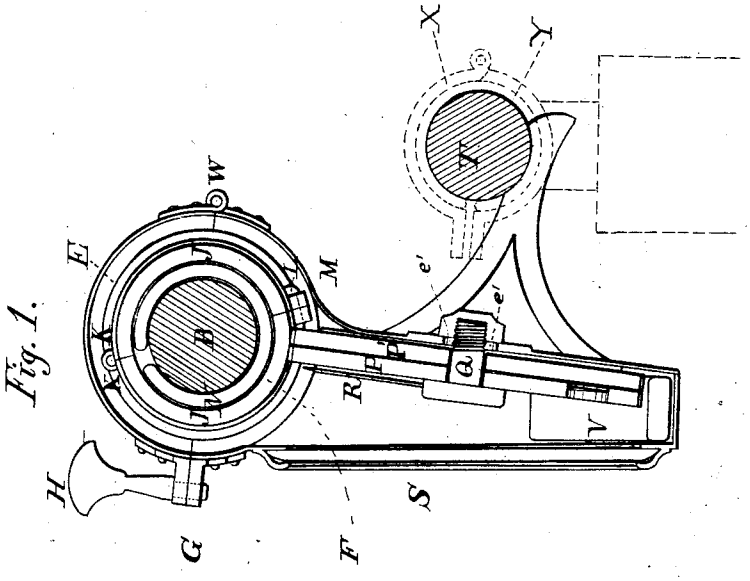


Fig. 1.



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L. M. Hopkins.

Inventor:

Henry S. Livingston

By Knight Bros.

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Fig. 4.

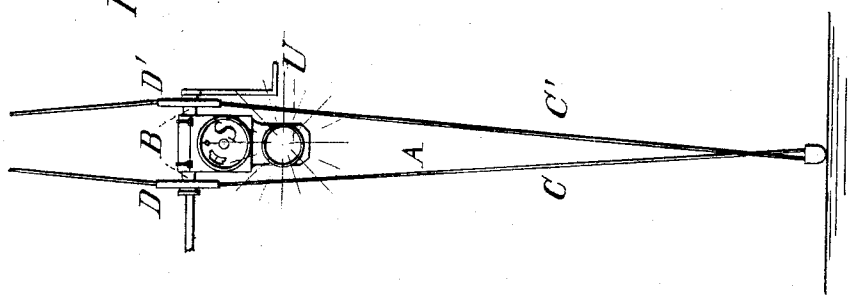
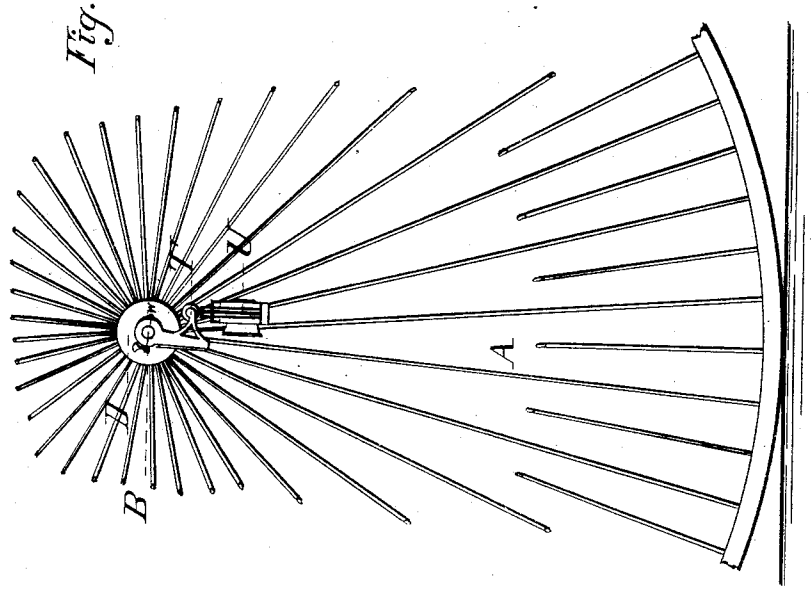


Fig. 3.



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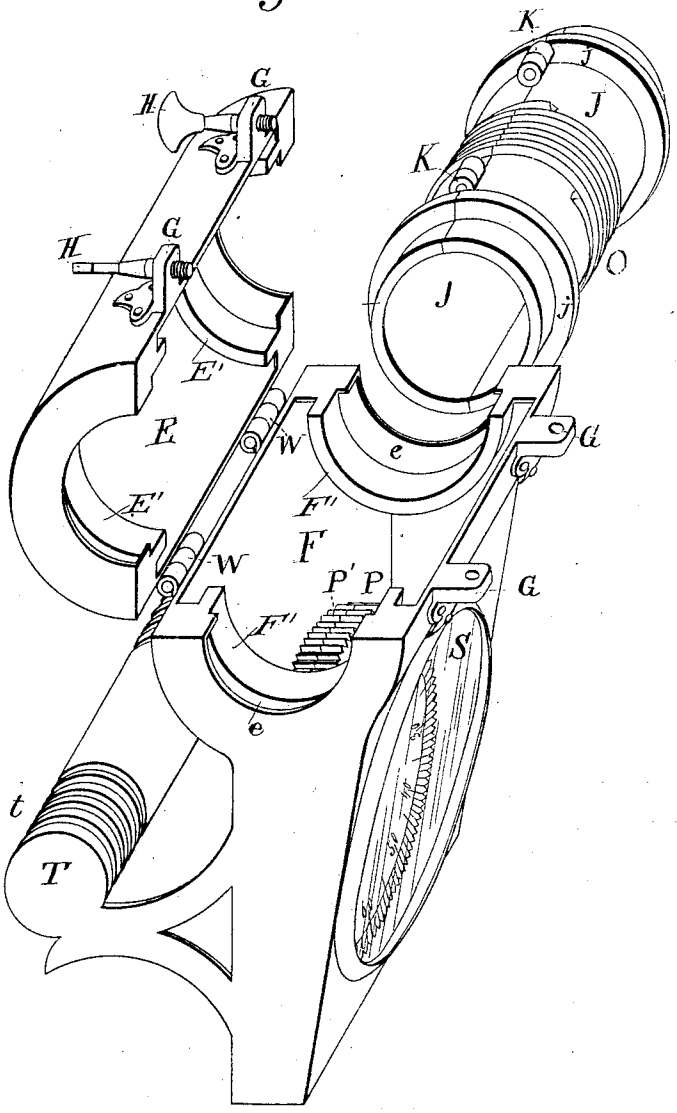
(No Model.) 3 Sheets—Sheet 3.

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CYCLOMETER.

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Fig. 5.



Witnesses:

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UNITED STATES PATENT OFFICE.

HENRY S. LIVINGSTON, OF CINCINNATI, OHIO.

CYCLOMETER.

SPECIFICATION forming part of Letters Patent No. 259,562, dated June 13, 1882.

Application filed November 15, 1881. (No model.)

To all whom it may concern:

Be it known that I, HENRY S. LIVINGSTON, a citizen of the United States, residing at Cincinnati, in the county of Hamilton and State of Ohio, have invented a new and useful Cyclometer Attachment for Bicycles, of which the following is a specification.

My invention relates to an attachment or appendage for a bicycle or like vehicle for the automatic indication of the number of revolutions of its driving-wheel.

My device is so constructed as to be easy, certain, and positive in its operation, adaptable to wheels and shafts of any diameter, free from liability to derangement from the jar of travel, and capable of ready attachment or removal and of easy restoration to the zero-point at any moment.

In the accompanying drawings, Figure 1 is a section in the plane of the bicycle-wheel of a cyclometer attachment embodying my invention. Fig. 2 is a section of the same in the plane of the wheel-shaft. Figs. 3 and 4 are respectively side and front elevations (to a smaller scale) of my said attachment and its suspended lamp in position on the bicycle-wheel, of which a portion only is here shown. Fig. 5 is a perspective view of my cyclometer separated from the bicycle-shaft and the worm removed from the housing.

A may represent any suitable driving-wheel of a bicycle, and B its shaft or axle. For my purpose the driving-wheel is preferably of the familiar duplex form here illustrated—that is to say, having two series of spokes, C C′, with corresponding hubs, D D′.

On the portion of the shaft included between the hubs D D′ is suspended the cyclometer case or housing. To enable ready attachment or removal of my cyclometer, its housing is made to consist of two parts, E F, which meet at the horizontal plane of the shaft's axis, and are hinged together, as at W, on one side and fastened at their other side by thumb-screws H H, occupying lugs G G. The said parts have broad semi-annular interior flanges, E′ F′, which, fitting snugly upon without clamping the shaft, serve to so suspend the housing as to secure the proper intermeshing (without binding) of the hereinafter-described worm and indicator wheels. Sockets *e* in said flanges hold semi-annular gaskets *f*, that serve to exclude dust and to retain the oil or other lubricant employed.

J J are two half-cylinders, provided with a bushing, N, of caoutchouc. These two half-cylinders, constituting my worm-sleeve, are coupled by hinges K on one side and by screws L and lugs M on the other side. The said caoutchouc bushing, in conjunction with said screws, besides securing a tight grip, enables the sleeve to be applied without special fittings to any sized shaft. The ends J′ J′ of the worm-sleeve J J form bearings on which the case or housing E F is suspended, enabling the said sleeve to turn freely within said housing as the wheel revolves. This provision insures the correct intermesh of the worm-gearing without regard to accuracy in the shape of the axle or to the concentricity of the sleeve therewith, and enables the ready application of the instrument to the axle by unskilled persons. Collars *j* near the extremities of said sleeve bear against the inner walls of the flanges E′ F′, and, besides serving to hold the housing to its proper longitudinal position, serve as an additional protection against both the admission of dust and the escape of oil.

Upon the periphery of the sleeve J J there is formed a screw-thread, O, that meshes in two spur-wheels, P P′, journaled upon a horizontal stud, Q, that extends forward from the rear wall of the housing beneath and at right angles to the sleeve. Of these wheels the rear wheel, P′, has its number of teeth one in excess of those of the front wheel, P, in order that the latter may at each of its revolutions overtake the former the arc distance of a single tooth. The front wheel, P, moving the distance of one tooth at each revolution of the bicycle-shaft, and said wheel having a hundred teeth in its circuit, it results that each complete rotation of the wheel P indicates one hundred revolutions of the bicycle-wheel. A scale from 0 to 100, (seen in Fig. 2,) together with an up-pointing hand or digit, R, upon the stud Q, enables the user to read off the number of revolutions on the face of the wheel P. The rear wheel, P′, is similarly marked, and its lagging behind the front wheel one tooth at each rotation of the latter indicates by its said relative shift of one tooth distance a hundred revolutions of the bicycle-wheel.

In order to enable the reading of the indi-

cations on the rear wheel, an opening is provided in the front wheel, and said opening is furnished with a pointer, as shown in Fig. 2. A glazed window, S, in the front wall of the housing permits the indications to be read off at any moment.

A rack or bar, T, secured to the housing a short distance in rear thereof, enables the convenient suspension therefrom of any customary or desired lamp or lantern, U. Circumferential grooves *t* on the bar T coact with clamp X and bushing Y to hold the lamp in position. One or more masses of metal, V, in the bottom of the housing insure the retention of the cyclometer to the proper perpendicularity, notwithstanding the disturbing influences to which it is subjected.

The indicating mechanism may be quickly restored to "zero" as follows: Remove the cyclometer-housing and its attached parts from the bicycle-shaft and its attached worm. The indicator-wheels, being then at liberty, may be set by the operator's hand to the desired position, which becomes fixed by the replacement of the worm, until the resumption of the latter's rotations in obedience to the revolutions of the bicycle, in the manner already explained.

To set the wheels P P′ after wear, temporarily slacken screw Q and move up in slot *e′*.

I claim as new and of my invention—

1. The worm-sleeve J O, adapted for application to the axle B and provided with bearings J′, in combination with the cyclometer case or housing E F, suspended on said bearings, substantially as herein set forth.

2. The combination of the divided worm-sleeve J J O, hinges K, clamps L M, and elastic bushing N, substantially as and for the purpose set forth.

3. The combination of the two-part housing E F, having semi-annular flanges E′ F′, the thumb-screws H H, sockets *e*, gaskets *f*, worm-sleeves J J O, hinges K, clamps L M, and elastic bushing N, substantially as and for the purpose set forth.

4. The rack or bar T at the rear of a cyclometer-housing for bicycles, &c., for suspension of a lamp or lantern, in the manner set forth.

In testimony of which invention I hereunto set my hand.

HENRY S. LIVINGSTON.

Attest:

GEO. H. KNIGHT,

SAML. S. CARPENTER.