

(No Model.)

2 Sheets—Sheet, 1.

C. H. CLAWSON.
CYCLOMETER.

No. 569,322.

Patented Oct. 13, 1896.

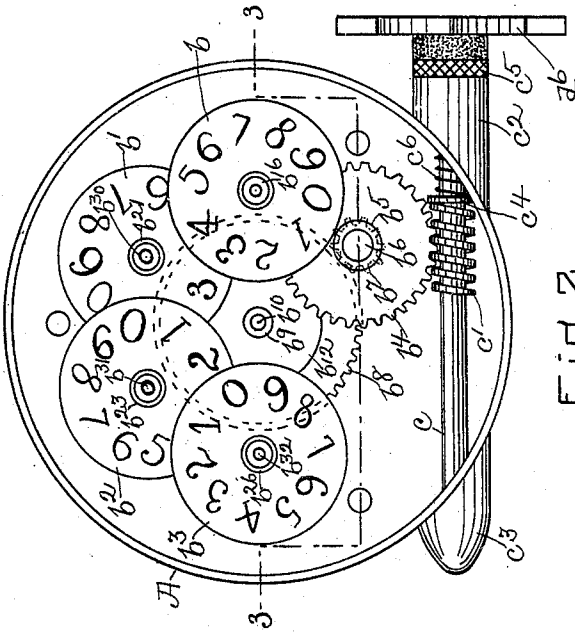


Fig. 2.

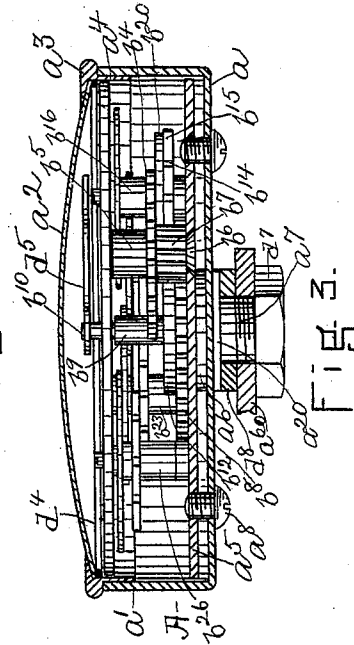
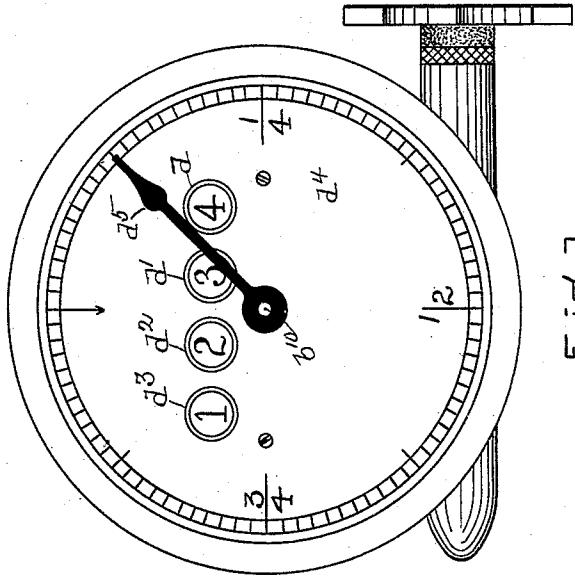


Fig. 3.



(No Model.)

2 Sheets—Sheet 2.

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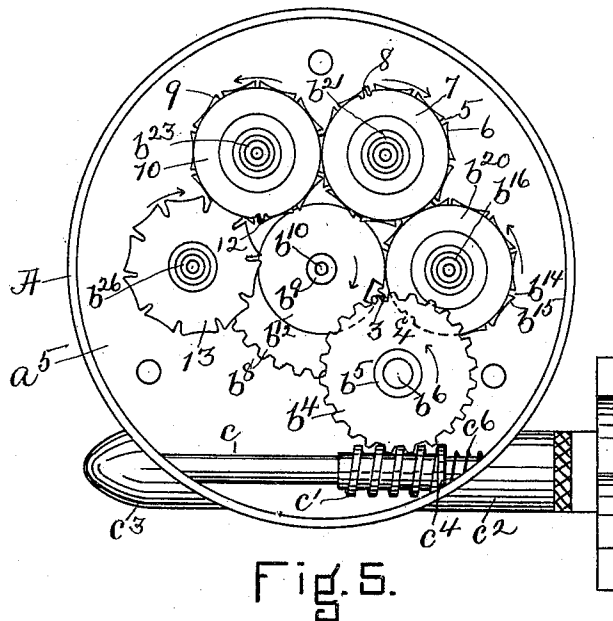


Fig. 5.

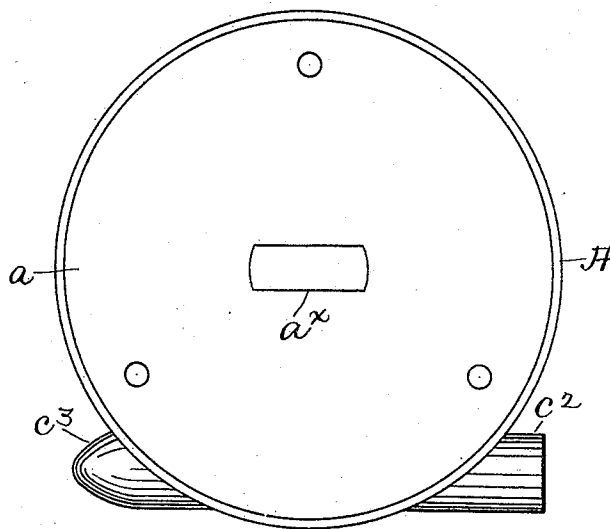


Fig. 6.

WITNESSES.

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by Jas. F. Churchill

ATT'Y

UNITED STATES PATENT OFFICE.

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CYCLOMETER.

SPECIFICATION forming part of Letters Patent No. 569,322, dated October 13, 1896.

Application filed September 5, 1895. Serial No. 561,512. (No model.)

To all whom it may concern:

Be it known that I, CHARLES H. CLAWSON, residing in Everett, in the county of Middlesex and State of Massachusetts, have invented an Improvement in Cyclometers, of which the following description, in connection with the accompanying drawings, is a specification, like letters on the drawings representing like parts.

This invention relates to cyclometers of the class commonly employed on bicycles, and has for its object to improve the construction of the same, whereby increased registration may be obtained in a small and compact instrument.

Prior to this invention I am aware that cyclometers of substantially small size have been made which are capable of registering as high as one thousand miles, but these cyclometers as now commonly constructed are limited to the above-mentioned total registration, owing to their construction, which prohibits a higher registration without increasing the size or diameter of the instrument, so as to render the same unsalable and commercially worthless.

In accordance with my present invention I am enabled to provide a cyclometer of substantially small or what may be regarded as the standard or commercial size which is capable of registering as high as ten thousand miles without increasing the diameter or thickness of the instrument, as will be described.

Another feature of this invention consists in increasing the accuracy and durability of the instrument, as will be described.

These and other features of this invention will be pointed out in the claims at the end of this specification.

Figure 1 is a plan view of a cyclometer embodying this invention, the instrument being shown as enlarged to twice its size; Fig. 2, a top or plan view with the pointer and face-plate or dial removed; Fig. 3, a section on the irregular line 3-3, Fig. 2, with parts shown in elevation; Fig. 4, a top or plan view of one of the indicating-disks removed; Fig. 5, a top or plan view of the apparatus shown in Fig. 2 with the indicating-disks removed, and Fig. 6 a top or plan view of the case.

The cup-shaped case A, consisting of the bottom *a* and annular flange *a'*, may be of any suitable or usual construction, and is provided with the removable glass top or cover *a²*, provided with the supporting-rim *a³*, having the depending flange *a⁴*, adapted to fit into the case A.

The case A contains within it an annular plate or disk *a⁵*, preferably supported above the bottom *a* of the case A by the head *a⁶* of a threaded rod or bolt *a⁷*, extended through a hole *a⁸* in the bottom *a*, the plate or disk *a⁵* being secured in a fixed position within the said case by screws *a⁹*, as clearly shown in Fig. 3.

The plate or disk *a⁵* constitutes the support for the motor mechanism or gearing employed to operate the indicating-disks *b b' b² b³*.

The motor mechanism herein shown consists of a worm-gear *b⁴*, (see Figs. 2 and 5,) fast on a sleeve *b⁵*, fitted to turn on a stud *b⁶*, erected from the plate or disk *a⁵*, a pinion *b⁷* being secured to or forming part of the sleeve *b⁵* and located below the worm-gear *b⁴*, as represented by dotted lines, Fig. 2, and by full lines, Fig. 3.

The pinion *b⁷* meshes with a gear *b⁸*, secured to or forming part of the sleeve *b⁹*, loosely fitted upon a stud arbor (not shown) erected from substantially the center of the plate or disk *a⁵*, the said sleeve having extended from it a stud *b¹⁰*, upon which is mounted a pointer *b¹¹*.

The sleeve *b⁹* has secured to or forming part of it above the gear *b⁸* a disk *b¹²*, of smaller diameter than the gear *b⁸*, and provided with a tooth or projection 3, (see Fig. 5,) which is adapted to enter slots or openings *b¹⁴* in the periphery of a disk *b¹⁵*, (see Fig. 3,) secured to or forming part of the sleeve *b¹⁶*, upon which is mounted the indicating-disk *b*, which latter will be hereinafter referred to as the "units-disk." The disk *b¹⁵*, between the openings *b¹⁴*, has its periphery made concaved, so as to engage the convex periphery of the disk *b¹²* and thereby hold the disk *b¹⁵* stationary until it is rotated a step by the engagement of the tooth 3 on the disk *b¹²* with an opening or slot *b¹⁴*. The sleeve *b¹⁶* has secured to or forming part of it above the disk *b¹⁵* a second disk *b²⁰*, (see Figs. 3 and

5,) which is provided with a smooth periphery and with a projection or tooth 4, which in practice engages with slots 5 in a disk 6, fast on a sleeve b^{21} , upon which the tens-indicating disk b' is mounted to turn therewith.

The disks mounted upon the sleeve b^{21} are similar in construction to the disks b^{15} b^{20} , and the disk 7, which is mounted on the sleeve b^{21} , is provided with a tooth or projection 8, which engages a slotted disk 9, similar to b^{15} , on a sleeve b^{23} , upon which is mounted to turn therewith the hundreds-disk b^2 . The sleeve b^{23} is provided with a disk 10, similar to b^{20} , and this latter disk is provided with a tooth or projection 12, which engages a slotted disk 13, similar to b^{15} , secured to or forming part of the sleeve b^{26} , upon which the thousands-indicating disk b^3 is secured to turn therewith.

The sleeves b^{21} b^{23} b^{26} are respectively loosely mounted upon studs b^{30} b^{31} b^{32} , erected upon the supporting plate or disk a^5 , the said studs being erected in the arc of a circle having as its center the stud b^{10} . The indicating-disks b' b^2 b^3 are arranged as herein shown and the substantially diametrically opposite sleeves b^{16} b^{32} are higher or longer than the intermediate sleeves b^{21} b^{23} , so that the two end indicating-disks b' b^3 are located in a plane or planes above the intermediate indicating-disks b' b^2 , and in the present instance the sleeve b^{21} is made shorter than the sleeve b^{23} , and the indicating-disk b' is located in a lower plane than the indicating-disk b^2 , but, if desired, the relative positions of the indicating-disks b' b^2 may be reversed, so that the indicating-disk b^2 would be in a lower plane than the indicating-disk b' . This construction of the sleeves and the arrangement of the disks in different planes with relation to each other, so that the two end or extreme indicating-disks b' b^3 are in a higher plane than the intermediate disks b' b^2 , is made so as to enable the said indicating-disks to be arranged in the smallest possible compass with their centers in a circle of minimum radius, and to enable the driving-gearing to be engaged with each other and with the center driving-gear b^8 .

Motion is imparted to the indicating-disks by a worm-shaft c , provided with a worm c' , which normally is in engagement with the worm-gear b^4 , the said worm-shaft being supported, as shown, in tubular projections or bosses c^2 c^3 , extended from the case A, the said worm-shaft being provided, as shown, with a collar c^4 , between which and the cap c^5 for the hollow boss c^2 is located a spring c^6 , which acts to keep the worm-shaft in proper position in the hollow boss c^3 .

As above explained, the peculiar arrangement of the indicating-disks with relation to each other enables the instrument to be made of a minimum size or diameter and to be in practice substantially small and compact, while the construction of the sleeves mounted upon the studs erected from the base-plate

a^5 permits the gearing employed to drive the indicating-disks to be assembled very close to the supporting-disk a^5 , and thereby enables the cyclometer to be made of a minimum thickness, and, furthermore, the said sleeves, having secured to them the driving-gear, renders the latter less liable to get out of order, avoids the use of springs, and thereby insures greater accuracy and durability, as the driving-gearing is substantial in its nature and is not liable to get out of order when in operation on the cycle.

One of the objects of this invention is to increase the registration without increasing the size or diameter of the cyclometer, and this result is obtained, as above described, by the peculiar arrangement of the indicating-disks and the driving mechanism therefor.

Another feature of the present invention consists in a construction of the indicating-disks whereby the numerals on the said disks indicative of the mileage may assume a straight line when four disks are employed. This result is effected in accordance with this invention by providing the upper surface of each indicating-disk with numerals arranged in a circle about the disks, but applied to or made on the disks at an incline to a radial line of the disk, that is, each numeral on the disk instead of being directly in a radial line is inclined with relation to a radial line passed through the center of the numeral, as clearly illustrated in Fig. 4. This inclination of the numerals on the various indicating-disks enables four sight-openings d' d^2 d^3 in a suitable dial d^4 , which in practice is loosely mounted upon the stud b^{40} , to be arranged in a straight line, as clearly shown in Fig. 1, so as to get what may be regarded as a straight reading. The dial d^4 may be provided with suitable graduations indicative of a fraction of a mile, with which coöperates the pointer or hand d^5 . The worm-shaft c is provided outside of the casing with the usual spoked wheel d^6 , by which rotation is imparted to the said shaft. The threaded bolt or rod a' is fastened to the bottom of the cup-shaped case A by means of a nut d^7 and washer d^8 after the usual manner now common to cyclometers.

I am aware that cyclometers of substantially small size have been made in which a straight reading is obtained with three indicating-disks; but prior to this invention I am not aware that a straight reading has been obtained with four indicating-disks, as heretofore it has been supposed that the small size or diameter of the instrument prohibited such result.

In cyclometers as now commonly constructed difficulty is experienced in securing the case A to the machine so as to prevent the fastening devices from being torn or separated from the said case in practical operation.

In the present construction of cyclometer I have obviated this difficulty by cutting away the under side of the head a^6 of the retaining-

bolt a^7 , so as to form on the under side of the said head an angular, square, or oblong rib a^{20} , (see Fig. 3,) which enters the substantially narrow slot a^x in the bottom a of the case A (see Fig. 6) and locks the same against rotation, and the round head a^6 affords a broad bearing-surface which cannot be pulled through the slot in the bottom a^5 with a force such as would be encountered in the ordinary use of the bicycle. The bracket to which the cyclometer is fastened is represented in Fig. 3 by a^{60} .

I claim—

1. A cyclometer comprising the following instrumentalities, viz: a containing-case of substantially small diameter provided with a dial having four openings arranged in a substantially straight line, four indicating-disks located within the casing and arranged in a circle, one behind each opening, and each disk being provided with indications or numerals arranged at an angle to a radial line through the center of the numeral, the two outside or endmost disks being located in a different plane from the two intermediate disks, and gearing to effect progressive rotation of the said disks, to thereby bring each numeral on each disk opposite its opening in the dial whereby all the numerals will be substantially vertical to a transverse line through the openings in the dial, to thereby obtain a

straight reading of the four numerals, substantially as described.

2. A cyclometer comprising the following instrumentalities: viz; a containing-case of substantially small diameter, a plate a^5 located in said case, screws inserted through the bottom of the case to firmly secure the plate a^5 within the said case, studs erected upon the plate a^5 in the arc of a circle, sleeves upon the said studs, four indicating-disks mounted on said sleeves with the two outside or endmost disks in a different plane from the two intermediate disks, each disk being provided with numerals or indications arranged at an angle to a radial line through the center of the numeral, gearing secured to the said sleeves to effect progressive rotation of the said indicating-disks, a dial d^4 within the casing having four holes or openings arranged in a straight line and with each of which coöperates an indicating-disk to obtain a straight reading of the four numerals brought in line with the said openings, substantially as described.

In testimony whereof I have signed my name to this specification in the presence of two subscribing witnesses.

CHARLES H. CLAWSON.

Witnesses:

JAS. H. CHURCHILL,
J. MURPHY.