

(No Model.)

C. F. FERNALD.
CYCLOMETER.

No. 503,953.

Patented Aug. 29, 1893.

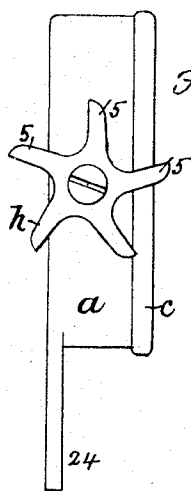


Fig. 1.

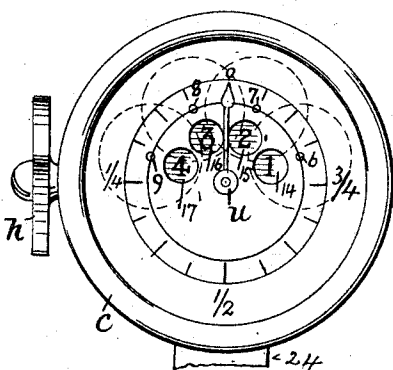


Fig. 2.

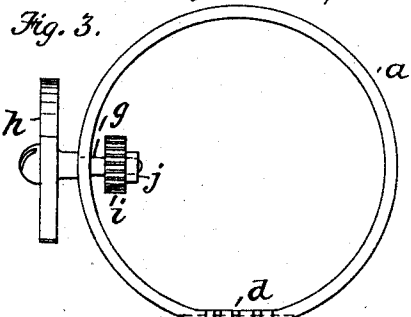


Fig. 3.

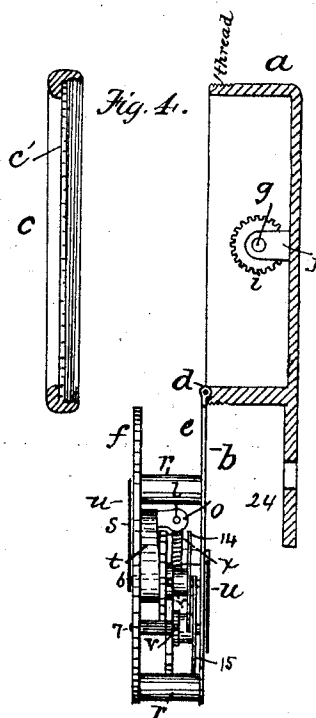


Fig. 4.

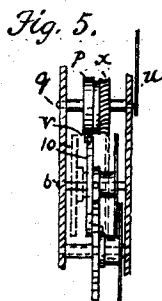


Fig. 5.

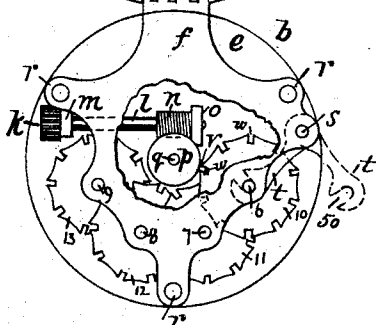


Fig. 6.

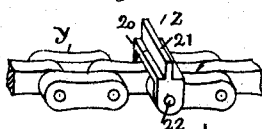


Fig. 7.

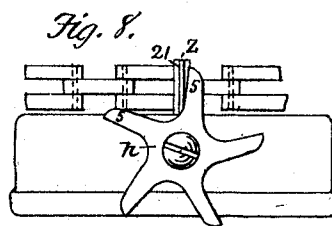


Fig. 8.

Attest.

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UNITED STATES PATENT OFFICE.

CHARLES F. FERNALD, OF BOSTON, MASSACHUSETTS, ASSIGNOR OF ONE-HALF TO ALOYSIUS J. OCHS, OF SAME PLACE.

CYCLOMETER.

SPECIFICATION forming part of Letters Patent No. 503,953, dated August 29, 1893.

Application filed March 23, 1893. Serial No. 467,341. (No model.)

To all whom it may concern:

Be it known that I, CHARLES F. FERNALD, residing at Boston, in the county of Suffolk and State of Massachusetts, have invented certain
5 Improvements in Cyclometers, of which the following is a specification.

This invention relates to means for registering or noting the distance traveled by a wheeled vehicle, such as a velocipede or bicycle, through the medium of a moving part of
10 said vehicle, which actuates a registering mechanism by its movement. These registering devices, commonly called "cyclometers," as ordinarily applied to a vehicle are so arranged that a striker placed upon one of the
15 rotating wheels, at each rotation thereof, strikes a lever connected with the cyclometer which acts on appropriate means to register upon a dial in figures the distance traveled; 20 the said means consisting in some instances of quite a complicated mechanism.

The purpose of my invention is to provide a cyclometer register to be placed upon such bicycles as employ a chain to convey motion
25 from the treadle cranks to the working wheel, and located near to the said chain. I attach a striker upon the chain in such a way that in its movement it intermittently strikes an arm of a star wheel upon a shaft projecting
30 from the casing of the cyclometer and causes the said shaft to make a partial revolution and to bring another arm of the wheel into position to be struck by the said striker when it comes into position again. The cyclom-
35 eter is made with comparatively few parts of the simplest description, and is designed in its mode of operation to wear but slightly and to last for a long time. When the striker is placed upon a spoke of the wheel as is ordi-
40 narily the case it is a means of trouble, as it may catch the clothing of the rider and tear it, or if there is any trouble with the mechanism of the cyclometer preventing it from revolving, when the striker hits the lever the
45 spoke will be bent out of shape. By placing the striker upon the chain these possible troubles are eliminated, and as the chain is much longer than the circumference of the driven sprocket wheel upon the same shaft
50 with the working wheel, the striker will not hit the cyclometer lever so often, and conse-

quently the mechanism of the cyclometer will not wear out as quickly as by the ordinary arrangement. The registering mechanism is proportioned to register the length of the 55 chain, and not the circumference of the working wheel. I also provide means for resetting the registering mechanism at any time, whether it has reached the limit of registering or not. All of which I will now proceed 60 to describe and point out in the claims.

Of the drawings, Figure 1 represents a side view and Fig. 2 a face view of a cyclometer embodying my invention. Fig. 3 is a view showing the registering mechanism swung 65 out from its case, and Fig. 4 is a partial sectional view of Fig. 3. Fig. 5 is a detached side view of a portion of the registering mechanism. Fig. 6 shows my cyclometer attached to the working wheel of a velocipede, and Figs. 70 7 and 8 show portions of the chain and method of operating the registering mechanism.

In the several figures, *a* is a cup shaped case within which the registering mechanism *b* is inclosed; and *c* is a ring carrying a pro- 75 tecting glass disk *c'*, which is screwed onto the end of the case *a*.

The registering mechanism *b* is composed of two plates *e* and *f* joined together by posts *r, r, r*, and between the plates are secured the 80 spindles 6, 7, 8 and 9 upon which rotate the registering wheels 10, 11, 12 and 13.

g is a shaft having upon one end and outside of the case *a* a star or lever wheel *h*, and upon its other end a pinion *i*. The shaft is 85 journaled in the case *a* and in the stud *j*. When the registering mechanism *b* is shut into the case *a*, to which the plate *f* is hinged by hinge *d*, the pinion *i* meshes into the pinion *k* upon the shaft *l*. The shaft *l* is held in 90 bearings *m* and *o*, and has upon one end a worm *n* which meshes with the worm wheel *p* upon the shaft *q*. The upper part of the worm wheel has a pin *v* which engages in a slot *w* of the registering wheel 10, at each 95 revolution of the worm wheel; and the wheel 10 bears upon its hub a pin *v* which meshes in the slots *w* of the registering wheel 11, whose hub in turn has a pin which operates the wheel 12, which in turn operates wheel 13 100 in like manner. The hubs of the several wheels 10, 11, 12 and 13 each have upon their

hubs near the plate *e* disks 14, 15, 16 and 17, which bear upon their faces or peripheral surfaces, figures from 1 to 9 inclusive, which are seen through openings in the front of plate *e*, as shown in Fig. 2. The operation of this mechanism will be readily seen without much explanation. The center shaft or spindle *q* carries upon the face a hand or pointer *u* which traverses a scale on the dial, and its complete revolution denotes one mile, which is recorded upon the disk 14 which is the unit disk; the disk 15 denotes the tens, the disk 16 the hundreds, and the disk 17 the thousands. After the mechanism has registered its limit, or even before, if the cyclist wishes to reset the mechanism at any time to zero, the result is obtained as follows: The cyclometer is opened as shown in Fig. 3, by removing the ring *c* and pulling the mechanism out; the block *t* is then pushed outward as shown in dotted lines. This block *t* is pivoted at *s* to the plate *e*, and has at its free end a slot 50 which embraces the spindle 6, and fills the space between the plate *f* and the wheel 10, as shown in full lines; when the block is pushed out as described, the wheel 10 can then be moved along its spindle 6 into the position shown in dotted lines in Fig. 5, so that it is free from the wheels *p* and 11, whereupon it and the wheels 11, 12 and 13 can be reset; the wheel 10 is then slid back and the block *t* pushed back into place to hold it there.

I prefer to attach the cyclometer to the end of the shaft 23 of the working wheel of a bicycle by means of the strap 24 and a nut, as shown.

The means for intermittently operating the registering mechanism are as follows: Bicycles at the present time are largely operated by means of treadles placed between the front and rear wheels; and motion from the treadles is conveyed by means of a "rag" chain from a sprocket wheel on the treadle shaft to another sprocket wheel upon the rear or working wheel shaft. The latter sprocket wheel is smaller than the former and as there is some distance between the two wheels the chain is several times longer than the circumference of the small sprocket wheel. As shown in Figs. 6, 7 and 8, I attach a striker *z* to the chain *y* and locate the cyclometer near thereto upon the driving wheel axle as previously mentioned, so that the striker will hit the arms 5 of the star wheel *h* when in motion. The striker is a saddle shaped piece of metal and embraces one of the links of the chain, the pin of which is long enough to extend through the arms or sides of the striker. Upon the top of the striker *z*, extending across it and outwardly from the chain link is a projection which is the part which hits the arms 5 as it passes them. Owing to the length of the chain, as mentioned, the striker does not

hit an arm 5 at each revolution of the working wheel of the bicycle, but at each revolution of the chain the length of which being known forms a part of the calculation in proportioning the thread of the worm *n* on the shaft *l* of the cyclometer. By this arrangement a much slower movement is imparted to the worm and worm gear of the registering mechanism, than under the present mode where the striker hits the star wheel at every revolution of the sprocket and working wheel, and per consequence the parts do not wear out so fast, and the movement is easier.

I do not confine the location of the cyclometer to the axle of the working wheel, but may locate it anywhere in the path of the chain.

Having now described my invention, what I claim is—

1. The combination with a velocipede of a cyclometer provided with means of attachment thereto, and with means for actuating its registering mechanism as a lever or star wheel; of an intermittent striker located upon the chain which conveys motion from the treadles to the working wheel.

2. A cyclometer consisting of an inclosing case and registering mechanism hinged thereto, and a locking ring; the said inclosing case being provided with means of attachment to a velocipede, and supporting a shaft having upon its outer end outside of the said case a star wheel, and upon its inner end inside of the said case a pinion adapted to engage with the said registering mechanism when it is within the case and to be detached therefrom when it is opened outward.

3. The combination with a velocipede of a cyclometer provided with means of attachment thereto, and with means for actuating its registering mechanism as a lever or star wheel, the said mechanism being provided with means whereby one of its wheels may be removed from gear; of an intermittent striker which conveys motion from the driving chain to the said registering mechanism.

4. The combination with a velocipede of a cyclometer provided with means of attachment thereto, and with means for actuating the registering mechanism as a lever or star wheel upon the outside of the cyclometer case; and an intermittent striker located upon the chain which conveys motion from the treadles to the working wheel, the said chain being of greater length than the circumference of the driven sprocket wheel, as and for the purpose set forth.

In testimony whereof I have signed my name to this specification, in the presence of two subscribing witnesses, this 21st day of March, 1893.

CHARLES F. FERNALD.

Witnesses:

GEO. WILLIS PIERCE,
A. J. OCHS.