

(No Model.)

2 Sheets—Sheet 1.

J. S. HILLIARD.
CYCLOMETER.

No. 508,941.

Patented Nov. 21, 1893.

FIG. 1.

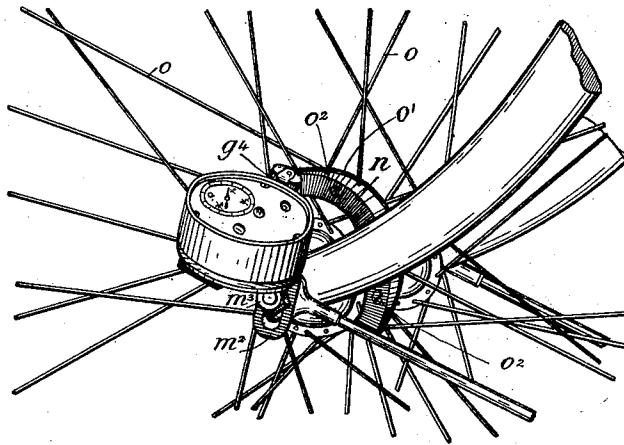


FIG. 2.

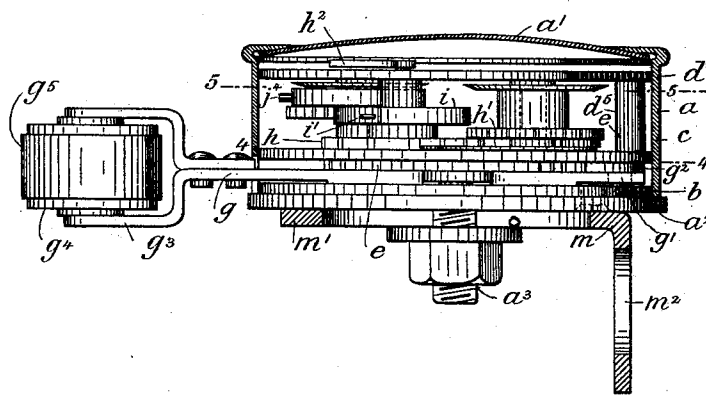
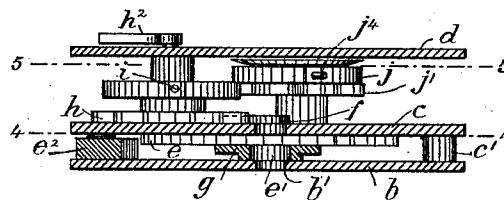


FIG. 3.



WITNESSES:
Thomas M. Smith.
Richard C. Maxwell.

INVENTOR,
John S. Hilliard,
BY J. Walter Douglas
ATT'Y.

J. S. HILLIARD.
CYCLOMETER.

No. 508,941.

Patented Nov. 21, 1893.

Fig. 4.

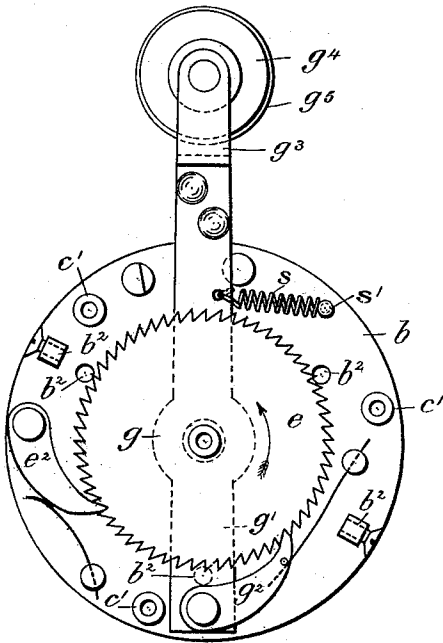


Fig. 6.

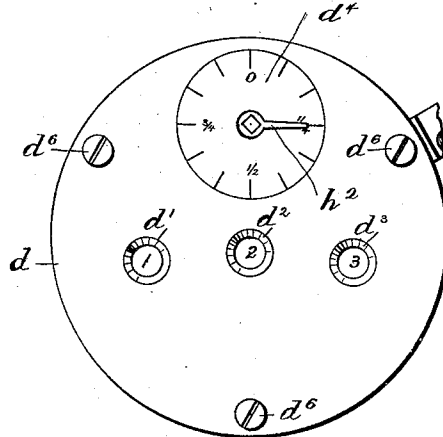
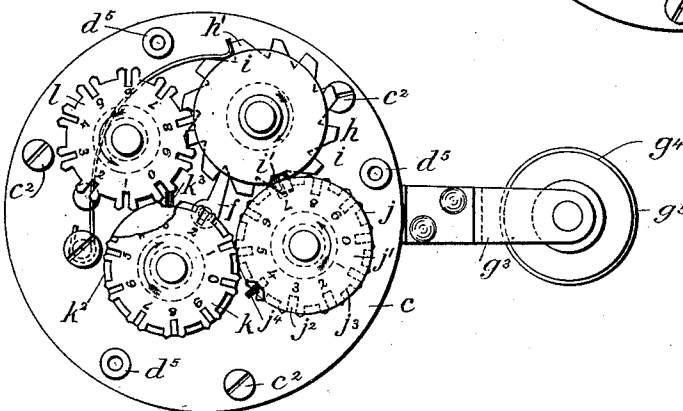


Fig. 5.



WITNESSES:

Thomas M. Smith.
Richard C. Maxwell.

INVENTOR,
John S. Hilliard,
BY J. Walter Longhans.
ATT'Y.

UNITED STATES PATENT OFFICE.

JOHN S. HILLIARD, OF PHILADELPHIA, PENNSYLVANIA, ASSIGNOR TO THE
HILLIARD CYCLOMETER COMPANY, OF SAME PLACE.

CYCLOMETER.

SPECIFICATION forming part of Letters Patent No. 508,941, dated November 21, 1893.

Application filed December 8, 1892. Serial No. 454,471. (No model.)

To all whom it may concern:

Be it known that I, JOHN S. HILLIARD, a citizen of the United States, residing at the city of Philadelphia, in the county of Philadelphia and State of Pennsylvania, have invented certain new and useful Improvements in Cyclometers, of which the following is a specification.

The principal objects of my present invention are first, to provide a neat, compact, reliable, accurate and comparatively inexpensive cyclometer, especially adapted for attachment to the frame-work of a bicycle, tricycle or other similar vehicle in such manner as to be always in plain view of the rider; second, to provide simple, adjustable and efficient means for imparting motion to a train of registering wheels of the instrument from a point in close proximity with the axle or hub of one of the wheels of the vehicle in such manner that the instrument is not subjected to undue shock or jar; and third, to provide the instrument with a train of registering wheels arranged and adapted for operation in such manner that accidental retrograde motion thereof is prevented.

My invention consists of the improvements in cyclometers hereinafter described and claimed.

The nature, characteristic features and scope of my invention will be more fully understood from the following description taken in connection with the accompanying drawings forming part hereof; and in which—

Figure 1 is a perspective view showing a cyclometer embodying features of my invention in application to the front wheel of a bicycle, tricycle or other similar vehicle. Figs. 2 and 3, are views partly in elevation and partly in section taken from the respective sides of the cyclometer. Fig. 4, is a section on the line 4—4, of Figs. 2 and 3, showing the rocker-arm, ratchet-wheel and their accessories. Fig. 5, is a section on the line 5—5, of Figs. 2 and 3, showing the train of registering wheels and illustrating the application of a Geneva stop motion thereto; and Fig. 6, is a top or plan view of the dial-plate and its complementary ordinals, and with the housing removed.

Referring to the drawings the exterior hous-

ing of the cyclometer is preferably circular in form and comprises two parts, whereof one a , is provided with a glass-plate or cover a' , and the other a^2 , is provided with a lug a^3 , and its complementary nut and washer, whereby the device may be secured to position for use in a manner to be presently fully described.

b , is a base-plate provided with a centrally disposed journal bearing b' , and with suitable internally threaded or tapped apertures b^2 , for the reception of screws, whereby the respective members a and a^2 , of the housing are held to place.

c , is a partition-plate connected with and carried above the base-plate b , by means of distance pieces c' , and screws c^2 .

d , is a dial-plate provided with windows d' , d^2 and d^3 , and with a dial d^4 . This dial-plate is supported above the partition plate c , and beneath the glass cover a' , by means of distance pieces d^5 and screws d^6 .

e , is a ratchet-wheel carried upon an arbor e' , journaled in the bearing b' , and extending upward through an aperture in the partition plate c . The upper extremity of this arbor e' , is provided with a finger f , located above the partition plate c .

e^2 , is a detent for preventing retrograde movement of the ratchet-wheel e .

g , is a rocker-arm loosely mounted upon the arbor e' , and provided at or near one extremity g' thereof, with a spring controlled pawl g^2 , for engaging the respective teeth of the ratchet-wheel e .

s , is a spring connected at its respective extremities with the rocker-arm g , and with a post s' , projecting upward from the base-plate b . The other extremity g^3 , of the rocker-arm g , projects through a suitable slot in the exterior housing of the device and is provided with a roller g^4 , having a rubber or other elastic tread g^5 , adapted to collide with and run over a suitable projection on the vehicle wheel, so that the projection causes the rocker-arm g , to be shifted toward the left in Fig. 4, once during each revolution of the vehicle wheel and the spring s , causes the rocker-arm g , to be returned to its normal position as soon as it is released by the projection. Each reciprocation of the rocker-

arm g , causes the spring-pawl g^2 , to advance the ratchet-wheel e , in the direction indicated by the arrow in Fig. 4, a distance equal to the space between its respective teeth, with the result that the finger f , is shifted in a similar direction and at the same rate of speed.

h , is a registering spur-wheel revolubly mounted upon the partition-plate c , and adapted to be driven by the finger f , in the direction indicated by the arrow in Fig. 5.

h' , is a detent for preventing retrograde motion of the wheel h .

The wheel h , is advanced by the finger f , a distance equal to the space between its teeth for every revolution of the ratchet-wheel e , and is provided with a pointer or hand h^2 , that operates in connection with the dial d^4 .

i , is a disk carried by the wheel h , and provided with a radial recess, from the center of which a radial pin i' , projects beyond the periphery of the disk.

j' , is a registering-wheel revolubly mounted upon the partition-plate c , and provided with spaces j^2 , adapted to mesh with the pin i' , and with concavities j^3 , adapted to slide upon the periphery of the disk i , and to enter the radial recess therein, so that the wheel j' , and disk i constitute a so-called "Geneva stop-movement," whereby the registering wheel j' , is held against retrograde movement in such manner that it may be advanced in the direction indicated by the arrow in Fig. 5, through the intervention of the pin i' , and once for each revolution of the wheel h . This wheel j' , is provided with the numerals from 0 to 9 inclusive, visible through the opening d^3 , and with a disk j , similar in all respects to the disk i .

k , is a registering-wheel precisely similar to the wheel j' , and revolubly mounted upon the partition-plate c . This wheel k , is controlled by the disk j , and is driven in the direction indicated by the arrow in Fig. 5, for a distance equal to the space between its teeth by the pin j^4 , of the disk j , during each revolution of the latter. This wheel k , is provided with the numerals from 0 to 9 inclusive, visible through the openings d^2 , and with a disk k^2 , and pin k^3 , that drives the registering-wheel l , in precisely the same manner as the disk j , drives the wheel k . This wheel l , is provided with numerals from 0 to 9 inclusive, disposed in such manner that they are visible through the opening d' .

It may be remarked that the employment of the "Geneva stop-movement" for driving the registering-wheels j' , k and l , prevents retrograde movement thereof and causes one complete revolution of one of them to advance the next wheel in the series a distance equal to the space between its respective teeth. In the present instance each wheel has ten teeth and a corresponding number of numerals, so that a complete revolution of one wheel causes the next wheel of the series to be advanced a distance equal to one tenth

of a revolution, whereby the succeeding numeral is caused to appear beneath the opening in the dial-plate d , as is hereinafter more fully explained.

My improved cyclometer may be applied to a bicycle by means of a bracket m , provided with slotted arms m' and m^2 , whereof one of the arms m' , engages the lug a^3 , and the other m^2 , is clamped to the nut m^3 , that serves to connect the one extremity of the axle with the bifurcated or other head of the vehicle.

n , is a semi-circular crown-cam connected with the spokes o , of the wheel of the vehicle by means of a clamping-plate o' , and set-screws o^2 , and adapted to contact with the roller g^4 , and thus reciprocate or trip the arm g , once during each revolution of the vehicle wheel. It may be remarked in this connection that the slotted bracket m , permits of the adjustment of the cyclometer, and that the crown-cam n , and roller g^4 , not only prevent any undue shock from being imparted to the rocker-arm g , but also permit of the machine being run in a reverse direction.

In practice the number of teeth of the ratchet-wheel e , will depend upon the diameter of the wheel of the vehicle, the object being to cause the ratchet-wheel e , to be revolved through the instrumentality of the rocker-arm g , crown-cam n , and spring s , once for each twelfth of a mile traversed by the vehicle. In the present instance, by reference to the drawings, it is to be assumed that the diameter of the vehicle wheel is thirty inches. Consequently the ratchet-wheel e , is provided with fifty-six teeth. If a larger or smaller vehicle-wheel is employed a ratchet-wheel having a proportionately larger or smaller number of teeth must be employed. The spur-wheel h , is provided with twelve teeth and consequently is advanced by the finger f , one tooth for each revolution of the ratchet-wheel e , and consequently one tooth for each twelfth of a mile traversed by the vehicle, and makes one complete revolution for each mile traversed thereby; and the pointer or hand h^2 , indicates upon the dial d^4 , the distance traversed in twelfths, quarter and half miles. The wheel j' , is provided with ten teeth disposed in alignment with the ordinals 0 to 9 inclusive, and is advanced by the pin i' , one tooth for each revolution of the spur-wheel h , thus causing a corresponding numeral to appear beneath the aperture d^3 , so that the wheel j' , makes one complete revolution for every ten miles traversed by the vehicle. The wheel k , and its ordinals are advanced a distance corresponding to one of its ten teeth by the pin j^4 , for every revolution of the wheel j' , or for every ten miles traversed by the vehicle, so that the ordinals appearing beneath the aperture d^2 , indicate the number of ten miles that have been traversed by the vehicle. The wheel l , and its ordinals are advanced a distance corresponding to one of its ten teeth by the pin k^3 , for every revolution of the wheel

k, so that the ordinals appearing beneath the aperture d' , indicate the number of hundred miles that have been traversed by the vehicle. Thus the cyclometer registers the distance in miles and fractions thereof traversed by the vehicle up to one thousand miles, whereupon the registration proceeds anew for another thousand miles without any necessity of resetting the apparatus. The distance traversed less than a thousand miles may be readily ascertained by reading the ordinals that appear beneath the apertures d' , d^2 and d^3 , in the usual manner and then ascertaining the fractions of a mile traversed by reference to the dial d^4 , for example, the distance indicated by the cyclometer illustrated in Fig. 6, is one hundred and twenty-three and one-quarter miles.

In cases where a greater number of miles than one thousand is to be registered an additional wheel or wheels provided with ordinals and arranged in the manner hereinbefore described may be employed, and this duplication of wheels, it will be readily understood, may be extended as required and still be within the scope of my invention.

Having thus described the nature and objects of my invention, what I claim as new, and desire to secure by Letters Patent, is—

1. A cyclometer comprising a housing attached to the outer end of the axle, a train of registering wheels, a centrally pivoted arm provided with a pawl for actuating said train of wheels, a crown cam carried by the spokes of the vehicle wheel and adapted to rock said arm in one direction and a retracting spring

for rocking the arm in the other direction, substantially as and for the purposes set forth.

2. A cyclometer comprising a housing attached to the end of the axle of a vehicle wheel, a train of registering wheels, a centrally pivoted arm provided at one extremity with a pawl for actuating said train of wheels and at the other extremity with a roller, a crown cam carried by the spokes of the vehicle wheel and adapted to run under said roller and rock the arm in one direction, and a retracting spring for rocking the arm in the other direction, substantially as and for the purposes set forth.

3. A cyclometer comprising a housing, a bracket adjustably attached to the axle of a vehicle and to the housing, a train of registering wheels, a centrally pivoted arm provided at one extremity with a pawl for actuating said train of wheels and at the other extremity with a roller, a crown cam adjustably secured to the spokes of the vehicle wheel by a clamping plate and screws and adapted to run under said roller and rock the arm in one direction, and a retracting spring for rocking the arm in the other direction, substantially as and for the purposes set forth.

In testimony whereof I have hereunto set my signature in the presence of two subscribing witnesses.

JOHN S. HILLIARD.

Witnesses:

THOMAS M. SMITH,
 ARTHUR W. YALE.