No. 644,579. Patented Mar. 6, 1900.

E. D. CLAPP.

COMBINED CYCLOMETER AND SPEED INDICATOR.

(Application filed May 17, 1899.)

(No Model.)

Fig. 1.

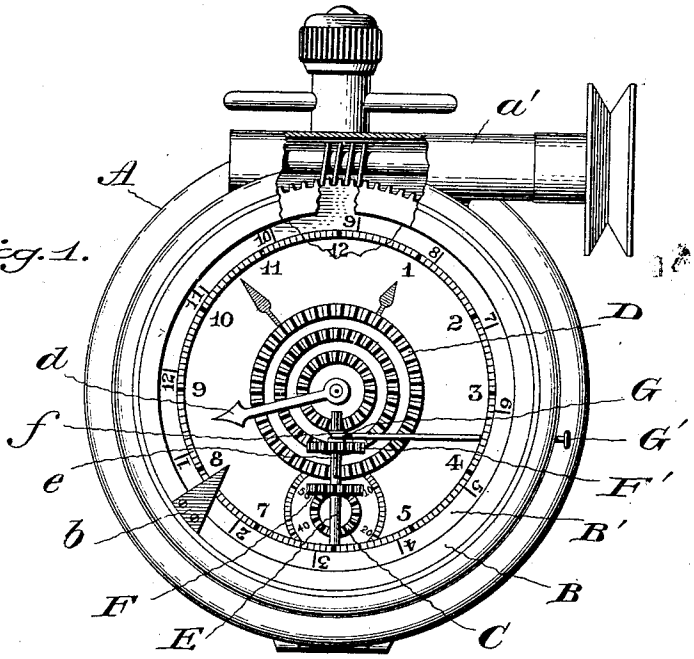
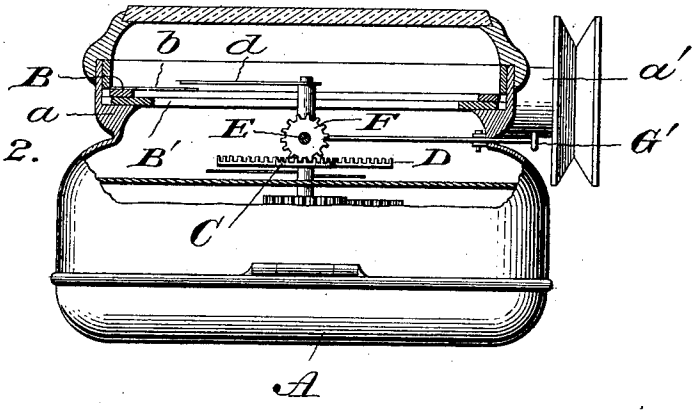


Fig. 2.



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UNITED STATES PATENT OFFICE.

EDWARD D. CLAPP, OF WASHINGTON, DISTRICT OF COLUMBIA.

COMBINED CYCLOMETER AND SPEED-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 644,579, dated March 6, 1900.

Original application filed April 1, 1898, Serial No. 676,069. Divided and this application filed May 17, 1899. Serial No. 717,210. (No model.)

To all whom it may concern:

Be it known that I, EDWARD D. CLAPP, a citizen of the United States, and a resident of Washington, in the District of Columbia, have invented certain new and useful Improvements in a Combined Cyclometer and Speed-Indicator, of which the following is a specification.

This invention is an improvement in a combined cyclometer and speed-indicator for bicycles and other vehicles; and the object of the same is to provide an instrument of this character which shall be compact in construction and positive in operation and in which provision is made for readily and conveniently changing the relative gearing of the distance-measurer and time mechanism, all as hereinafter fully described and specifically claimed.

This application is a division of original application filed April 1, 1898, Serial No. 676,069.

In the accompanying drawings, which form a part of this specification, Figure 1 is a plan or face view of the combined cyclometer and speed-indicator. Fig. 2 is a side view, partly in section.

In carrying out my invention I employ as an essential part thereof a watch or chronometer of any approved make and extend the upper part of the casing A to adapt the same to receive the mechanism hereinafter described in addition to the time mechanism of the watch. The extended portion of the casing is provided interiorly with an annular shoulder *a*, located a suitable distance above the face of the watch, and exteriorly said extended portion has formed at one side thereof a tube *a'*, inclosing a worm-shaft that meshes with the peripheral teeth of a pair of annular plates or gear-rings B and B', mounted upon the shoulder *a*, the lower ring being wider than the other and provided with graduations, as shown, to indicate the distance in miles. These gear-rings or annular plates form the cyclometer or distance-measurer, and to this end the lower ring, which has the graduations, is provided with a less number of teeth than the other ring, and the gearing between the worm-shaft and wheel of the vehicle is so proportioned that each revolution of the upper gear-ring or plate will represent a certain fraction of a mile, and a number of revolutions will represent a mile, registered by the graduations on the lower ring in conjunction with the pointer *b*, carried by the upper ring, said pointer also coöperating with the time mechanism hereinafter described for indicating when the vehicle is attaining a predetermined rate of speed.

The cyclometer or speed-measurer just described is similar to that shown in my said original application in which the pointer of said distance measurer and recorder coöperated with a second pointer driven from the watch-movement to indicate a certain speed when both pointers moved in unison, the relative gearing being changed by interchangeable gear-wheels by which the movement of the time mechanism of the watch was transmitted to said second pointer.

By this application I contemplate a means of changing the relative gearings of the distance-measurer and time mechanism, which consists in attaching a bevel-pinion C to the extended arbor of the seconds-hand of the watch-movement, loosely mounting a differential gear-wheel D on the extended arbor or shaft at the center of the watch, and gearing the two by a fixed pinion and a movable pinion, as hereinafter particularly described. To this end a shaft E is mounted above the differential gear-wheel and pinion and carries a fixed pinion F, in mesh with the aforesaid pinion C, and a pinion F', movable upon the said shaft to mesh with any one of the series of gear-teeth on the differential gear-wheel D. The pinion F' engages a spline or feather *e* on the shaft and has a grooved collar *f* at one side, with which engages a yoke G, formed on the end of a shifting lever G', the latter being pivoted to the watch-casing, as shown, and extends beyond the same to be conveniently operated. This lever can frictionally engage its bearings sufficiently to hold it in an adjusted position, though it is obvious that any other means could be employed for the purpose. It is also apparent that provision could be made for further increasing and diminishing the time-gearing between the pinion C and gear-wheel D by having the pinion F movable the same as pinion F' and mounting a differential gear-

wheel in place of the pinion C, in other words, by merely duplicating the gearing between the shaft and gear-wheel D and substituting same for the gearing between said shaft and arbor of the seconds-hand of the watch. The differential gear-wheel D carries a hand or pointer *d*, which coöperates with the pointer *b* of the distance measurer and recorder to indicate the speed at which the vehicle may be traveling. It will be understood, of course, that the gearing of the pointer or hand *d* with the time mechanism of the watch is so proportioned with respect to the gearing of the pointer *b* with the wheel of the vehicle that both pointers will move in unison when a predetermined speed is attained by said vehicle, and the changeable gearing mechanism hereinbefore described provides for changing the relative time-movement of the pointer *d* to have it go either slow or fast. It is obvious, therefore, that when the pointer *d* is so geared to the time-movement or mechanism that the pinion F′ is in mesh with the inner series of gear-teeth on the wheel D the synchronous movement of the pointers *d* and *b* will indicate that the vehicle is attaining a certain speed—for instance, a mile in two minutes and ten seconds—while the gearing of said pinion with the outer series of gear-teeth on wheel D would indicate a much slower speed. In practice it is intended, therefore, that each series of gear-teeth on the gear-wheel D shall represent a certain speed-gear in conjunction with the movable pinion, by which the time-movement is transmitted to said gear-wheel. This peculiar manner of changing the relative gearings of the distance-measurer and time mechanism by regulating the time-movement of the pointer *d* permits the changeable gearing to be located above the face of a watch and in connection with the simple form of distance-measurer forms a very compact device which is but very little larger than an ordinary watch.

By employing the differential gear-wheel and movable pinion the time-movement of the pointer *d* can be regulated to indicate different speeds, and as said movable pinion is operated by the lever, which extends beyond the watch-casing, the speed-indicating mechanism can be readily and conveniently changed. This will be found very convenient, more especially when the device is used upon a bicycle to indicate any deviations in the speed of the same from the time designed to be made by it, for the designated time can be changed while the rider is propelling his bicycle and without removing the device from its support.

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

1. In a combined cyclometer and speed-indicator, the combination with a watch, of distance-measuring mechanism operating a pointer above the face of the watch, a gear-wheel driven by the watch-movement, a second gear-wheel carrying a pointer, one of the gear-wheels being a differential gear-wheel, and means for gearing said gear-wheels one to the other, substantially as shown and for the purpose set forth.

2. In a combined cyclometer and speed-indicator, the combination with the watch, of distance-measuring mechanism operating a pointer above the face of the watch, a gear-wheel driven from the watch-movement, a second gear-wheel carrying a pointer adapted to move in unison with the aforesaid pointer, one of the gear-wheels being a differential gear-wheel, a shaft, and pinions mounted on the shaft to mesh with the gear-wheels, substantially as shown and for the purpose set forth.

3. In a combined cyclometer and speed-indicator, the combination with a watch, of distance-measuring mechanism operating a pointer above the face of the watch, a gear-wheel driven by the watch-movement, a second gear-wheel carrying a pointer adapted to move in unison with the aforesaid pointer; one of the gear-wheels being a differential gear-wheel; a shaft; pinions on the shaft to mesh with the aforesaid gear-wheels, one of the pinions being movable upon the shaft, and means for moving said pinion, substantially as shown and for the purpose set forth.

4. In a combined cyclometer and speed-indicator, the combination, of a watch, distance-measuring mechanism operating a pointer above the face of the watch, a gear-wheel driven by the watch-movement, a second gear-wheel carrying a pointer adapted to move in unison with the aforesaid pointer; one of the gear-wheels being a differential gear-wheel; pinions mounted on a shaft to mesh with the gear-wheels, one of the pinions being movable; and an operating-lever connected to the movable pinion, substantially as shown and for the purpose set forth.

5. In a combined cyclometer and speed-indicator, the combination, of a watch, distance-measuring mechanism operating a pointer above the face of the watch, a gear-wheel driven by the watch-movement, a second gear-wheel carrying a pointer adapted to move in unison with the aforesaid pointer, one of the gear-wheels being a differential gear-wheel; pinions mounted on a shaft to mesh with the gear-wheels, one of the pinions being movable and provided with a grooved collar; and a lever having a yoke engaging the grooved collar, the end of the lever projecting beyond the watch-casing, substantially as shown and for the purpose set forth.

6. In a combined cyclometer and speed-indicator, the combination, of a watch having a casing extended above the face of the watch; differential gear-rings mounted in said extension and having graduations and a pointer, respectively; a gear-wheel driven by the watch-movement; a second gear-wheel mounted above the face of the watch and carrying a pointer adapted to move in unison with the

aforesaid pointer; and changeable gearing between said gear-wheels, substantially as shown and for the purpose set forth.

7. In a combined cyclometer and speed-indicator, the combination, of a watch, distance-measuring mechanism operating a pointer above the face of the watch, a gear-wheel driven by the watch-movement, a second gear-wheel, and a pointer operated by the latter; together with changeable gearing between the aforesaid gear-wheels, substantially as shown and for the purpose set forth.

In testimony whereof I affix my signature in the presence of two witnesses.

EDWARD D. CLAPP.

Witnesses:

FRANK D. BLACKISTONE,

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