No. 879,540. PATENTED FEB. 18, 1908.

E. J. HALL, DEC'D.

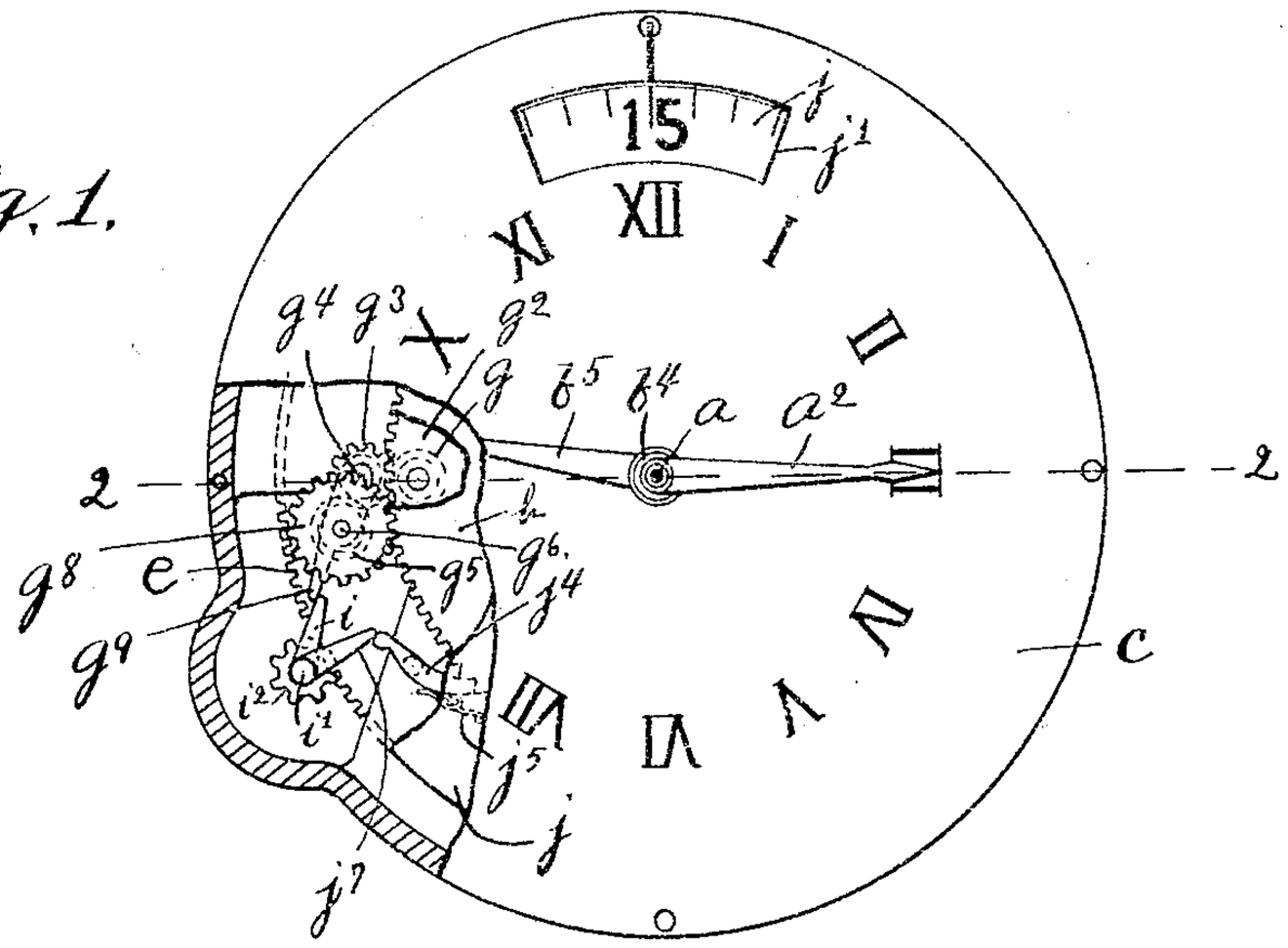
A. L. HALL, EXECUTRIX.,

TIME SPEED INDICATING DEVICE.

APPLICATION FILED AUG. 14, 1905.

2 SHEETS—SHEET 1.

Fig. 1.



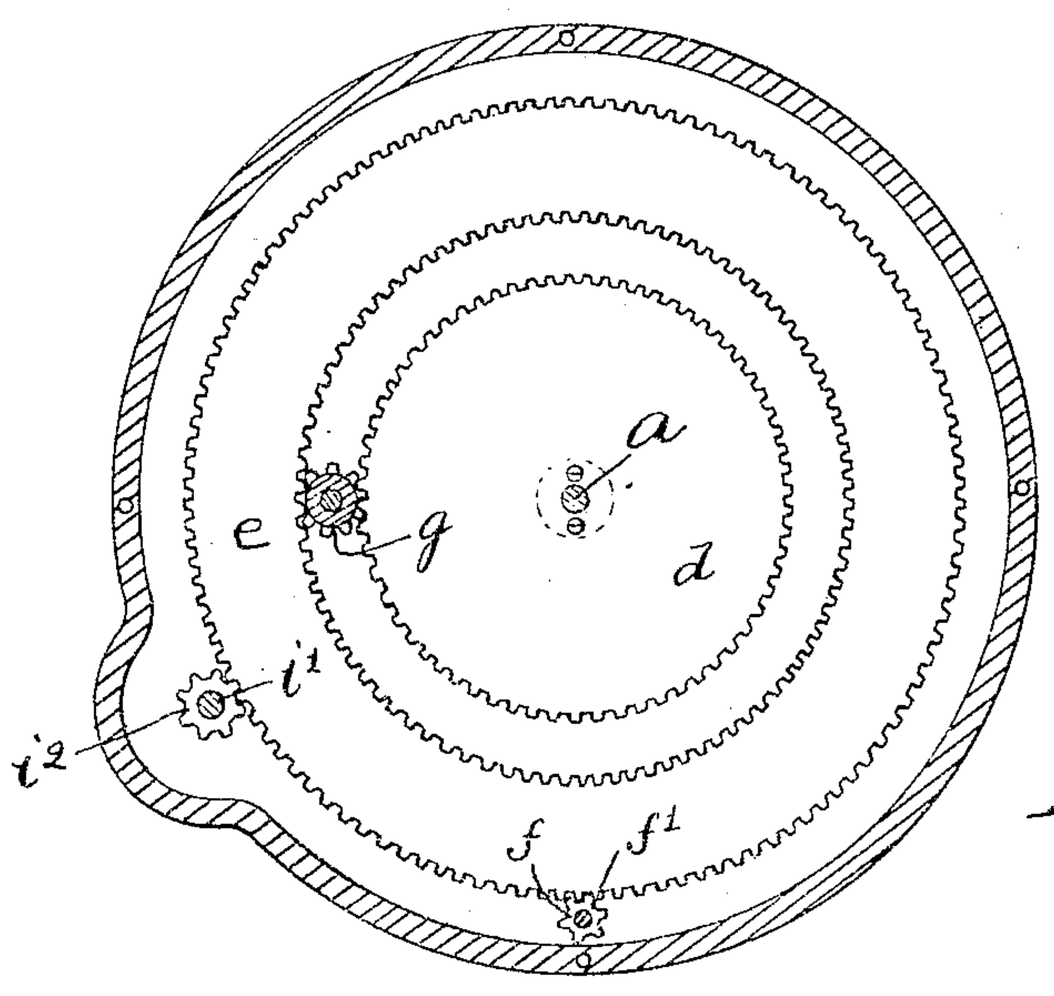


Fig. 3.

Fig. 2.

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2 SHEETS—SHEET 2.

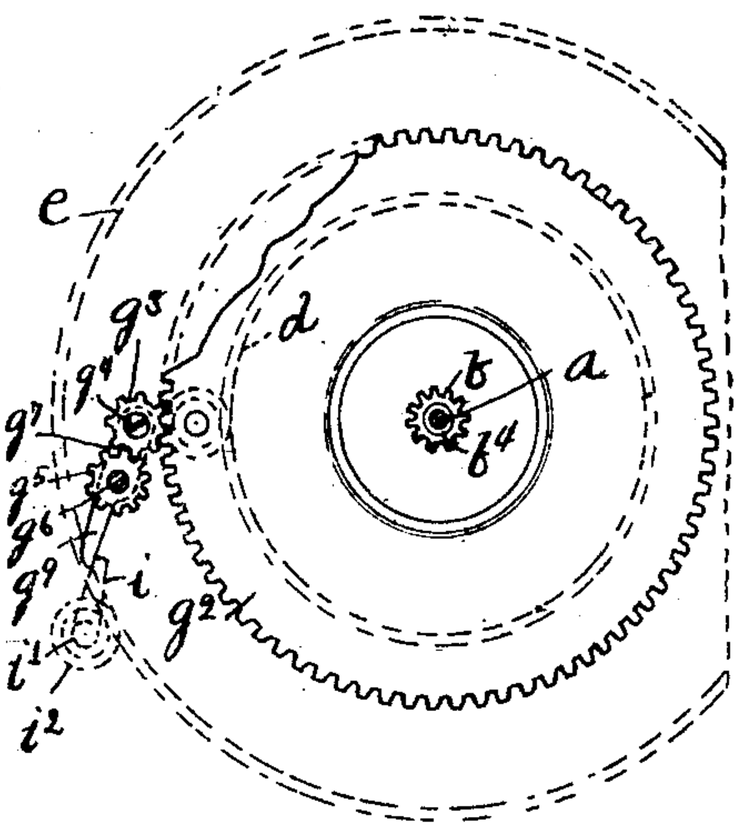

Fig. 4.

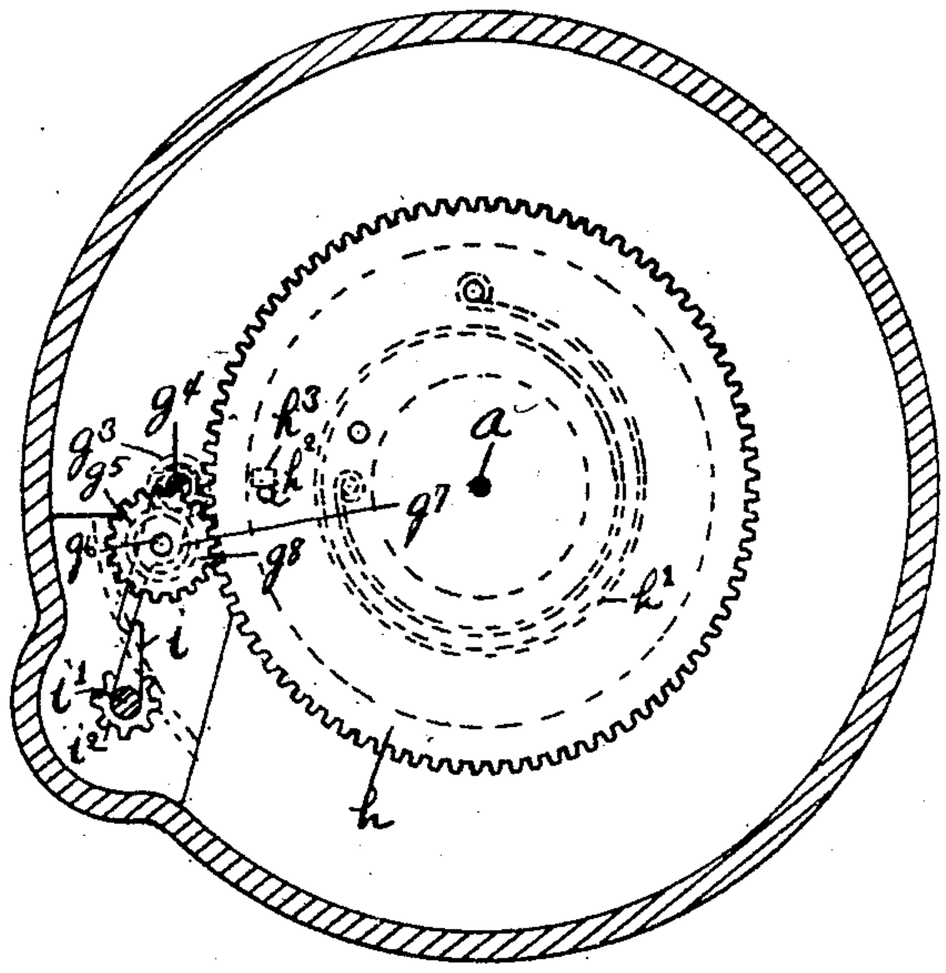

Fig. 5.

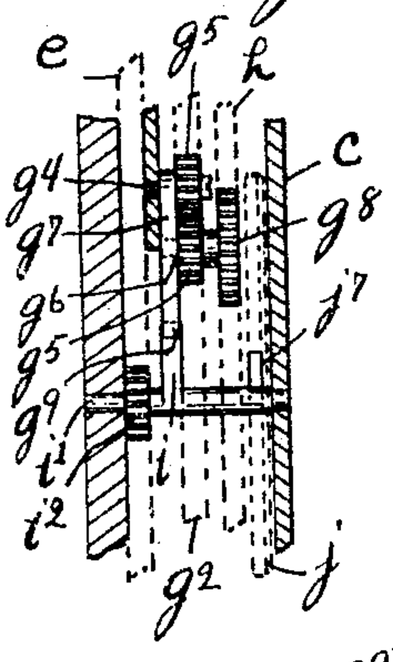

Fig. 7.

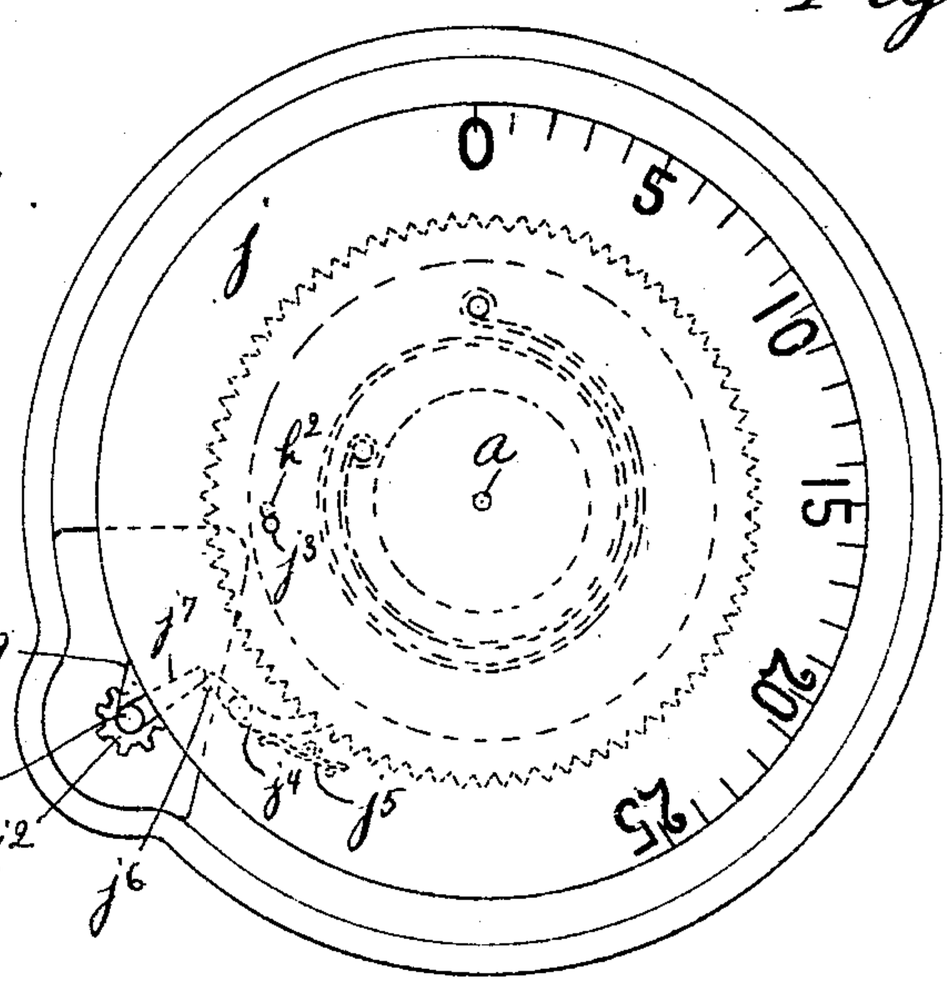

Fig. 6.

Witnesses:

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UNITED STATES PATENT OFFICE.

EDWIN J. HALL, OF WALTHAM, MASSACHUSETTS; ANNIE L. HALL EXECUTRIX OF SAID EDWIN J. HALL, DECEASED.

TIME SPEED-INDICATING DEVICE.

No. 879,540. Specification of Letters Patent. Patented Feb. 18, 1908.

Application filed August 14, 1906. Serial No. 330,381.

To all whom it may concern:

Be it known that I, EDWIN J. HALL, of Waltham, county of Middlesex, State of Massachusetts, have invented an Improvement in Time Speed-Indicating Devices, of which the following description, in connection with the accompanying drawings, is a specification, like characters on the drawings representing like parts.

This invention relates to time speed indicating devices, and has for its object to construct an indicator whereby the maximum rate of speed attained while traveling a predetermined distance, as for instance, a mile or fraction thereof or multiple thereof may be indicated; also to arrange the indicating mechanism in connection or combination with an ordinary clock movement whereby the time will be indicated as well as the speed.

The invention consists essentially in an element driven at a variable speed by a moving part of an automobile and an element driven at a constant speed by a clock movement, an actuator operated by said two elements and indicating mechanism operated by said actuator.

Figure 1 shows in plan view a time speed indicator embodying this invention. Fig. 2 is a vertical section of the time speed indicator shown in Fig. 1, taken on the dotted line 2—2. Fig. 3 is a plan view showing the constantly driven element and the variable driven element and a part of the actuator for the indicating mechanism. Fig. 4 is a plan view showing the actuator for the indicating mechanism and pinion engaging it. Fig. 5 is a plan view showing one of the gears of the indicating mechanism and adjacent parts. Fig. 6 is a plan view showing in dotted lines the indicating disk and locking device therefor, and tripping device for said locking device. Fig. 7 is a detail to be referred to.

a represents the usual center arbor of an ordinary watch or clock movement, which latter is not herein shown but is contained in the shell or case *a'*, and a^2 is the minute hand. *b* represents the usual cannon pinion on the center arbor which engages a pinion *b'* connected with the pinion b^2, which engages a pinion b^3 on a sleeve b^4 bearing the hour hand b^5. *c* represents the usual clock dial over which the hands a^2 and b^5 move. So much of my device is of any ordinary construction and may be what is usually termed a carriage clock.

A toothed gear *d* is connected to the center arbor *a*, which is driven by said arbor constantly, ordinarily making one revolution per hour, although for the purposes of my invention it may make a complete revolution in any other predetermined period of time.

e represents a toothed ring or gear it having both internal and external teeth, and said ring is disposed concentric to the constantly driven gear *d* and in the same plane. The toothed gear *e* is adapted to be driven by means connected with some moving part of an automobile, and for this purpose any moving part thereof may be selected, and to said part a pinion *f* is connected in any suitable manner which engages the external teeth of the gear *e* and thereby drives said gear. The movement of the gear *e* or speed at which it is driven will be variable according as the moving part of the automobile varies, and hence is herein termed the variable driven member or gear. Although the speed at which the toothed gear *e* is driven will vary according to the speed of the automobile yet said gear will make one complete revolution in a predetermined distance traveled, as, for instance, it will make one revolution for each twenty miles, yet for the purposes of my invention the gear may be arranged to make one complete revolution for any other predetermined distance.

A pinion *g* is located between the constantly driven member or gear *d* and the variable driven member or gear *e*, which engages the teeth of both gears and is thereby turned by them either separately or conjunctively according as the gears move relative to each other, as, for instance, if the gear *e* is at rest the gear *d* will drive the pinion constantly and thereby cause said pinion to travel around the gear *d*, but if the gear *e* is revolving then the pinion will be moved by both gears *d* and *e* and will travel along its circular path at a variable speed, depending upon the relative speeds of the two gears. The pinion *g* is loosely mounted on a stud *g'* projecting downward, as here shown, from a toothed gear g^2, which is mounted to revolve freely on the center arbor *a*, and as the pinion *g* is moved along its circular path the toothed gear g^2 will be correspondingly revolved. The toothed gear g^2 serves as the actuating member or gear for the indicating mechanism. The toothed gear g^2 engages a pinion g^3 mounted loosely on a stud g^4 which is

secured to one of the stationary plates of the frame, and said pinion g^4 engages a pinion g^5 mounted loosely on a stud g^6, secured to a plate g^7, which is loosely mounted on the stud g^4 so as to swing thereon, see Fig. 7, and said pinion g^5 is rigidly connected to a pinion g^8 so that said pinion g^8 will revolve with the pinion g^5. The pinion g^8 engages a toothed gear h, which is loosely mounted on the sleeve bearing the hour hand, and said pinion is adapted to be moved into and out of engagement with said gear h at certain times. To accomplish this result the swinging plate g^7 has an extension or arm g^9 which is adapted to be engaged by an arm i projecting from a shaft i', to which a pinion i^2 is secured which engages the external teeth of the variable driven gear e, and once during each revolution of said pinion i^2, the arm i strikes the extension g^9 of the plate g^7 and moves it to disengage the pinion g^8 from the toothed gear h. As the variable driven gear e makes one revolution for a predetermined distance traveled by the automobile, as for instance, for twenty miles the arm i will be moved to cause the pinion g^8 to disengage the gear h, at the end of each mile or quarter mile or any other fractional part of the predetermined distance. While the pinion g^8 is in engagement with the gear h it revolves said gear, but as soon as it is disengaged therefrom the gear h is free. The gear h as herein shown has attached to it one end of a spring h', see Fig. 5, the other end of which is attached to a fixed point, as for instance, to one of the stationary plates of the frame, and said spring serves as a restoring spring for the gear h, acting to return said gear h to its starting point each time it is disengaged. The gear h has on it a stop pin h^2 which, at the starting point, engages a stop pin h^3 on the frame plate, and as the gear h is moved by the pinion g^8 the spring h' will be wound and the stop pin h^2 will be moved away from the stop pin h^3, but when disengaged said gear will be returned immediately to its starting point. The gear h will be moved successively variable distances according to the movement of the main actuating gear g^2, but each time it will be returned to its starting point.

A disk j is mounted loosely on the sleeve bearing the hour hand, which has on its upper face a series of indicating marks and numerals to indicate the speed, as for instance, the miles per hour, and said disk occupies a position back of the dial plate of the clock, and the indicating marks and numerals thereon are visible through an opening j' in said dial plate. The disk j has provision for a spring j^2, one end of which is attached to the disk and the other end to the gear h, and said disk has a stop pin j^3 which is engaged by the stop pin h^2 on the gear h, said stop pin h^2 being suitably extended for this purpose. Thus the disk j is adapted to be moved by the gear h.

The disk j is formed or provided with a toothed edge see Fig. 6 adapted to be engaged by a pawl j^4, pivoted to the frame plate and normally held pressed into engagement with the teeth on the disk by a spring j^5. As the disk j is advanced by the gear h the pawl acts to hold it at the maximum point of advancement while the gear h returns to its starting point. The pawl j^4 has an extension j^6 adapted to be engaged by an arm j^7 which is secured to the shaft i', being similar to the arm i thereon, and by said arm j^7 the pawl j^6 is moved out of engagement with the disk, and when said disk is thus released the spring j^2 acts to return it until its stop pin j^3 engages the stop pin h^3.

The operation of the indicating portion o my device is as follows. As the actuating gear g^2 is rotated the gear h will be advanced by the pinion g^8 until said pinion is disengaged therefrom, and the disk j will be correspondingly advanced, then as soon as the pinion g^8 disengages the gear h the latter returns immediately to its starting point, but the disk j is held in its advanced position by the pawl and indicates the maximum miles per hour or rate of speed traveled during the first mile or other predetermined distance to which the device is set or adjusted; then the pinion g^8 is immediately moved into engagement with the gear h and again operates to advance said gear h, and the stop pin h^2 thereon is moved toward the stop pin j^3 on the disk j, and if a higher rate of speed is attained during the second mile the pin h^2 will engage the pin j^3 and advance the disk j, but if a lower rate of speed is attained then the pin h^2 will approach, but will not engage the pin j^3, and when the second mile or other predetermined distance is completed and while the gear h is still held at its maximum point of advancement, the disk j will be released by a movement of the pawl j^4, and the pin j^3 carried by the disk will move into engagement with the pin h^2 on the gear h and then the pawl is released and again permitted to engage the disk j to hold it, and then the gear h is disengaged and permitted to return to its starting point. Thus the indicating disk j always shows the maximum rate of speed traveled during the previous mile or other predetermined distance.

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

1. In a time speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a toothed gear adapted to be driven at a variable speed, speed indicating mechanism, and an actuating member for said indicating mechanism bearing a pinion which engages

both said constantly and variably driven gears, substantially as described.

2. In a speed indicator, the combination with the center arbor of a clock movement, a toothed gear secured thereto and thereby driven at a constant speed, a ring gear disposed concentric to said toothed gear which is adapted to be driven at a variable speed, speed indicating mechanism, and an actuating member for said indicating mechanism bearing a pinion which engages both said constantly and variably driven gears, substantially as described.

3. In a speed indicator, the combination of a ring gear adapted to be driven at a variable speed, a constantly driven gear within said ring gear, speed indicating mechanism and an actuator for said indicating mechanism bearing a pinion which is interposed between said gears, substantially as described.

4. In a speed indicator, the combination with the center arbor of a clock movement, a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, speed indicating mechanism and an actuating gear for said indicating mechanism bearing a pinion which engages both said variably and constantly driven gears, substantially as described.

5. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, an actuating gear turning on said center arbor bearing a pinion which engages both said constantly and variably driven gears, an indicating disk also turning on said center arbor, and means for operating it which is operated by said actuating gear, substantially as described.

6. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, and means for turning it on its axis operated by said rotatable member, substantially as described.

7. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, an operating device for said disk, means operated by said rotatable member for moving said operating device forward variable distances, substantially as described.

8. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, means operated by said rotatable member for turning it on its axis in one direction, a locking device for said disk, a tripping device for said locking device and a restoring spring for said disk, substantially as described.

9. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, and means for turning it on its axis operated by said rotatable member, a locking device for said indicating disk and a tripping device for said locking device, substantially as described.

10. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, means operated by said rotatable member for turning it on its axis in one direction, a locking device for said disk, a tripping device for said locking device and a restoring spring for said disk, substantially as described.

11. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, an operating device for said disk, means operated by said rotatable member for moving said operating device forward variable distances, and means for disconnecting said operating device from said rotatable member, and means for returning said operating device to its starting point, substantially as described.

12. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, a locking device for said disk, a tripping device for said locking device, a restoring spring for said disk, an operating device for said disk, means operated by said rotatable member for moving said operating device forward variable dis-

tances, means for disconnecting it from said rotatable member and means for returning it to its starting point, substantially as described.

13. In a speed indicator, an indicating disk, a reciprocating operating-device for said disk, means for moving said operating-device in one direction variable distances, means for disconnecting said operating-device from said actuating means, and means for returning the operating-device, substantially as described.

14. In a speed indicator, an indicating disk, an operating device for said disk, an actuating member for moving said operatiing-device variable distances, means for disconnecting said operating-device from said actuating member, means for returning said operating-device when disengaged, a constantly driven gear, a gear adapted to be driven at a variable speed and a pinion interposed between said constantly and variably driven gears, which is borne by said actuating member, substantially as described.

15. In a speed indicator, an indicating disk, a locking device for said disk, a tripping device for said locking device, means for returning said indicating device when released, an operating device for said disk, an actuating member for moving said operating device variable distances, means for disconnecting said operating device from said actuating member, means for returning said operating device when disengaged, a constantly driven gear, a gear adapted to be driven at a variable speed, and a pinion interposed between said constantly and variably driven gears, which is borne by said actuating member, substantially as described.

16. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, and means for turning it on its axis operated by said rotatable member, a locking device for said indicating disk and a tripping device for said locking device, and means for operating said tripping device operated by said variably driven gear, substantially as described.

17. In a speed indicator, the combination with the center arbor of a clock movement, of a toothed gear secured thereto and thereby driven at a constant speed, a gear adapted to be driven at a variable speed, a pinion engaging both said constantly and variably driven gears, a rotatable member bearing said pinion, an indicating disk, an operating device for said disk, means operated by said rotatable member for moving said operating device forward variable distances, and means operated by the variably driven gear for disconnecting said operating device from said rotatable member, substantially as described.

18. In a speed indicator, the combination of a constantly driven gear, a variably driven gear, a rotatable member bearing a pinion which engages both said constantly and variably driven gears, an indicating disk operated by said rotatable member, and means operated by the variably driven gear for repeatedly disconnecting the indicating disk from the rotatable member, and means for restoring said indicating disk, substantially as described.

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

EDWIN J. HALL.

Witnesses:
EDWARD P. STARBUCK,
CHARLES H. LEIGHTON.