(No Model.) 2 Sheets—Sheet 1.

T. ACKLEY.

SPEED INDICATOR.

No. 273,423. Patented Mar. 6, 1883.

Fig. 1.

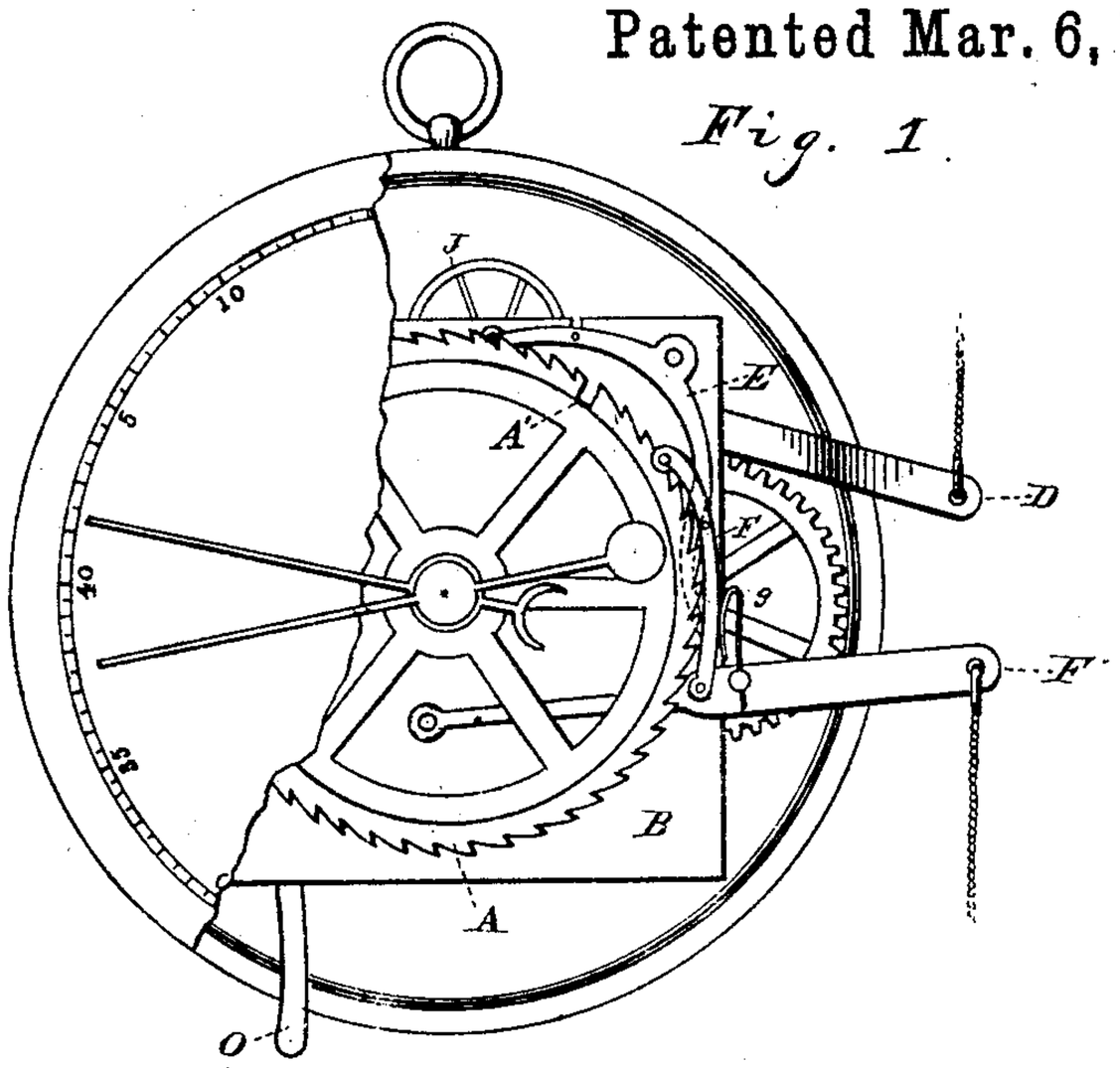
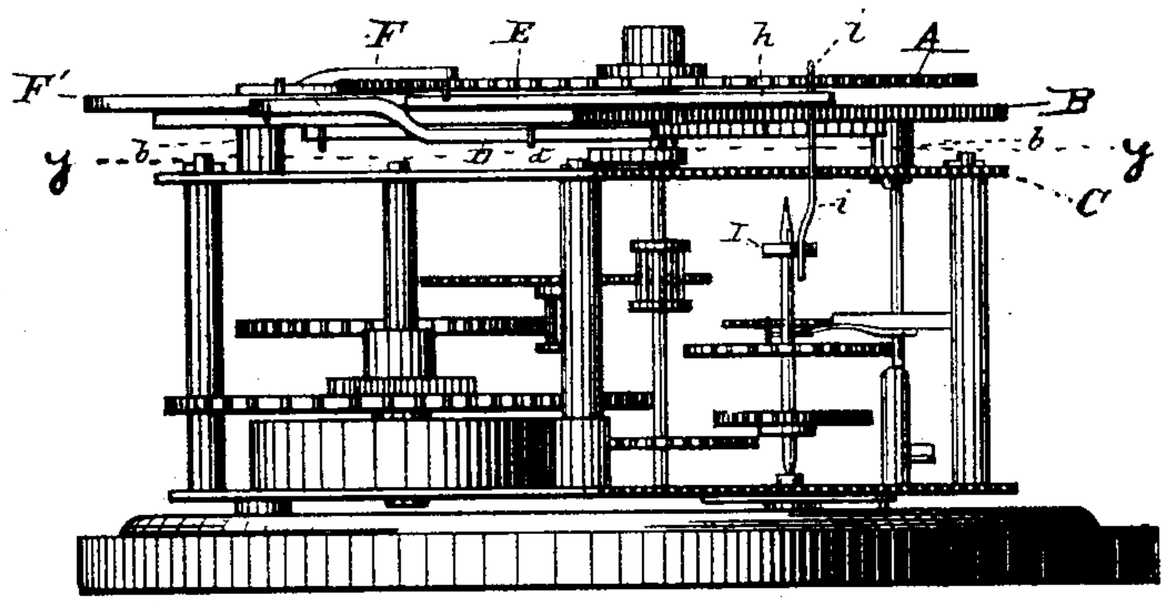


Fig. 2.



WITNESSES

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Jno. Crowell Jr

INVENTOR

Thaddeus Ackley

By Liggett & Liggett

ATTORNEY'S

(No Model.)

2 Sheets—Sheet 2.

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Fig. 3.

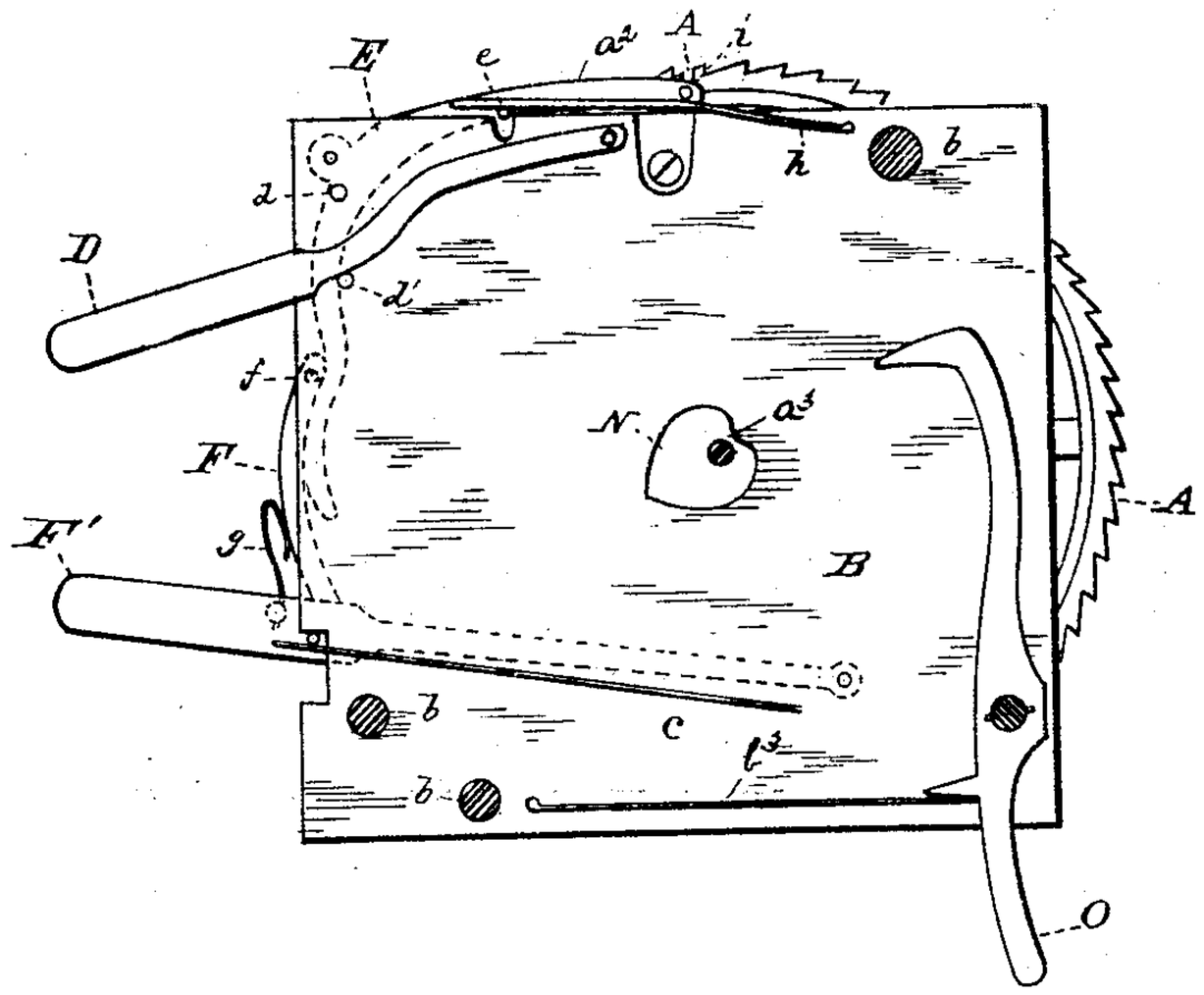


Fig. 4.

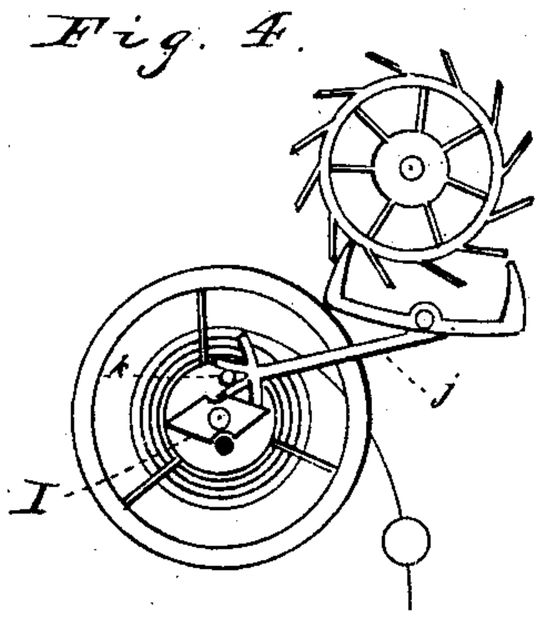


Fig. 5.

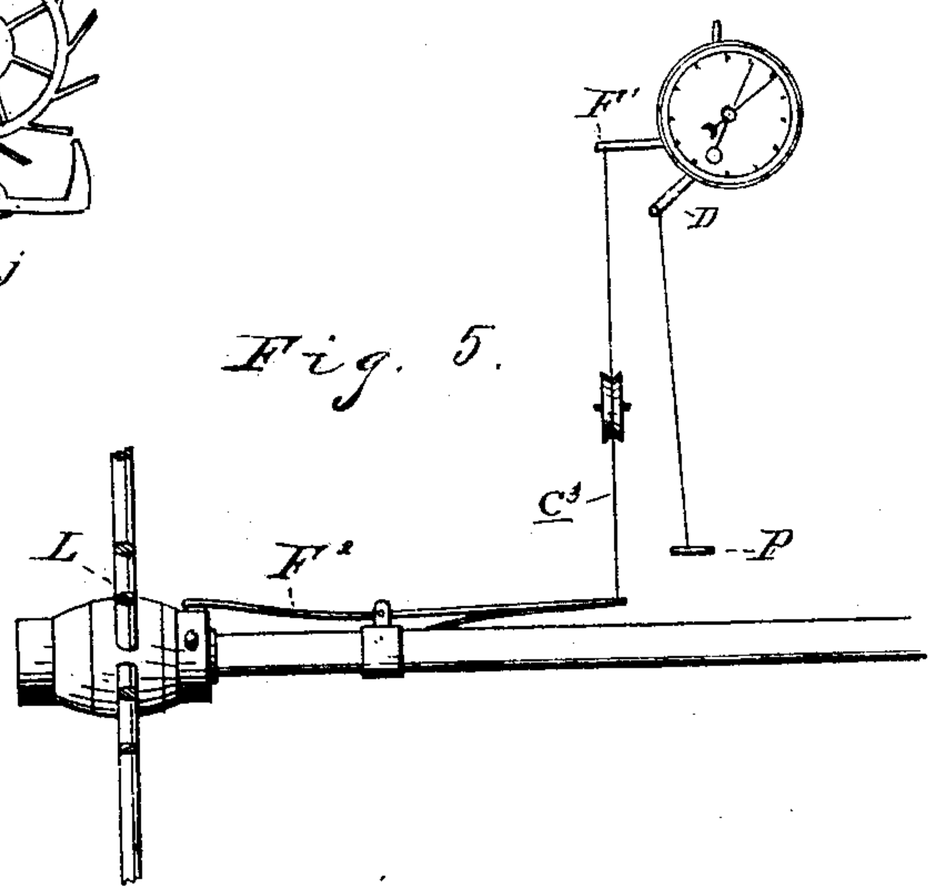
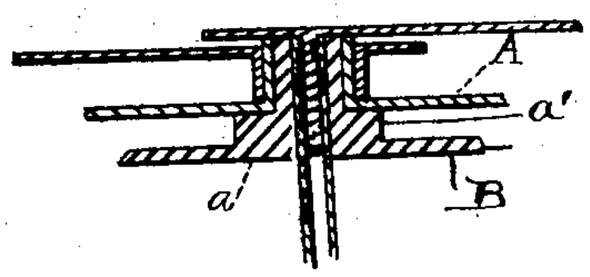


Fig. 6.



WITNESSES

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INVENTOR

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UNITED STATES PATENT OFFICE.

THADDEUS ACKLEY, OF WARREN, OHIO.

SPEED-INDICATOR.

SPECIFICATION forming part of Letters Patent No. 273,423, dated March 6, 1883.

Application filed June 22, 1882. (No model.)

To all whom it may concern:

Be it known that I, THADDEUS ACKLEY, of Warren, in the county of Trumbull and State of Ohio, have invented certain new and useful Improvements in Speed-Indicators; and I do hereby declare the following to be a full, clear, and exact description of the invention, such as will enable others skilled in the art to which it pertains to make and use the same.

My invention relates to an apparatus for indicating the speed of a vehicle or steam-engine, or the rate at which other machines work, said speed being indicated by index-hands on a dial that is suitably lettered and marked.

I will describe my device as used in connection with a sulky, as it is more particularly adapted for use in timing the speed of horses.

In the drawings, Figure 1 represents a plan view of my device with a portion of the dial broken away, so as to give a view of the internal mechanism. Fig. 2 represents a side elevation of my device. Fig. 3 is a longitudinal sectional view taken through the line *y y* in Fig. 2. Fig. 4 represents a detached view of the cam and escapement. Fig. 5 shows one manner of operating my device by connecting it with suitable mechanism to the hub of a wheel. Fig. 6 represents a detached sectional view of the gear-wheel and central arbor.

The clock-movement represented in Figs. 1 and 2 is the usual time mechanism, consisting of a train of wheels driven by the recoil of a spring and controlled by the escapement. The index-hand, which is secured to the central arbor, may thus be regulated to traverse around the face of the dial at any desirable speed.

A represents a ratchet-wheel cut with any number of teeth to correspond with the revolutions of the sulky-wheel in a quarter of a mile. This ratchet-wheel rests on a shoulder, *a'*, extending from the sleeve *a*, said sleeve *a* being secured to the plate B, as shown in Fig. 6. This plate B rests on posts *b b*, which are secured to a similar plate, C, that covers the clock mechanism.

A lever, D, is pivotally attached to the under side of the plate B. Its movement back and forth is limited to the space between the lugs *d* and *d'*. When the lever D is pressed forward it engages with the pin *e*, which is secured to the bell-crank lever E, which latter is pivotally secured to the opposite side of plate B. One end of the lever E rests against a pin, *f*, which is secured to the pawl F, which is pivoted to the lever F', that is loosely attached to the plate B, as shown in Fig. 1. Any suitable spring may be attached to the lever F' for pressing it forward.

In Fig. 3 is represented a steel spring, *c*, that is secured to the plate B, the other end resting against a pin that extends from the lever F'. The pawl F is also provided with a spring, *g*, which acts to keep the pawl in the teeth of the ratchet-wheel.

Having described the connection of one end of the bell-crank lever, I will now describe the construction and function that the other end or arm *a* thereof performs. This arm a^2 is provided with a pin, *e*, on which the spring *h* bears, the tendency of which latter is to hold the rod *i*, secured to arm a^2 near its outer end, down in engagement with the wheel A. In the periphery of said ratchet-wheel is formed a slot, A', which is adapted to receive the pin *i*. The inner or free end of the pin *i* engages with the cam I, when the pin drops in the slot A', thus stopping the movement of the wheels, the cam being attached to the spindle of the fly-wheel. The cam I is elongated, being pointed or conical at both ends, so that when the pin *i* engages with it, it will rest against the narrow side of the cam, as shown in Fig. 4. The escapement-lever *j* engages with a pin, *k*, which is secured opposite the narrow portion of the cam to the disk of the fly-wheel J. This prevents the wheel from stopping at a dead-center.

In Fig. 5 is represented one manner of operating my apparatus in connection with a sulky. A wire or rod is attached at one end to the lever F', and the other end is secured to an arm, F^2, that is pivoted to a sleeve, which is secured to the axle of the sulky. This arm extends over the hub of the wheel L, on which a projection is formed, that is adapted to come in contact and raise the arm. The lever D is operated by means of any suitable foot-lever, a cord or chain being used to connect the two together.

N represents a heart-shaped cam, that is se-

cured to the central arbor. A lever, O, pivoted to the plate B, is adapted to engage with the cam and move it around to the position shown in Fig. 3 whenever it is desirable to turn the index-hand back to the starting-point. The cam N and the index-hands are so arranged relatively to each other that when the index-hand is opposite 5 or any other desired or predetermined starting-point or mark on the dial, the cam N will be in the position shown. When it is desired to turn the hand back to the starting-point, so as to begin anew, the hooked end of the lever O, is moved inward until it strikes the cam, which it turns rapidly until the end of the said lever enters the notch a^3 and brings the hand around to the starting-point. When the lever O is released the spring b^3 forces the end of the said lever away from the cam N and holds it in position until it is again desired for use.

Having thus described the different parts of my device, its operation is as follows: We will suppose that the driver wishes his horse to travel at the rate of two minutes and forty seconds per mile. The clock mechanism is regulated so that the index-hand will traverse around the face of the dial four times, to represent the above-mentioned time.

In my improved indicator the toothed wheel is independent from the clock mechanism, and in the present instant is operated by a cam on the hub of the sulky through the intervention of the lever F^2 and the wire cord c^3. Every time the lever F strikes the cam on the wheel-hub the toothed wheel A is moved one tooth. One index-hand is, as before stated, connected to this toothed wheel and the other with the clock mechanism. Now, suppose, for the sake of convenience, that the horse's time is two minutes and forty seconds, that the index-hand attached to the toothed wheel A is rotated once in every mile, and that the index-hand attached to the clock-work rotates four times in two minutes and forty seconds. Now, when everything is in readiness to start, the lever P is moved by the driver's foot, which liberates the cam and starts the hands moving. If the horse travels at the rate of two minutes and forty seconds per mile, the two hands will move simultaneously. If the horse travels at a less rate of speed, the index-hand connected to the toothed wheel will fall behind the other index-hand, and if traveling at a greater rate of speed will pass the other index-hand, thereby enabling the driver to tell at a glance whether he is driving too slow or too fast. When the operator does not wish to use the apparatus he releases the lever D. This will cause the pin *i* to drop in the notch A′ of the toothed wheel A, and at the same time the other end of the bell-crank lever disengages the pawl F from the teeth of the ratchet-wheel. The slot in this toothed or ratchet wheel will cause the machine to stop at the end of a quarter of a mile, unless the driver wishes to time a half-mile or a full mile, which he can do by holding the starting-lever as the hands pass the quarters.

What I claim is—

1. In an apparatus for indicating the speed of horses, &c., the combination, with the ratchet-wheel A, provided with the notch A′, that is adapted to receive the pin *i*, said pin being attached to the bell-crank lever E, which is operated by the lever D, of a lever, F′, that is pivoted to the plate B, said lever having a pawl attached to it that engages with the teeth of the ratchet-wheel, substantially as and for the purpose set forth.

2. In a speed-indicator, the combination of the ratchet-wheel A, which is provided with the notch A′, with the lever F′, having a pawl, F, that engages with the teeth of the ratchet-wheel, the lever D, adapted to engage with the bell-crank lever E, said lever E being so constructed as to connect with the pawl F at one end, and at the other provided with a pin, *i*, said pin adapted to pass in the slot A′, and also engage with the cam I, all these parts combined with the clock mechanism, substantially as specified.

3. A speed-indicator stopping device consisting in the lever D and bell-crank lever E, said lever having the rod *i* attached to it, that is adapted to engage with the cam I, said cam being secured to the balance-staff for the purpose of stopping the wheel off the dead-center, substantially as and for the purpose set forth.

4. The combination, with an indicator having an index finger or pointer operated by clock mechanism, and an independent finger or pointer, of the lever F^2, operated by a cam or lug on the hub of a vehicle-wheel, and adapted by suitable intervening mechanism to impart an intermittent movement to the independent finger or pointer.

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

THADDEUS ACKLEY.

Witnesses:

MARSHALL WOODFORD,

C. G. HARRIS.