(No Model.) 3 Sheets—Sheet 1.

J. A. LAKIN & C. J. EMERSON, Jr.

CYCLOMETER.

No. 348,851. Patented Sept. 7, 1886.

Fig 1

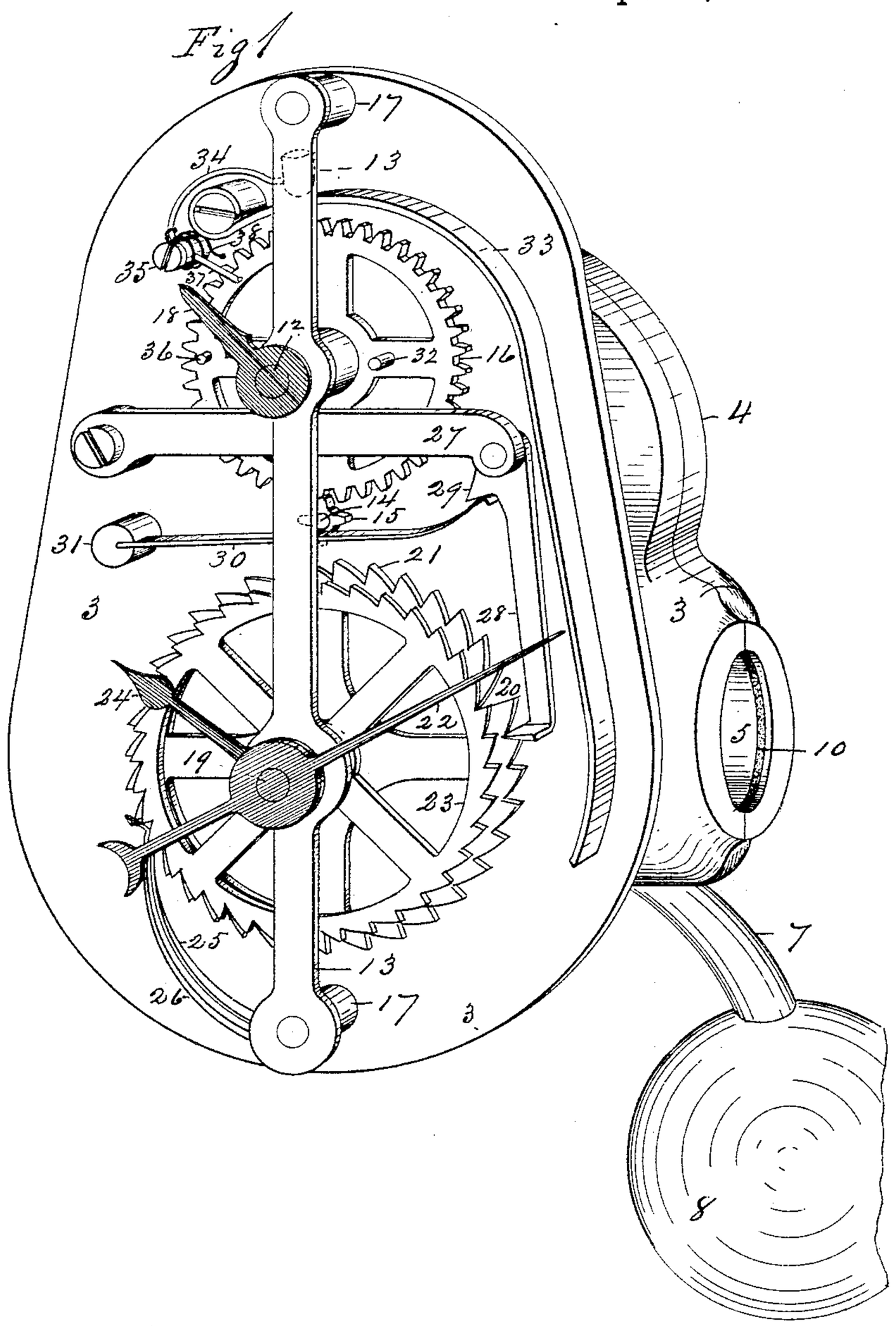

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Fig 2

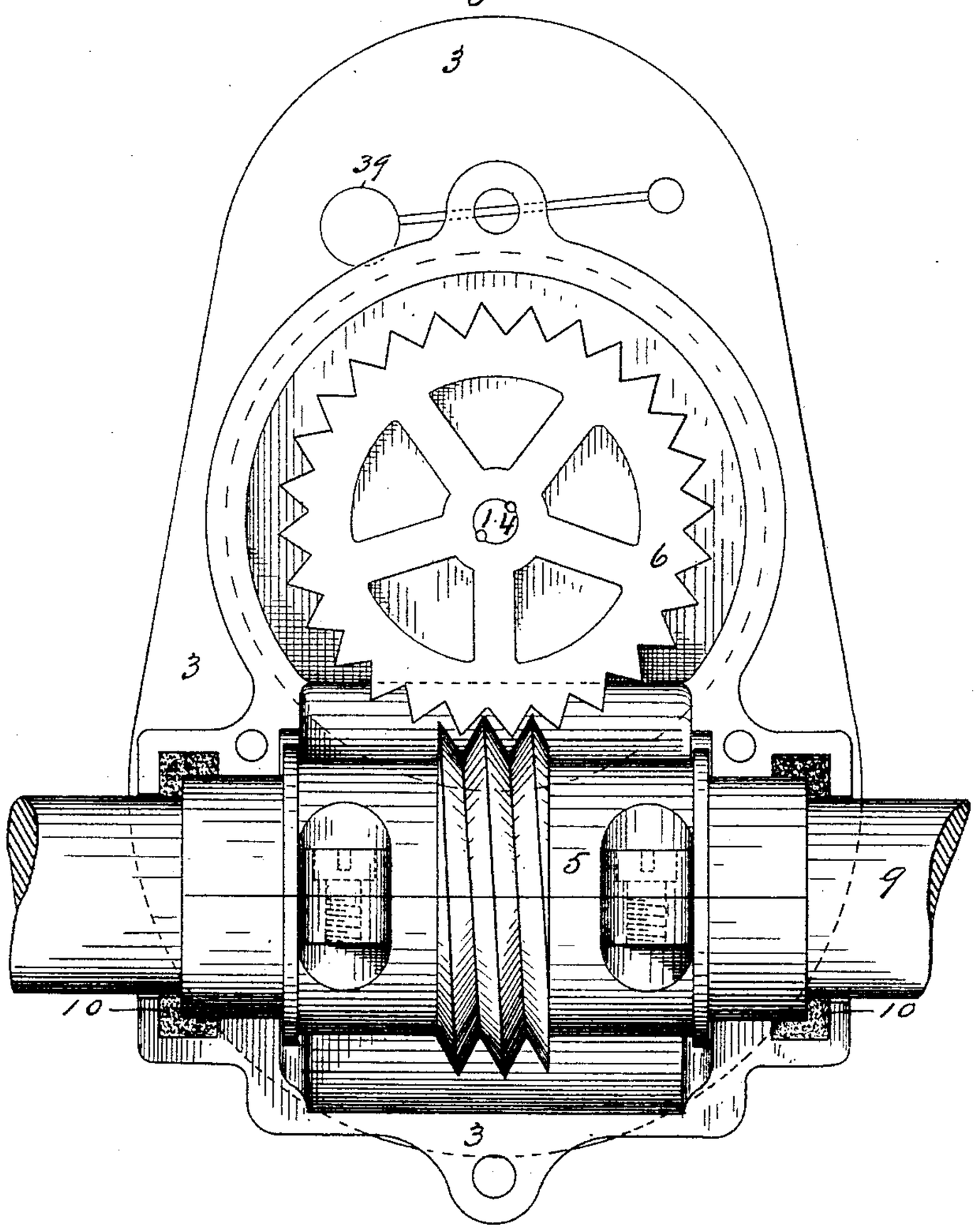

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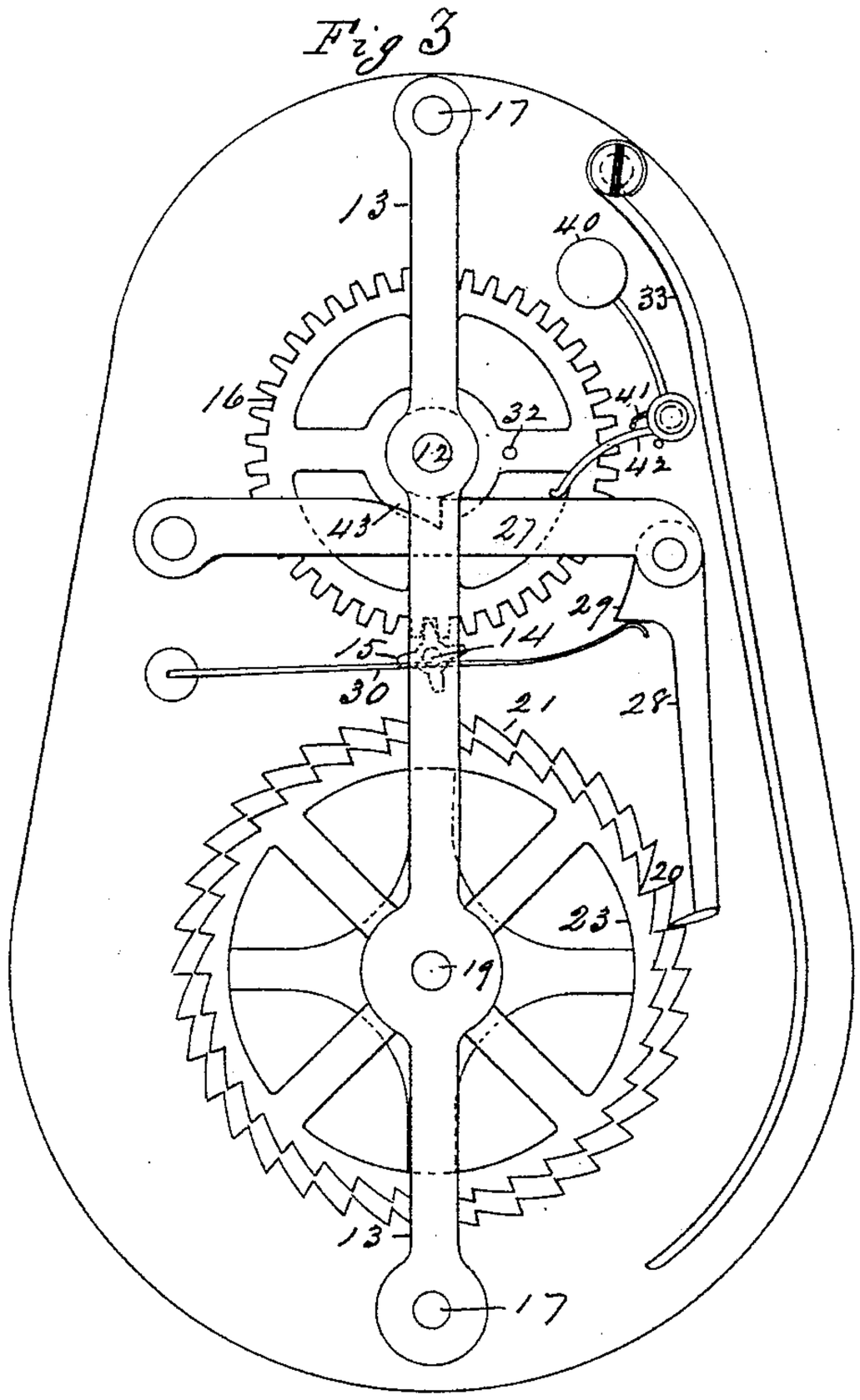
Fig 3



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UNITED STATES PATENT OFFICE.

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CYCLOMETER.

SPECIFICATION forming part of Letters Patent No. 348,851, dated September 7, 1886.

Application filed May 21, 1886. Serial No. 202,851. (No model.)

To all whom it may concern:

Be it known that we, JAMES A. LAKIN and CYRUS J. EMERSON, Jr., citizens of the United States, residing at Westfield, in the county of Hampden and State of Massachusetts, have invented new and useful Improvements in Cyclometers, of which the following is a specification.

This invention relates to improvements in cyclometers; and the invention consists in the peculiar arrangement and construction of the parts of the machine, as hereinafter fully described, and set forth in the claims.

In the drawings forming part of this specification, Figure 1 is a front perspective view of a cyclometer embodying our improvements, the dials being removed therefrom. Fig. 2 is a rear elevation, the rear part of the case and the balance-ball being removed, a portion of the shaft on which the cyclometer is secured being shown in this figure. Fig. 3 is a front elevation showing a portion of the mechanism of the machine and illustrating a modification of the mechanism whereby the bell is struck.

In the drawings, 3 is the main case or frame of the machine, and 4 is the rear portion of said case, the latter being secured to the former by suitable screws, and between the said two parts of the case are inclosed the worm-sleeve 5 and the worm-gear 6. (See Fig. 2.) To the lower part of the rear side of the main case part 3 is attached by an arm, 7, the balance-ball 8.

In Fig. 2 the shaft 9 represents a portion of the axle of a bicycle or other vehicle which rotates when the latter moves, and on which is clamped by suitable screws, as shown in Fig. 2, the worm-sleeve 5, so that the latter shall rotate with said shaft. The ends of the said worm-sleeve are adapted to turn in suitable bearings formed in the aforesaid two parts of the case when the latter are fastened together, as shown in Fig. 1, and between said sleeve-bearings and the outer ends of those portions of the case in which they are located are placed absorbent fibrous packings 10, to contain, if need be, a small portion of oil, and to prevent dust from entering the case of the instrument at those points.

The machine, as shown in the drawings, is considerably enlarged, to afford more convenient means of illustration, and a border-rim which in practice is fixed around the edge of the case 3, and having a glass front, is not shown in the drawings.

A shaft, 14, passes through the case 3, having a suitable bearing in the latter, and on its rear end is fixed the worm-gear 6, and on its front end is fixed the pinion 15, which engages with the one-mile gear-wheel 16. Said gear-wheel 16 is fixed on a shaft, 12, one end of which has a bearing in the case 3, and its opposite end is supported and rotates in a proper bearing in the bar 13, which is secured on the ends of two projecting studs, 17, which are fixed in the outer side of the case 3. The said gears 6 and 16 and the pinion 15 are so proportioned that the rotations of the axle 9, caused by the movement of the vehicle one mile, will cause the gear 16, on whose shaft 12 is the pointer 18, to be revolved once every mile. A shaft, 19, is located in suitable bearings in the case 3 and in the bar 13, on which is hung the ratchet-wheel 21, having thereon a long hub extending forward, on the end of which is secured the pointer 22. Said ratchet-wheel 21 has a deep notch, 20, between two of its teeth, as shown. A ratchet-wheel, 23, is also supported on shaft 19, but rotates on the aforesaid long hub on the ratchet-wheel 21, and has a hub extending through the bar 13, on which is secured the pointer 24. Two stop-springs, 25 and 26, are secured by one end to one of the studs 17, and their free ends spring against and are engaged with the peripheries of the ratchet-wheels 21 and 23, lying between the teeth of said wheels when the latter are at rest, and permitting the teeth of said wheels, one by one, to be moved under said springs, when the ends of the latter drop between the teeth and hold the wheels until they are moved again by the mechanism below described.

A lever, 27, is pivoted on the case 3, by one end, and extends under the bar 13 and outside of the gear 16, in a direction across said case, and to the free end of said lever is pivoted the pawl 28, having its lower end adapted to engage with the teeth of the ratchet-wheel 21, and, after a complete revolution of the latter, with a tooth of the ratchet-wheel 23. The

[redacted]

said pawl 28 has on one edge thereof, just below its pivot-point, a short arm, 29, with which a spring, 30, engages. One end of said spring 30 is fixed in a stud, 31, on the case 3, and its free end bears against the under side of said arm 29, acting to swing the free end of the lever 27 upward against the hub of the gear-wheel 16 and to swing the free end of the pawl toward and hold it against the periphery of the ratchet-wheel 21, but permitting the lower end of said pawl to vibrate sufficiently to properly engage with one tooth after another of the wheel 21 in the ordinary way. An intermittent vibratory motion is imparted to said lever 27 by the rotation of the gear-wheel 16, a pin, 32, projecting from the side of the latter striking said lever and swinging it toward said ratchet-wheel once in every revolution of said gear-wheel, the spring 30 swinging said lever back against the hub of wheel 16 after the pin 32 has passed off from said lever.

A sonorous metallic strip, 33, which serves as a gong, and in place of the ordinary bell which is generally used on machines of this kind to be struck at the end of every mile traveled, is secured by one end on the inner side of the case 3 to a suitable stud or screw, its free end extending within the case a suitable distance, as shown in Figs. 1 and 3. The said gong is struck by a hammer, 34, hung on a stud, 35, on case 3, near the periphery of the wheel 16, and a pin, 36, projecting from the side of the latter, strikes an arm 37, attached to said hammer, and lifting the latter lets it fall against said gong, actuated by a spring, 38, one end of which is attached to case 3 and the other to the hammer, as shown in Fig. 1. When it is desired to employ the bell in place of said gong 33, said bell may be located on the rear side of case 3, in the position indicated by dotted lines in Fig. 2 on that part of the case 3 in which the worm-gear 6 is located, and said bell may be struck by a hammer, 39, having a stud thereon passing through the case 3 and having an engagement with the wheel 16, in substantially the manner above described relative to the hammer 34.

Fig. 3 illustrates a modified construction of the mechanism above described, whereby the gong 33 is struck at stated intervals, for the purpose set forth. In the said Fig. 3, the hammer 40 of that figure is hung upon a stud and actuated in one direction by a spring, 41, in substantially the same manner as is the hammer 34 of Fig 1; but instead of depending upon the force of a spring to operate said hammer 40, to cause it to strike the gong, an arm, 42, connected with hammer 40, engages directly with one side of lever 27, and by the action of the latter, as below described, hammer 40 is made to strike the gong, and the spring 41 retracts said hammer.

The lever 27 is provided on its side next to the hub of wheel 16 with a notch, 43, and when the pin 32 in said wheel swings against the side of said lever the latter and the pawl 28 are swung downward against the force of the spring 30, and the ratchet-wheels 21 and 23 are thereby operated, as above described; but when the pin 32 swings into the notch 43 in said lever the latter is thrown by spring 30 quickly against the arm 42 of the hammer 40, causing the latter to strike the gong. The said modified construction of the gong-striking devices provides for operating the hammer by means of the spring 30 through the intermediary of the lever 27, instead of making a connection directly with the gear-wheel 16, as in Fig. 1.

The operation of our improvements is as follows: When the worm-sleeve 5 is clamped tightly on the axle 9, as above described, and the case parts of the machine are secured on said sleeve, said parts have a free vibratory motion on the sleeve, and are caused by the counterbalancing-weight 8 to be held with the upper or dial side of the machine in such position that a person sitting above the cyclometer can look downward and watch the movement of the hands or pointers thereof. The rotation of the axle 9 causes the mile-wheel 16 to be rotated, and a suitable dial under the pointer 18, carried by said wheel, indicates fractions of a mile during the rotation of said pointer, and at the completion of a mile the pin 32 on said mile-wheel strikes the lever 27, swinging the latter and the pawl 28, and causing the latter, whose lower end is in engagement with the teeth of the ratchet-wheel 21, to turn said ratchet-wheel one tooth, and the pointer 22, connected with said wheel 21, indicates on a suitable dial under the latter a corresponding movement or one mile, and at each complete revolution of the ratchet-wheel 21 the end of pawl 28 drops into the deep notch 20 in wheel 23 and moves the latter the extent of one tooth thereof, and the pointer 24, attached to the last-named wheel, indicates on a suitable dial thereunder the movement thereof, or the entire distance registered by a full revolution of the ratchet-wheel 21. In practice the ratchet-wheel 21 is constructed to be rotated once to every fifty revolutions of the gear-wheel 16, and the ratchet-wheel 23 to be rotated once to every fifty revolutions of the ratchet-wheel 21, or one tooth to each revolution of the latter. During the rotation of the gear-wheel 16 the gong and its striking devices are operated upon to cause a blow of the hammer to be struck at each revolution of the mile-wheel, as above described.

What we claim as our invention is—

1. A cyclometer consisting of the case parts 3 and 4, having a chamber therebetween to receive a worm-sleeve, a worm-sleeve divided longitudinally into two parts and secured together by suitable screws, whereby it is clamped onto the axle of a vehicle, a shaft extending through one of said case parts, having on one end a worm-gear engaging with said worm-sleeve, and on the other end a pinion, a mile-wheel engaging with the latter, a lever pivoted at right angles to the axis of said mile-wheel and engaged by the latter once in

each revolution thereof to vibrate said lever, a pawl pivoted to the free end of the latter, a spring engaging with an arm on said pawl, whereby the latter is swung on its pivot and said lever is swung toward the axis of said mile-wheel, combined with the ratchet-wheels 21 and 23, with which said pawl engages, substantially as set forth.

2. In combination, the ratchet-wheel 21, the vibratory lever 27, the pawl 28, pivoted to the latter and having the arm 29, the spring 30, engaging with the latter to swing said pawl against said ratchet-wheel and said lever from the latter, and the mile-wheel 16, having an engagement with said lever once in every revolution, substantially as set forth.

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