

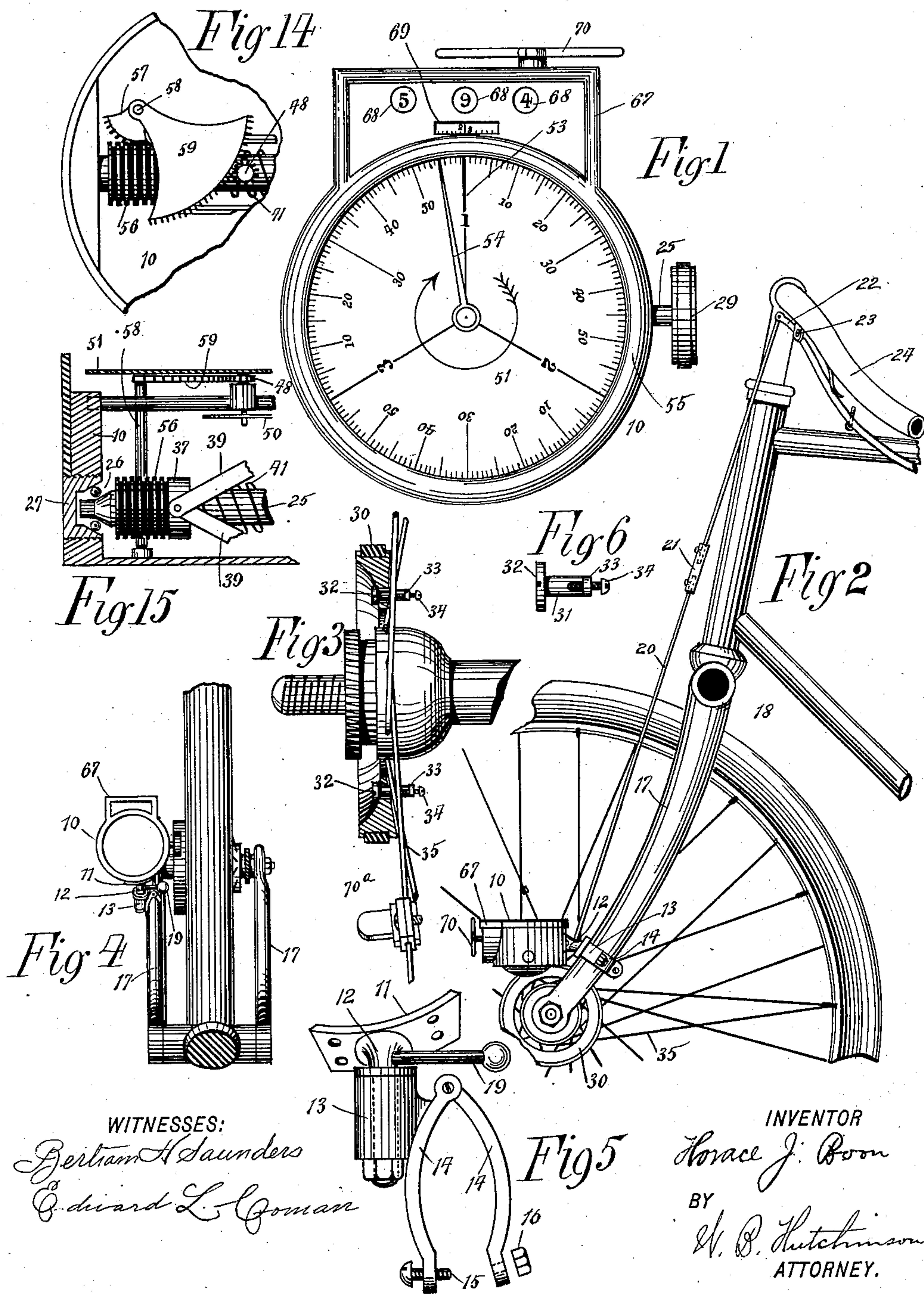
(No Model.)

2 Sheets—Sheet 1.

H. J. BOON.
SPEED MEASURE FOR VEHICLES.

No. 567,260.

Patented Sept. 8, 1896.



WITNESSES:

Bertram H. Saunders
Edward L. Goman

INVENTOR

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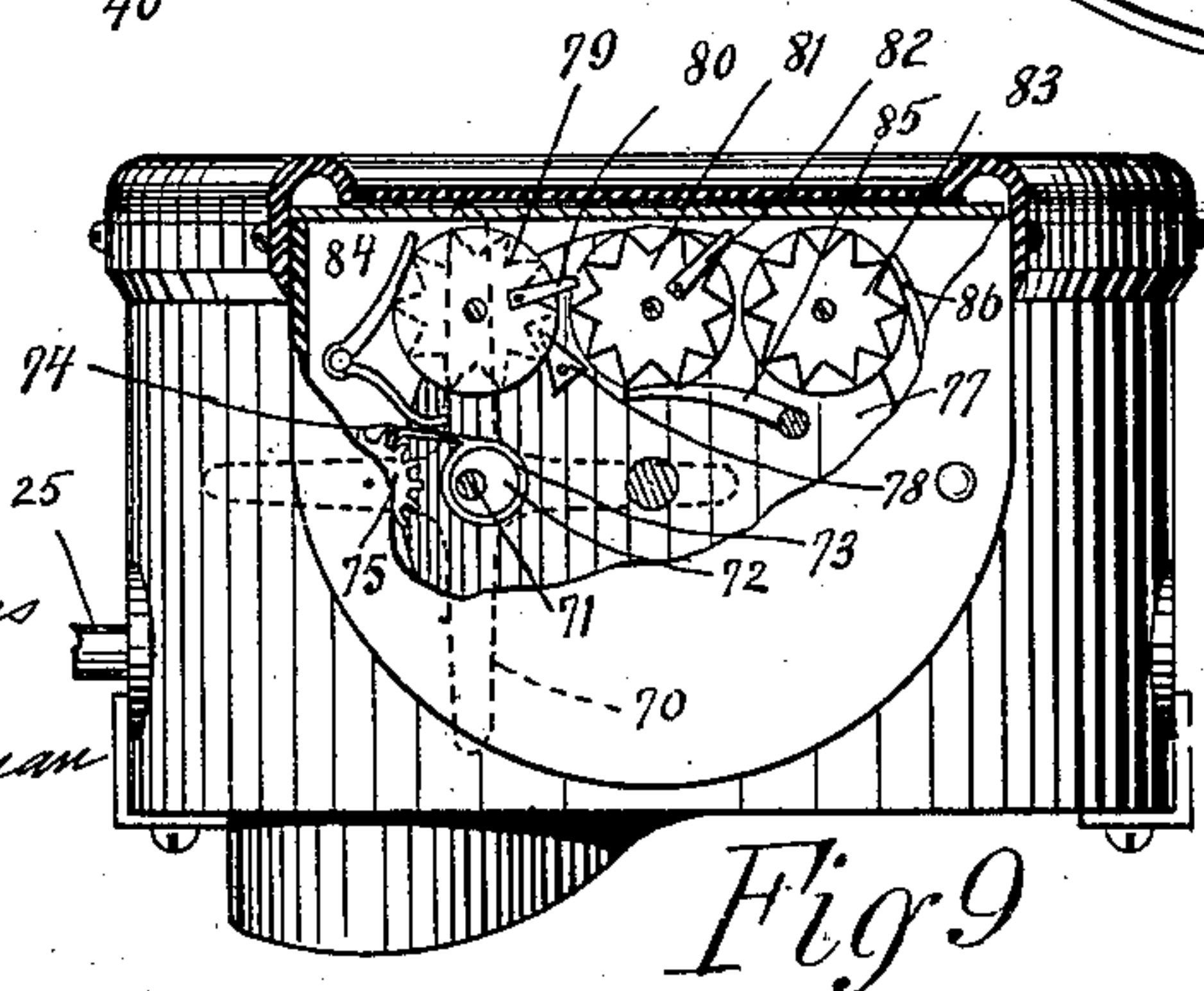
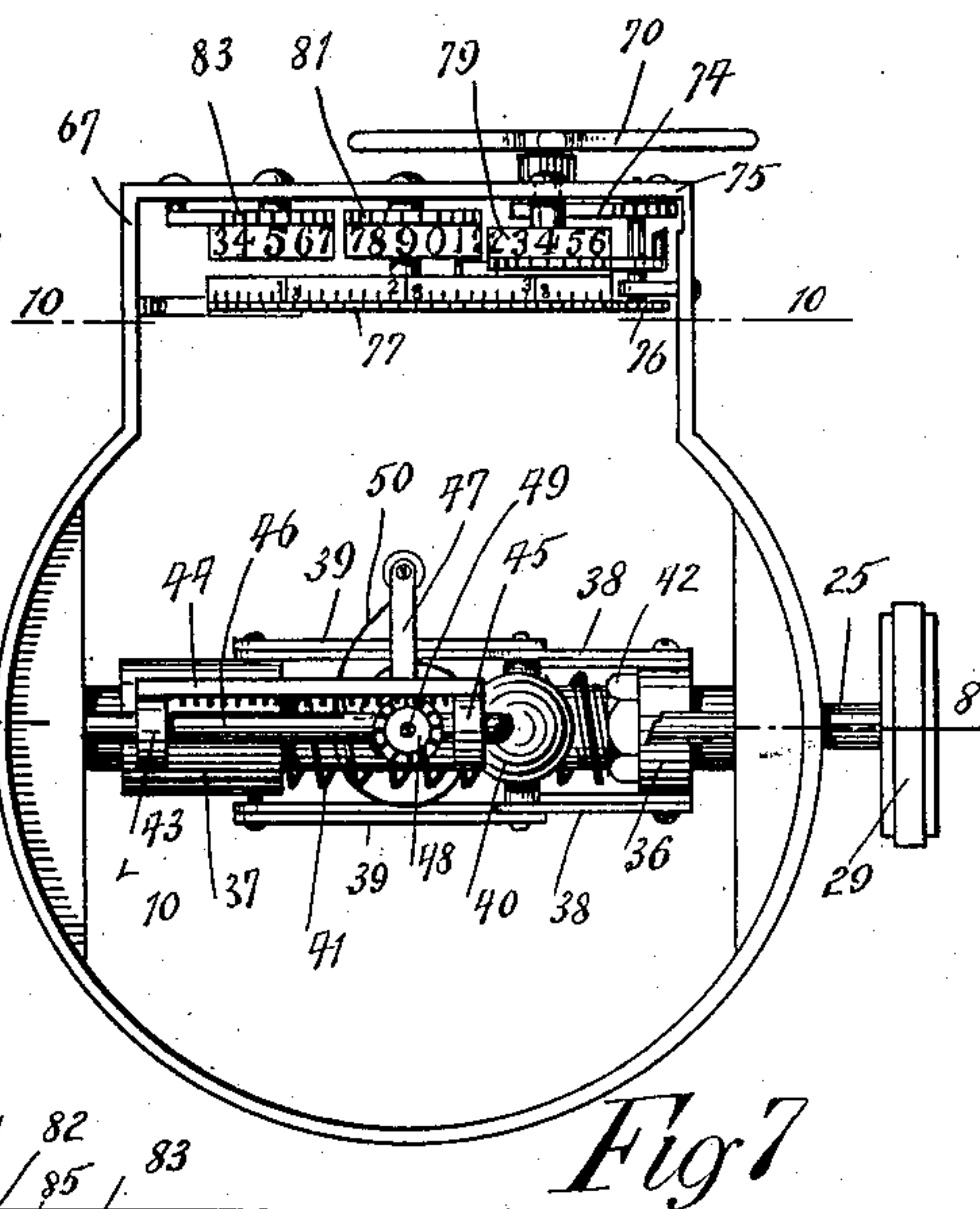
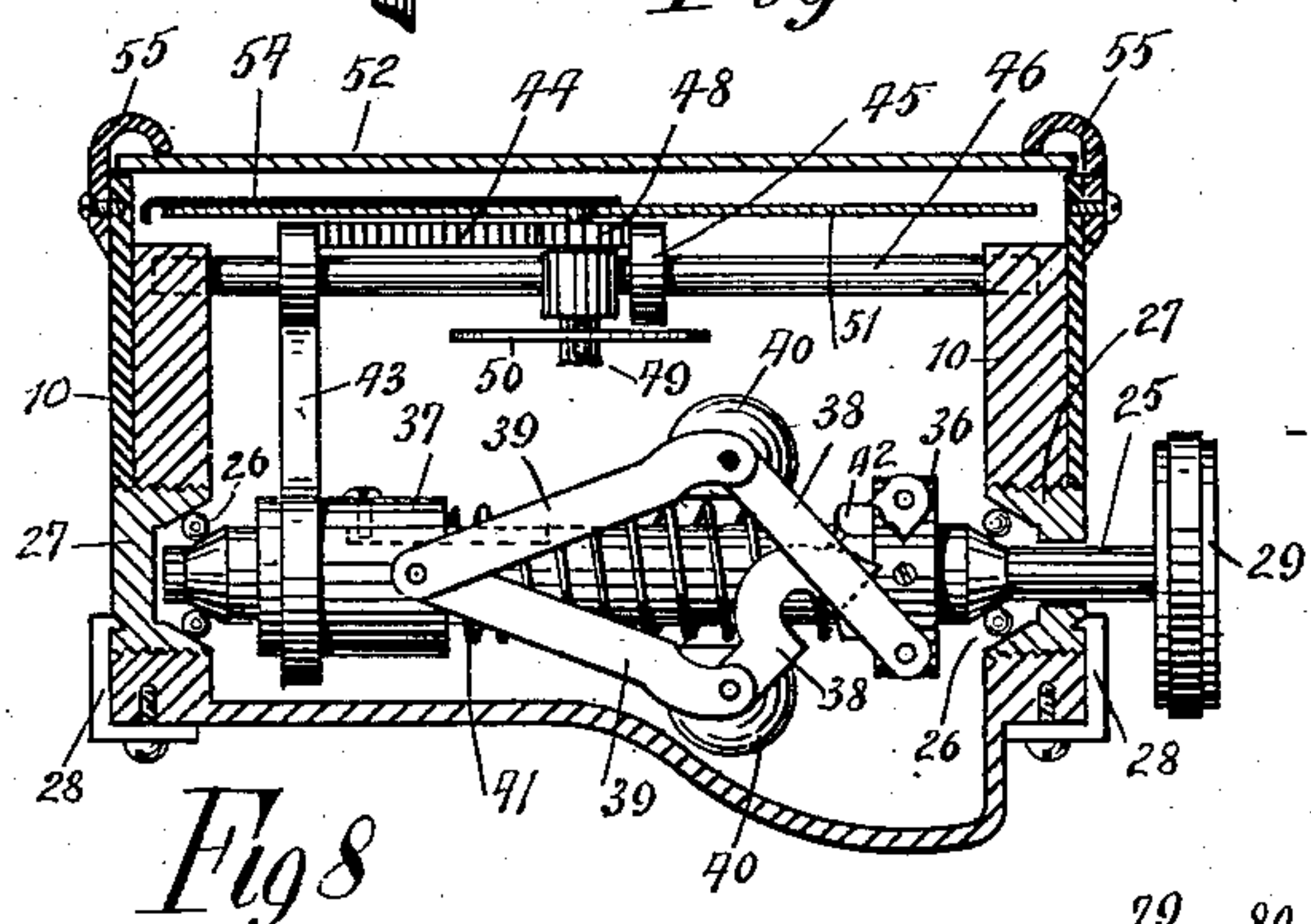
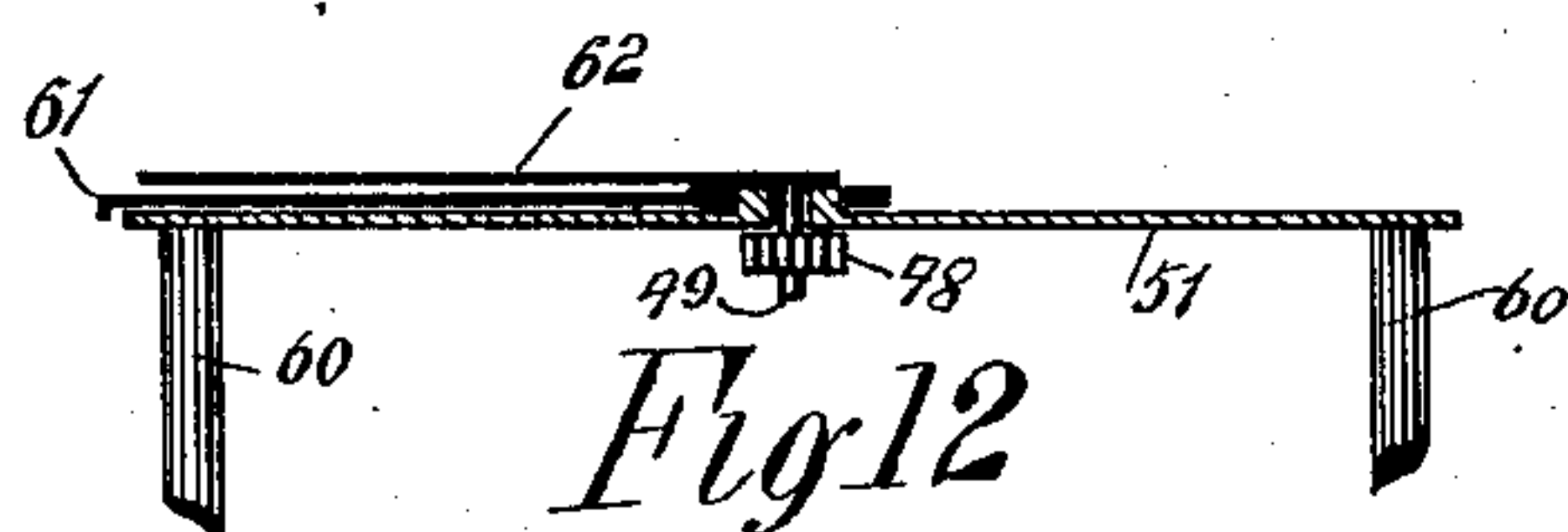
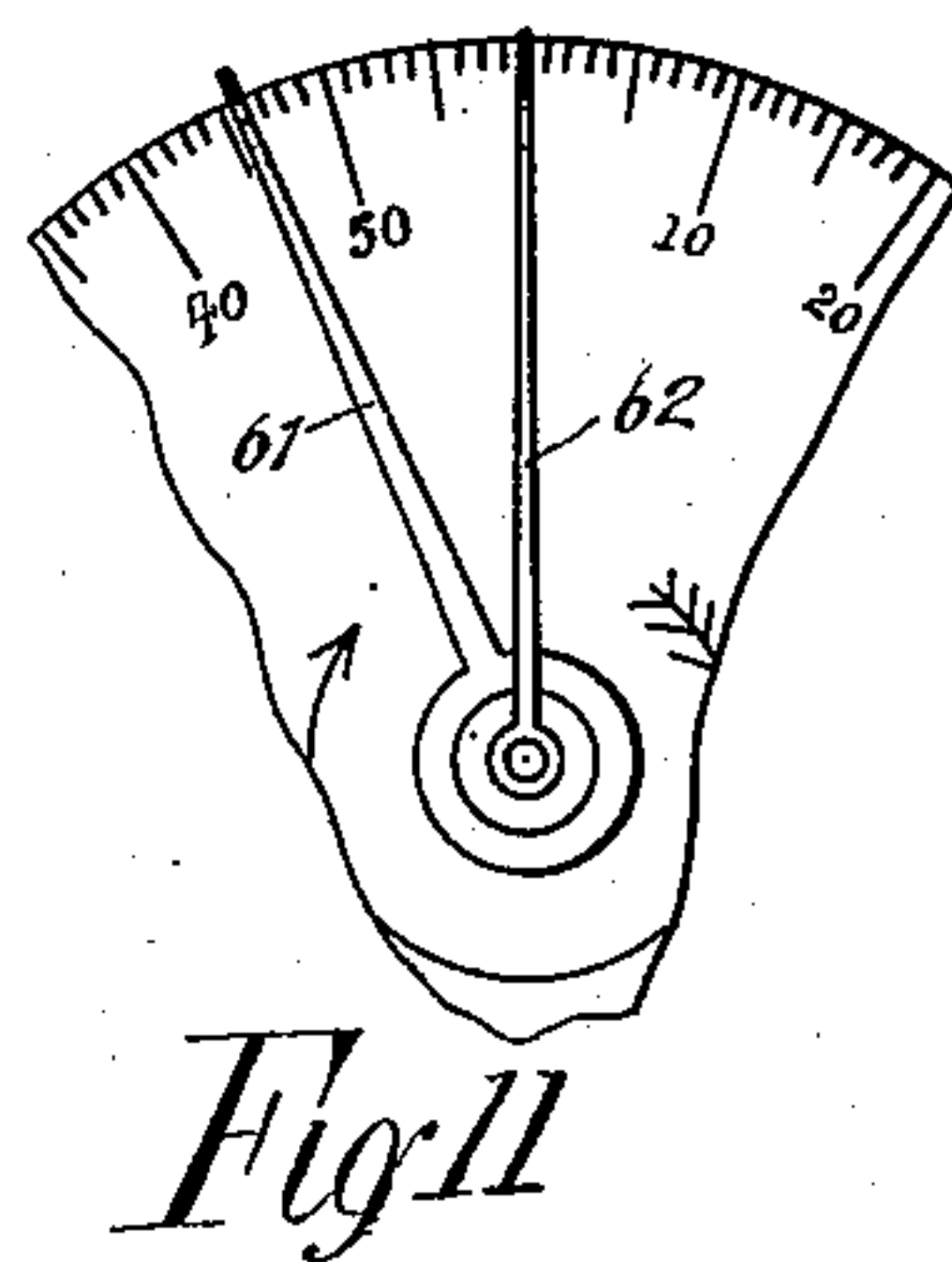
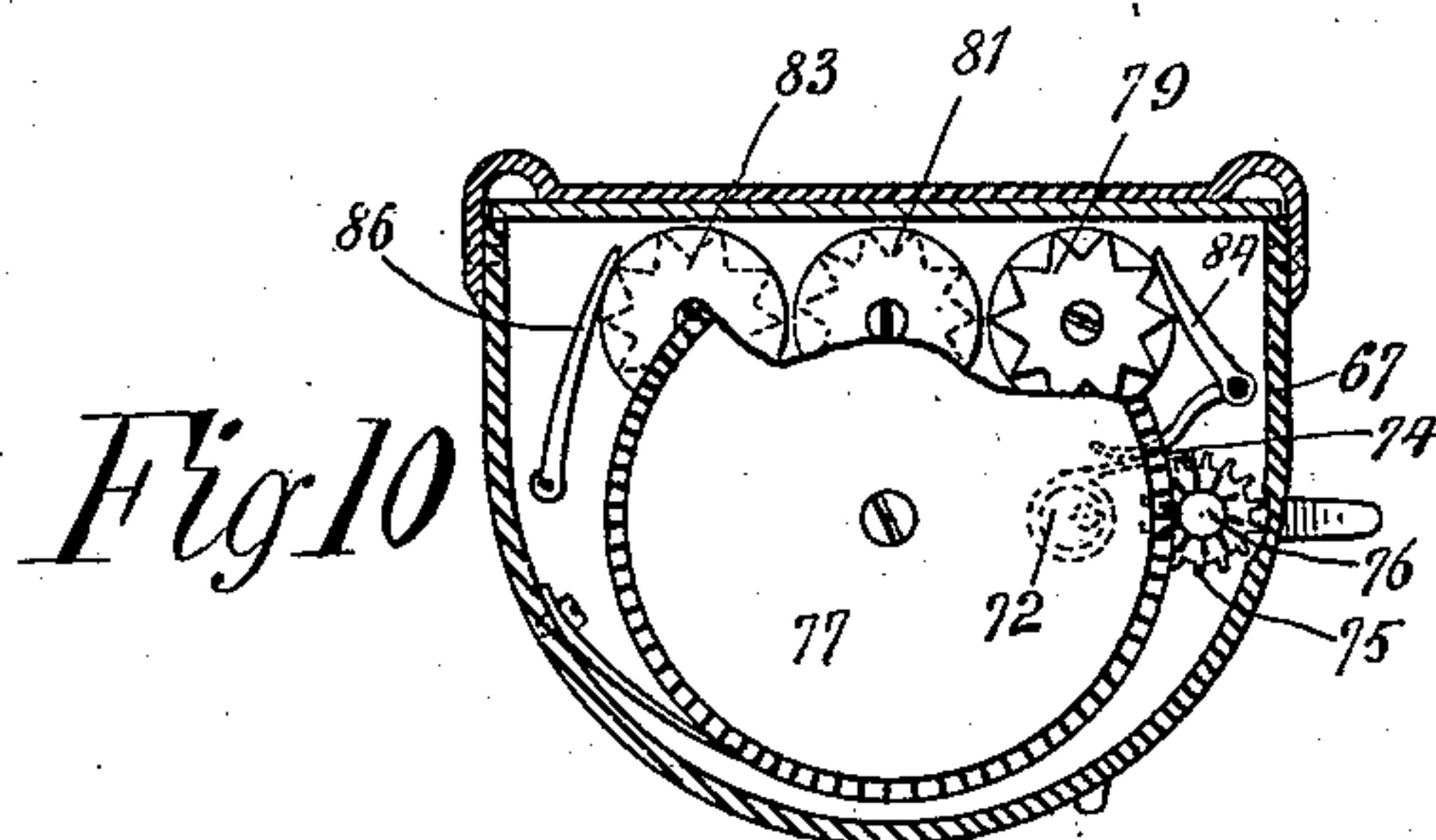
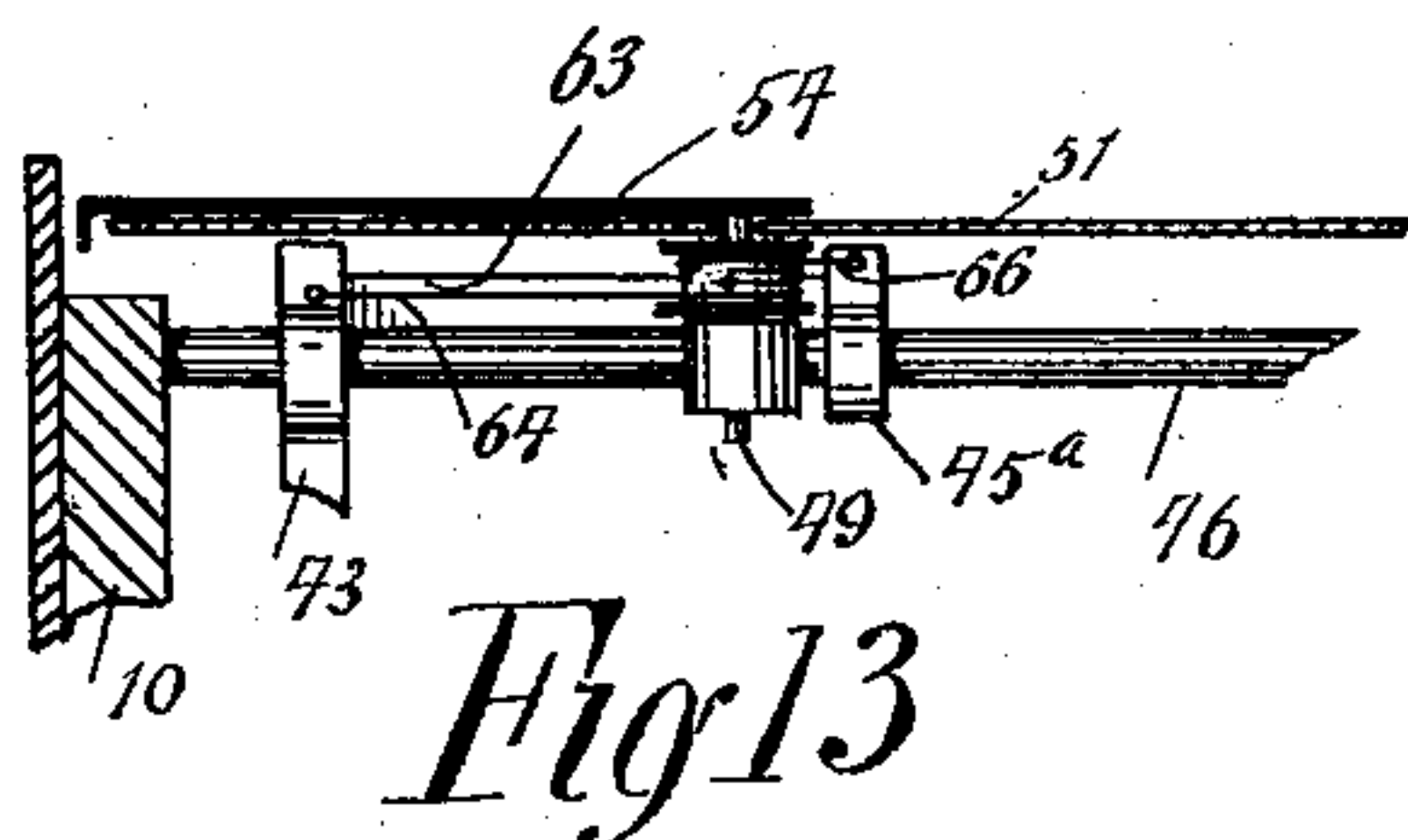
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2 Sheets—Sheet 2.

H. J. BOON.
SPEED MEASURE FOR VEHICLES.

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UNITED STATES PATENT OFFICE.

HORACE JOHN BOON, OF CALUMET, MICHIGAN.

SPEED-MEASURE FOR VEHICLES.

SPECIFICATION forming part of Letters Patent No. 567,260, dated September 8, 1896.

Application filed August 21, 1895. Serial No. 559,976. (No model.)

To all whom it may concern:

Be it known that I, HORACE JOHN BOON, of Calumet, in the county of Houghton and State of Michigan, have invented certain new and useful Improvements in Speed-Indicators and Cyclometers, of which the following is a full, clear, and exact description.

My invention relates to improvements in that class of devices which are applied to moving parts, particularly the wheels, of vehicles, and more especially bicycles, to ascertain the speed of said vehicle and the number of miles traveled.

The object of my invention is to produce a simple and durable device which may be conveniently applied to a vehicle, especially a bicycle, and by which a person may ascertain at a glance the speed at which he is traveling and the number of miles he has traveled; also to provide means for easily throwing the device into and out of gear without dismounting, and, further, to produce a device which shall work easily and not interfere perceptibly with the easy running of the vehicle.

To these ends my invention consists of certain features of construction and combinations of parts, which will be hereinafter described and claimed.

Reference is to be had to the accompanying drawings, forming a part of this specification, in which similar figures refer to corresponding parts throughout the several views.

Figure 1 is a detail plan view of the device embodying my invention. Fig. 2 is a side elevation of the same, on a reduced scale, as applied to a bicycle. Fig. 3 is a detail cross-section of the driving-wheel, which is secured to the bicycle-wheel. Fig. 4 is a detail sectional plan showing the application of the device to a bicycle. Fig. 5 is an enlarged detail plan view of the clamping and supporting device for attaching the instrument to a bicycle. Fig. 6 is a detail view of one of the clamping-bolts used in fastening the driving-wheel to a bicycle-wheel. Fig. 7 is a plan view of the device with the dial removed. Fig. 8 is a vertical section on the line 8 8 of Fig. 7. Fig. 9 is a broken detail sectional elevation showing the arrangement of the number-wheels in the cyclometer. Fig. 10 is a cross-section on the line 10 10 of Fig. 7 and shows the internal arrangement of the cy-

clometer. Fig. 11 is a broken detail plan view of a modified form of dial arrangement for the speed-indicator. Fig. 12 is a sectional elevation of the mechanism shown in Fig. 11. Fig. 13 is a detail sectional view of a modified means of moving the dial of the speed-indicator. Fig. 14 is a broken plan view of another modification of the mechanism for moving the speed-indicator dial, and Fig. 15 is a detail sectional elevation of the construction shown in Fig. 14.

The device is provided with a suitable containing-case 10, which has secured to it a bracket-plate 11, this being carried by an arm 12, which turns in a socket or bearing-sleeve 13 on one of the jaws 14, which jaws are oppositely arranged, as shown in Fig. 5, and are adapted by means of the bolt 15 and nut 16 to be clamped to the fork 17 of the bicycle 18; but it will be understood that the case 10 may be fastened to the bicycle-fork in any other convenient manner without departing from the principle of my invention.

The arm 12 has projecting from the side next the bicycle-wheel a rod 19, which connects by an ordinary ball-joint (not shown in detail) with a rod 20, which has the ordinary adjusting-coupling 21 (see Fig. 2) and leads to a hand-lever 22, which is fulcrumed, as shown at 23, on the handle-bar 24 of the bicycle. It will thus be seen that by tilting the hand-lever 22 the rod 20 may be pulled and the arm 12 turned so as to tilt the case 10 and throw the speed-indicator out of gear, as will more clearly appear from the description to follow.

The speed-indicator is provided with a main shaft 25, which is journaled in ball-bearings 26, these having removable cups 27, which, as illustrated, are prevented from getting loose by the fastening-clips 28, (see Fig. 8,) but the cups may be held in any convenient manner.

The shaft 25 has secured to its inner end a friction-wheel 29, which is turned by engaging the driving friction-wheel 30, this being secured to the bicycle-wheel by means of clamping-bolts 31, (see Fig. 3,) and it will thus be seen that when the case 10 is tilted, as already described, the wheel 29 is lifted out of engagement with the wheel 30, and so the indicator is not actuated. It will of course be

understood that instead of friction-wheels 29 and 30 gear-wheels of any kind may be substituted.

The clamping-bolts 31 have large heads 32, which fit against the wheel 30, and the inner ends of the bolts are provided with flanges 33, through which extend screws 34, which are adapted to impinge on the spokes 35 of the bicycle-wheel at the points where the spokes cross, and thus by tightening the screws 34 the wheel 30 is held securely in place.

The driving-shaft 25 of the speed-indicator is provided with a fixed collar 36 and with a sliding sleeve 37, the two being connected by oppositely-arranged pairs of arms 38 and 39, which are pivoted, respectively, to the collar and sleeve and which are also pivoted to weight-balls 40. The arms 38 are pivoted off the center of the shaft 25, the ends of the arms which are fastened to the collar being also on opposite sides of the shaft from the balls 40, and thus the balls are given a comparatively large range and are sensitive to the centrifugal motion of the shaft. The balls are flattened on their inner sides, so that they may lie close to the shaft, and when they fly outward at the impulse of the centrifugal motion of the shaft they draw the sleeve 37 toward the collar 36 against the tension of the spring 41 and actuate the indicator, as hereinafter described. The spring 41 encircles the shaft 25 and presses against the sleeve 37, the tension of the sleeve being adjusted by a nut 42 on the shaft. Journaled on and carried by the sleeve 37 is an arm 43, which extends upward and is secured to a rack 44, which is parallel with the shaft 25, and which at one end is secured to a lug 45, the said lug and the upper end of the arm 43 sliding on a guide-rod 46, which extends across the upper part of the case 10. The rack will thus slide back and forth with the sleeve 37. The rack 44 engages and turns a pinion 48 on a vertical shaft or spindle 49, which is suitably supported and is provided with a balance-spring 50, one end being secured to the shaft and the other to an adjacent support 47.

The upper end of the spindle 49 is secured to a dial 51, which may be graduated in any approved manner, and which is covered by a glass 52, having a mark 53 thereon, so that as the dial turns beneath the glass the speed will be indicated by the deflection of the graduation-marks from the mark 53.

The dial carries a hand 54, which may be adjusted at any desired point and which, when deflected from the mark 53, may be easily seen and thus save the necessity of observing the figures on the dial.

The glass is preferably held over the dial by means of the clamping clip or ring 55, which is secured to the case 10 and overlaps the glass, and this arrangement provides for the easy renewing of the glass in case it is broken. Any other suitable means, however, may be used for fastening the glass.

It will be seen from the foregoing descrip-

tion that when the bicycle-wheel revolves the motion will be transmitted to the shaft 25 by means of the wheels 30 and 29, and as the shaft 25 revolves the balls 40 fly out in proportion to the speed of the shaft, thus sliding the sleeve 37, moving the rack 44, and turning the dial 51.

Instead of transmitting the motion to the dial by mechanism just described, the sleeve 37 may be grooved circumferentially, as shown at 56 in Figs. 14 and 15, and the grooved part of the sleeve made to engage a segmental rack 57 on a vertical shaft 58, which carries a second rack 59, meshing with the pinion 48 above described, and thus the reciprocation of the sleeve rocks the shaft 58 and moves the pinion 48 and the dial mechanism connected therewith.

In connection with the spindle 49 and the actuating mechanism already described the dial may be made stationary on supports or studs 60 (see Fig. 12) or other supports and two hands 61 and 62 used, one being stationary and the other movable, as already described, and the speed indicated by the separation of the hands. This construction is shown clearly in Figs. 11 and 12.

Another modified means of actuating the dial mechanism is shown in Fig. 13, where a lug 45^a slides on the rod 63 with the arm 43, and the sliding of the lug and arm actuates a drum 65, secured to the spindle 49, which carries the dial, this drum being turned by the cords 64 and 66, which are oppositely wound on the drum and connected, respectively, with the arm 43 and lug 45^a.

The form of the containing-case is not particularly essential, but is preferably as shown in Fig. 1, where the case is provided with an extension 57, containing the cyclometer mechanism and provided with sight-holes 68, through which the figures of the number-wheels may be seen and a sight-slot 69 for the fractions of miles.

The cyclometer is provided with a common spur-wheel 70, (see Figs. 1 and 9,) which is turned by a striking-trip 70^a on the wheel of the bicycle, and this trip may be of any usual kind.

The spur-wheel is secured to the shaft 71, which carries an eccentric 72, (see Fig. 9,) on which is a strap 73, which has a pawl 74, engaging a ratchet-wheel 75, which is journaled adjacent to the shaft, as shown best in Fig. 7, and the ratchet-wheel carries a pinion 76, which engages the teeth of the large-number wheel 77, this being marked to indicate the fractions of the mile and the figures on it turning beneath the sight-slot 69. The wheel 77 is provided on one side (see Fig. 9) with a tooth of projection 78, which at each revolution of the wheel 77 engages one of the teeth of the units-number wheel 79, which turns beneath the units sight-hole 68 and has the usual arrangement of numbers or digits thereon. The wheel 79 is provided with a lug or projection 80, which at

every revolution of the wheel engages and turns the tens-number wheel 81, and this is provided with a lug or projection 82, which at every revolution of the tens-wheel engages 5 and turns the hundreds-wheel 83, the wheels being arranged beneath the respective sight-holes 68. The adjacent wheels are arranged in a common manner, and they may be differently arranged without affecting the principle of my invention. The wheels 79, 81, 10 and 83 are prevented from turning back by ordinary detents 84, 85, and 86. (See Fig. 9.)

It will be seen from the above description that at every revolution of the bicycle-wheel 15 the spur-wheel 70 will be partly turned and the motion transmitted to the wheel 77 and the number-wheels 79, 81, and 83 in the manner already described, and it will be further noticed that the rider may without difficulty 20 look down upon the instrument and see how many miles he has traveled and also observe the rate of speed at which he is traveling.

I have shown and described a form of cyclometer which can be combined to advantage 25 with the speed-indicator; but I do not claim the cyclometer as a part of this invention.

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

30 1. The combination with the bicycle, of the speed-indicator pivotally supported on the bicycle-frame, an operative driving connec-

tion between the speed-indicator and a wheel of the bicycle, and a lever mechanism for tipping the indicator bodily and so throwing it 35 out of gear, substantially as described.

2. A device of the kind described, comprising an inclosing case adapted to be fastened to a supporting-frame, a main shaft journaled in the case, a driving-wheel on the 40 main shaft, a fixed collar on the main shaft, a sliding sleeve on said shaft, oppositely-arranged pairs of cross-arms pivoted to the fixed collar and to the sliding sleeve, said arms lying off the longitudinal center of the 45 shaft, weight-balls carried by the arms at the points where they are pivoted together, an arm secured to the sliding sleeve, a rack carried by the arm, a dial mechanism, and a 50 direct gear connection between the dial mechanism and the rack, substantially as described.

3. In an apparatus of the kind described, the combination with the bicycle and the speed-indicator, of a pair of jaws to clamp 55 the steering-fork, a bracket-arm carrying the indicator and journaled on one of the jaws, and a lever mechanism for tilting the bracket-arm and indicator, substantially as described.

HORACE JOHN BOON.

Witnesses:

HARRY KING,
JAMES SOWDEN.