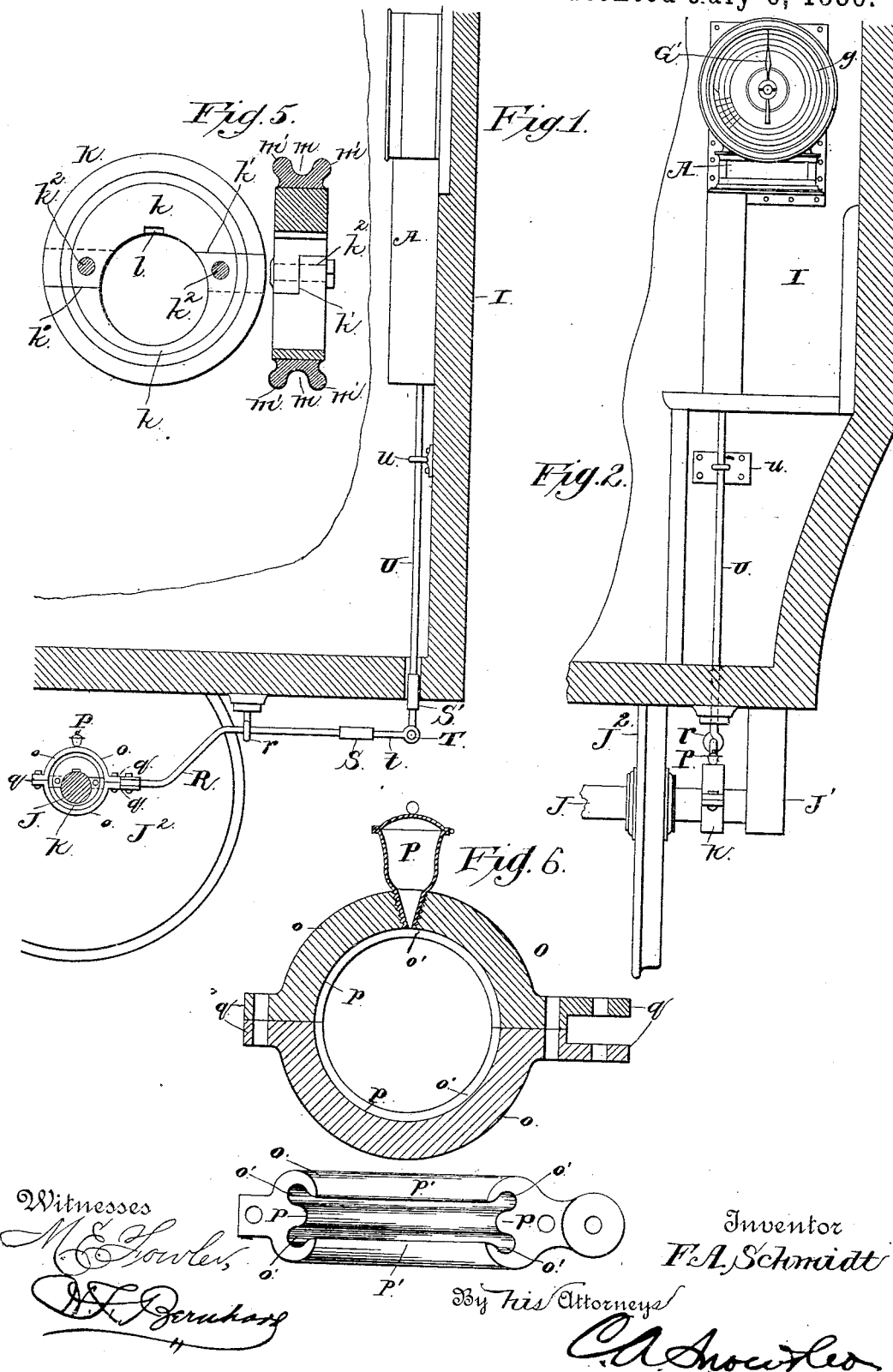


F. A. SCHMIDT.
AUTOMATIC SPEED AND STATION INDICATOR.

No. 344,993.

Patented July 6, 1886.



Witnesses
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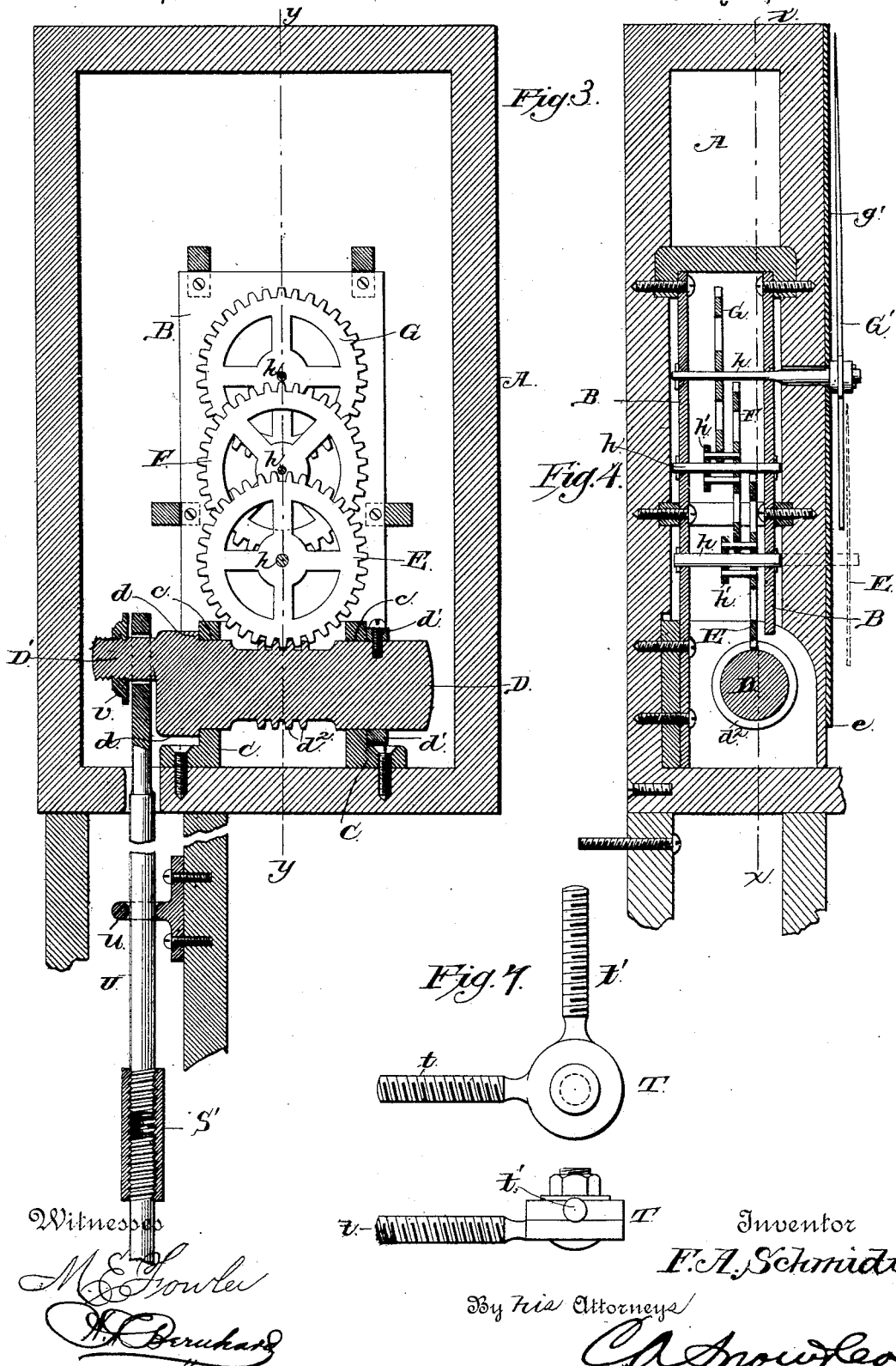
By His Attorneys

C. A. Fowler

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UNITED STATES PATENT OFFICE.

FRED AUG. SCHMIDT, OF MINNEAPOLIS, MINNESOTA.

AUTOMATIC SPEED AND STATION INDICATOR.

SPECIFICATION forming part of Letters Patent No. 344,993, dated July 6, 1886.

Application filed February 13, 1886. Serial No. 191,909. (No model.)

To all whom it may concern:

Be it known that I, FRED AUG. SCHMIDT, a citizen of the United States, residing at Minneapolis, in the county of Hennepin and State of Minnesota, have invented a new and useful Improvement in Automatic Street or Station and Speed Indicators, of which the following is a specification, reference being had to the accompanying drawings.

My invention relates to improvements in automatic street or station and speed indicators; and it consists of the peculiar and novel construction and combination of parts, substantially as hereinafter fully set forth, and specifically pointed out in the claims.

The objects of my invention are to provide a device of the class named which can be applied to street or other railway cars to automatically indicate the name or number of the streets in a town or city which the car is approaching or passing by, or the name of a station or city which a steam-railway car is approaching or passing; to provide means whereby the speed of a train or car can be ascertained or reckoned; to provide means whereby the device can be readily applied to and disconnected from a car and the axle thereof, and to provide a device which shall be simple, strong, and durable in construction, thoroughly effective and reliable in operation, and comparatively cheap of manufacture.

In the accompanying drawings, Figure 1 is a vertical sectional view taken through the longitudinal axis of a street or horse railway car, showing my improved apparatus in side elevation. Fig. 2 is a similar sectional view through a car of the same class and taken at right angles to Fig. 1, showing my invention in front elevation. Fig. 3 is a vertical sectional view through the indicator on the line *xx* of Fig. 4. Fig. 4 is a similar view on the line *yy* of Fig. 3. Figs. 5, 6, and 7 are enlarged detail views of parts of my improvements.

Referring to the drawings, in which like letters of reference indicate corresponding parts in all the figures, A designates the inclosing case or shell of my improved indicator, that is adapted to be applied to a horse or steam railway car and at any point within the body thereof. In the drawings I have shown

the indicator located at one end of a street-railway car; but it is obvious that it can be located or supported at any other desirable point.

The inclosing-case is preferably rectangular in form, and is provided with vertically-disposed supporting plates or standards B, that are suitably secured to the inclosing-walls of the case by screws or bolts. Near its lower end the inclosing-case is provided with vertically-disposed parallel bearings C, which are provided with angular feet having perforations for the passage of screws or bolts, to secure the bearings to the case. The bearings are arranged parallel and at some distance apart, and they are each provided with an opening, *c*, in which openings are journaled a horizontally-disposed cylinder or roller, D. This roller or cylinder is provided at one end with an annular flange or enlargement, *d*, that bears against one of the outer faces of one of the bearings C, to prevent longitudinal play of the cylinder or roller in one direction, and at its other end the cylinder has a removable ring, *d'*, that is rigidly held thereon and bears against the outer vertical face of the other bearing, to prevent movement of the cylinder in the other direction, while at the same time it permits the cylinder to be removed from the bearings when it is desired to repair the same.

Between the bearings C the cylinder or roller has a worm-gear, *d''*, on its periphery, and at one of its ends it is further provided with a crank-pin, D', for causing the cylinder to be rotated by motion transmitted from one of the axles of a car, suitable intermediate mechanism being provided for the latter purpose, which will be fully described hereinafter.

E, F, and G designate gear-wheels, which are geared together and rotated by motion from the revoluble worm cylinder or shaft, the gear-wheels being arranged one above the other. Each gear-wheel is rigidly affixed on a shaft, *h*, that is journaled at its ends in the vertically-disposed parallel supporting plates or standards B, and each shaft *h*, except the upper one, carries a fixed pinion, *h'*.

The gear-wheel E meshes with the teeth formed on the rotating shaft or cylinder D, the gear-wheel F meshes with the pinion on

the shaft of the wheel E, and the gear-wheel G in turn meshes with the pinion on the shaft of the wheel F; and when the worm shaft or cylinder D is rotated by motion from the axle 5 the entire train of gearing above described is rotated for the purpose of indicating the speed of the car and a station or street which the car is approaching or passing.

The gear-wheel E has its shaft extended 10 through the front wall of the inclosing-case, and is provided with an index hand or pointer, E, (shown in dotted lines in Fig. 4,) which moves around or over a dial, *e*, that is permanently attached to the case A. This dial is 15 marked off into thirty equal parts or divisions, and is for the purpose of indicating the speed of a train or car, the gear-wheel and cylinder being properly proportioned to the diameter of the car-wheel from the axle of which the 20 devices derive their motion. The number of teeth of the gear-wheel E is preferably proportioned to the car-wheel so that one revolution of the said gear-wheel indicates that the car has traveled one-eighth ($\frac{1}{8}$) of a mile, 25 and when the gear-wheel revolves eight times it indicates that the car has traveled a mile.

To illustrate the adaptation of my invention, I have appended hereto the following approximate proportion of parts; but it will be understood that these proportions are not inflexible, but they can be varied to suit the requirements of the case—as, for instance, if we suppose the car-wheel to be thirty-three inches 30 in diameter the wheel E has seventy-seven teeth, and if the car-wheel is thirty-six (36) inches in diameter the wheel E has seventy teeth, and so on in proportion. The dial *e* is about four (4) inches in diameter, and is divided in thirty (30) equal parts; and the rate 40 of speed that the car travels can be computed or determined by observing the number of spaces that the index-hand E' travels in a given period of time—say fifteen seconds. The number of spaces that the hand E' travels in fifteen seconds denotes the rate of speed in miles 45 per hour. The shaft of the gear-wheel G is also extended through an opening in the front wall of the case A, and provided with an index hand or pointer, G', that moves over a 50 dial, *g*', secured to the case A, and having the names or numbers of the streets of a town or city stamped thereon, if the indicator is applied to a horse-car of a street-railway, or the names of stations or cities lying on the route 55 of a steam-car railway-track. This dial *g*' has the proper divisions marked thereon at the proper intervals apart, or at points thereon which the indicator-hand will arrive at when the train passes a given station on its route.

60 If it is deemed desirable, the indicator-hand E' and the dial *e* can be dispensed with when the device is applied to steam-railway cars, as it is obvious that the speed of the train can be reckoned by the rate of movement which 65 the hand G' traverses over the dial *g*'; but I prefer to employ the hand E' and dial *e*, for the reason that the rate of speed can be more

easily and readily computed from the divisions on the dial *e*, which are placed at further intervals apart, and hence more easily discernible, than the divisions on the dial *g*, which are 70 necessarily crowded or contracted, owing to the large number of stations on the route and the space which the proper lettering takes up on the face of the dial.

75 In indicators that are applied to horse-railway cars I do not contemplate to apply the hand E' and dial *e*, owing to the frequent number of stoppages that the cars of this class have to make in taking on and letting off passengers; 80 but it is obvious that the indicators of this class of cars may be provided with the speed-indicator hand and dial, if it be deemed desirable or necessary.

I designates the body of the car; J, the 85 axle; J', the bearing for the axle, permanently affixed to the car-body; and J², one of the car-wheels mounted on the axle, all of which are of the ordinary well-known class.

K designates an eccentric that is rigidly 90 keyed or otherwise fastened on the axle J to rotate therewith. This eccentric is made in two detachable sections, *k*, which are rigidly connected together by a lap joint (shown at *k'* in Fig. 5) and through-bolts *k*², passing through 95 the lapped meeting ends of the sections *k*. The inner face or edge of one of the sections is provided with a key-seat, *l*, to permit a key to pass therein to fasten the device to the axle, and the key is preferably a block of rubber, 100 or it may be the ordinary steel key-pin. At its periphery the eccentric is provided with a circumferential groove, *m*, that provides two projecting ribs, *m'*, at the edges of the eccentric, and these ribs and the groove form a seat 105 for the ring O. This ring is made in two detachable sections, *o*, which are each provided on their inner edges with grooves *o'*, arranged near their sides to form a middle flange or tongue, *p*, and side flanges, *p'*. These middle 110 and side flanges are each curved in cross-section to snugly and closely fit the seats in the periphery of the eccentric. The middle tongue, *p*, of the ring fits snugly and slides within the groove *m* of the eccentric A, and the curved 115 grooves and flanges fit the ribs or seats *m'* of the eccentric, and the eccentric is free to rotate with the axle within the ring to actuate the latter and connecting-rods to the worm shaft or cylinder D of the indicator. 120

The grooved ring O is seated or fitted snugly to the seats of the eccentric to exclude dirt, dust, and other foreign matter, to prevent too great friction and wear between the parts, and to further reduce the friction and wear be- 125 tween the opposing faces of the ring and eccentric, that are in contact with each other. I provide the ring with a lubricator, P, of any preferred construction, that is adapted to discharge the lubricating material between the 130 ring and eccentric. The sections of the ring are semicircular in form, and at their ends they have outwardly-projecting or angular perforated lugs *q*, which are bolted securely

together, one of the lugs of each section of the ring being extended, and having an enlarged head of a movable connecting-rod, R, pivoted therein, so as to adapt the eccentric and its ring to move laterally independent of the motion of the car-body, while at the same time the eccentric and ring serve to move the rod longitudinally to actuate the worm shaft or cylinder of the indicator.

10 The rod R is bent or inclined upwardly to bring it close to the body of the car, and it passes through and is supported in a guide, *r*, which is suspended from the car-body. The forward end of the rod R is threaded exteriorly and screwed into a coupling-sleeve, S, and this sleeve is connected to a threaded arm, *t*, of a joint, T. This joint comprises two pivotally-connected arms, *t t'*, that are disposed at right angles to each other, the vertical arm *t'* being connected to a coupling-sleeve, S', similar to the sleeve S. This coupling-sleeve S' has one end of a vertically-disposed connecting-rod, U, screwed therein, and this rod is guided in a guide piece or casting, *u*, affixed to the car, within the body thereof, and connected at its upper end to the crank-pin of the rotating worm shaft or cylinder D, the said upper end of the connecting-rod being enlarged and provided with an enlarged opening that fits loosely around the crank-pin, and is prevented from displacement thereon by a nut, *v*.

The operation of my invention will be readily understood from the foregoing description, taken in connection with the drawings.

It will be observed that my improved indicator can be readily and quickly applied to a railway-car of any class, and that the eccentric, its ring, and the connecting-rods can be connected to the axle without disturbing the wheels or bearings in any manner; that the stations or the names and numbers of the streets will be indicated to notify passengers of their destination; that the speed of a train can be readily ascertained, and that the apparatus is simple and cheap. The indicator can also be used in locomotive-cabs and in cars propelled by electricity, as is obvious.

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

1. In an indicating apparatus for cars, the combination of a detachable eccentric on an axle, a sectional ring seated on the periphery

of the eccentric, a connecting-rod, R, pivoted to the ring, a vertical connecting-rod, U, a joint, T, intermediate of the rods, couplings between the ends of the rods and the joint, guides for the rods secured to the car-body, and an indicator having a worm shaft or cylinder, and gearing actuated by the said worm-shaft, substantially as described.

2. In an indicating apparatus for cars, the combination of an eccentric fitted on the axle or shaft, and having the peripheral seats and a groove intermediate of the seats, a sectional ring fitted on the peripheral seats of the eccentric, and having a projecting rib fitted in the groove of the said eccentric, an indicator, and connections intermediate of the sectional ring and the indicator for actuating the latter, substantially as described.

3. In an indicating apparatus for cars, the combination of a sectional eccentric adapted to be fitted on an axle or shaft and provided with the projecting rib seats at its periphery and a groove intermediate of the seats, a sectional ring detachably and loosely fitted on the eccentric, and having a central rib fitting in the groove thereof, and the side flanges, *o'*, bearing on the projecting ribs, an indicator having a worm-shaft, and connections R U intermediate of the sectional ring and the worm-shaft of the indicator, substantially as described, for the purpose set forth.

4. The combination of an inclosing-case having the dial, the vertically-disposed bearing-plates B, inclosed within the case, the journals C, also in the case, the worm shaft or cylinder supported in the journals, and having a collar, *d'*, and flange *d* at opposite ends, and the crank-pin D', the gearing journaled in the bearing-plates and actuated by the worm-shaft, one of the shafts of the said gear-wheel having an index or pointer adapted to traverse the dial, an eccentric fitted on an axle or shaft, a ring seated on the eccentric, and connections intermediate of the ring and the crank-pin of the worm-shaft, all arranged and combined to operate as described.

In testimony that I claim the foregoing as my own I have hereto affixed my signature in presence of two witnesses.

FRED AUG. SCHMIDT.

Witnesses:

JAMES BURK,
A. M. ALLEN.