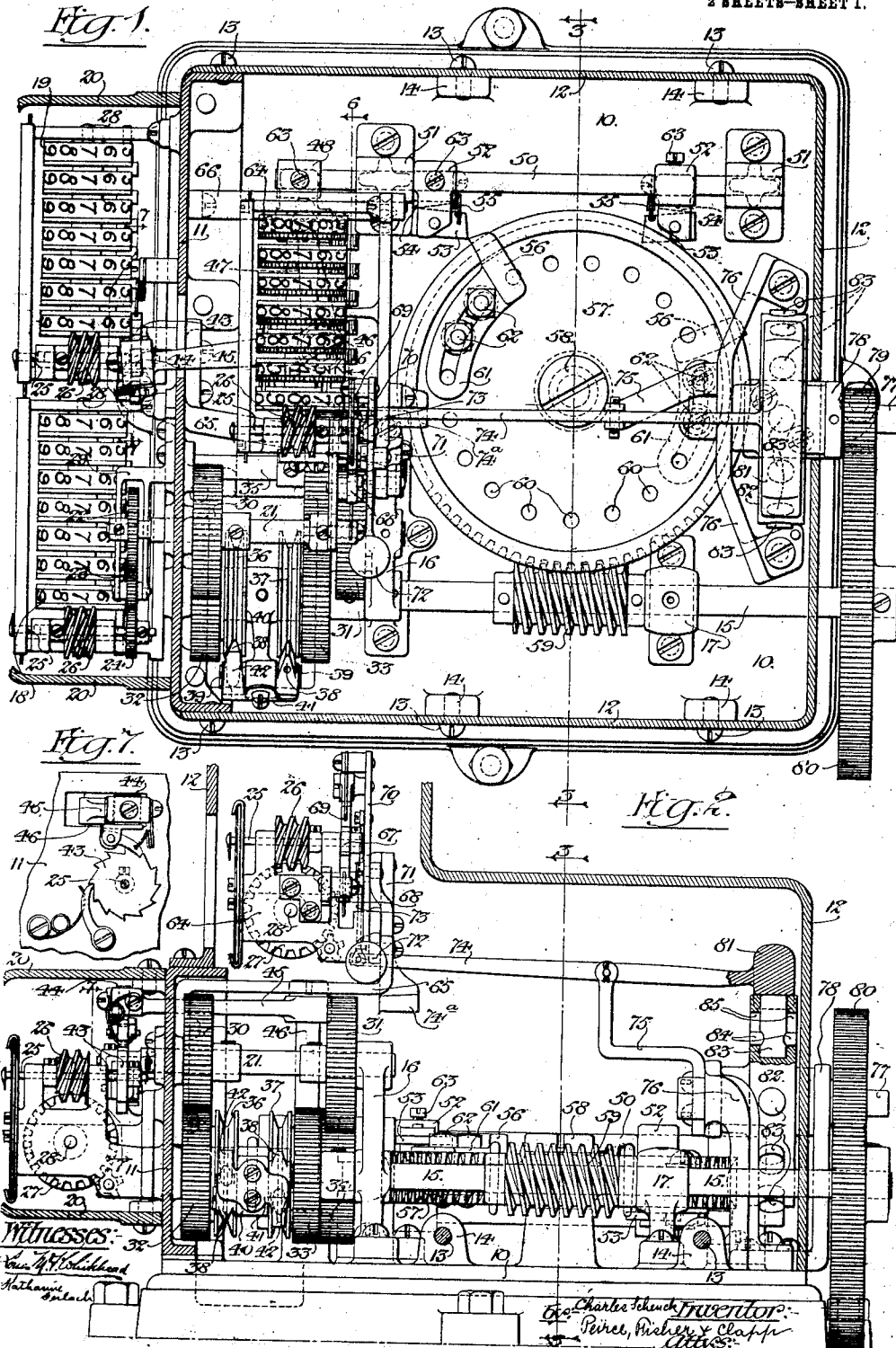


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REGISTER FOR ELEVATOR CARS.
APPLICATION FILED JULY 14, 1911.

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Patented Apr. 15, 1913.

2 SHEETS-SHEET 1.

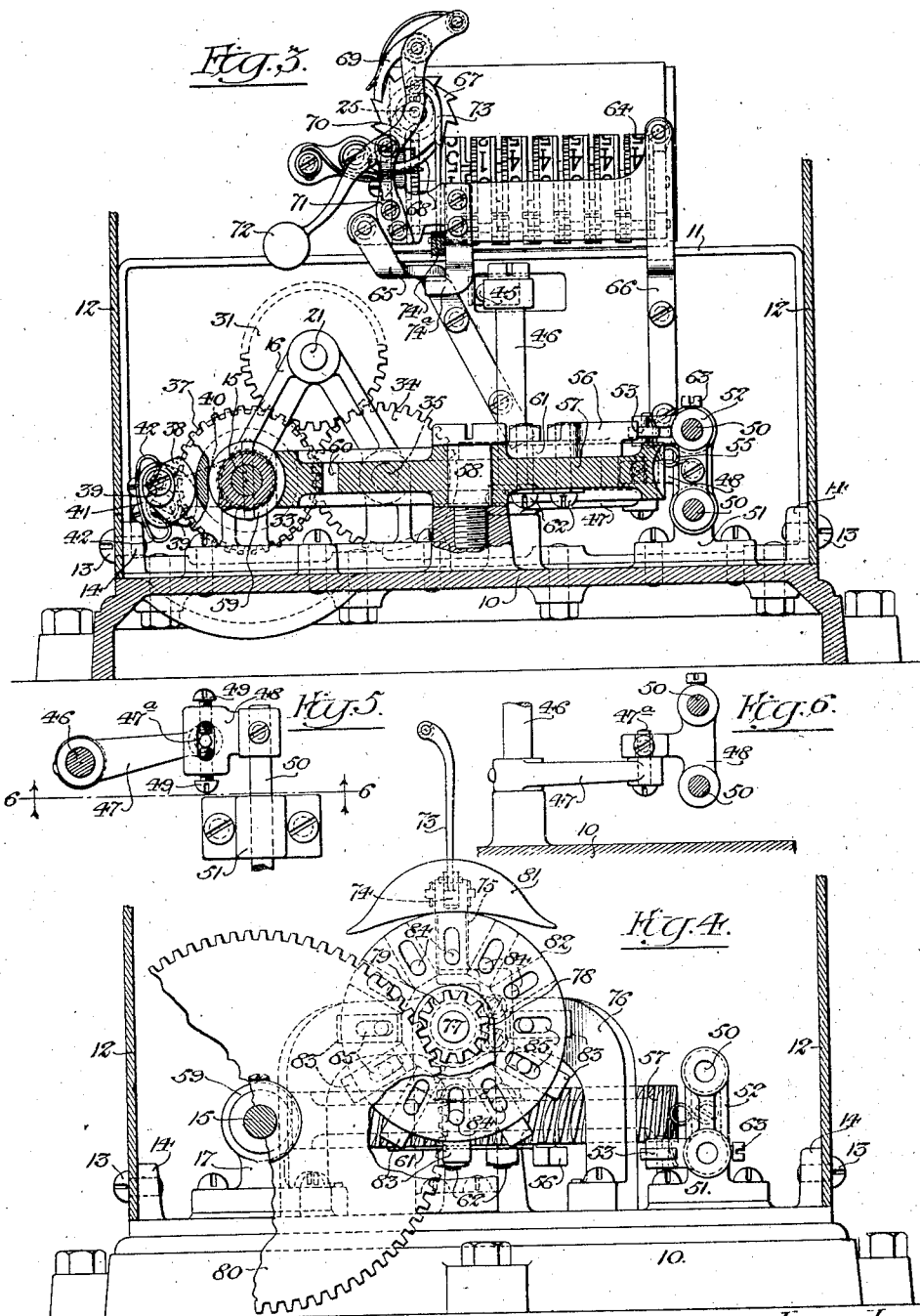


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UNITED STATES PATENT OFFICE.

CHARLES SCHENCK, OF CHICAGO, ILLINOIS, ASSIGNOR TO ELEVATOR SUPPLY & REPAIR COMPANY, OF CHICAGO, ILLINOIS, A CORPORATION OF ILLINOIS.

REGISTER FOR ELEVATOR-CARS.

1,059,078.

Specification of Letters Patent. Patented Apr. 15, 1913.

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To all whom it may concern:

Be it known that I, CHARLES SCHENCK, a citizen of the United States, and a resident of Chicago, county of Cook, and State of Illinois, have invented certain new and useful Improvements in Registers for Elevator-Cars.

The invention relates to registers or recorders for elevator cars and seeks to provide simple and effective means whereby the total distance traveled by the elevator car, the number of trips and the number of stops made by the car can be registered or recorded.

The invention consists in the features of improvement hereinafter set forth, illustrated in the preferred form in the accompanying drawings and more particularly pointed out in the appended claims.

In the drawings, Figure 1 is a plan view of the improved register with the casing thereof shown in section. Fig. 2 is a side elevation with portions of the casing broken away and parts thereof shown in section. Fig. 3 is a vertical section on the lines 3—3 of Figs. 1 and 2. Fig. 4 is a partial rear elevation with the casing broken away and partly shown in section. Fig. 5 is a portion of the operating mechanism for the counter that registers the trips. Fig. 6 is a detail view of parts shown in section on the lines 6—6 of Figs. 1 and 5. Fig. 7 is a detail view of the actuator for the trip registering counter.

The frame of the improved recorder comprises a base 10 and upright flanged plate 11 secured to the base at its front edge. An inclosing casing 12 is removably secured in position by screws 13 which extend through the flanges of the plate 10 and through lugs 14 upon the base. The register is preferably mounted in position at the upper end of the elevator shaft. The main operating shaft 15 for the register is journaled in suitable bearings in the end plate 2 and in brackets 16 and 17 that are fixed to the base 10. One end of the shaft projects through the inclosing casing 3 and is suitably connected to the elevator mechanism and rotates in opposite directions as the elevator car travels up and down. The extent of rotation or the number of revolutions of the register operating shaft 15 is definitely proportionate to the travel of the car.

Two counters 18 and 19, for respectively

registering the travel and the number of trips of the elevator car, are mounted upon the outer face of the front plate 11 and are inclosed in a supplemental casing 20 removably secured to the front plate. These counters may be of any usual or suitable construction. The counter 18 which registers the distance traveled by the car, is driven from a shaft 21 which is journaled in suitable bearings formed in the front plate 11, and in the upper end of the triangular bracket 16. The forward end of this shaft extends through the front plate and is provided with a gear 22 connected by an intermediate pinion 23 to a pinion 24 on the end of a transverse shaft 25 journaled in the counter frame. A worm 26 on the shaft 25 drives a worm wheel 27 on the main shaft 28 of the counter. The idle pinion 23 is mounted upon a bracket 29 (see Fig. 1) secured to the front plate 11.

The register operating shaft 21 is driven in one direction from the oppositely rotating shaft 15 through the medium of two automatic, oppositely acting clutches and suitable connecting gearing so that the registering counter 18 is advanced when the elevator car travels either up or down and to an extent proportionate to the travel of the car. As shown, the shaft 21 has two gears 30 and 31 fixed thereto. The gear 30 directly engages the gear 32 mounted upon the main drive shaft 15. The gear 31 is connected to a gear 33 on the main drive shaft through the medium of a wide, intermediate idler 34 mounted upon a counter shaft 35 (see Figs. 2 and 3). The gears 32 and 33 are loose on the main drive shaft 15 and are arranged to be alternately connected thereto as the shaft rotates in one or the other direction by a pair of oppositely acting clutches. These clutches comprise a pair of clutch disks 36 and 37 which are loosely mounted on the shaft 15 and connected to the gears 32 and 33. These disks are provided with annular, peripheral grooves which are V-shaped in section and which are arranged to be engaged by a pair of V-shaped, segmental, friction dogs 38. These dogs are eccentrically pivoted by screws 39 upon the end and on opposite sides of an arm 40 which is fixed to the shaft 15 between the clutch disks 36 and 37. A spring metal plate 41 fixed upon the end of the arm 40 is provided with extensions 42 which

engage the friction dogs 38 and press them lightly against the grooved friction disks 36 and 37. Each eccentrically pivoted friction dog 38 is so arranged that when the shaft 15 is rotated in one direction, it will bind within the groove of the companion friction disk and drive it together with the gear connected thereto, but when the shaft rotates in the opposite direction, the dog will slip idly through the groove of the clutch disk. The dogs are oppositely arranged so that, as the shaft 15 rotates in one direction, the clutch disk 36 will be clamped thereto by the corresponding dog 38, while the other dog will slip idly through the groove of the clutch disk 37. Under such circumstances, the shaft 15 will drive the register operating shaft 21 through the medium of the clutch disk 36 and gears 32 and 30. When the shaft is driven in the opposite direction, the clutch disk 37 rotates with the shaft 15 and the shaft 21 is driven through the medium of the gears 33, 34 and 31. The gear 32 and clutch disk 33, then rotate idly on the main drive shaft 15. Inasmuch as the clutch disk 37 is connected to the shaft 21 through the medium of the intermediate idler 34, the register operating shaft 21 will, however, be driven in the same direction as when driven from the shaft 15 through the medium of the friction disk 36, and the counter 18 will thus be driven in the same direction to register the distance traveled by the car, irrespective of the direction in which the car is moving. The construction of the clutch disks and dogs is such that they will act instantly to connect or disconnect the corresponding gears 32 and 33 and the drive shaft 15 upon the reversal of movement of the shaft, an entire travel of the car both up and down is thereby actively registered.

The construction of the trip registering counter 19 is similar to the counter 18. The actuator shaft 25 of this counter is provided at its inner end with a ratchet wheel 43 which is driven by a pawl or dog 44 on the end of a swinging arm 45 that extends through a slot in the front plate 11. This arm is mounted at its inner end (see Figs. 2 and 3) upon the upper end of a vertical shaft 46, the lower end of which is journaled in a suitable bearing upon the base 10. At its lower end, the shaft 46 is provided with a projecting arm 47 (see Figs. 3, 5 and 6) and a pin 47^a on the end of this arm extends through a slot in the lateral offset portion of a head or member 48. Adjusting screws 49 extending through the offset portion of the member 48 engage the pin. The head or member is fixed to the forward end of a pair of shifter rods 50 which are arranged to slide through suitable guide openings or bearings in a pair of upright brackets 51 fixed to the base 10.

A pair of heads or members 52 fixed to the sliding rods 50 are provided with oppositely arranged, pivoted dogs 53 that are held in normal position against stops 54 by a pair of springs 55. One of the dogs 53 is arranged opposite the upper rod 50 and the other opposite the lower rod and these dogs are arranged to be engaged by a pair of tappets or lugs 56 mounted upon the upper and lower faces of a worm wheel 57. The worm wheel 57 is journaled upon a stud 58 fixed to a boss on the base 10 and is driven by a worm 59 on the main operating shaft 15. The worm wheel 57, together with the lugs or abutments thereon, is thus rotated at a very slow speed in opposite directions as the car travels up and down.

The lugs or tappets 56 are so arranged that as the car is moving up and approaches the upper limit of its movement, one of the lugs or abutments 56, the upper lug for example, will engage the corresponding dog 53 and move the shifter rods 50 in one direction. When the car travels up, the other or lower lug or tappet 56 passes idly over the corresponding dog 53, but, when the car moves down and approaches the lower limit of its movement, this lower lug or tappet 56 will engage its companion dog 53 and shift the rods 50 in the opposite direction. The connected rods 50 are thus shifted back and forth and the counter 19 is advanced one step upon each complete trip of the elevator car.

The worm wheel 57 is provided with a circular series of openings 60 and the lugs or tappets 56 are provided with slotted segmental arms 61. By means of screw bolts 62 which pass through the openings 60 and the slotted arms 61, the tappets 56 may be set upon the worm wheel in proper position to shift the actuator of the trip registering counter at points adjacent the upper and lower limits of movement of the car. By this arrangement, the register may be properly adjusted in accordance with the height of the elevator shaft. Preferably, also, the heads or members 48 and 52 are adjustably clamped upon the rods 50 by set screws 63, so that the operating mechanism for the counter 19 may be so set as to accurately register only the number of complete trips made by the car.

A counter 64 is mounted upon a pair of arms or brackets 65 and 66 which are fixed to the rear face of the front plate 2 and project rearwardly and upwardly therefrom. The actuator shaft 25 of this counter is provided at its rear end with a ratchet wheel 67 (see Fig. 3) which is arranged to be engaged by spring-held retaining and actuating pawls or dogs 68 and 69. The actuating dog is mounted on an arm 70 which is pivoted between its ends on an upright 71 fixed to the counter frame. The opposite

end of the arm 70 is provided with a counter-weight 72 which tends to hold the arm in the position shown in the drawings. The dog operating arm 70 is connected by a depending link 73 to the forward end of an operating lever 74 (see Figs. 3 and 4) which extends rearwardly and is pivotally mounted between its ends upon a bent arm or bracket 75. This arm or bracket is fixed to the upper portion of an upright U-shaped bracket 76 that rises from the base 10.

A short shaft 77 journaled in the bracket 76 and in an upright 78 on the base 1, extends through the rear wall of the casing 3 and is provided on its rear end with a pinion 79 (see Figs. 2 and 5), which engages a gear 80 on the rear end of the main operating shaft 15. The rear end of the arm or lever 72 is provided with a shoe 81 which rests upon the periphery of a wheel 82 mounted on the shaft 77. This wheel is provided with a series of radial slots or seats in which are arranged a series of short, cylindrical blocks 83. These blocks are provided with laterally projecting studs 84 which extend through radial slots 85 in the sides of the wheel 82.

The gearing between the main drive shaft 15 and the shaft 77 is such that the latter and the wheel 82 thereon are driven at high speed whenever the elevator car is in motion and the blocks 83 are thrown out in radial direction by centrifugal force against the shoe 81 and uphold the shoe and the rear end of the arm or lever 74, as long as the car is in motion. When the rear end of the lever 74 is thus upheld, its forward end rests upon a stop 74^a and the upper end of the pawl arm 70 is depressed and the dog 69 drawn back for the space of one tooth on the ratchet wheel 67. When the car stops, the weight of the shoe 81 and the counter-weight 72 shift the arms 74 and 70 and the dog 69 advances the counter 64 one step. The counter thus accurately registers the number of stops made by the car.

The counters for registering the travel, trips and stops of the elevator car, are all properly driven from the common shaft 15 which is connected to the car and rotates in opposite directions as the car travels up and down.

It is obvious that numerous changes may be made in the details set forth without departure from the essentials of the invention as defined in the claims.

I claim as my invention:

1. In a register for elevator cars, the combination with travel and stop registering counters, of a main drive shaft for said counters connected to the car and rotating in opposite directions in accordance with the travel of the car, two oppositely acting clutches and connecting gearing interposed between said main drive shaft and said

travel registering counter for advancing the latter as said shaft rotates in one or the other direction, an actuator for said stop registering counter and means controlled by the starting and stopping of said main drive shaft for operating said actuator, substantially as described.

2. In registers for elevator cars, the combination with travel and stop registering counters and separate actuating shafts therefor, of a main drive shaft connected to the car and rotating in opposite directions in accordance with the travel thereof, two oppositely and automatically acting clutches alternately driven by said main shaft in accordance with the direction of rotation thereof, gearing interposed between said clutches and said travel registering counter for rotating the latter in the same direction, pawl and ratchet actuator mechanism for advancing said stop registering counter and a centrifugal device driven by said main shaft and operating said pawl and ratchet mechanism, substantially as described.

3. In a register for elevator cars, the combination with travel, trip and stop registering counters, of a main drive shaft connected to the car and rotating in opposite directions in accordance with the travel of the car, two oppositely acting clutches and connecting gearing interposed between said main drive shaft and said travel registering counter for advancing the latter as said shaft rotates in one or the other direction, actuating devices for said trip and stop registering counters, means operated by said main shaft for shifting the actuator of said trip registering counter back and forth at the opposite ends of the travel of the car and means controlled by the starting and stopping of said main shaft for shifting the actuator of said stop registering counter, substantially as described.

4. In a register for elevator cars, the combination with travel, trip and stop registering counters, a main drive shaft connected to the car and rotating in opposite directions in accordance with the travel of the car, two oppositely and automatically acting clutches alternately driven by said main shaft as the latter rotates in one or the other direction, gearing interposed between said clutches and said travel registering counter for advancing the latter in the same direction, pawl and ratchet actuators for said trip and stop registering counters, speed reducing gearing connected to said main shaft and driven in opposite directions thereby for operating said trip counter actuator at the opposite ends of the travel of the car, and a centrifugal device driven by said main shaft for shifting said stop counter actuator as said main shaft starts and stops, substantially as described.

5. In a register for elevator cars, the com-

combination with a shaft connected to the car and rotating in opposite directions in accordance with the travel of the car, of a trip registering counter, a pawl and ratchet actuator therefor, a reciprocating shifter for said pawl and ratchet actuator, a worm wheel driven from said main shaft and adjustable tappets and dogs mounted on said worm wheel and said shifter for operating said pawl and ratchet actuator at the opposite ends of the travel of the car, substantially as described.

6. In a register for elevator cars, the combination with a shaft connected to the car and rotating in opposite directions in accordance with the travel of the car, of a stop registering counter, an actuator therefor and means controlled by the starting and stopping of said shaft for operating said actuator, substantially as described.

7. In a register for elevator cars, the combination with a shaft connected to the car, and rotating in opposite directions in accordance with the travel of the car, of a stop registering counter, an actuator therefor, a reciprocating pawl actuator for said counter and a centrifugal device connected to and rotated by said shaft and arranged to shift said pawl back and forth as said shaft starts and stops, substantially as described.

8. In a register for elevator cars, the combination with a shaft connected to the car, and rotating in opposite directions in accordance with the travel of the car, of a stop registering counter, an actuator therefor, an actuating pawl for said counter, an operating shifter for said pawl and a rotating member geared to said shaft and having a series of radially movable parts arranged to

engage said shifter and thereby effect the movement of the latter in opposite directions as said shaft starts and stops, substantially as described.

9. In a register for elevator cars, the combination with trip and stop registering counters, of a main drive shaft connected to the car to rotate in opposite directions in accordance with the travel of the car, actuators for said counters, speed reducing gearing connected to said shaft and driven in opposite directions thereby and arranged to shift said trip counter actuator back and forth at the opposite ends of the travel of the car and means controlled by the starting and stopping of said shaft for shifting said stop counter actuator, substantially as described.

10. In a register for elevator cars, the combination with trip and stop registering counters, of a main drive shaft connected to the car to rotate in opposite directions in accordance with the travel of the car, pawl actuators for said counters, speed reducing gearing connected to said shaft and driven in opposite directions thereby, means controlled by said gearing for shifting said trip counter actuator back and forth at the opposite ends of the travel of the car, a centrifugal device connected to and driven by said shaft and means controlled by said centrifugal device for shifting said stop counter actuator back and forth as said shaft starts and stops, substantially as described.

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