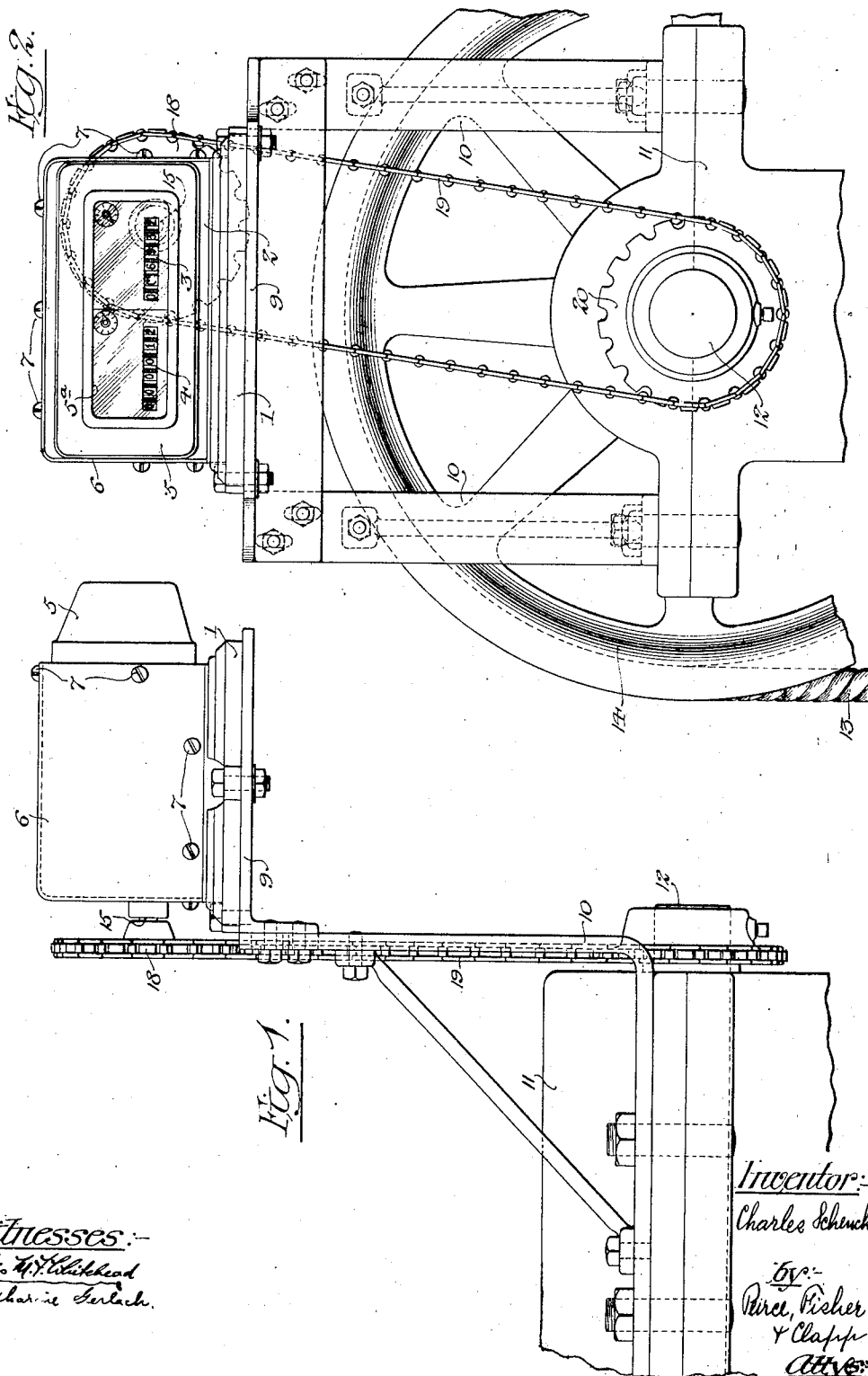


C. SCHENCK.
ELEVATOR CAR REGISTER.
APPLICATION FILED JULY 14, 1911.

1,059,077.

Patented Apr. 15, 1913.

4 SHEETS—SHEET 1.



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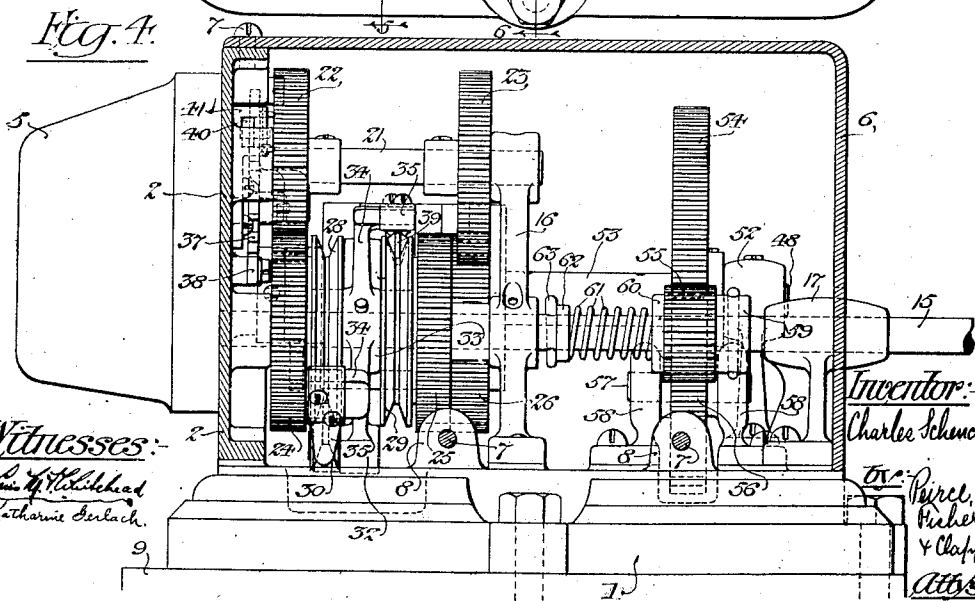
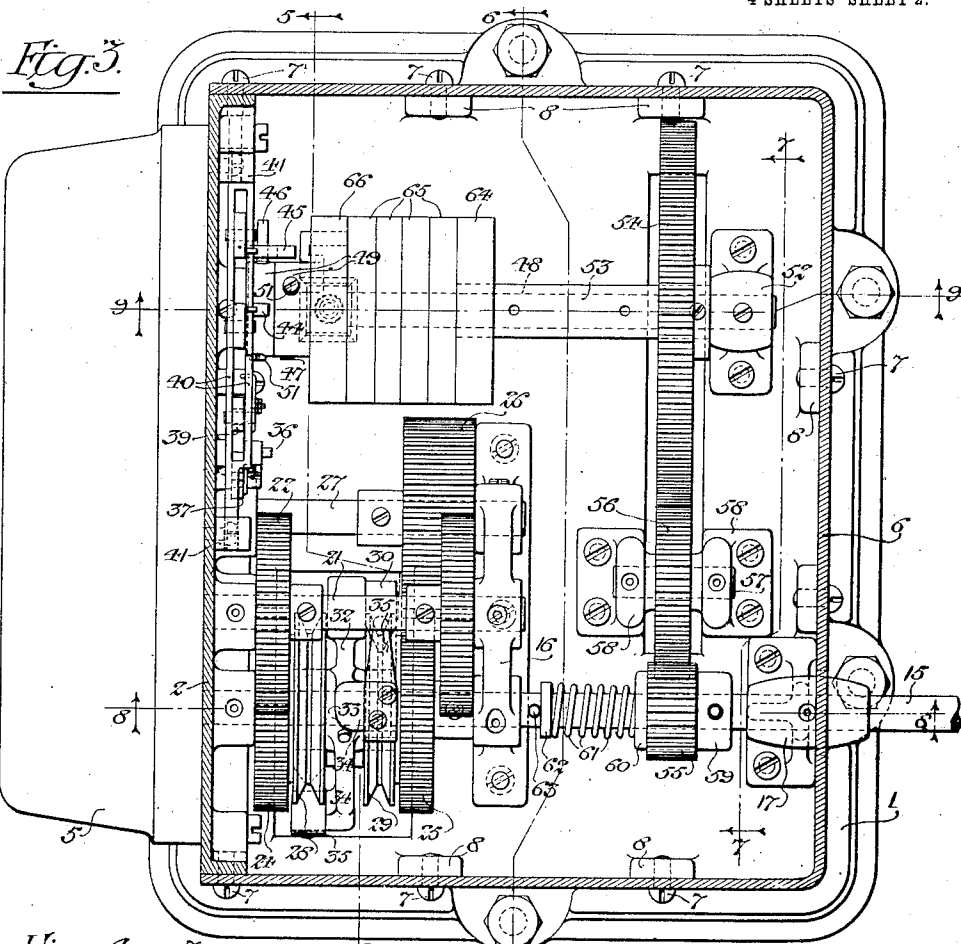
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4 SHEETS-SHEET 3.

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Fig. 5.

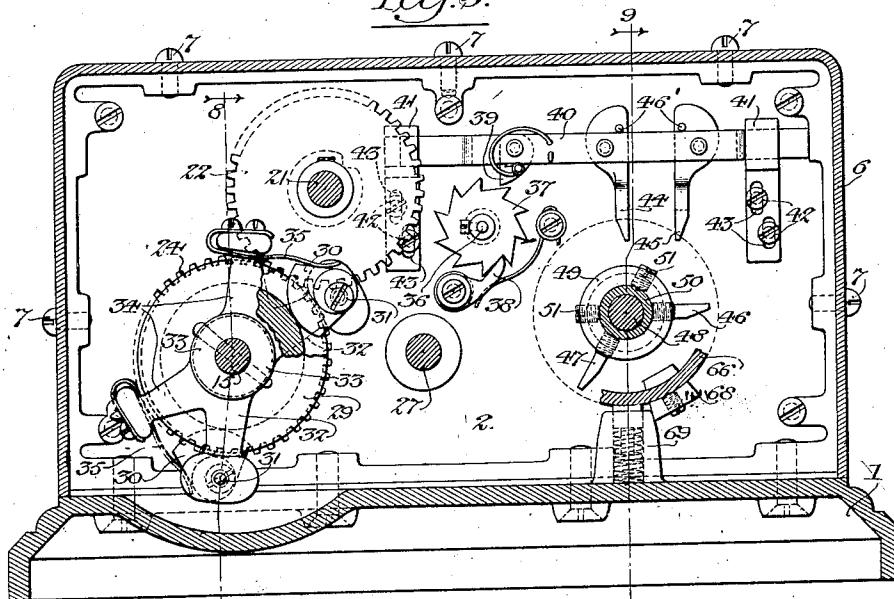
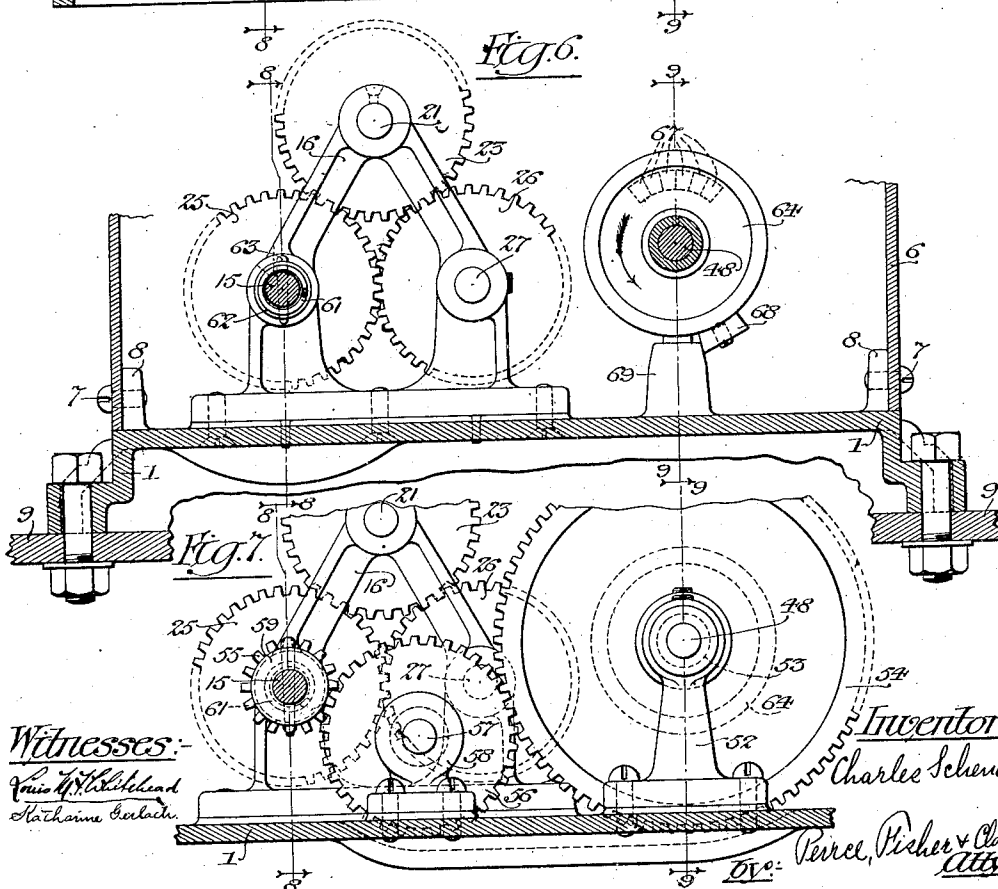


Fig. 6.



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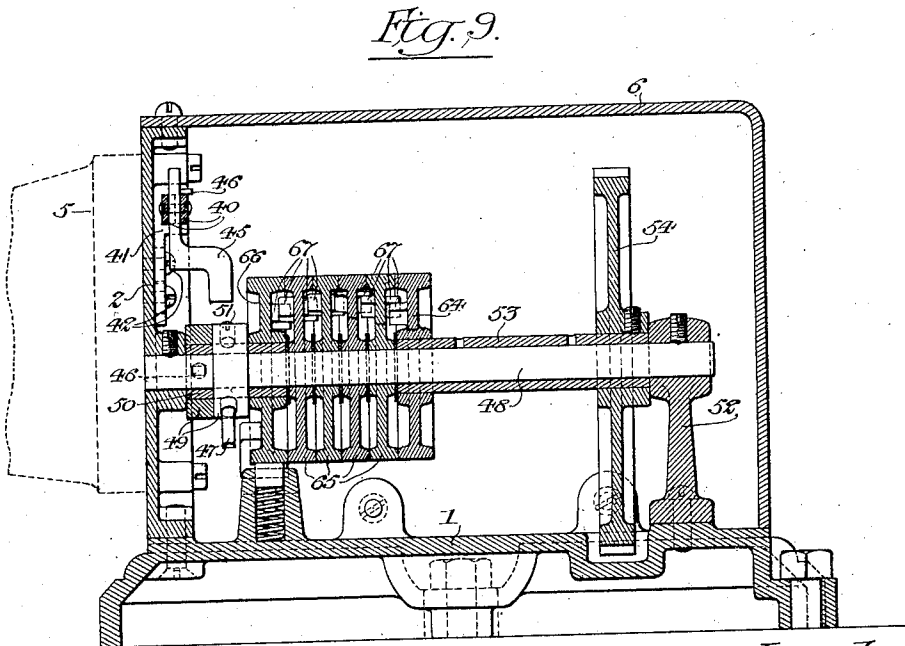
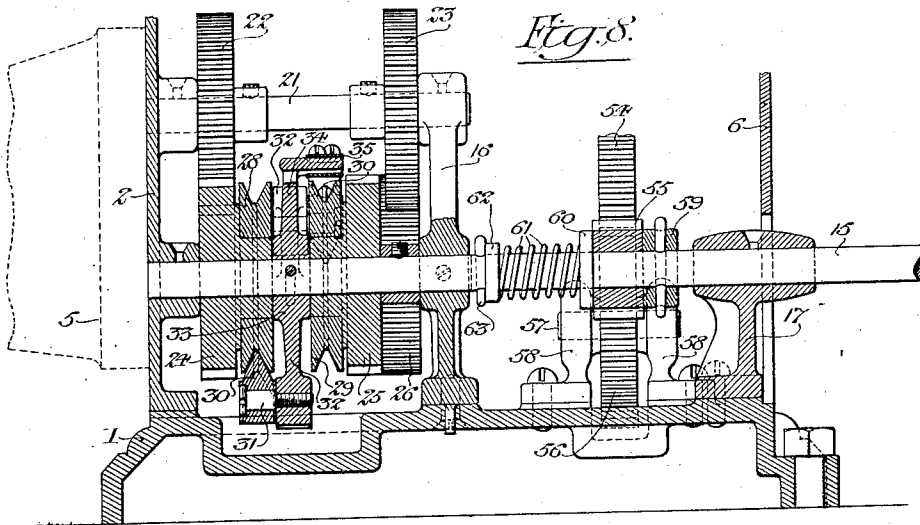
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4 SHEETS-SHEET 4.

1,059,077.



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UNITED STATES PATENT OFFICE.

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ELEVATOR-CAR REGISTER.

1,059,077.

Specification of Letters Patent.

Patented Apr. 15, 1913.

Application filed July 14, 1911. Serial No. 638,568.

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 Elevator-Car Registers, of which the following is a full, clear, and exact description.

The invention relates to registers for elevator cars and seeks to provide simple and effective means by which the distance traveled by an elevator car can be accurately registered and also the number of total trips made by the car.

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.

Figure 1 is a view in side elevation of the improved register mounted in position at the upper end of an elevator shaft. Fig. 2 is a front elevation of the parts shown in Fig. 1. Fig. 3 is a plan view of the improved register with the casing thereof shown in section. Fig. 4 is an end elevation of the casing shown in section. Figs. 5, 6 and 7 are detail sections on the lines 5-5, 6-6 and 7-7, respectively, of Fig. 3. Figs. 8 and 9 are sections on the lines 8-8 and 9-9, respectively, of Figs. 5, 6 and 7.

The frame of the improved register comprises a base 1 and a front plate fixed thereto. The counters 3 and 4 (see Fig. 2) for respectively registering the distance traveled by the car and the number of trips, are arranged within a casing 5 that is fixed to the front face of the vertical plate 2. The operating mechanism for the counters is mounted upon the base 1 and is inclosed by a casing 6 which is removably secured in position by screws 7 which extend through lugs 8 on the base 1 and through the flange of the front plate 2.

The register is preferably secured in position at the upper end of the elevator shaft. In Figs. 1 and 2 it is shown mounted upon a bracket 9 which is carried upon uprights 10. These uprights are fixed to the bearing block 11 of the transverse counter shaft which is located at the top of the elevator shaft. The hoisting cable 13 for the car passes over a drum 14 on the shaft 12. The register is provided with a main drive shaft 15 which is journaled in suitable bearings

in the front plate 2 and in brackets 16 and 17 fixed on the base 1. At its outer end, the shaft 15 is provided with a sprocket wheel 18. The latter is connected by a chain 19 to a sprocket wheel 20 on the end of the shaft 12. The shaft 12 and, in consequence, the main drive shaft 15 of the register rotate in opposite directions as the car travels up and down and the extent of rotation or the number of revolutions of the main operating shaft 15 is definitely proportional to the travel of the car.

The counters 3 and 4 are visible through a glazed opening 5^a in the front of the casing 5. These counters may be of any usual or suitable construction. The counter 3 which registers the extent of travel of the car, is driven by an actuating shaft 21 that is journaled in the front plate 2 and at its rear end in the upper portion of the triangular bracket 16. This shaft projects through the front plate 2 and is connected to the counter 3 by any suitable reducing gearing (not shown) to thereby operate the counter. The shaft 21 is driven in turn from the main operating shaft 15 of the register through the medium of two automatic clutches which are arranged to act alternately as the shaft 15 rotates in opposite directions and are suitably geared to the shaft 21 to rotate the latter in the same direction, to thus advance the counter whenever the elevator car is in motion, irrespective of the direction in which the car is moving, to thereby properly register the total travel of the car.

As shown, the shaft 21 has two gears 22 and 23 fixed thereto. The gear 22 meshes directly with the gear 24 on the main operating shaft 15. The gear 23 is connected to a gear 25 on the main operating shaft through the medium of a wide intermediate idler 26 that is mounted on a shaft 27 journaled at its ends in the front plate 2 and bracket 16. The gears 24 and 25 are loose on the shaft 15 and are connected respectively to a pair of clutch disks 28 and 29 which are also loosely mounted on the shaft 15. These disks are provided with annular peripheral grooves which are V-shaped in section, and which form friction surfaces that are arranged to be engaged by a pair of friction clutch dogs 30. These dogs are segmental in outline and are shaped to fit within the V-shaped grooves of the clutch

disks 28 and 29. The dogs are eccentrically pivoted by screws 31 upon the ends of a pair of arms 32. These arms are mounted upon a common hub 33 that is fixed to the main drive shaft 15 between the clutch disks 28 and 29. The hub 33 is also provided with a pair of arms 34, carrying leaf springs 35 that engage the clutch dogs 30 and tend to press them into engagement with the clutch disks 28 and 29.

Each of the clutch dogs is so shaped and pivoted that, when the shaft 15 is rotated in one direction, the dog tends to rock on its pivot and firmly grip the corresponding clutch disk to compel the rotation of the disk and gearing connected thereto with the shaft 15. When this shaft rotates in the opposite direction, the clutch dog releases the companion disk and moves idly through the groove thereof. The dogs are oppositely arranged so that they are alternately thrown into and out of operation as the shaft 15 rotates in opposite directions. When the latter rotates in one direction, the counter operating shaft 21 will be driven therefrom through the medium of a clutch disk 28 and the connecting gears 24 and 22, but, when the shaft 15 rotates in the opposite direction, it will drive the counter actuating shaft 21 through the medium of the gears 25, 26 and 23. By this arrangement the actuating shaft 21 is always driven in the same direction at a rate corresponding to the rate of movement of the shaft 15, but irrespective of the direction in which this shaft is rotated. The counter is therefore advanced to register the amount of travel of the car, whether the car is moving up or down. The clutch dogs and disks are arranged to instantly connect and disconnect the gears 24 and 26 on the shaft 15 upon the reversal of motion of the latter, so that the entire travel of the car is properly registered.

The counter 4 which registers the complete trips of the car, is driven by an actuator shaft 36 (see Fig. 5) which extends through the front plate 2 and is provided at its rear end with a ratchet wheel 37. A spring-held holding pawl 38, pivoted on the rear face of the plate 2, engages the ratchet wheel 37. The latter is advanced by a spring-held dog or pawl 39 mounted upon a bar 40. The latter is arranged to slide longitudinally through a pair of guide lugs 41 secured to the rear face of the front plate 2. Preferably, these lugs are adjustably held in position by screws 42 extending through longitudinal slots 43 in the lower portions of the lugs.

The bar 40 is longitudinally slotted, as shown in Figs. 3 and 9, and the dog 39 and two oppositely arranged dogs or pawls 44 and 45 are arranged between and pivotally connected to the side portions of the bar. The dogs or pawls 44 and 45 are normally

held by gravity in the positions shown in the drawings, with stop pins 46 thereon engaging the upper edge of the bar 40. The lower ends of these dogs or pawls are arranged out of line and are adapted to be engaged respectively by a pair of tappets 46 and 47 on an operating shifter. The tappets 46 and 47 are preferably fixed to collars 49 mounted on a loose sleeve 50 on a shaft 48 and adjustably fixed to the sleeve by set screws 51. The shaft 48 is fixed at its ends in a boss on the front plate 2 and in an upright 52 on the base 1. A sleeve 53 loosely mounted on the shaft, has a gear 54 fixed thereto and the latter is driven from a gear 55 on the main operating shaft 15 through the medium of an intermediate idler 56 (see Figs. 3 and 7). The idler 56 is mounted on a shaft 57 that is journaled in brackets or lugs 58 on the base 1. The gear 55 is not rigidly fixed on the shaft 15, but is mounted thereon between a pair of collars or washers 59 and 60. The washer 59 is fixed to the shaft and a spring 61 coiled about the shaft extends between the washer 60 and a washer 62 on the shaft. The latter washer abuts against the cross pin 63 extending through the shaft. By this arrangement, the gear 55 is firmly gripped between the washers 59 and 60 and rotates accurately with the shaft 15, unless the movement of the gearing connected thereto is arrested. Then the gear 55 slips on the shaft.

Suitable reducing gearing is provided between the shaft 15 and the operating shifter sleeve 50 which carries the tappet lugs 46 and 47 that shift the slide bar 40. As shown, this reducing gearing comprises the gears 54 and 55 and a series of wheels 64, 65 and 66. The wheel 64 is fixed to the sleeve 53 and the wheel 66 is fixed to the sleeve 50. The intermediate wheels 65 are loosely mounted on the shaft 48 and are provided upon their opposite faces with lugs 67. The end wheels 64 and 65 are provided with similar lugs 67 on their inner faces and the lugs of each pair of adjacent wheels are adapted to contact and form a one-way connection between the same. That is to say, if the lugs are in the position shown in Figs. 6 and 9, the travel of the car in one direction, for example upward, will drive the gear 54, sleeve 53 and wheel 64 in the direction indicated by the arrow in Fig. 6. After one revolution of the wheel 64 it will pick up and rotate the wheel 65. Each succeeding revolution picks up and rotates the succeeding wheel 65 and the sixth revolution of the gear wheel 54 will pick up and rotate the wheel 66 and the shifter sleeve 50 to thereby rotate the sleeve and bring the tappet 46 thereon against the dog 44 to shift the bar 40 to the left and advance the ratchet wheel and counter actuator shaft 36 one step. During this movement of the

shaft in this direction, the tappet 47 passes idly beneath its companion dog or pawl 45. This speed reducing connection or gearing is so designed that the bar 40 is shifted as the elevator car approaches the upper end of its movement. As the car travels down, the shaft 48 rotates in the opposite direction and, as before, the wheels 64, 65 and 66 are picked up one at a time at each revolution of the sleeve 53 and, when the car approaches the lower end of its movement, the tappet 47 coöperates with the pawl 45 to return the bar 40 to normal position. In this way, the counter 4 is operated once for each complete trip of the car.

In order to insure the proper operation of the trip register, it is essential that the bar 40 be operated near the ends of the travel of the car and, hence, means are provided for correcting any slip of the hoisting cable over its drum or pulley. For this purpose, the wheel 66 is provided with a stop lug 68 which is arranged to engage an abutment 69 see Fig. 6 on the base 1, to thus arrest the movement of the counter actuating mechanism. The car at this time has not quite completed its travel, but the continued movement of the shaft 15 in the same direction will not break any part of the mechanism, since the gear 55 will then slip or yield on the shaft 15. To hold the sleeve 48 and the abutments 46 and 47 thereon in proper position, a friction shoe 70 is mounted within a socket in the lug 69 and is pressed by a spring 71 in the socket against the periphery of the wheel 66.

The mechanism accurately registers the travel of the elevator car and the complete number of trips and both registering counters are properly operated from the same main shaft which is connected to the car and rotates in opposite directions as the latter travels up and down. The number of wheels 65 can be readily varied to adapt the register to elevator cars having different extents of travel. While this arrangement is preferred other adjustable speed reducing gearing could be employed.

It is obvious that 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 registers for elevator cars, the combination with a drum forming part of the elevator hoisting mechanism, of a shaft connected to said drum to revolve therewith in opposite directions, a pair of friction clutch disks having grooved peripheries loosely mounted on said shaft, a coöperating clutch member fixed to said shaft, a pair of oppositely acting, spring-pressed friction dogs pivoted on said member and arranged to engage the peripheral grooves of said disks to connect one or the other to said shaft in

accordance with the direction of rotation of the latter, a counter actuating shaft and gearing connecting said clutch disks to said counter actuating shaft and arranged to rotate the latter in the same direction, substantially as described. 70

2. In a register for elevator cars, the combination with a drum forming part of the elevator hoisting mechanism, of a shaft connected to said drum to rotate therewith in opposite directions, a pair of grooved, friction clutch disks loosely mounted on said shaft, a coöperating clutch member fixed to said shaft, a pair of oppositely acting friction dogs pivoted on said member and coöperating with said disks to connect one or the other to said shaft, in accordance with the direction of rotation of the latter, a counter, a counter actuating shaft parallel to said first mentioned shaft, and two separate sets of gears connecting said clutch disks to said counter actuating shaft and arranged to drive the latter in the same direction, substantially as described. 75 80

3. In a register for elevator cars, the combination with travel and trip registering counters, of a main drive shaft for said counters connected to the car to rotate in one or the other direction 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, speed reducing gearing connected to said main shaft and driven in opposite directions thereby and an actuator for said trip registering counter operated by said gearing. 85 90 95 100

4. In a register for elevator cars, the combination with travel and trip registering counters and separate actuating shafts therefor, of a main drive shaft connected to the car and driven in opposite directions, two oppositely and automatically acting clutches alternately driven by said main shaft as the latter rotates in one or the other direction, gearing connecting said clutches and the actuating shaft for said travel registering counter arranged to rotate said actuator shaft in the same direction, pawl and ratchet actuating mechanism for advancing said trip registering counter and speed reducing gearing connected to said main drive shaft and driven in opposite directions thereby for shifting said pawl and ratchet mechanism back and forth at the opposite ends of its movement, substantially as described. 105 110 115

5. In a register for elevator cars, the combination with a shaft connected to the car and driven in opposite directions thereby, a trip registering counter, an actuator therefor, speed reducing gearing driven by said shaft and means operated by said gearing 120 125 130

for shifting said actuator back and forth 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 trip registering counter, a pawl and ratchet actuator therefor, speed reducing gearing driven from said shaft and adjustable tappets operated by said gearing and arranged to shift said actuator at the opposite ends of the movement of said car, 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 trip registering counter, an actuator therefor, speed reducing gearing driven in opposite directions by said shaft for operating said actuator, a stop device for limiting the movement of said gearing and a friction connection between said gearing and said shaft, 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 trip registering counter and actuator pawl for said counter, a shifter for moving said pawl back and forth, speed reducing gearing driven in opposite directions by said shaft for operating said shifter, cooperating stop members for limiting the movement of said shifter in opposite directions and a yielding friction device for connecting said gearing to said shaft, substantially as described.

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

bination 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, an actuator therefor and speed reducing gearing interposed between said shaft and said actuator and including a set of wheels arranged side by side, each wheel of the set having a lost motion connection with the adjacent wheels, substantially as described.

10. 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 trip registering counter, an actuator therefor and speed reducing gearing interposed between said shaft and said actuator and including a set of wheels arranged side by side, each wheel of the set having a lost motion connection with the adjacent wheels, substantially as described.

11. 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 trip registering counter, a pawl actuator therefor, an oscillating shifter having tappets thereon for moving said pawl back and forth and speed reducing gearing between said shaft and said shifter, said speed reducing gearing including a set of wheels arranged side by side upon a common axis, and having projecting lugs forming lost motion connections between the adjacent wheels of the set, substantially as described.

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