

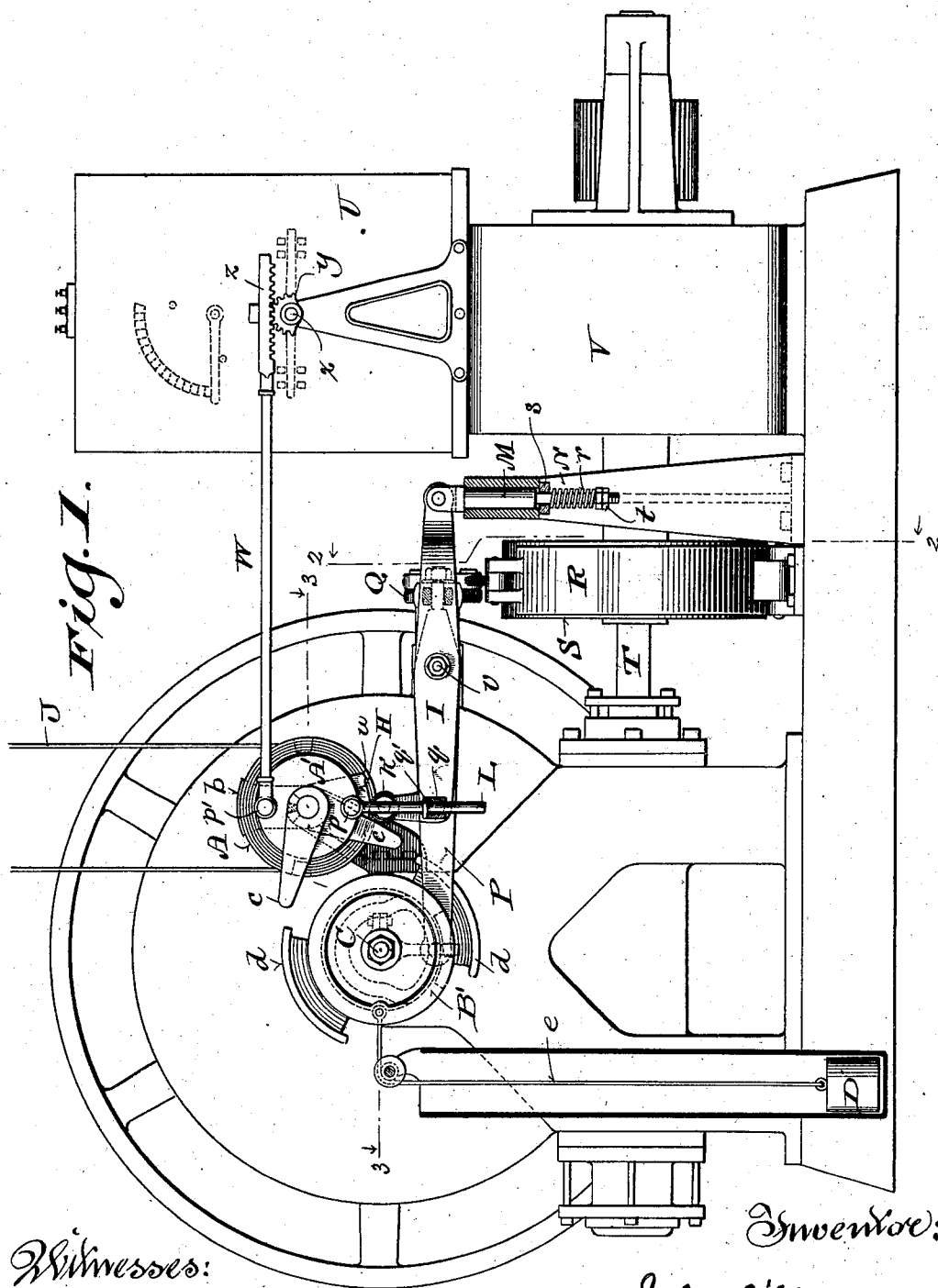
No. 742,173.

PATENTED OCT. 27, 1903.

J. DILLON.
ELEVATOR MECHANISM.
APPLICATION FILED JAN. 26, 1903

NO MODEL.

4 SHEETS—SHEET 1.



Witnesses:
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N. E. Oliphant

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4 SHEETS—SHEET 2.

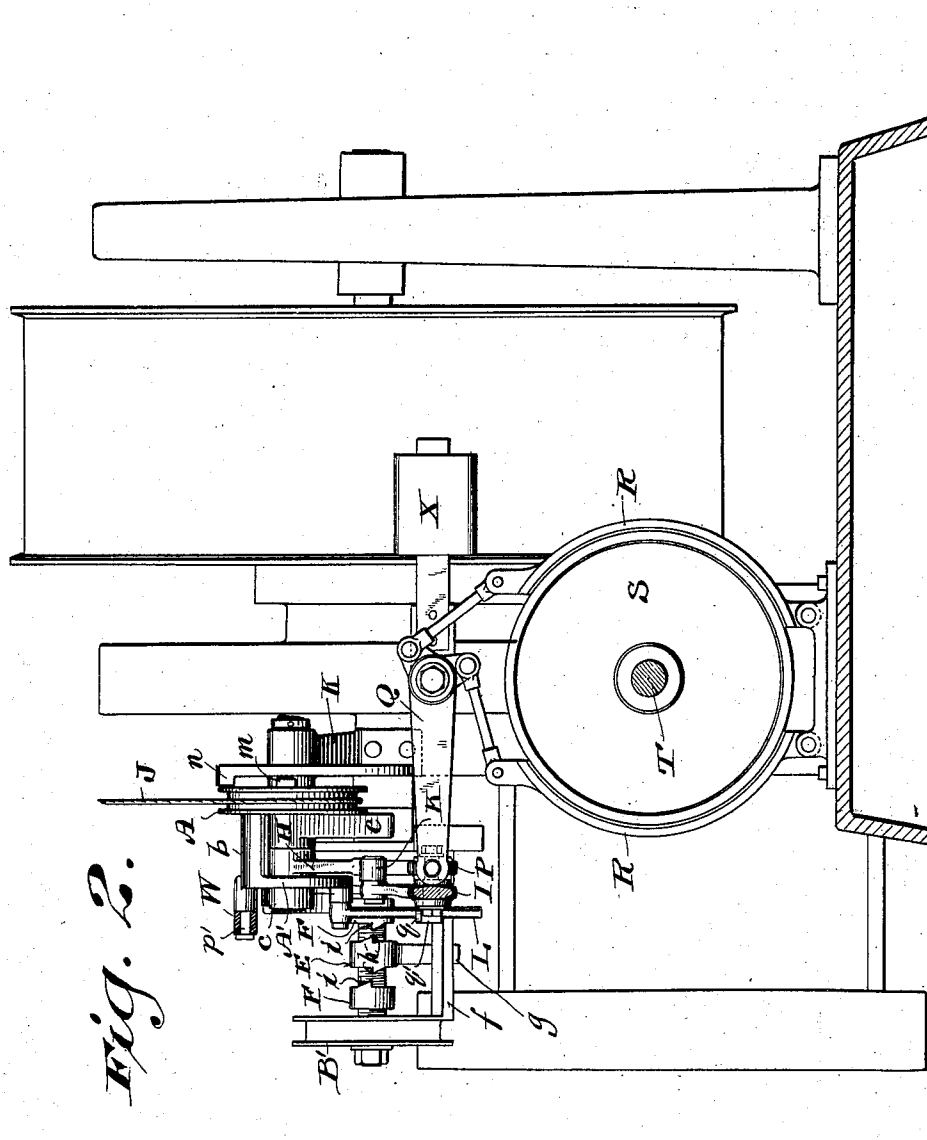


Fig. 2.

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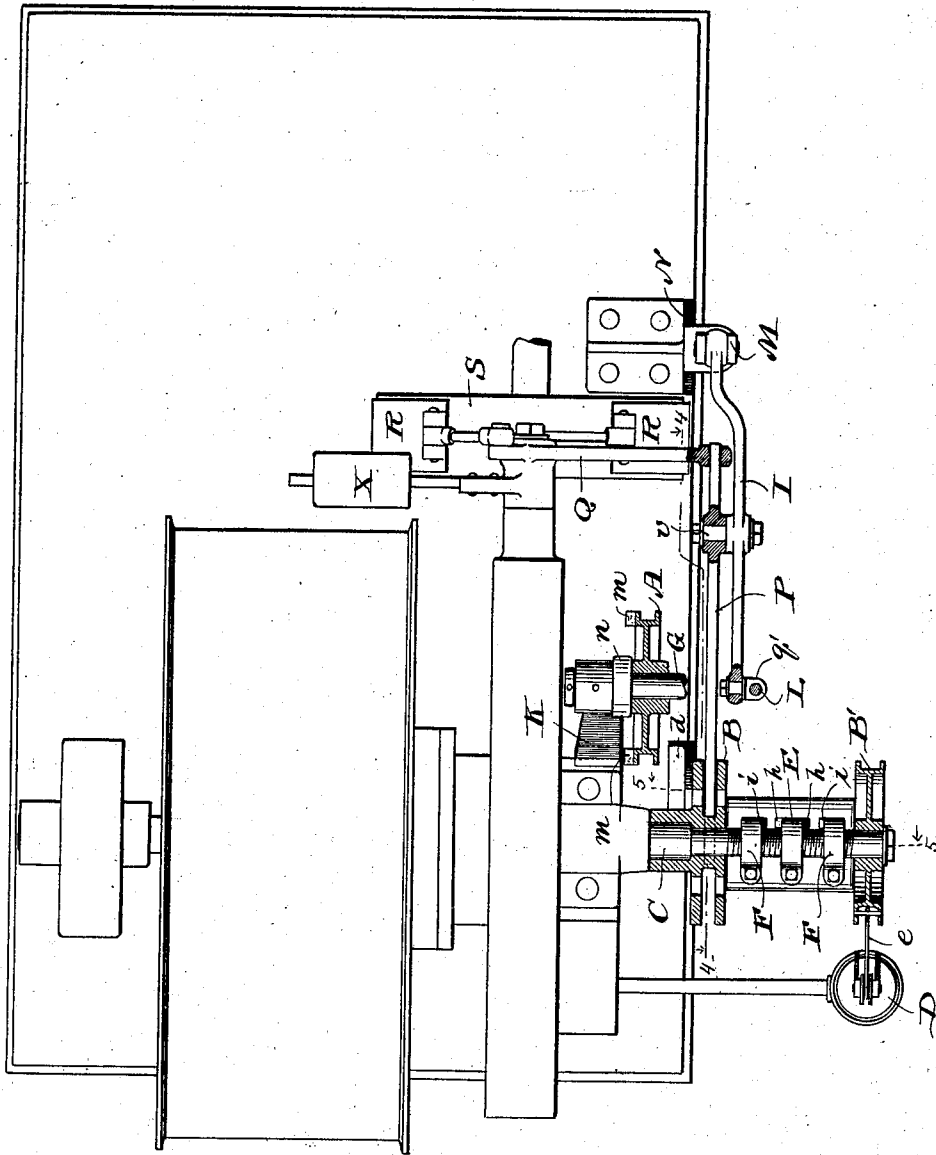


Fig. 3.

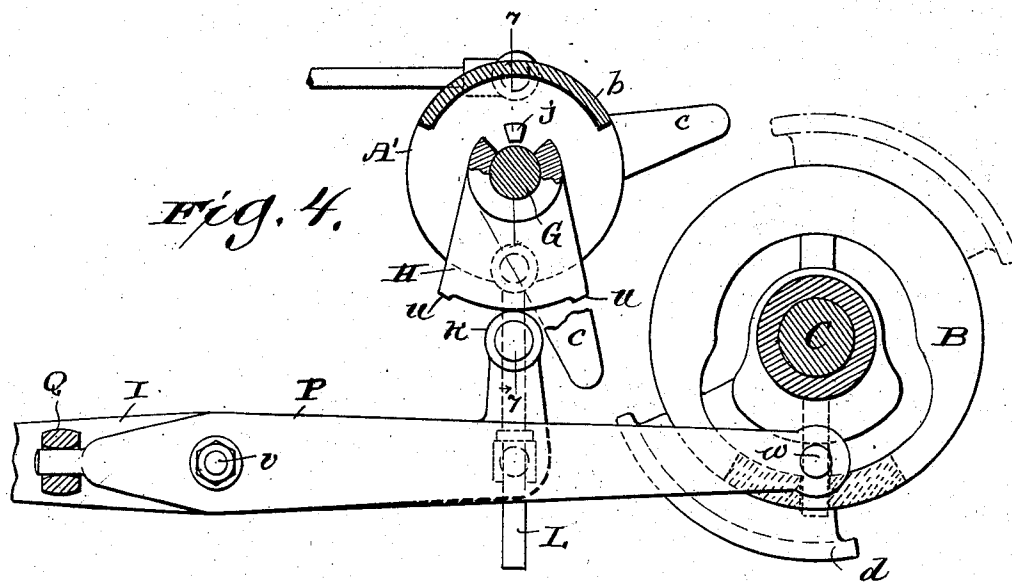
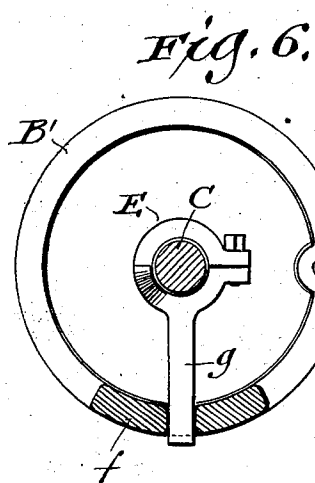
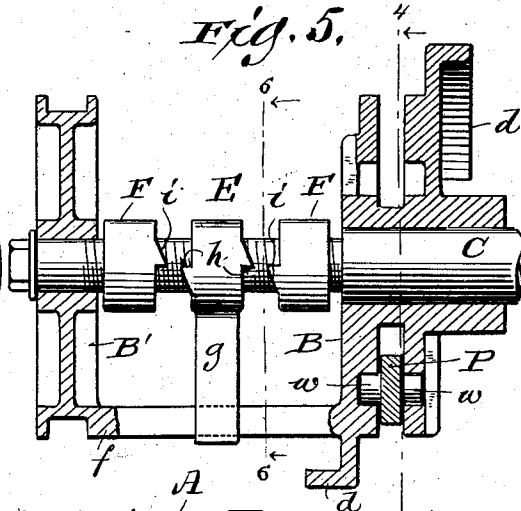
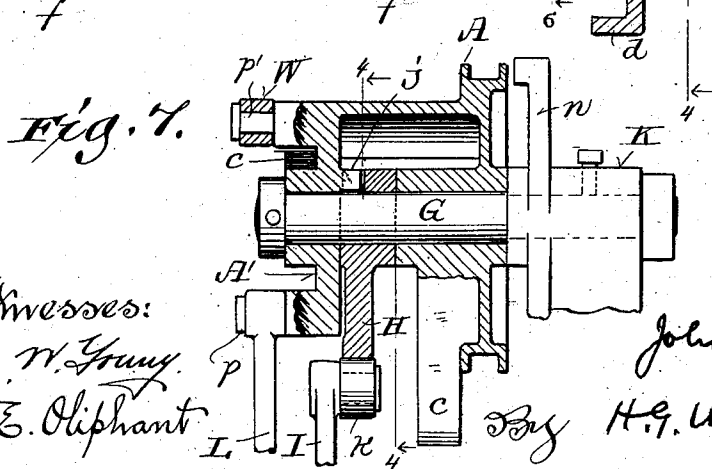
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4 SHEETS—SHEET 4.



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UNITED STATES PATENT OFFICE.

JOHN DILLON, OF MILWAUKEE, WISCONSIN.

ELEVATOR MECHANISM.

SPECIFICATION forming part of Letters Patent No. 742,173, dated October 27, 1903.

Application filed January 26, 1903. Serial No. 140,544. (No model.)

To all whom it may concern:

Be it known that I, JOHN DILLON, a citizen of the United States, and a resident of Milwaukee, in the county of Milwaukee and State of Wisconsin, have invented certain new and useful Improvements in Elevator Mechanism; and I do hereby declare that the following is a full, clear, and exact description thereof.

My invention has especial reference to electric elevators, its object being to prevent over-running of the car of an elevator at terminal landings and to provide for automatic cut-out of the motor and a like setting of the brake pertaining to said car should the operator fail to do the work for a stop at either of said landings. Hence said invention consists in certain peculiarities of construction and combination of parts hereinafter particularly set forth with reference to the accompanying drawings and subsequently claimed.

Figure 1 of the drawings represents a partly-sectional side elevation of electric-elevator mechanism in which my improvements are embodied; Fig. 2, a partly-transverse section view of the same, indicated by lines 2 2 in the first figure; Fig. 3, a partly-horizontal section view of said mechanism, indicated by line 3 3 in said first figure; Fig. 4, a view indicated by lines 4 4 in the third, fifth, and seventh figures; Fig. 5, a view indicated by lines 5 5 in the third figure; Fig. 6, a view indicated by line 6 6 in the fifth figure, and Fig. 7 a view indicated by line 7 7 in the fourth figure.

The mechanism herein shown is similar to that ordinarily employed in the application of electric energy and friction with respect to the operation of an elevator in so far as it involves an electric motor and rheostat, a cable-drum, a friction-brake, a start-and-stop rocker, and means in connection with the rocker for controlling the motor and brake, said mechanism being arranged and connected on a supporting-frame of suitable construction.

Referring by letters to the drawings, the start-and-stop rocker is shown made to comprise a sheave A and wrist-plate A', connected by a web b, the whole being, preferably, a single casting having a pair of radially-projecting tappets c at an acute angle to each other, one being extended from said sheave

and the other from said wrist-plate. The arrangement of the rocker-tappets is such that one or the other is in the path of one or the other of a pair of wipers d, that are in one piece or otherwise rigid with a preferably double cam B loose on the drum-shaft C, this cam being operative against yielding resistance by which it is automatically returned to normal position. The resistance herein shown is a weight D, connected by a sheave-supported flexible device e with a pulley-wheel B', that is also loose on the drum-shaft and connected by a longitudinally-grooved web f with the cam B, this cam, the pulley-wheel, and connecting-web being, preferably, a single casting. Instead of a weight it is practical to employ a suitably arranged and connected spring for the yielding resistance, or the cam may be counterbalanced.

Outward from cam B the drum-shaft is screw-threaded and engaged by a traveling nut E, that has its play between a pair of tight nuts F, adjustable on said shaft. The traveling nut is provided with a shank g, that plays in the groove of the web f, connecting the cam B with the pulley-wheel B', and clutch-lugs h on opposite sides of said nut are for engagement with similar lugs i, extending inward from said tight nuts. The distance apart of the tight nuts is proportionate to the distance between terminal landings for the elevator-car, and at about the time this car arrives at either of said landings a clutch engagement of the traveling nut with one of said tight nuts will result in a movement of the cam B and pulley-wheel B' therewith on the drum-shaft against the yielding resistance aforesaid.

Arranged on the arbor G, that supports the aforesaid rocker, is the hub of a loose pend-ent cam H, and a segmental recess in the cam-hub is engaged by a lug j, that extends inward from the wrist-plate portion of said rocker, movement on the part of this rocker in either direction serving to actuate said cam when said lug reaches either extremity of said recess, in which it is centered if the motor be cut out and the brake set.

The lower end of the cam H opposes an anti-friction-roller k, with which an upturned crank end of a lever I is provided, and said cam is timed to move nearly the distance of

a full throw in either direction of the hand device by which an operator in the elevator-car actuates the rocker, motion of the hand device being communicated to said rocker by means of a belt J, that passes around the sheave portion A of same. The rocker-sheave A is provided with stop-lugs *m*, between which is arranged an arm *n* of a bracket K, attached to a frame-standard, the arbor G for the rocker and cam H being set in the bracket.

A shouldered pin L is loose at one end on a wrist *p*, with which the plate A' of the rocker is provided, and a guide *q* for the pin has swivel connection with the aforesaid crank end of lever I, the other end of this lever being coupled to a rod M, guided in the head of a standard N and surrounded by a spiral spring *r* under tension between a washer *s* and nuts *t* on said rod below the standard-head. The spring *r* constitutes a yielding resistance to a tilt of lever I by the cam H, pin L, or both; but some other yielding resistance may be employed in practice for the same purpose.

The major portion of the working face of cam H is a segment of a circle between projections *u*, and it is preferable in practice to have clearance between roller *k* and the opposing portion of said cam intermediate of said projections when the pin L is centered in stop position, at which time the pin-shoulder *q'* in contact with the guide *q* serves to take the strain that would otherwise come upon the aforesaid cam.

The lever I is shown fulcrumed about midway of its length on a pivot-bolt *v*, that engages an aperture provided in another lever P, one end of which is provided with oppositely-arranged studs *w*, engaging grooves of the double cam B, above specified, the other end of the lever P being connected to the weighted arm Q in toggle connection with the friction-shoes R, that oppose the brake-wheel S, fast on the shaft T of the electric motor.

The switch-arbor *x* of the rheostat U, in conjunction with the electric motor V, is provided with a toothed segment *y*, engaged by a rack *z* at one end of a rod W, the other end of this rod being loose on a wrist *p'* of the plate A' of the rocker above specified, the wrists *p p'* of said plate being diametrically opposite one another.

From the foregoing it will be readily understood that when the rocker, cams, and levers are in the positions herein shown and described the motor is cut out and the brake set. The rocker being swung in either direction from the position illustrated, the pin L moves up in its guide *q*; but the cam H holds the brake set until the roller *k*, carried by the lever I, is cleared by said cam, said brake being then automatically released by the power of the weight X, in connection with the brake-arm Q, and the motor is cut in. During this operation a projection *u* of cam H works on the roller *k*, carried by the lever I, and the increase of exertion necessary on the part of

the operator to make said cam clear said roller insures a full throw of the rocker in the desired direction, whereby any chance of the brake being released before cut in of the motor is avoided, the mechanism being so timed that the rheostat switch-bar will be nearly in on contacts when the cam projection is acting on said roller to tilt said lever on its fulcrum against the yielding resistance. A reverse operation will serve to cut out the motor and set the brake when it is desirable to stop the elevator-car at any landing, and at a terminal landing there is an automatic operation of the cam B, due to clutch of traveling nut E with a tight nut F on the drum-shaft C, whereby the lever P is operated to increase the tension of said brake, and thus prevent over-running of the elevator-car. The yielding resistance in connection with pulley-wheel B' restores cam B to normal position when the traveling nut E moves out of clutch with a tight nut F on the drum-shaft. The rocker being swung to release the brake and cut in the motor, a tappet *c* of said rocker is in the path of one of the wipers *d* of the cam B, and should the operator fail to cut out said motor and set said brake when the elevator-car is approaching a terminal landing there will be action of said wiper on said tappet to thereby automatically shift said rocker for the purpose of cutting out the aforesaid motor, this operation being timed to take place ahead of an automatic setting of the aforesaid brake by action of said cam on the lever P, above specified.

While a preferred construction and arrangement of parts has been shown and described in conjunction with the rocker for actuating the lever I, the detail of mechanism for this purpose may be varied in practice without departure from the scope of my invention.

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

1. An elevator mechanism comprising means in conjunction with a drum-shaft and brake thereof for automatic setting of the brake at greater than ordinary hand-controlled tension whenever the elevator-car arrives at either of its terminal landings.

2. An elevator mechanism comprising means in conjunction with a drum-shaft and brake thereof for automatic setting of the brake at greater than ordinary hand-controlled tension whenever the elevator-car arrives at either of its terminal landings, a start-and-stop rocker provided with a pair of tappets, and a pair of wipers with the means aforesaid arranged to be one or the other in position to operate upon a tappet of said rocker when the latter is adjusted to permit running of said car.

3. An elevator mechanism comprising a partly-screw-threaded drum-shaft, tight clutch-nuts on the threaded portion of said shaft, a traveling clutch-nut on the same

shaft between the tight clutch-nuts, a cam loose on the aforesaid shaft and provided with a pair of wipers, a guide in connection with the cam engaged by a shank with which the traveling clutch-nut is provided, a lever controlled by said cam, a brake-arm in connection with the lever, and a start-and-stop rocker provided with a pair of tappets arranged to be one or the other thereof in the path of a cam-wiper when said rocker is at full throw in either direction from stop position.

4. An elevator mechanism comprising a start-and-stop rocker, a cam arranged and connected to be actuated by the rocker when the same is on throw to and from stop position, a lever arranged to be operated by the cam, another lever with which the one aforesaid has fulcrum connection, a brake-arm in connection with the second lever, and means for automatically actuating said second lever independent of the first to increase tension of the brake whenever the elevator-car arrives at a terminal landing.

5. An elevator mechanism comprising a start-and-stop rocker, a cam arranged and connected to be actuated by the rocker when the same is on throw to and from stop position, a lever arranged to be operated by the cam, another lever with which the one aforesaid has fulcrum connection, yielding resistance opposing cam action on the first lever, a brake-arm in connection with the second lever, and means for automatically actuating said second lever independent of the first to increase tension of the brake whenever the elevator-car arrives at a terminal landing.

6. An elevator mechanism comprising a start-and-stop rocker, a cam arranged and connected to be actuated by the rocker when the same is on throw to and from stop position, a lever arranged to be operated by the cam, a shouldered pin in wrist connection with said rocker, a pin-guide in swivel connection with said lever and in contact with the pin-shoulder when said rocker is centered in stop position, another lever with which the one aforesaid has fulcrum connection, a brake-arm in connection with the second lever, and means for automatically actuating said second lever independent of the first to increase tension of the brake whenever the elevator-car arrives at a terminal landing.

7. An elevator mechanism comprising a start-and-stop rocker provided with a pair of

radially-projecting tappets, a cam arranged and connected to be actuated by the rocker when the same is on throw to and from stop position, a lever arranged to be operated by the cam, a drum-shaft having a screw-threaded portion, tight clutch-nuts on the threaded portion of said shaft, a traveling clutch-nut on the same shaft between the tight clutch-nuts, a cam loose on the aforesaid shaft and provided with a pair of wipers arranged to be one or the other thereof operative against one or the other of said tappets when the aforesaid rocker is at full throw in either direction from stop position, a guide in connection with the drum-shaft cam engaged by a shank with which the traveling clutch-nut is provided, another lever controlled at one end by said drum-shaft cam and with which the lever aforesaid has fulcrum connection, and a brake-arm in connection with the other end of the second lever.

8. An elevator mechanism comprising a start-and-stop rocker, a lever and means in conjunction with the rocker for actuating the lever, another lever in fulcrum connection with the one aforesaid, a brake-arm in connection with the second lever, and means for automatically actuating said second lever independent of the first to increase tension of the brake whenever the elevator-car arrives at a terminal landing.

9. An elevator mechanism comprising a start-and-stop rocker, provided with a pair of radially-projecting tappets, a lever and means in conjunction with the rocker for actuating the lever, another lever in fulcrum connection with the one aforesaid, a brake-arm in connection with the second lever, a drum-shaft, a cam loose thereon in connection with said second lever and provided with wipers arranged to be one or the other thereof operative against one or the other of said tappets when the aforesaid rocker is at full throw in either direction from stop position, and means whereby the cam is automatically actuated when the elevator-car arrives at a terminal landing.

In testimony that I claim the foregoing I have hereunto set my hand, at Milwaukee, in the county of Milwaukee and State of Wisconsin, in the presence of two witnesses.

JNO. DILLON.

Witnesses:

N. E. OLIPHANT,
BERNARD C. ROLOFF.