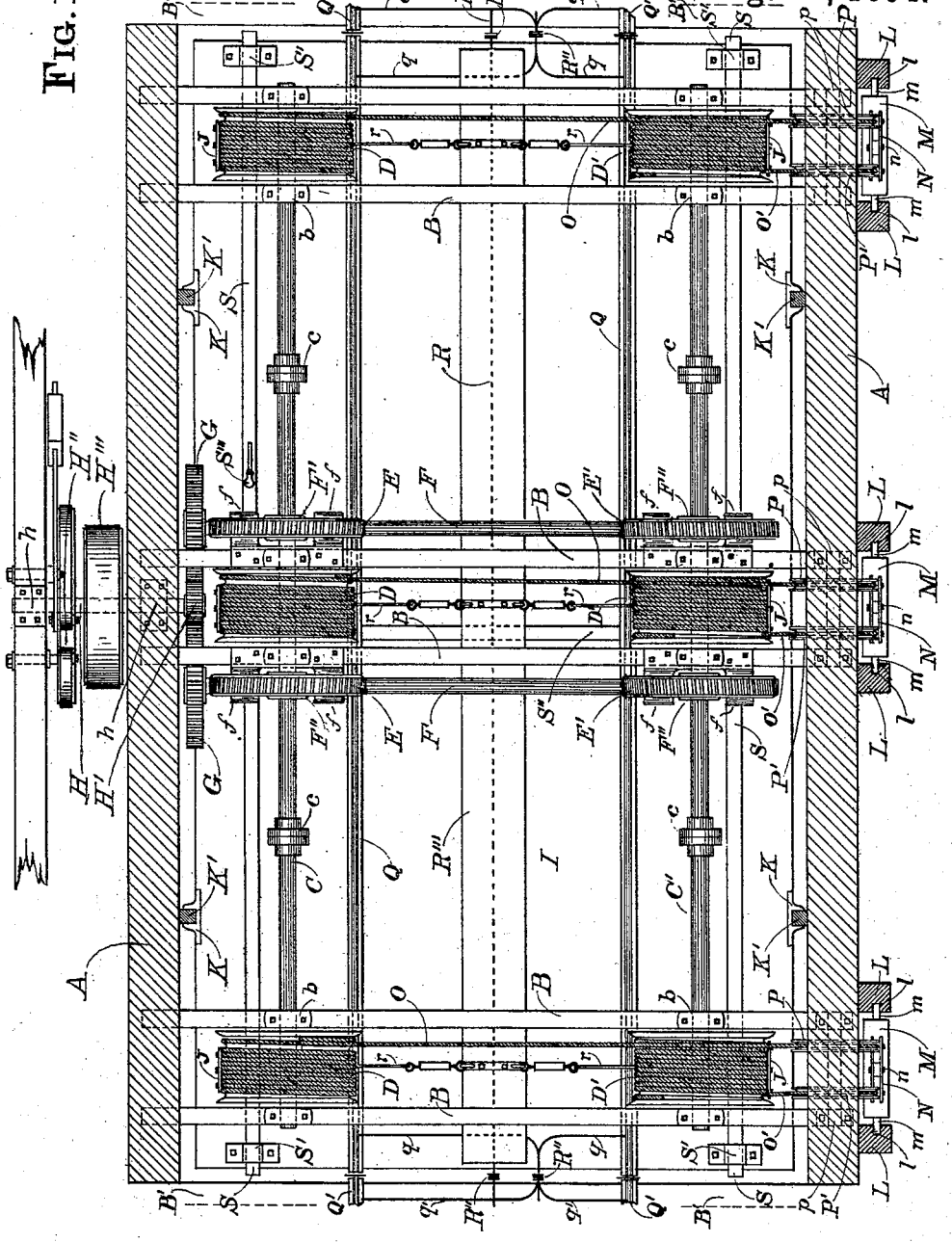
(No Model.) 4 Sheets—Sheet 1.

G. T. McLAUTHLIN, M. W. E. BRUNKHORST & M. B. McLAUTHLIN.

RAILROAD CAR ELEVATOR.

No. 524,344. Patented Aug. 14, 1894.

FIG. 1.



WITNESSES:
J. Kenny
John A. Johnson.

INVENTORS
George Thomas McLauthlin
Martin Wilhelm Eberhard Brunkhorst
Martin Bernard McLauthlin
by James Naylor Jr ATTORNEY.

(No Model.) 4 Sheets—Sheet 2.

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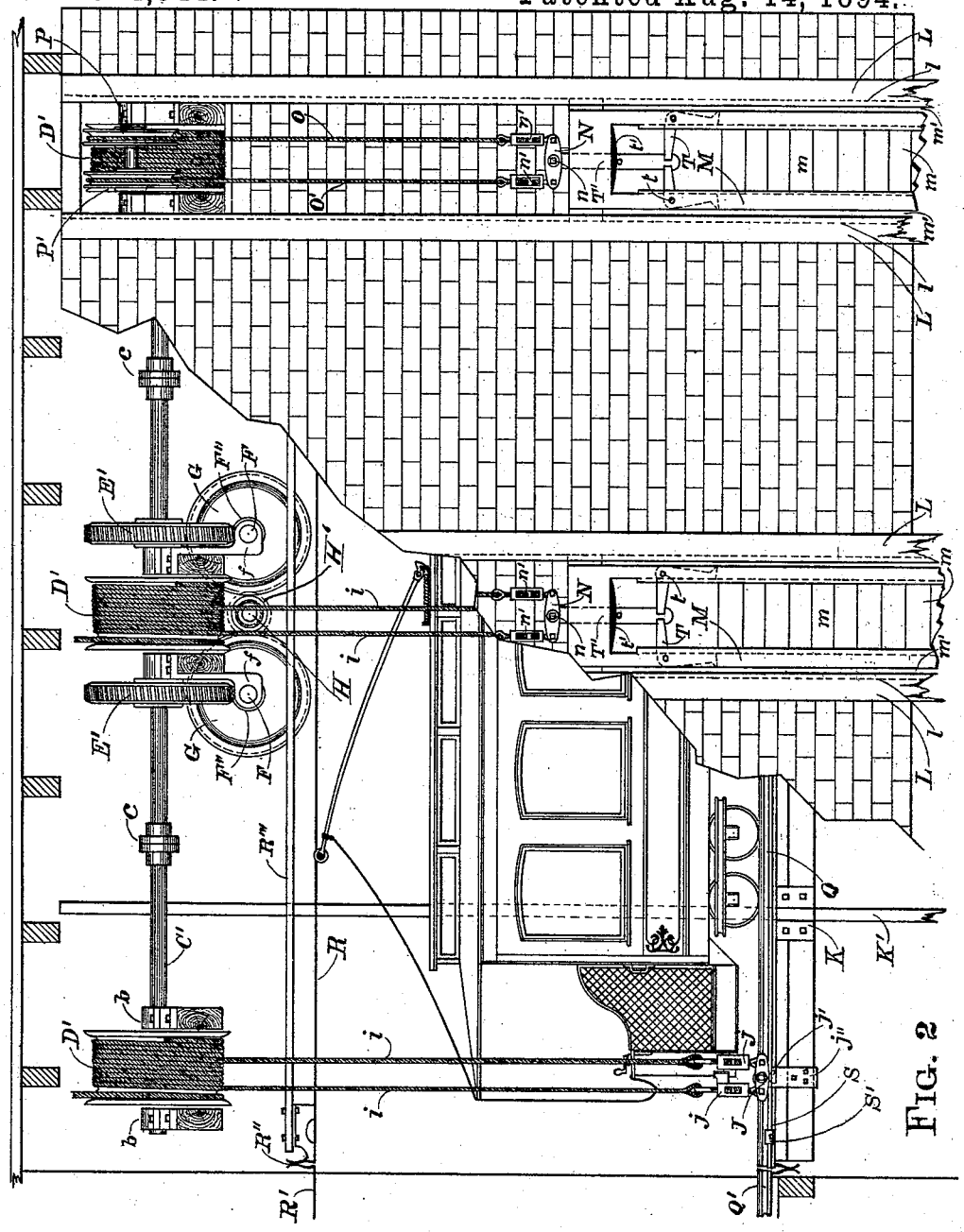

FIG. 2

WITNESSES:
A. Kenny
John A. Johnson

INVENTORS
George Thomas McLauthlin
Martin Wilhelm Eberhard Brunkhorst.
Martin Bernard McLauthlin
by James Naylor Jr ATTORNEY.

(No Model.) 4 Sheets—Sheet 3.

G. T. McLAUTHLIN, M. W. E. BRUNKHORST & M. B. McLAUTHLIN.

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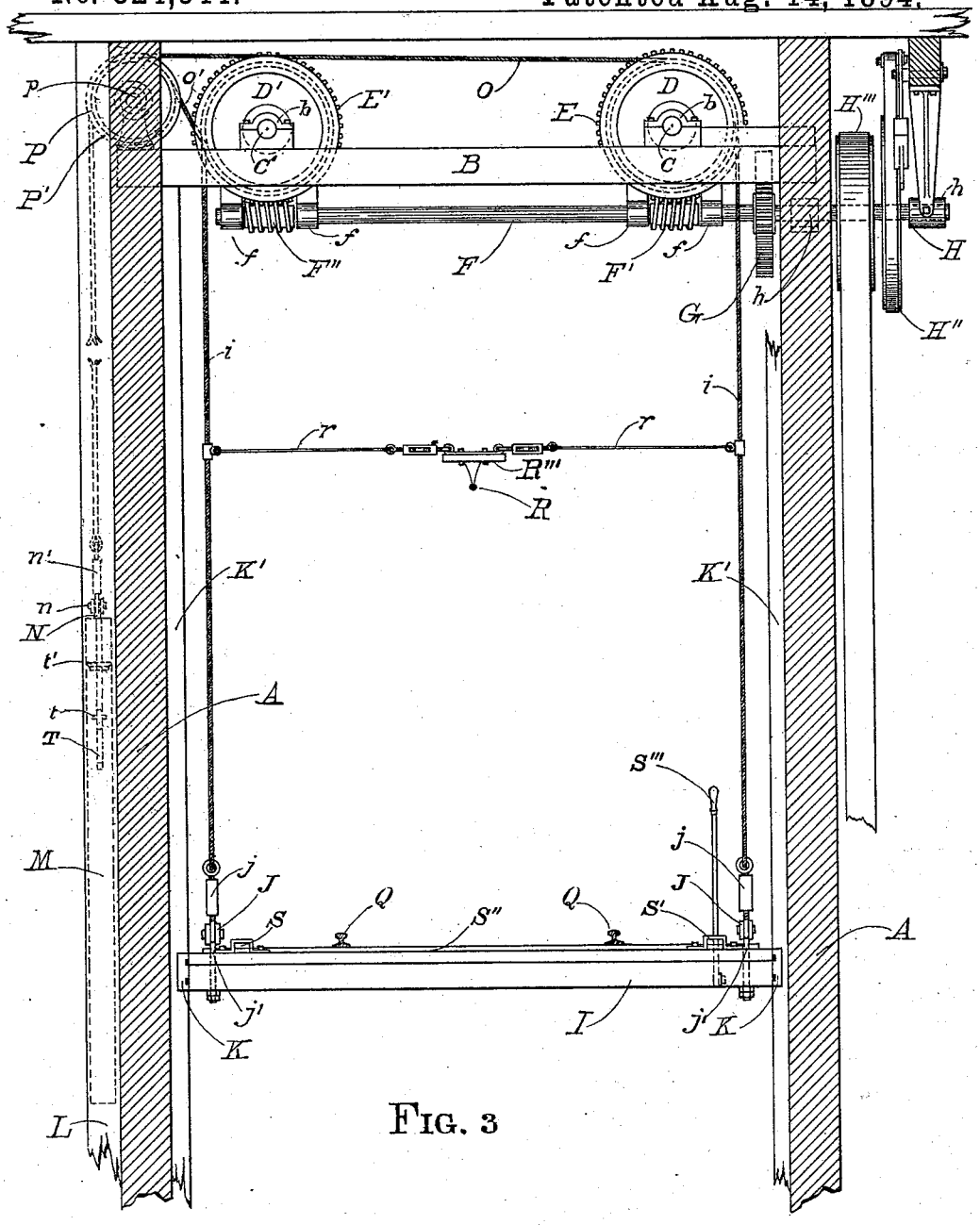

FIG. 3

WITNESSES:
A. Kenny
John. A Johnson

INVENTORS
George Thomas McLauthlin
Martin Wilhelm Eberhard Brunkhorst
Martin Bernard McLauthlin
by James Naylor Jr ATTORNEY.

(No Model.) 4 Sheets—Sheet 4.

G. T. McLAUTHLIN, M. W. E. BRUNKHORST & M. B. McLAUTHLIN.

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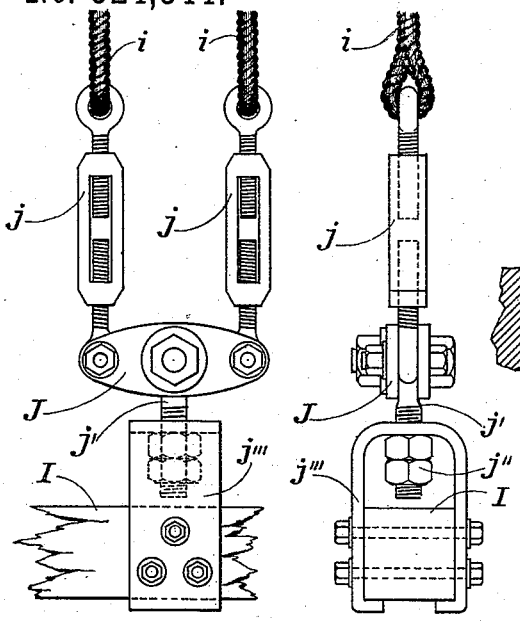

FIG. 4

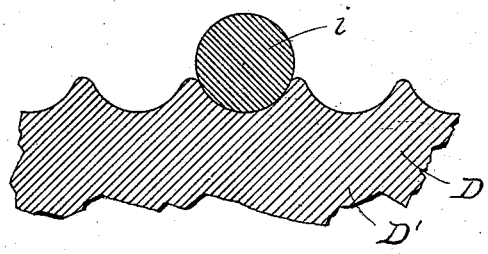

FIG. 5

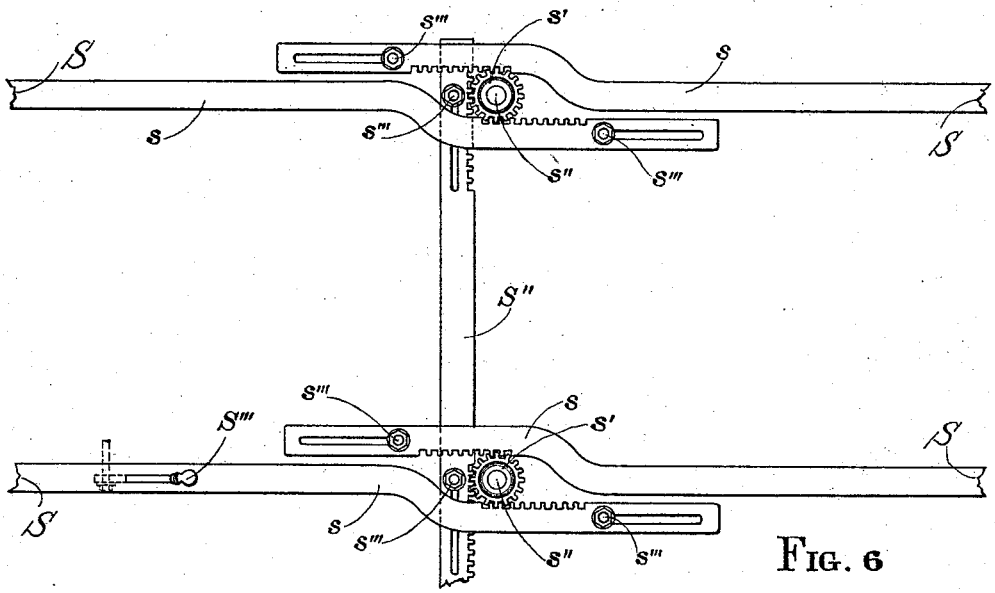

FIG. 6

WITNESSES:
A. Kenny
John A. Johnson.

INVENTOR
George Thomas McLauthlin
Martin Wilhelm Eberhard Brunkhorst.
Morten Bernard McLauthlin.
by James Naylor Jr ATTORNEY.

UNITED STATES PATENT OFFICE.

GEORGE THOMAS McLAUTHLIN, OF BOSTON, MARTIN WILHELM EBERHARD BRUNKHORST, OF SOMERVILLE, AND MARTIN BERNARD McLAUTHLIN, OF MALDEN, MASSACHUSETTS; SAID BRUNKHORST AND MARTIN BERNARD McLAUTHLIN ASSIGNORS TO SAID GEORGE THOMAS McLAUTHLIN.

RAILROAD-CAR ELEVATOR.

SPECIFICATION forming part of Letters Patent No. 524,344, dated August 14, 1894.

Application filed November 6, 1893. Serial No. 490,171. (No model.)

To all whom it may concern:

Be it known that we, GEORGE THOMAS McLAUTHLIN, of Boston, in the county of Suffolk, MARTIN WILHELM EBERHARD BRUNKHORST, of Somerville, and MARTIN BERNARD McLAUTHLIN, of Malden, county of Middlesex, State of Massachusetts, have invented certain new and useful Improvements in Railroad-Car Elevators; and we do hereby declare the following to be a full, clear, and exact description of the construction and operation of the invention, as will enable others skilled in the art to which it appertains to make and use the same, reference being had to the accompanying drawings, together with the letters of reference thereon, which also form a part of this specification.

The object of these improvements is to provide means for the raising and lowering of railroad cars vertically from one elevation to another and to accomplish such with safety and certainty and by an economic use of power.

They consist essentially of the construction and operation of parts in such manner that the power applied to move the load is applied and distributed evenly over the entire area of the surface moved; and that the sustaining power to hold the load is also distributed over the same area. Also of the application of an auxiliary power in such manner, that the prime mover is enabled to raise a load that without it, would be excessive.

They also consist in the equalization of strains, and in the distribution of wearing surfaces so that friction is greatly reduced; and in other features which will be hereinafter fully described and set forth in the claims.

Figure 1 is a general plan view taken from under the joists of the roof; Fig. 2 a general side elevation showing an electric car on the platform; Fig. 3 an end elevation; Figs. 4, 5 and 6 being detail views.

A A A A represent the masonry walls, which serve to support the whole construction of the elevator.

B B B B B B are the cross beams which are built into the walls, which support and to which are secured all the bearing boxes *b b b b b b b b b b b b* which carry the drum shafts C and C′ parallel to each other. These shafts are in three lengths each, and are connected by the couplings *c c c c*. Secured upon the shaft C are the drums D D D and to the shaft C′ the drums D′ D′ D′. All these drums are scored so that about one third of the cable's circumference has a perfect bearing upon the surface of the drum as seen in Fig. 5. This scoring is cutting a spiral groove into the periphery of the drums, a lead to suit the diameter of the cable. The scoring of the drums D D D is left hand and D′ D′ D′ right hand, or the reverse of each other.

E E are worm gears having teeth to engage a left hand worm; and secured to the shaft C.

E′ E′ are worm gears having teeth to engage a right hand worm, and secured to the shaft C′.

F F are the intermediate shafts having the left hand worms F′ F′, the right hand worms F″ F″ and the gears G G secured thereto, and mounted in the bearing boxes *f f f f f f f f* which are bolted to the cross beams B B. These intermediate shafts are each a duplicate of the other.

Supported in the bearing boxes *h h* is the primary shaft H, to which the pinion H′ is secured. This pinion engages and drives the gears G G.

H″ is a brake pulley, having a brake band of ordinary make, and operative connections therefrom to each floor.

H‴ is the main pulley to which motion is communicated from any prime mover having reversible motions.

I is the platform suspended by twelve cables *i i i i i i i i i i i i* in the well way. All these cables have one end secured to the drums, there being two cables to each drum, one of which is made fast at the middle and the other at or near the edge, both cables traversing the scoring in the same direction. Each two cables thus secured to each drum

have their lower ends made fast to the outer ends of the balanced levers J J J J J J by an adjustable fastening. See Fig. 4. The cables terminate at the loops, and are connected by the turnbuckles *j j j j j j* to the ends of the balanced levers.

The whole weight of the platform and load is suspended from the center-pins of the balanced levers by the eye bolts *j' j' j' j' j' j'*, thus equalizing the strain to both cables. The whole strain of the twelve cables or of the six pairs is equalized by the adjustment of the eye bolts at *j''*; see Fig. 4. These eye bolts may extend entirely through the platform, thus dispensing with the straps *j'''* and bringing the jam nuts below the platform instead of above it as shown in Figs. 1 and 3. The platform is provided with the guide slides K K K K secured thereto which slide against the vertical posts K' K' K' K' extending the whole height of travel of the platform. These guide posts are made secure to the walls A A. There are other guide posts L L L L L L provided with grooves *l l l l l l*.

M M M are heavy frames carrying additional weights *m m m m m* and provided with the lugs *m' m' m' m' m' m'*, which freely enter the grooves of the posts. The aggregate weight of all these frames and parts may exceed the weight of unloaded platform and frictional resistance combined.

N N N are balanced levers and are linked to the frames M M M by the pins *n n n*. At the end of the levers are the turnbuckle connections *n' n' n' n' n' n'* which adjust and hold the cables thereto. These cables are in three pairs, each pair being connected to one of the frames M. The cable O passes over the carrying sheave P, said sheeve mounted to turn freely upon the stationary shaft *p*; and to the drum D upon the shaft C where it is secured so as to coil reversely to the cables upon the same drum which sustain the platform and load. The other cable of the pair O' passes over another carrying sheave P', also mounted upon the shaft *p*, and passes to the drum D' upon the shaft C', where it is also secured so as to coil reversely to the cables upon the same drum which sustain the platform and the load. It is evident that the same scoring on the drums will serve for both cables, since when the one is coiled the other is uncoiled and vice versa.

Secured to the platform I are the rails Q Q so laid as to conform to the required gage. Connecting rails Q' Q' Q' Q' on the floors at either or both ends of the well way facilitate the moving on and off of cars; and to further facilitate the moving of electric cars, the overhead wire R is held in position so as to move with the platform. It has the wipers or electric connections R'' at each end and is made secure to and insulated from the longitudinal support R'''; the whole being held and sustained in position by the lateral wire supports *r r r r r r* provided with means for adjustment and located at the proper elevation above the platform. The ends of all the electric wires at the well way are also provided with wipers R'', and it is obvious that all such wires and wipers are properly insulated.

When an ordinary trolley car is upon the platform the electric circuit is complete at any floor level.

The rails Q Q and Q' Q' are connected by the wires *q q q q*, wipers R'' R'', and wires *q' q' q' q'*.

To bring the rails Q Q and Q' Q' to an exact level at the different floors, are the slide bolts S S S S passing freely through the yokes S' S' S' S', which are firmly secured to the platform, so that the slide bolts are upon the upper surface of the platform, and held thereto by the yokes. These slide bolts have an in and out movement over the edge of the platform, so as to clear the floors when drawn in and to come to a bearing upon the floors over the cross beams B' B' when set out. The mechanism to move the slide bolts consist of the toothed extensions *s s s s* of said bolts intermeshing the pinions *s' s'* mounted freely upon the studs *s'' s''* secured into the platform floor; the connecting rack bar S'' also intermeshing said pinions, and guides *s''' s''' s''' s''' s''' s'''* to hold the teeth in engagement. Other simple means may be used for operating these slide bolts, the main object being to move all together from a hand lever; part of the mechanism may be placed under the platform if desired.

The ordinary safety appliance may be used in connection with each pair of cables to prevent any drop of the platform or sag of any part of it, in event of slip or breakage to any part.

A safety appliance is inserted in the frames M M M consisting of the angle lever dogs T T pivoted at *t*, and bifurcated into the center strap T', said dogs having chisel ends to cut into the posts L L in event of action. A double elliptic spring *t'* is inserted between the weight and a pin through the center strap to insure the action of the dogs. The weight of the whole part M closes the spring *t'* and so holds it continually; which in event of unforeseen slip or breakage is always ready to force out the chisel end dogs into the posts and thus prevent the fall of the weight, which in such cases might do excessive damage.

The operation is as follows:—The platform is supposed to be at the level of a floor, with the slide bolts out and in contact with the floor over the cross beams B' B', so that said beams sustain a considerable part of the weight of the platform and its load. The car, if an ordinary steam car, is run on the platform by a locomotive, if an electric car of the trolley type, it is run on by its own motor and the electric circuit provided at the floor levels; and if the car is of light build it may be run on by hand. The movement of the platform

is always first to relieve the slide bolts and must be upward; the bolts are then drawn in and the platform with its load is free to either lower or ascend to the other floors. The reversible motions to raise and lower are governed and given by the motor to the pulley H upon the primary shaft which through the gears H′ and G G revolve the intermediate shafts F F both in the same direction, which in turn through the worms F′ F′ and F″ F″ and worm gears E E and E′ E′ give the slow powerful motion to the drum shafts; the motion of the shaft C being in a reverse direction to that of the shaft C′. The reverse direction of these parallel shafts enables the construction within confined walls, because the cables *i i i i i i i i i i i i* may all be brought within an inch of the walls. This reverse direction also provides for a perfect balance of strain, the load giving an equal compression strain on each of the intermediate shafts between the worms F′ and F″. It will, therefore, be observed that all end thrust of worm shafts is avoided, and that every shaft of the whole construction is entirely free from end strains. The platform and its load is moved by the coiling and uncoiling of the cables from the drums. The over-sustaining power of the frames and weights M M M being applied by the cables O O O and O′ O′ O′ to said drums in a reverse direction to the cables *i i i i i i i i i i i i* insuring to the prime mover a less force to move the load than its equivalent would otherwise call for; or in other words, a motor of four horse power can be made to lift a load upon the platform that actually calls for five horse power under ordinary construction. The platform and its load are held from any horizontal end or side play by the guides and the guide posts, as also the frames M M M are held by their guides and grooves. When the load and platform is a little above the required floor elevation, the slide bolts S S S S are set out by the lever S″ through the mechanism shown, so that said bolts are in position to come into bearing upon the floor over the cross beams. The suspended platform and load is then settled down so that the slide bolts come in positive bearing.

All the electric connections are made by the position of the platform at each floor, which makes some of the parts moving with the platform a part of the electric circuit.

The car, if an ordinary steam car, is hauled off, if a trolley electric car it moves off by its own motor and the electric circuit formed by the position of the platform at the different floors; and if a car of light build may be pushed off by hand.

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

1. In a railroad car elevator, the combination with platform, and two series of rotatable drums and wormwheels, said wormwheels being operatively connected and located in each series alternately with said drums; of a series of cables secured to said drums and to said platform and means for guiding said platform in its movement, substantially as shown and described.

2. In a railroad car elevator the combination with the platform; of means for raising and lowering said platform, means for guiding the platform in its movement, the slide-bolts S—S—S—S, toothed extensions *s—s—s—s*, pinions *s′—s′*, connecting rack bar S″, and hand lever operatively connected to said slide-bolts substantially as described.

3. In a railroad car elevator the combination with the platform and a series of rotatable drums; of a series of cables in pairs secured to said drums and to said platform, means for guiding the platform in its movement, weights M—M—M and cables in pairs connecting each weight with two separate drums mounted upon separate shafts substantially as described.

4. In a railroad car elevator, the operatively connected worm wheels and shafts C—C′; in combination with the drums secured to said shafts alternately with said worm wheels, the platform and connecting cables to said drums, and the counterweights with their connecting cables also to said drums, substantially as shown and described.

5. In a railroad car elevator the combination with means for sustaining the platform and load consisting of the cables secured near the edges of said platform and connected to drums, said drums, shafts C C and wormwheels secured thereto, right and left worms and shafts F F; of means whereby said shafts F F are given their motions to raise or lower the said sustained platform and load as herein set forth.

6. In a railroad car elevator, the platform I provided with the rails Q Q, mechanism to sustain and move same vertically from floor to floor, conductor wires R and *q q q q* supported by and moving with said platform and provided with the wipers R″ R″ in combination with the supported and stationary wires R′ R′ R′ R′ and *q′ q′ q′ q′*, provided also with the wipers R″ R″ R″ R″, substantially as shown and for the purpose specified.

7. In a railroad car elevator, the primary shaft H, connecting mechanism therefrom to the intermediate shafts, said shafts each provided with the right and left hand worms to engage the worm gears; said worm gears secured to the shafts C and C′; said shafts, drums and cables in combination with the platform provided with guides, and suspended directly from the drums to the platform; and the guide posts substantially as shown and described.

8. In a railroad car elevator the combination with the movable platform and means

for guiding it in its movement; of the shaft H pinion H′ on said shaft, shafts F—F gears G—G on said shafts F—F meshing with the pinion H′, worms F′—F′—F″—F″ on said shafts F—F, shafts C—C, wormwheels on said shafts C—C meshing with said worms F′—F′—F″—F″, drums on said shafts C—C and cables connecting said drums with said platform substantially as described.

In testimony whereof we have hereunto signed our names in the presence of two subscribing witnesses.

GEORGE THOMAS McLAUTHLIN.
MARTIN WILHELM EBERHARD BRUNKHORST.
MARTIN BERNARD McLAUTHLIN.

Witnesses:
A. KENNY,
JOHN A. JOHNSON.