Jan. 22, 1929. 1,699,544

J. M. ROHLFING

MOVABLE PLATFORM

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Fig. 1.

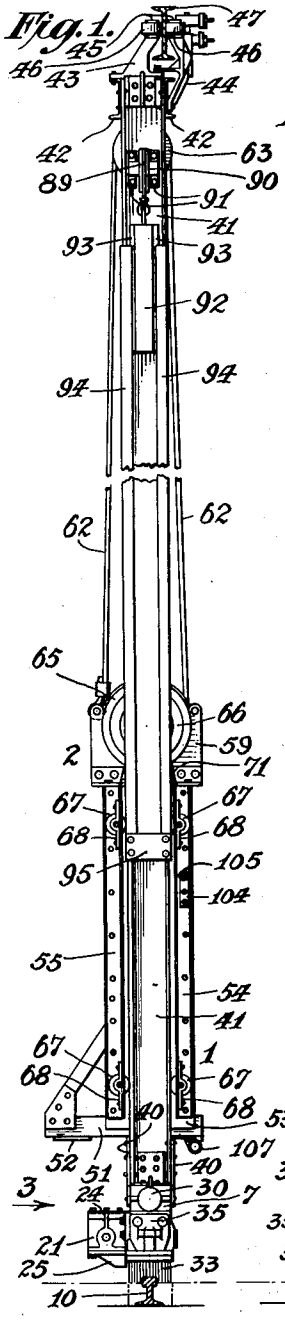
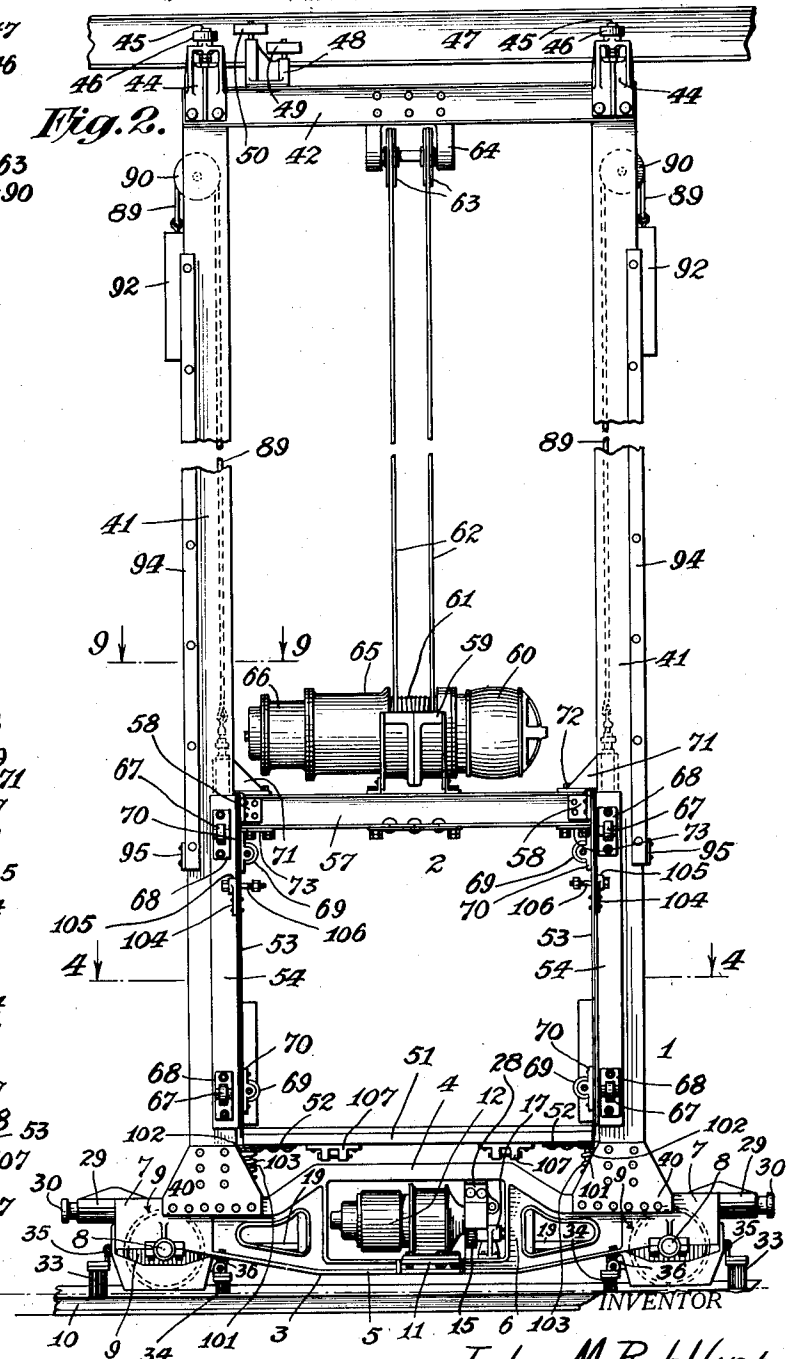


Fig. 2.



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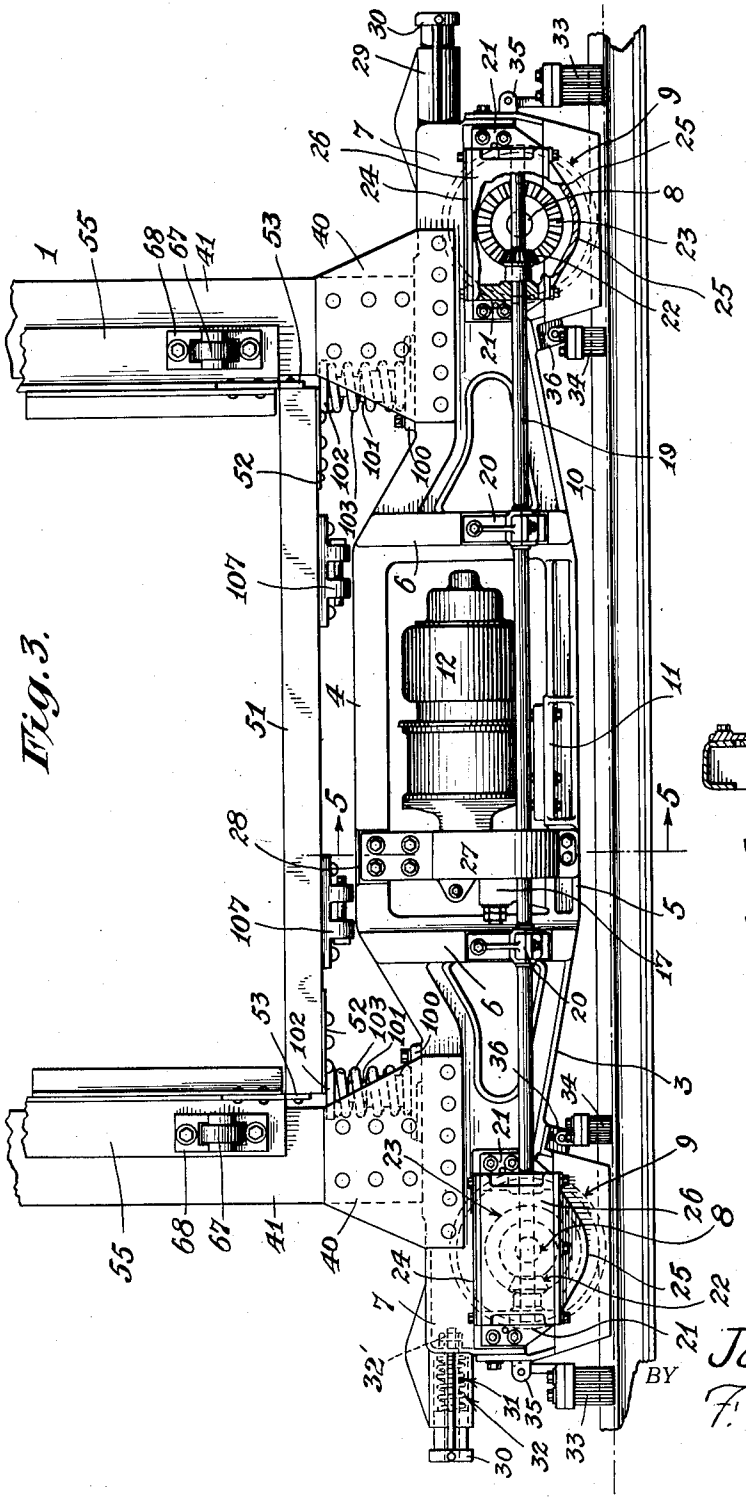


Fig. 3.

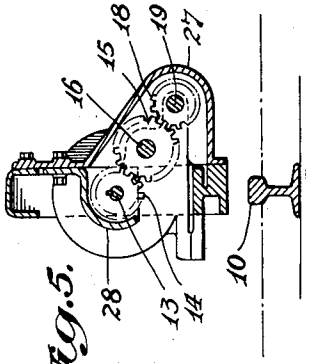


Fig. 5.

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Fig. 4.

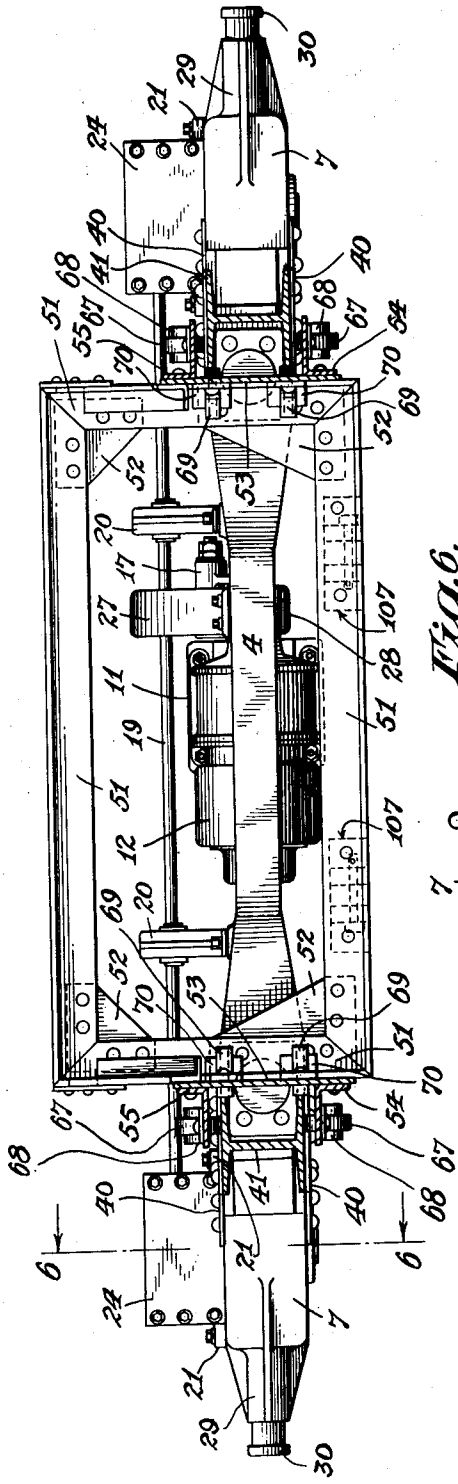
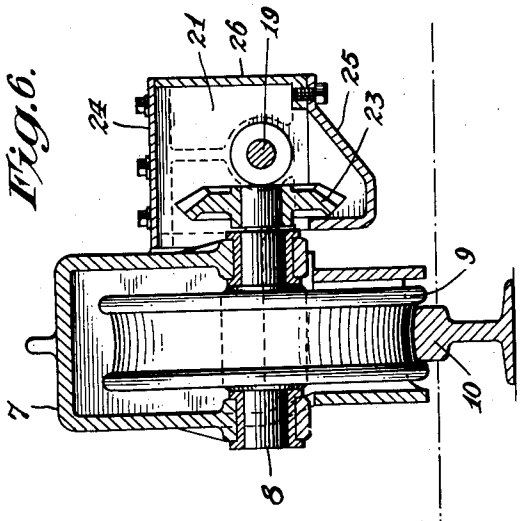


Fig. 6.



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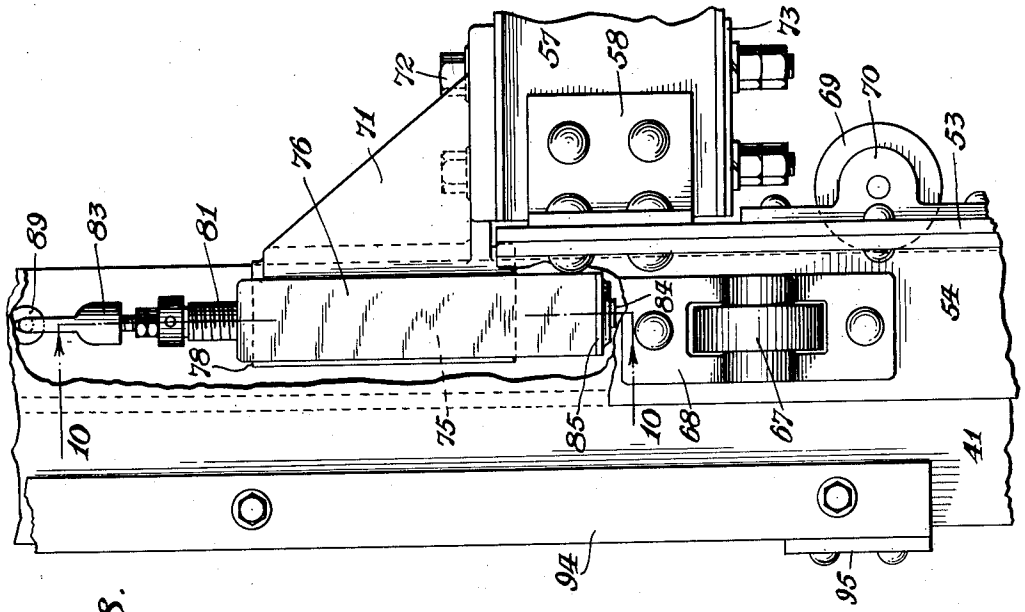


Fig. 8.

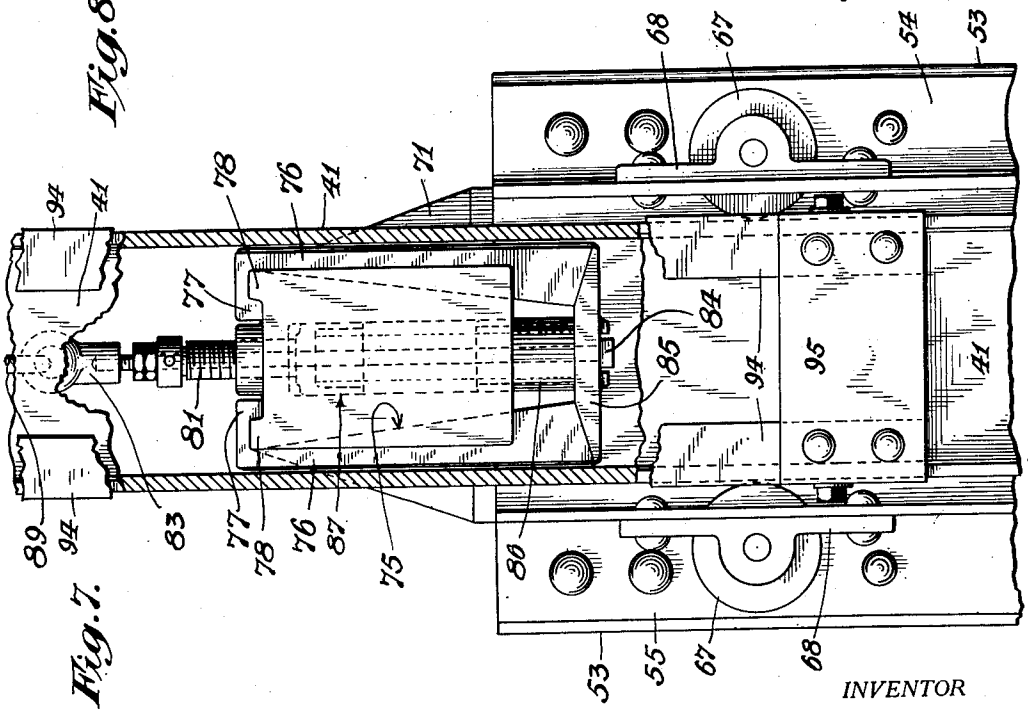


Fig. 7.

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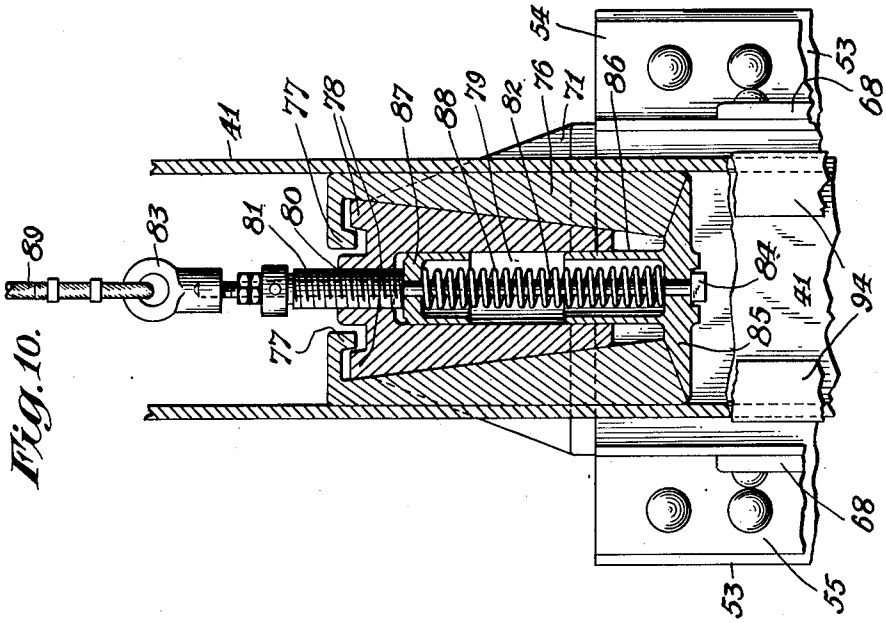


Fig. 10.

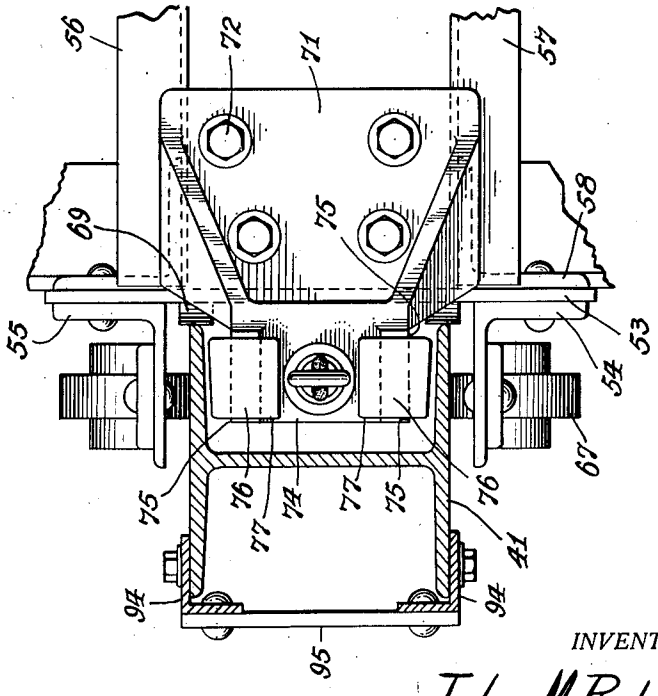


Fig. 9.

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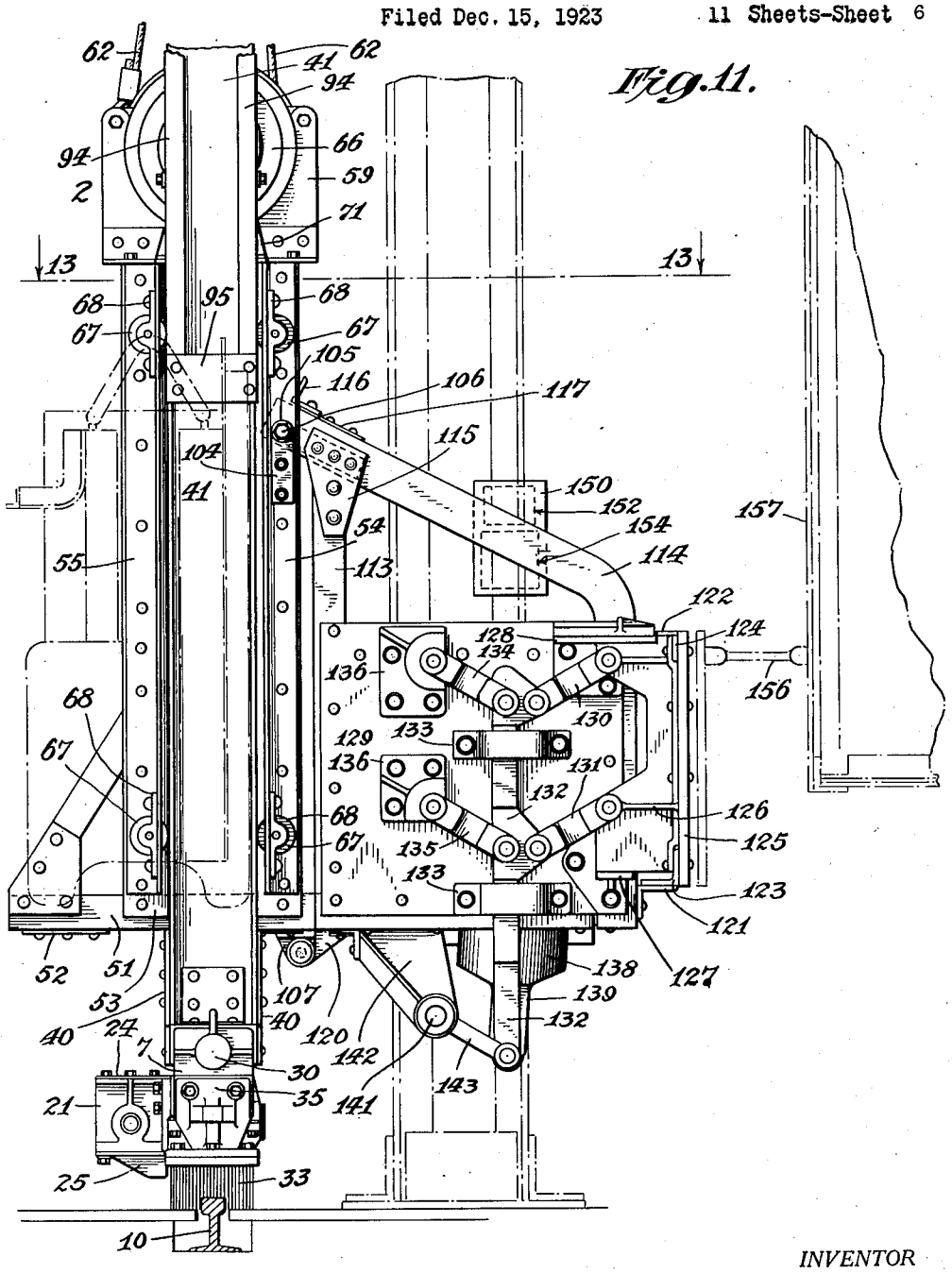
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Fig. 11.



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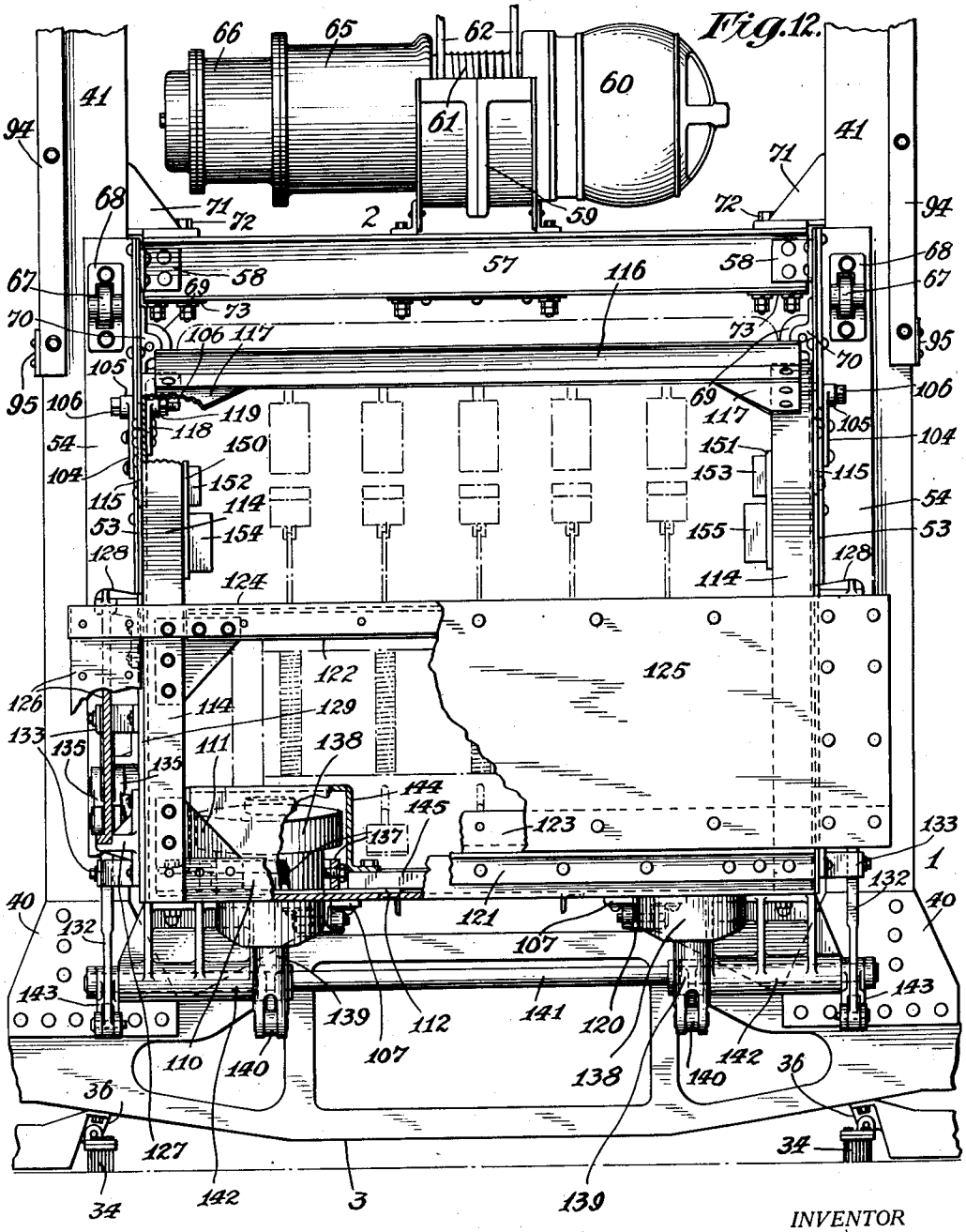
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Fig. 12.



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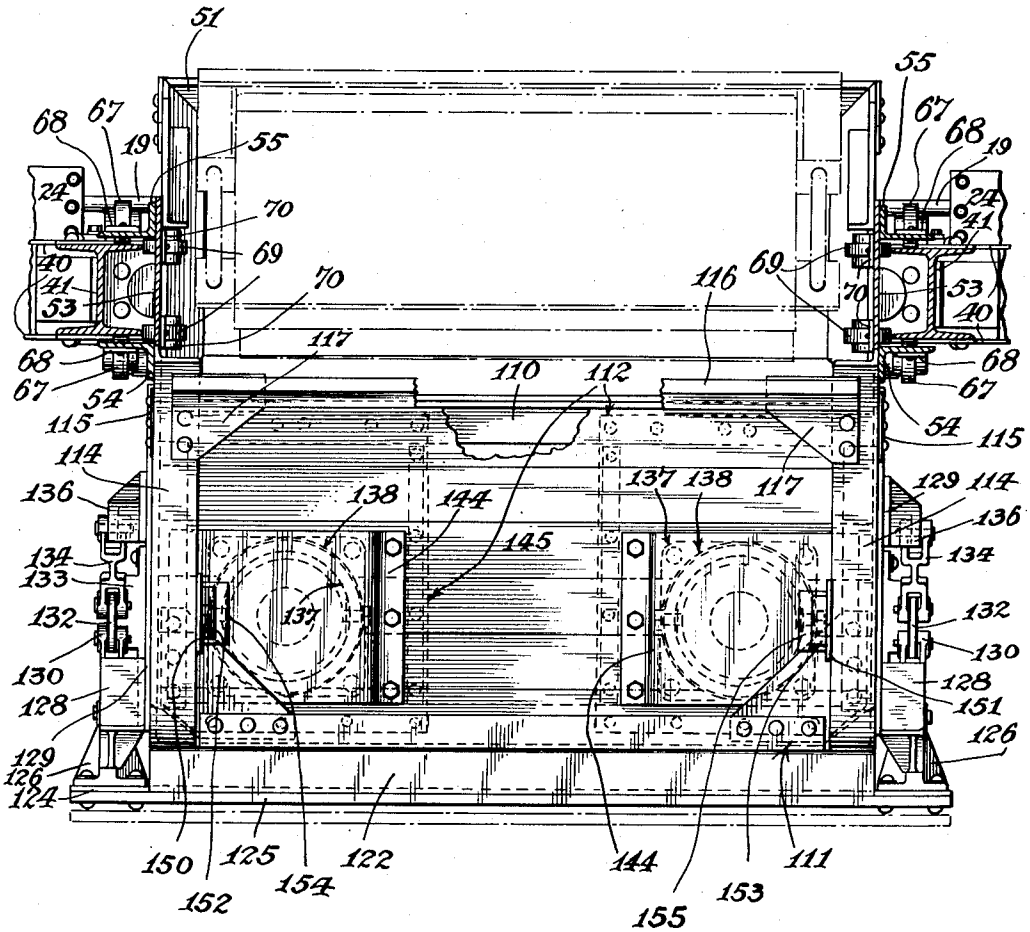
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MOVABLE PLATFORM

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Fig. 13.



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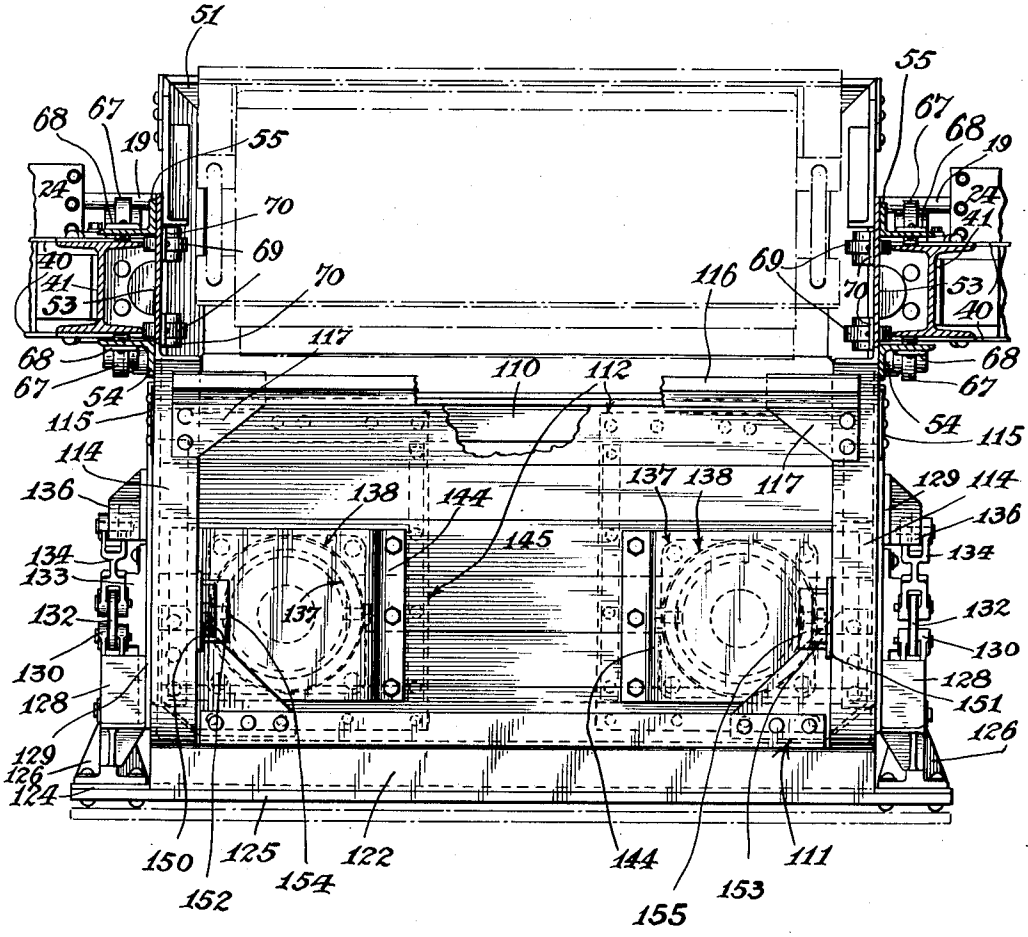
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Fig. 13.



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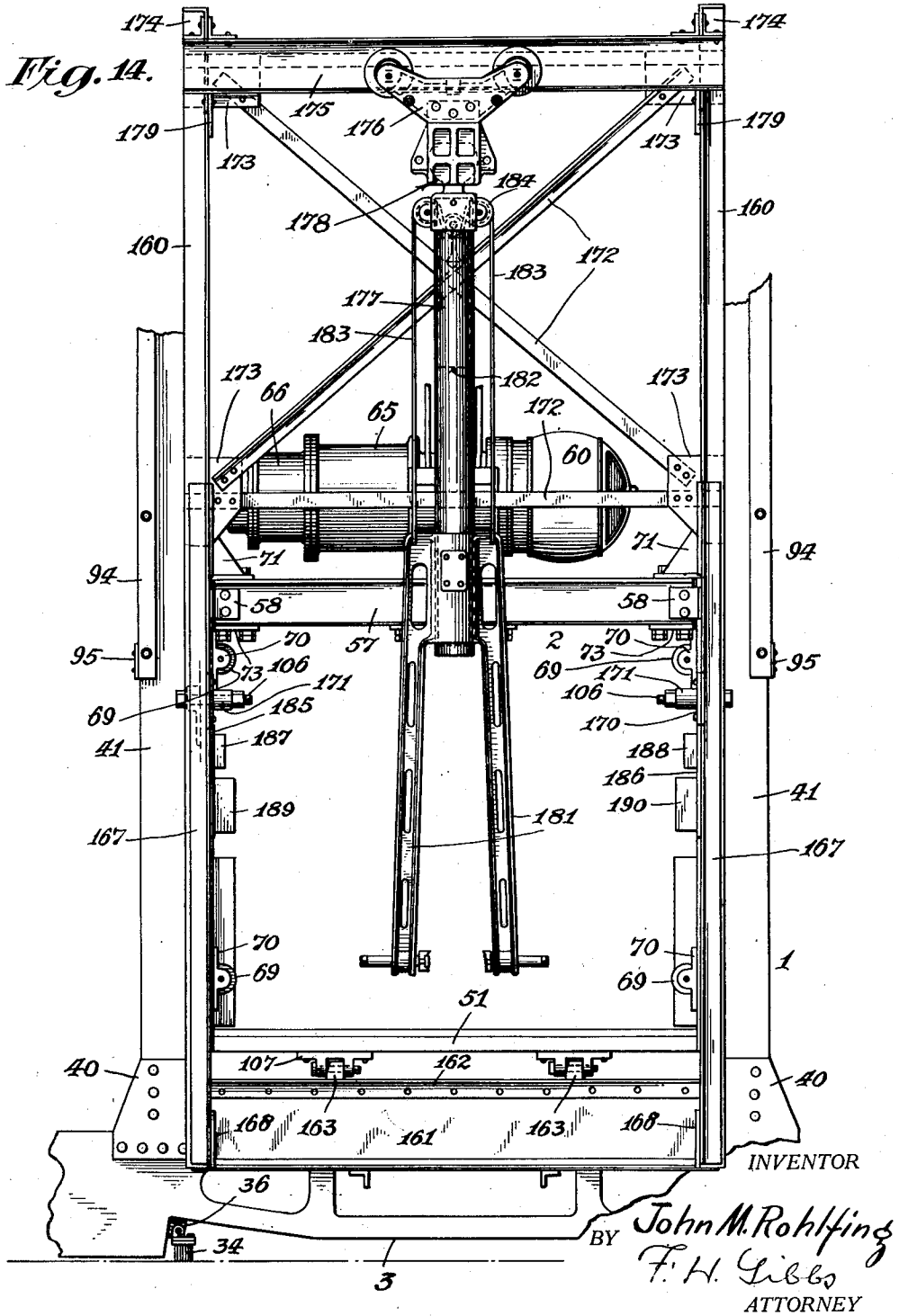
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Fig. 14.



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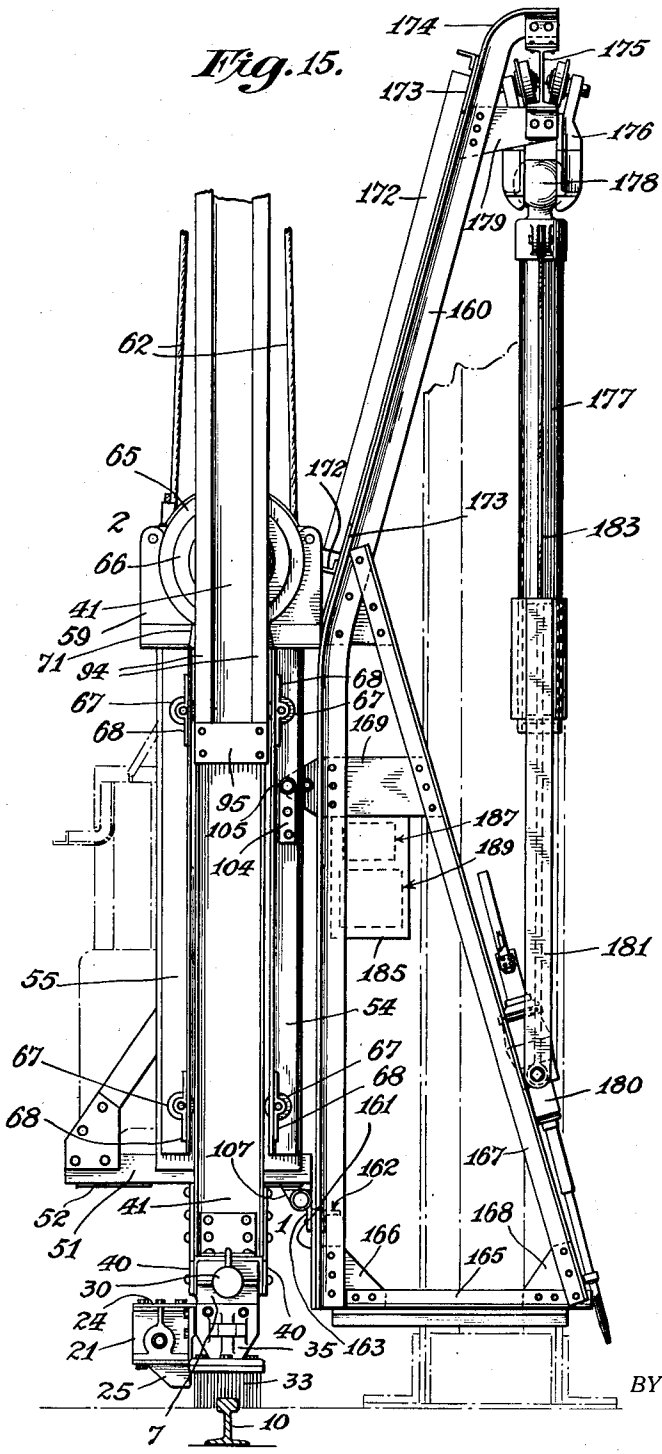
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MOVABLE PLATFORM

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Fig. 15.



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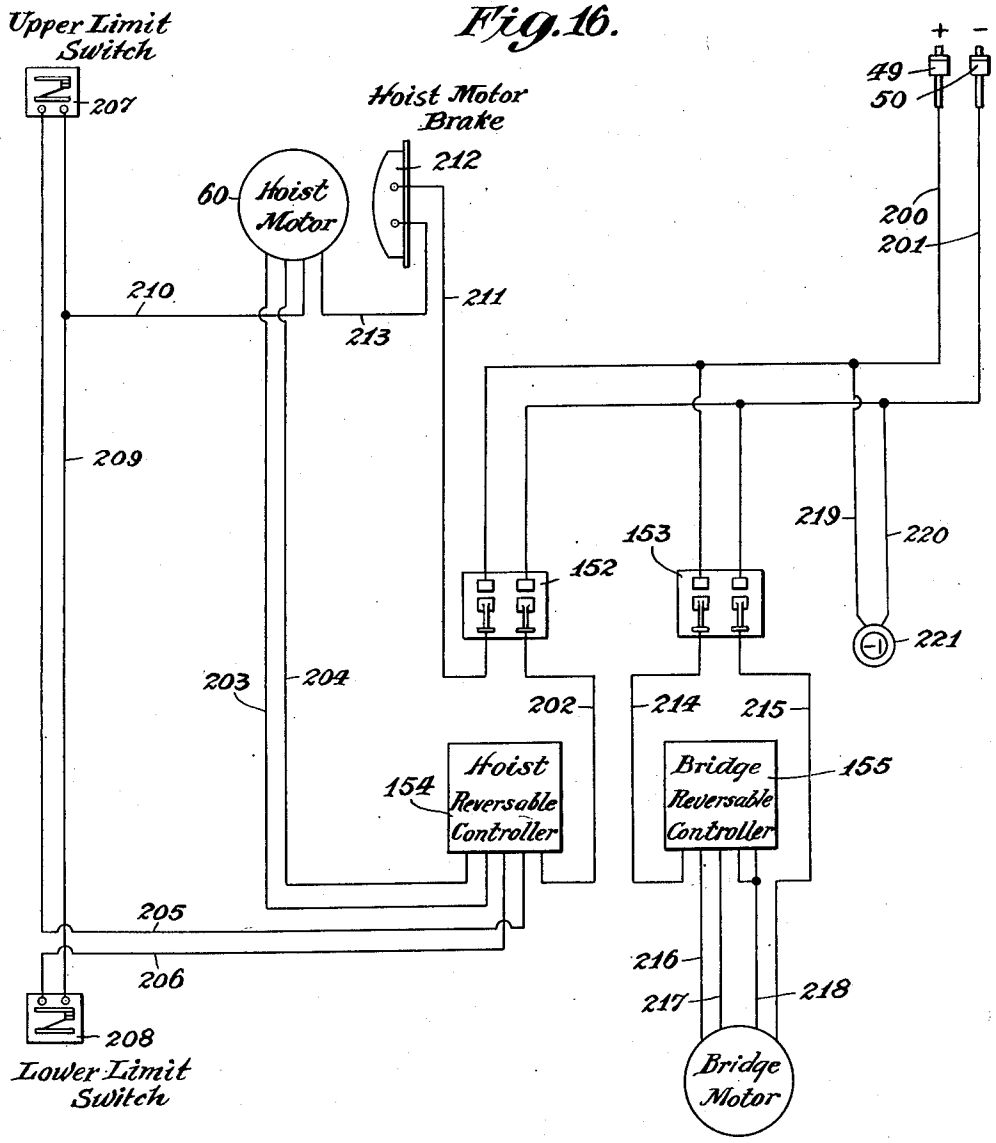
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Fig. 16.



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Patented Jan. 22, 1929. 1,699,544

UNITED STATES PATENT OFFICE.

JOHN M. ROHLFING, OF PLAINFIELD, NEW JERSEY, ASSIGNOR TO AMERICAN CAR AND FOUNDRY COMPANY, OF NEW YORK, N. Y., A CORPORATION OF NEW JERSEY.

MOVABLE PLATFORM.

Application filed December 15, 1923. Serial No. 680,880.

Reference is had to the accompanying drawings which illustrate the preferred form of the invention; though it is to be understood that the invention is not limited to the exact details of construction shown and described, as it is obvious that various modifications thereof within the scope of the claims will occur to persons skilled in the art.

In said drawings:

Fig. 1 is a broken end elevation of a carriage and an elevator for supporting a platform constructed in accordance with this invention;

Fig. 2 is an elevation of the structure shown in Fig. 1;

Fig. 3 is an elevation on a larger scale of the lower portion of the structure shown in Fig. 1, looking in the direction of the arrow 3 shown in Fig. 1;

Fig. 4 is a horizontal section taken on the line 4—4 of Fig. 2, looking in the direction of the arrows;

Fig. 5 is a vertical section taken on the line 5—5 of Fig. 3, looking in the direction of the arrows;

Fig. 6 is a vertical section taken on the line 6—6 of Fig. 4, looking in the direction of the arrows;

Fig. 7 is a view in elevation, partly broken away, showing the manner of securing the counterweights to the elevator;

Fig. 8 is a view in elevation similar to and taken at right angles to the view of Fig. 7;

Fig. 9 is a section, drawn to a larger scale and taken on the line 9—9 of Fig. 2;

Fig. 10 is a section taken on the line 10—10 of Fig. 8;

Fig. 11 is a partial end elevation of the carriage and elevator with a riveting platform carried thereby, the rivet heater, car side and post of the building frame being indicated by broken lines to show the relative positions thereof;

Fig. 12 is an elevation of the structure shown in Fig. 11, looking from the riveting platform side, parts being broken away to show other parts more clearly;

Fig. 13 is a section taken on the line 13—13 of Fig. 11 and showing the riveting platform in plan view;

Fig. 14 is a partial elevation of the carriage and elevator having a platform equipped with a reaming device carried thereby, the reaming tool being omitted from this view;

Fig. 15 is an end elevation of the structure shown in Fig. 14, the reaming tool being shown; and

Fig. 16 is a diagram of the electrical wiring for the elevator and carriage operating motors.

It is an object of this invention to provide an improved supporting carriage and an elevator carried thereby to which platforms equipped for performing work of different kinds may be attached and it is also an object of this invention to provide improved platforms for attachment to the elevator for use in performing work of different kinds. It is also an object of this invention to provide an improved means for automatically checking the descent of the elevator in the event of the parting of the elevator supporting cables or upon the sudden operation of the elevator motor to lower the elevator. It is also an object of this invention to provide each of the platforms which may be attached to the elevator with controlling means for the carriage and elevator operating motors, the controlling means being designed to meet the requirements of each platform.

As shown in the drawings this invention comprises a carriage or bridge 1 adapted to carry an elevator or hoist 2 to which platforms suited for different classes of work are adapted to be interchangeably secured. The carriage 1 comprises a truck having a frame 3 composed of separate spaced top and bottom members 4 and 5, respectively, which are joined or connected at intermediate points by vertical members 6, and are united at their ends to form channel-shaped portions or structures 7 in which are journaled the axles 8 having thereon wheels 9 which are adapted to travel upon track 10. The bottom member 5 is formed with a seat 11 to which is secured a motor 12 driving through reduction gearing a shaft 13 upon which is mounted a pinion 14 which meshes with the pinion 15 journaled upon a stub axle 16 mounted in a bracket 17 carried by the bottom member 5. The pinion 15 also meshes with a pinion 18 keyed upon a shaft 19 journaled in bearings 20 secured to the vertical members 6 of the frame 3. The ends of the shaft 19 are journaled in bearings formed in brackets 21 secured to the end portions 7 of the frame and have keyed thereon pinions 22 which mesh with gears 23 keyed upon the axles 8. Top and bottom cover plates 24 and 25, respectively, are secured to the brackets 21 and are

joined by the front plates 26, the plates and the brackets forming casings which enclose the gears, protecting the gears from dirt and serving to retain the lubricant therefor. The pinions 14, 15 and 18 are protected by a casing comprising a member 27 secured to the top and bottom members 4 and 5, respectively, and a member 28 secured to the member 27. Formed integral with the channel-shaped end portions 7 are annular projecting portions 29 which have the buffing members 30 slidably mounted therein, each buffing member 30 being formed with a reduced portion 31 which is surrounded by a spring 32 and has an end projecting through an opening in the end portion 7 and carrying lock nuts 32'. The brushes 33 and 34 pivotally mounted in brackets 35 and 36, respectively, secured to the frame serve to remove small obstructions from the track 10.

Resting on and secured to the end portions 7 by gusset plates 40 are vertical guide members or elevator ways 41 formed of I-beams having their flanges parallel with the axis of the truck and having their upper ends connected by channel members 42. Secured to the channel members 42 and guide members 41 are brackets 43 and 44 in which are mounted stub-axles 45 adapted to receive rollers 46 which engage upon opposite sides of the I-beam guide member 47 which guides and supports the upper end of the carriage frame. Secured to the channels 42 is a bracket 48 in which are mounted, but insulated therefrom, the current collectors 49 and 50 which engage conductors, (not shown) which serve as a source of power for the motors used to operate the device.

Mounted for reciprocation in the guides 41 is the elevator or hoist 2 which comprises a structurally complete frame including a rectangular floor frame composed of angles 51 united at their ends by gusset plates 52, and vertical members composed of a plate 53 and angles 54 and 55 spaced from each other and lying on opposite sides of the guides 41. The lower ends of the vertical members are secured to the floor frame, and their upper ends are connected by the channels 56 and 57 which are secured to the plates 53 by angle pieces 58. Mounted upon the channels 56 and 57 is a bracket 59 in which is mounted a hoisting device comprising a motor 60 which operates a drum 61 about which are wound the cables 62 which pass over sheaves 63 carried by brackets 64 secured to the channel members 42 and are connected to the casing 65 of the hoisting device. The casing 65 is provided with a portion 66 in which is placed the usual automatic electrically operated brake used with this type of hoist. To guide the elevator in its movement in the guides 41 the angles 54 and 55 are provided with openings through which project rollers 67 mounted in brackets 68 secured to the angles 54 and 55, the rollers engaging the outer surfaces of the flanges of the I-beams forming the vertical guide members 41. The plate 53 is also provided with openings through which project similar rollers 69 mounted in brackets 70 secured to the plates 53, the rollers 69 engaging with the edges of the flanges of the I-beams forming the guides 41.

Secured to the channels 56 and 57 are brackets 71 having openings to receive bolts 72 which pass between the channels and engage plates 73 in engagement with the bottom flanges of the channels. Each bracket 71 is provided with a portion 74 which projects into the opening between the flanges of a guide member 41 and is provided with surfaces 75 which diverge upwardly and receive tapered brake shoes 76 which fit between the flanges of the guide member 41 and the surfaces 75 and are provided at their upper ends with hook portions 77 which engage with lugs 78 formed on top of the projecting portion 74 of the bracket 71. The projecting portion 74 of the bracket is also provided with a circular chamber 79 open at the bottom and having an opening 80 of reduced diameter which is open to the upper surface of the portion 74 and has threaded therein a tubular member 81. Extending through the tubular member 81 and chamber 79 is a rod 82 threaded at its upper end to receive an eye 83 and having a rectangular head 84 in engagement with a follower 85 which engages beneath the brake shoes 76 and has an annular projection 86 adapted to slidably fit in the chamber 79. Surrounding the rod 82 and confined between the follower 85 and a follower 87 is a compression spring 88 designed to normally sustain the weight of a counterweight. Secured to the eye 83 is a flexible member or cable 89 which passes over a sheave 90 journaled in a bracket 91 secured to the web of the guide 41 and projecting through an opening in the web. The other end of the cable 89 is secured to a counterweight 92 adapted to travel between the flanges of the guide 41 and having flange portions 93 which engage behind flanges of the angles 94 secured to the flanges of the guide 41 and retain the counterweight in the groove formed by the flanges of the guide. Part of the counterweight 92 projects beyond the flanges of the guide 41 and will be engaged by a plate 95 which joins the flanges of the angles 94 at their lower ends to retain the counterweight in the groove in case of failure of the cable 89. Mounted upon the end portions 7 of the truck frame are brackets 100 having upwardly extending annular portions 101 adapted to receive plungers 102 normally forced upwardly by the springs 103 which surround the plungers 102 and the annular portions 101 and cushion the blow in case the elevator descends too far.

To the plates 53 and angles 54 are secured

brackets 104 having bosses 105 in which are mounted pins 106 while to one of the angles 51 forming the rectangular floor frame of the elevator frame proper are secured the hinge brackets 107. The pins 106 and hinge brackets 107 are adapted to secure to the elevator platforms suitable for different classes of work, one of which, as shown in Figs. 11 to 13 inclusive, comprises a rectangular floor frame formed of angle bars 110 joined at their ends by gusset plates 111 and connected by horizontal floor plates 112. Secured to the rear corners of the floor frame are vertical angle members 113 while secured to the front corners of the floor frame are the angle members 114 which are vertical for a part of their length and then bend towards the rear angle members 113, being secured to the rear angle members by gusset plates 115 and connected together by an angle member 116 secured to the angle members 114 by gusset plates 117. The angle members 114 are provided with brackets 118 having bosses 119 adapted to receive the pins 106 while the rectangular floor frame is provided with hinge brackets 120 adapted to cooperate with the hinge brackets 107 in securing the platform to the elevator. The angle members 114 are also connected by angle bars 121 and 122 which are placed so as to have one flange horizontal and adapted to be engaged by angle members 123 and 124, respectively, each of which has a flange projecting inwardly and adapted to rest on the angle bars 121 and 122, respectively. The angle bars 123 and 124 are connected to the top and bottom edges of a holding-up plate 125 which extends beyond the angle bars 114 and has castings 126 secured thereto beyond the angle bars 114. Each casting 126 engages with guide brackets 127 and 128 carried by a side plate 129 which is secured to the vertical angle bars 113 and 114 at each side of the platform.

To the castings 126, outside the side plates 129, are pivoted links 130 and 131 which have their other ends pivotally connected to slide bars 132 adapted to travel in guide brackets 133 also secured to the side plates 129. To the slide bars 132 are also pivotally secured the links 134 and 135 which have their other ends pivotally connected to brackets 136 secured to the side plates 129. The pairs of links 130 and 134, and 131 and 135 form with the slide bars 132 toggle links which are adapted to advance and retract the holding-up plate 125 as the slide bars 132 are raised and lowered.

Mounted on the platform floor and frame plates 112 and surrounding the openings therein are castings 137 in which are pivotally mounted solenoids 138 having armatures 139 connected to cranks 140 on a shaft 141 journaled in bearing brackets 142 secured to the floor frame below the floor. To the ends of the shaft 141 are secured cranks 143 connected to the slide bars 132. The solenoids are protected by casings 144 which are mounted on planking 145 carried by the angle bars 110. Secured to the angle bars 114 are switch board panels 150 and 151 having circuit breakers 152 and 153 and controllers 154 and 155 thereon, the panel 150 with the circuit breaker 152 and the controller 154 thereon being devoted to the control of the elevator motor 60 while the panel 151 and the circuit breaker 153 and the controller 155 thereon are devoted to the control of the carriage motor 12. Connections to the source of power and the motors are established by means of flexible cables (not shown) which extend between sockets on the carriage and elevator. The solenoids 138 are operated by current taken from the same source of power and controlled by means of a switch (not shown). The platform shown in Figs. 11 to 13 is intended to serve as a riveting platform, the holding-up plate being designed to hold a holding-up tool 156 against the head of a rivet placed in a car side 157 while the other end of the rivet is headed, the heated rivets being supplied from a suitable rivet heating device carried upon the platform of the elevator formed by the angles 51, there being indicated, in dotted lines in Figs. 11 and 12 a suitable electric rivet heater for this purpose such as for example, as is shown in the Johnson and Sheffer Patent, No. 1,452,511 of April 24, 1923.

Thus, it will be seen, the elevator frame proper and the working platform with its framing are separate and separable structures, the latter of which may be attached or detached at will,—in the latter case, leaving the elevator frame undisturbed and unimpaired for operation in the elevator ways, while carrying with it its own working equipment intact. Accordingly, the apparatus can be equipped for various kinds of work by a mere simple substitution or interchange of working platforms. As shown in Figs. 11, 12, 13, and 14 and already mentioned, the platforms may have the controlling means for the operation of the travelling carriage and of the elevator mounted thereon; so that when the platforms are interchanged for different kinds of work, the control may thereby be correspondingly changed.

In Figs. 14 and 15 is shown a platform adapted to be secured to the elevator and forming a support for the operators and for a reaming or drilling device. The platform comprises a frame having vertical angle members 160 connected at their bottom ends by a plate 161 and an angle bar 162 to which are secured hinge brackets 163 adapted to cooperate with the hinge brackets 107 on the elevator. To the lower ends of the vertical members 160 there is secured a platform floor frame of angle bars 165 connected to the vertical members 160 by gusset plates 166 and

connected by gusset plates 168 to angle members 167 which connect the outer edge of the frame to the vertical angle members 160. The angle members 167 and 160 are also connected by plates 169 to which are secured brackets 170 having bosses 171 which receive the pins 106 which secure the platform to the elevator. The upper portions of the angle members 160 are connected by stiffening angles 172 secured to the angle members 160 by the gusset plates 173 while the upper ends of the angle members 160 are bent over as at 174 and have secured thereto an I-beam 175 which supports a traveller 176 having a tube 177 swiveled therein at 178. The traveller is limited in its movement on the I-beam 175 by the plates 179 which connect the I-beam 175 to the angle members 160 and aid in supporting it. The tube 177 serves as a support for a reaming or drilling device 180 pivotally mounted in a frame 181 which is slidably mounted upon the tube 177, the weight of the frame and tool being counterweighted by a weight 182 disposed within tube 177 and connected to the frame 181 by cables 183 which pass over sheaves 184 and are secured to the counterweight 182.

To the vertical angle bars 160 are secured switch board panels 185 and 186 having circuit breakers 187 and 188 and controllers 189 and 190 thereon, the panel 185 with its circuit breaker and controller being devoted to the control of the elevator motor 60 while the panel 186 with the circuit breaker and controller thereon is devoted to the control of the carriage motor 12. The controllers on the different platforms are designed to give the speeds suitable for the operation of the elevator and carriage for use in connection with the particular platform, as already mentioned. Power for the operation of the reaming or drilling devices will be furnished from the same source of power through a flexible connection (not shown). While but two types of platforms which may be secured to the elevator have been shown it is to be understood that this invention is not to be limited to the particular platforms shown as platforms suitable for other kinds of work may be attached to the elevator, each platform being provided with controllers adapted to give the control of the carriage and elevator motor best suited for the kind of work the platform is designed for.

In Fig. 16 there is diagrammatically shown the connections for the control of the elevator and carriage motors, the flexible connections being omitted. The collectors 49 and 50 are connected through leads 200 and 201 to the circuit breakers 152 and 153. The circuit breaker 152 is connected through a lead 202 to the controller 154 which is connected through leads 203 and 204 with the elevator motor 60 and through leads 205 and 206 with upper and lower limit switches 207 and 208, respectively, the limit switches being connected through leads 209 and 210 with the motor. Circuit breaker 152 is also connected through lead 211 to the automatic electrically operated brake 212 in the casing 66 which in turn is connected through the lead 213 with the elevator motor. Circuit breaker 153 is connected through lead 214 with the controller 155 and through lead 215 with the motor, the controller being connected through the leads 216, 217 and 218 with the motor. The leads 200 and 201 are also connected through leads 219 and 220 to a socket 221 which serves to establish connection for the solenoids 138 of the reaming or drilling devices.

In the operation of this device the operator on the platform controls the raising and lowering of the elevator through controller 154 or 189 and controls the traveling back and forth of the carriage through the controller 155 or 190 to position the platform for the work. It will be noted that in the case of the riveting platform the holding-up plate 125 is of suitable area to permit of engagement of the holding-up tool 156 by the holding-up plate over a considerable area of the car side without necessitating a shift of the platform and that in the case of the reaming or drilling device, the device may travel the full width of the platform and be raised and lowered so that the device may be operated over a considerable extent of the car side without necessitating a movement of the platform.

In the operation of the holding-up device with the platform in position and the heated rivet inserted in the rivet opening, the holding-up tool 156 will be placed against the rivet head and the solenoids 138 energized to operate the toggle levers, forcing forward the plate 125 and holding the tool 156 in engagement with the rivet head while the other end of the rivet is being headed. Upon the completion of the heading of a rivet the solenoids are deenergized allowing the plate to be retracted and the tool 156 withdrawn so that another rivet may be readily inserted.

In the lowering of the elevator, should the operator start to lower the elevator too suddenly or should the elevator supporting cable 62 break, permitting the sudden descent of the elevator, the descent of the elevator will carry with it the brackets 71 and portions 74 which project into the openings between the flanges of the guides 41. Owing to the inertia of the counterweights 92, the sudden movement downwardly of the portions 74 of the brackets 71 will compress the springs 88 before the counterweights 92 are placed in motion upwardly. Compression of the springs 88 will permit a relative movement of the brackets 71 and brake shoes 76, so that the brake shoes 76 will be forced outwardly into contact with the flanges of the guides 41 by the inclined surfaces 75 causing a braking ac-

tion which will check the sudden descent of the elevator to such an extent that the springs 103 and buffers 102 may receive the elevator without danger of injuring the structure or the operators. It will be noted that raising the elevator will tend to withdraw the tapering projecting portions 74 from between the brake shoes 76, the brake shoes being held by their engagement with the flanges of the guides 41 so that after the brakes have been applied either because of careless operating or of a cable breaking, the brake shoes may be released by merely raising the elevator.

What is claimed is:

1. In a device of the class described, a carriage comprising a truck frame formed of a single casting and having spaced top and bottom members united at their ends in integral inverted channel structures, a motor mounted on the bottom member, wheels journaled in said channel structures and operatively connected to said motor, and upright elevator ways resting on said channel structures.

2. A device of the kind described, comprising in combination a truck frame, elevator ways secured to the truck frame, a frame movable in said ways, attaching means secured to the frame, a working platform freely attachable to and detachable from the frame at the attaching means thereof, and means on the platform for controlling the operation of the frame and the working platform.

3. A device of the kind described, comprising in combination a truck frame, means for operating said truck frame, elevator ways secured to the carriage, an elevator frame movable in said ways, means supported by the frame for operating said frame, a working platform freely attachable to and detachable from the elevator frame, and means on the platform for controlling the operation of the frame and said platform.

4. In a device of the kind described, a carriage comprising a cast metal truck frame having spaced top and bottom members integrally connected to each other at their ends to form inverted channel shaped wheel housings, wheels journaled in said housings, a motor mounted on the bottom member for driving the wheels and upright elevator ways supported on said housings.

5. In a device of the kind described, a carriage comprising a truck frame having spaced top and bottom members integrally united at their ends to form inverted channel wheel housings, wheels journaled in said housings, a motor mounted on the bottom member for driving the wheels, upright elevator ways secured directly to said housings, an elevator mounted for movement in said ways and an operator's platform freely attachable to and detachable from the elevator.

6. In a device of the kind described, a carriage comprising a unitary structure having spaced top and bottom members integrally united at their ends to form housings, wheels journaled in said housings, a motor on the bottom member for driving the wheels, elevator ways secured to the housings, an elevator movable in said ways, a motor on the elevator for operating the latter and an operator's platform freely attachable to and detachable from the elevator.

7. In a device of the kind described, a carriage comprising a unitary structure having spaced top and bottom members integrally united at their ends to form inverted channel shaped wheel housings, wheels journalled in said housings, a motor on the bottom member for driving the wheels, elevator ways secured to the wheel housings, an elevator movable in said ways, a motor on the elevator for operating the latter, an operator's platform freely attachable to and detachable from the elevator and means on the platform for controlling the operation of the carriage and elevator.

8. In a device of the kind described, a carriage comprising a unitary structure having spaced top and bottom members integrally united at their ends to form housings, wheels journaled in said housings, a motor on the bottom member for driving the wheels, elevator ways secured to the top member, an elevator movable in said ways, a motor on the elevator for operating the latter, an operator's platform freely attachable to and detachable from the elevator, working mechanism on the platform, and means on the platform for controlling the operation of the carriage, the elevator and the working mechanism as desired.

9. In a device of the kind described, a truck frame comprising a unitary structure having the ends thereof formed into integral inverted channel shaped wheels housings, elevator ways secured directly to said wheel housings, an elevator frame movable in said ways, and a working platform hingedly secured to the said frame to be detachable therefrom.

10. A device of the kind described comprising in combination portable elevator ways, an elevator frame guided therein, means on said frame for raising and lowering the latter, an operator's platform hingedly secured to the lower end of the frame to be detachable therefrom, and releasable cooperating means on the platform and elevator frame for detachably securing the platform to the frame.

11. A device of the kind described comprising a truck frame formed of a single casting having spaced top and bottom members intermediate its ends to provide a motor receiving space, said members being united at their ends to form inverted channel shaped wheel housings, and elevator ways mounted upon the wheel housings and secured thereto.

12. In a device of the kind described, a

carriage comprising a single casting having a portion thereof intermediate its ends formed into upper and lower members defining a motor receiving space, said lower member being cast with a motor supporting portion, and elevator ways secured to the ends of said casting.

13. In a device of the kind described, a carriage comprising a single truck frame casting having a portion thereof intermediate its ends formed into upper and lower members defining a motor receiving space, said lower member having a motor support cast therewith, vertical castings connecting said upper and lower members, and elevator ways secured to the ends of said casting.

14. In a device of the kind described, a carriage comprising a truck frame having inverted channels formed at the ends thereof to define wheel housings, elevator ways resting upon and secured to said inverted channels, a hoist guided by said elevator ways, and means on the hoist for detachably securing a platform thereto.

15. In a device of the kind described, a carriage comprising a truck frame formed of a single unit having spaced upper and lower members intermediate its ends to provide a motor receiving space therebetween, said upper and lower members being united at their ends to form inverted channel wheel housings, elevator ways resting upon and secured to said wheel housings, and a hoist mounted between the ways for reciprocation therein.

In witness whereof I have hereunto set my hand.

JOHN M. ROHLFING.