J. M. KELLEY.

ELECTRIC CRANE AND DERRICK.

APPLICATION FILED JUNE 17, 1909.

989,506.

Patented Apr. 11, 1911.

3 SHEETS—SHEET 1.

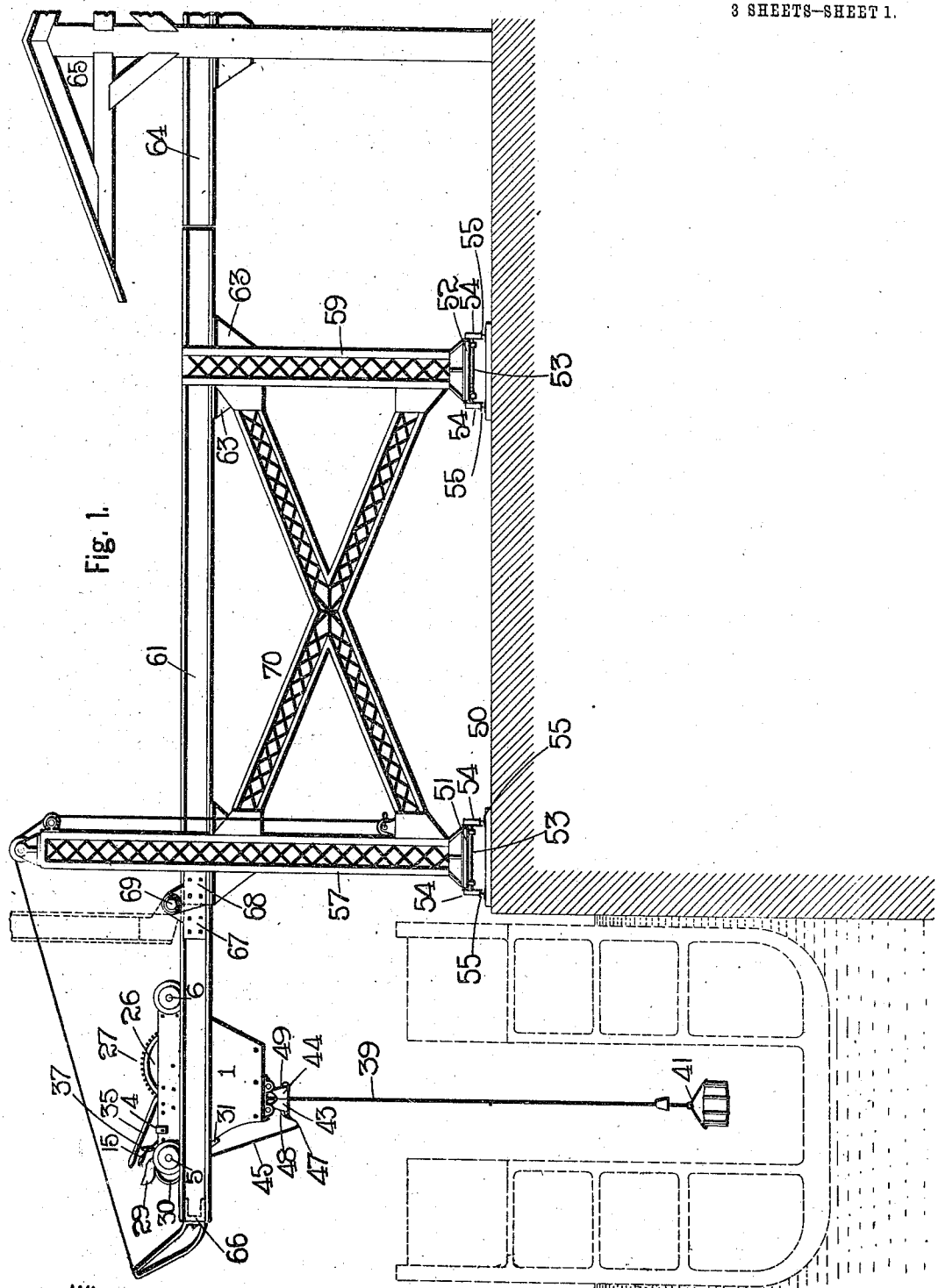

Fig. 1.

Witnesses.

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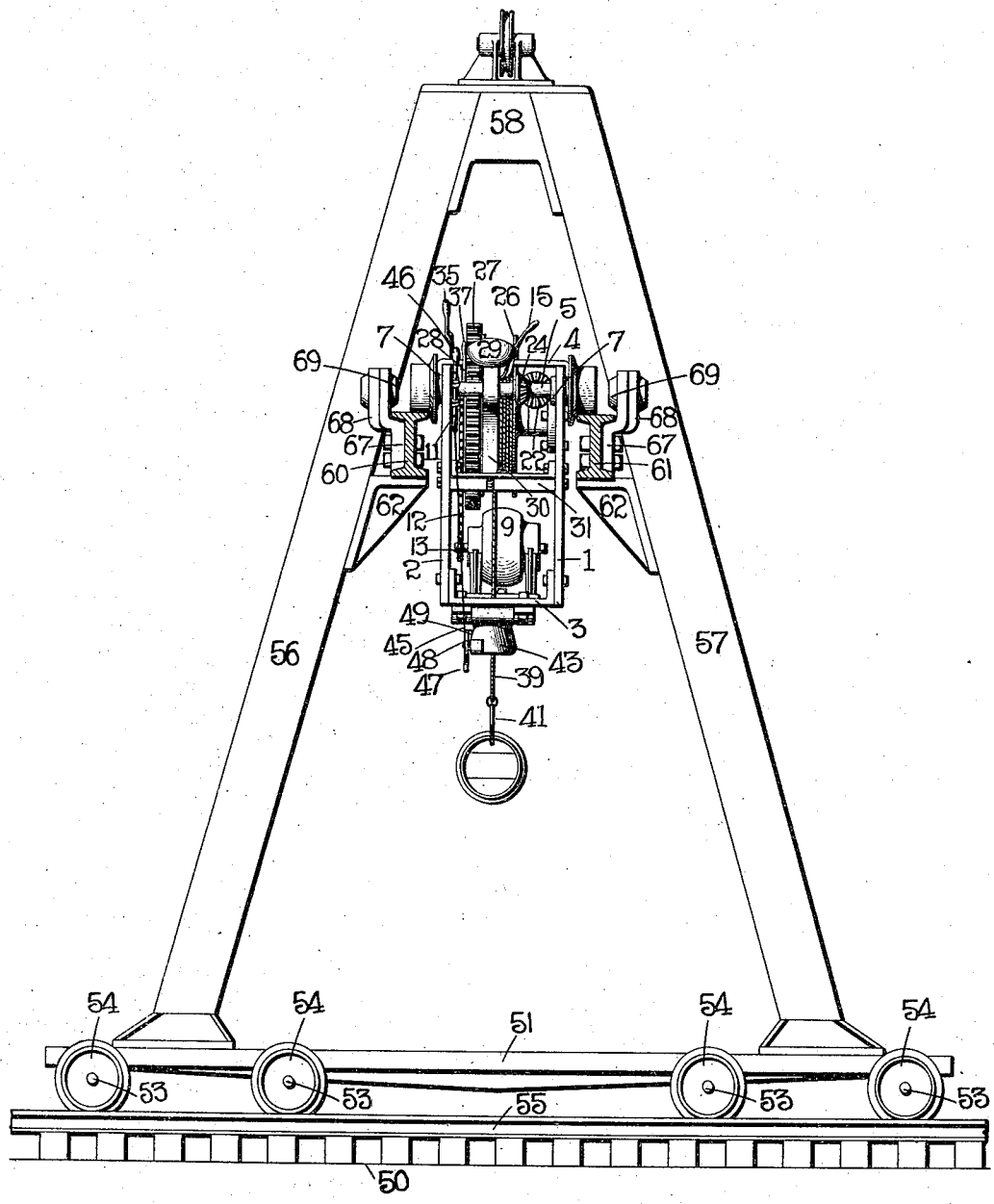
3 SHEETS—SHEET 2.

Fig. 2.



Witnesses.

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3 SHEETS—SHEET 3.

Fig. 3.

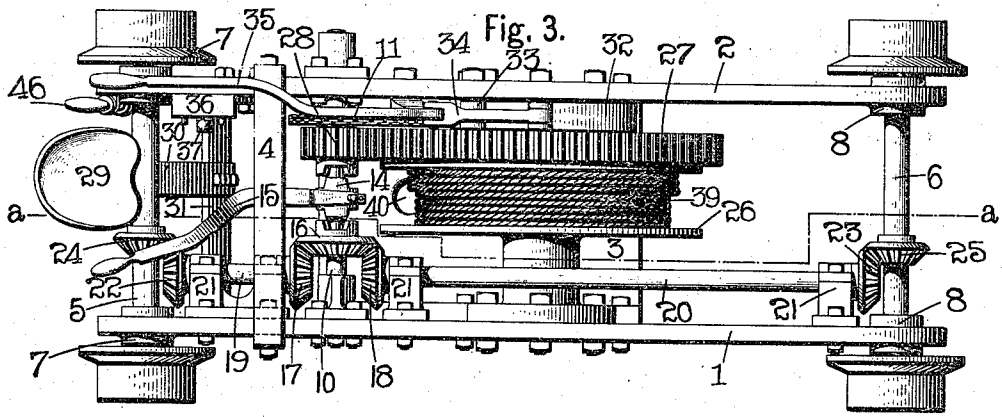


Fig. 4.

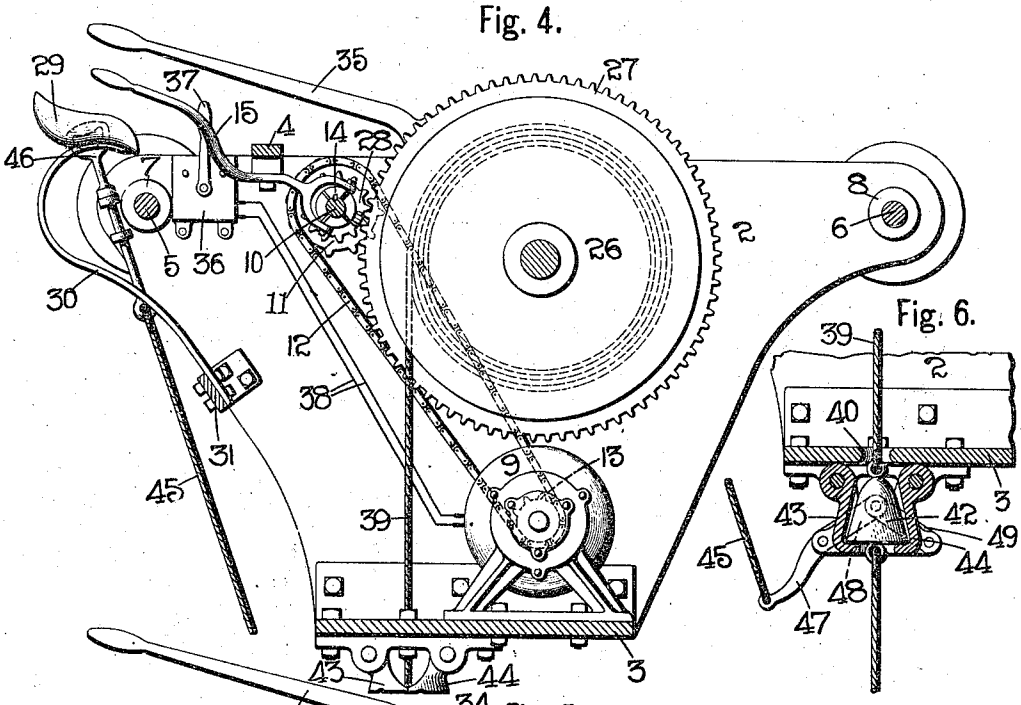
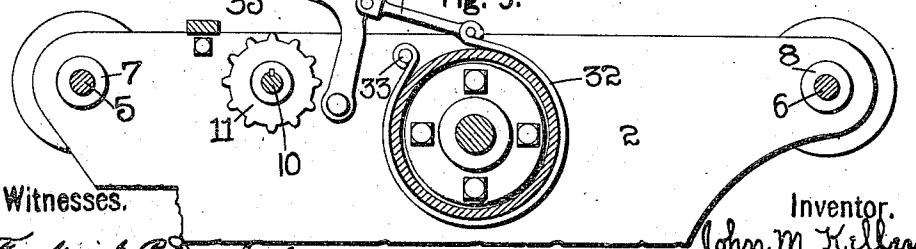


Fig. 6.

Fig. 5.



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ELECTRIC CRANE AND DERRICK.

989,506. Specification of Letters Patent. Patented Apr. 11, 1911.

Application filed June 17, 1909. Serial No. 502,696.

To all whom it may concern:

Be it known that I, JOHN M. KELLEY, a citizen of the United States, residing at Buffalo, in the county of Erie and State of New York, have invented a certain new and useful Improvement in Electric Cranes and Derricks, of which the following is a specification.

This invention relates to improvements in elevated traveling cranes and principally to the construction of the car.

The invention also relates to certain details of construction which will be hereinafter described and claimed reference being had to the accompanying drawings, in which:—

Figure 1 is a side elevation, partly fragmentary of the supporting structure for the track and the car mounted thereon, and also illustrates a fragment of a freight shed or warehouse and a vessel in dotted lines arranged at a dock on which the rail structure is located to illustrate one of the purposes for which the invention is adapted. Fig. 2 is a rear elevation of one of the inverted V-shaped supports with a transverse section through the rails of the track and also shows a rear elevation of the car mounted on said track. Fig. 3 is a detached enlarged top plan view of the car. Fig. 4 is a vertical longitudinal section through the car, on line *a a*, Fig. 3. Fig. 5 is a fragmentary view of a portion of the car partially in section to illustrate the brake construction and its controlling lever. Fig. 6 is a fragmentary view partially in section to illustrate the cable lock.

In referring to the drawings in detail, like numerals designate like parts.

While in Fig. 1 of the accompanying drawings an adaptation of this invention is shown for unloading vessels, it should be understood that it is also adapted for other purposes.

The preferred type of car is illustrated and has a frame which is formed of two side members 1 and 2, a bottom transverse member 3 which is bolted to the lower ends of the side members and extends and connects said side members, and a top transverse member 4 which extends across between the side members at the top and is bolted at its ends to the side members. The side members are each formed substantially flat of suitable metal of the desired thickness and are nearly triangular in shape having a straight horizontal top edge terminating at each end in rounded top corners and being truncated or cut away at its lower or bottom corner to leave an approximately straight horizontal bottom edge which is decidedly shorter in length than the top edge. The two side members are arranged vertical and parallel with each other and are separated sufficiently to provide a space between them for machinery. The forward and rear axles 5 and 6 of the car are journaled respectively in the top corners of the triangular side members the side members being enlarged at these points to constitute journals by forming bosses 7 and 8 on opposite sides of the members, see Fig. 3. This car is driven by a suitable electric motor 9 which is bolted rigidly to the bottom transverse member 3 of the frame.

Each of the car axles 5 and 6 is connected to the motor by chain and sprocket and bevel gearing mechanism.

A transverse counter shaft 10 is journaled in the side members of the frame at points between the axles and practically in horizontal alinement with the axles and has a sprocket wheel 11 mounted thereon which is connected by a chain 12 to a sprocket wheel 13 of smaller diameter on the driving shaft of the electric motor. A double clutch 14 is mounted on the counter shaft and is adapted to be shifted in either direction by a lever 15. A bevel gear wheel 16 is rotatably mounted on the counter shaft and meshes with bevel gears 17 and 18 mounted at the adjacent ends of longitudinal shafts 19 and 20. These longitudinal shafts 19 and 20 are journaled in bearings 21 fastened to the inner surface of the side member 1 of the frame and extend oppositely to each other into operative proximity with the car axles carrying bevel gears 22 and 23 at their outer ends which mesh respectively with bevel gears 24 and 25 mounted on the car axles, see Fig. 3.

A winding drum 26 is rotatably mounted between the side members of the frame and has a spur gear wheel 27 at one side thereof which meshes with a spur pinion 28 rotatably mounted on the counter shaft.

Both the bevel gear wheel 16 and the spur pinion 28 have clutch engaging members which are located in opposed position with respect to each other and on opposite sides

of the double clutch which can be disengaged from both or engaged with either one but not with both at the same time. By this means the motor can be used to drive the car while the drum is stationary or rotate the drum while the car is stationary but cannot be connected to operate both the car and drum simultaneously.

A seat 29 is mounted on a curved spring 30 which is attached at its lower end to a cross bar 31 bolted to the side members of the frame. The seat is located at the rear of the car and nearly over the rear axle and in such manner that the operator will have a clear view both horizontally forward and vertically downward.

A friction brake is provided for the drum which consists of a spring band 32 which encircles a circular portion of the drum and has one end secured to a pin 33, extending from one of the side members and the opposite end connected by a link 34 to an angular lever 35 which extends within convenient reach of an operator on the seat 29. The clutch lever 15 also extends within convenient reach of the seated operator and a control box 36 is arranged in proximity to the seat and has a lever 37. The control box 36 is connected by suitable wiring 38 to the motor see Fig. 4. A hoisting rope or cable 39 is wound on the drum and has its outer portion extending through an opening 40 in the bottom transverse member 3. Suitable devices such as hooks 41 are secured to the lower end of the cable for attachment to the material or articles to be hoisted.

A lock is provided for fastening the cable and its load in its elevated position while the car is traveling to the warehouse which consists of a metal block 42 having an enlarged lower end which is adapted to be locked between pivotal gripping members 43 and 44 pivoted to the bottom transverse member 3. The members are moved or separated from each other to free the block 42 by a rope 45 having a handle 46 in convenient reach of the occupant of the seat 29; said rope being connected at its lower end to a lever 47 which in turn is connected to the inner connecting ends of two toggle levers 48 and 49 which have their outer ends connected to the members 43 and 44.

The electric motor is supplied with current in any suitable and well known manner.

The preferable form of the structure on which the car is mounted and travels is shown in Figs. 1 and 2, and consists of a skeleton frame which is portable being supported on tracks arranged along the dock 50. The frame has two separated base members 51 and 52 which extend substantially parallel and each of which is provided at its opposite ends with axles 53 arranged in pairs and carrying wheels 54 which engage the tracks 55 on the dock. Each base member has four axles provided with wheels at each end making eight wheels in all, and two tracks 55 are provided each consisting of two rails, see Fig. 1. It will be noted that the base members are separated quite a considerable distance from each other for the purpose of providing a very substantial support for the car. Two inclined supporting members 56 and 57 extend upward from the base member 51 and gradually converge toward each other being joined at their upper terminals by a center bracket 58 see Fig. 2. Two inclined supporting members 59 corresponding to the members 56 and 57 also extend upward from the other base member 52 and gradually converge toward each other. They have their upper terminals provided with brackets upon which rails 60 and 61 are supported. These members 59 are considerably shorter in length than the members 56 and 57 see Fig. 1. The rails 60 and 61 are made of I-iron, steel or other suitable metal and are very strong and stiff so as to bear the weight of the car. These rails are supported from the inclined members of the frame being mounted on brackets 62 and 63 attached to intermediate portions of the inclined members 56 and 57, and to the inclined members 59, see Fig. 1. The rails extend a suitable distance outwardly from the inclined members 59 and are adapted to register with the rails of a track 64 extending from a warehouse 65 as shown in Fig. 1, so that the car may be run from the frame into the warehouse. The rails 60 and 61 also extend a short distance outwardly from the inclined members 56 and 57 and a pivotal track section which is composed of prolongations of the rails 60 and 61 is connected to these projecting ends by pivot joints. The outer ends of the rails of the pivotal section track are connected by an angular connecting member 66 which serves both to maintain the rails in parallel alinement and also as a stop to prevent the car running off the track. The rails of the pivotal section track are each pivoted to the rails 60 and 61 by hinges each of which consist of two members 67 and 68 of angular formation which are bolted to the rail ends and bent angularly outward and upward and are joined by strong hinge pins 69. The object of this angular construction of hinge is so that a clear unobstructed path is provided along the rails for the wheels of the car, as shown in Fig. 2. The inclined members 56 and 57 and 59 are very rigidly and strongly connected by diagonally extending brace members 70 which are practically arranged in the form of a cross, see Fig. 1. By this means a very strong and rigid and at the same time, a comparatively light portable supporting frame for the car is provided.

It will be noted that the car is compara-

tively simple in construction and possesses great strength and rigidity of structure and the bulk of its weight is supported between or below the rails of the track.

The operation of the apparatus is as follows:—The traveling track frame is moved in any well known manner to the desired location and the car is then run along the track frame to the position shown in Fig. 1. The end of the cable is attached to the material to be unloaded by hooks or other well known means and the material is elevated by connecting the drum to the electric motor by the clutch. When the load is elevated to the proper position it is locked against descent by the means shown in Fig. 6 or a similar means, and the clutch is then brought into engagement with the bevel gears to drive the car along the track.

The electric motor is started, stopped, reversed and controlled in speed in the well known way from the starting box.

In this construction it is impossible to raise a load while the car is being driven owing to the fact that the clutch can not operatively engage both the bevel gears connecting with the car axles and the spur gears connecting with the drum at the same time.

I claim—

1. In an elevated traveling crane, the combination of a car mounted on wheels adapted to travel on a track, the sides of the car extending below the wheels, a transverse bottom member connecting the sides, a winding drum supported from the sides of the car, means for moving the car on the track, an electric motor carried by the bottom member and connected by proper gearing with the said wheels, and driving means including a clutch between the motor and the drum.

2. In a traveling crane the combination of a car mounted on wheels adapted to travel on an elevated track, the car having sides extending below the wheels, a transverse bottom member connecting the sides, a winding drum supported between the sides of the car, a gear fastened to the end of the drum, a counter-shaft journaled in the sides of the frame, a pinion mounted on the shaft and meshing with said gear, a bevel gear mounted on the counter-shaft, an electric motor bolted to the bottom member of the frame and operatively connected with said counter-shaft, means for moving the car by said motor and means for controlling the winding and moving operations.

3. In an elevated traveling crane, the combination of a car adapted to travel on a track, the car provided with axles, wheels on the axles for engaging said tracks, gears fastened to the axles, the car having sides extending below the wheels, a transverse bottom member connecting the sides, a winding drum supported between the sides of the car, a gear fastened to the end of the drum, a counter-shaft journaled in the sides of the frame, a pinion mounted on the shaft and meshing with the gear on the end of the drum, a gear mounted on the counter-shaft, a longitudinal shaft extending on each side of said counter-shaft and journaled in brackets on the inner side of the car, gears fastened on the outer ends of the longitudinal shafts meshing with said gears on the axles, gears on the other ends of said longitudinal shafts meshing with the gear on the counter-shaft, an electric motor secured to the bottom member and connected to rotate the said counter-shaft, and means whereby the motor may be made to rotate the drum or move the car.

4. In an elevated traveling crane, the combination of a car adapted to travel on a track, the car provided with axles, wheels on the axles for engaging said tracks, gears fastened to the axles, the car having sides extending below the wheels, a transverse bottom member connecting the sides, a winding drum supported between the sides of the car, a gear fastened to the end of the drum, a counter-shaft journaled in the sides of the frame, a pinion mounted on the shaft and meshing with said gear on the end of the drum, a gear mounted on the counter-shaft, a longitudinal shaft extending on each side of said counter-shaft and journaled in brackets on the inner side of the car, gears fastened on the outer ends of the longitudinal shafts meshing with said gears on the axles, gears on the other ends of said longitudinal shafts meshing with the gear on the counter-shaft, an electric motor secured to the bottom member and connected to rotate said counter shaft and a double clutch slidably mounted on the counter-shaft whereby the gear on the end of the drum or the gears on the longitudinal shafts may be connected to said counter-shaft either to rotate the drum or move the car.

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