April 5, 1938. J. E. MORTON 2,113,308

CONTROL SYSTEM FOR CONVEYERS

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Fig. 1.

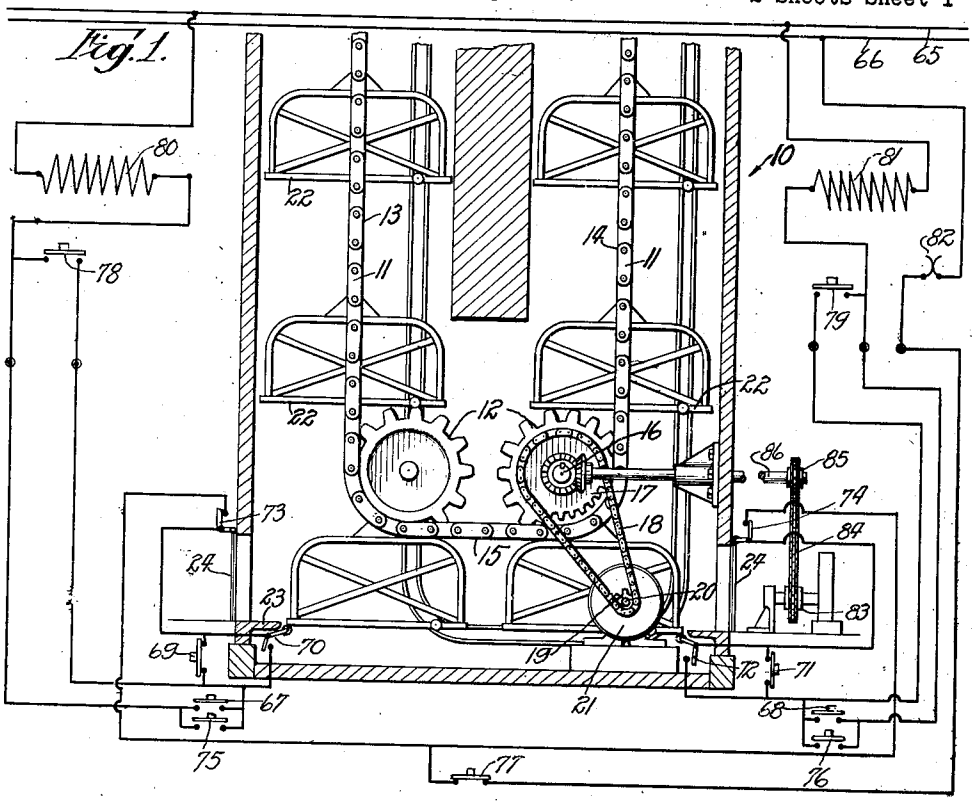


Fig. 4.

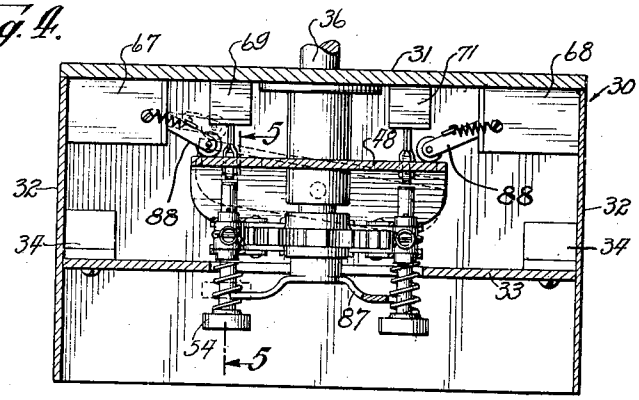
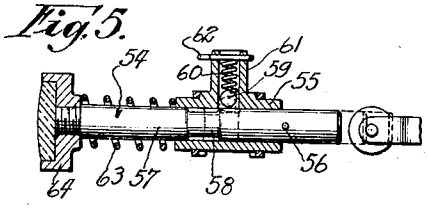


Fig. 5.



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Fig. 2.

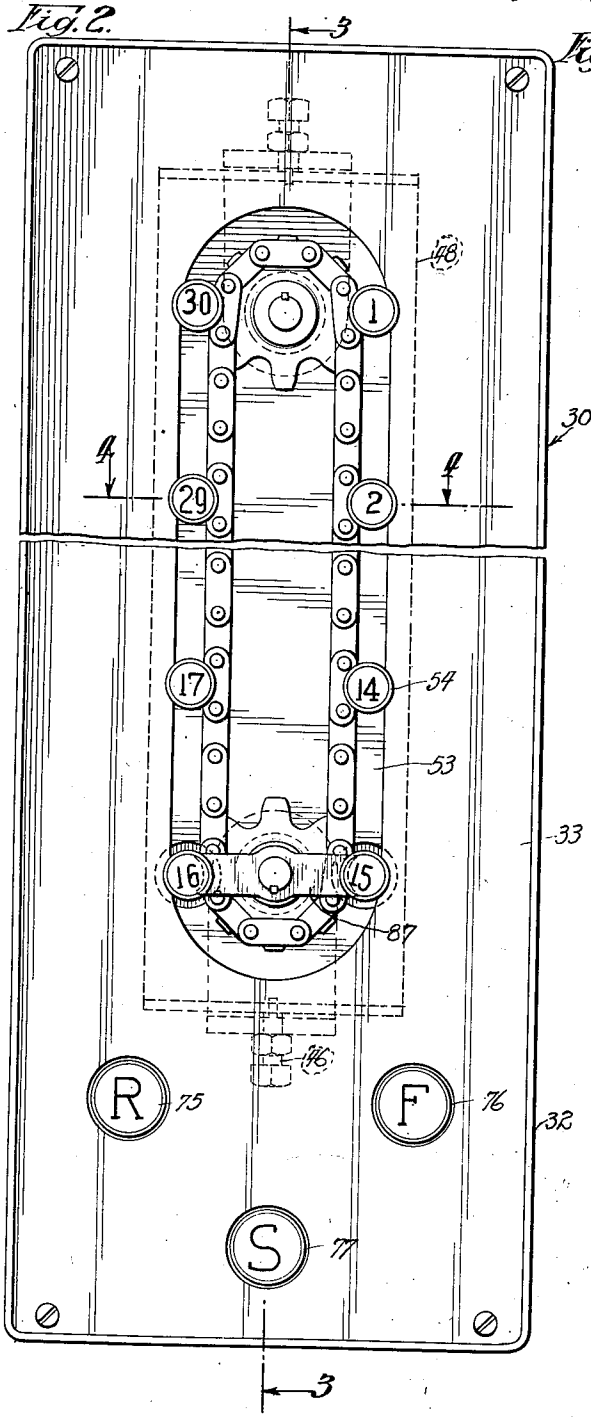
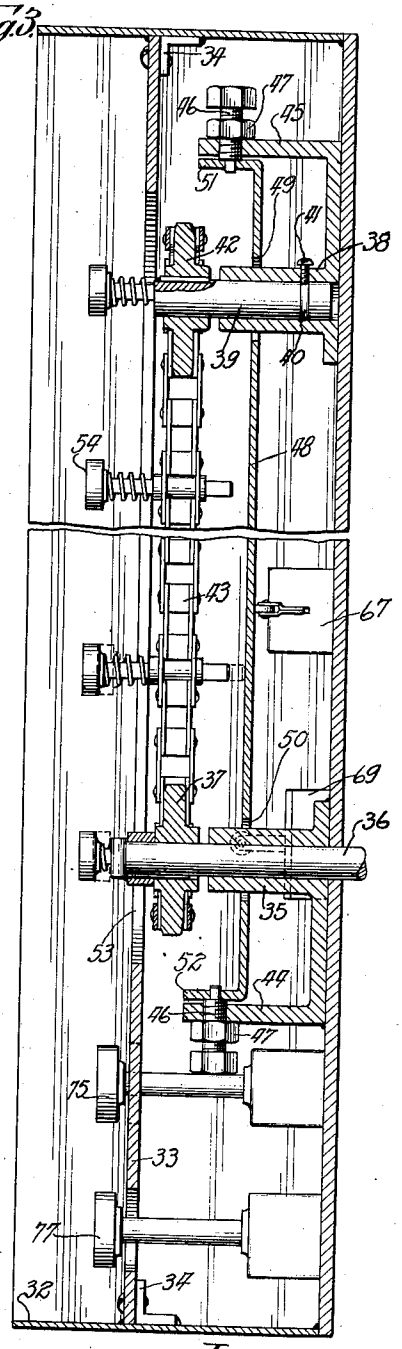


Fig. 3.



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UNITED STATES PATENT OFFICE

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CONTROL SYSTEM FOR CONVEYERS

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Application April 6, 1933, Serial No. 664,681

3 Claims. (Cl. 187—16)

The invention relates to a control system for conveyers or elevators and particularly is concerned with a control device for storage systems provided for the handling and storing of vehicles and other articles.

It is an object of the invention to provide a control for a conveyer system whereby said conveyer is brought to a standstill upon a predetermined portion thereof reaching a predetermined position.

A further object aims at providing a control system for a conveyer which system operates as an indicator to show relative positions of portions of said conveyer.

A still further object aims at providing a parking tower for motor vehicles with a control permitting the conveying of a vehicle or parking platform over the shortest route to the loading or unloading zone.

It is a further object to provide a control system of the character described, in which a single means permits the selection of a predetermined car or platform placing the conveyer in motion and arresting movement of said conveyer when the selected car or platform has reached the loading zone.

A still further object aims at providing means for preventing the conveyer from being set in motion when the selected car or platform is already at the loading or unloading zone.

With these and many other equally important objects in view which will become apparent from a perusal of the invention, the latter comprises the means described in the following specification, particularly pointed out in the claims forming a part thereof, and illustrated in the accompanying drawings, in which

Fig. 1 is a fragmentary elevational view of a parking tower to which my invention has been applied in a more or less diagrammatic manner.

Fig. 2 is an elevational view of the control and indicator device,

Fig. 3 is a section on the line 3—3 of Fig. 2.

Fig. 4 is a section on the line 4—4 of Fig. 2, and

Fig. 5 is a section on the line 5—5 of Fig. 4.

The invention is described in connection with a parking tower for vehicles wherein an endless conveyer is provided with a number of spaced platforms adapted to park vehicles. The invention, however, is not limited to parking towers but may be applied to numerous uses. The parking tower is only described to an extent necessary for an understanding of the invention as it does not per se form a part thereof.

Referring to Fig. 1, 10 generally designates a parking tower which includes an endless conveyer 11 trained around sprocket wheels 12 in such manner that the conveyer has vertical runs 13 and 14 which are connected by horizontal portions 15 so as to travel in a closed path. To the shaft 16 of one of the sprocket wheels 12 is secured another sprocket wheel 17 around which is trained a chain 18 encompassing a wheel 19 on the shaft 20 of a reversible motor 21 whereby the conveyer 11 may be driven clockwise or counter-clockwise depending on the direction of rotation of said motor.

The conveyer is provided with a plurality of spaced platforms 22 adapted to receive a motor vehicle and said platforms in the lowermost portion are flush with a loading platform 23 access to which may be had through a door 24.

The combined control and indicating device comprises a box-like structure generally designated by 30 having a bottom 31, and upstanding therefrom a wall 32. A partition 33 parallel to the bottom is secured by angle irons 34 as shown in Figs. 3 and 4.

A bearing 35 secured to the bottom 31 supports a drive shaft 36 which is provided with a sprocket wheel 37. Another bearing 38 is likewise secured to the bottom and supports an idler shaft 39 provided with a circumferential groove 40 into which extends a screw 41 from the bearing sleeve to maintain the shaft against longitudinal movement but permitting rotary movement.

The shaft 39 carries a sprocket wheel 42 in vertical alignment with sprocket wheel 37 and a chain 43 is trained around both wheels.

The bearings 35 and 38 are provided with extensions 44 and 45, respectively, in which are arranged screws 46 provided with lock-nuts 47.

A plate 48 normally parallel to the bottom 31 is provided with large openings 49 and 50 to clear the bearings 35 and 38 and has end flanges 51 and 52 at right angles to said plate provided with apertures to receive the ends of pivot screws 46 so that the plate which acts as a direction selector plate, hereinafter further explained, may be tilted to a limited extent about the axis defined by the pivot screws 46.

The partition 33 is provided with an elongated opening 53 to expose to view the sprocket chain 43 to which are attached selector buttons 54 corresponding to the number of platforms 22 of the tower or elevator structure used for the storing of vehicles or other articles. In the drawings a parking tower with thirty platforms is shown,

so that thirty selector buttons **54** are provided which are numbered from one to thirty in the same sequence as the tower platforms to identify the same at a glance.

If preferred, of course, other means of identification may be used.

The selector buttons **54** are slidably mounted in bearings **55** secured to the sprocket chain **43** and are equipped with stop pins **56** which upon engagement with the bearing limit the outward movement of the button. The stem **57** is provided at its intermediate portion with a circumferential groove **58** into which is adapted to be pressed a ball **59** under the influence of a spring **60** arranged in a tubular extension **61** of the bearing **55** and pressing at and against said ball while its other end engages a cross pin **62**. A spring **63** surrounds the stem **57** and is interposed between the bearing **55** and the head **64** of the button **54**. The spring normally holds the selector button in outward position.

The electrical equipment includes power lines **65**, **66**, a starting switch **67** to start the parking tower in counterclockwise direction and a starting switch **68** for clockwise movement, so that the platforms of either vertical tier is brought down to the loading zone in the shortest possible way.

In addition a stop switch **69** is provided in parallel with a hatch limit switch **70** and similarly a stop switch **71** in parallel with a hatch limit switch **72** controls movement in the opposite direction.

Door switches **73**, **74**, are provided and must be in closed position before the parking tower can operate in either direction.

In order to permit operation of the parking tower independent of the selector buttons **54**, emergency push button switches **75**, **76**, and **77** are provided. Upon depressing switch **75** the parking tower is operated in counter-clockwise direction whereas switch **76** controls clockwise movement. Switch **77** permits, upon actuation, instantaneous stopping of the parking tower irrespective of actuation of the selector buttons **54** or switches **75** and **76**.

The circuit is closed by a switch **78** or **79** of standard construction which is operated by a solenoid **80**, **81** upon the closing of either starting switch.

The provision of an overload relay **82** is part of the standard equipment and does not per se form a part of the invention.

The control and indicating device is operatively connected with the motor drive by a sprocket wheel **83** which is encompassed by a chain **84** trained around a sprocket wheel **85** fast on a shaft **86** geared to the shaft **16**.

To prevent a selector button from being pressed in to the starting position when the corresponding platform is already at the loading zone, a stop **87** (Figs. 2 and 4) is provided to lock the push button against inward movement.

The operation of the control and indicating mechanism is as follows:

Assuming that a car parked on platform **17** is desired to be removed, then the corresponding selector button marked **17** is found in the left tier and as shown is one space above the loading or unloading zone. Upon button **17** being pushed in, the direction selecting plate **48** is tilted toward the left and contacts with an arm **88** of the starting switch **67** causing the parking tower to move in counter-clockwise direction so that the desired platform is brought to the loading zone in the shortest travel.

Upon release of the selector button the same is pushed outward until the ball **59** enters the groove **58** so that the button is arrested at an intermediate position in which its inner end projects sufficiently to engage an arm of the stop switch **69** and opens the same.

When the parking platform **17** reaches the loading zone the hatch limit switch **70** is opened and the parking tower is stopped accurately with the selected platform flush with the loading floor. Attention is called to the fact that the stopping of the parking tower is controlled by the opening of two switches, namely **69** and **70** or **71** and **72**.

While the hatch limit switches **70** and **72** are opened by the passing of each platform, yet the parking tower is not stopped until the appertaining stop switch **69** or **71** is also opened.

When the depressed selector button is returned to original position (with the pin **56** contacting with the bearing) by a slight pull, the stop switch **69** or **71** is closed and the device is again ready for operation.

While the drawings show a preferred embodiment of the invention various changes, alterations and modifications may be made without departing from the spirit of the invention.

I, therefore, do not limit myself to the details of construction and arrangement, as shown, nor to the use mentioned by way of example, but claim my invention as broadly as the state of the art permits.

I claim:

1. In a circuitous elevator, a plurality of receptacles movable in an endless path, means for selecting any one of said receptacles and causing it to be moved to a predetermined position by the shortest route, said means including control means having a member movable in accordance with the movement of said receptacles, a plurality of operating means on said movable member, one for each of said receptacles, for the purpose of selecting a desired receptacle, and means responsive to the actuation of any one of said operating means for selectively effecting the movement of said receptacles whereby the selected receptacle moves to the predetermined position by the shortest route.

2. In a circuitous elevator, a plurality of receptacles movable in an endless path, means for selecting any one of said receptacles and causing it to be moved to a predetermined position and stopped thereat, said means including control means, having a member movable in accordance with the movement of said receptacles, a plurality of operating means on said movable member, one for each of said receptacles for the purpose of selecting a desired receptacle, and means responsive to the actuation of said operating means for effecting the movement of the selected receptacle to the predetermined position and the stopping thereof upon its arrival at the predetermined position.

3. In a circuitous elevator, a plurality of receptacles movable in an endless path, means for selecting any one of said receptacles and causing it to be moved to a predetermined position by the shortest route and stopped thereat, said means comprising motive means for moving said receptacles, and control means therefor, including a member movable in accordance with the movement of said receptacles, a plurality of operating means on said movable member, one

for each of said receptacles, for the purpose of selecting a desired receptacle, and means responsive to the actuation of any one of said operating means for selectively effecting the actuation of said motive means whereby the latter moves the receptacle, thus selected, to the predetermined position by the shortest route and for effecting the stopping of said motive means upon the arrival of the selected receptacle at the predetermined position.

JAMES E. MORTON.