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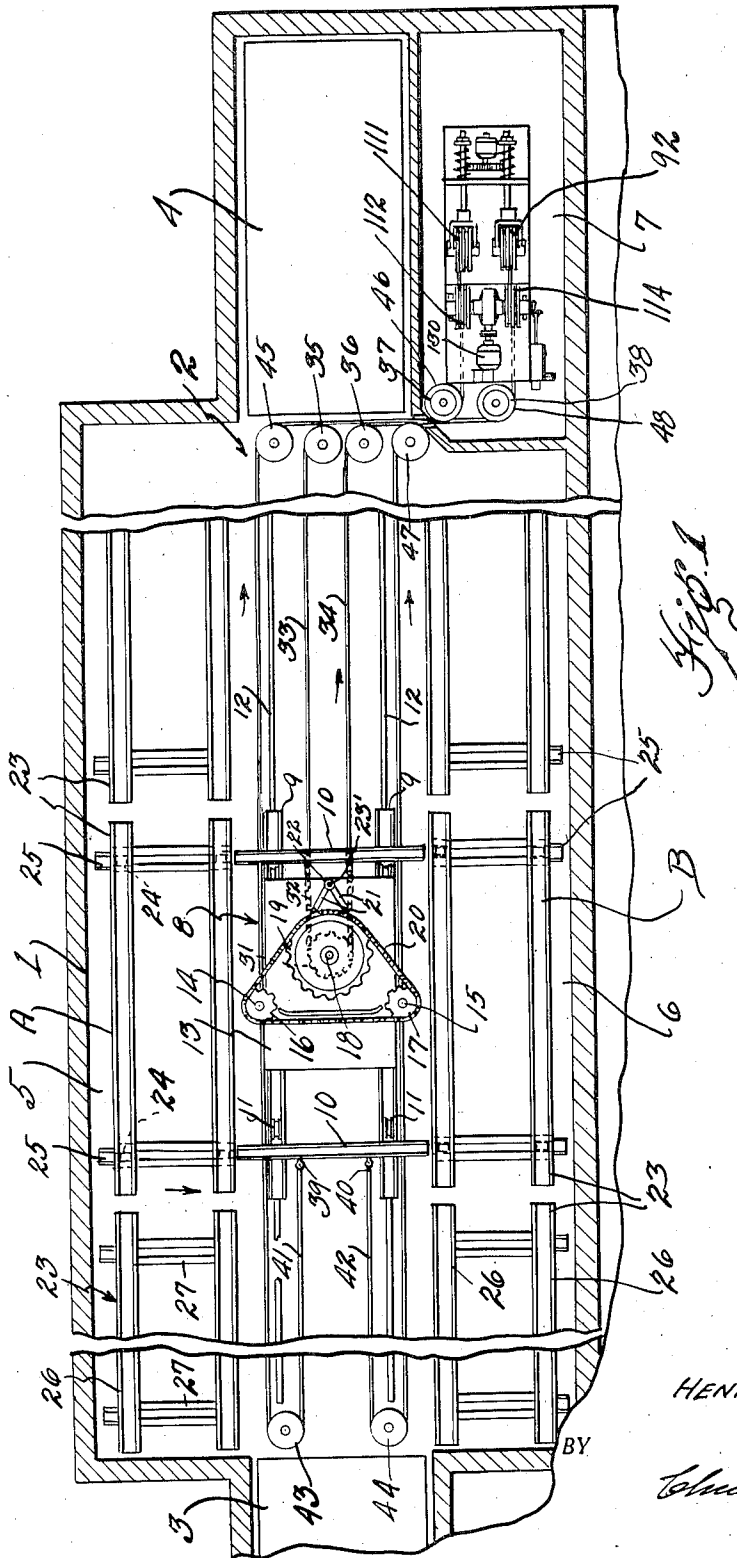
H. F. MARTIN

1,944,253

AUTOMATICALLY CONTROLLED TRANSFER DEVICE

Filed Jan. 5, 1931

4 Sheets-Sheet 1



INVENTOR.
HENRY F. MARTIN

BY
Charles E. Martin
ATTORNEY.

Jan. 23, 1934.

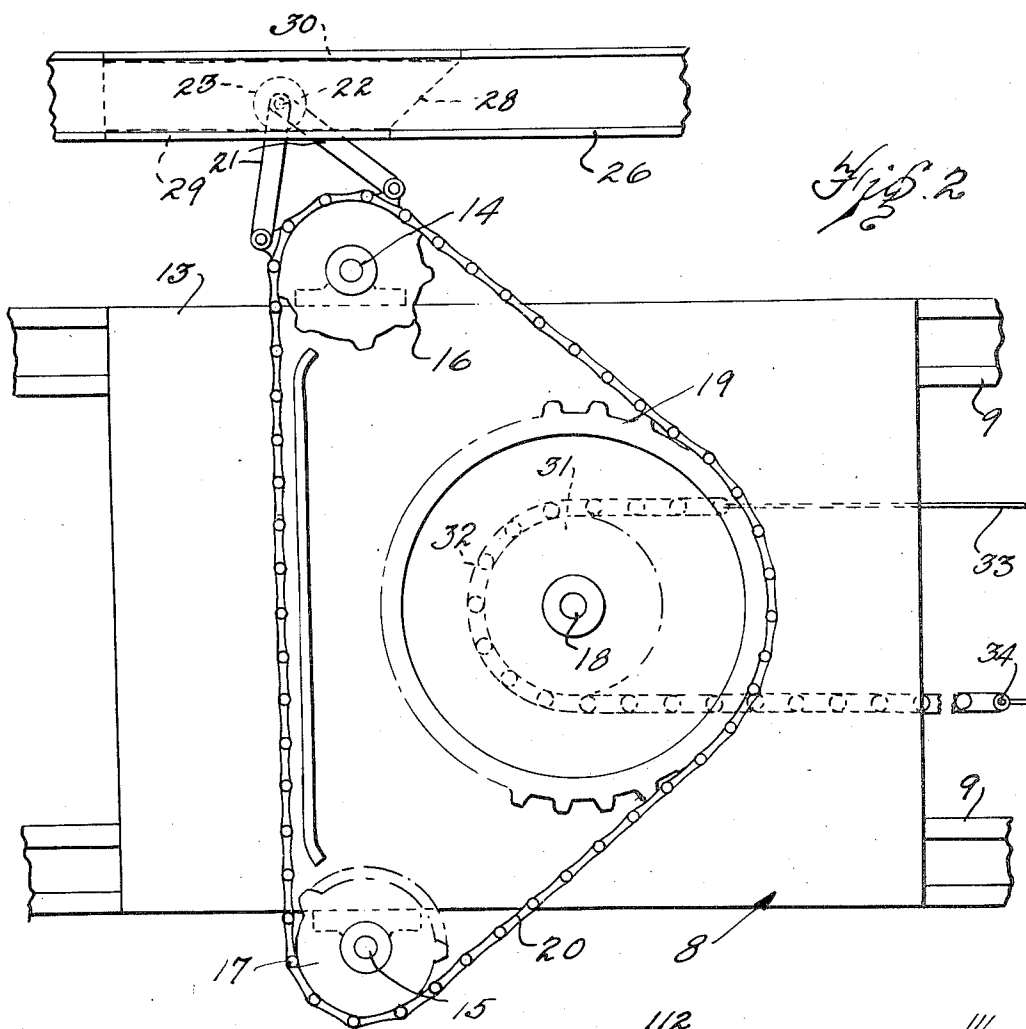
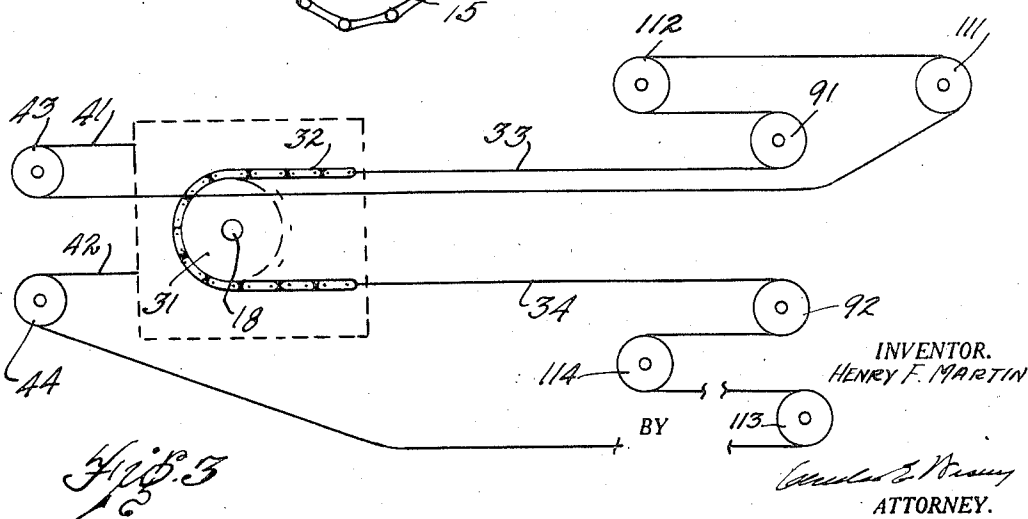
H. F. MARTIN

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AUTOMATICALLY CONTROLLED TRANSFER DEVICE

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4 Sheets-Sheet 2



INVENTOR.
HENRY F. MARTIN

BY

Charles E. Waring
ATTORNEY.

Jan. 23, 1934.

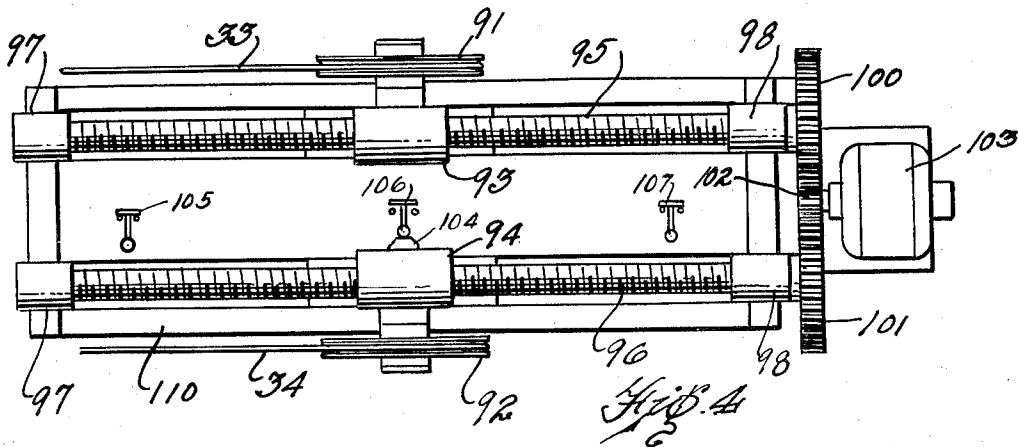
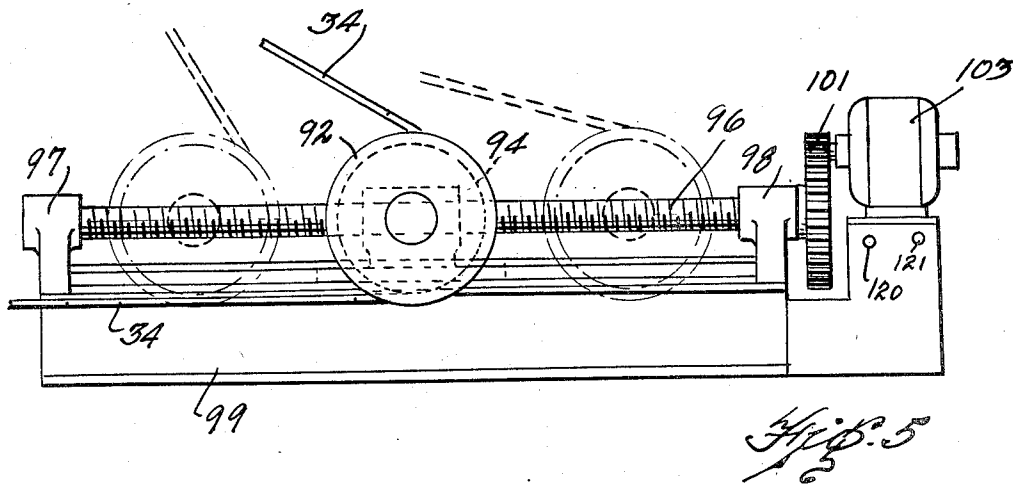
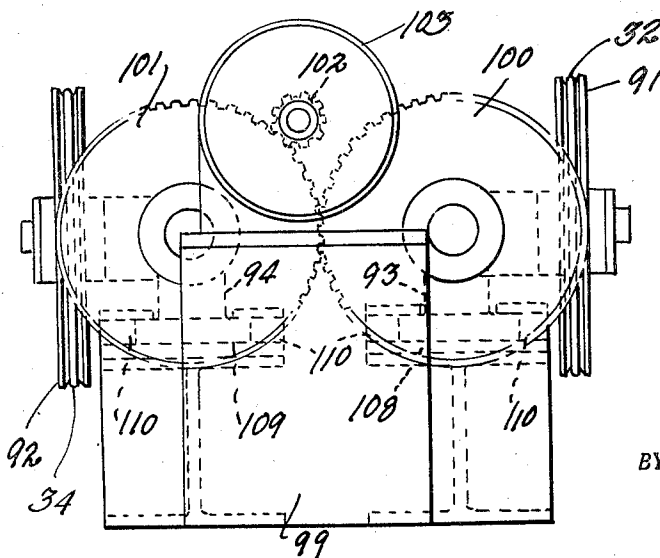
H. F. MARTIN

1,944,253

AUTOMATICALLY CONTROLLED TRANSFER DEVICE

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4 Sheets-Sheet 3



INVENTOR.
HENRY F. MARTIN
BY
Charles E. Henry
ATTORNEY.

Jan. 23, 1934.

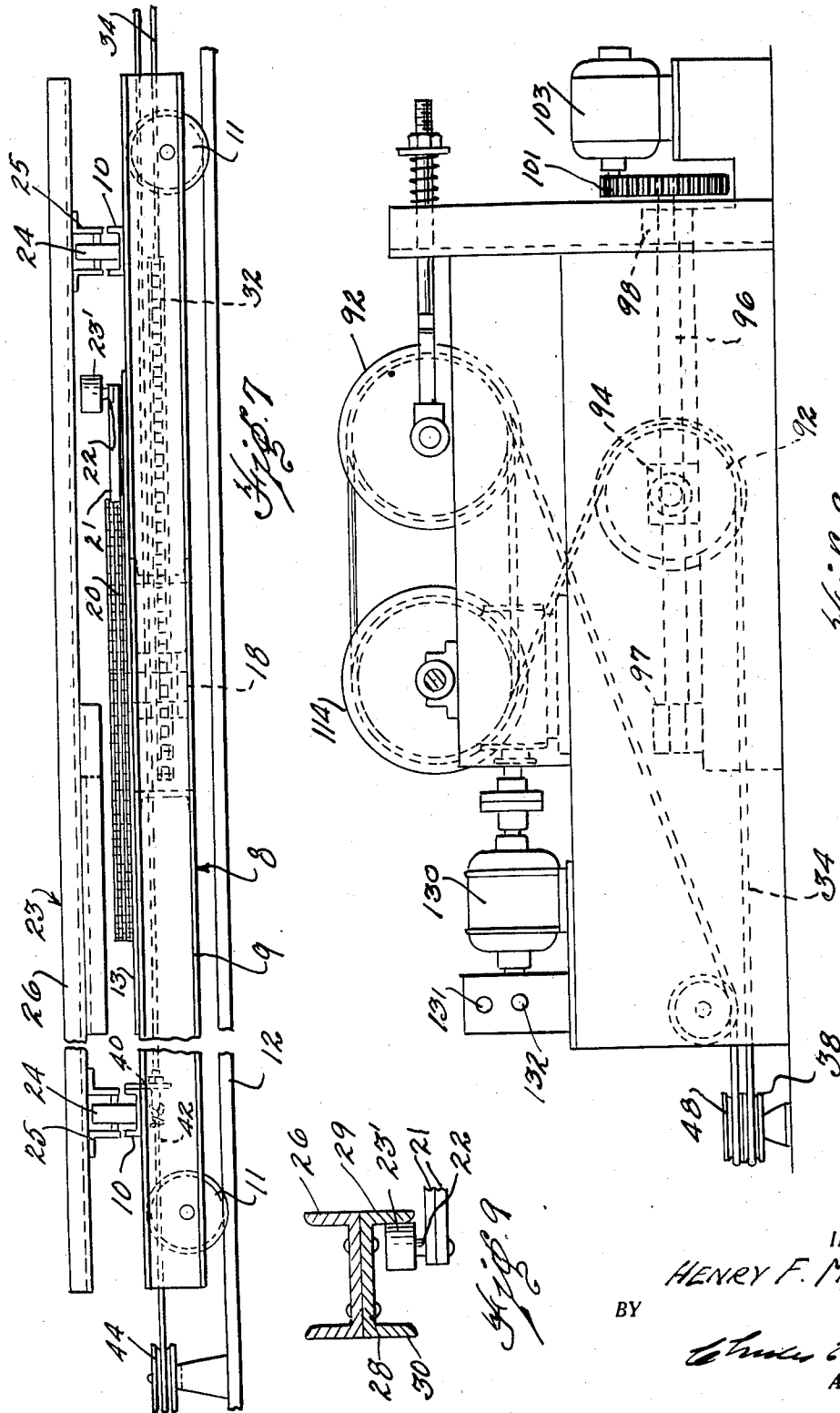
H. F. MARTIN

1,944,253

AUTOMATICALLY CONTROLLED TRANSFER DEVICE

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4 Sheets-Sheet 4



INVENTOR.
HENRY F. MARTIN
BY
Charles E. Hume
ATTORNEY.

UNITED STATES PATENT OFFICE

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AUTOMATICALLY CONTROLLED TRANSFER
DEVICEHenry F. Martin, Detroit, Mich., assignor to De-
troit Hoist and Machine Company, Detroit,
Mich., a corporation of Michigan

Application January 5, 1931. Serial No. 506,583

9 Claims. (Cl. 214—16.1)

This invention relates to automatically controlled transfer devices.

An object of the invention is to provide a carriage that may be moved in either direction in a predetermined path and on which mechanism is mounted for moving a tray onto or delivering it from the carriage at an angle to the path of travel of the same.

The device as shown in the drawing is for use in a garage for storing automobiles but it is to be understood that it may be used in a number of places such as a warehouse or the like where it is desired to discharge merchandise from a central bay into any of a series of stalls adjacent both sides of the same.

Another object and feature of the invention is to provide a device of this character in which all of the electrical apparatus used in operation of the same may be enclosed in a fire-proof room positioned at one end of the building so that danger of fire, due to sparking of the motors or short circuiting of the wires, is eliminated in the main storage room.

Another object of the invention is to provide a device of this character in which all the controls for the operating mechanism are centralized in one room so that any breakdowns may be quickly repaired by the operator.

A still further object of the invention is the novel means employed in moving the carriage to a point in line with any desired stall and then automatically discharging from the carriage a tray carrying an automobile or taking a tray from the stall onto the carriage.

Another object of the invention is to provide a device of this character which is comparatively cheap to install and which is of relatively low height thus permitting the building to be constructed with low ceilings thereby cutting down the cost of construction of the same.

These objects and the several novel features of the invention are hereinafter more fully described and claimed and the preferred form of construction by which these objects are attained is shown in the accompanying drawings in which—

Fig. 1 is a plan view of my improved transfer mechanism installed in a building.

Fig. 2 is an enlarged plan view of a portion of the truck.

Fig. 3 is a diagrammatic view of the cable arrangement.

Fig. 4 is a plan view of the mechanism used for discharging a tray from the carriage to one of the stalls.

Fig. 5 is a side elevation thereof.

Fig. 6 is an end view thereof.

Fig. 7 is a side elevation of the carriage.

Fig. 8 is a side elevation of the drive mechanism for the carriage.

Fig. 9 is a section taken on line 9—9 of Fig. 2.

Referring now to the drawings it will be seen that the building 1 is provided at each end of the longitudinally extending bay 2 with the elevators 3 and 4 for raising or lowering cars from or to the main floor or street level. The building 1 is also provided on each side of the bay 2 with the offset portions 5 and 6 into which cars or automobiles are stored and is further provided at one end with a room 7 the walls of which are preferably of fire-proof construction and in which all of the electrical mechanism is placed thus eliminating the danger of fire in the main storage room caused by short circuiting of any of the electric wires or sparking of the motors.

As best seen in Figs. 1, 2 and 7 a carriage 8 is constructed of the longitudinally extending beams 9 and the horizontally disposed channel beams 10 riveted or otherwise secured together. The beams 9 are provided intermediate their ends with the wheels 11 for engaging the rails 12 extending approximately the full length of the bay 2. A platform 13 is mounted upon the beams 9 between the beams 10 and has suitably mounted thereon the shafts 14 and 15 for carrying the idler sprockets 16 and 17. A shaft 18 is also mounted in the plate 13 and carries the sprocket 19. A chain 20 engages the sprockets 16, 17 and 19 and a pair of links 21 are pivotally connected to the chain 20 the outer ends of the same being pivotally connected together as indicated at 22 and a roller 23' is mounted upon the pivot 22 for a purpose to be hereinafter described.

In each of the offset portions 5 and 6 there are arranged a series of trays 23 having the wheels 24 positioned therebeneath for riding in the channel guides 25, the same being secured to the floor of the building and in horizontal alignment with the channels 10. The trays 23 are composed of the longitudinally extending channels 26 and the spaced angle irons 27 between which the wheels 24 are pivoted. The beams 26 are spaced apart an amount equal to the tread of an automobile so that an automobile may be moved from either of the elevators 3 or 4 onto one of the trucks 26 when the same is in alignment with the center line of the bay 2, as will be more fully described. As will be seen by reference to Figs. 2 and 9 each of the beams 26 nearest the bay 2 has secured thereto the channels 28 secured back to back to the beams 26 and it will be seen that the legs 29

of the channels 28 are shorter than the legs 30 for a purpose to be later described.

The shaft 18 mounted in the carriage 8 has also mounted thereon the sprocket 31 positioned below the plate 13 as will be more clearly understood by reference to Fig. 7. A chain 32 extends around the sprocket 31 and the ends of the chain have the cables 33 and 34 connected thereto, as will be readily understood by reference to Fig. 1.

The cables 33 and 34 then pass around suitable guide pulleys 35 and 36 positioned at one end of the bay 2 and then pass around the guide pulleys 37 and 38 positioned in the room 7 and thence pass to the mechanism for causing movement of the cables, as will be later described. The end beam 10 of the carriage 8 nearest the elevator 3 is provided with a pair of eyebolts 39 and 40 the same having the cables 33 and 34 connected thereto. A pair of guide pulleys 43 and 44 are positioned at the end of the bay 2 nearest the elevator 3, as will be seen by reference to Fig. 1. The cable 33 passes round the pulley 43 and then around the pulley 45 positioned at the opposite end of the bay 2 and thence around the pulley 46 carried by the same vertical pivot as the pulley 37. The cable 34 passes around the pulley 44 and thence around the pulley 47 positioned at the opposite end of the bay 2 and thence around the pulley 48 the same being in vertical alignment with the pulley 38. The cables 41 and 42 then pass to suitable driving mechanism as will be later described.

The operation of this part of the device is as follows: If for instance, it is desired to place an automobile upon the tray A the cable 34 will be pulled in a direction as shown by the arrow in Fig. 1 causing the sprockets 31 and 19 to be rotated in a counter clockwise direction.

The sprocket 20 carrying the arms 21 with it will likewise be moved in a counter-clockwise direction and when the roller 22, carried by the arms 21, has passed by the right hand end of the leg 29 of the channel 20 and then engaged behind the same, the tray A will then be moved toward the carriage 8 and the wheels 24 will ride in the channels 10 of the carriage 8 until it has come into central alignment with the same whereupon the movement of the cable 34 will cease thus allowing the tray A to remain upon the carriage 8. The cables 33 and 34 will then be moved in a direction indicated by the arrows in Fig. 1 causing the carriage 8 to be moved along the rails 12 until it has come into close proximity to the elevator 3 whereupon movement of the same will stop. If an automobile has been brought from the main floor by the elevator 3 the same will be moved off of the elevator and onto the tray A and then locked in position on the same by mechanism not here shown. The carriage 8 will then be returned until the channels 10 of the carriage have come into alignment with the channels 25 from which the tray A has been removed. Then when the mechanism operating the cables 33 and 34 is reversed the roller 22 will engage against the leg 30 of the channel 28 and move the tray A back into the position which it formerly occupied.

The roller 22 will continue its movement and pass by the right hand end of the leg 29 of the channel 30 until it has reached the position as shown in Fig. 1 whereupon movement of the same will be automatically stopped by suitable mechanism not shown. If it is desired to move the tray B onto the carriage 8 the operation will be exactly the same with the exception that the

rotation of the sprockets 19 and 31 will be in a clockwise direction to draw the tray B onto the carriage 8 as will be readily understood.

Referring now to Figs. 4, 5 and 6 it will be seen that the pulleys 91 and 92 are carried by the respective nuts 93 and 94, the same being threaded respectively upon the rods 95 and 96, the said rods being mounted in the bearings 97 and 98 carried by the base 99. The rod 95 carries at one end thereof a gear 100 while the rod 96 carries the gear 101, the same meshing with a pinion 102 driven by the motor 103. As more clearly indicated in Fig. 6 the gear 100 meshes with the gear 101 thus causing the shafts 95 and 96 to rotate in opposite directions. The nut 94 is provided with the extension 104 to operate the switches 105, 106 and 107, which are shown diagrammatically in Fig. 4 and which are commonly known as Hatchway switches.

Since the shafts 95 and 96 are provided with the same pitch thread and since they rotate in opposite directions it will be clearly understood that when the nut 94 carrying the pulley 92 moves toward the right that the nut 93 carrying the pulley 91 will be moved the same distance and at the same speed toward the left or if the direction of rotation of the shafts is reversed, due to reversing of the motor 103 the pulley 92 will be moved toward the left while the pulley 91 will be moved toward the right. The nuts 93 and 94 are provided respectively with the base portions 108 and 109 guided in suitable channels 110, as will be clearly understood by reference to Fig. 10.

It will be seen by reference to Fig. 4 that when the nut 94 is positioned centrally of the threaded shaft 96 that the switch 106 will be opened and that if the nut 94 is moved to the left the switch 105 will be opened and in like manner when the nut 94 is moved to the right the switch 107 will be opened. It will be further understood that when the cam 104 is moved away from any one of the switches the same will automatically close. The switches 105, 106 and 107 are so arranged in respect to the electric motor 103 and the push buttons 120 and 121 that upon opening the electric switches the current will be broken to the electric motor 103 thereby stopping operation of the same and consequently stopping rotation of the shafts 95 and 96.

Upon operation of the push button 120 the electric circuit to the motor 103 will be completed causing the nut 94 to be moved toward the left until the cam 104 operates the switch 105 whereupon movement of the nut will cease. During this movement the sprocket 31 will have been rotated in a clockwise direction and likewise the sprocket 20 carrying the roller 23' and one of the trays B will have been moved from its stall onto the carriage 8. If the push button 121 had been closed the rotation of the motor 103 would have been reversed causing the nut 94 to move toward the right thereby causing the sprocket 31 and the sprocket 20 to be rotated in a counter-clockwise direction thus carrying one of the trays A onto the carriage 8.

Referring now to Fig. 3 the cable hook-up becomes readily apparent. The cable 33 has one end 41 anchored to the carriage 8 as heretofore described, it then passes around the pulley 45 and thence over suitable guide pulleys, not shown in this figure, to the take-up pulley 111, thence around the driving pulley 112, thence around the pulley 91 and is then connected to the sprocket chain 32, as heretofore described.

In like manner the cable 34 has one end 42 anchored to the carriage 8 and then passes around a pulley 44 and thence over suitable guide pulleys to the take-up pulley 113 thence around the driving pulley 114, thence around the pulley 92 and is thence connected to the sprocket chain 32. Referring now to Figs. 1 and 8 it will be seen that the driving drums 112 and 114 are rotated by the electric motor 130 through a suitable train of gears (not shown). It is to be understood that the motor 130 may be rotated in either direction, the push buttons 131 and 132 controlling the direction of rotation of the same. When it is desired to move the carriage 8 to a point opposite any particular tray the motor 130 is set in motion thereby causing the driving drums 112 and 114 to be rotated both at the same speed thereby pulling the carriage 8 along the rails 12, the pulleys 91 and 92, 111 and 113 merely acting as idlers. When the carriage 8 has reached any desired point in its travel the supply of current to the electric motor 133 is broken, either manually by the operator or automatically by means that form no part of this invention. Again referring to Fig. 3 it will be seen that the pulleys 91 and 92 may be moved either to the right or to the left as desired without changing the relation of the respective cables 33 and 34 between the pulleys 112 and the carriage 8 or between the pulley 114 and the carriage 8.

From the foregoing description it becomes evident that I have provided a novel means for moving the carriage in a predetermined path of travel and for discharging a tray from the carriage to either side of the line of travel of the same or for moving a tray onto the carriage from either side of the same and further since all the driving motors are positioned in a room positioned remotely from the same fire hazards are eliminated in the main storage room. It will also be seen that the device is easily operated and will not easily get out of order.

Having thus fully described my invention, its utility and mode of operation, what I claim and desire to secure by Letters Patent of the United States is—

1. A device of the character described comprising a carriage, and a tray, means for moving the carriage in a predetermined path, said means comprising a stationarily positioned power device cable connected with the carriage and a trackway for the carriage, mechanical means only on the carriage for either discharging the tray from the same at an angle to the path of travel of the carriage or for moving the tray onto the carriage, and means remote from the carriage for operating the discharging means thereon.

2. A device of the character described comprising a carriage, means including a cable and a remotely positioned stationary power apparatus for controlling the same for moving the same in a predetermined path, a series of trays positioned on each side of the path of travel of the carriage, mechanical means only on the carriage for moving any one of the trays thereon or for discharging the same therefrom and means remote from the carriage for operating the tray discharging means thereon.

3. A device of the character described comprising a carriage, a cable attached thereto, a driving drum positioned remotely to the carriage for operating the said cable, to move the carriage along a predetermined path, a plurality of trays positioned on either side of the path of travel of the carriage, mechanical means only on

the carriage for moving a tray thereon or for discharging the same therefrom, and means remote from the carriage for operating the discharging means thereon.

4. A device of the character described comprising a carriage and a tray, discharging means on the carriage, a pair of cables attached to the carriage, the opposite ends of the cables attached to the discharging means thereon, two pairs of pulleys positioned remotely to the carriage, the intermediate portion of the cables passing respectively around the pulleys, the pulleys being so arranged that longitudinal movement of one pair will operate the discharging means on the carriage for moving the tray therefrom or thereon, and rotation of the other pair of pulleys will move the carriage along a predetermined path.

5. A device of the character described comprising a carriage, means for moving the same in a predetermined path, said means comprising a stationary power apparatus positioned at a point remote from the carriage, and a drum and cable mechanism connected with the carriage, a series of trays positioned on either side of the line of travel of the carriage, means for stopping the carriage in alignment with any desired tray, mechanical means only on the carriage for moving a tray thereon or for discharging the same therefrom, and means including a cable and operating means therefor remote from the carriage for operating the discharging means thereon.

6. A device of the character described comprising a carriage, and a tray provided with an extension, discharging means on the carriage, which comprises a sprocket chain and a roller carried thereon, for engaging with the extension on the tray for moving the tray onto or discharging it from the carriage, a second sprocket chain carried by the carriage, a pair of cables attached to the carriage and the opposite ends of the same attached to the ends of the second mentioned sprocket, a plurality of pulleys, the intermediate portions of the cables passing over said pulleys, the same being so arranged that longitudinal movement of some of the pulleys will operate the discharging means on the carriage and rotation of the other pulleys will move the carriage along a predetermined path.

7. A device of the character described comprising a carriage, and a tray, discharging means on the carriage, a pair of cables attached to the carriage, the opposite ends of the cables attached to the discharging means thereon, the intermediate portion of the cables passing respectively around a pair of pulleys, mechanism for imparting horizontal movement to one pair of pulleys for operating the discharging means on the carriage, and mechanism for operating the second pair of pulleys for moving the carriage in either direction along a predetermined path.

8. A device of the character described comprising a movable carriage, and a plurality of trays arranged on both sides of the path of travel of the carriage, means on the carriage for moving a tray thereon or discharging therefrom, a cable arrangement attached to the carriage and to the discharging means thereon, means remote from the carriage for pulling the cable to move the carriage in either direction along a predetermined path, and a second means also remote from the carriage for operating the discharging means thereon while the carriage is standing still.

9. A device of the character described compris-

ing a carriage and a tray, means on the carriage including an arm movable to engage the tray to discharge the same from the carriage at an angle to its path of travel or for moving the tray onto the carriage from one side of its path of travel, a cable attached to the carriage and to said discharge means, means for operating the cable to move the carriage along a predetermined path, and means remote from the carriage for moving the cable to operate the discharge means while the carriage is standing still.

HENRY F. MARTIN.

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