

Sept. 27, 1932.

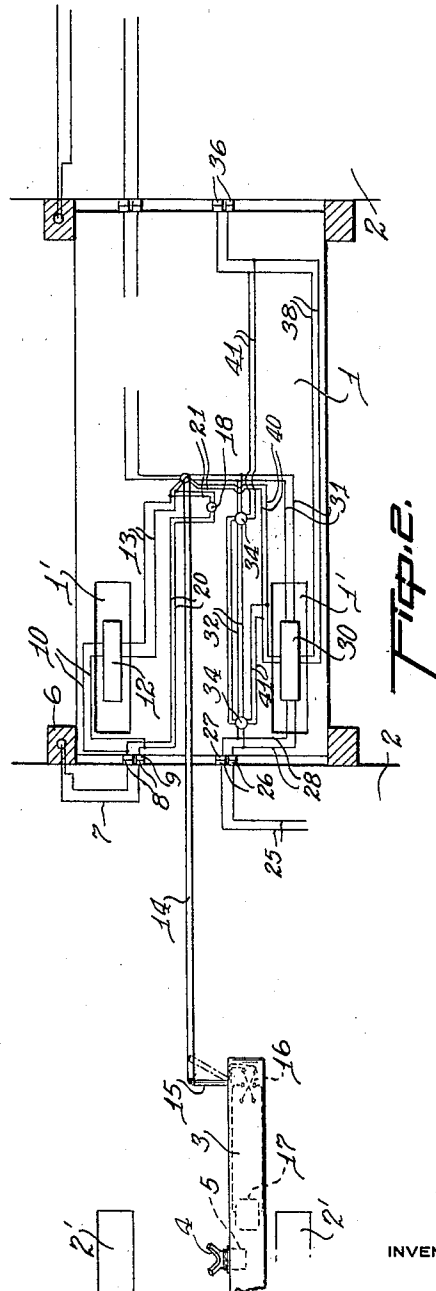
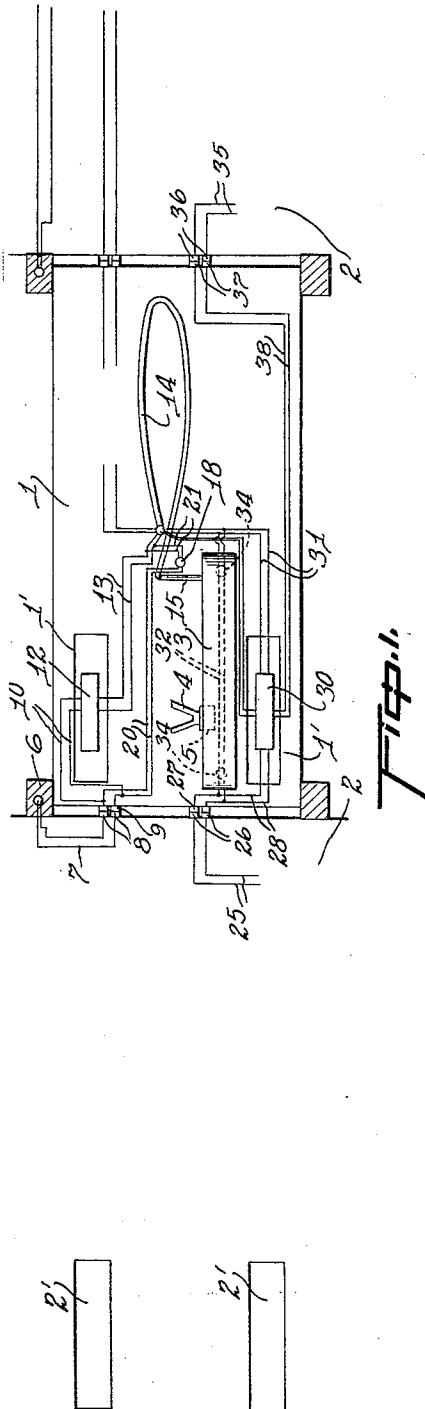
H. L. SCOTT

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SELF LOADING AND UNLOADING ELEVATOR

Filed Nov. 14, 1930

2 Sheets-Sheet 1



BY

Henarie L. Scott

Robert W. Scott

INVENTOR

ATTORNEY

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H. L. SCOTT

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2 Sheets-Sheet 2

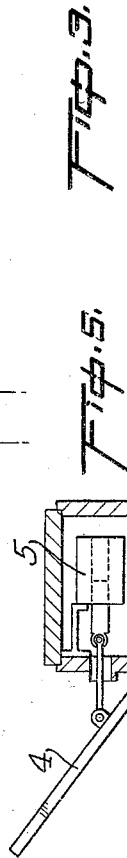
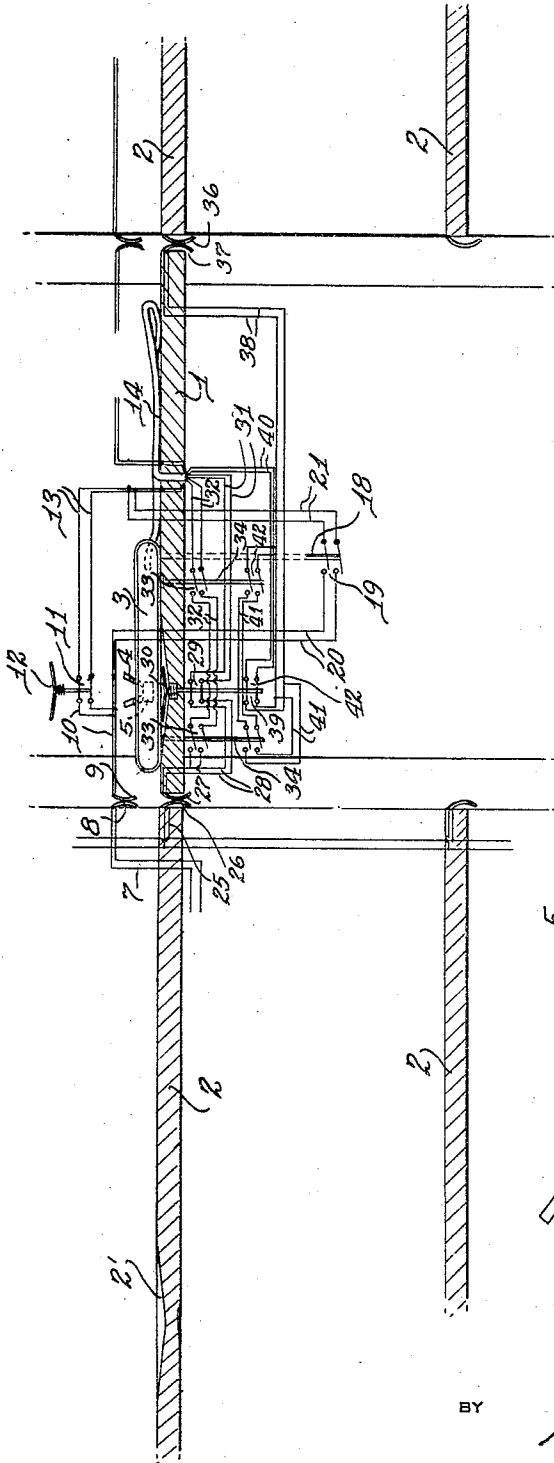


FIG. 3.

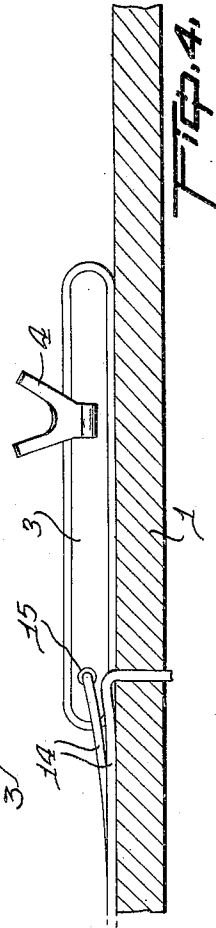


FIG. 4.

INVENTOR

Henarie L. Scott

BY

Bentley & Bentley

ATTORNEYS

UNITED STATES PATENT OFFICE

HENARIE L. SCOTT, OF SAN ANTONIO, TEXAS

SELF LOADING AND UNLOADING ELEVATOR

Application filed November 14, 1930. Serial No. 495,703.

The present invention pertains to a novel automatic loading and unloading mechanism of a type especially designed to move automobiles on to and off of elevators employed for conveying the automobiles to any of a plurality of floors in a building constructed to receive the automobiles for the purpose of parking the same.

The primary object of the present invention is to devise a mechanism which facilitates the prompt delivery of the automobile when the same is called for by employing a mechanism which is remotely controlled and which avoids the necessity of attendants handling the automobiles, thereby reducing the overhead expenses. Instead of requiring an attendant at each floor to move the desired automobile on the elevator under its own power it is only necessary for the cashier in the office to receive the check from the customer which identifies his automobile and the cashier notes the location of the automobile which is indicated on the check and then pushes a button on a switchboard which causes the elevator to go to the floor where the automobile is and as soon as the elevator comes in line with the proper floor the automatic mechanism functions and moves the automobile onto the elevator and it can then be conveyed by the elevator to the main floor. The check is given to the customer by an attendant who is stationed at the entrance and who moves the automobile onto the elevator and then pushes a button corresponding to the number of the check and the elevator goes to that floor and as soon as it is in line therewith the automatic mechanism functions and moves the automobile onto the floor and leaves it there. Means is also provided which prevents the automatic mechanism from functioning in a manner whereby it would try to move an automobile onto the elevator when another automobile is already located thereon.

With the above and other ends in view the invention consists in the matters hereinafter set forth and more particularly pointed out in the appended claims, reference being had to the accompanying drawings, in which

Figure 1 is a diagrammatic plan view of the present device applied to an elevator;

Fig. 2 is a diagrammatic plan view illustrating another stage of the operation of the present mechanism;

Fig. 3 is a diagrammatic cross sectional view;

Fig. 4 is a detail view of the caterpillar which moves the automobiles, and

Fig. 5 is a cross sectional view through the caterpillar illustrating the manner in which the fork is mounted to be actuated by the electro-magnet.

Like characters of reference are employed throughout to designate the corresponding parts.

The numeral 1 indicates an elevator platform which is raised and lowered by any suitable means that may be purchased upon the market and 2 indicates floor levels in the building in which the elevator is installed. The elevator raising and lowering means is preferably of the conventional automatic type, that is its electric motor is controlled by push-buttons which cause the motor to raise or lower the elevator to the floor corresponding to the button pushed and then it stops.

An electrically operated caterpillar 3 is carried by the elevator and is provided with a pivoted fork 4 and adjacent this fork is mounted an electric magnet 5 so that when this magnet is energized in a manner presently to be described the fork is caused to raise and when it is in the raised position it engages the rear axle of an automobile resting upon the elevator platform and when the motor in the caterpillar is energized it moves the automobile off the elevator.

It will be assumed that an automobile has been placed on the elevator so that its rear wheels are received in the depressions 1' that are provided therein and the elevator platform lined up with the floor 2. The elevator is brought to this floor by pushing a button on the main floor at the bottom of the column 6 and thereby energizing the wires 7 which are connected to a pair of resilient fingers 8. When the elevator platform is lined up with the floor 2 as illustrated in Fig. 3 of the

drawings the fingers 8 contact with similar fingers 9 that are mounted on the edge of the elevator platform so that the current may pass therethrough only when the platform of the elevator is lined up with the floor. From the fingers 9 the wires 10 lead to the current to the switch 11 which is closed by the weight of the automobile wheel resting upon the plate 12 which is received in the depression 1', the plate being ordinarily held in an upwardly projecting position by any suitable resilient means so that when the weight of the automobile is removed from this plate it causes the switch 11 to open and break the circuit. From the switch 11 the wires 13 lead the current to a cable 14 and the latter carries the current through the pivoted arm 15 and reversible switch 16 (see Fig. 2) to the caterpillar motor 17 and at the same time energizes the magnet 5 whose magnetic attraction causes the fork 4 to move on its pivot so that it raises and engages the axle of the automobile that has its wheel resting upon the plate 12.

A pin 18 is mounted in the platform of the elevator in the path of the caterpillar 3 and a switch 19 is operated by this pin so that when the pin is depressed the switch remains open but as soon as the caterpillar 3 moves off the pin the switch closes. This switch 19 is connected by wires 20 to the wires 10 above the switch 11 and is connected by the wires 21 to the wires 13. In this manner a relay is provided so that when the automobile wheel is removed from the plate 12 by the caterpillar the latter is by that time off the pin 18 and the switch 19 is closed so that the current may flow through the wires 20, switch 19, wires 21 and wires 13 to the cable 14.

The caterpillar is driven by the motor 18 so that it moves the automobile completely off the elevator and the wheels which formerly rested in the depressions 1' come to rest in the depressions 2' in the floors 2 and the cable 14 becomes taut as illustrated in Fig. 2 and causes the arm 15 to pivot from the position shown in full lines to that illustrated in broken lines. The pivoting of the arm 15 causes the switch 16 to reverse the direction of the motor 18 and at the same time it de-energizes the magnet 5 so that the fork 4 may drop out of engagement with the axle of the automobile. The caterpillar then returns to its position on the elevator and is stopped thereon as soon as it depresses the pin 18 to break the circuit leading to the cable 14.

When a customer calls for his automobile he will present his check to the cashier who pushes a button and energizes the wires 25 and when the elevator platform comes level with the floor where the automobile is the fingers 26 contact with the fingers 27 and the current flows to the wires 28 which lead to the switch 29 which is operated by a tread plate 30 which is mounted in the recess 1' so

that when an automobile is resting thereon the switch 29 is opened but at this stage of the description the elevator is vacant and therefore the switch is closed. It will become obvious however, that it is impossible to attempt to load another automobile upon the elevator when one is already there.

From the switch 29 the current flows through the wires 31 to the cable 14 and through corresponding wires therein to the motor 17, causing the motor to rotate in a manner to move the caterpillar 3 off the elevator. When the caterpillar has traveled the length of the cable 14 the latter causes the arm 15 to reverse the switch 16 which reverses the motor 17 and energizes the magnet 5 so that the fork 4 raises and engages the axle of the automobile, alignment between the axle and the fork being insured by the provision of the recesses 2' and providing the cable 14 of a certain length which means the magnet will be energized to raise the fork at the proper point.

When the motor has been reversed as above described the caterpillar moves the automobile onto the elevator and the front wheels will rest upon the plate 30 and depress the same. To continuously supply the current to the motor when this plate has been thus depressed there is provided relay wires in which a switch or switches 33 are inserted to be operated by pins 34 that are mounted in the platform 1 so as to be depressed by the caterpillar as it rolls thereon. When the caterpillar depresses either or both of these pins the circuit through the switches 33 is broken but when the weight of the caterpillar is off the pins the current can flow there-through. When the caterpillar has moved the car onto the elevator the caterpillar has come to a position where it depresses both pins and the automobile wheel has depressed the plate 30 and therefore the current supply to the motor 17 has been cut off.

The arm 15 and switch 16 are so constructed that when the current has been cut off the arm extends outwardly substantially at right angles and the wiring in the cable 14 is such that if the current is supplied from the left, the caterpillar moves to the left and if the current comes from the circuit on the right the caterpillar will move to that direction. The unloading and loading circuits are kept entirely separate because in one operation it is necessary that the magnet 5 should be de-energized as the motor 17 is reversed and in the other operation it is necessary that the magnet 5 should be energized as the motor is reversed.

The above description discloses the manner in which the caterpillar moves an automobile from the left side of the elevator and to deliver one from the right side the wires 35 are energized and the current flows through the fingers 36 and 37 to the wires 38

which lead to the switch 39 which is operated by the plate 30 and from the switch 39 the wires 40 lead to the cable 14. A relay 41 is provided with switches 42 operated by the pins 34 and the operation is identical with that above described.

Suitable guide and traction means may also be provided for the caterpillar on both the elevator or platform or the floor so that the caterpillar will always be in the proper alignment with the automobile.

Although a specific embodiment of the present invention has been illustrated and described it is to be understood that various alterations may be made within the scope of the appended claims without departing from the spirit of the invention and such alterations are contemplated.

What I claim is:

1. The combination with an elevator, of a caterpillar, a fork carried by said caterpillar for engaging the axle of an automobile, means for causing said caterpillar to move a predetermined distance and return again, and means automatically operated after a predetermined amount of travel of said caterpillar away from said elevator for moving said fork out of engagement with said axle.

2. The combination with an elevator, of a caterpillar, a fork carried by said caterpillar adapted to engage the axle of an automobile, means for causing said caterpillar to move a predetermined distance and return again, and means automatically operated after a predetermined amount of travel of said caterpillar away from said elevator for moving said fork into engagement with said axle.

3. The combination with an elevator, of a caterpillar, a fork carried by said caterpillar adapted to engage the axle of an automobile, means for causing said caterpillar to move a predetermined distance and return again, and a magnet adapted to be energized when said caterpillar has completed its travel away from said elevator to raise said fork and cause it to engage the axle of an automobile.

4. The combination with an elevator, of a caterpillar, a reversible motor in said caterpillar adapted to be automatically energized when said elevator is in line with a selected floor, means on said caterpillar for engaging the axle of an automobile, and means for automatically reversing said motor when said caterpillar has moved a predetermined distance off said elevator.

5. The combination with an elevator, of a caterpillar, a reversible motor in said caterpillar adapted to be automatically energized when said elevator is in line with a selected floor, means on said caterpillar for engaging the axle of an automobile, means for automatically reversing said motor when said

caterpillar has moved a predetermined distance off said elevator, and means for automatically stopping said caterpillar at a predetermined point on said elevator.

6. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for energizing the motor to cause it to move said caterpillar, and means for reversing said motor after a predetermined amount of travel and at the same time energizing said magnet whereby it raises said fork.

7. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for energizing the motor to cause it to move said caterpillar, means for reversing said motor after a predetermined amount of travel and at the same time energizing said magnet whereby it raises said fork, and means for de-energizing said motor and magnet when said caterpillar reaches a predetermined point on said elevator.

8. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for energizing the motor to cause it to move said caterpillar and at the same time energizing said magnet to cause it to raise said fork, and means for reversing said motor and de-energizing said magnet after a predetermined amount of travel.

9. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for energizing the motor to cause it to move said caterpillar and at the same time energizing said magnet to cause it to raise said fork, means for reversing said motor and de-energizing said magnet after a predetermined amount of travel, and means for cutting off the energizing source of supply for said motor when said caterpillar has returned to a predetermined point on said elevator.

10. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for energizing the motor to cause it to move said caterpillar, and a cable for reversing said motor after a predetermined amount of travel and at the same time energizing said magnet whereby it raises said fork.

11. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for energizing the motor to cause it to move said caterpillar, a cable for reversing said motor after a predetermined amount of travel and at the

same time energizing said magnet whereby it raises said fork, and means for de-energizing said motor and magnet when said caterpillar reaches a predetermined point on said elevator.

5 12. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for
10 energizing the motor to cause it to move said caterpillar and at the same time energizing said magnet to cause it to raise said fork, and a cable for reversing said motor and de-energizing said magnet after a predeter-
15 mined amount of travel.

13. The combination with an elevator, of a caterpillar, a fork pivoted on said caterpillar, a magnet adjacent said fork, a reversible motor in said caterpillar, means for
20 energizing the motor to cause it to move said caterpillar and at the same time energizing said magnet to cause it to raise said fork, a cable for reversing said motor and de-energizing said magnet after a predetermined
25 amount of travel, and means for cutting off the energizing source of supply for said motor when said caterpillar has returned to a predetermined point on said elevator.

In testimony whereof I affix my signature.

HENARIE L. SCOTT.

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