

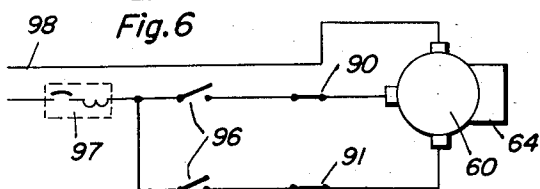
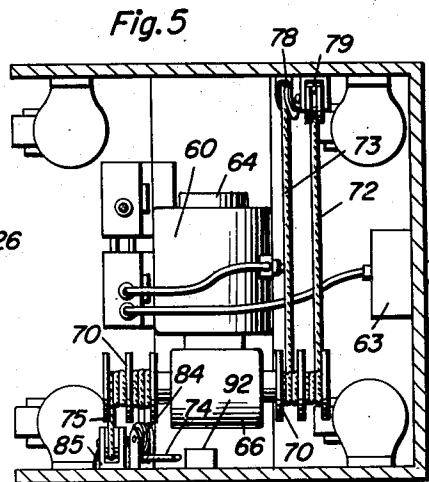
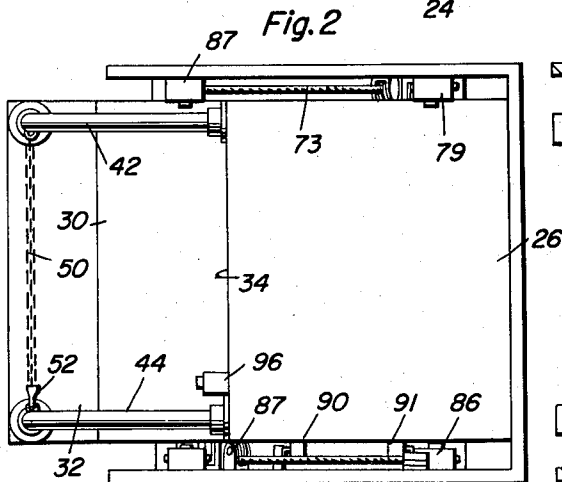
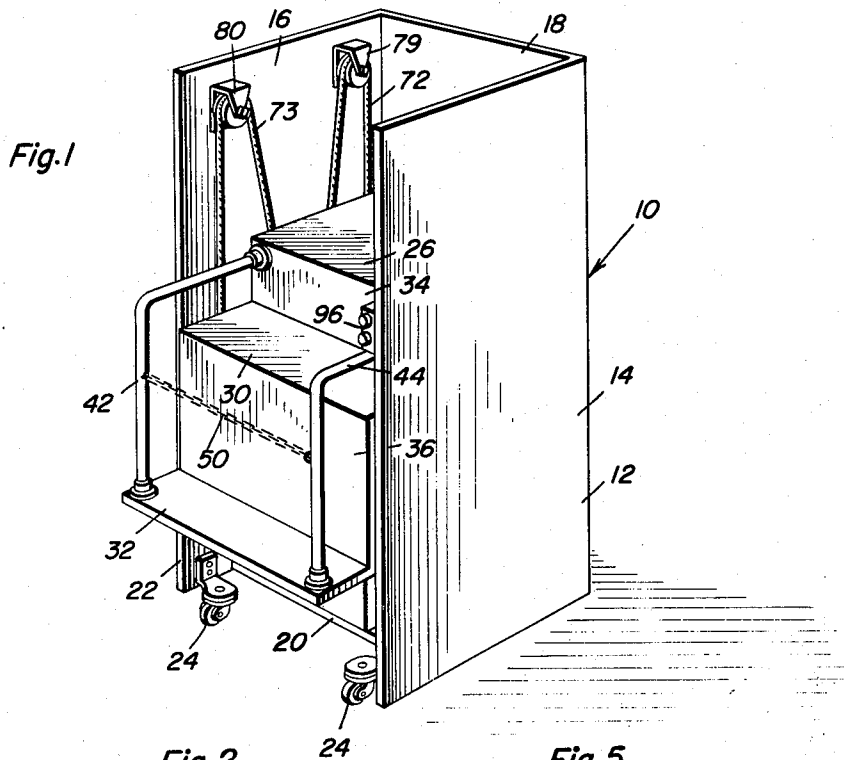
Feb. 21, 1961

P. D. GRANT  
PORTABLE ELEVATOR

2,972,394

Filed March 28, 1958

2 Sheets-Sheet 1



Gertrude B. Grant, Executrix of the  
Estate of Paul D. Grant, Deceased.  
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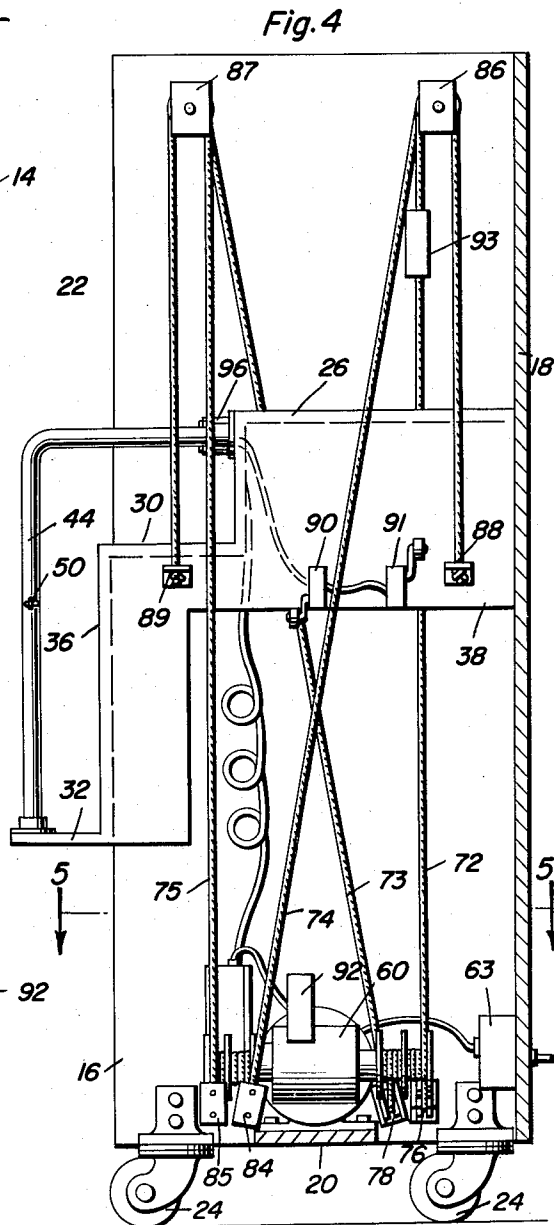
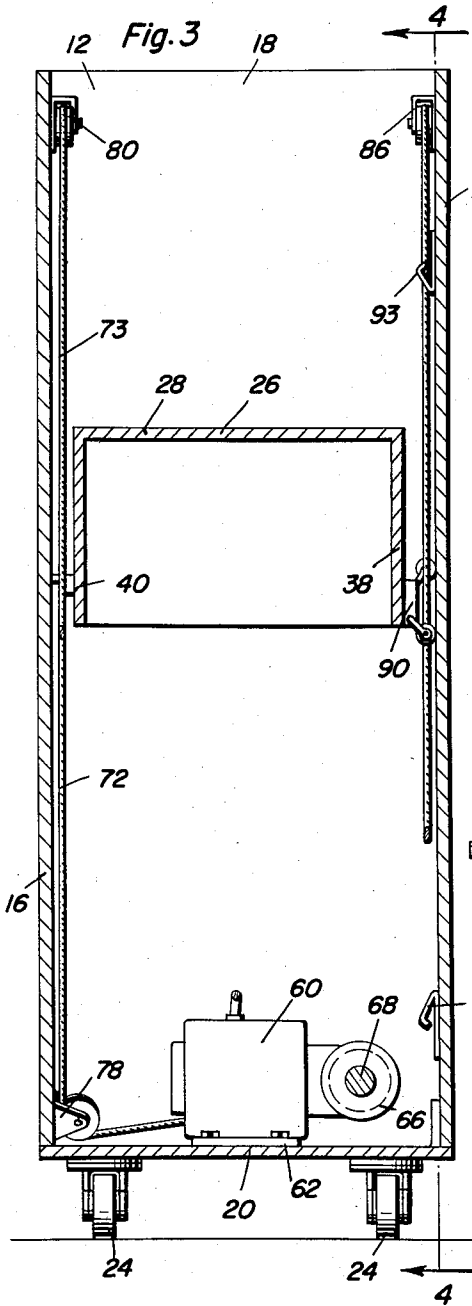
P. D. GRANT

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PORTABLE ELEVATOR

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2 Sheets-Sheet 2



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1

2,972,394

**PORTABLE ELEVATOR**

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2 Claims. (Cl. 187—11)

This invention relates to a portable elevator and more particularly to an elevator which is adapted to lift small heavy objects so that they can be more easily applied on shelves in warehouses, book stores and in a variety of other places.

An object of the present invention is to provide a portable elevator which has a novel supporting structure within which a platform is vertically movable. The platform is driven by an electric motor and a series of cables and pulleys that attach to a transmission that is actuated by the motor. It is preferred that the motor have a built in brake so that as soon as the power is turned off, as by actuating a switch, the brake automatically is applied so that the elevator platform remains at the selected height.

The elevator can be constructed very economically but yet in a manner so that it will be attractive and durable and provide long, satisfactory service. This is accomplished by the particular supporting structure which may be either a closed panel or an open web or a combination of both, in addition to the unique elevating mechanism including the configuration of the platform, which is supported by the structure.

A further object of the present invention is to provide an elevator capable of being raised and lowered, wherein there are upper and lower limit switches to stop the motion of the elevator platform when the extreme positions are reached.

Other objects and features of importance will become apparent in following the description of the illustrated form of the invention.

In the drawings:

Figure 1 is a perspective view of an elevator constructed in accordance with the invention.

Figure 2 is a top view of the elevator in Figure 1.

Figure 3 is a vertical sectional view of the elevator.

Figure 4 is a sectional view taken on the line 4—4 of Figure 3.

Figure 5 is a transverse sectional view taken on the line 5—5 of Figure 4.

Figure 6 is a wiring diagram showing one suggested manner of wiring the elevator.

In the accompanying drawings there is an elevator which is constructed in such a manner as to demonstrate the principles of the invention. The elevator includes a supporting structure 12 that has sides or side walls 14 and 16 together with a back wall 18 and a bottom or bottom wall 20. The top and front 22 of the support structure 12 is open. Wheels 24 which may be of the caster or fixed spindle type, are attached to the bottom wall 20 so that the elevator is capable of locomotion. Platform 26 has a square or rectangular article supporting surface or panel 28 that partially fills an elemental cross-sectional area of the support structure. Two steps are attached to the article supporting panel 28 and they include treads 30 and 32 together with risers 34 and 36. Sides 38 and 40 constitute parts of the risers and are secured to the side edges of the panel 28. The lowermost step tread 32 protrudes beyond the front 22 of the

2

support structure and has the lower ends of a pair of L-shaped guard rails 42 and 44 secured thereto. The upper parts of the guard rails have extremities which are attached to the riser 34, as by being welded or otherwise fastened. A chain 50 extends across the guard rails and has a catch 52 at one end to attach to one of the guard rails. The chain functions as a safety device for articles and/or personnel who may use the elevator.

In order to power the elevator, that is to raise the platform 26, there is an electric reversible motor 60 which is bolted or otherwise fastened to the bottom wall 20 by the motor mounting flanges 62 and bolts. The electric cord for motor 60 preferably operatively connects with an automatic rewind device 63. An electromagnetic or other type of clutch 64 is built in with a motor and operates automatically in response to deenergization of the motor 60. Hence, as soon as the electric power is removed from motor 60, the brake automatically applies with ample force to stop rotation of the armature shaft of the motor practically instantaneously. The armature shaft is attached to a shaft of transmission 66 that is provided with a power output shaft 68 on which multiple pulleys 70 are secured. There are four such pulleys and four cables in pairs 72, 73 and 74, 75 which are attached to the multiple pulleys. Cables 72 and 73 are guided by lower pulleys 76 and 78 (Figure 4) attached to the side wall 16 of the support structure 12. They are entrained over the upper pulleys 78 and 80 attached to the same side wall 16 and extending downwardly for attachment to the side 40 of the platform. Cables 74 and 75 are entrained over lower pulleys 84 and 85 and upper pulleys 86 and 87 at the lower and upper ends of wall 14 of supporting structure 12. These cables 74 and 75 are attached by brackets 88 and 89 (Figure 4) to the side 38 of the elevator platform 26. Flexible curtains covering the cables and pulleys can be disposed between the guard rails 42 and 44 as a protective measure.

Automatically closed limit switch 90 and 91 are attached to side 38 of the platform 26 and they strike lower and upper abutments 92 and 93 attached to the inner surface of supporting structure side 14. Switches 91 and 90 have switch arms on which there are rollers which make actual contact with the inwardly protruding abutments.

In operation, a manual switch 96 having up and down buttons will be used. It is preferred that this switch be attached to the platform so that it can move up and down with it. The switch 96 is schematically shown in Figure 6, as is one suggested wiring for the elevator. This schematic representation shows a thermal overload circuit breaker 97 in one side of the line 98, this same side having the parallel connected up and down switch sections of switch 96 arranged in parallel. They are respectively connected in series with the upper limit switch 91 and the lower limit switch 90 so that a parallel path is established for the up and down movement of the reversible motor 60, and each path has its energization button plus a limit switch serially connected with it.

Although the elevator platform is actually driven in a down direction by the reversal of motor 60, the invention could well be practiced by having the elevator wholly or entirely gravity lowered rather than partially gravity lowered or at least aided in the downward movement by the pull of gravity. Other switch arrangements could be adopted as well as various other modifications made without departing from the claimed invention.

What is claimed as new is as follows:

1. An elevator comprising a supporting structure which has a bottom, sides, and means attached to said sides holding said sides spaced from each other, said structure having an open top and an open front and constituting a guideway, a platform vertically movably disposed in said guideway between said sides, said platform having a part

3

which is accessible through the open front of said structure, an electric motor, drums connected to said electric motor and located at opposite sides of said motor, cables oppositely wound on said drums and operatively connected with said platform to elevate said platform in response to actuation of said motor, guides at the upper and lower parts of said supporting structure over which said cables are entrained, means responsive to the movement of said platform to a particular height for de-energizing said motor, and an automatic brake operatively connected with said motor and which becomes engaged to mechanically stop the motor from turning in response to de-energization of said motor.

2. The elevator of claim 1 wherein said platform has at least one step, and a guard rail connected to said step

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and having a portion which protrudes inwardly between said sides of said supporting structure.

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