Oct. 31, 1950 E. TODD 2,527,897

SINGLE COLUMN ELEVATOR DEVICE

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FIG. 1

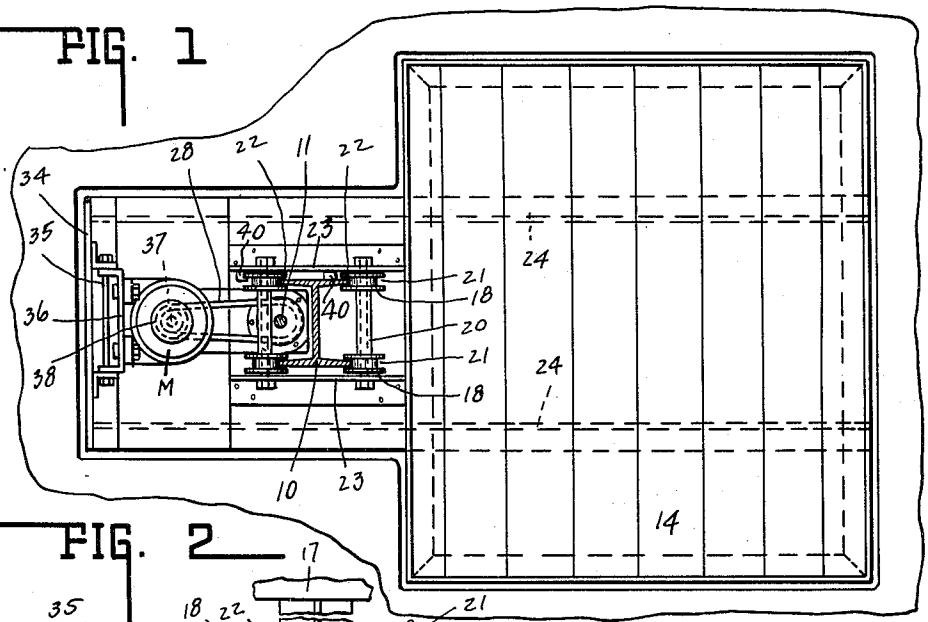

FIG. 2

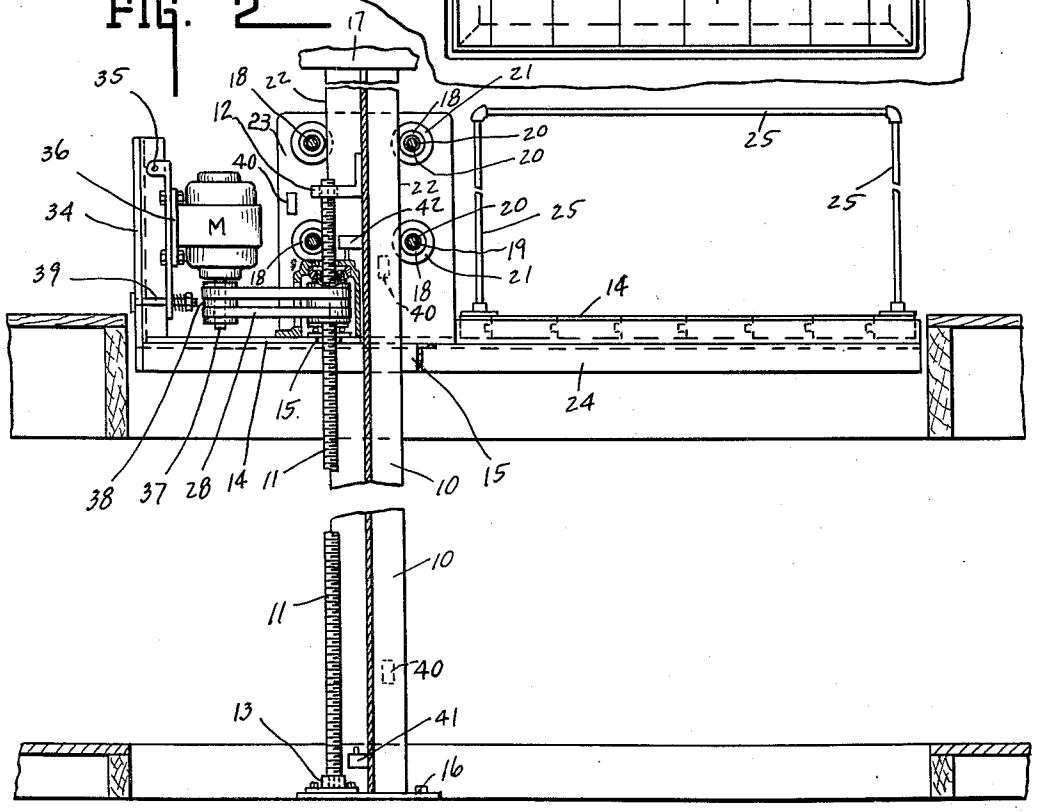

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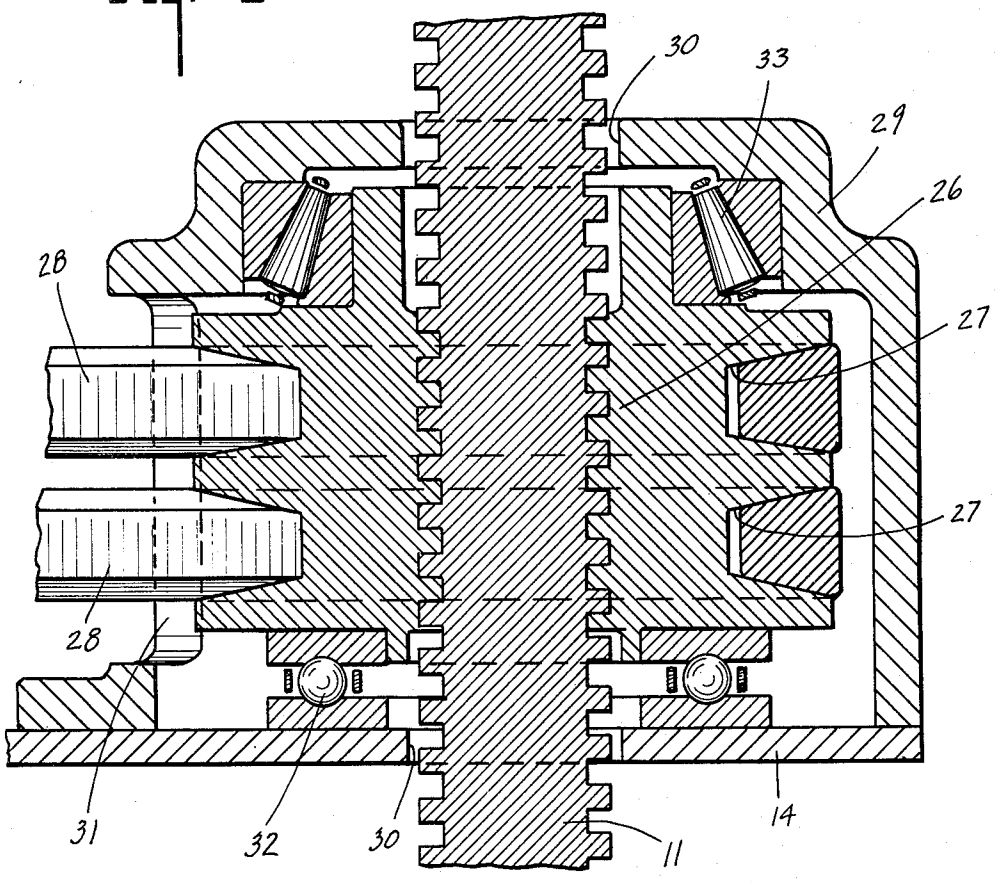
FIG. 3



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SINGLE COLUMN ELEVATOR DEVICE

Earl Todd, Indianapolis, Ind.

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5 Claims. (Cl. 187—25)

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This invention relates to a motor operable elevator structure.

The chief object of this invention is to provide a structure of the character indicated and which can be assembled as a unit and readily installed with a minimum of effort, and which is further characterized that it can be standardized and but two parts cut to length according to the lift to be accommodated.

One chief feature of this invention resides in utilizing a single column and slidably mounting thereon, in enveloping relation, a platform, the column extending through the same and associating therewith a substantially parallel, approximately coextensive screw, nut and nut rotating means of reversible type, the latter two being carried by the platform whereby such an elevator can be installed by merely anchoring both ends of the column. Such a structure can be applied within a wide range of lifts to any specific lift by cutting the screw and column only to the required length for the specified lift.

Another chief feature of the invention resides in the anti-friction, column enveloping, support of the platform on the column.

A further feature of the invention resides in the combination unitary multiple nut and pulley structure.

Still a further feature of the invention resides in the control means for the reversible motor whereby same can be actuated and stopped at will and whereby overrunning in the platform raising and lowering directions is prevented.

Other objects and features of the invention will be set forth more fully hereinafter.

The full nature of the invention will be understood from the accompanying drawings and the following description and claims:

Fig. 1 is a top plan view of the platform and immediately associated parts, the column and screw being shown in transverse section.

Fig. 2 is a side elevation of the invention, the two floors associated therewith being shown in section.

Fig. 3 is an enlarged vertical sectional view of the unitary multiple nut and belt pulley structure and its platform support.

In the drawings 10 indicates an H or I section column and 11 a screw substantially parallel thereto and coextensive therewith and solely supported at the ends by a loose upper bearing 12 and at the lower end by a non-rotative tongue and socket connection 13. Preferably the column partially nests the screw, thus serving as a guard therefor.

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A platform 14 is suitably apertured as at 15 to pass the screw and the column. The latter is rigidly anchored at its lower end as at 16 and at 17 to an upper floor level not necessarily that level immediately above the bottom level.

A plurality of spaced layers of rollers is carried by the platform and embracingly engages the column 10 for platform stabilization and anti-friction movement. Herein each roller layer comprises four rollers 18 carried by spaced shafts 19. Each shaft mounts a spacing bushing 20 between rollers thereon and each roller 18 is grooved as at 21 to embracingly engage a flange edge 22 of the column. As many layers may be provided as desired or required. Usually two are sufficient as shown herein.

The upper and lower shafts 19 are supported by spaced members 23, suitably braced if desired or required and carried by the parallel members 24 which carry the platform 14. Guard members 25 may be mounted thereon if desired.

The nut means, see Fig. 3, comprise the internally threaded member 26 having a plurality of V-grooves 27 in its outer periphery for V-belt 28 accommodation. A housing 29 envelopes the nut and naturally same is apertured as at 30 for screw clearance and apertured at 31 for belt access.

An anti-friction structure 32 supports the lower end of the vertically disposed nut means and within said housing. A tapered roller bearing structure 33 rotatably supports the upper end of said nut means and constitutes a lateral thrust resisting element and same also is housing enclosed as illustrated.

The platform 14 mounts frame 34 to which is hingedly mounted as at 35 motor base plate 36 to which motor M is suitably secured. Same has depending shaft 37 carrying a multiple V-groove sheave 38 or dual sheaves to take the belts 28. Screw means 39 shifts the motor on its pivot whereby the desired belt tensioning is effected.

The motor control includes a triple station switch button structure marked "up" —"off"— and "down." Any desired number of such structures connected in multiple may be employed as for example, one at each level and one on the platform.

Near the bottom level adjacent column 10 is low level travel limit switch 41 for stopping the motor for further lowering when the platform engages said switch and is at its lowest desired level. Similarly an upper travel limit switch 42 is provided for platform engagement when this platform has reached its uppermost desired ele-

vation and for cutting off the motor supply. Each limit switch when activated may condition the motor circuit for reverse travel if desired, but same does not occur until the other one of the manual controls, is activated at a push-button station, as on the platform or at a floor level.

While the invention has been illustrated and described in great detail in the drawings and foregoing description, the same is to be considered as illustrative and not restrictive in character.

The several modifications described herein, as well as others, which will readily suggest themselves to persons skilled in the arts, all are considered to be within the broad scope of the invention, reference being had to the appended claims.

The invention claimed is:

1. In an elevator structure having a rigid single vertically disposed column, said column in section having two substantially parallel side portions and an intermediate connecting portion substantially transversely disposed relative thereto and forming a web portion, a platform vertically movable upon said column and peripherally enveloping the same, roller means carried by the platform and bearing upon opposed column faces for platform-column alignment at all times and in all positions, the combination of a column guarded rigid screw parallel to the column and disposed contiguous to the web portion thereof and between the side portions thereof, rotatable nut means enveloping the screw and carried by the platform, means carried by the platform constraining said nut enveloping means to pre-determined portion relative to the platform, and reversible motor means on the platform for reversibly rotating the nut means for platform raising and lowering.

2. An elevator structure as defined by claim 1 wherein there is provided a drive connection between the motor and nut means and of belt-pulley type, and means tiltably supporting said motor for gravity position adjustment and automatic belt drive tension.

3. An elevator structure as defined by claim 1, wherein said screw is supported solely at the ends thereof, means providing such support, one of said support means and the screw having a non-rotative connection, and one of said support means and the screw having a loose relationship for screw-nut means alignment accommodation.

4. An elevator structure as defined by claim 1, wherein the nut constraining platform carried means is anti-friction mounted on said platform and at opposite ends of the nut means, one of the anti-friction mountings being of self-centering, lateral thrust resisting type.

5. An elevator structure as defined by claim 1, wherein the roller means is of multiple character, each roller being of grooved type, the rollers being arranged in layers and including four in each layer, the column edges nesting in the roller grooves, the rollers in effect peripherally enveloping, as it were, said column.

EARL TODD.

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