

[54] **ELECTRIC TRAVELLING POWERED
MAINTENANCE SCAFFOLD**

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[51] Int. Cl. **E04g 1/18**

[58] Field of Search..... 182/63, 141, 148;
187/9

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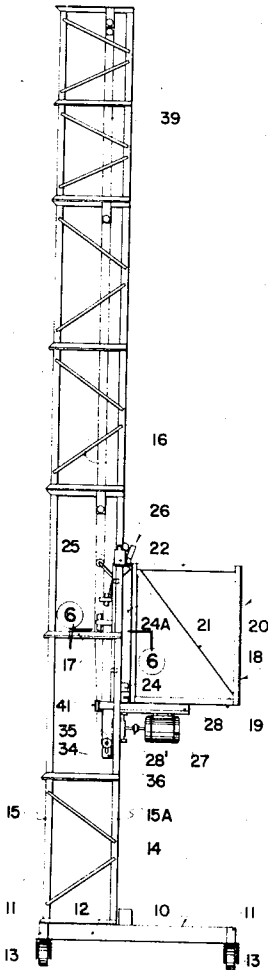
[57] **ABSTRACT**

A cage is mounted for reciprocation vertically in a scaffold or framework. An electric motor is secured to the cage together with a reduction gear box. A drive sprocket and an idler sprocket are mounted on said cage, the drive sprocket being connected to the electric motor. A further idler is journaled at the top of the scaffold and a sprocket chain is anchored by one end thereof to the cage. It extends upwardly of the scaffold, over the idler at the top of the scaffold and then back down to the cage whereupon it engages around the idler on the cage and around the drive sprocket so that the other end of the chain loops freely and is supported on the cage for convenience. Rotation of the drive sprocket pulls the cage up and down the scaffold with friction and mechanical advantage remaining constant.

[56] **References Cited**

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10 Claims, 6 Drawing Figures



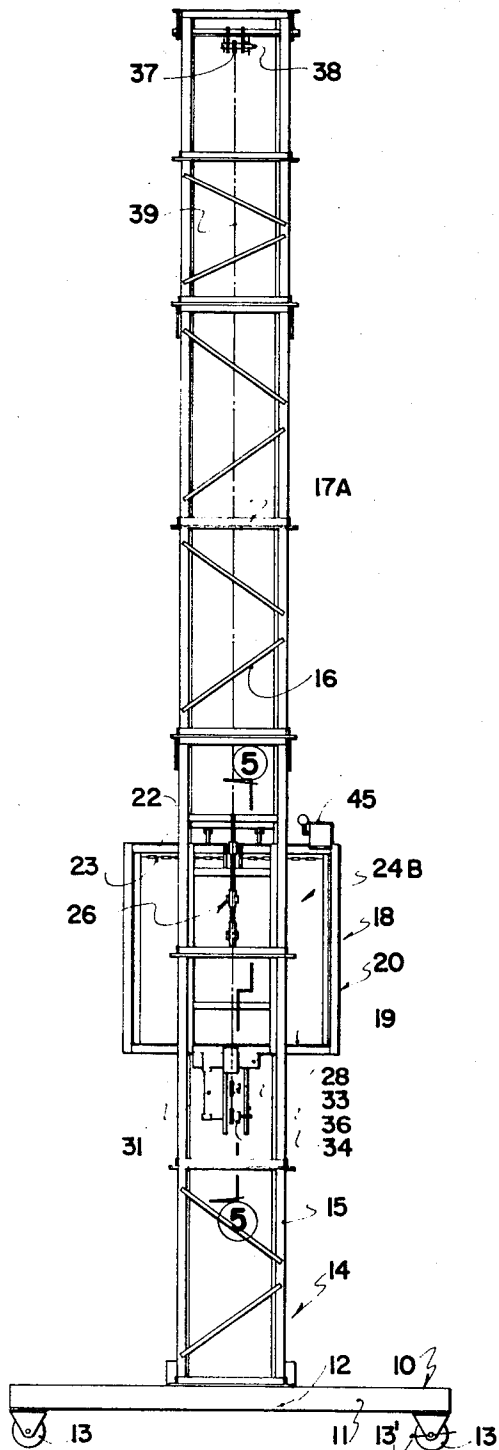


FIG. 1

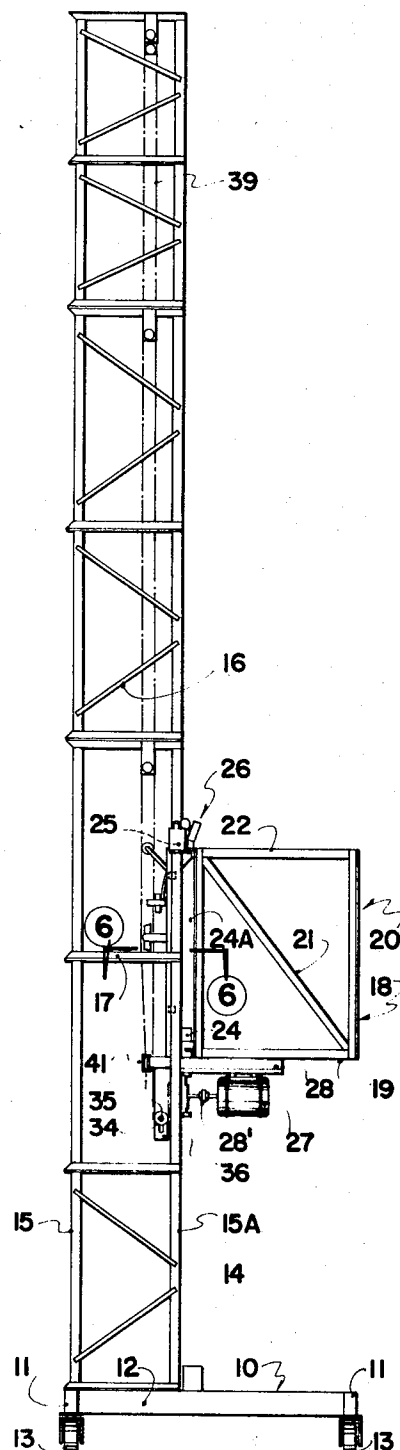


FIG. 2

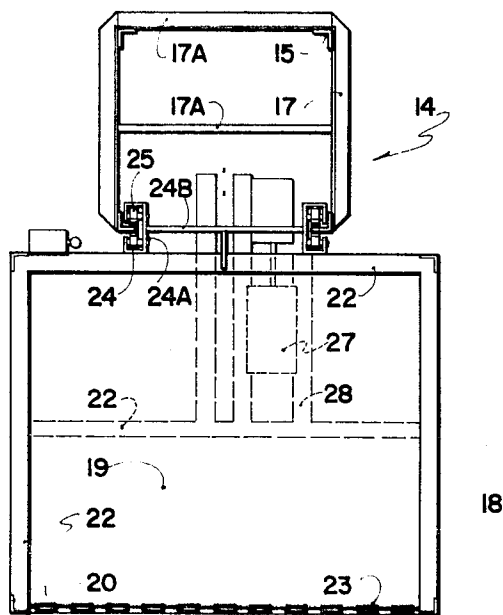


FIG. 3

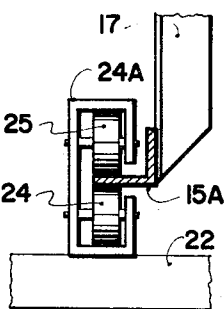


FIG. 6

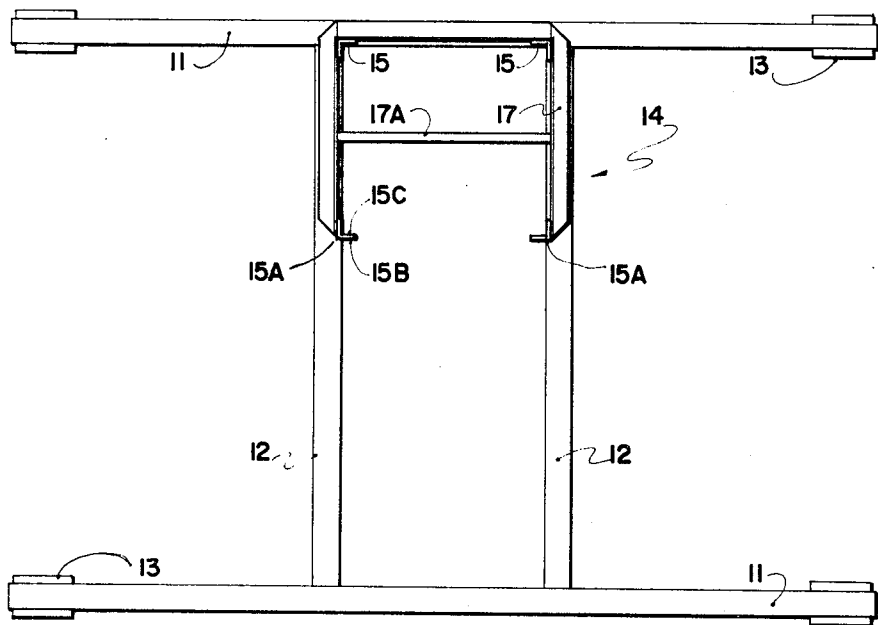


FIG. 4

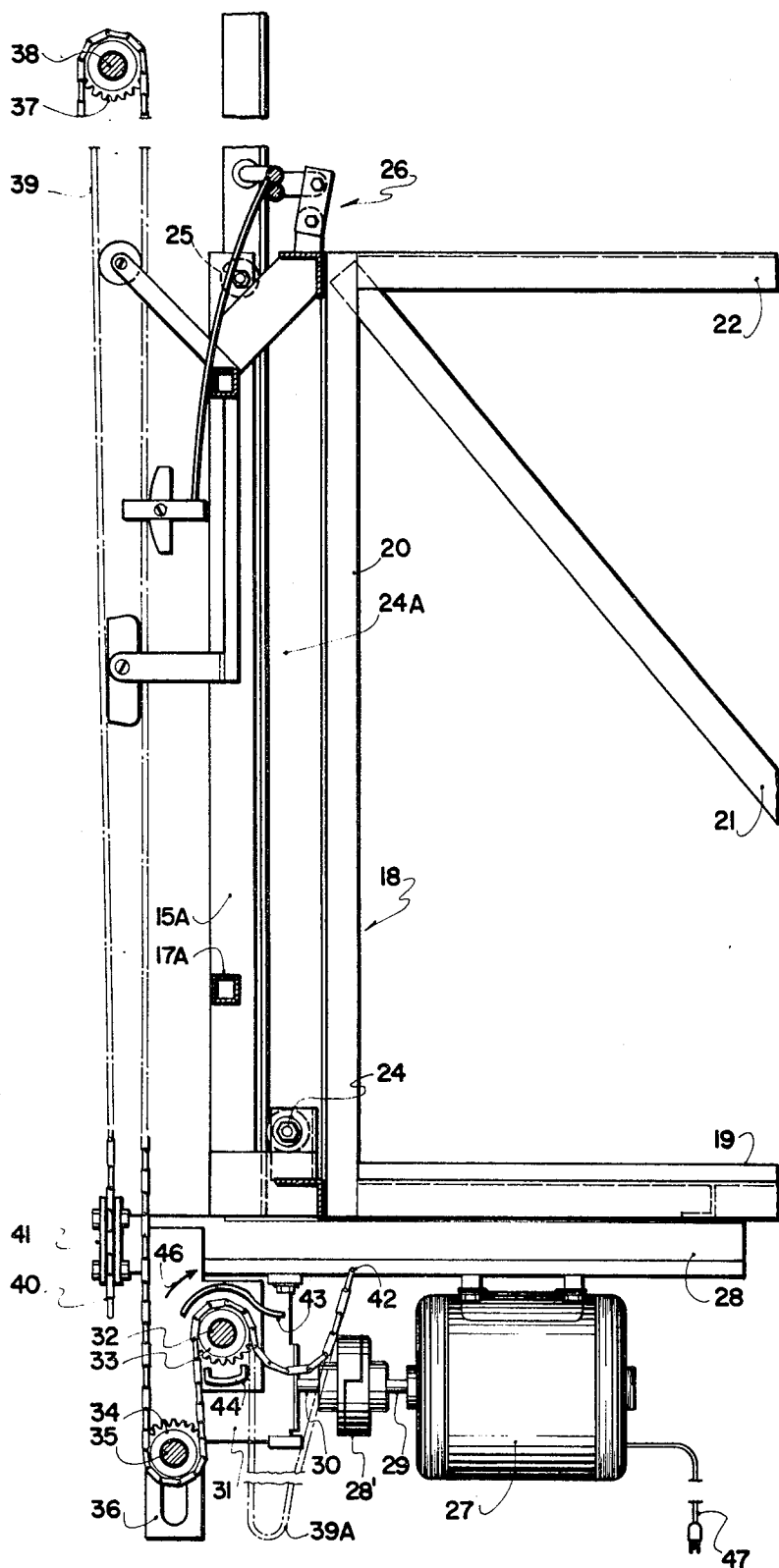


FIG. 5

ELECTRIC TRAVELLING POWERED MAINTENANCE SCAFFOLD

BACKGROUND OF THE INVENTION

This invention relates to new and useful improvements in travelling scaffolds used primarily for maintenance in buildings or the like although, of course, the device can be used for other purposes.

Such scaffolds are usually manually operated or hydraulically operated due to the fact that electrically operated scaffolds normally require a relatively heavy duty electric motor which makes the cost excessive apart from the fact that heavy duty motors of relatively large horsepower cannot be operated from conventional power outlets.

The reason for the requirement of heavy duty or large horsepower motors is due to the fact that such motors are usually stationary and transmit power to the platform or hoist cage either through chain and sprocket or cable so that when the platform or cage is the farthest distance from the electric motor, there are relatively large transmission losses due to friction, the weight of the cables and chains, and lack of mechanical advantage.

SUMMARY OF THE INVENTION

The present device overcomes all of these disadvantages by providing a portable or movable maintenance scaffold having a cage or platform which moves vertically up and down the supporting structure and is provided with an electric motor which is secured to the cage or platform rather than the stationary scaffold.

By utilizing a chain and sprocket system in conjunction with a reduction gear box, it has been found that a one-fourth horsepower motor is adequate for normal operation due to the fact that the friction and other losses are constant throughout the entire length of travel of the cage or platform.

This enables a relatively light weight portable and economical maintenance scaffold to be provided which is entirely adequate for the majority of maintenance problems encountered in most buildings.

With the foregoing objects in view, and such other or further purposes, advantages or novel features as may become apparent from consideration of this disclosure and specification, the present invention consists of the inventive concept which is comprised, embodied, embraced, or included in the means, method, process, product, construction, composition, arrangement of parts, or new use of any of the foregoing, herein exemplified in one or more specific embodiments of such concept, reference being had to the accompanying drawings in which:

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a front elevation of the device.

FIG. 2 is a side elevation thereof.

FIG. 3 is a plan view of the platform.

FIG. 4 is a plan view of the base per se.

FIG. 5 is an enlarged section of the drive mechanism for the carriage or platform substantially along the line 5-5 of FIG. 1.

FIG. 6 is an enlarged fragmentary section along the line 6-6 of FIG. 2.

In the drawings like characters of reference indicate corresponding parts in the different figures.

DETAILED DESCRIPTION

Proceeding therefore to describe the invention in detail, reference character 10 illustrates the base which consists of two longitudinal members 11 in spaced and parallel relationship and maintained thereby a pair of transverse members 12 extending therebetween and intermediate the ends as clearly shown in FIG. 4.

Castor wheel assemblies 13 are secured to each end of the longitudinals 11 as shown in the drawings thus enabling the device to be moved from one position to the other easily and readily. A conventional castor wheel brake indicated by reference character 13' is provided on one of the castor wheel assemblies.

Extending upwardly from the transverse members 12 adjacent one member 11 is a vertical framework collectively designated 14 which consists of four angle irons 15, 15A, braced by vertically lying diagonal braces 16 and horizontally extending braces 17 and 17A.

This structure forms a three sided, vertically extending framework with the open side facing inwardly of the base and towards the other member 11.

Reference should be made to the angle irons specifically designated 15A, the flanges of which face inwardly towards one another as clearly shown in FIG. 4.

A cage or platform collectively designated 18 includes a rectangular floor 19 and vertical guard structure 20 braced by diagonals 21 and horizontal members 22 thus forming a three sided wall structure. A safety chain 23 extends between two of the vertical members and provides access to the cage for the operator.

A lower pair of guide rollers 24 are journaled for rotation within the lower ends of a pair of spaced and parallel vertical members 24A which extend from the upper side to the lower side of the cage frame and on the inner wall 24B thereof. These members have a channel configuration when viewed in plan as seen in FIG. 6. These guide rollers 24 engage and bear against the outer surfaces 15B of the flanges of the angle irons 15A.

An upper pair of guide rollers 25 are journaled for rotation within the upper ends of members 24A and these guide rollers engage and bear against the inner surfaces 15C of the flanges of the angle irons 15A so that the cage is mounted for vertical reciprocation up and down the angle iron members 15A and is supported in a cantilever fashion therefrom (see FIGS. 4, 5 and 6).

A conventional U-shaped safety brake assembly 26 cooperates between the flanges of the angle irons 15A and the cage if the drive chain breaks but as this is conventional in structure and operation, it is not deemed necessary to describe same in detail.

FIG. 5 shows details of the drive mechanism which consists of a source of power taking the form of an electric motor 27 bolted to an angle iron 28 which in turn is secured to and assists in supporting the floor 19 of the cage so that the electric motor is suspended below the cage as clearly shown.

A coupling 28' connects drive shaft 29 to input shaft 30 of a reduction gear box 31 also supported to member 28 below the floor 19 of the cage.

An output or drive shaft 32 extends from the reduction gear box at right angles to the shaft 30 and is provided with a chain sprocket 33 secured thereto and rotatable therewith.

An idler sprocket 34 is journaled upon a spindle 35 which in turn is secured to a downwardly extending support member 36 also depending from the underside of the cage 18.

Adjacent the upper end of the vertical scaffold or structure 14, is a further idler sprocket 37 journaled upon a spindle 38 which is preferably provided with a roller bearing (not illustrated). Reference to FIGS. 1 and 2 show the position of this upper idler sprocket 37.

A chain 39 extends around the sprockets and one end 40 of this chain is anchored by means of clamp assembly 41 to the inner end of member 28, that is to the inner lower side of the cage 18 as shown in FIG. 5. The chain then extends upwardly and over the upper idler sprocket 37 and then downwardly and around the lower idler sprocket 34. It then extends upwardly and around the drive sprocket 33 and the free end or looped portion 39A of the chain extends downwardly and then upwardly to be secured by end 42 to the underside of the cage as shown in FIG. 5.

An arcuately curved guide 43 extends around part of the periphery of the drive sprocket 33 in order to maintain the chain 39 in contact with the drive sprocket and an angulated guide 44 is situated below drive sprocket 33 and maintains the desired separation between the substantially vertical runs of the chain upon each side thereof and prevents then wrapping around the drive sprocket.

In operation, the electric motor is controlled by means of a switch assembly 45 within the cage. The motor is of course reversible and when it is operated to rotate drive sprocket 33 in the direction of arrow 46 (see FIG. 5), the cage will be moved upwardly with the excess chain forming a loop at 39A, until the cage reaches the uppermost limits of the scaffold or vertical structure 14.

By reversing the motor, the cage is lowered under power as desired.

Because the electric motor is always travelling with the cage, frictional losses are the same at either end of the travel and the mechanical advantage is also constant.

It will, of course, be appreciated that an electric cable 47 extends freely from the electric motor to a convenient electrical plug and that the length of this cable is sufficient for same to be connected to the plug when the cage is at the uppermost position.

However, the fact that a fractional horsepower motor is used, means that a relatively lightweight cable is required so that even when fully extended, the weight thereof is slight.

Various modifications may be constructed or performed within the scope of the inventive concept disclosed. Therefore what has been set forth is intended to illustrate such concept and is not for the purpose of limiting protection to any herein particularly described embodiment thereof.

What I claim as my invention is:

1. A maintenance scaffold and the like comprising in combination a base, a vertically situated scaffold extending upwardly from said base and a cage in said scaffold, means mounting said cage for up and down movement in said scaffold, and power means cooperating between said cage and said scaffold for moving said cage up and down same, said power means including an electric motor mounted on said cage, a drive sprocket driven by said electric motor and upper idler means at

the top of said scaffold, lower idler means on said cage, and a sprocket chain secured by one end thereof to said cage and extending operatively around both said idler means and said drive sprocket, said idler means taking the form of a chain sprocket journaled for rotation in said scaffold and said cage respectively, said idler sprocket on said cage being below said drive sprocket, said chain extending from said one end thereof, upwardly around said idler chain sprocket in said scaffold and then downwardly and around said idler chain sprocket and then up and over said drive sprocket.

2. The device according to claim 1 which includes an arcuately curved guide spaced from and extending around the upper side of said drive sprocket to maintain said chain in engagement therewith.

3. The device according to claim 1 which includes a further guide spaced from the underside of said drive sprocket to prevent said chain from wrapping around said drive sprocket.

4. The device according to claim 1 which includes a further guide spaced from the underside of said drive sprocket to prevent said chain from wrapping around said drive sprocket.

5. A maintenance scaffold and the like comprising in combination a base, a vertically situated scaffold extending upwardly from said base and a cage in said scaffold, means mounting said cage for up and down movement in said scaffold, and power means cooperating between said cage and said scaffold for moving said cage up and down same, said power means including an electric motor mounted on said cage, a drive sprocket driven by said electric motor and upper idler means at the top of said scaffold, lower idler means on said cage, and a sprocket chain secured by one end thereof to said cage and extending operatively around both said idler means and said drive sprocket, said means mounting said cage for vertical movement in said scaffold including a pair of spaced and parallel vertically extending members on said scaffold having inwardly facing flanges, channel means on said cage extending vertically thereof in spaced and parallel relationship and being spaced apart substantially the same amount as said vertically extending members, a lower roller journaled for rotation adjacent the lower end of each of said channel means, said rollers bearing against and engaging the outer surfaces of said flanges, and an upper roller journaled for rotation adjacent the upper end of each of said channel means, said upper rollers bearing against and engaging the inner faces of said flanges whereby said cage is mounted in a cantilever relationship with said scaffold.

6. The device according to claim 5 in which said idler means taking the form of a chain sprocket journaled for rotation in said scaffold and said cage respectively, said idler sprocket on said cage being below said drive sprocket.

7. The device according to claim 6 in which said chain extending from said one end thereof, upwardly around said idler chain sprocket in said scaffold and then downwardly and around said idler chain sprocket and then up and over said drive sprocket.

8. The device according to claim 7 which includes an arcuately curved guide spaced from and extending around the upper side of said drive sprocket to maintain said chain in engagement therewith.

9. The device according to claim 7 which includes a further guide spaced from the underside of said drive sprocket to prevent said chain from wrapping around said drive sprocket.

10. The device according to claim 8 which includes a further guide spaced from the underside of said drive sprocket to prevent said chain from wrapping around said drive sprocket.

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