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Rendelman

[11] **3,756,561**

[45] **Sept. 4, 1973**

[54] **CARPET LIFT AND LOADING ASSEMBLY**

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[22] Filed: **Mar. 27, 1972**

[21] Appl. No.: **238,445**

[52] **U.S. Cl.** ..... **254/4 R,** 212/13, 254/144, 254/4 R

[51] **Int. Cl.** **B60p 1/14,** B60p 11/22

[58] **Field of Search** ..... 214/390, 396; 254/4 R, 4 B, 4 C, 144; 212/13, 14

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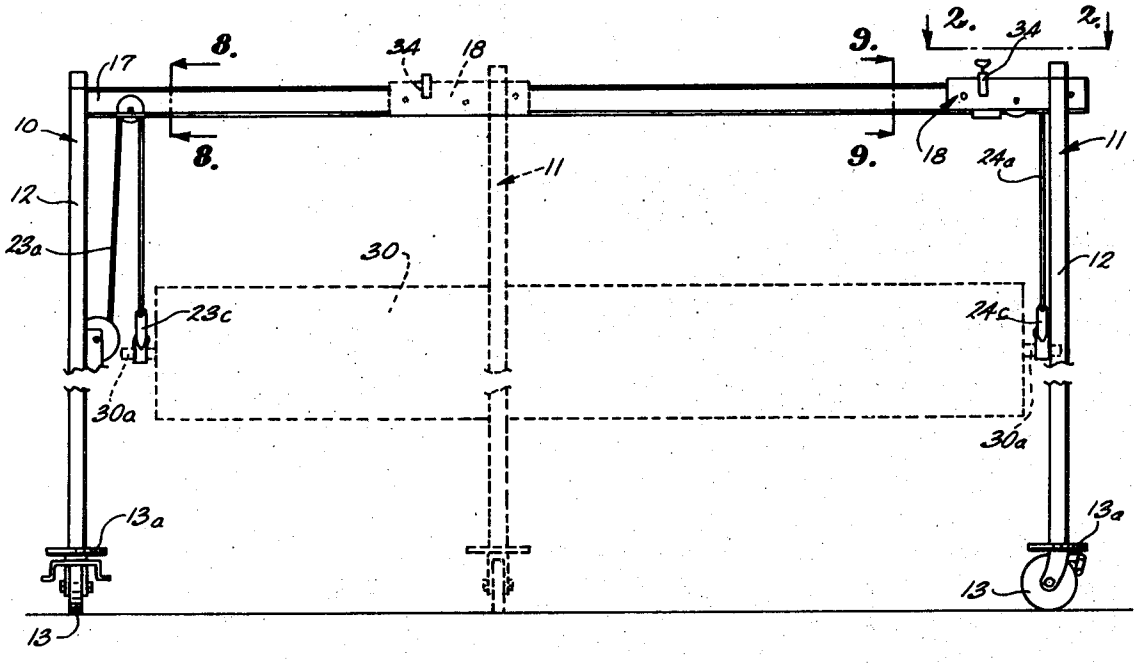
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Primary Examiner—Gerald M. Forlenza
Assistant Examiner—R. B. Johnson
Attorney—William B. Kircher et al.

[57] **ABSTRACT**

A carpet lifting and loading assembly comprises a track supported by two sections. One section is movable on the track relative to the other. A cable lifting means is mounted on the fixed section and track of the assembly. Means are mounted on the movable section that cooperates with the cable lifting means to prevent the movable section from moving to a position on the track that would render the assembly unstable when a load is attached and supported by the cable lifting means.

7 Claims, 11 Drawing Figures



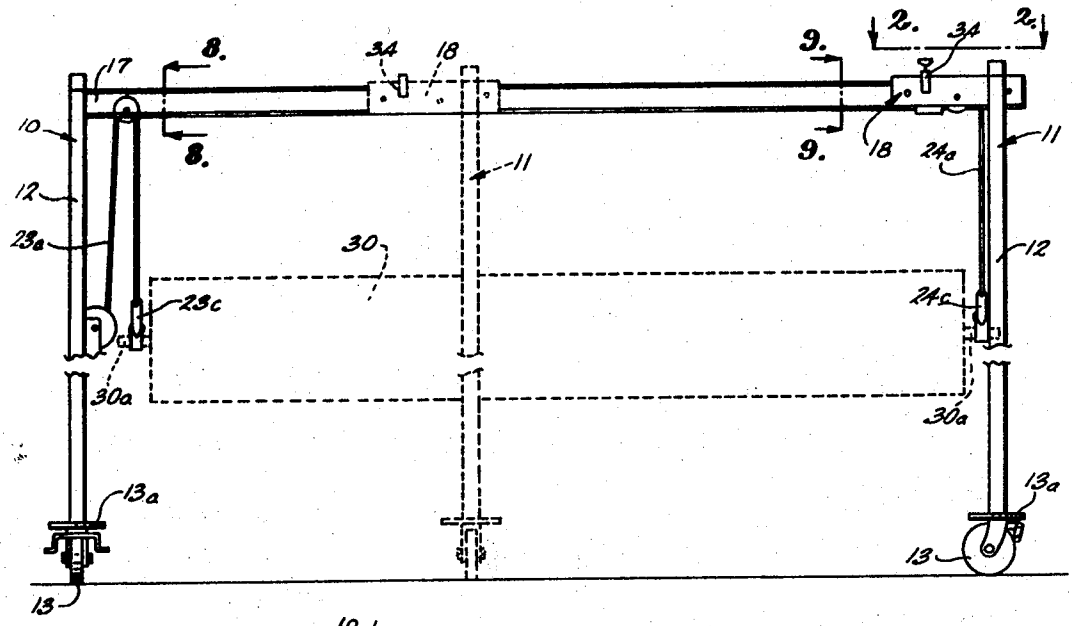


Fig. 1.

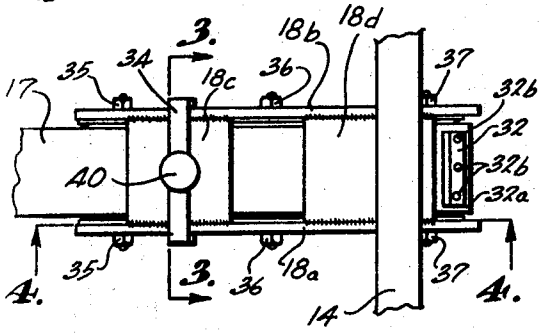


Fig. 2.

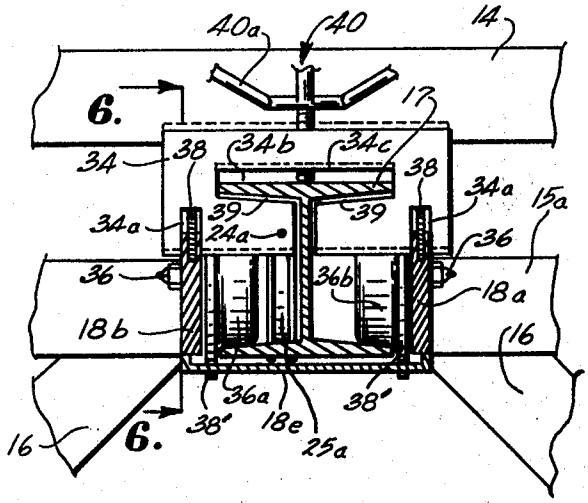


Fig. 3.

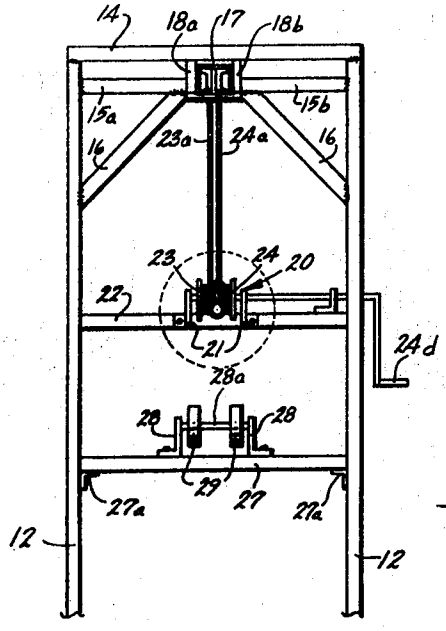


Fig. 5.

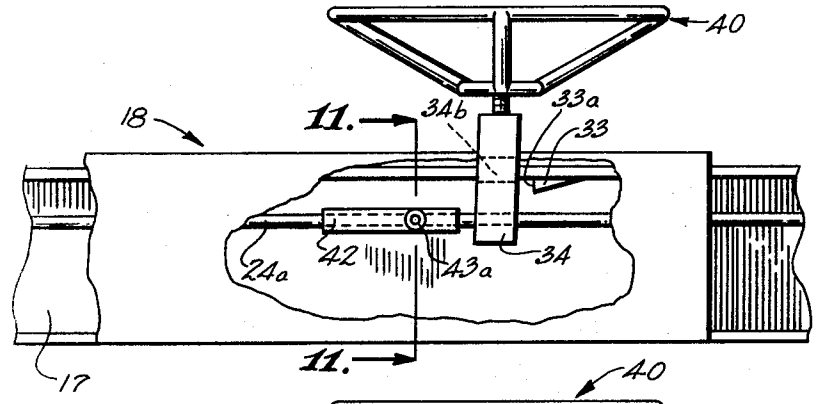


Fig. 6.

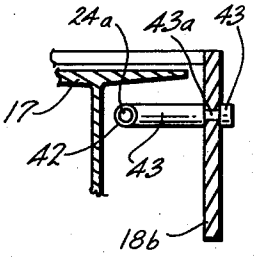


Fig. 11.

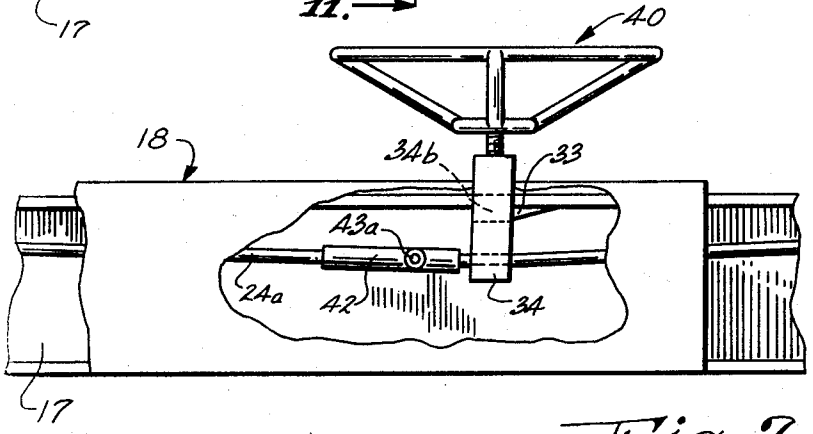


Fig. 7.

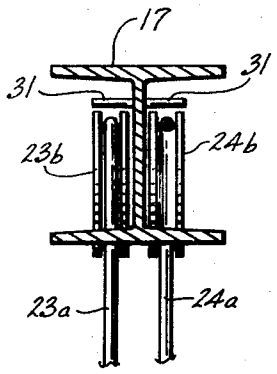


Fig. 8.

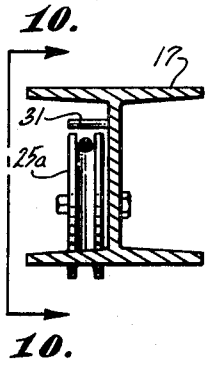


Fig. 9.

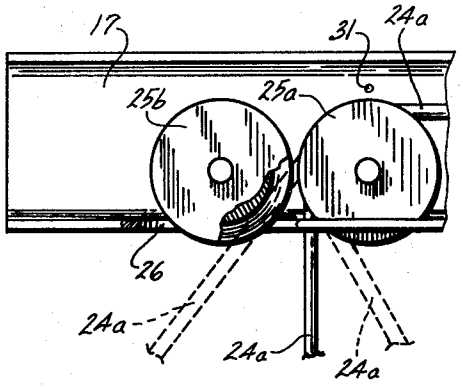


Fig. 10.

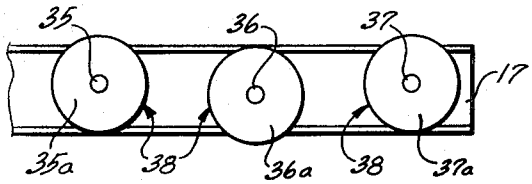


Fig. 4.

CARPET LIFT AND LOADING ASSEMBLY

BACKGROUND AND BRIEF DESCRIPTION OF THE INVENTION

Prior art techniques for handling large carpet rolls or other heavy cylindrical objects often included a plurality of A-frame type supporting structures with various means for changing the elevation of the A-frame supports to accommodate difficult terrain or for loading purposes. In any event, the ability to extend the carpet roll or cylindrical object forward of the forward end support was markedly limited and often dangerous when supporting heavy loads. This almost precluded the use of such a device in loading or unloading truck or flat car beds and in the utilization of the lift and loading assembly to appropriately stack or otherwise locate the cylindrical objects once lifting of same has been accomplished.

The subject invention which has been briefly described in the above abstract includes a unique trolley construction in conjunction with a trolley stop brake that permits the positioning of the movable end section at any location along the length of the H-beam. More particularly, two stops are secured opposite each other on the H-beam track structure at the balance point or substantially halfway along the beam. A brake structure is attached to the trolley and will be lightly positioned in contact with the H-beam by a pair of spring members so that the trolley will ordinarily stop by the brake structure contacting the stops at a halfway point. These beam balance or halfway stops can be passed only if weight is removed from the forward cable of the lift assembly. When weight (the carpet roll) is taken off of the forward cable, the brake can be moved in a direction to bypass the safety stops. A pivotal tubular cable holder is located adjacent the brake, so that weight on the forward cable and the cable holder will not permit the brake to be moved downwardly and the stops to be bypassed. This structure insures that the entire lift assembly will not inadvertently tip over when the lift assembly is in operation.

An object of the invention is to provide a uniquely constructed lift assembly which is easily used and economically constructed.

Another object of the invention is to provide a uniquely constructed lift assembly of the character described which enables any single individual to load, unload, or stack trucks, vans, and flat bed open and closed vehicles of all types with heavy cylindrical objects such as large carpet rolls. It is a feature of the object that a significant amount of labor and effort may be saved as well as decreasing the time that a loaded vehicle is normally tied up in the loading or unloading processes.

A further object of the invention is to provide a uniquely constructed lift assembly having a combined trolley and brake that operates in a cooperating fashion to preclude inadvertent tipping or overloading of the forward end of the lift assembly during the operation of same.

Still further object of the invention is to provide a uniquely constructed trolley and brake structure of the character described which structurally supports a roller mounted end section for fore and aft movement on a horizontal H-beam. It is a feature of this invention that the brake operates to preclude end section movement

past the balance point of the lift assembly with weight on the lift assembly cables.

Another object of the invention is to provide a uniquely constructed brake structure that enables a movable end section of a lift assembly to be locked at any location along a track structure with respect to a fixed end section thereof.

Other and further objects of the invention, together with the features of novelty appurtenant thereto, will appear in the course of the following description.

DETAILED DESCRIPTION OF THE INVENTION

FIG. **1** is a side elevational view of the lift assembly with the broken lines showing a carpet roll horizontally elevated and the movable forward end section of the lift assembly moved toward the stationary or fixed end section;

FIG. **2** is an enlarged top elevational view looking substantially along the line **2—2** of FIG. **1** in the direction of the arrows and showing the upper portion of the trolley and the brake assembly;

FIG. **3** is a sectional view taken generally along the line **3—3** of FIG. **2** in the direction of the arrows and showing the H-beam brake and trolley structure along with portions of the movable end section frame;

FIG. **4** is a side elevational view of the trolley rollers indicating the location of the roller shafts with respect to the H-beam track and with the trolley structure removed to more clearly indicate same;

FIG. **5** is an end elevational view taken from the forward or movable end of lift assembly with the caster rollers not shown;

FIG. **6** is a side view taken generally along the line **6—6** of FIG. **3** in the direction of the arrows with a portion of the trolley side wall broken away to disclose the brake and balance point stop bypass mechanism associated with the trolley;

FIG. **7** is a view similar to FIG. **6** however showing the brake structure moved downwardly with no weight on the forward lift cable length permitting the movable end section to bypass the balance point of the lift assembly;

FIG. **8** is a sectional view taken generally along the line **8—8** of FIG. **1** in the direction of the arrows showing the two pulleys located adjacent the fixed or stationary end frame section;

FIG. **9** is a sectional view taken generally along the lines **9—9** of FIG. **1** in the direction of the arrows showing a rear elevational view of one of the tandemly arranged forward pulleys;

FIG. **10** is a view taken generally along the line **10—10** of FIG. **9** in the direction of the arrows showing the forward pulleys in elevation; and

FIG. **11** is a partial sectional view taken generally along line **11—11** of FIG. **6** in the direction of the arrows showing the pivotal cable holder which renders the stop bypass action of the trolley and brake structure ineffective when the cable has weight applied thereto.

Turning now to the drawings, reference numeral **10** represents the fixed or stationary end section while reference numeral **11** is used to depict the movable or forward end section. The construction of the end sections are substantially similar with the exception of the location of a boat winch on the fixed end section **10** and the trolley and carpet support rollers located on a movable end section **11**. Both of the end section modifications will be discussed in detail, infra.

The two sections are comprised of rectangular sectioned steel structurals generally indicated as the two vertical legs **12** on each of the end sections with caster rollers **13** being swivel-mounted in a conventional manner on each one of the vertical legs. These caster rollers or wheels will be provided with a suitable conventional locking or braking means and will include an upper wheel **13***a* which may contact walls or other vertical structures for protective purposes. The upper portions of both end sections **10** and **11** will include the horizontal structural **14** welded across the end extremities of each pair of legs **12.** Also, a structural **15** which will span the two vertical legs of the fixed end section at a lower level but operates to provide a weldment attachment for the trolley structure on the forward end section **11** as will be described. In both cases, structural braces **16** extend from the inside surfaces of the vertical legs **12** and are angled to contact and support the horizontal structural **15.**

A horizontal H-beam **17** will be bolted to the midpoint of the horizontal structurals **14** and **15** of fixed end section **10.** This H-beam is so oriented that the lower side of the H-shape forms a track structure for the trolley which interconnects the movable end section **11** with the H-beam **17.** The trolley structure, generally designated by the numeral **18,** provides the vertical side walls **18***a* and **18***b* which weldedly connect with the upper horizontal structural **14** at their upper end surfaces and flushly contact the inside end portions of the shorter and lower horizontal structurals **15**a and **15**b respectively to thereby complete the inner span between vertical legs **12** of the forward end section and to fixedly locate the upper center portion of forward end section **12** and trolley on the H-beam track **17** for fore and aft movement with respect thereto.

Returning now to the combined construction of the two end sections and the horizontal H-beam track **17,** the above mentioned boat winch is generally shown by the numeral **20** and is of a conventional design mounted by brackets **21** on the horizontal structural member **22** which spans to legs **12** of the rear or fixed end section **10.** The winch is provided with two separated reels **23** and **24** with the cable lengths **23***a* and **24***a* wound respectively thereon. The winch, is suggested, is operated by the crank member **24***d* and has the usual locks and releases for controlling the playing out or reeling in of the cable lengths **23***a* and **24***a*.

A pair of pulleys **23***b* and **24***b* (which are rated above the cable strength) are located on either side of the H-beam track **17** adjacent the stationary end section **12** and operate to receive the cable lengths **23***a* and **24***a* respectively therein. This construction permits the cable length **23***a* to extend from the reel **23** up through a suitable slot (not shown) in the lower side of the H-beam **17** and over the pulley **23***b* and from thence down through the slot again to terminate in a sling **23***c* of a conventional design which will engage the center rod support (**30***a*) for the carpet roll **30.** The cable length **24***a* does not extend down through the same slot as cable length **23***a* but rather extends along the length of the H-beam track **17** (see FIG. **8**) and is finally engaged over the rearmost forward pulley **25***a* located near the forward end portion of H-beam track **17.** Actually, a second pulley **25***b* is also provided and is tandemly spaced forward of pulley **25***a* so that the cable link **24***a* may operatively contact the lower right hand quadrant of pulley **25***b* to accommodate the forward extension of a large carpet roll. As shown in FIG. **10,** the slot **26** will permit the outer periphery of both pulleys **25***a* and **25***b* to extend therethrough and to permit the cable length **24***a* to extend downwardly after engagement with either or both of the tandem pulleys **25***a* and **25***b*.

The lower end portion of the cable **24***a* is equipped with sling **24***c* (similar to **23***c*) thereby enabling supporting rod **30***a* through the carpet roll **30** to be engaged in the same horizontal plane as the cable length **23***c* engages the rearwardmost end thereof. Accordingly, the normal operation of the conventional boat winch raises and lowers the carpet roll **30** supported between the two cable end slings (**23***c* and **24***c*) thereby enabling a single operator to raise, lower, move, stack or unload the very heavy and cumbersome rolls.

As will be seen with respect to the discussion of the trolley **18,** the lift assembly may be used for loading and unloading panel trucks, pickup trucks or flatbed carriers either enclosed or open. To facilitate this arrangement, a structural **27** mounted on brackets **27***a* spans the legs **12** of the forward end section **11.** This structural (**27**) supports two other angle brackets **28** with roller shaft **28***a* located therebetween. Roller wheels **29** are mounted for rotation on shaft **28** and are a little higher than the normal tailgate height of a pickup or panel truck. In this manner, the carpet roll **30** (or other heavy elongated objects) may be supported by the roller wheels **29** when the movable front end section **11** is moved to the broken line position (or any position between its fully extended and rearwardmost location). This permits some of the supporting load to be lessened from the cables and associated pulleys. Alternatively, suitable means may be provided for raising and lowering wheels **29** for any desired elevation along the vertical length of legs **12** of section **11.**

With respect to the cable and trolley construction, horizontal roll pins **31** (see FIGS. **8, 9** and **10**) are fixedly located in the web of the H-beam track immediately above the upper surface of each of the pulleys **23***b*, **24***b* and **25***a* to preclude the respective cable lengths from inadvertently slipping out of the pulley groove. Further, since the trolley **18** is movable in a fore and aft direction with respect to the H-beam track **17,** a stop **32** (see FIG. **2**) with rubber bumper **32***a* is bolted to the upper surface of H-beam track **17** by the bolts **32***b* near the forward end extremity of the H-beam track. In this manner, the trolley is precluded from becoming disengaged from H-beam track **17** unless the forward stop **32** is removed therefrom. For shipping purposes, it may sometimes be desirable to remove the forward end section; however it is a simple task to remove the bolts **32***b* and to reassemble same.

As shown in FIGS. **6** and **7,** balance point stops **33** are located at substantially the mid-length of H-beam track **17.** These stops are wedge-shaped and are located on either side of the center H-beam web with a flat vertical surface **33***a* operable to contact a brake portion, infra, and to preclude a rearward movement of the trolley and movable front end section. As will be seen, under certain conditions, the balance point stops may be bypassed.

Turning now more particularly to the trolley and brake construction, the trolley side walls have previously been identified by the numerals **18***a* and **18***b*. These walls rigidly are spaced apart by the presence of the welded top plates **18***c* and **18***d* and by the bottom plate **18***e* (FIGS. **2** and **3**). The actual dimensions of the

top and bottom plates are significant only in that they rigidly and weldedly form a box-like structure having a substantially rectangular cross section and which is extremely rugged and durable. Actually, the top plate **18***c* may be thought of as being two plates with the brake structure **34** located therebetween. Also, the bottom plate **18***e* will in no way interfere with or extend into a contacting relationship with the peripheral edge of the two forward pulleys **25***a* and **25***b* during the operation thereof since upper plate **18***d* contacts the rear edge of the forward stop **32.** In this manner, the rearwardly spaced location of the lower plate **18**e eliminates any inadvertent pulley contact.

As shown in FIGS. **2,3** and **4,** the spaced apart trolley sides **18***a* and **18***b* act as supporting surfaces for roller shaft pairs **35, 36** and **37.** Each pair is comprised of two axially aligned shafts that do not extend from plate to plate but terminate after the interconnection with a respective roller. For example, the shafts **36** as shown in FIG. **3** extend through the walls **18***a* and **18***b* and are axially aligned. The shaft **36** extending through wall **18***b* supports a roller **36***a* thereon while the other shaft **36** extending through wall **18***b* supports the roller **36***b* thereon. These rollers have an outside rim **38'** which locate the inner cylindrical roller surfaces on the upper surface of the lower portion of the H-beam track in that the inside surface of the rims contact the track edge and will not permit the rollers to become skewed during the fore and aft movement of same. It should be pointed out that each of the shaft pairs (**35, 36** and **37**) have two roller wheels **35***a*, **35***b;* **36***a*, **36***b;* and **37***a*, **37***b* respectively, located thereon providing a total of six roller surfaces within trolley **18** for movement on the upper surface of the lower horizontal H-beam track. Further, the axis of the roller shafts **36** lie in a horizontal plane slightly below a horizontal plane through the axes of shafts **35** and **37.** Off-setting the roller wheels in this fashion precludes the trolley from binding on the H-beam track as is potentially the case if all roller wheel shafts were in the same horizontal plane.

Turning now more particularly to the brake structure, FIG. **3** discloses the front and rear shape of brake **34** and the method of mounting same with respect to the side walls **18***a* and **18***b* of the trolley and the upper portion of the H-beam track. For example, counterbore type recesses **34***a* are located in brake **34** to matingly fit over the sidewalls **18***a* and **18***b* so as to permit limited up and down movement of the brake with respect to the trolley side walls. Further, the compression springs **38** bias the brake structure **34** upwardly until the interior upper surfaces **39** (see FIG. **3**) of the brake structure contacts the lower surfaces of the upper portion of the inside of the H-beam track. It should be pointed out that the brake as seen from the side as in FIG. **3** would approximate the shape of a squared off C that has been rotated 90° in a clockwise direction. With this in mind, it should then be understood that the web of the H-beam track is located mid-distance between the open portions of the C while the upper portion of the H-beam track occupies the space within the C shape. In this fashion, the legs of the C, having the upper surfaces **39,** are spring biased upwardly to engage the underside of the upper H-beam horizontal structure.

The forward cable **24***a* passes through a suitable aperture in the brake as shown in FIG. **3** as well as a pivotally mounted tube which will be discussed later and the brake is movable up and down with respect to the H-beam by manipulating the adjustment screw **40.** This externally threaded screw may have any kind of convenient knurled top **40***a* and will extend through an internally threaded aperture at the mid-point of brake **34** so that the end extremity thereof bears against the upper surface of the H-beam flange. Accordingly, when the adjustment screw **40** is rotated in the opposite direction or loosened, the springs **38** force the brake surfaces **39** up and against the undersurface of the upper portion of the H-bar beam. If screw **40** is rotated to draw the brake tightly against H-beam track **17,** the end section **11** will be locked at a particular location on track **17.**

As shown in FIGS. **3, 6, 7** and **11,** the adjustable screw operates to move brake **34** up and down with respect to the upper side of the H-beam track **17.** Accordingly, when the adjustable screw **40** is rotated to move brake **34** downwardly in the space between the inside surfaces **39** of the C-shaped brake and the lower surface of the upper side of H-beam **17** (**34***c*) to permit the trolley structure to bypass the wedge-shaped stops **33** which are located on either side of the vertical web of the H-beam. In this manner, the trolley mounted movable end section **11** is permitted to move past the stops and be located at any location along the length of the H-beam **17.** It should be pointed out that the ability to reciprocally move brake **34** in an up and down direction is restricted if any weight is on the forward cable length **24***a*. If there is no weight on the cable length the above described operation is permitted.

In the preferred embodiment, the vertical orientation (see FIGS. **6** and **7**) of brake **34** is such that it is angled approximately 2° with respect to the vertical. In this manner, the adjustable screw **40** may be manipulated to raise the surfaces **39** against the undersurface of the upper side of H-beam track **17** thereby essentially locking the trolley at a preselected position along the length of the track. However, angled orientation permits the upper edge of surfaces **39** to make the initial contact with the undersurface of the upper side of track **17** thereby binding the brake against the track in order to effect substantially more frictional resistance to movement and thereby enhancing the locked condition. Of course, the locked condition may be released by manipulating the adjustable screw in the opposite direction.

As suggested above, when weight is applied to cable length **24***a* the tension of the cable maintains brake **34** in a plane that precludes the bypassing of stops **33** by the inside brake surfaces **39.** As a result, a loaded lift assembly will not permit the movable end section **11** to be moved to the rear past the balance or halfway point thereby eliminating any tendency of the entire assembly to tip over.

In order to assure that the cable tension is sufficient to preclude the downward movement of brake **34** and the bypassing of stops **33,** a pivot tube **42** acts as a cable carrier immediately forward of brake **34.** This pivot tube is somewhat T-shaped (when viewed from above) and is attached to sidewall **18***b* by shaft **43** which has a reduced diameter portion **43***a* pivotally located within the wall **18***b*. If an operator of a loaded lift assembly having a taut cable length **24***a* attempts to manipulate the adjustable screw **40** in an effort to lower brake **34** and thereby bypass stops **33,** the cable **24***a* must be kinked by the movement of the entire length

of the pivotal tube. Quite obviously, the increased effort necessary to kink a taut steel cable at either end of the pivot tube **42** precludes the inadvertent bypassing of stops **33** and under certain conditions may be designed so as to completely eliminate any possibility of the manual operation of the adjustable screw to permit the above described bypassed condition.

In operation, the lift may be utilized to hoist and load heavy elongated objects of various shapes provided only that a suitable sling or object engaging structure be located on the end portions of the cable length. The boat winch **20** is operated to raise or lower the elongated object depending on the particular job at hand. For example, once the winch completes the raising of the load, the movable end section **11** is easily moved in a fore and aft direction on track **17** between its forwardmost position and the balance point stops **33.** In this manner, the forward end of the heavy load may be extended inside of a covered van or over the top of various flat bed or carpet piles. If it is desired that unloading be accomplished, the movable end section may be moved to the broken line position shown in FIG. **1,** the H-beam track and cable length inserted within the truck over the object load, the winch operated to play out sufficient cable to engage both fore and aft ends of the load and locks and releases set to finally permit the winch to be operated to raise the load off its stacked condition. The entire assembly may then be rolled away from the truck, the movable end section optionally moved to its forward position and the load carried to its unloading position. At that time, the steps may be reversed to facilitate the stacking of the heavy load such as carpet roll in the most expeditions manner.

From the foregoing, it will be seen that this invention is one well adapted to attain all of the ends and objects hereinabove set forth together with other advantages which are obvious and which are inherent to the structure.

It will be understood that certain features and subcombinations are of utility and may be employed without reference to other features and subcombinations. This is contemplated by and is within the scope of the claims.

As many possible embodiments may be made of the invention without departing from the scope thereof, it is to be understood that all matter herein set forth or shown in the accompanying drawings is to be interpreted as illustrative and not in a limiting sense.

Having thus described my invention, I claim:

1. A lift assembly having a track structure supported by at least a first and a second end section, said assembly comprising

means for mounting said second end section for movement with respect to said track,

cable means supported on said track for attaching to a load and for raising and lowering said load with respect to said track, and

means on said second end section cooperating with said movement mounting means and said cable means for precluding said second end section movement in a preselected direction on said track structure beyond a predetermined location thereon when a load is attached and supported by said cable means.

2. The combination as in claim **1** including means for fixedly mounting said first end section with respect to said track.

3. The combination as in claim **2** wherein said movable second end section supporting means includes a trolley mounted for movement on said track, said second end section being fixedly attached to said trolley thereby permitting said second end section movement on said track, said movement precluding means including fixed stops located at a preselected position on said track, said stops contacting a portion of said trolley and precluding said second end section movement past said stops.

4. The combination as in claim **3** wherein said trolley includes a brake mounted for movement with respect to said trolley and relative to said track, means for effecting the brake movement into contact with said track to thereby fixedly locate trolley and said second end section on said track.

5. The combination as in claim **4** wherein said brake movement means moves said brake to a first position that contacts said stops and precludes trolley movement past same, said brake movement means operable to move said brake to a second position that permits said brake and trolley to bypass said stop thereby permitting said second end section to move substantially along the entire length of said track.

6. The combination as in claim **5** wherein said cable means includes at least one cable length, an aperture in said brake, said cable extending through said aperture and operable to preclude brake movement to said second position when a load is attached to said cable length.

7. The combination as in claim **6** including means for increasing the force required to move said brake to said second position when a load is attached to said cable length.

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