Jan. 17, 1967 R. G. MORRIS 3,298,462

TRACTION LIFT FOR SCAFFOLDING TOWERS

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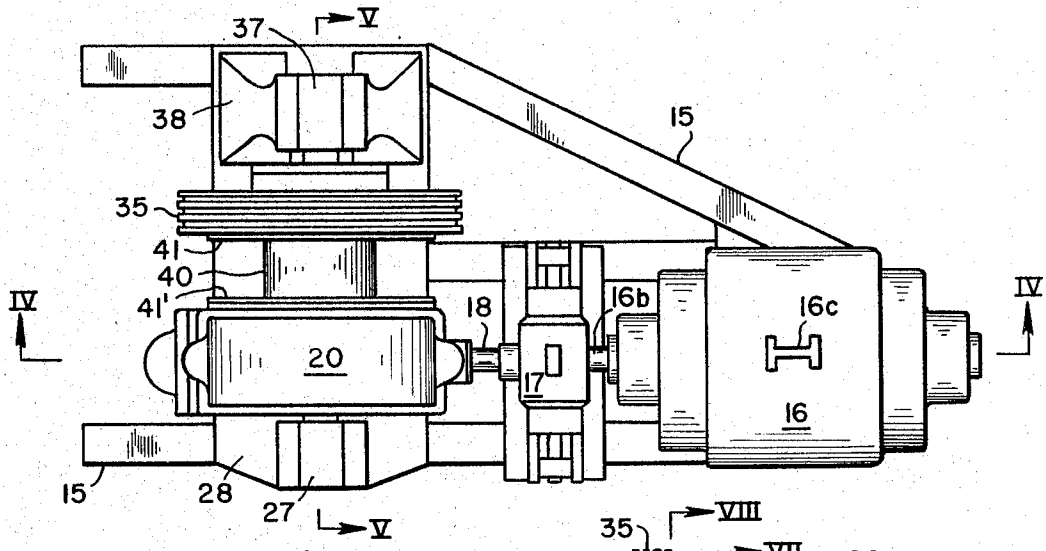


Fig. 1

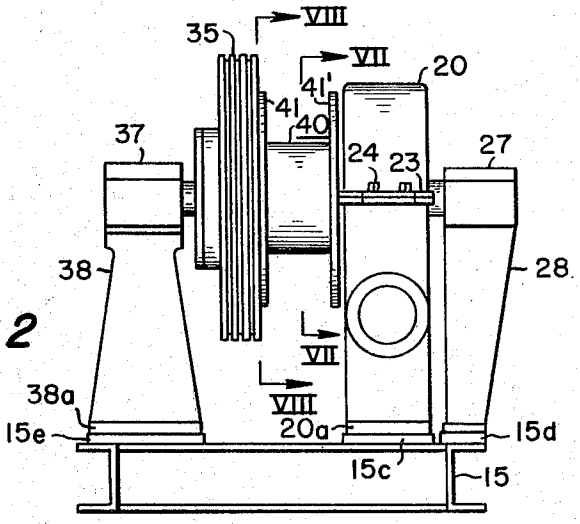


Fig. 2

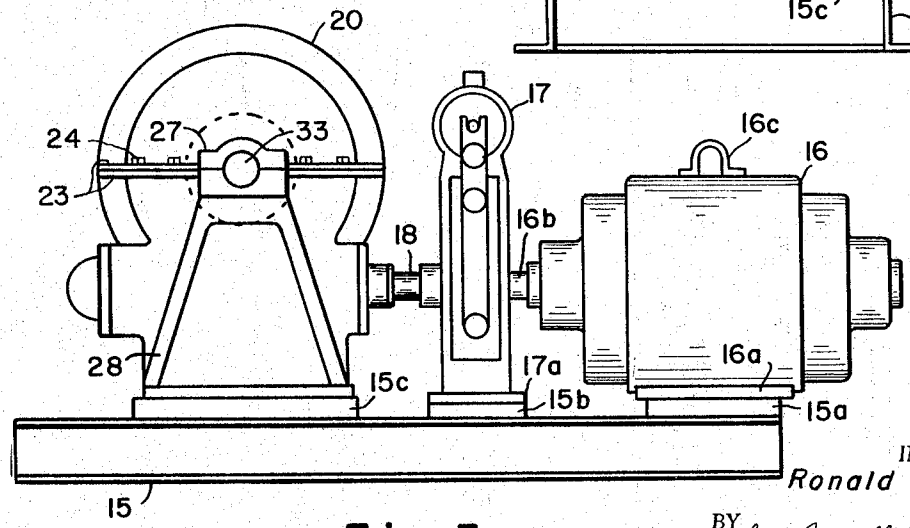


Fig. 3

INVENTOR.
Ronald G. Morris

BY Green, McCallister & Miller

HIS ATTORNEYS

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TRACTION LIFT FOR SCAFFOLDING TOWERS

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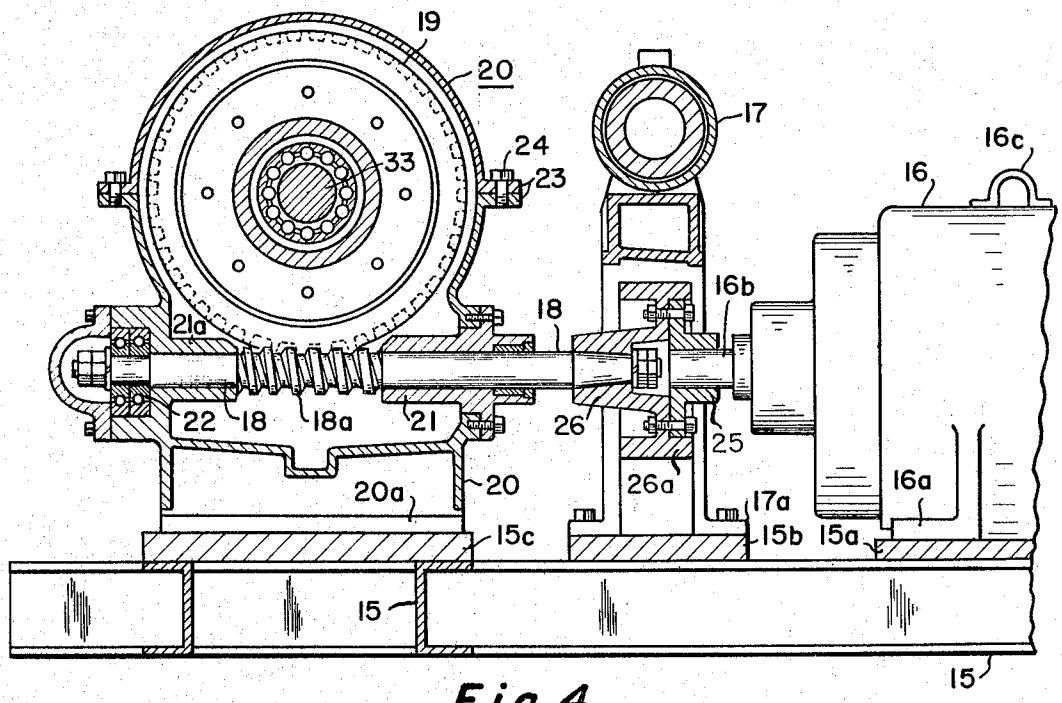


Fig. 4

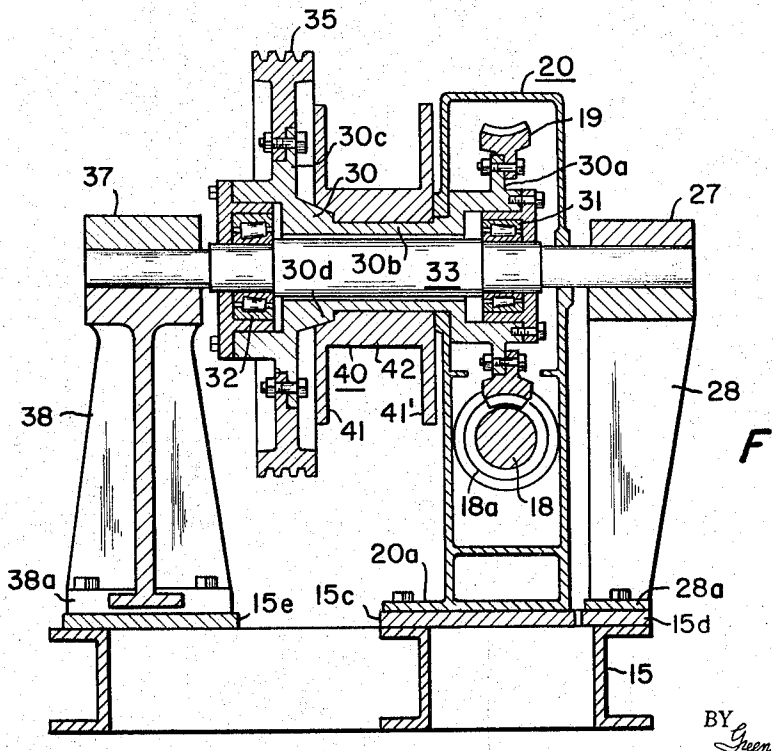


Fig. 5

INVENTOR.
Ronald G. Morris

BY Green, McCallister & Miller

HIS ATTORNEYS

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TRACTION LIFT FOR SCAFFOLDING TOWERS

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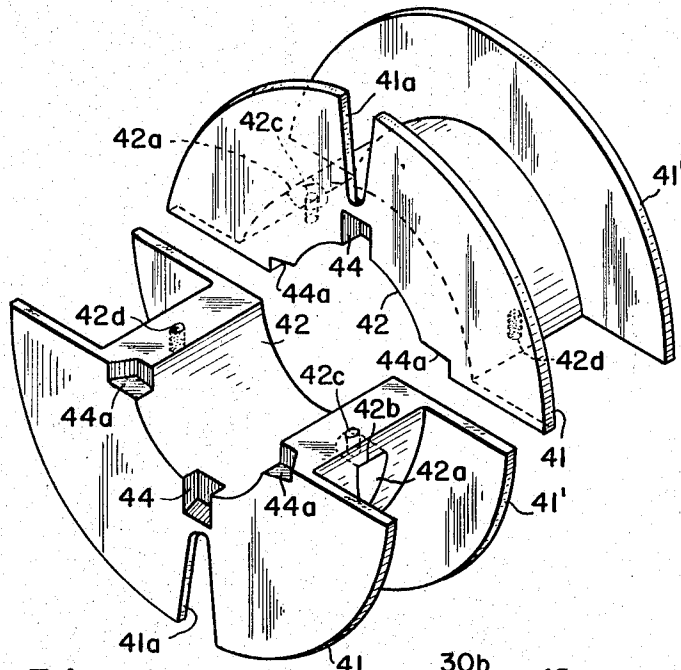


Fig. 6

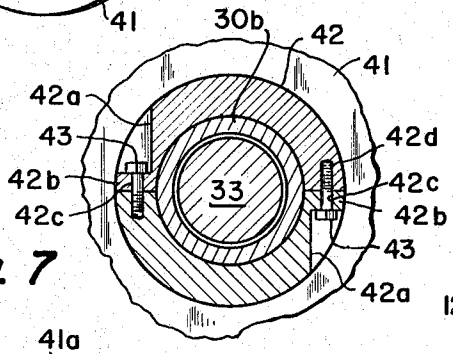


Fig. 7

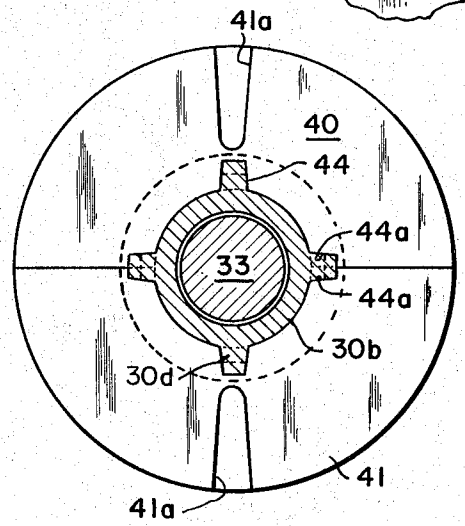


Fig. 8

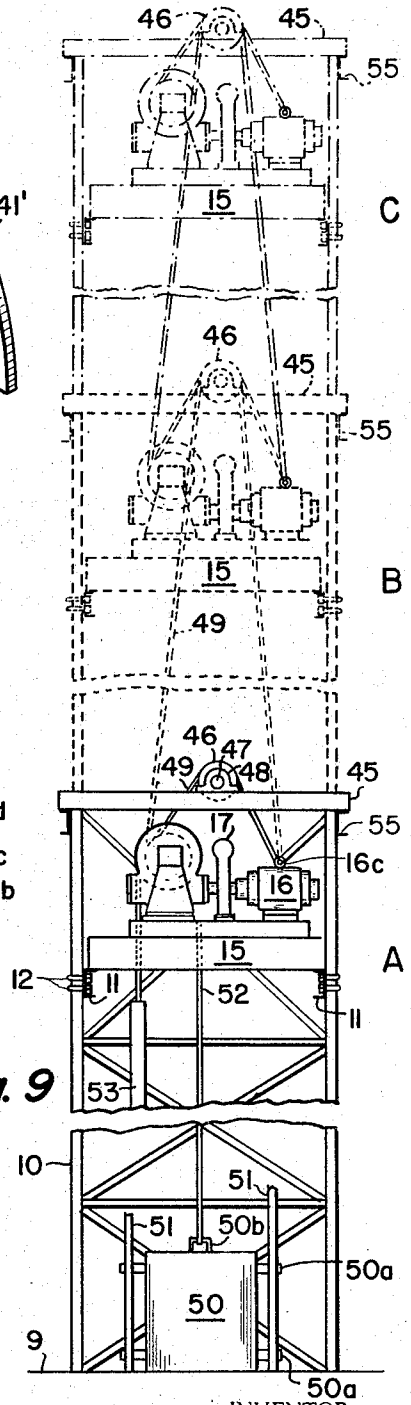


Fig. 9

INVENTOR.
Ronald G. Morris

BY Green, McCallister & Miller

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TRACTION LIFT FOR SCAFFOLDING TOWERS

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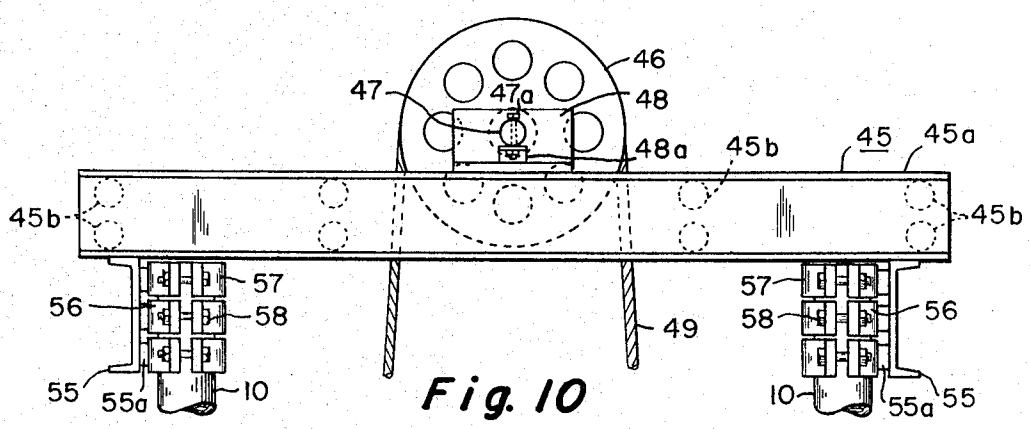


Fig. 10

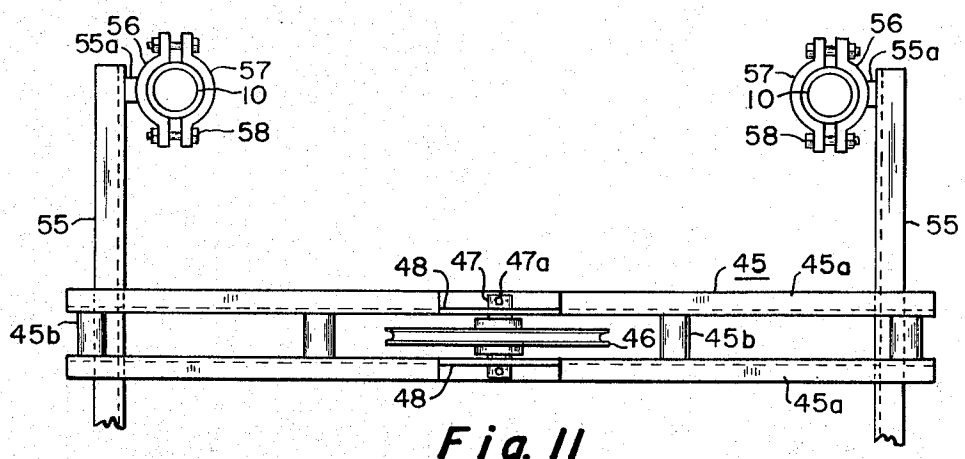


Fig. 11

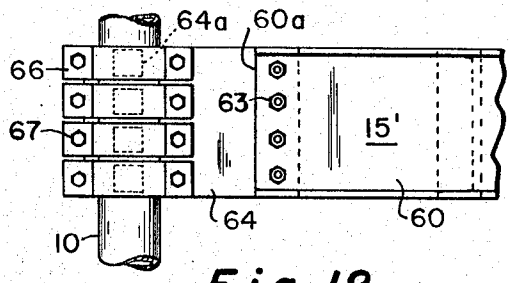


Fig. 12

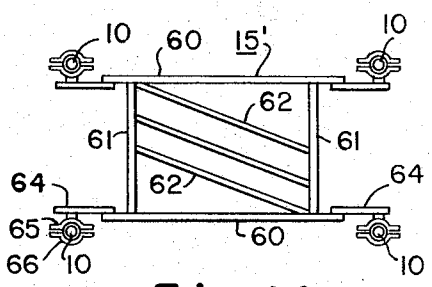


Fig. 14

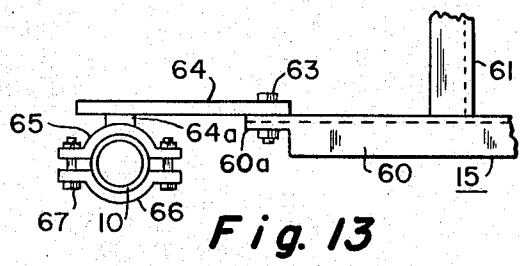


Fig. 13

INVENTOR.
Ronald G. Morris

BY Green, McCallister & Miller

HIS ATTORNEYS

United States Patent Office 3,298,462 Patented Jan. 17, 1967

3,298,462

TRACTION LIFT FOR SCAFFOLDING TOWERS

Ronald G. Morris, Beaver Falls, Pa., assignor to Beaver-Advance Corporation, Ellwood City, Pa., a corporation of Pennsylvania

Filed Jan. 17, 1966, Ser. No. 521,134
14 Claims. (Cl. 187—2)

This invention relates to means or apparatus for raising and lowering an overhead traction machine and its supporting platform to, in stages, extend the height of operation of a personnel elevator during the progress of building construction, and particularly to supplemental means associated with the traction machine for changing its operating height in accordance with the height to which personnel and equipment are to be lifted within a scaffold elevator tower.

In building construction and maintenance work, it has been customary to employ tubular and other types of scaffolding members and sections for progressively building up the working levels as the work progresses. Scaffolding for use on the outside of a proposed building construction will be constructed in stages, for example, from an initial height of about 60 or 70 feet up to about 150 feet representing several stories, in successive stages to the ultimate height of the building which may be 400 to 500 feet. That is, the building is constructed by the workmen up to the initial or first stage height of the scaffolding and then additional stages of scaffolding are built up for each additional height as it is completed and the procedure is continued until the full height of the building has been attained.

The present invention deals with apparatus for use with a scaffolding tower in which a lift platform carrying the traction machinery or a machine unit for raising and lowering the elevator that is employed to raise and lower the workmen and their equipment, is first fixed or secured at one height level or stage with respect to a personnel scaffolding tower, is then after work has progressed, raised to an upper level and fixed or secured in position thereat. The traction machinery is used at each such level until the need arises for further raising the overhead operating level. Heretofore difficulty has been encountered in raising and lowering the platform and the traction machinery from one stage or level to another, in the sense of leap frogging, during the construction of the building. It has heretofore been customary to use a special overhead crane for accomplishing this purpose. The use of such crane which is generally otherwise idle during the building work, greatly adds to the cost involved and takes up space that could otherwise be made available for more productive purposes.

It has thus been an object of my invention to solve the problem of raising or better, inexpensively and expeditiously changing the position of the traction machine and its platform in accordance with the progress of building construction work;

Another object has been to devise a means or approach to the problem which will make use of equipment associated with the traction or elevator raising mechanism in order to eliminate the need for an independent means for the purpose of raising and lowering the traction platform;

A further object of my invention has been to make use of the traction machinery on the platform for, itself, raising the platform and such machinery from one stage of the building construction level to another;

A still further object of my invention has been to provide a practical and inexpensive approach to accommodating the height positioning of traction machinery to the progress of building construction work;

These and other objects of my invention will appear to those skilled in the art from the illustrated embodiment, the description thereof and the claims.

In the drawings, FIGURE 1 is a top plan view of a traction machine, apparatus or operating unit constructed in accordance with my invention;

FIGURE 2 is an end view in elevation on the scale of and taken from the left end of the apparatus of FIGURE 1;

FIGURE 3 is a side view in elevation on the scale of FIGURES 1 and 2 and taken from the front side of the apparatus of FIGURE 1;

FIGURE 4 is an enlarged side sectional view in elevation taken along the line IV—IV of FIGURE 1;

FIGURE 5 is an end sectional elevation on the scale of FIGURE 4 and taken along the line V—V of FIGURE 1;

FIGURE 6 is a further enlarged perspective view of a winding drum constructed in accordance with my invention in an exploded relation to illustrate details of its construction;

FIGURE 7 is a fragmental end section on the scale of FIGURE 6 and taken along the line VII—VII of FIGURE 2;

FIGURE 8 is an end section on the scale of FIGURES 6 and 7 taken along the line VIII—VIII of FIGURE 2;

FIGURE 9 is a somewhat diagrammatic, greatly reduced, view in elevation illustrating a scaffolding tower and the stages in which it is built up and its traction platform is advanced during work progress in a building construction;

FIGURE 10 is a fragmental side view in elevation on the scale of FIGURES 4 and 5, illustrating details of the construction and mounting of an overhead cathead shown in FIGURE 9;

FIGURE 11 is a fragmental top plan view on the scale of and further illustrating the cathead of FIGURE 10;

FIGURE 12 is a side fragment in elevation on the scale of FIGURES 10 and 11 and illustrating details of a preferred construction and mounting of a traction or lift platform for use with the scaffolding tower of FIGURE 9;

FIGURE 13 is a top plan fragment on the scale of and of the platform of FIGURE 12; and

FIGURE 14 is a greatly reduced top plan view showing the complete platform whose details are illustrated in FIGURES 12 and 13.

In carrying out my invention as particularly illustrated in FIGURE 9, where a scaffold tower **10** is shown positioned on ground level **9**, an overhead, traction unit supporting or lift platform **15** may be first secured in position at a stage A by means of under-positioned, opposed, channel support members **11** on which the platform rests. The support members **11** are removably, semi-permanently secured in position by suitable means, such as U-bolts **12** and their associated nuts, to spaced-apart, upwardly-extending leg members of the personnel tower **10**. As the work progresses, the platform **15**, as shown by the dot and the dot and dash lines of FIGURE 9, may be periodically raised to successive heights, represented by B and C, at which its traction machinery is securely-supported and is then employed for raising and lowering a conventional elevator or cage **50**. It will be noted that when the building construction is completed, assuming, for example, that its height is attained when the lift platform **15** has reached the position of stage C, such platform may then be lowered to the ground level **9** by the same means which is employed for raising it periodically, progressively or suc-

cessively to positions A, B and C. As shown, the elevator **50** has conventional slide fingers **50***a* that are adapted to ride along opposed side rails **51** in a conventional manner.

In FIGURES 1 to 3 of the drawings, I have shown operating or traction apparatus securely-mounted on a platform **15** of structure members, such as channel members. The traction machinery or apparatus includes a suitable drive means that may, for example, be a reversing electric motor **16** of an induction type. The motor **16** is provided with a bottom mounting flange **16***a* that is secured on a mounting plate **15***a* of the platform **15** by any suitable means, such as conventional bolts. It will be noted that the lift platform or frame **15** also has mounting plates **15***b*, **15***c*, **15***d* and **15***e* for other parts of the traction apparatus.

Referring particularly to FIGURE 4, the motor **16** has a drive shaft **16***b* on which a hub flange **25** is keyed or secured as part of an electromagnetic brake unit **17**. In this connection, a conventional brake unit, such as manufactured by the Hollister-Whitney Company, is illustrated. The hub flange **25** is, in turn, secured as shown in FIGURE 4, by bolt and nut assemblies to a brake hub part **26** which carries a circumferential brake drum **26***a*. The part **26** has a frusto-conical bore therein and may be secured, as shown, by bolt, nut and washer assemblies on the end of a driven gear shaft **18** which has a complementary cone-shaped end portion that fits with such bore. The drive shaft **18** is journaled within and extends along hub portions **21** and **21***a* of a gear housing **20** and, at its outer reduced end, within a roller thrust bearing assembly **22**. The driven shaft **18** has an intermediate or central worm portion **18***a* which meshes with and drives a worm gear wheel or ring **19** (see also FIGURE 5) to provide a positive, forward and backward driven, reduction gear unit. The gear housing **20** has a mounting flange **20***a* which is secured on a mounting plate **15***c* of the platform **15**. It will also be noted that the magnetic brake unit **17** has a flange **17***a* which is bolted to the mounting plate **15***b*.

As also shown in FIGURE 5, a cross-extending, relatively short-length, stationary support shaft **33** extends through the gear unit housing **20** at right angles to the driven shaft **18**. At its one reduced end, the support shaft **33** is mounted within a boss mount portion **27** of a stand **28** and its other and further reduced end portion is carried within an opposed boss mount portion **37** of an opposed stand **38**. The stand **28** has a mounting flange **28***a* secured on the mounting plate **15***d* and the stand **38** has a mounting flange **38***a* secured on the mounting plate **15***e*.

A rotatable, driven, sheave spider, shaft, sleeve part or casting member **30**, having a bore providing a clearance relation with the central portion of the stationary shaft **33**, is positioned to extend therealong between the mounting bosses **27** and **37** by end thrust bearing assemblies **31** and **32**. The bearing assemblies **31** and **32** are bolted in position on the sleeve member **30** and rotatably-position the member on intermediate reduced portions of the support shaft **33**. One end portion of the sleeve member **30** has a peripherally-projecting, circular or annular flange portion **30***a* to which the worm gear ring or wheel **19** is secured as by nut and bolt assemblies for actuating it in accordance with the actuation of the driven shaft **18**.

The sleeve member **30** has a central cylindrical or annular portion **30***b* that connects the flange portion **30***a* with a second, outwardly-projecting, circular or annular flange portion **30***c* adjacent its opposite end. A main elevator sheave **35** of annular or ring shape is secured as by bolt and nut assemblies in a stepped interlocking fitted relation therewith to project radially-outwardly therefrom. The sheaves **35** serves to carry and reeve a conventional elevator lift cable **52** (see also FIGURE 9) which, at one end, is shown connected by an eyelet **50***b* to an elevator cage **50**. The cable **52**, at its other end, carries a counterweight **53** that is elongated, in order that it may raise and lower within side spacing between the personnel elevator cage **50** and its side guide rails **51** to minimize the force required for raising the elevator cage.

A winding drum **40** which may be termed an auxiliary or traction platform lift drum is carried on the central portions **30***b* of the rotatable sleeve member **30** for simultaneous rotation therewith during its actuation by the motor **16**. The drum **40** represents an important feature of my invention in that it is the means utilized in cooperative association with the ordinary elevator cage lifting means for raising and lowering the platform **15** and its supported traction machinery or unit.

In FIGURES 6, 7 and 8 I have illustrated details of the construction of the drum **40**. It is shown made in two substantially complementary parts that are adapted to have a complementary interfitting relation with each other to define an annular spool-like shape when securely-mounted in position on the central portion **30***b* of the rotatable driven sleeve member **30**. Each drum half has oppositely-positioned, radially-outwardly-projecting, annular side flanges or wings **41** and **41'** for containing a lift cable **49** for the platform **15**. Each part or half of the flange **41** is shown provided with a radially-inwardly-projecting and converging edge slot **41***a* for receiving an end of the cable **49** and locking it in position therein. The flange portions **41** and **41'** of each half are connected together in a spaced relation by a cylindrical sleeve or hub portion **42**. As shown particularly in FIGURES 6 and 7, each half of the drum **40** has a central-outwardly-open, offset or recess portion **42***a* therein that terminates in a mounting flange **42***b*. A headed, threaded bolt **43** is adapted to extend through a bore hole in the flange portion **42***b* and to be secured within a threaded bore **42***d* of the other half of the drum **40**. In this manner, the two halves of the drum **40** are tightly-secured about the portion **30***b* of the sleeve member **30**.

It will be further noted that the sleeve member **30** is provided with a series of radially-projecting, quadrant lug portions **30***d* (see particularly FIGURES 5 and 8) which are adapted to have a complementary fit within wedge-shaped quadrant slots **44** and quadrant slot halves **44***a* of the drum parts. The slotted portions **44** and **44***a* are shown cut in the flange **41** adjacent the hub **42**. This provides a positive latching or locking relation of the drum **40** on and with respect to the member **30** for rotation therewith.

As shown in FIGURES 2 and 3, the housing **20** not only encloses the driven shaft **18** which has the worm portion **18***a*, but also the worm ring gear **19**, a portion of the sleeve **30** and a portion of the stationary support shaft **33** (see also FIGURES 4 and 5). The housing **20** has, as shown in FIGURES 2 and 3, upper and lower halves or portions which have cooperating abutting flanges **23** that are removably-secured together by bolts **24**. This facilitates the mounting of the enclosed parts as well as their maintenance. Although I have shown an eyelet **16***c* as applied to the housing of the motor **16** as an attaching means for the one end of the auxiliary cable **49**, it will be apparent that such end of the cable may be secured directly to the lift platform **15** or to any other suitable means secured to such platform provided that, as shown in FIGURE 9, the cable **49** may be properly reeved over the overhead idler pulley **46** and connected at its ends in a substantially balancing relation with respect to the platform **15**.

In the ordinary operation of the traction unit, the motor **16** will drive the shaft **16***b*, driven shaft **18**, the sleeve **30** and the sheave **35** to raise the elevator cage **50**, for example, from the ground level **9** of FIGURE 9 to an upper level A for the convenience of the personnel and the transportation of their materials and equipment. During this period, a secondary or auxiliary cable **49** is car-

ried by the drum **40** and is maintained in a wound-up relation thereon. However, when one stage of the building has been constructed, such as A, and it is desired to then move the platform **15** to position B, the support channels **11** are maintained in place at A, one end of the cable **49** is unwound from the drum **40**, reeved over an idler pulley **46**, and connected at such end to an eyelet **16***c* projecting from the housing of the motor **16**.

It will be noted that the idler pulley or sheave **46** is rotatably-mounted on an overhead platform **45** that is designated as a cathead and that, during the raising operation, is secured by end channel members **55** and clamping bracket assemblies **56**, **57** on riser or vertical tubular members of the scaffolding **10** above the position, such as B, to which the platform **15** is to be raised. At this time, the channels **11** which are to support the platform **15** at its upper position B are not in position. The motor **16** is actuated to, in turn, actuate the drum **40**; as the cable **49** winds up on such drum **40**, the platform **15** and its associated supported traction machinery will be lifted to the position B. At this time, channels **11** may be secured in position therebeneath. After the one end of the cable **49** has been disconnected from the eyelet **16***c* and rewound on the drum **40** with its end projecting through one of the slots **41***a*, the traction machinery may then be employed using its sheave **35** to raise and lower the elevator cage **50** from the ground level **9** from stage A to a position below the stage B. As the work progresses, the platform **15** may be raised in the same manner in successive stages as indicated by position C of FIGURE 9. Before effecting a raising of the platform **15** and its traction apparatus to a new height level or stage, I first move the elevator **50** to, for example, a lower position, such as the ground position of FIGURE 9. To minimize the load on the motor **16**, I may also temporarily disconnect the lower end of the cable **52** from the elevator **50** and lower the counterweight **53**.

In FIGURES 10 and 11, I have illustrated details of a suitable construction for the cathead platform **45**. This platform is provided with clamping brackets adjacent its opposite ends for adjustably and removably securing it at desired selected positions along the scaffold tower, above the traction apparatus. As shown, a pair of longitudinally-extending transversely-spaced apart structural or channel members **45***a* are adapted to extend slightly beyond opposite pairs of riser or vertical tubular members of the scaffolding **10** and are formed into a narrow platform by cross-extending, connecting, spacer pin members **45***b*. The sheave or idler pulley **46** is shown rotatably-positioned on a pin shaft **47** which is supported on upwardly-projecting mounts **48** that are secured at a central position on the members **45***a*. As shown particularly in FIGURE 10, each mount **48** has on outwardly-projecting angle piece **48***a* that provides a lug extension upon which an associated end of the shaft **47** rests. Suitable means, such as nut and bolt assemblies **47***a* are adapted to extend through cross bores in each end of the shaft **47** to secure it on the lug extensions of the angle pieces **48***a*.

The platform **45** is secured adjacent its opposite ends on a pair of endwise-extending channel members **55** that carry mounts **55***a* adjacent their opposite ends and that project inwardly of the members **55** to support a fixed half or portion **56** of a clamping bracket made up of a fixed half **56** and a removable half **57**. The clamping brackets have semi-circular inner contours so as to complementary engage and fit over or about an associated member of the scaffolding **10** and to be tightly clamped thereon by means of nut and bolt assemblies **58**. As illustrated particularly in FIGURE 10, a group of bracket assemblies, three being shown, are mounted in an adjacent cooperating relation to extend vertically along the inside of each member **55** at each end thereof so as to provide a positive and sure type of gripping engagement with the vertically-extending members of the scaffolding **10**. It is thus apparent that the cathead **45** may be securely but removably and adjustably positioned at any suitable height along the extent of the scaffolding **10**.

In FIGURES 12 to 14, inclusive, I have illustrated a preferred construction and mounting of a traction unit supporting or lift platform, designated as **15'**. As disclosed in FIGURE 14, the platform **15'** may be of rectangular form made up of a pair of spaced-apart longitudinally-extending side channel members **60** and a pair of spaced-apart and transversely-extending end channel members **61**, is suitably reinforced in their assembled relation by diagonally-extending I-beam members **62**. The platform **15'** is provided with opposite end pairs of clamping brackets for adjustably and removably securing it at desired, selected positions along the scaffold tower. It will be noted that the side structural members **60** extend endwise beyond the transverse or end structural members **61** and are secured to mounting bracket assemblies at their opposite ends. It will be further noted that the mounting bracket assemblies cooperate with adjacent vertical tubular members of the scaffolding **10** to removably and vertically-adjustably secure the platform **15'** at a suitable height or location therealong.

With particular reference to FIGURES 12 and 13, each side structural member **60** has a flange portion **60***a* at its opposite ends which is adapted to be secured, as by nut and bolt assemblies **63**, to an inner end portion of an extension plate member **64**. The extension plate member **64**, in turn adjacent its outer end, carries a vertically-spaced group of clamping bracket assemblies, each of which has an inner bracket half **65** secured by a mount **64***a* thereto and has an outer half or part **66** which is substantially complementary with the half **65** and which cooperates therewith to substantially surround an associated tubular riser member of the scaffolding **10**. Nut and bolt assemblies **67** cooperate with end flanges of the bracket halves **65** and **66** to clamp them tightly in a secure position about the scaffolding member. The scaffolding construction of FIGURES 12 to 14, inclusive, eliminates any clearance problems, particularly from the standpoint of the movement of the platform through the tower of the scaffolding **10**. It also eliminates the necessity for having two sets of channels **11** (see FIGURE 9) or, in the alternate, to the letting of the traction platform **15** hang free when one set is moved from a lower to a higher level. The halves **65** and **66** of the end or corner clamping brackets may be merely loosened when the platform **15'** is to be raised and lowered so that they serve as guides along the vertical members of the scaffolding **10** during such movement. They can of course, be opened or removed when the platform **15'** is to be raised or lowered beyond a joint of the scaffolding **10**.

Although for the purpose of illustration, I have shown and described an embodiment of my invention, it will be apparent to those skilled in the art that various modifications and changes may be made without departing from the spirit and scope of the invention, as indicated by the appended claims.

I claim:

1. Traction apparatus for mounting on an overhead lift platform to raise and lower an elevator and to raise and lower the lift platform which comprises, a drive motor, a gear reduction unit having a driven shaft operatively-connected to said motor for actuation thereby, a support shaft, means for carrying said support shaft, sleeve means rotatably-positioned on said support shaft and connected to said gear reduction unit for actuation thereby, said sleeve means having a sheave to carry cable reeving for raising and lowering the elevator, a winding drum operatively-associated with said sleeve means for rotation therewith on said support shaft, and said wind-

ing drum having means to secure one end of a winding cable thereto for raising the lift platform from one to a second stage of elevation.

2. A traction apparatus as defined in claim 1 wherein a pulley for the winding cable is carried in an overhead relation with respect to the traction apparatus, and means is carried on the lift platform for securing the other end of the winding cable thereto.

3. Traction apparatus as defined in claim 1 wherein said gear reduction unit has a worm actuated by said driven shaft and a worm gear actuated by said worm and operatively-connected to said sleeve means.

4. Traction apparatus as defined in claim 1 wherein, said drive motor has a drive shaft, said driven shaft has a brake drum secured on one end portion thereof and coupled to said drive shaft, and said gear reduction unit has a cooperating worm and worm gear for restricting the actuation of said sleeve means to power actuation effected by said drive motor.

5. Traction apparatus as defined in claim 1 wherein, said driven shaft has a worm portion, a ring-shaped gear meshes with said worm portion and is securely connected to said sheave means for actuating it through the agency of said drive motor.

6. Traction apparatus as defined in claim 1 wherein, said sleeve means and said winding drum have cooperating tongue and groove portions for locking them in non-rotatable engagement with respect to each other, said drum is of two-part construction, and means cooperates with the two parts of said drum for removably-securing them together on said sleeve means.

7. Traction apparatus as defined in claim 1 wherein, a housing encloses said gear reduction unit and said driven shaft, said gear reduction unit has a worm meshing with a ring gear, said worm is carried by said driven shaft, one end portion of said support shaft extends through said housing, stands are positioned in a spaced relation with said housing to carry the opposite ends of said support shaft, said sleeve means is positioned on a central portion of said support shaft between said housing and one of said stands, bearing means is operatively-positioned between opposite end portions of said sleeve means and said support shaft for rotatably-positioning said sleeve means thereon, and said sleeve means has a central sleeve portion extending along said support shaft and at one end carrying said ring gear and at its other end carrying said sheave, and said winding drum is secured on said central sleeve portion of said sleeve means between said ring gear and said sheave for rotation therewith.

8. Traction apparatus for scaffolding to be mounted on an overhead lift platform to raise and lower an elevator and to periodically raise and lower the lift platform as work progresses which comprises, a drive motor, a gear reduction unit having a driven shaft operatively-connected to said motor for actuation thereby, a support shaft, means for positioning said support shaft above and at substantially right angles to said driven shaft, sleeve means rotatably-positioned on said support shaft and having means operatively-connecting one end portion thereof to said gear reduction unit for actuation thereby, said sleeve means having a sheave positioned on the opposite end thereof for receiving an elevator lift cable, and a winding drum securely-mounted on said sleeve means between said sheave and said operatively-connecting means for receiving a platform raising and lowering cable.

9. Traction apparatus as defined in claim 8 wherein, said winding drum is of partible construction, and said sleeve means and said winding drum have cooperating tongue and groove portions for positively-securing said winding drum on said sleeve means for rotation therewith.

10. In a scaffold tower provided with a lift platform, traction apparatus secured on the platform and having a sheave, an elevator, a cable on the sheave connected at one end to the elevator and at its other end to a counterweight, and an overhead pulley wheel above the traction apparatus, wherein the traction apparatus comprises, a drive motor adjacent one end of the lift platform, a worm reduction gear unit adjacent an opposite end of the lift platform operatively-connected for actuation by said drive motor, a stationary shaft, a spindle rotatably-positioned on said stationary shaft and carrying an output gear of said gear reduction unit at one end thereof and the sheave at the opposite end thereof, a winding drum securely-mounted on said spindle between said sheave and said output gear for rotation therewith, a lift cable carried by and having one end secured to said winding drum and adapted to reeve over the overhead pulley wheel, and means on said drive motor for securing the other end of said lift cable thereto.

11. In a scaffold tower as defined in claim 10 wherein, a lift platform is provided, said traction apparatus is positioned on said lift platform, and said platform has a pair of clamping assemblies projecting from opposite ends thereof to adjustably-secure said platform at selected vertical positions on the scaffold tower.

12. In a scaffold tower as defined in claim 10 wherein, a cathead platform is provided, said overhead pulley wheel is operatively-positioned on said cathead platform, and said cathead platform has structural end members carrying clamping brackets projecting therefrom to adjustably-secure said cathead platform at selected vertical positions on the scaffold tower above said traction apparatus; a lift platform is provided, said traction apparatus is positioned on said lift platform, and said lift platform has clamping means adjacent its opposite ends to adjustably-secure said lift platform at selected vertical heights on the scaffold tower.

13. In a scaffold tower as defined in claim 10 wherein, said drive motor is a reversible electrical motor having a drive shaft for rotating said spindle in opposite directions, said gear reduction unit has an input shaft, coupling means connects said drive shaft to said input shaft, a brake drum is carried by said coupling means, and a brake is operatively-positioned between said motor and said gear reduction unit to cooperate with said brake drum.

14. In a scaffold tower as defined in claim 13 wherein, said spindle has projecting quadrant-positioned lugs thereon adjacent the sheave, said winding drum has a pair of spaced-apart annular flanges connected by a hub portion, one of said flanges has quadrant-positioned slotted portions therein adjacent said hub to fit on said lugs, one of said flanges has one radial-outwardly open slotted portion to receive the one end of said lift cable and has a second radially-outwardly open slotted portion to receive the other end of said lift cable, said winding drum is of two-part construction and has cooperating inset portions in its hub portion, and bolts are removably-positioned in said inset portions to secure the parts of said winding drum together.

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SAMUEL F. COLEMAN, *Primary Examiner.*

H. C. HORNSBY, *Assistant Examiner.*