Jan. 19, 1965 C. H. REED 3,166,153

LINE TRUCK LIFT FOR ELEVATING LINEMAN TO OVERHEAD POWER LINES

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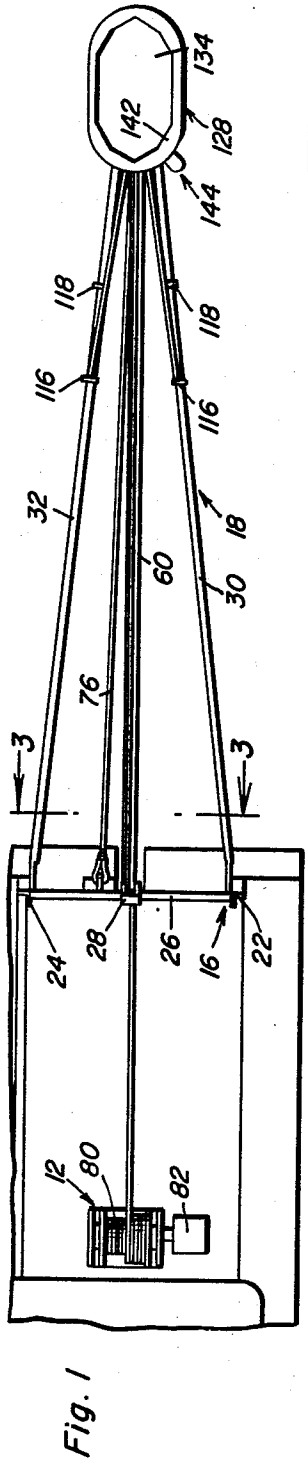


Fig. 1

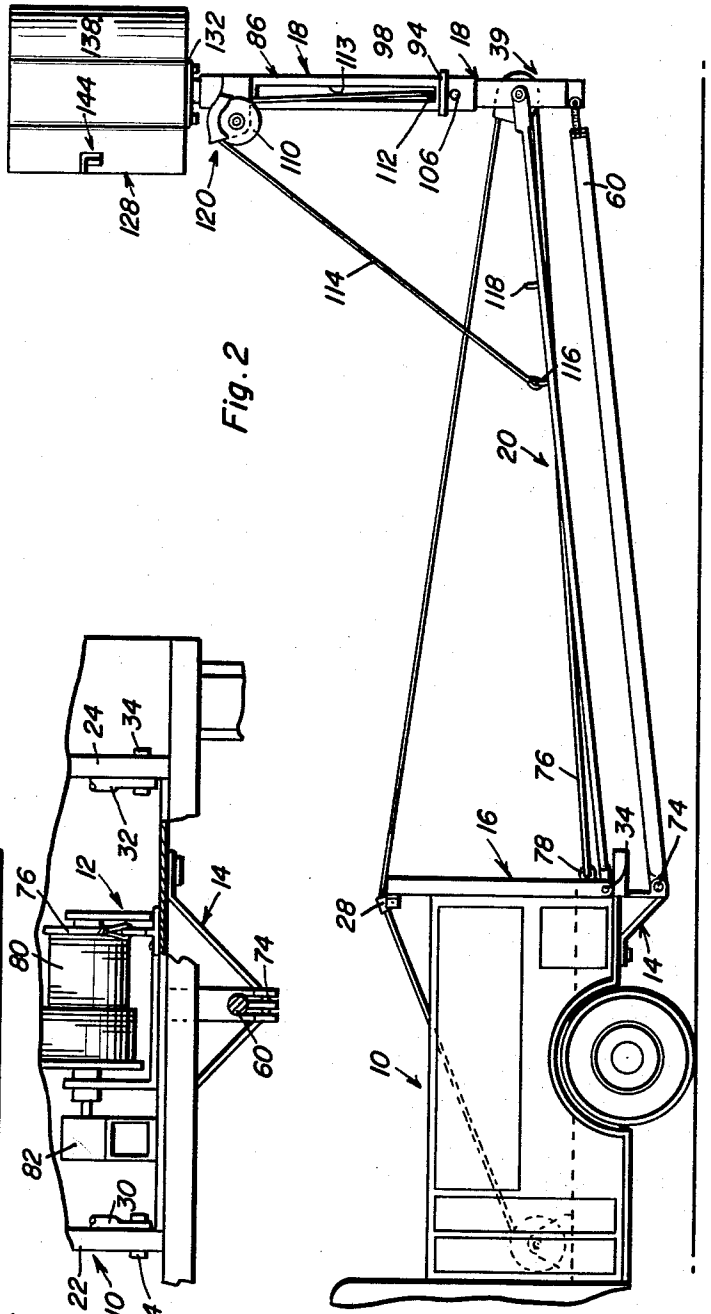


Fig. 2

Fig. 3

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Fig. 4

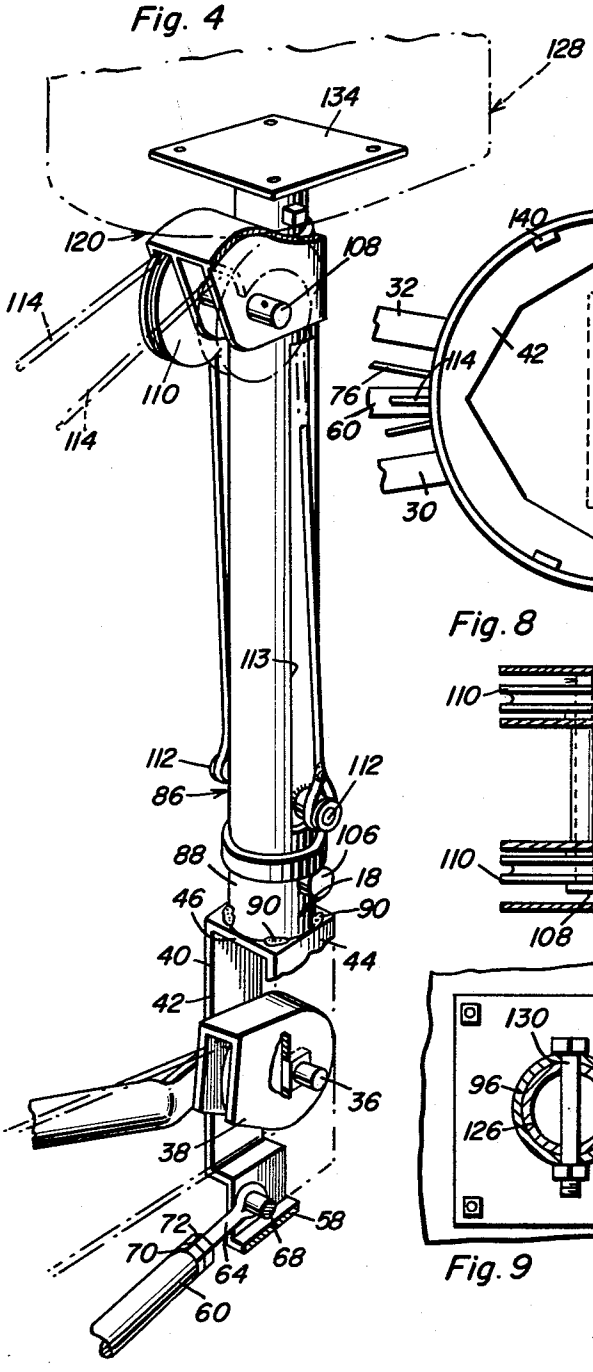


Fig. 5

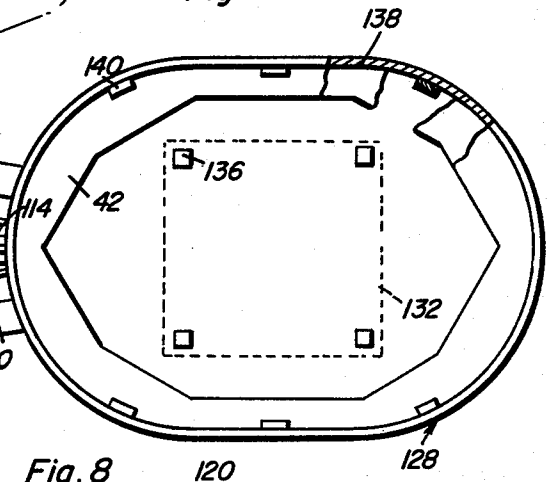


Fig. 8

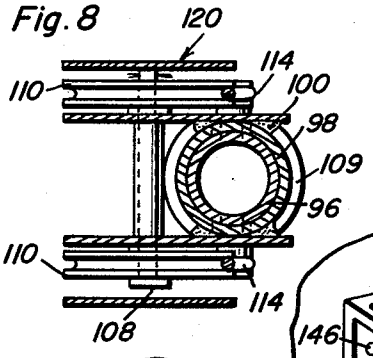


Fig. 10

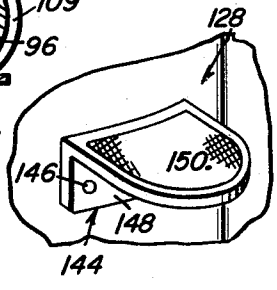


Fig. 9

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Fig. 6

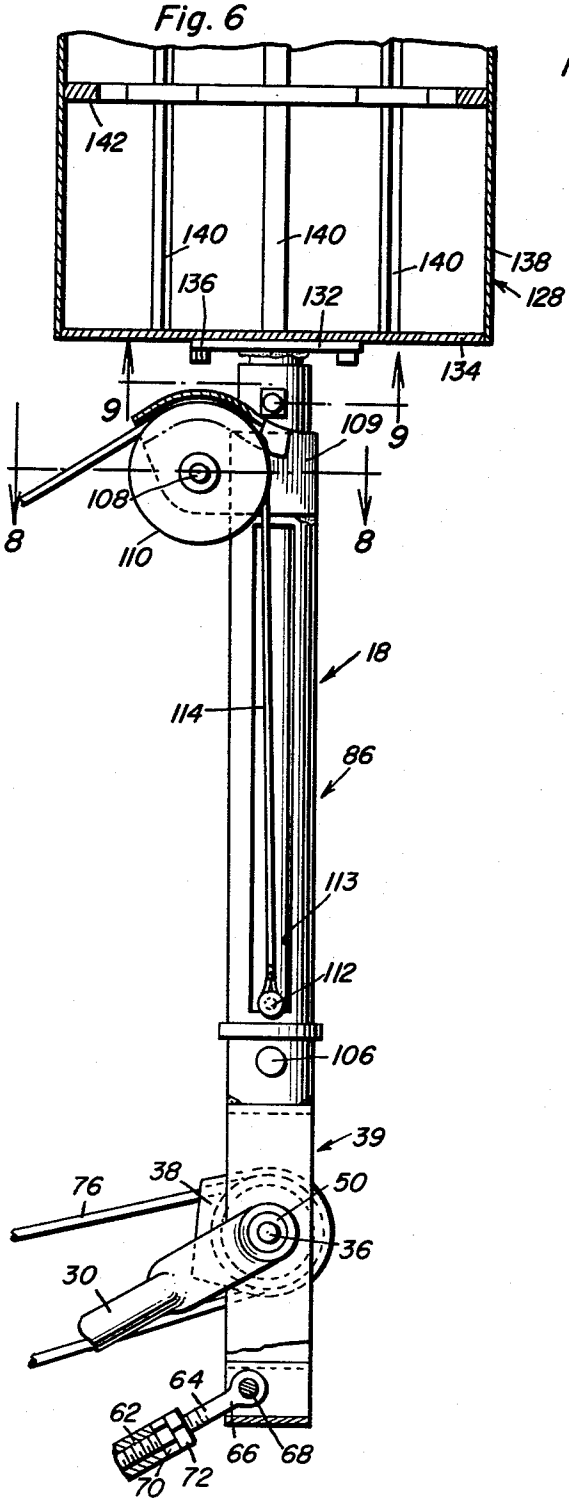
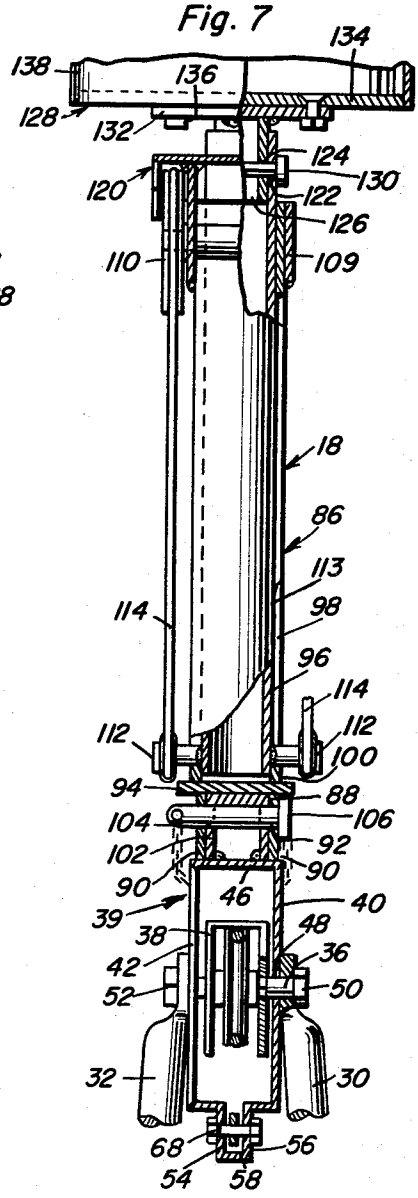


Fig. 7



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LINE TRUCK LIFT FOR ELEVATING LINEMAN TO OVERHEAD POWER LINES

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12 Claims. (Cl. 182—2)

This invention relates to a new and useful type of boom lift and more specifically to a boom lift primarily designed to be mounted on a line truck and utilized to elevate linemen to overhead power lines. In addition, the boom may also be used for other purposes such as a support for tree workmen.

The line truck lift of the instant invention includes a rigid boom-like member which is pivotally secured at one end to a truck for movement about a substantially horizontally disposed axis. Inasmuch as trucks are normally longer than they are wide, the axis about which the free end of the boom-like member is swingable extends transversely of the truck so that the boom-like member may be more readily properly positioned adjacent the power lines or trees workmen are to work upon by the maneuvering of the truck to which the boom lift is secured. The truck is provided with means for pivoting the boom from a substantially horizontally disposed position closely overlying the ground on which the truck is supported to an inclined position with the free end of the boom elevated above the pivoted end thereof. The free end of the boom is provided with an enclosure or platform for supporting one or more workmen and the platform or enclosure is pivotally mounted upon the free end of the boom for movement about an axis generally paralleling the axis of rotation of the end of the boom which is pivotally secured to the truck.

A rigid and longitudinally adjustable stabilizer rod is secured between the truck and the platform enclosure in a manner to form a parallelogram linkage which interconnects the platform and the truck in a manner whereby the platform may be maintained substantially horizontally disposed throughout the full path of swinging movement of the boom. In some cases lift platforms and the like have been pivotally secured to the free ends of swingable booms in a manner whereby the center of gravity of the platform is disposed between the axis of rotation of the platform with respect to the boom in order that the platform will continually be maintained in a horizontal position. However, when platforms and enclosures of the freely pivotable type are utilized to support one or more workmen and are required to operate in adverse conditions such as in a high wind, the platform will tend to pivot back and forth relative to the boom due to the high wind or because the workmen are required to move about the platform from one side to the other. For this reason, the line truck lift of the instant invention has been constructed in a manner to include a parallelogram linkage connection between the platform and the line truck.

The line truck lift of the instant invention includes a standard from whose upper end of the platform is supported and it is the standard that is pivotally secured to the free end of the lift boom. In addition to being provided with a parallelogram linkage connection between the platform and the line truck, the standard of the line truck lift to which the platform is secured is of the extendable type and means are interconnected between the extendable standard and the lift boom whereby the standard will be extended in length in direct response to upward swinging movement of the free end of the support boom.

The main object of this invention is to provide a pivoted boom-type lift having a platform or enclosure pivotally mounted on the free end thereof with a rigid stabilizer being interconnected between the platform and the boom of the lift in order to provide a parallelogram linkage between the platform and the lift so that the platform may be maintained in a horizontally disposed position throughout pivotal movement of the boom relative to the line truck to which it is pivotally secured.

A further object of this invention is to provide the support platform or enclosure of the line truck lift with an elongated standard which is extendable and pivotally secured to the free end of the lift boom and constructed in a manner so that the extendable support will be automatically extended in direct response to upward swinging movement of the free end of the lift boom thereby enabling the support platform or enclosure carried by the free end of the boom to be raised in elevation relative to the free end of the boom as the free end of the boom itself is raised. In this manner, the line truck lift of the instant invention may be utilized to lift workmen to a height above the lower end of the lift boom greater than the over-all length of the boom itself.

Still another object of this invention, in accordance with the preceding objects, is to provide a means for adjusting the effective length of the rigid stabilizer defining the parallelogram linkage whereby the pivoted boom and stabilizer may be mounted at alternate positions on a line truck or the like to which the boom lift is pivotally secured and the support platform or enclosure may be disposed horizontally even though the line truck to which the lift boom is pivotally secured is disposed other than horizontally.

Yet another object of this invention is to provide a support platform or enclosure for supporting one or more workmen on the free end of the lift boom including upstanding and encircling side walls whereby a workman will be afforded maximum safety precautions.

A still further object of this invention is to provide a means whereby the amount the extendable standard is extended in response to the raising of the free end of the lift boom a given amount may be adjusted.

A final object to be specifically enumerated herein is to provide a boom lift in accordance with the preceding objects which will conform to conventional forms of manufacture, be of simple construction and automatic in operation so as to provide a device that will be economically feasible, long lasting and simple to operate.

These together with other objects and advantages which will become subsequently apparent reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming a part hereof, wherein like numerals refer to like parts throughout, and in which:

FIGURE 1 is a fragmentary top plan view of the line truck lift of the instant invention;

FIGURE 2 is a side elevational view of the embodiment illustrated in FIGURE 1;

FIGURE 3 is an enlarged fragmentary transverse vertical sectional view taken substantially upon the plane indicated by the section line 3—3 of FIGURE 1;

FIGURE 4 is an enlarged fragmentary perspective view of the standard by which the support platform is pivotally secured to the free end of the lift boom;

FIGURE 5 is a fragmentary enlarged top plan view of the enclosure assembly carried by the free end of the lift boom;

FIGURE 6 is an enlarged fragmentary vertical sectional view of the embodiment illustrated in FIGURE 4 taken substantially upon the longitudinal center line passing through the standard;

FIGURE 7 is a fragmentary elevational view of the standard and the enclosure assembly with portions thereof being broken away and shown in section;

FIGURE 8 is a horizontal sectional view taken substantially upon the plane indicated by section line 8—8 of FIGURE 6;

FIGURE 9 is a fragmentary horizontal sectional view taken substantially upon the plane indicated by the section line 9—9 of FIGURE 6; and

FIGURE 10 is a fragmentary perspective view of the enclosure assembly illustrating the details of the construction of a step which is secured to the outer surfaces of the enclosure to assist workmen in climbing into and out of the enclosure.

Referring now more specifically to the drawings the numeral 10 generally designates a conventional type of line truck which has had a winch assembly generally referred to by the reference numeral 12 added thereto together with a boom member and supporting brace generally referred to by the reference numeral 16.

The line truck lift of the instant invention is generally designated by the reference numeral 18 and includes an elongated boom assembly generally referred to by the reference numeral 20. The brace assembly 16 includes a pair of upright standards 22 and 24 interconnected at their upper ends by means of a transverse support 26. A pulley assembly 28 is mounted on the transverse support 26 intermediate its opposite ends and the standards 22 and 24 and it will be noted that the boom assembly 20 comprises a pair of boom arms 30 and 32 which have corresponding ends thereof pivotally secured to the lower ends of the standards 22 and 24 by means of pivot pins 34. The free ends of the boom arms 30 and 32 have an axle assembly 36 secured therebetween and a pulley assembly 38 is mounted on the axle assembly 36 intermediate the free ends of the boom arms 30 and 32.

A support standard 39 includes a base 40 which is generally inverted U-shaped in configuration and includes a pair of sides 42 and 44 interconnected at their upper ends by means of a bight portion 46. The sides 42 and 44 are each apertured as at 48 and receive therethrough the free ends of the axle assembly 36 to which the outermost ends of the boom arms 30 and 32 are secured. The axle assembly 36 includes opposite end diametrically enlarged end portions 50 and 52 which prevent the free ends of the boom arms 30 and 32 from slipping off the ends of the axle assembly 36.

The lower ends of the sides 42 and 44 include inwardly offset lower end portions 54 and 56 which are interconnected at their lower edges by means of a bight portion 58.

The free end of an elongated rigid stabilizer bar 60 has a longitudinal threaded blind bore 62 formed therein in which the shank portion 64 of an eye member 66 is threadedly engaged. A connecting pin 68 is secured through the offset portions 54 and 56 and through the eye member 66. The shank 64 of the eye member 66 has an adjusting nut 70 threadedly engaged therewith and a jam nut 72 also threadedly engaged therewith. By means of the adjusting nut 70 and the jam nut 72, the over-all length of the rigid stabilizer bar 60 may be adjusted.

The end of the stabilizer bar 60 remote from the support standard 18 is pivotally secured to the lower end of the brace member support bracket 14 by means of a pivot pin 74. An elongated flexible tension member 76 has one end thereof secured to an attaching eye 78 carried by the truck 10 and the other end is passed through the pulley assembly 38 and the pulley assembly 28 and wound about the winding drum 80 of the winch assembly 12 which is powered by means of an electric motor 82.

Accordingly, it may be seen that upon actuation of the electric motor 82 the free end of the boom assembly 20 may be raised and lowered. In addition, inasmuch as the stabilizer bar 60 completes a parallelogram linkage connection between the support standard 39 and the truck 10, the support standard 39 will be retained in a substantially vertically disposed position throughout the full travel of swinging movement of the boom assembly.

The standard portion of the support standard 39 is generally referred to by the reference numeral 86 and includes a base socket 88 which is welded to the bight portion 46 by means of welding 90. The base socket 88 opens upwardly and has a pair of diametrically aligned bores 92 formed therein and an abutment shoulder 94 formed on the upper end thereof. The standard portion 86 includes first and second telescopically engaged sections 96 and 98. The outer section 98 is secured as by welding 100 to the shoulder 94 and the inner section 96 is slidably received in the outer section 98. A base socket 102 provided with a pair of diametric bores 104 which are registrable with bores 92 and a retaining pin 106 is removably secured through the aligned bores 92 and 104 for releasably securing the standard portion 86 to the base 40.

A transverse shaft 108 is journaled from the upper end of the outer section 98 by means of a collar 109 welded to the outer section 98 and a pair of pulley wheels 110 are journaled thereon. A pair of anchoring studs 112 are secured to the lower end of the inner section 96 and are slidably received in the slots 113 formed in the outer section 98. A pair of elongated flexible tension members 114 and 116 are secured at one pair of corresponding ends to the anchoring studs 112, pass upwardly and are entrained over the pulley wheels 110 and are secured to a selected pair of the eyes 116 and 118 carried by the boom arms 30 and 32.

The collar 109 includes a shield assembly generally referred to by the reference numeral 120 which supports the shaft 108 and partially encloses the pulley wheels 110. The upper end of the inner section 96 projects beyond the upper end of the outer section 98 and is provided with a pair of diametric bores 122 which are registrable with a pair of diametric bores 124 formed in the lower end of a downwardly opening socket member 126 which is dependingly supported from the lower end of the enclosure assembly 128.

A connecting pin 130 is secured through the registered pairs of bores 122 and 124 in order to secure the socket member 126 to the upper end of the inner section 96.

The upper end of the socket member 126 includes a mounting flange 132 to which the bottom 134 of the enclosure assembly 128 is secured by means of suitable fasteners 136.

With attention now directed to FIGURES 5 and 6 of the drawings it will be noted that the enclosure assembly 128 is provided with an upstanding encircling side wall assembly 138 which is secured about the periphery of the bottom wall 134 and is braced by means of upstanding internal brace members 140 and circumferentially extending internal brace members 142.

A step assembly which can best be seen in FIGURE 10 of the drawing and which is generally designated by the reference numeral 144 may be secured to the enclosure assembly 128 in any convenient manner such as by fasteners 146 and is generally L-shaped in side elevation including a mounting flange 148 through which the fasteners 146 are secured and a horizontally disposed tread flange 150.

It is to be noted that while the support standard 39 has herein been described and illustrated as being extendable, it can very easily be made rigid thus doing away with the necessity for the pulley wheels 110, the eyes 116 and 118, the anchoring studs 112, and the flexible tension members 114. If a rigid support standard were provided, the operation of the line truck lift would be substantially the same as the line truck lift illustrated and described herein with the exception being that the enclosure assembly thereof would not be elevated relative to the free ends of the boom arms in direct response to the raising of the free ends of the boom arms.

It is to be further noted that the enclosure assembly 128 may readily be constructed of dielectric materials so as to enable linemen to work in safety. Finally, the

two pairs of attaching eyes **116** and **118** may be used to adjust the amount the standard portion **86** will be extended in response to the raising of the free end of the boom assembly a given amount.

The foregoing is considered as illustrative only of the principles of the invention. Further, since numerous modifications and changes will readily occur to those skilled in the art, it is not desired to limit the invention to the exact construction and operation shown and described, and accordingly all suitable modifications and equivalents may be resorted to, falling within the scope of the invention as claimed.

What is claimed as new is as follows:

1. A truck lift for elevating lineman to overhead power lines comprising an elongated boom assembly, means on one end of said boom assembly adapted to pivotally secure the latter to a truck for rotation about an axis extending transversely of said boom, an elongated support standard, means on the lower end of said standard pivotally securing the latter to the other end of said boom assembly for movement about an axis generally paralleling the first mentioned axis, a rigid elongated stabilizer member, means pivotally securing one end of said stabilizer to said standard for rotation about an axis generally paralleling the second mentioned axis and means adapted to pivotally secure the other end of said stabilizer member to said truck for movement about an axis generally paralleling and spaced from the first mentioned axis a distance substantially equal to the distance between the second and third mentioned axes, the effective length of said boom and said stabilizer member being substantially equal, and a support platform carried by said support standard, said elongated standard being extendable, and means interconnected between said boom assembly and said standard for automatically extending said standard in response to the raising of the other end of said boom assembly relative to said one end thereof.

2. The combination of claim 1 including means for adjusting the effective length of said stabilizer.

3. The combination of claim 1 including an upwardly opening enclosure carried by said platform adapted to receive linemen to be elevated to an overhead power line.

4. The combination of claim 3 wherein said enclosure includes an upstanding and encircling retaining wall, a plurality of outwardly projecting step members carried by said retaining wall for assisting linemen when entering the enclosure when the boom is lowered.

5. The combination of claim 1 wherein said boom assembly comprises a pair of legs converging toward each other at said other end of said boom, said second mentioned pivotal securing means interconnecting said legs at said other end of said boom.

6. The combination of claim 1 wherein said last mentioned means includes means for adjusting the amount said support standard will be extended in response to upward movement from one position to another.

7. The combination of claim 6 wherein said support standard includes first and second upper and lower endwise overlapped sections, a support platform being carried by the upper end of said upper section.

8. A boom assembly, an elongated support standard including first and second upper and lower endwise overlapped sections, means pivotally securing the lower portion of the lower section to one end portion of said boom assembly about an axis extending transversely of said boom assembly and sections, said standard being longitudinally extendable, and means interconnected between said boom assembly and said upper section for automatically extending and retracting said standard upper section relative to said lower section in response to pivotal movement of said standard relative to said boom assembly.

9. The combination of claim 8 including a support to which the other end portion of said boom assembly is pivotally secured for rotation about an axis generally paralleling the first mentioned axis, and means interconnected between said support and standard for pivoting the latter relative to said boom assembly in response to pivoting movement of said boom assembly relative to said support.

10. The combination of claim 9 wherein last mentioned means includes means for positively oscillating said standard relative to said boom assembly in response to oscillation of said boom assembly relative to said support.

11. First and second elongated members, said second member including first and second elongated endwise overlapped and longitudinally extendable sections, means pivotally securing one end of said first member to a free end of said first section of said second member for rotation about an axis extending transversely of said first member and said first section, and means interconnected between said first member and said second section for automatically extending and retracting said second section relative to said first section in response to pivotal movement of said first section relative to said first member.

12. A boom assembly, an elongated support standard including first and second upper and lower endwise overlapped sections, means pivotally securing the lower portion of the lower section to one end portion of said boom assembly for rotation about an axis extending transversely of said boom assembly and standard, said sections being longitudinally extendable, and means interconnected between said boom assembly and said upper section for automatically extending and retracting said standard upper section relative to said lower section in response to pivotal movement of said standard relative to said boom assembly, said standard including first and second upper and lower endwise overlapped sections, the lower end of said lower section being pivotally secured to said boom assembly, guide means carried by the upper end of said lower section, and flexible elongated tension member means secured at one end to the lower end portion of said upper section and guidingly engaged by said guide means at its mid-portion and secured to said boom assembly at its other end a spaced distance from the axis of rotation of the standard relative to the boom assembly comprising said means by which said standard is automatically extended and retracted in response to pivotal movement of said standard relative to said boom assembly.

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