Oct. 16, 1951 C. B. GARLAND 2,571,858

BOOM FOR LIGHT HOISTING

Filed Nov. 4, 1947 2 SHEETS—SHEET 1

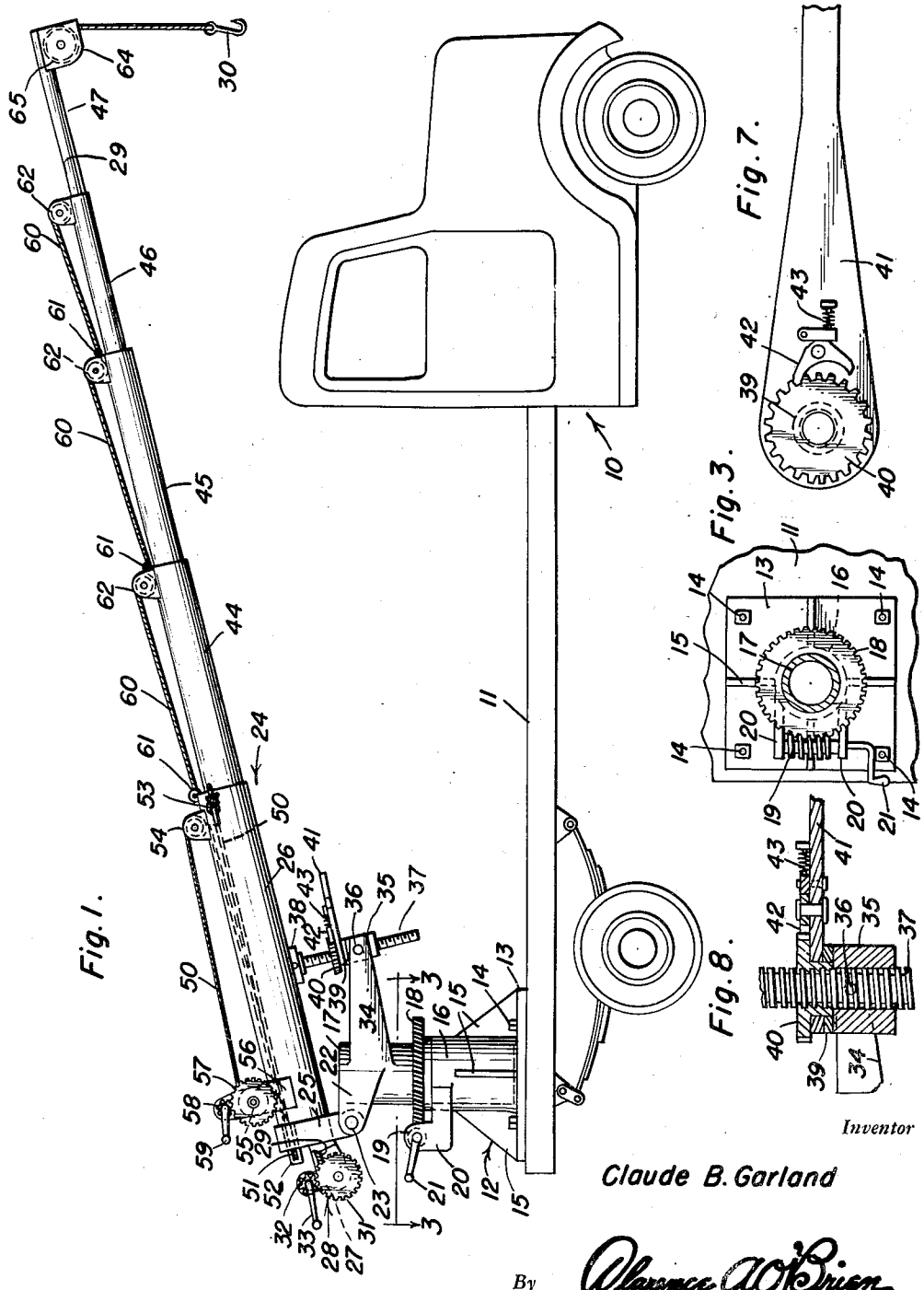


Fig. 1.

Fig. 7.

Fig. 3.

Fig. 8.

Inventor

Claude B. Garland

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Oct. 16, 1951 C. B. GARLAND 2,571,858

BOOM FOR LIGHT HOISTING

Filed Nov. 4, 1947 2 SHEETS—SHEET 2

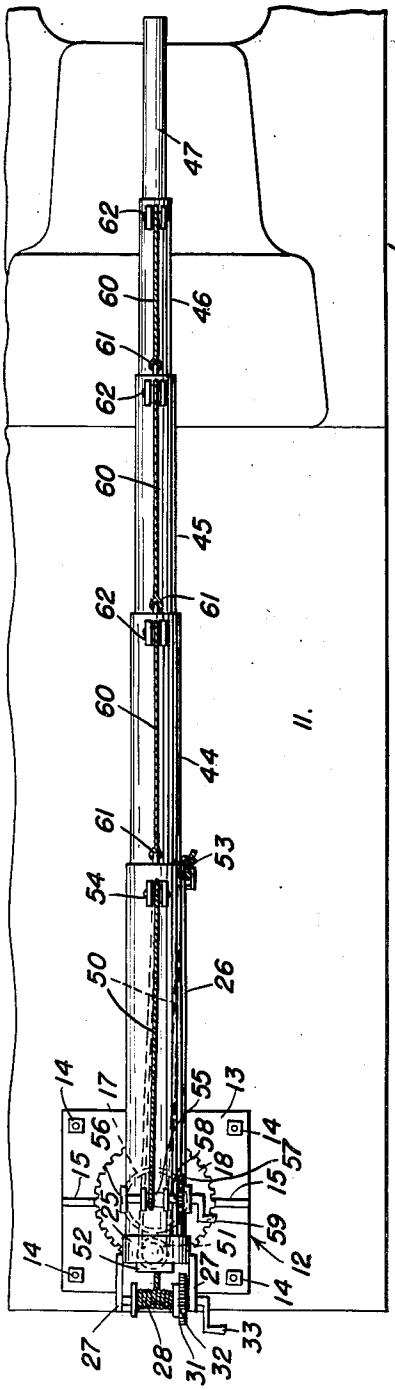


Fig. 2.

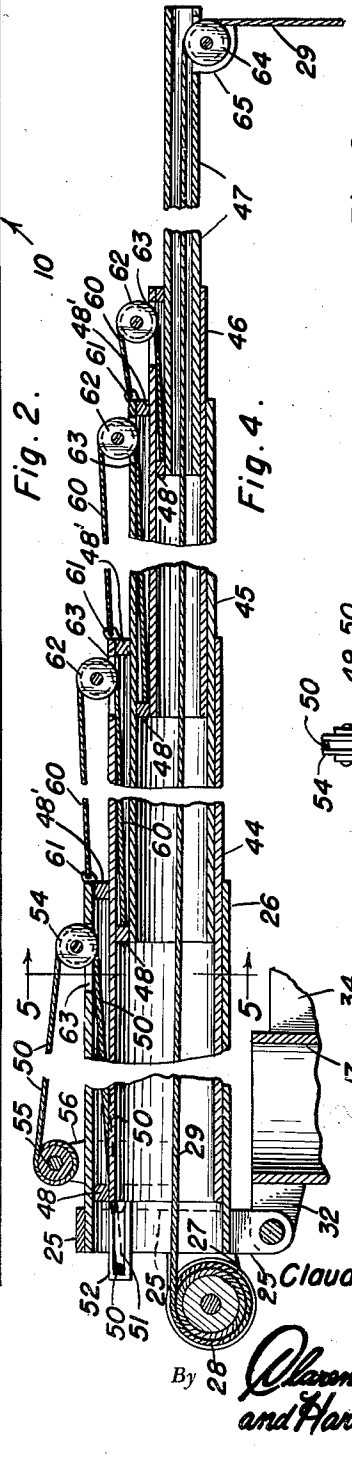


Fig. 4.

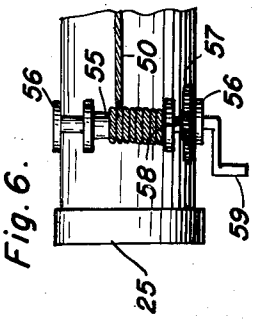


Fig. 6.

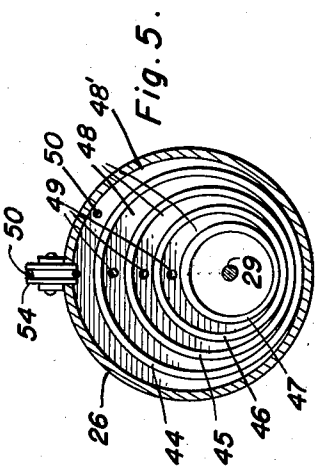


Fig. 5.

Inventor

Claude B. Garland

By Clarence A. O'Brien and Harvey B. Jacobson

Attorneys

Patented Oct. 16, 1951

2,571,858

UNITED STATES PATENT OFFICE

2,571,858

BOOM FOR LIGHT HOISTING

Claude B. Garland, Compton, Calif., assignor to Garland Crane Company, Long Beach, Calif., a partnership

Application November 4, 1947, Serial No. 783,865

5 Claims. (Cl. 212—55)

1

This invention relates to derricks, and more especially to a boom or gin pole therefor adapted for light hoisting.

The object of the invention is to provide a derrick or boom structure of novel and simple construction adapted to be mounted upon a truck platform and easily extended from a collapsed position to the desired elevation and elevated at the proper angle as well as turned or revolved in a complete circle, for hoisting light articles such as in hanging neon signs or any other hoisting in its capacity range, so as to set such signs in place for mounting on a building or otherwise in a quick and convenient manner.

Another object of the invention is to provide a novel boom consisting of telescoping sections and novel means for collapsing or extending the sections from a single winch or winding drum.

Another object of the invention is to provide a novel mounting for the boom whereby it can be swung around in a complete circle, and means for raising and lowering a hoist rope extended through the sections of the boom without dragging on any of the parts thereof, and additional means for elevating or lowering the boom to change the angle of inclination and elevation of the free end thereof at the point where the sign or other object is raised.

A still further object of the invention is to so mount the telescoping sections of the boom that ropes used in the collapsing and extension thereof are given free space in which to operate, without providing grooves or other special alterations of the pipe sections composing the boom, in which to travel back and forth, thus rendering the device economical in production and capable of being quickly and easily assembled.

Other objects and advantages reside in the details of construction and operation as more fully hereinafter described and claimed, reference being had to the accompanying drawings forming part hereof, wherein like numerals refer to like parts throughout, and in which:

Figure 1 is a side elevation of a derrick having a boom or gin pole constructed in accordance with the invention and adjustment means for revolving the boom and changing the elevation thereof as well as means for raising and lowering the load;

Figure 2 is a top plan view of the structure shown in Figure 1;

Figure 3 is a horizontal sectional view taken on the line 3—3 of Figure 1;

Figure 4 is an enlarged longitudinal sectional view of the boom and adjacent operating parts;

2

Figure 5 is a cross sectional view taken on the line 5—5 of Figure 4;

Figure 6 is a fragmentary plan view showing the winch or drum for extending and collapsing the boom;

Figure 7 is a plan view of the ratchet lever for operating the jack screw to raise or lower the boom; and,

Figure 8 is a sectional view of the jack screw mounting and operating lever.

Referring to the drawings in detail, the device is shown applied to a motor vehicle truck 10 having a platform 11 and comprises a base 12 including a rectangular or other base plate 13 bolted to the platform as indicated at 14 through suitable holes provided for the purpose and provided with braces, gusset plates or webs 15 radiating from a central tubular bearing support 16 open at the top and from which said braces extend to the edges of the plate. Rotatably mounted in the tubular bearing 16 and extending above the same, is a tubular standard 17 provided with a worm gear 18 encircling the same near the upper end of the tubular bearing 16 horizontally and engaged by a worm 19 horizontally journaled in a bearing bracket 20 carried upon the bearing 16. The shaft of the worm 19 is provided with a crank handle 21 by which it may be turned to revolve the standard 17 therein in a complete circle.

Above the bracket 20, the standard 17 is provided with a bearing bracket 22 which like the bracket 20, comprises spaced jaws apertured to receive a pivot 23 in which the boom structure 24 is pivotally mounted on a horizontal axis at its lower or inner end through the medium of spaced jaws of a collar 25 fixed to lie around the lower tubular section 26 of the boom at its lower end. Formed integral with or separate from the ring or collar 25 is a bearing bracket 27 carrying a rotatable winch or hoist drum 28 on which a cable 29 carrying a hook 30 or other hoisting device at its free end, is wound. The drum 28 carries a large gear 31 with which a pinion 32 mounted in upward extensions of the bracket 27 meshes and has its shaft provided with a crank handle 33 by which it may be rotated to drive the gear 31 and drum 28 to wind and unwind the cable or rope 29 to raise and lower the load. A bearing bracket 34 comprising spaced arms, extends forwardly from the standard 17 diametrically opposite the bearing bracket or arms 22 and a block or carriage 35 has trunnions 36 at its ends horizontally pivoted in the arms of the bearing bracket 34 and provided with a

threaded bore therethrough or a smooth bore, to receive a jack screw 37. The screw may be swivelled, pivoted or otherwise fixed as indicated at 38 to the bottom of the tubular or pipe section 26 of the boom 24 and bears a nut 39 having a ratchet wheel 40 at the top. A lever 41 is mounted to turn on the nut and has a pawl 42 of angular formation and reversible character spring pressed as indicated at 43, to engage the ratchet wheel in either direction and turn the nut for the purpose of adjusting the boom up and down to different inclinations or elevations at its free end. If the nut is threaded on the screw, the carriage or block 35 may have an unthreaded bore through which the screw freely moves, or the lever may be used to turn the screw where it is swivelled at its upper end in the bearing 38, to move the boom up and down while the pivots or trunnions 36 accommodate the variations in angles.

The boom comprises a plurality of sections telescoping one within the other, comprising tubular members or pipes and including the successively smaller tubular or pipe sections 26, 44, 45, 46 and 47 as shown. These sections are substantially one inch smaller toward the free end of the boom in respect to the inner fitting sections and the lower or inner ends of each of sections 44, 45, 46 and 47 are provided with spacers 48 rigid with the lower ends thereof so as to operate in the respective inter-fitting outer tubular sections including the lower section 26. The upper or outer ends of the sections 26, 44, 45 and 46 may be provided, on the inside, with similar internal spacers 48'. It will be seen that each of tubular pipe sections 44, 45, 46 and 47 slides in the spacers 48' at the outer end of the next larger section, while the spacers 48 carried by the inner ends of said sections 44, 45, 46 and 47 slide within the next larger sections 26, 44, 45, and 46, respectively, functioning in this respect not only as spacers but also as bearings, As shown in Figure 5, the sections are disposed in eccentric relation with the tubes inter-fitting at the bottom and the collars or spacers 48 and 48' formed as crescent-shaped members, with the spacers 48 having openings 49 or other means for anchoring subsequently described cables 60 thereto. It will be seen that the spacers 48 position the pipes so as to provide longitudinal channels for the cables, and also function as bearings engaging upwardly against the surrounding pipes. In the preferred form, as illustrated herein, this longitudinal channel space, which is uninterrupted to provide a clear passage for the cables, has been provided by the use of pipes of such progressively smaller sizes as to afford the necessary clearance space when the pipes are placed in the eccentric relationship as described. It will be seen, however, that the eccentric relationship, while a preferred feature, is not indispensible since by making each successive pipe section sufficiently smaller than the preceding pipe section, the necessary clearance space for the channels is afforded even without the eccentric positioning. Broadly, the important fact, therefore, is that the pipe sizes and spacer means have been selected and arranged to provide an uninterrupted longitudinal cable channel space between the outside periphery of one pipe section and the inside periphery of the pipe section which telescopes within the former.

Cable and pulley means are provided for extending the pipe sections. A lower cable 50 is operatively connected to the lower or inner end of the pipe section 44 by being passed around a horizontal pulley 51 journaled in a bracket 52 in the lower end of the pipe section 44, and both flights of the cable are thence passed through openings in the rearward spacer 48 and thence through the uninterrupted channels between pipes 26 and 44, one of said flights extending out of the forward end of the pipe 26, and the end of the cable being anchored to the outer end of the pipe 26 as indicated at 53 at the outside so it can be inspected. The other flight of the cable passes out of the pipe section 26 through a slot 63 in the top of said pipe near the forward end thereof, being looped around a pulley 54 mounted at the top of the lower section 26 near its free end and is then extended around a winch or drum 55 mounted in the arms of a bearing bracket 56 on top of the section 26 near its lower end. The drum bears a large gear 57 with which a small pinion 58 mounted in the upper portion of the bracket engages and is adapted to be turned by a crank handle 59 to wind and unwind the cable 50.

The free end of the section 26 has a cable 60 anchored thereto as indicated at 61 and then extended around a pulley 62 at the free end of the section 44, after which it is extended through a slot 63 in the free end of the section 44 at the top and along the space provided between the top of the section 44 and the inter-fitting telescoping section 45, the same as the cable 50 extends between the section 44 and the section 26, and is anchored to a collar 48 on the lower end of the section 45. This construction provides a clearance between the boom sections so that the cable will not scrape and in view of the fact that there is a difference of about one inch in size between the sections or pipes of the boom, the sections are guided straight by the collars or top projections at the lower ends of the sections to keep the pipes from pinching the cable, while allowing the hoisting cable 29 to come down through the center of the boom and pipe sections thereof to the winch or drum that lifts the load at the center of the lower section of the boom so that the cable is always lined up with the load regardless of the angle or degree of inclination or point at which it is revolved horizontally on the support. The other sections are connected in a similar manner by a corresponding cable 60 anchored in the same manner and passing over similar pulleys, while the cable 29 operates over a pulley 64 in the free end section 47 at the bottom which is slotted to receive the cable therethrough, the sheave or pulley 64 being mounted in a suitable bracket 65 at the bottom of the section 47 at its free end, for this purpose. The arrangement of the cable 50 provides substantially a block and tackle arrangement with two cables bearing the stresses of the first section and the other sections thereon on account of the compound leverage of the pulley of the next pipe and the others therebeyond, and two ends of the cable are disposed outside to render the same clearly visible for inspection. Thus, by operating the crank handle 59 and the drum 55, the cable 50 would be wound thereon to pull against the lower end of the section 44 and project or extend the latter from its telescoped position within the section 26. Corresponding pull will be exerted on the successive cables 60 to raise the boom or rather to extend the same to the required length by extending the corresponding sections thereof. Reverse operation of the drum will permit the sections of the boom to be readily collapsed or telescoped one within the other, and this may be facilitated by engaging

the hook 30 at the free end of the boom or section 47 thereof and winding the cable 29 upon the drum 28 or otherwise forcing the sections inwardly into telescoping relation.

From the above, it will be seen that the boom may be revolved at any desired point upon the supporting bearing or base over or extending laterally from the truck platform or body and may be elevated at the desired angle and extended or telescoped quickly and efficiently. The device is designed for hanging neon signs or for other light hoisting jobs within its range or capacity and may be economically produced and assembled as well as mounted upon a truck platform in a manner described.

In view of the foregoing description taken in conjunction with the accompanying drawings it is believed that a clear understanding of the construction, operation and advantages of the device will be quite apparent to those skilled in this art. A more detailed description is accordingly deemed unnecessary.

It is to be understood, however, that even though there is herein shown and described a preferred embodiment of the invention the same is susceptible to certain changes fully comprehended by the spirit of the invention as herein described and the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A hoisting boom comprising at least two telescoping pipe sections, a first of which is adapted for pivotal mounting on a base member, and a second of which is telescopically received within said first section, said second section being sufficiently smaller in diameter than said first section to leave a clearance space therebetween, a spacer on the inner end portion of said second section having bearing on the inside of the first section, said spacer positioning said pipe sections with an uninterrupted cable channel space extending longitudinally therebetween from said spacer to the forward end portion of said first pipe section, and cable and pulley means for extending the second pipe section from the first including a pulley mounted on the forward end portion of the first pipe section and a cable trained over said pulley and extended rearwardly in said uninterrupted cable channel space to an operative connection with the rearward end portion of the second pipe section.

2. The subject matter of claim 1, wherein said spacer comprises a structural member having bearing on the inner upper surface of said first section and positioning said second section in an eccentric position within said first section, in such manner as to provide a substantially crescent-shaped cable channel space between the first and second sections.

3. A hoisting boom structure including at least three telescoping pipe sections, a first of which is adapted for pivotal mounting on a base member, a second of which is telescopically received within said first section, and a third of which is telescopically received within said second section, said third section being smaller in exterior diameter than the interior diameter of said second section to provide channel space between the second and third sections, spacer means on the inner end portion of the third pipe section and bearing on the inside of the second pipe section to provide a longitudinal uninterrupted channel between said second and third pipe sections, an anchorage on the boom structure for a cable fixedly mounted relative to said first pipe section, a pulley mounted at the outer end of the second pipe section, a cable entrained over said pulley having one flight portion extending through said channel and operatively connected to the inner end portion of said third pipe section, and the other flight portion secured to said anchorage, and means for extending said second pipe section from said first pipe section.

4. A hoisting boom structure as called for in claim 3 including spacer means on the inner end portion of the second pipe section and bearing on the inside of the first pipe section to provide an uninterrupted channel between the first and second pipe sections, a winch mounted on said boom structure adjacent the inner end of said first section, a first-section pulley mounted on said first section adjacent the outer end thereof, an inner second section pulley mounted on said second section adjacent the inner end thereof, and a cable wound on said winch, extended forwardly from said winch externally of the first section to said first section pulley, looped therearound, thence extended rearwardly therefrom in the channel between the first and second sections, looped around the inner second section pulley, and thence extended forwardly in the channel between the first and second sections to a cable support point adjacent the outer end of said first section, the end of said cable being secured to said boom structure in a fixed relation to said first section.

5. A hoisting boom as called for in claim 4, wherein said spacers comprise structural members having bearing on the inner upper surfaces of the first and second sections and positioning the second and third sections, respectively, in eccentric positions within said first and second sections, in such manner as to provide substantially crescent-shaped cable channel spaces between the first and second sections and between the second and third sections.

CLAUDE B. GARLAND.

REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
326,336	Sandberg et al.	Sept. 15, 1885
358,558	Lathrop	Mar. 1, 1887
550,700	De Vos	Dec. 3, 1895
689,642	Fannon	Dec. 24, 1901
722,552	Anderson	Mar. 10, 1903
1,003,072	Taylor	Sept. 12, 1911
1,345,304	Zied	June 29, 1920
2,029,709	Field	Feb. 4, 1936
2,475,963	Howell	July 12, 1949