Nov. 1, 1966 H. P. ATCHESON 3,282,450

TILT BOOM LOADER

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Fig. 1

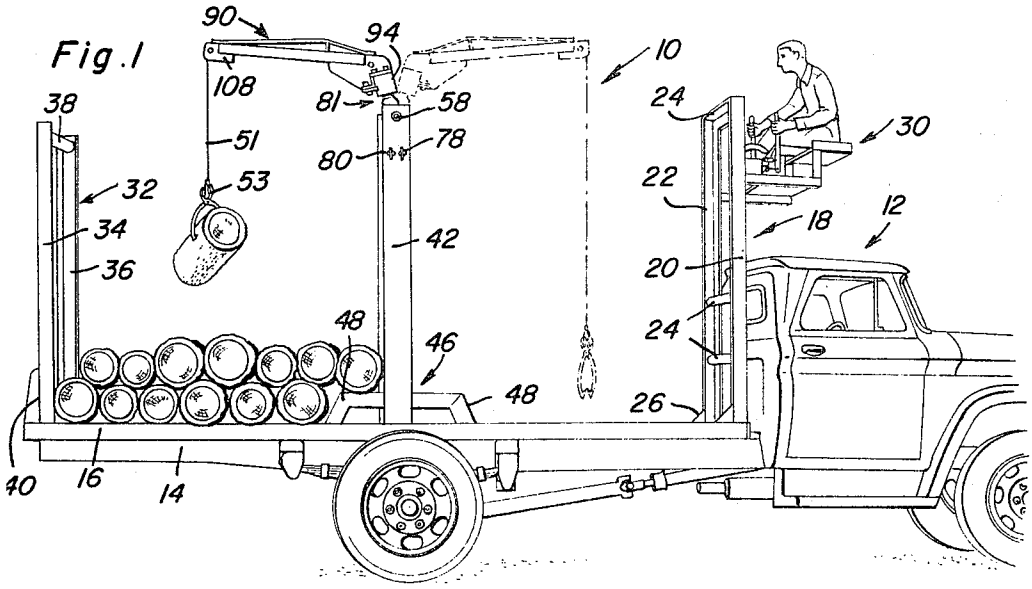


Fig. 2

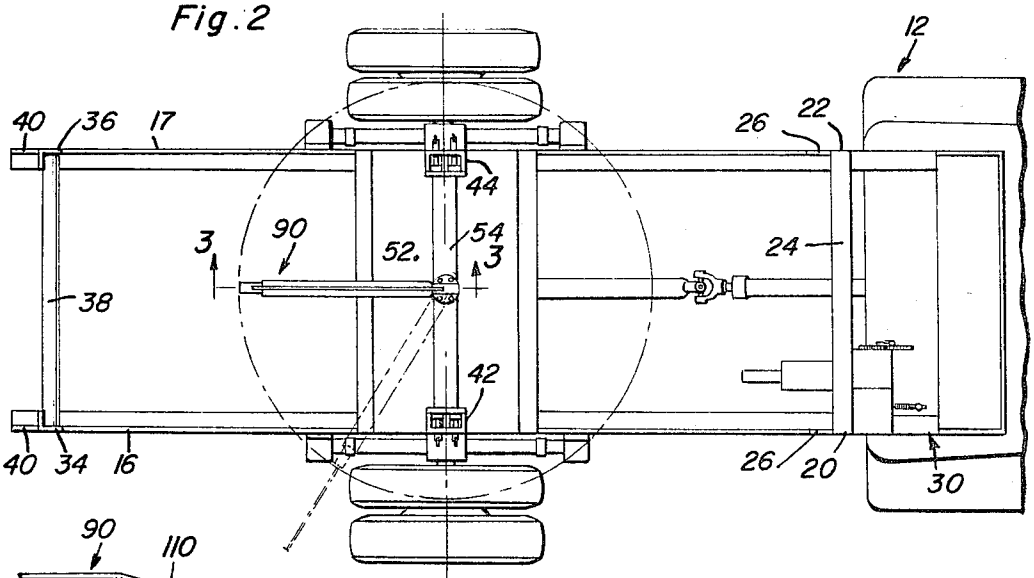
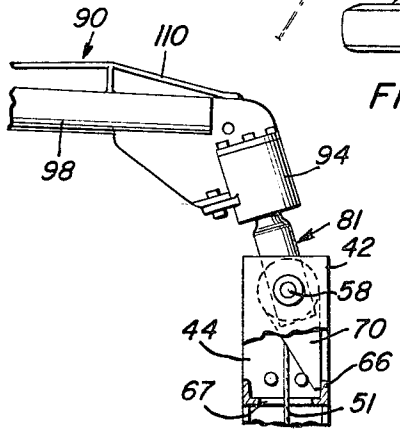


Fig. 5



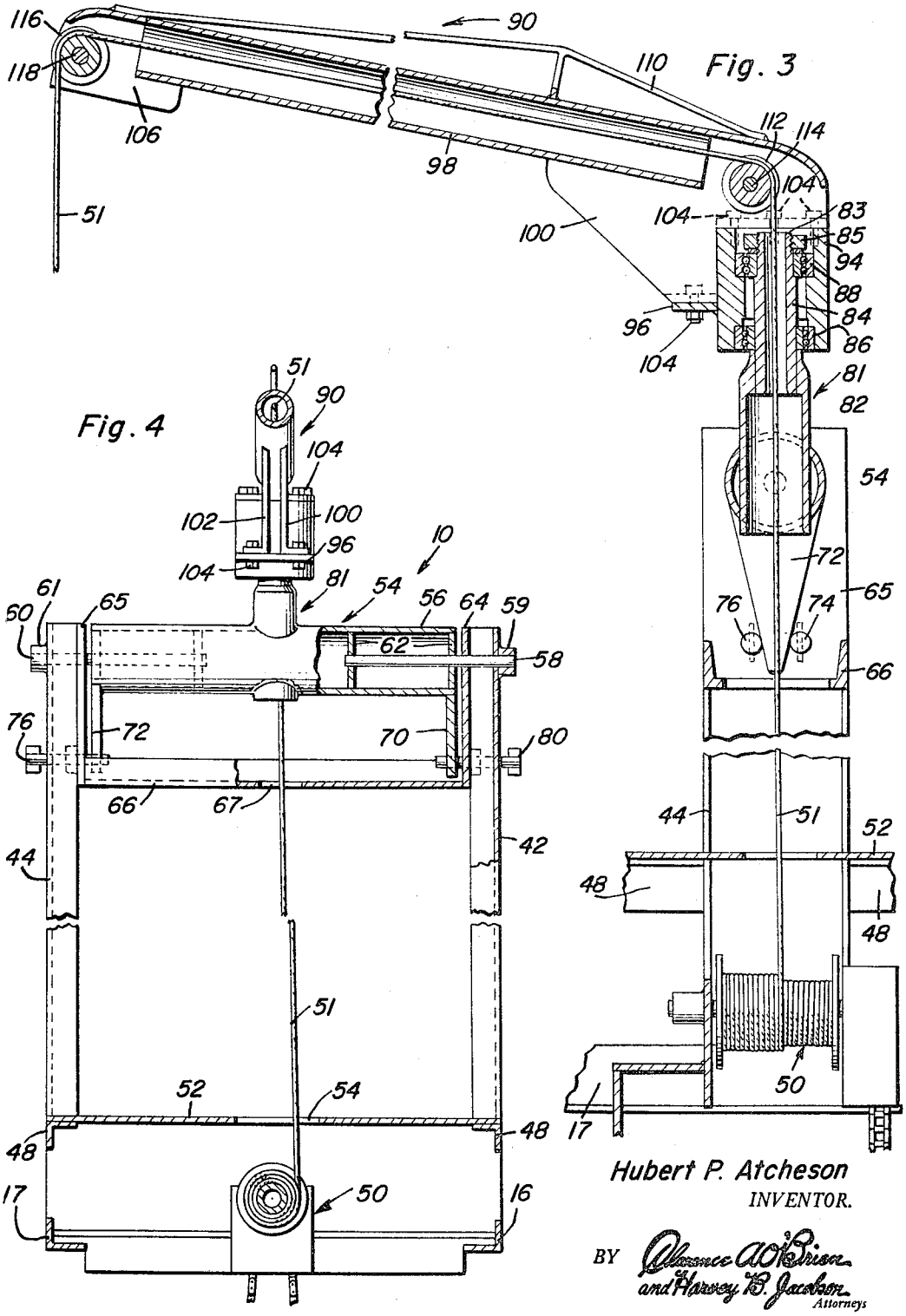
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TILT BOOM LOADER

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4 Claims. (Cl. 214—75)

This invention relates to a loading attachment for trucks and more particularly to a boom-type loader for logs.

Numerous motor operated boom-type loaders have been designed in an attempt to facilitate the loading of trucks which haul pulp wood, logs, or the like. Units of this type generally were provided with a cantilevered boom which was adapted to swing over the side of the truck. The boom was further provided with a winch and cable to engage and hoist the logs, or the like.

The boom-type loaders of this type heretofore known have not been entirely satisfactory because they were not provided with a simple efficient means of effortlessly swinging the hoisted log, or the like, into position over the bed of the truck for placement thereon.

It is therefore an object of this invention to provide a boom loader attachment for trucks which is adapted to drag a log to the truck and subsequently hoist the log up onto the truck with a minimum of effort upon the part of the persons utilizing the loader.

Another object of this invention is to provide a boom loader attachment for trucks which automatically swings the hoisted log, or the like, from a position beside a truck to a position astride a truck body.

A further object of this invention is to provide a self-contained boom loader attachment for trucks which may be secured to the chassis of a conventional truck.

Still a further object of this invention is to provide a boom loader attachment for trucks which includes a boom mast which may be selectively adjusted so as to provide gravity means for swinging the boom from a load engaging position lateral of the truck to a load depositing position substantially longitudinal above the body of the truck.

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 side elevational view of the boom-type loader attachment embodying the present invention mounted on a truck chassis, and further showing an operator loading the truck with pulp wood logs;

FIGURE 2 is a top plan view of the boom-type loader of the present invention shown mounted on a truck chassis, further showing how the boom may be rotated 360° to facilitate loading of the forward and rear portion of the truck;

FIGURE 3 is an enlarged vertical sectional view of a portion of the boom loader taken substantially along the plane of the line 3—3 of FIGURE 2.

FIGURE 4 is a front elevational view of the boom-type loader with portions broken away in section to reveal interior details; and

FIGURE 5 is a fragmentary side elevational view of a portion of the boom-type loader with a portion broken away to show details of the boom mast adjusting means.

Referring now to the drawings and FIGURE 1 in particular, there is illustrated a boom-type loader attachment for trucks which is indicated generally at **10**. The truck **12** and its associated chassis **14** are shown for purposes of illustration only, and do not constitute a part of the present invention. The boom-type loader attachment **10** includes a pair of horizontal spaced apart frame members **16** and **17** which are secured to the chassis **14** of the truck **12**. As seen best in FIGURES 2 and 4, the horizontal frame members **16** and **17** are preferably formed of angle iron or the like.

Adjacent the forward end of the horizontal frame members **16** and **17** there is provided a forward load-retaining means **18** which includes a pair of upright standards **20** and **22**. The upright standards **20** and **22** may be provided with a plurality of cross braces **24**. The forward load retaining means may also be provided with an operator's control platform. It will be understood, however, that the boom-type loader attachment controls may be placed elsewhere at any suitable convenient position on the loader attachment frame or the truck. The forward load retaining means **18** may be formed of angle iron, channel members, or the like and is preferably braced by gusset members **26** in a conventional manner. The forward load retaining means **18** is preferably secured to the horizontal frame members **16** and **17** by welding, for example.

A rear load retaining means **32** is provided adjacent the rear of the horizontal frame members **16** and **17** and includes a pair of upright standards **34** and **36** which may be formed of angle iron, channel iron, or the like. The rear load retaining means **32** is further provided with one or more cross braces **38**. Gussets **40** are provided to brace the upright standards **34** and **36**. The rear load retaining means is assembled and secured to the horizontal frame members **16** and **17** by means of welding, or the like.

The boom-type loader **10** further includes a pair of upright spaced apart parallel post members **42** and **44** which are secured to the horizontal frame members **16** and **17** by suitable means such as welding, for example. The upright parallel posts **42** and **44** are preferably formed of U-shaped channel members for reasons which will become clear. As seen best in FIGURES 2 and 4, the flanges of the U-shaped portion of the upright posts **42** and **44** project inwardly of the truck body. A bracing means indicated generally at **46** is provided to brace the upright posts **42** and **44**. As seen best in FIGURES 1 and 4, the bracing means **46** includes a plurality of generally L-shaped angle iron braces **48**. As seen best in FIGURES 3 and 4, the upright post bracing means **46** also functions to protect a power takeoff powered hydraulically operated which indicated generally at **50**. Accordingly, the generally L-shaped braces **48** may be covered with suitable metal plating **52** to preclude the possibility of a log, or the like, inadvertently dropping onto the hydraulic winch **50**. The winch cover plate **52** is provided with an aperture **54** to permit the upward passage of the winch cable **51**. It will be noted that the generally L-shaped braces **48** in effect also function to slightly reduce the loading capacity of their respective forward or rear compartment, accordingly, the generally L-shaped brace members **48** may be substantially longer than shown so as to provide a weight distribution means to insure proper distribution of the load. In other words, by elongating the rearmost members **48** the load capacity of the rear compartment would be somewhat reduced thereby tending to lessen the possibility of overloading the overhanging portion of the chassis **14**.

Adjacent the upper ends, the upright post **42** and **44** pivotally support a mast support means indicated generally at **54**. The mast support means **54** includes a tubular member **56** which is rotatably secured between the upright posts **42** and **44** by a pair of stub shafts **58** and **60**. A plurality of apertured plug members **62** are welded inside the tubular member **56** to provide a means of rotatably journaling the mast support means **54** to the upright posts **42** and **44**. As seen best in FIGURE 4, a

pair of flat plates **64** and **65** are welded to the inside of the U-shaped posts **42** and **44** adjacent their upper ends thus boxing in the channel member. As seen best in FIGURES 3 and 4, a U-shaped channel member **66** is welded between the opposed plates **64** and **65** and the opposed posts **42** and **44**. The channel member **66** has a dual function, first it provides a means of rigidly securing the upper ends of the posts **42** and **44**, and secondly it cooperates to form one portion of a stop means which is utilized in positioning the mast support means **54**, as will become clear. The channel member **66** is provided with an aperture **67** for the throughpassage of the winch cable **51**.

The stub shafts **58** and **60** of the mast support means **54** pass through suitable apertures in the plates **64** and **65** and the support posts **42** and **44** and are secured in outwardly projecting bosses **59** and **61** by means of set screws, pins, etc. (not shown). Although not shown, it will be understood that the apertured plugs **62** and the bosses **59** and **61** may be provided with suitable anti-friction means, such as ball or roller bearings, for example.

The mast support means **54** further includes a pair of downwardly projecting integral tilt plates **70** and **72** which are secured adjacent the outer lower ends of the tubular member **56** by suitable means such as welding, for example. As seen best in FIGURE 3, the two plates **70** and **72** provide a means of rotatably adjusting the mast support means **54**. In the position shown in FIGURE 3 the tilt plate **72** is operatively positioned between a pair of tilt pins **74** and **76** which protrude through suitable apertures in the post **44** and the plate **65** to limit the arcuate travel on the depending end of the tilt plate **72**.

In a similar fashion the tilt plate **70** may be adjusted by use of pins **78** and **80** which also pass through suitable apertures in the upright posts **42** and the plate **64** and project into the path of the tilt plate **70**. In the position shown in FIGURE 5, the two plates **70** and **72** have been selectively positioned by withdrawing the pins **78** and **74** thereby permitting the tilt plates **70** and **72** to assume the position shown in FIGURE 5. Subsequently, the tilt pins **74** and **78** are re-inserted thereby positively positioning the mast support means **54** into the position shown in FIGURE 5 for reasons which will become clear.

A generally upright tubular mast means indicated generally at **81** is rigidly secured to the mast support means **54** by suitable means such as welding, for example. The tubular mast means **81** includes a lower tubular portion **82** of relatively large diameter and an integral upstanding portion **84** of relatively smaller diameter. The juncture of the relatively larger tubular member **81** and the relatively smaller tubular member **84** provides a shoulder which operatively positions an anti-friction bearing **86**. Adjacent its upper end the member **84** is provided with a region of reduced diameter for the reception of an upper anti-friction bearing **88**. The member **84** is also provided with a threaded portion adjacent its upper end for reasons which will become apparent. As seen best in FIGURE 3, the tubular mast means **81** provides a means of rotatably supporting a free swinging boom indicated generally at **90**. The free swinging boom **90** includes a bearing housing **94** and an integral mounting plate **96**. The bearing housing **94** is rotatably carried by the anti-friction bearings **86** and **88** and is secured in this rotatable relationship by nut **85** which is threadably received on the threaded portion **83** of the upper portion **84** of the mast means **81**.

The boom **90** further includes a tubular member **98** to which is secured a pair of gusset plates **100** and **102** and their integral apertured tabs which provide a means of bolting the boom **90** to the bearing housing **94** by means of bolts **104** as seen best in FIGURES 3 and 4. The boom means **90** further includes a pair of outer pulley mounting plates **106** and **108**. The boom means **90** further includes a truss member **110**. The boom means is further provided with an inner cable pulley **112** which is rotatably journaled on a shaft **114** and an outer cable pulley **116** which is rotatably journaled on a shaft **118** as seen best in FIGURE 3. The winch cable **51** extends upwardly from the winch **50** between the upright posts **42** and **44** and then through the tubular mast means **81** and around the boom cable pulleys **112** and **116**.

It will be understood, of course, that all the various component parts which are rigidly secured may be joined by welding, or the like.

Although only schematically shown, it will be understood that the hydraulic winch **50** is operated by a suitable hydraulic means which derives its power from the power takeoff shaft of the truck, and which may be controlled in a conventional manner by suitable motor control and hydraulic valve control means to wind up and pay out the winch cable **51**.

In operation, the boom loader of the present invention would be utilized in the following manner. With the truck **12** alongside logs or the like which it is desired to load the mast support means **81** would be adjusted to the position shown in FIGURES 1 and 5 so that the mast **81** is tilted slightly towards the horizontal. With the mast means **81** and its rotatably secured boom means **90** in the position shown in FIGURES 1 and 5, it will be apparent that the boom **90** will tend to align itself in the full line position shown in FIGURE 2 due to the inclined axis **81** about which the boom **90** is freely rotatable. With the boom set in the position shown in FIGURE 5, the rearmost compartment of the truck **12** may be loaded.

The winch cable **51** would be payed out and the boom **90** swung out over the side of the truck by means of grasping the payed out winch cable **51** to utilize the load engaging means to engage a log, or the like which is alongside the truck **12**. This would normally be accomplished by a "cable man" who assists the winch operator. With the load engaging means **53** grasping the log the winch operator would reel in the cable, consequently dragging the log along the ground to the truck and as the weight of the log clears the ground and is supported solely by the boom **90**, the boom **90** will tend to swing toward the rest position as shown by full line position in FIGURE 2 due to the forces of gravity established by the inclination of the tubular mast means **81** about which the boom **90** is freely rotatable. Accordingly, it may be seen, that it is a relatively simple matter to load a suitable number of logs, or the like on the truck.

When the load has reached a sufficient height so that the boom **90** does not clear the load when swinging to the rest position shown in FIGURE 2, pins **74** and **78** would be withdrawn and the mast support means adjusted into the position shown in FIGURE 3, and the pins **74** and **78** reinserted wherein the mast means **81** will assume a substantially vertical position. In the position shown in FIGURE 3 of course any logs hoisted upon the truck to top the load would have to be manually swung around into proper position.

The procedure for loading the forward compartment of the truck **12** would be similar to the procedure for loading the rear portion with the exception that the mast support means **54** would be adjusted by withdrawing the pins **80** and **76** to permit the tilt plates **70** and **72** to move clockwise and then come to rest against the upstanding portion of the member **66** thus inclining the tubular mast means **81** into the broken line position shown in FIGURE 1 thereby permitting the boom means **90** to swing around into the broken line position shown in FIGURE 1 by virtue of its own weight. The loading of the forward portion of the truck **12** would then proceed in the manner similar to loading of the rear portion.

Accordingly, it may be seen that there has been pro-

vided a relatively simple yet efficient boom-type loader attachment for a truck which is highly efficient. The design of the present boom-type loader permits a substantial reduction in the parts that would be required to fabricate a fully power operated boom, which would be rotated by power means.

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 a loading attachment for trucks, comprising a horizontal frame secured to the chassis of said truck, a pair of upright spaced apart parallel post members secured to said horizontal frame intermediate its ends, a mast support means secured between said parallel posts adjacent the top of said posts for limited rotational adjustment about a horizontal axis transverse to the truck body, a generally upright tubular mast carried by said mast support means, an elongated tubular boom extending at an angle from said tubular mast and rotatably secured thereto for rotation about an axis longitudinal of said mast, a power winch disposed adjacent the base of said upright posts, said winch including a cable having an end extending upwardly between said posts, through the mast and outwardly through the boom, said cable including a free end disposed beyond the outer end of said boom, load engaging means connected to said free end of the cable, and means adapted to couple said winch to a power takeoff shaft of the truck.

2. A loading attachment for trucks comprising a horizontal frame secured to the chassis of said truck, a pair of upright spaced parallel post members secured to said horizontal frame intermediate its ends, a mast support means secured between said parallel posts adjacent the top of said posts for limited rotational adjustment about a horizontal axis transverse to the truck body, said mast support means including adjusting means for selectively positioning said mast support at a point about its axis, a generally upright tubular mast carried by said mast support means, said mast support adjusting means cooperating to adjust said mast between a substantially vertical position and a position inclined toward the horizontal, an elongated tubular boom extending at an angle from said tubular mast and rotatably secured thereto for rotation about an axis longitudinal of said mast, a power winch disposed adjacent the base of said upright posts, said winch including a cable having an end extending upwardly between said posts through the mast and outwardly through the boom, said cable including a free end disposed beyond the outer end of said boom, load engaging means connected to said free end of the cable, and means adapted to couple said winch to a power takeoff shaft of the truck.

3. A loading attachment for trucks comprising a horizontal frame secured to the chassis of said truck, a pair of upright spaced parallel post members secured to said horizontal frame intermediate its ends, a mast support means secured between said parallel posts adjacent the top of said posts for limited rotational adjustment about a horizontal axis transverse to the truck body, a generally upright tubular mast carried by said mast support means, and elongated tubular boom extending at an angle from said tubular mast and rotatably secured thereto for free rotation about an axis longitudinal of said mast, said mast support means being operatively positionable at an angle toward the horizontal, said inclination of said mast support thereby causing the rotation of said tubular boom under the influence of gravity from a first position lateral of said truck to a second position in overlying relationship of said truck.

4. A loading attachment for trucks comprising a horizontal frame secured to the chassis of said truck, a pair of upright spaced parallel post members secured to said horizontal frame intermediate its ends, a mast support means secured between said parallel posts adjacent the top of said posts for limited rotational adjustment about a horizontal axis transverse to the truck body, said mast support means including adjusting means for selectively positioning said mast support at a point about its axis, said adjusting means including a generally U-shaped channel member secured between said upright parallel post members beneath said mast support means with the upstanding portions of said U-shaped channel member towards that mast support means, an integral downwardly projectioning mast support tilt limiting means secured to said mast support means, said tilt limiting means comprising a tilt plate, said tilt plate, being limited in its arcuate movement by said upstanding portions of said generally U-shaped transverse channel member beneath said mast support means, a generally upright tubular mast carried by said mast support means, said mast support adjusting means and said mast support tilt plate cooperating to adjust said mast between a substantially vertical position and a position inclined toward the horizontal, an elongated tubular boom extending at an angle from said tubular mast and rotatably secured thereto for free rotation about an axis longitudinal of said mast, the inclination of said mast causing said elongated tubular boom to rotate from a first position lateral of said truck to a second position substantially overlying said truck under the influence of gravity, a power winch disposed adjacent the base of said upright post, said winch including a cable having an end extending upwardly between said post through the mast and outwardly through the boom, said cable including a free end disposed beyond the outer end of said boom, load engaging means connected to said free end of the cable, and means adapted to couple said winch to a power takeoff shaft of the truck.

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