A crane boom stowing device having a pair of stowing legs secured to the crane frame by means of a universal type joint and detachably securable to a saddle mounted on the boom, thus permitting the boom to be locked in a predetermined position when the crane is transported or stowed.

6 Claims, 6 Drawing Figures
CRANE BOOM STOWING MECHANISM

BACKGROUND OF THE INVENTION

Truck mounted cranes require some means to support the crane booms when the unit is in a stowed or transporting configuration. If the booms are simply allowed to rest on the tilt cylinder when traveling, excessive pin wear and unnecessary wear on the cylinder can occur. In addition the boom will try to swing from side to side as the vehicle is moved along a roadway thus causing undue stress to be generated against the turning mechanism. The turning mechanism, if accomplished by a gear reduction will allow side sway due to backlash in the gears. If cable turn or other methods are employed, the same resulting side sway is evidenced.

In order to eliminate this situation, it becomes necessary to provide a boom support of some type either over the cab of the vehicle or on the bed of the truck. When a structure is provided for stowing the boom over the cab, considering the crane to be mounted directly behind the cab, the supporting members of the structure generally must be attached to the frame of the vehicle at the front bumper. This provides an adequate support for the boom, however, it limits visibility for the driver of the truck because of the structural braces in front of the cab.

Conversely, if the booms are to be positioned toward the rear of the vehicle, considering the crane to be mounted directly behind the cab, it becomes necessary to provide a boom rest somewhere on the truck bed, thus consuming valuable carrying space.

SUMMARY OF THE INVENTION

This invention relates generally to a crane boom stowing device and primarily to a boom stowing device for a vehicular mounted crane. The device includes a pair of stowing legs, one on each side of the frame, which are secured on one end to the crane frame by universal type joints and which are detachably securable on the other end to the boom, wherein the boom can be positioned to extend either forwardly or rearwardly from the crane frame.

It is an object of this invention to provide a crane boom stowing device which effectively locks the boom to the crane frame to prevent movement and in particular side sway of the boom when the crane is being transported.

Another object of this invention is the provision of a boom stowing device for a vehicular mounted crane which does not utilize a support device secured to the frame or structure of the vehicle.

A further object of this invention is to provide a boom stowing device for a truck mounted crane which does not obstruct the visibility of the operator of the truck when the crane is being transported by the truck.

Yet another object of this invention is the provision of a boom stowing device which does not consume valuable space, for example, part of the bed of a vehicle on which the crane is being carried.

Still a further object of this invention is to provide a crane boom stowing device which is extremely simple and compact of construction, economical of manufacture and effective in use.

These objects and other features and advantages of this invention will become more readily apparent upon reference to the following description when taken in conjunction with the accompanying drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a side elevational view of a truck mounted crane wherein the boom is depicted in a stowed position in either a forward or rearward configuration by the stowing device of this invention;

FIG. 2 is a rear elevational view thereof;

FIG. 3 is a partial view of the frame and boom wherein the stowing device is depicted in a non secured position;

FIG. 4 is a top plan view of the stowing device operably secured between the frame and the boom;

FIG. 5 is a sectional view taken along the lines 5—5 in FIG. 4; and

FIG. 6 is a partial, enlarged, rear elevational view of the stowing device secured to the frame, wherein the forward elevational view is a mirror image thereof.

DESCRIPTION OF THE PREFERRED EMBODIMENT

Referring now to the drawings, the crane boom stowing device is generally indicated at 10 in FIGS. 1 and 2 operably secured to a truck mounted crane 11. The truck 12 includes a frame 13 mounted on a plurality of axles, one of which is shown in FIG. 2 at 14, having wheels 16 journaled thereon. Secured proximate one end of the frame 13 is a cab 17. Disposed behind the cab 17 to the frame 13 and projecting upwardly therefrom is the crane 11.

The crane 11 (FIGS. 1 and 2) includes an A frame 18 secured at its base 19 to the truck frame 13. Rotatably mounted in the A frame 18 is a vertically disposed mast 21 which projects upwardly therefrom. Pivotally secured to the top of the mast is a boom 22 having a pair of spaced pivot ears 23 welded thereto and projecting rearwardly therefrom as well as depending therefrom. Aligned holes (not shown) are formed in the depending portion of the pivot ears 23 and radially through the upper end of the mast 21 through which is disposed a pin 24 thus permitting the boom to tilt relatively to the mast.

Projecting radially of the mast 21 (FIGS. 1 and 3) and disposed substantially parallel to and intermediate the plates 23, is a triangularly shaped tilt cylinder ear 26 having a hole 27 formed therethrough. A pair of spaced, vertically disposed, tilt cylinder ears 28 (FIG. 1) are secured to and depend from the lower side of the boom 22 proximate the outer end thereof. Interconnected between the tilt cylinder ears 26 and 28 is a hydraulic cylinder 29. The cylinder is adapted to tilt the boom 22 in a vertical plane relative to the mast 21.

The crane boom stowing device 10 (FIGS. 4 and 5) comprises a pair of swivel bracket assemblies 31 secured to the sides of the upper end of the A frame 18, stowing legs 32, each secured on one end 33 to one of the swivel bracket assemblies 31, and a saddle assembly 34 secured to the mast 22 wherein the other end 36 of each leg is detachably seated in the saddle assembly 34 when the boom 22 is in a stowed position.

Referring now to FIGS. 5 and 6, the swivel bracket assembly 31 includes a face plate 37 secured by gussets 38 to the A frame 18. Rotatably secured to the face plate 37 by a bolt 38 and nut 39, is a swivel plate 41 having a pair of parallel swivel gussets 42 projecting normally therefrom. Each swivel gusset 42 has a hole
(not shown) formed therethrough, wherein said holes are in alignment. A screw 43 having a head 44 and a threaded shank 46 is pivotally connected to the swivel gussets 42, wherein the head 44 has a hole drilled therethrough. A pin 47, disposed in the head hole and swivel gusset holes, pivotally secures the head to the swivel gussets.

Each leg 32 (FIGS. 4 and 5) has a leg nut 48 axially secured to the leg one end 33 which threadably receives the shank 46 of the screw 43. A lock nut 49 is also threadably mounted on the screw 43. Thus it will be noted that the length of the leg 32 can be adjusted and locked by operation of the screw and lock nut. The leg other end 36 is rounded to form a socket 50.

The saddle assembly 34 includes a cross bar 51 (FIGS. 4 and 5) secured transversely to the boom 22. On each end of the cross bar 51 is secured a socket arm 52 which projects rearwardly toward the mast. Secured to each socket arm 52 is one end 53 of a trough 54 which opens upwardly. The socket arm 52 proximate the trough one end 33 has a socket indent 56 formed therein for receiving the socket 50. The trough 54 is generally U shaped in cross section and open on its free end 55. It will therefor be noted that in stowed position the leg 32 will be in the trough with the socket 50 disposed in the socket indent.

In the actual operation of the crane the stowing legs 32 are generally disposed along the sides of the A frame 18 with the socket end 36 thereof depending from the swivel bracket assembly 31. When it is desired to move the crane to a new location or to stow the boom, the boom is positioned toward the front or rear of the mast at approximately 10° from the horizontal. The socket end 36 of each leg 32 is then manually placed in its respective trough 54 by rotating it about the bolt 37 and pivoting it about the pin 47. The boom 22 is then tilted down by operation of the crane tilt cylinder 29 until the socket 50 is firmly seated in the socket indent 56. The boom is now carried by the two stowing legs 32. Since one leg is on each side of the boom, no side sway or lateral movement will occur, thus relieving the turning mechanism of the mast and the pin of the tilt cylinder from undue stress. Furthermore, the positioning of the socket in the socket indent, along with the weight of the boom will substantially eliminate any vertical displacement of the boom.

When the boom is to be placed in operation, the tilt cylinder 29 is activated and the boom is elevated approximately 10° above the horizontal. Each stowing leg 32 can then be manually removed from its respective trough and rotated and pivoted about the swivel bracket assembly to a vertical disposition along the sides of the A frame 18. Thus the stowing legs remain out of the way for general crane operation.

Because the universal attachment, swivel bracket assembly 31, is made directly in the center of the A frame 18, the boom may be placed over the rear of the vehicle in the same fashion as was done in stowing over the front. Each leg is equipped with the screw adjustment so that the leg may be lengthened or shortened for varying stowing clearance heights.

We claim:

1. A crane boom stowing device for a crane having a frame, a mast rotatably mounted on the frame and projecting upwardly therefrom, and a boom secured to the free end of the mast, the device comprising:

   a. saddle means mounted on the boom; and
   b. a first leg means secured on one end thereof to the frame and detachably securable on the other end thereof to said saddle means for substantially preventing the boom from moving relative to the frame.

2. A crane boom stowing device as defined in claim 1 and including a second leg means spaced apart from said leg means and secured on one end thereof to the frame and detachably securable on the other end thereof to said saddle means wherein said leg means are disposed opposite each other with the mast disposed therebetween.

3. A crane boom stowing device as defined in claim 2 wherein said first leg means includes a universal joint secured to said frame and a leg secured on one end thereof to said joint, thereby permitting said leg to rotate and pivot about said joint.

4. A crane boom stowing device as defined in claim 3 wherein said saddle means includes a bar means secured to the boom and a pair of spaced apart trough means secured on one end thereof to said bar means, each said trough means having a free end which is open ended and which projects toward said legs.

5. A crane boom stowing device as defined in claim 4 wherein each joint includes an outwardly projecting externally threaded shank secured thereto and each said leg one end has a hollow internally threaded leg nut axially secured thereto, wherein said leg nut threadably receives said shank thus permitting the combined length of said joint and said leg to be varied.

6. A crane boom stowing device as defined in claim 5 wherein each end of said bar means has a socket indent axially formed therein and each said leg other end has a socket formed thereon for seating in said socket indent.

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