# United States Patent [19]

**Sholl et al.**

[11] **3,792,778**

[45] **Feb. 19, 1974**


[54] **CRANE BOOM STOWING MECHANISM**


[75] Inventors: **Arthur F. Sholl**, Omaha; **Donald L. Wolfe**, Wahoo, both of Nebr.

[73] Assignee: **Paxton Mitchell Company**, Omaha, Nebr.



[22] Filed: **Sept. 20, 1972**

[21] Appl. No.: **290,463**

[52] **U.S. Cl.** ..... **212/1**, 212/55, 212/144

[51] **Int. Cl.** ..... **B66c 23/00**

[58] **Field of Search** ..... 212/1, 59, 55, 144, 145



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*Primary Examiner*—Richard A. Schacher

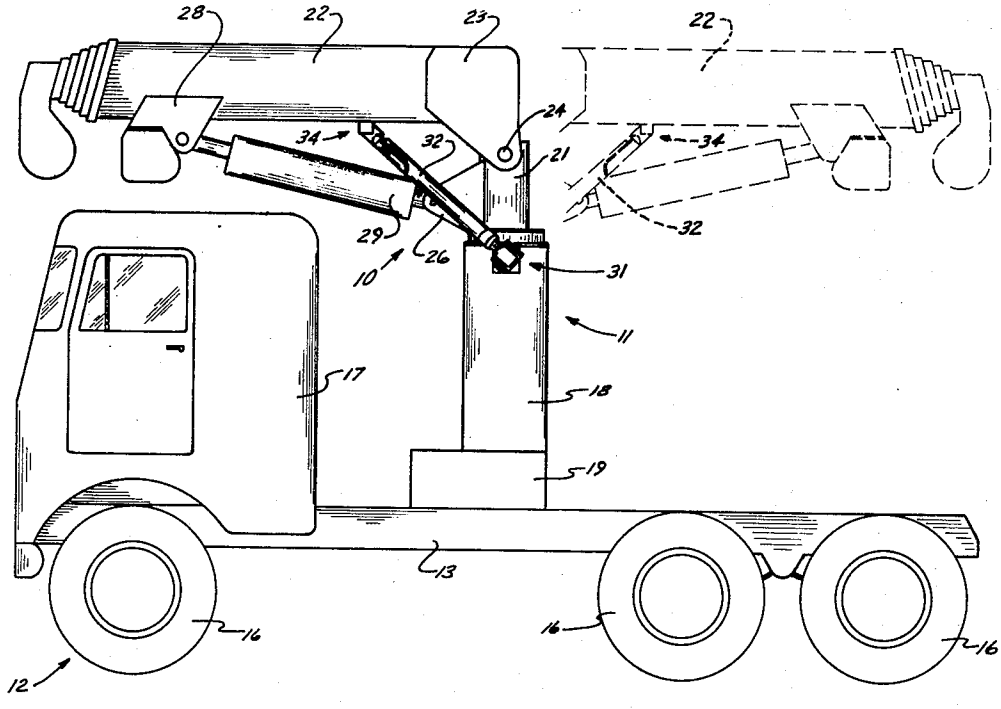
*Attorney, Agent, or Firm*—Henderson & Strom



[57] **ABSTRACT**

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**



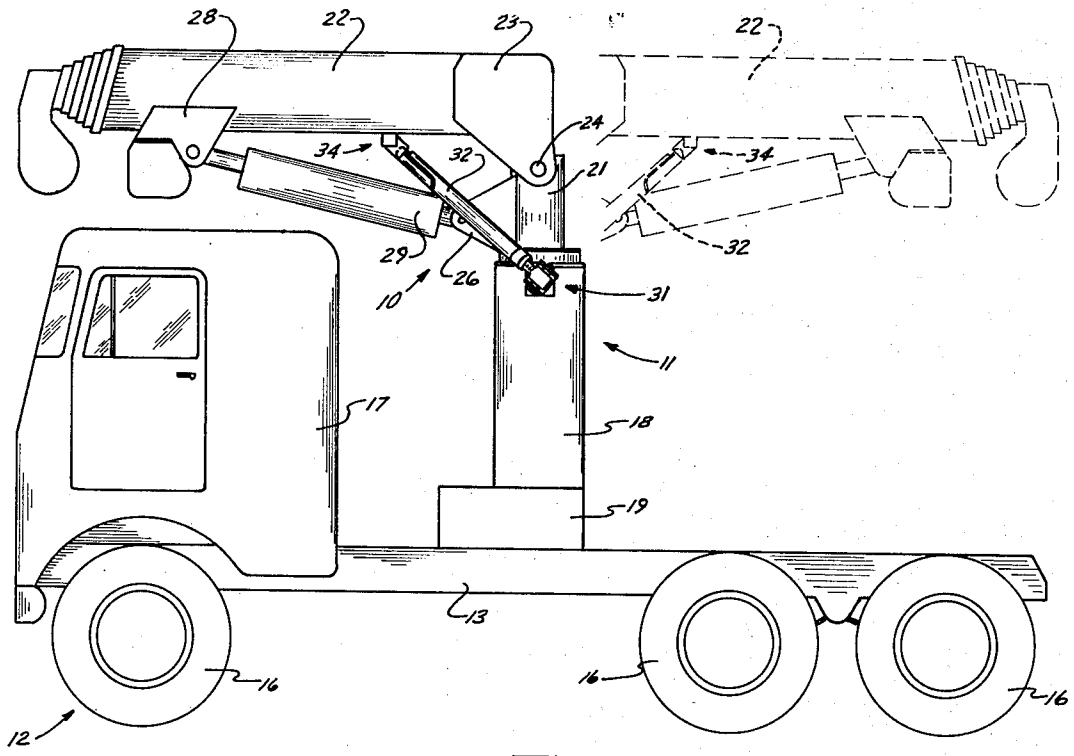



FIG. 1

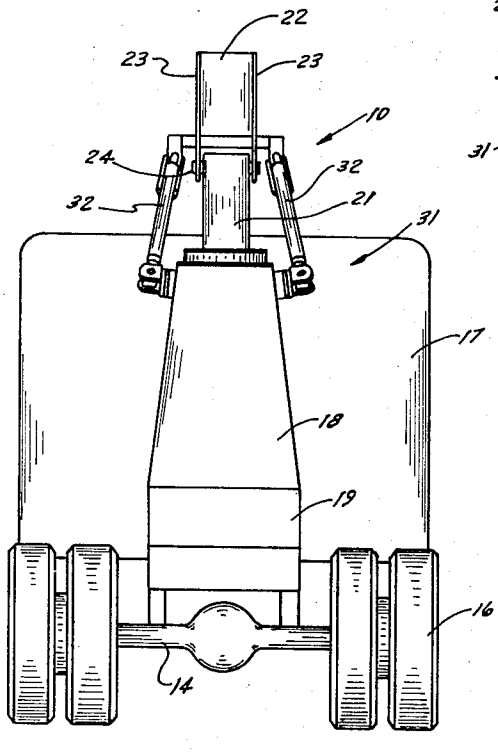



FIG. 2

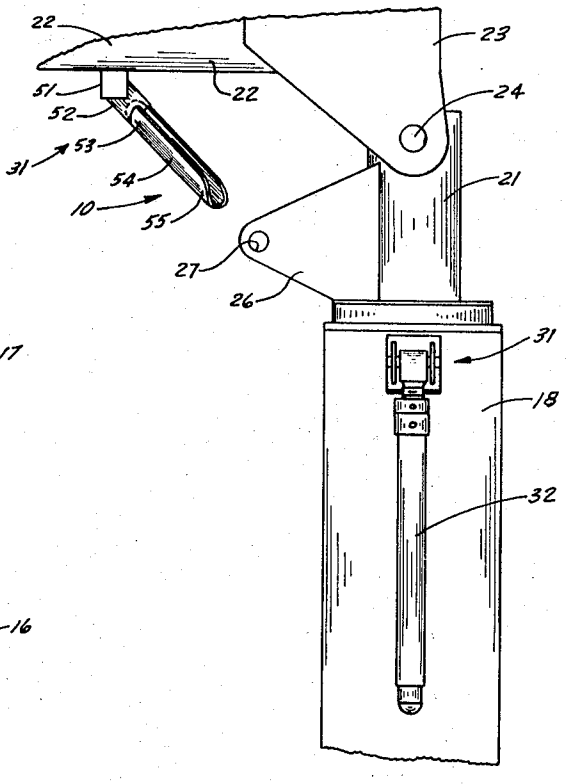



FIG. 3

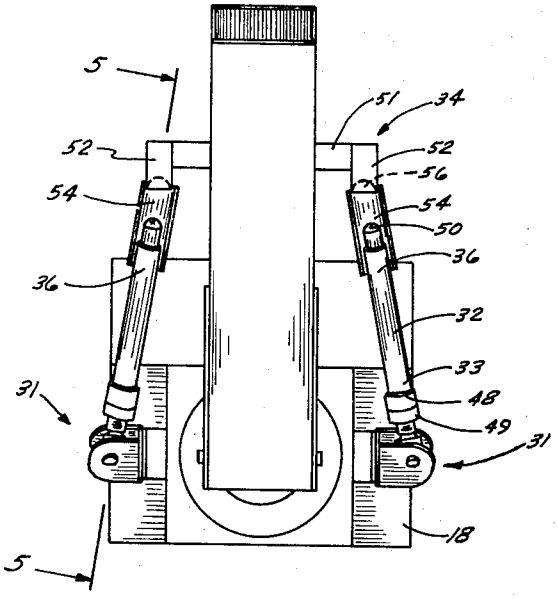



FIG. 4

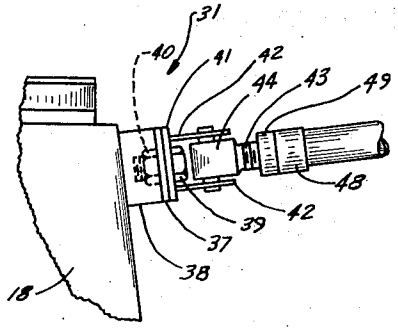



FIG. 6

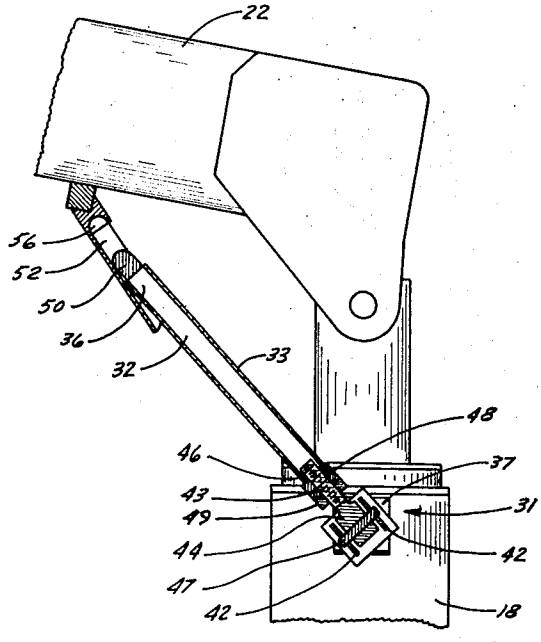



FIG. 5

# 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** journalled 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 relative 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 assemblys **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 assemblys **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:

saddle means mounted on the boom; and

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 each said 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 to 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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