

[54] **SIDE STOWABLE JIB FOR CRANE BOOMS AND JIB MOUNTING**

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[51] Int. Cl. **B66c 23/66, B66c 23/68**

[58] Field of Search..... **212/55, 144, 35, 212/59**

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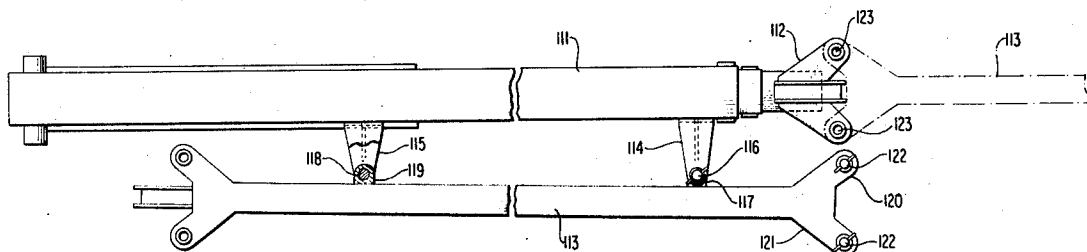
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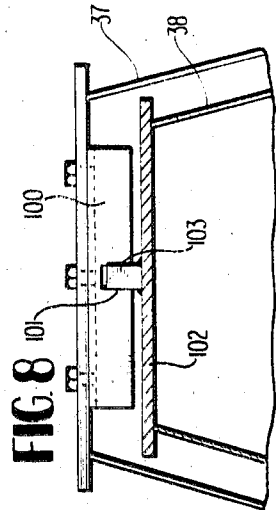
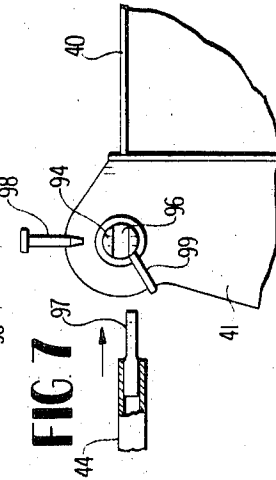
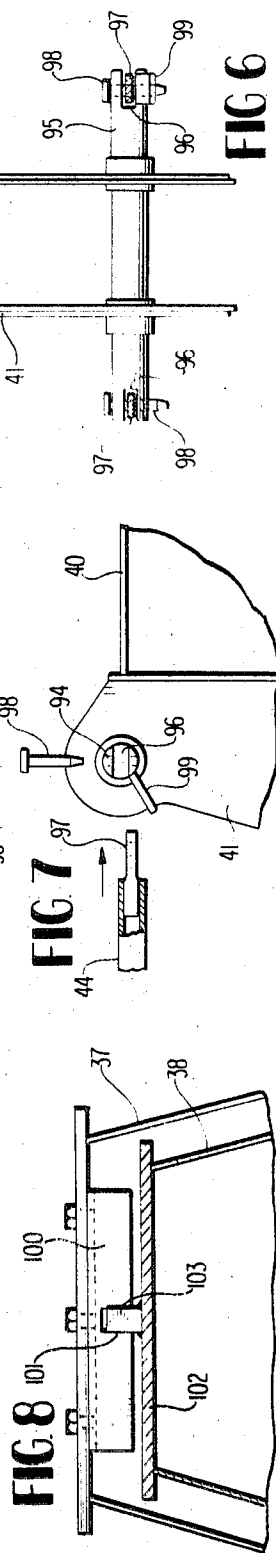
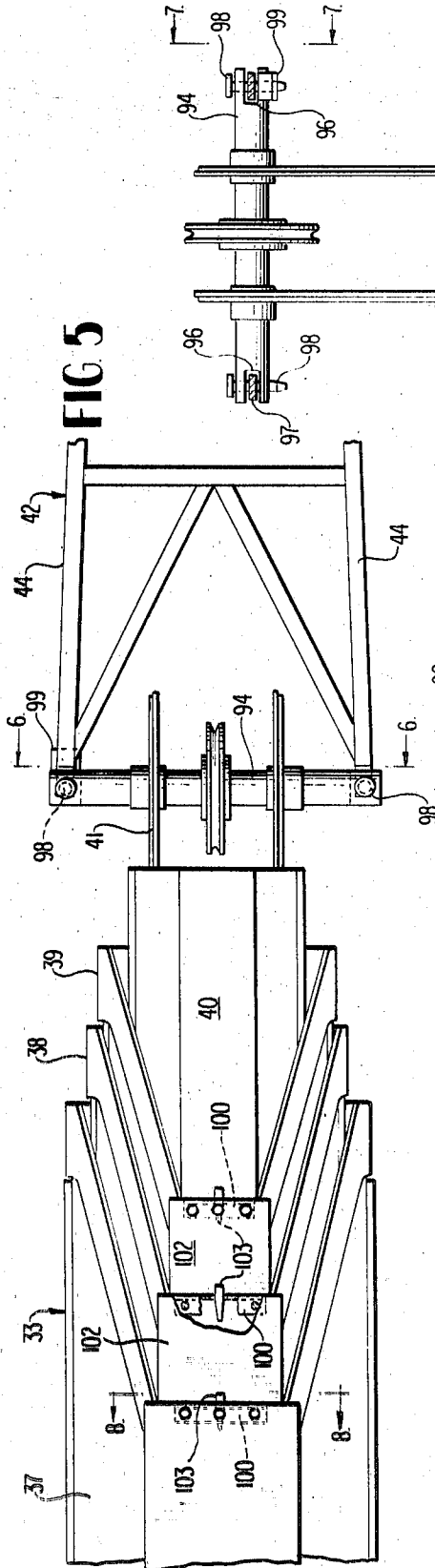
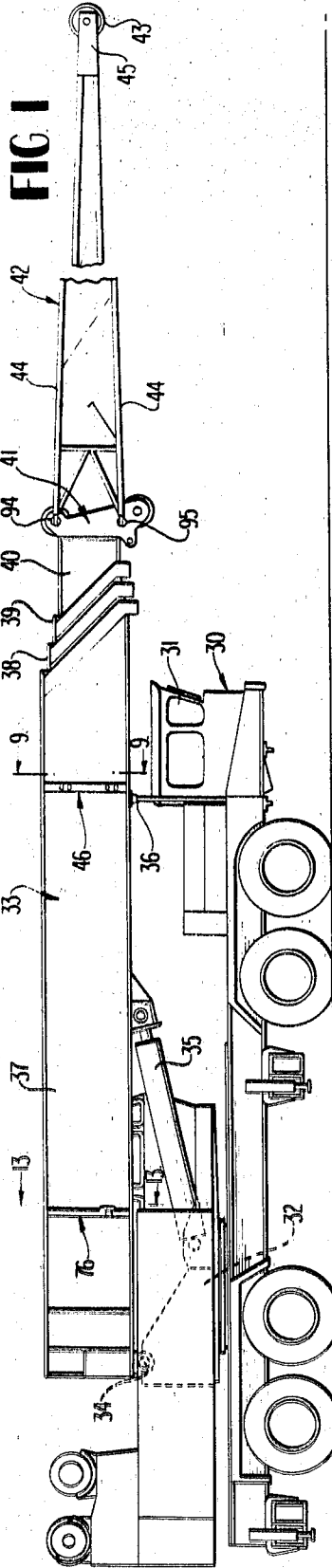
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[57] **ABSTRACT**

An extension jib for telescoping crane booms is stowed in a non-use position along one side of the boom when the boom is retracted. The stowed jib is held in forward and rear bracket structures on the boom base section. The forward bracket embodies a pivot for the stowed jib and the rear bracket embodies a multi-position latch. The base of the jib which faces forwardly in the stowed position is adapted to be pivoted to the nose assembly on the boom fly section but is normally spaced from the nose assembly. Pivoting of the stowed jib on the forward bracket structure while the latch on the rear bracket structure is in a safety position moves the base of the jib toward the nose assembly so that a pivotal connection with the nose assembly can be established. Subsequently, the pivotal connection between the jib and forward bracket structure is eliminated and the latch on the rear bracket structure is moved to a release position and the jib is swung 180 degrees on its pivotal connection with the nose assembly and is then locked thereto in a forwardly extending use position. The entire manipulation of the jib is accomplished by one man with safety and without the need for tools.

17 Claims, 22 Drawing Figures





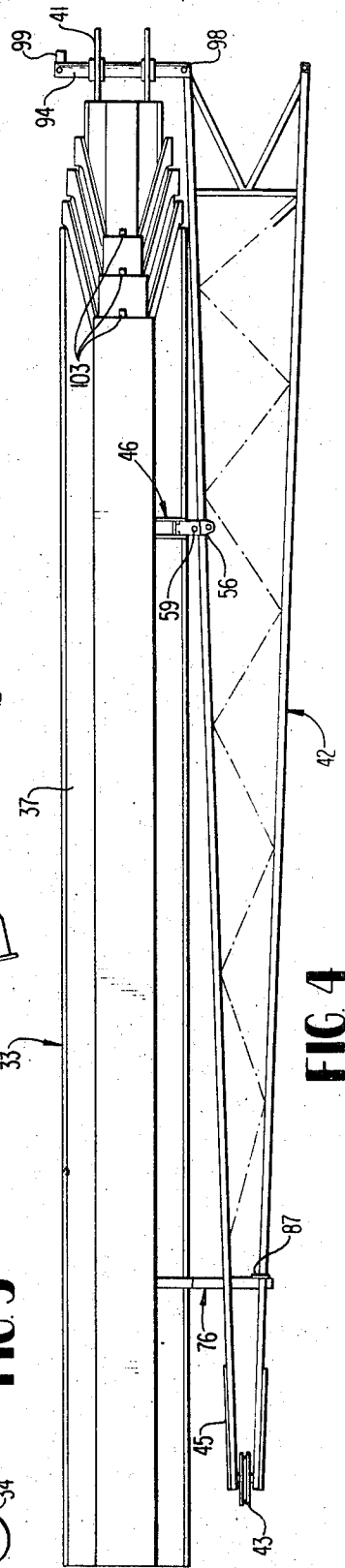
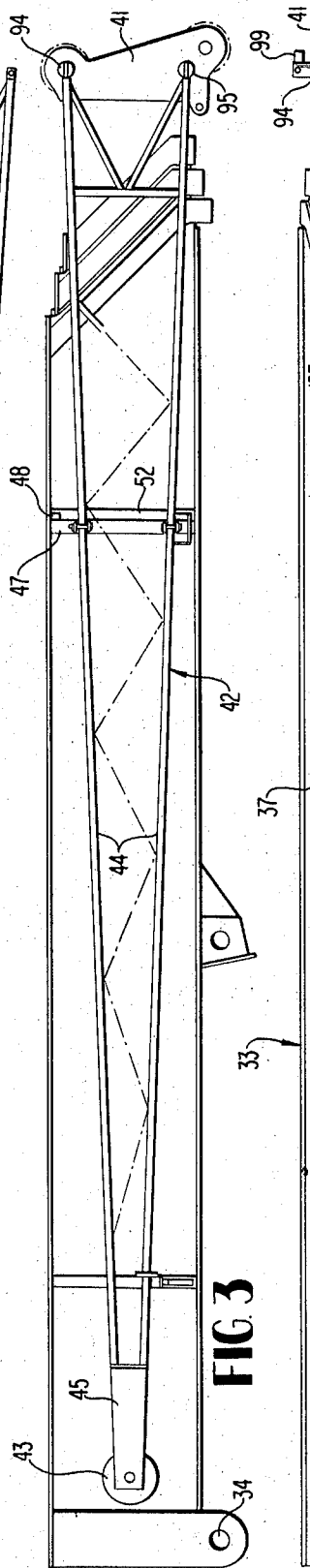
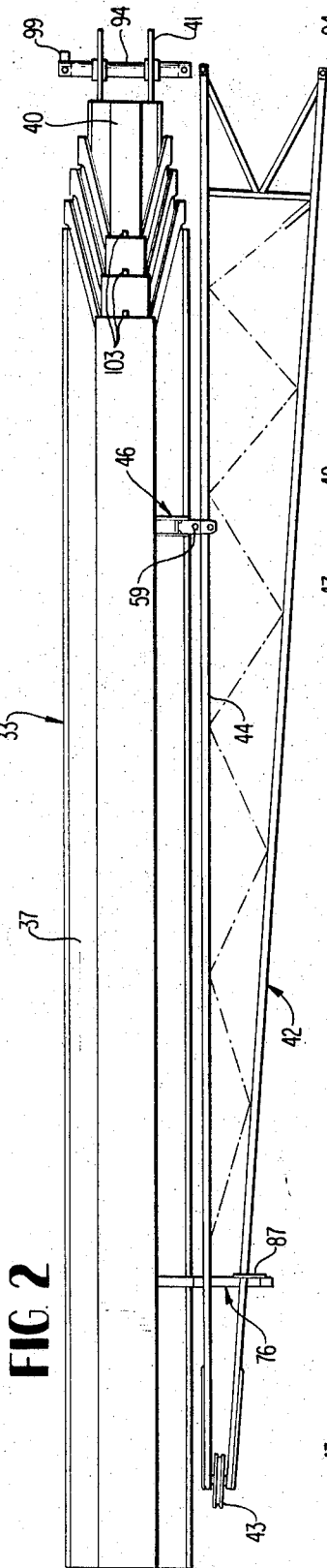


FIG 9

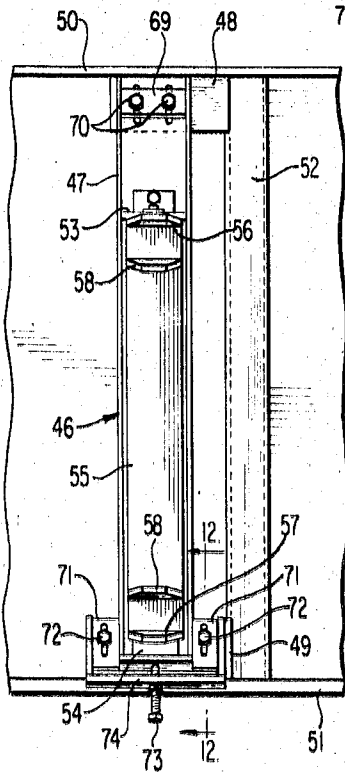
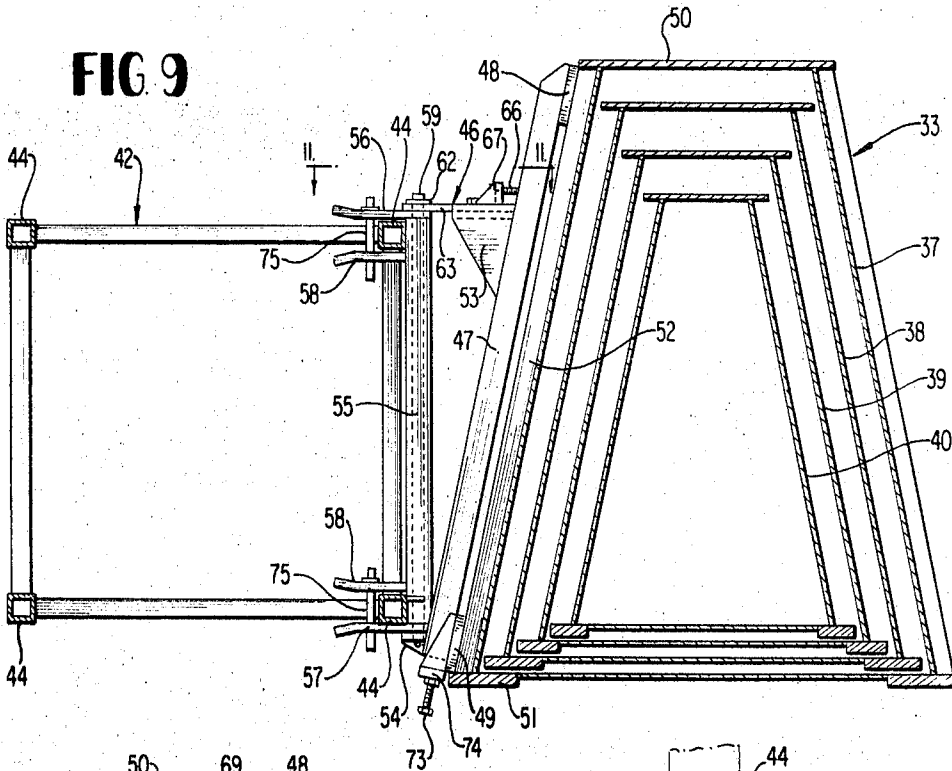


FIG 10

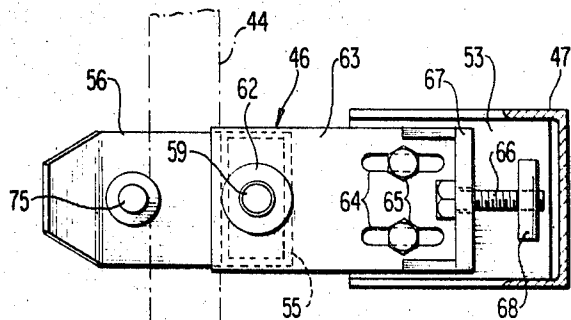


FIG 11

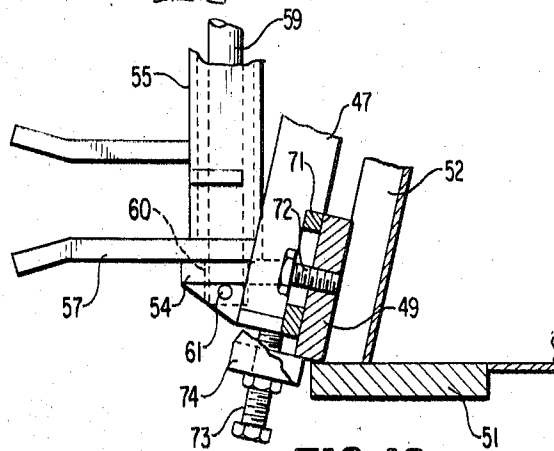


FIG 12

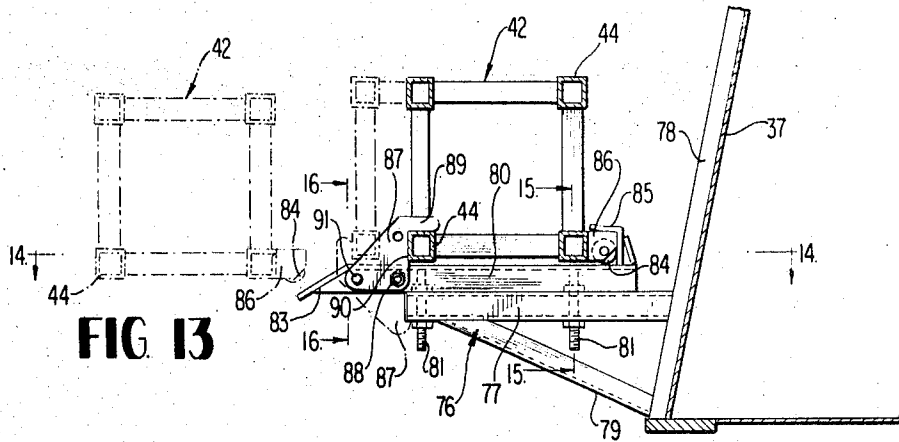


FIG 13

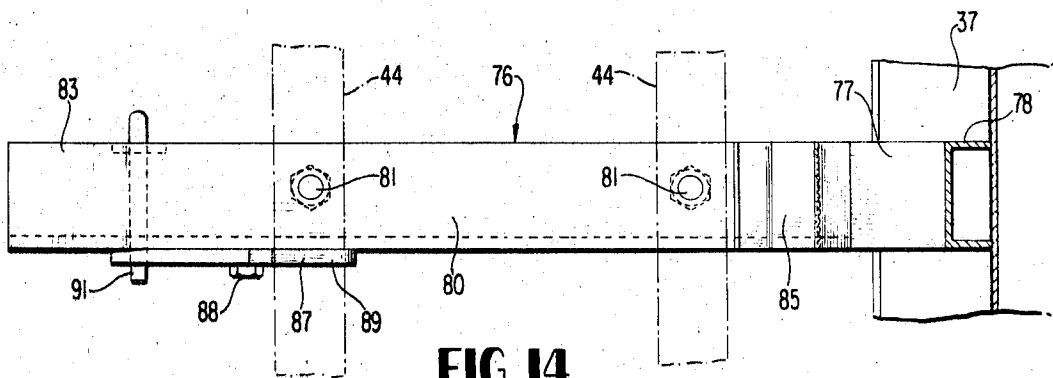


FIG 14

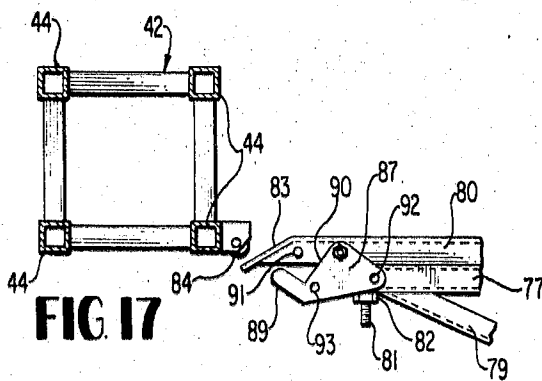


FIG 17

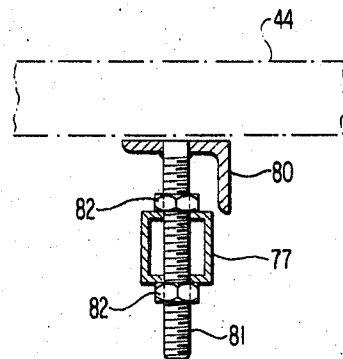


FIG 15

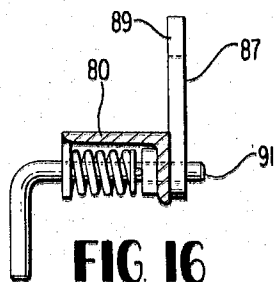
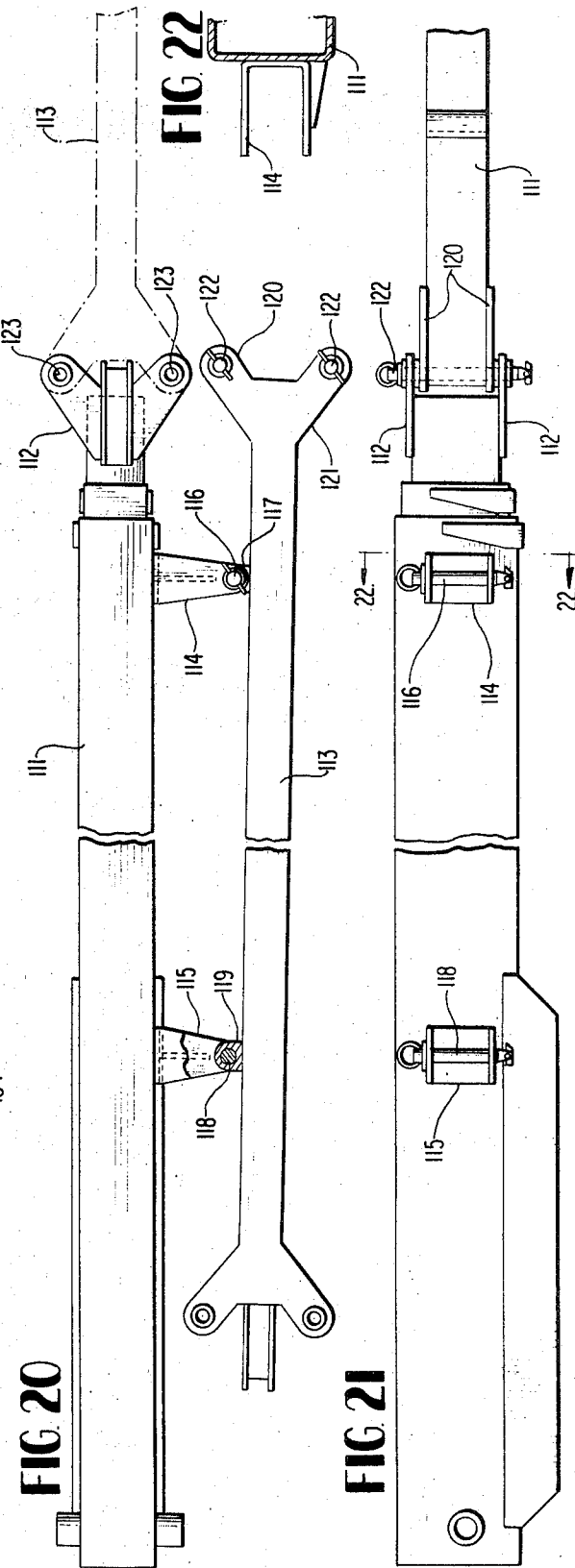
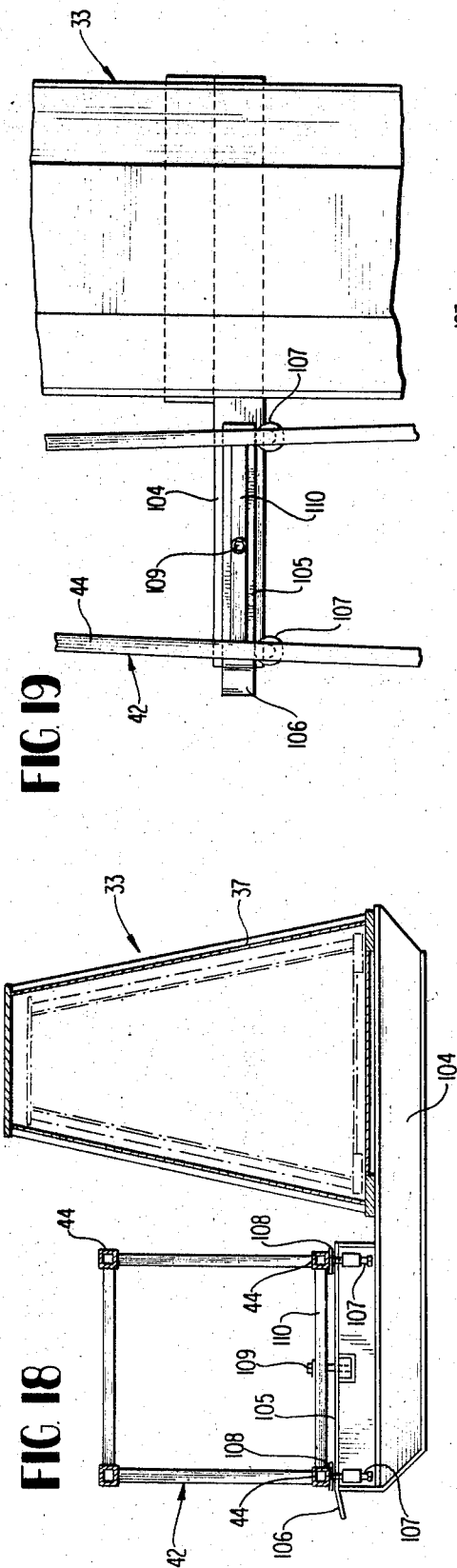


FIG 16



SIDE STOWABLE JIB FOR CRANE BOOMS AND JIB MOUNTING

BACKGROUND OF THE INVENTION

Crane booms are customarily equipped with extension jibs adapted to be coupled to the nose assembly of the boom so as to provide additional boom length for special jobs. Most of the time the jib is not utilized and it must be set aside or stowed until it is needed. Sometimes the jib is stored on a separate boom truck and the prior art proposes arrangements for stowing the jib in a non-use position on the crane boom. U.S. Pat. No. 3,366,250 to Grove illustrates one such prior art proposal. Generally, in the prior art as exemplified by the above Grove patent, the jib is stowed along the bottom of the crane boom and is held in suitable support brackets on the lower side of the boom. In some cases, erection of the jib is accomplished by pinning the jib to the nose assembly of the boom, followed by elevating the boom and connecting guy and hoist cables. More than one operator is needed to erect and stow the boom and sometimes an operator must crawl to a somewhat dangerous position on the boom structure. Generally, the prior art proposals are not satisfactory in connection with increasingly large telescopic cranes and the large jibs associated therewith. Jibs up to 36 feet in length are now being employed, as well as telescoping jibs which can measure up to twice this length. Therefore, there is an increasing need for a more efficient, economical, convenient and safe jib stowing and erecting arrangement or mounting.

The present invention has for its object to satisfy the above need of the art by providing a stowing arrangement and jib mounting and erection system where one man can accomplish all of the necessary manipulating of the jib in relative safety and mostly at ground level or while standing on a low support or on the crane carrier. The only tool required is generally a hammer for tapping home the connecting pins which anchor the base of the jib to the boom nose assembly when the jib is erected. By utilizing a unique two pivot concept between the jib and boom structure, economy of manufacturing is achieved in that dimensional tolerances, particularly in the pivotal connection of the jib to the nose assembly, are rendered less critical than would be the case where a single pivot only exists between the jib and boom. A very simple jib erection and stowing procedure is evolved by virtue of the invention, and the invention embodies a number of adjustability features which compensate for normal wear and possible deformation of the jib, sometimes caused by excessive loading. The aforementioned double pivot construction, to be fully described, is a key feature which solves the problems of side stowing of the jib, not heretofore successfully solved in the art.

Other features and advantages of the invention will become apparent during the course of the following description.

BRIEF DESCRIPTION OF DRAWING FIGURES

FIG. 1 is a side elevation of a mobile crane having the jib mounting and side stowing arrangement in accordance with the invention, the jib being shown in the erected or use position;

FIG. 2 is a plan view of the crane boom and jib with the latter in the side stowed position;

FIG. 3 is a side elevation of the boom and jib as depicted in FIG. 2;

FIG. 4 is a further plan view of the boom and jib showing the jib turned on a first pivot to permit the alignment and formation of a second pivotal connection between the jib and boom nose assembly;

FIG. 5 is an enlarged fragmentary plan view of the boom and jib showing means to prevent twisting of the boom structure when the jib is swung to the side;

FIG. 6 is a fragmentary vertical section taken on line 6—6 of FIG. 5;

FIG. 7 is a fragmentary exploded elevational view taken substantially on line 7—7 of FIG. 6;

FIG. 8 is an enlarged fragmentary vertical section taken on line 8—8 of FIG. 5;

FIG. 9 is a similar section taken on line 9—9 of FIG. 1;

FIG. 10 is an enlarged fragmentary side elevation of a front bracket assembly for the support of the stowed jib;

FIG. 11 is an enlarged fragmentary horizontal section taken on line 11—11 of FIG. 9;

FIG. 12 is an enlarged fragmentary vertical section taken on line 12—12 of FIG. 10;

FIG. 13 is an enlarged fragmentary vertical section showing the rear bracket assembly and latch means taken on line 13—13 of FIG. 1;

FIG. 14 is an enlarged fragmentary horizontal section taken on line 14—14 of FIG. 13;

FIG. 15 is an enlarged fragmentary vertical section taken on line 15—15 of FIG. 13;

FIG. 16 is a similar section taken on line 16—16 of FIG. 13;

FIG. 17 is a fragmentary cross sectional view similar to FIG. 13 showing the jib separated from the rear bracket assembly and the rear bracket latch in a free or release position;

FIG. 18 is a transverse vertical section through a boom, jib and front bracket assembly in accordance with a first modification of the invention;

FIG. 19 is a fragmentary plan view of the elements in FIG. 18;

FIG. 20 is a plan view, partly in section, of a crane boom and side stowed jib in accordance with a second modification;

FIG. 21 is a side elevation of the boom and jib in the second modification with the jib in its use position; and

FIG. 22 is a fragmentary vertical section taken on line 22—22 of FIG. 21.

DETAILED DESCRIPTION

Referring to the drawings in detail, wherein like numerals designate like parts, and referring initially to FIG. 1, the numeral 30 designates a crane carrier having a driver's cab 31 and counterweighted turntable 32 upon which a hydraulically operated multi-section telescoping boom 33 is mounted through a main pivot 34 between the base section of the boom and the turntable structure. The usual lift cylinder means 35 is provided to raise and lower the extensible boom, as required. A rest 36 for the boom in the horizontal position is also provided on the crane carrier. Other details of the carrier and the boom structure need not be described for a proper understanding of the present invention. While the invention has been illustrated in connection with a particular form of mobile crane having a four section

trapezoidal boom, it should be clearly understood that the invention is applicable to other forms of cranes.

As shown, the telescopic crane boom 33 is trapezoidal in cross section and includes a base section 37, inner and outer mid-sections 38 and 39, and a fly section 40. The fly section 40 is equipped with a nose assembly 41 of generally conventional construction. The usual winch cables, hook block and the hydraulic ram means which extend and retract the boom sections are omitted from the drawings for simplicity and because they are not required for a full understanding of the invention.

As already explained, the invention is particularly concerned with the stowing, mounting and manipulation of an extension jib 42. In practice, the jib 42 may be as much as 36 feet long from its base or rear end to its nose sheave 43. It is a truss-type jib and comprises four main corner bars 44 which converge toward a nose 45. Truss bracing interconnects the bars 44 on all sides of the jib, as required, and the jib is rectangular and box-like in cross section as shown in FIGS. 9 and 13.

For stowing the jib 42 on one side of the crane boom 33, FIGS. 2 and 9, a front bracket assembly 46 is provided on the boom base section 37 somewhat rearwardly of its forward end. This front bracket assembly comprises a sturdy mounting channel 47 disposed parallel to the adjacent inclined side of the trapezoidal base section 37 and extending substantially from top to bottom of the base section. The upper and lower ends of the channel 47 rest upon fixed plates 48 and 49 which are securely welded to the top and bottom walls 50 and 51 of the boom base section 37 and are also welded to an adjacent reinforcing channel member 52 on the base section of the boom.

The front bracket assembly 46 further includes an upper bracket extension 53 on the channel 47 rigid therewith and a lower bracket extension 54 also fixed to and rigid with the channel 47. The top faces of the bracket extensions 53 and 54 are horizontal, as best shown in FIG. 9. A vertical rectangular tubular member 55 extends between the bracket extensions 53 and 54 and has rigidly secured to its opposite ends, as by welding, outwardly projecting horizontal plates 56 and 57 whose extremities are somewhat flared, as shown. Slightly below and above the plates 56 and 57 and parallel thereto, similar plates 58 are also rigidly attached to the member 55, and the pairs of horizontal plates 56-58 and 57-58 form socket or holding means for the stowed jib 42, as will be further discussed. The elements 55, 56, 57 and 58 constitute a rigid unit.

Means are provided to form a vertical axis hinge joint between this last-mentioned unit and the rigid unit composed of the elements 47, 53 and 54. This means comprises a vertical hinge pin or rod 59 extending through the rectangular tubular member 55 centrally and through openings providing in the plates 56 and 57. The lower end of the rod 59 is received in a socket recess 60 of bracket extension 54 with some clearance between the rod and recess, and the rod 59 is preferably pinned at 61 to the bracket extension 54 and thereby held against rotation. The upper end of the vertical rod 59 carries a thrust bearing or collar 62 which bears upon a horizontally shiftable adjustment plate 63 projecting outwardly from bracket extension 53 and resting thereon. The upper end of the rod 59 is also received through an opening in the adjustment plate 63.

The horizontal adjustment plate 63 is slotted at 64, FIG. 11, and these slots receive locking screws 65 which engage threadedly into the fixed bracket extension 53. A horizontal adjusting screw 66 on an upstanding wall 67 of the plate 63 has screw-threaded engagement with a stationary lug 68 on the fixed bracket extension 53. By this means, the plate 63 and consequently the upper end of the hinge rod 59 and associated parts may be adjusted horizontally inwardly or outwardly through distances limited by the slots 46 and securely locked in the selected adjusted position by tightening the locking screws 65. The lower end of the rod 59 has sufficient clearance in the socket recess 60 to pivot slightly as required when the above adjustment is made.

Additionally, the entire front bracket assembly 46 may be raised and lowered along or parallel to the brace 52 in the following manner. Near its top, the mounting channel 47 has a slotted place 69 welded therein receiving locking screws 70 which engage within threaded openings in the fixed plate 48. At its lower end, the channel 47 carries side slotted plates 71 rigid therewith, receiving locking screws 72 having threaded engagement with the fixed plate 49. An adjusting screw 73 on a rigid extension 74 of the plate 49 bears against a lower end abutment web on the channel 47 and allows the latter to be adjusted bodily lengthwise by distances limited by the slots in plates 69 and 71. By this means, the entire front bracket assembly 46 can be raised and lowered and securely locked. These adjustments are made available to compensate for normal wear between the boom sections and for slight bending or deformation of the jib 42 which may occur in practice. The front bracket assembly 46, in addition to being adjustable in the manner described, embodies a hinge joint to facilitate a limited horizontal swinging of the stowed jib. The elements which hinge or pivot on the vertical axis of the rod 59 are the unitized elements 55, 56, 57 and 58.

Removable vertical retainer pins 75 are also provided on the front bracket assembly 46 and these engage through aligned openings in the pairs of plates 56-58 and 57-58, as shown in FIG. 9. When the interior side bars 44 of jib 42 are socketed between these pairs of plates, the removable pins 75 serve to lock the jib safely to the pivotal unit of the front bracket assembly 46. At the proper time, the pins 75 are manually removed to release the jib so that it may be swung horizontally 180 degrees to its use position shown in FIGS. 1 and 5. This operation will be further described.

To further aid in stowing the jib 42 at the side of the boom 33, a rear bracket assembly 76 and latch means is provided on the boom base section 37 near its rear end. The rear bracket assembly 76 comprises a horizontal mounting arm 77 having its inner end welded to an adjacent channel reinforcement 78 of base section 37. A welded underlying diagonal brace 79 reinforces the mounting arm 77. Another horizontal arm or track 80 is vertically adjustably mounted upon the fixed arm 77 through the medium of adjusting screws 81 having locking nuts 82 above and below the fixed arm 77, FIG. 15. The outer end of adjustable track 80 carries an inclined ramp 83 engageable by a guide wheel 84 on one side of the jib 42 to facilitate entry of the jib onto the rear bracket assembly. At its inner end, the arm or track 80 carries a fixed socket and abutment element

85 to receive the small wheel 84 and its housing 86 and position the same precisely as depicted in FIG. 13.

The rear bracket assembly further includes a three position latch plate 87 pivoted to one side of the track 80 by a pivot element 88. The latch plate has an active jib-locking position shown in full lines in FIG. 13 where a finger extension 89 on the latch plate extends over the lower outside bar 44 of the jib and one edge 90 of the roughly triangular latch plate is in engagement with the outer side of the bar 44 to secure the inner side of the jib against the element 85. A manually operated spring-loaded locking pin 91, FIG. 6, on the track 80 now engages a first opening 92 near the corner of the latch plate remote from the finger 89 to secure the latch plate in the active jib-holding position, FIG. 13. The latch plate also has a free-hanging jib-releasing position depicted in FIG. 17 where the pin 91 has no engagement with the latch plate 87. The latch plate assumes the position shown in FIG. 17 by gravity and the finger 89 remains clear of the ramp 83 and track 80 so that the jib may move off of or onto the rear bracket assembly.

The latch plate 87 has a third or intermediate safety position shown in broken lines in FIGS. 13. In this intermediate safety position, the latch plate allows limited horizontal swinging of the jib 42 on the axis of pivot rod 59 as shown in FIG. 4 but still prevents complete separation of the jib from the rear bracket assembly 76. This assures that there will be no time during which the heavy jib does not receive adequate support at the forward and rear bracket assemblies 46 and 76 prior to being safely coupled pivotally to the boom nose assembly 41, as will be fully described. When the latch plate 87 is in the intermediate position shown in dotted lines, the spring-loaded locking pin 91 enters a second opening 93 in the latch plate near its corner carrying the finger 89, see FIG. 17.

It should be mentioned here that FIGS. 2 and 3 show the jib 42 in the stowed and fully locked or secured position on the two bracket assemblies 46 and 76. FIG. 4 shows the jib in the slightly pivoted position where the latch plate 87 is in the intermediate safety position shown in dotted lines in FIG. 13 and the base end of the jib, now facing forwardly, has been shifted toward the boom nose assembly 41 prior to pivotally coupling the jib to the boom nose assembly and then swinging the boom around 180 degrees to its erected use position. While stowed, the normal forward tip of the jib carrying the sheave 43 faces rearwardly as illustrated in FIGS. 2 through 4.

The aforementioned nose assembly 41 embodies a pair of spaced vertical plates connected with and supporting a pair of vertically spaced horizontal shafts 94 and 95. The nose assembly is securely anchored in a conventional manner to the forward end of boom fly section 40. Other details of the nose assembly and its general purpose for guiding the winch-operated cable means are well known and need not be described herein.

The opposite ends of the nose assembly shafts 94 are slotted or bifurcated as shown at 96 in FIG. 6 for the reception of flattened end extensions 97, rigidly anchored in the ends of the corner bars 44 of the jib at the base end of the jib. The slotted ends of the shafts 94 and the elements 97 have registering apertures to receive therethrough tapered pins 98. The ends of the shafts 94 and 95 remote from the stowed jib 42, FIG.

2, have short inclined ramp elements 99 welded thereto for an important purpose to be described. The pins 98 are applied and removed manually at the required times, as will be described. The vertically spaced pair of pins 98 remote from the ramps 99 and closest to the stowed jib, FIG. 4, constitute the vertical axis pivot around which the base end of the jib is pivoted a full 180 degrees from its position in FIG. 4 to its use position in FIG. 1, after the jib is released by the latch plate 87 and after the pins 75 of the front bracket assembly 46 have been removed. When the jib is swung to the use position, the second vertically spaced pair of pins 98 are placed into position as in FIG. 6 to fully couple and lock the jib 42 onto the nose assembly 41 for use. The ramp elements 99 will engage and guide the elements 97 into the slots 96 on the far side of the shafts 94 and 95 and thus compensate for any possible twisting or sagging of the jib as it is swung around on the forward pivot composed of one pair of pins 98. The previously-described ramp 83 functions similarly to guide the jib into place on the rear bracket assembly 76 when the jib is swung to the stowed position.

It should be mentioned here that by virtue of the various adjustments on the forward and rear bracket assemblies 46 and 76 and the provision of the ramp elements 99 and the unique arrangement of the two pivots for the jib, namely, the first pivot around the axis of the rod 59 and the second or main pivot around one pair of pins 98, all contributes to the practicality of the invention and materially lessens the cost of manufacturing. This is true because certain dimensional tolerances are less critical than would be the case without the above features of the invention, and therefore the invention overcomes the primary problems encountered in the side storage of a jib. For example, without the double pivot arrangement for the jib illustrated at 59 and 98 in FIG. 4, it would be required to almost perfectly align the openings in the ends of shafts 94 and 95 with the openings in the elements 97 of the jib so that the pins 98 could be engaged. This would require very close and expensive machining tolerances. With the double pivot arrangement of the invention and the various adjustment features, the manufacturing tolerances need not be unreasonably precise.

A further feature of the invention rendering it practical is a means to prevent collective twisting of the telescoped boom sections when the jib 42 is pivoted to the side or generally perpendicular to the axis of the boom. This condition will occur during movement of the jib to its stowed or use positions. To resist this twisting of the boom, FIGS. 5 and 8, each of the boom sections 37, 38 and 39 is provided upon its top wall with a fixed transverse rigid angle bar 100 having a guide slot 101 formed in its vertical web. On the top wall 102 of each boom section which is next innermost, a tapered key element 103 is welded and is adapted to enter the adjacent guide slot 101 when the boom is fully retracted. The boom will be fully retracted during shifting of the jib 42 to the stowed or to the use position. The interengagement of the elements 100 and 103, FIGS. 5 and 8, will prevent twisting or relative lateral shifting of the boom sections during manipulation of the jib.

In FIGS. 18 and 19 of the drawings, there is shown a modification of the front bracket structure for supporting the stowed jib 42 at one side of the boom 33 and in this modification the pivotal connection of the jib with the front bracket structure is at the transverse

center of the jib instead of near the inner side of the jib, as in FIG. 9. The rear bracket assembly and the connections between the jib and boom nose assembly may be the same as in the preferred embodiment.

Referring to FIGS. 18 and 19, the front bracket assembly comprises a transverse horizontal beam 104 secured rigidly to the bottom of boom base section 37 in the same region where the previously-described front bracket assembly 46 is located. The beam 104 extends beyond one side of the boom 33 as shown and has mounted thereon a raised support member or track 105 having an inclined ramp extension 106 at its outer end to aid in the passage of the jib 42 onto the front bracket assembly. A pair of vertical jack screws or adjusters 107 are mounted on the member 105 and include pads 108 which engage the corner bars 44 of the jib so that the jib can be raised or lowered slightly relative to the front bracket assembly. A vertical pivot pin 109 located at the transverse center of the jib engages through an opening in one cross brace 110 of the jib and is connected to the member 105 so as to establish a vertical axis pivotal connection between the jib and front bracket assembly. The modification in FIGS. 18 and 19 still features the two pivot arrangement for the jib, fully described in the preferred embodiment but differs from the preferred embodiment chiefly in the location of the pivot on the front bracket assembly and in other details of the front bracket.

FIGS. 20 through 22 show a further modification of the invention applicable to a small crane boom having a relatively low lifting capacity, such as two tons. In this embodiment, the telescopic crane boom is shown at 111 having a nose assembly 112 on the boom fly section. A jib 113 is adapted to be stowed at one side of the boom and is held in the stowed position by front and rear brackets 114 and 115 projecting from one side of the boom base section. A vertical pivot pin 116 in the front bracket 114 forms a vertical axis pivot for the side-stowed jib and engages through an apertured knuckle 117 carried by the jib near its forward end. A similar connection between the jib and rear bracket 115 is formed by a second movable pin 118 and a second apertured knuckle 119 on the jib near its rear end. The various adjustments in the front and rear bracket assemblies of the preferred embodiment and the first modified form are not present and are not necessary in the second modified form because of the relatively light weights being lifted. The base end of the jib 113 is bifurcated and includes vertically spaced pairs of apertured extensions 120 and 121 adapted to receive coupling pins 122 which also engage through openings 123 in the nose assembly 112 to couple the jib 113 to the boom 111 in the use position.

The same dual pivot concept for the side-stowed jib is utilized in the second modification and the front and rear side support bracket arrangement is utilized. The same broad mode of operation for shifting the jib from the stowed to the use position is adhered to, although the construction and operation is more simplified in view of the smaller and lighter weight construction. For example, to move the jib 113 from its side stowed position in FIG. 20 to its active position shown in broken lines in FIG. 20, it is only necessary to remove the rear pin 118 and swing the jib counter-clockwise slightly on the axis of pin 116 which forms the first pivot until the apertured extensions 120 register with the adjacent openings 123 of retracted boom nose piece 112. At this

time, the first pin 122 is dropped into place to establish the second pivot for transferring the jib and the pin 116 is now removed and the jib is swung approximately 180 degrees to the use position and coupled to the nose assembly 112 rigidly by slipping the second pin 122 into place.

The operation of the preferred form, FIGS. 1 through 17, is a bit more detailed and may be summarized as follows. Assuming that the jib is stowed on the boom 33 as shown in FIG. 2 and it is desired to move the jib to the use position shown in FIG. 1, the following sequence of operations are performed by a single man.

First, the rear latch plate 87 is moved to the intermediate or safety position shown in FIG. 4 and in broken lines in FIG. 13.

Secondly, the jib 42 is manually pivoted to the position shown in FIG. 4 to register one pair of apertured elements 97 with the apertures in the near ends of nose assembly shafts 94 and 95.

Third, the boom 33 is lowered below the horizontal (negative angle) and the workman places the lower pivot pin 98 on the near side of the nose assembly 41 into place while standing safely on the ground.

Next, the workman while standing on something of sufficient height puts the second pivot pin 98 on the near side into place to establish the second pivot as indicated at 98 in FIG. 4.

Following this, the boom 33 is raised to horizontal.

Next, the operator removes the retaining pins 75, FIG. 9, of the front bracket assembly 46 and this can be done while standing on the cab of the crane carrier 30 or some other convenient part of the crane carrier.

Next, the rear latch plate 87 is moved to the free-hanging position, FIG. 17, and the operator now swings the jib 42 a full 180 degrees around the axis of the pivot 98, FIG. 4, by pulling on a tow line attached to the boom. This can be done while walking on the ground.

Following this, the boom 33 is lowered below the horizontal again and extended somewhat and the jib 42 is manually pushed into registration with the far side slots 96 and apertures in the slotted ends of nose shafts 94 and 95. The operator, holding the tip of the jib 42, is capable of applying strong leverage through the long jib and the ramp elements 99 will assist in guiding the extensions 97 into the far side slots 96 of the nose assembly shafts.

Next, the operator puts into place the lower locking pin 98 on the far side of the boom and, finally, places the upper pin 98 into place while standing on a suitable object. The pins 98 are tapered for ease of entry but because the jib 42 is sometimes deformed due to wear and tear, it may be necessary to tap in the final pin 98 with a hammer.

It may now be seen that the entire manipulation of the large jib can be accomplished by one man with safety and convenience and without special tools. The two pivot arrangement fully described above is the key to success in the side stowed jib and renders the invention practical and economical, as previously explained, and overcomes the main problems which have been encountered in the past in attempting to produce a side stowable jib arrangement. It is believed that the many advantages of the invention will now be fully apparent to those skilled in the art without further elaboration herein.

The terms and expressions which have been employed herein are used as terms of description and not

of limitation, and there is no intention, in the use of such terms and expressions, of excluding any equivalents of the features shown and described or portions thereof but it is recognized that various modifications are possible within the scope of the invention claimed.

I claim:

1. In a crane, an extensible boom having a base section and a fly section, a jib attachable to the nose of the fly section in a forwardly extending use position, and means to support the jib in a stowed position along one side of the boom base section and to facilitate coupling the jib to said nose in said use position, said means including spaced front and rear bracket assemblies on one side of the boom base section to support the jib bodily with the base end of the jib disposed forwardly in the stowed position in spaced relation to said nose of the fly section, means forming a first pivotal connection between the jib and front bracket assembly and allowing swinging of the base end of the jib on a radius around said means forming said first pivotal connection from the stowed position where it is spaced outwardly from the nose laterally inwardly into an aligned coupling position with said nose, said first pivotal connection including a releasable securing means for the jib on the front bracket assembly, separable means forming a second pivotal connection between the base end of the jib and said nose in the aligned coupling position and allowing further swinging of the jib on the axis of the second pivotal connection to said use position upon release of said releasable securing means, and separable coupling means locking the jib in said use position rigidly.

2. The structure of claim 1, and the base end of said jib including two laterally spaced pairs of apertured coupling elements with the coupling elements in each pair vertically spaced and having their apertures in vertical alignment in the pairs, said separable means forming a second pivotal connection comprising a pair of axially aligned pivot pins engageable through the apertures of one vertically aligned pair of said elements and through registering apertures in parts of said nose.

3. The structure of claim 2, and said nose including a pair of vertically spaced horizontal shafts whose opposite ends are slotted to receive said pairs of coupling elements and apertured to register with the apertures in said coupling elements when the latter are in the slots of said shafts.

4. The structure of claim 3, and said separable coupling means locking said jib comprising another pair of vertically aligned pins engaging through the other pair of coupling elements on the base end of the jib and through the other slotted apertured ends of said shafts.

5. The structure of claim 1, and said front bracket assembly being bodily adjustable on the boom base section in at least two directions, said rear bracket assembly including a jib support member which is bodily adjustable in at least one direction relative to said base section.

6. The structure of claim 1, and said front bracket assembly comprising a mounting member secured to one side wall of the boom base section, a vertical axis pivot element on the mounting member, a jib retainer unit having a pivotal connection with the vertical axis pivot element and having upper and lower side opening sockets for a pair of corner bars of the jib, and a pair of removable retainer pins engaging across the open sides of said sockets to lock the jib corner bars therein.

7. The structure of claim 6, and lockable screw-threaded means to adjust the mounting member upwardly and downwardly on the side wall of the boom base section, and a separate lockable screw-threaded means to adjust the upper socket and the upper end of said pivot element inwardly and outwardly relative to the side wall of the boom base section.

8. The structure of claim 6, and each socket comprising a pair of spaced apertured plates projecting outwardly of said pivot element, and said removable retainer pins engageable through the apertures of said socket forming pairs of plates.

9. The structure of claim 1, and said rear bracket assembly comprising substantially horizontal support member rigid with one side of the boom base section and projecting laterally thereof, a vertically adjustable and lockable track member on said horizontal support member including an inclined ramp element at the outer end of the track member, a socket and abutment element on the track member near its inner end adapted to receive a guide roller means on the inner lower corner bar of the jib, and a three position pivoted latch plate on the track member near the outer end thereof, and means to releasably lock the latch plate rigidly in a jib locking position and in an intermediate safety position, the third position of the latch plate being a free-hanging position where the latch plate is clear of the top of the track member and said ramp element.

10. The structure of claim 9, and said latch plate having a finger extension which overlies the outer lower corner bar of the jib in said jib locking position, said finger extension being vertically disposed in the path of horizontal swinging movement of the outer lower jib corner bar when the latch plate is locked in said intermediate safety position.

11. The structure of claim 1, and interengaging rigid means on the telescoping sections of the extensible boom to prevent axial twisting of the boom sections caused by the weight of the jib when the latter is extending transversely of the boom during its pivotal movement from its side stowed position to its forwardly extending use position.

12. The structure of claim 1, and said means forming a first pivotal connection being on the boom base section and being formed by a stationary unit of the front bracket assembly attached to the base section and a movable unit of the front bracket assembly attachable to the jib.

13. The structure of claim 1, and said means forming a first pivotal connection comprising a pivot element on the jib connected with a part of the front bracket assembly and spaced laterally outwardly of the boom base section.

14. A boom jib mounting comprising in combination a crane boom having a nose element, a jib for the crane boom attachable to the nose element in a forwardly extending use position and being stowable at one side of the boom with the base end of the jib projecting forwardly and laterally outwardly spaced from the nose element in the stowed position, a front support bracket assembly for the jib on said one side of the boom including a jib holding unit which is pivotal on a substantially vertical axis and which includes releasable jib retaining means, a rear jib supporting bracket assembly on said one side of the boom spaced substantially rearwardly of the front bracket assembly and including a

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multi-position jib latch which in one position locks the jib rigidly to the rear bracket assembly and in another position releases the jib so that it can move clear of the rear bracket assembly, the latch when in an intermediate safety position allowing restricted movement of the jib on the rear bracket assembly when the jib is pivoting with the jib holding unit of the front bracket assembly, means to pivotally interconnect the base end of the jib with said nose element when the jib base end pivots with said jib holding unit laterally inwardly along a radius about said substantially vertical axis bringing the base end of the jib into a registered interconnecting position with said nose element and when said latch is in the intermediate position, and means to rigidly couple the base end of the jib to the nose element after the jib has been further swung substantially 180 degrees on the pivot axis of the connection between the jib and nose element and after the latch has been moved to the jib release position and after release of said jib retaining means on the pivotal jib holding unit of the front bracket assembly.

15. The structure of claim 14, and said jib retaining means comprising removable locking pin means on said pivotal jib holding unit.

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16. The structure of claim 14, and said means to pivotally interconnect the base end of the jib with said nose element and the means to rigidly couple the base end to the nose element both comprising removable pin means.

17. A boom jib mounting comprising in combination a crane boom having a nose assembly, a jib having a base end attachable to the nose assembly in a forwardly extending use position, means pivotally connecting said jib to one side of the boom base section for mounting said jib in a stowed position along one side of the boom base section whereby the base end of said jib is spaced laterally outwardly from said nose assembly and is pivotal from the stowed position laterally inwardly into registration with said nose assembly along a radius around said pivotal connection means, second means forming a second pivotal connection between the base end of said jib and said nose assembly on the same side of said boom as said first pivotal connection means and allowing further pivotal swinging of said jib about said second means to said forwardly extending use position upon release of said first pivotal connection means.

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