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(54) Title: ROLL BAR AND CRANE DEVICE

(57) Abstract

This invention relates to a roll bar and crane device (10) comprising a first leg member (12) and a second leg member (14) both of which are attachable to a vehicle. A brace means (22) is provided for use in bracing at least one of the leg members in an upright configuration, the brace means (22) being at least partly releasably attached to the least one leg member. The device also includes an elongate lifting member (76) defining a first and a second end region (102 and 100), the first end region (102) being releasably attached to the first leg member (12), the second end region (100) being attached to the second leg member (14) to allow the lifting member (76) to selectively pivot about both a vertical axis and a horizontal axis, thereby allowing the device (10) to operate as a crane when the first end region (102) is released from the first leg member (12) and allowing the device (10) to operate as a roll bar when the first end region (102) is attached to the first leg member (12).
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ROLL BAR AND CRANE DEVICE

TECHNICAL FIELD

The device of the present invention generally relates to roll bars which are primarily used on vehicles such as pickup trucks. More particularly, the device of the present invention relates to a new and improved roll bar for vehicles such as pickup trucks which also functions as a crane.

BACKGROUND OF THE INVENTION

Roll bars are very commonly used in conjunction with various vehicles and especially trucks such as pickup trucks. The roll bars are mounted on the truck bed close to the passenger cab and function to help prevent the crushing of the cab in the event the truck is accidentally overturned or rolled over.

More recently, roll bars have been constructed in a manner whereby they also function as a crane for selectively lifting and moving objects on and off the truck bed. In one such prior roll bar and crane device, the upper horizontal member of the roll bar is, at one end, pivotally connected so as to turn about a vertical axis and, at its other end, is selectively detachable from the roll bar lower portion. A hydraulic cylinder is also provided and is pivotally connected to the horizontal member near the pivotable
connection for selectively raising and lowering the horizontal member. Thus, the roll bar upper horizontal member is selectively pivotable about a vertical axis and is also selectively pivotable and movable vertically in a manner whereby various objects can be selectively attached at the other end of the horizontal member and selectively lifted and moved on and off the truck bed.

The roll bar and crane devices of the past however have shortcomings and drawbacks. These roll bar and crane devices are not aesthetically pleasing and, therefore, are undesirable by many typical consumers. They are also very large and bulky and are very difficult to be packed and transported to the consumer for attachment to a vehicle or truck. Prior roll bar and crane devices are also structurally inferior and are not readily, easily or safely usable as a crane.

Accordingly, a need exists for a roll bar crane device which is aesthetically pleasing, easily packable and transportable and which can be easily, readily and safely used as both a roll bar and a crane.

**SUMMARY OF THE INVENTION**

It is the object of the present invention to overcome or reduce at least some
of the above-discussed disadvantages associated with the prior roll bar and crane devices.

One such object of the present invention is to provide a new and improved bar and crane device which is selectively dismountable so that it may be easily packaged and transported and selectively re-assembled on a vehicle such as a truck.

A further such object of the present invention is to provide a new and improved roll bar and crane device which is aesthetically pleasing and desirable.

A yet further such object of the present invention is to provide a new and improved roll bar and crane device which is structurally reliable and which is easily, readily and safely usable.

According to the present invention there is provided a roll bar and crane device comprising a first leg member and a second leg member both of which are attachable to a vehicle; brace means for in use bracing at least one of the leg members in an upright configuration, the brace means being at least partly releasably attached to the at least one leg member; an elongate lifting member defining a first and a second end region; the first end region being
releasably attached to the first leg member; the second end region being attached to the second leg member to allow the lifting member to selectively pivot about both a vertical axis and a horizontal axis, thereby allowing the device to operate as a crane when the first end region is released from the first leg member and allowing the device to operate as a roll bar when the first end region is attached to the first leg member.

Preferably the brace means in use braces each of the leg members in an upright configuration. The brace means may form part of each leg member, each leg member defining a vertical leg; and a bracing leg operatively extending downwardly at an angle from the vertical leg onto a support surface; and the bracing leg being releasably attachable to the vertical leg to form the brace means.

In a preferred embodiment of the invention the brace means comprises a connecting member for releasably connecting the first and second leg members to each other.

According to a preferred embodiment of the invention there is provided a roll bar and crane device comprising a first leg member and a second leg member both of which are attachable to a vehicle; a connecting member for releasably connecting the first and second leg members to each other; an
elongate lifting member defining a first and a second end region; the first end region being releasably attached to the first leg member; the second end region being pivotally attached to the second leg member to allow the lifting member to selectively pivot about both a vertical axis and a horizontal axis, thereby allowing the device to operate as a crane when the first end region is released from the first leg member and allowing the device to operate as a roll bar when the first end region is attached to the first leg member.

The connecting member may comprise an elongate beam defining a first end and a second end, the first end being releasably attachable to the first leg member and the second end being releasably attachable to the second leg member. The first end may be receivable in a socket formation provided on the first leg member and the second end may be receivable in a socket formation provided on the second leg member.

The device may also include securing means for releasably securing the elongated connecting beam to the first and second leg members. In one embodiment of the invention the securing means may comprise a number of nut and bolt combinations; and holes provided in the socket formations and the first and second ends, which holes are in use aligned to receive the bolts therethrough to secure said socket formations to said ends.
Alternatively or additionally the securing means may comprise beam attachment plates at either end of the elongate connecting beam; leg attachment plates on the first and second leg members; and locking members in use provided through aligned holes in the beam attachment plates and the leg attachment plates of the first and second leg members to lock the beam attachment plates to the leg attachment plates. At least some of the plates may comprise brace members, and preferably the beam attachment plates comprise brace members. The locking members may comprise nut and bolt combinations.

Each leg member may comprise a vertical leg and preferably it also includes a bracing leg operatively extending downwardly at an angle from the upright leg. The bracing leg is preferably releasably attachable to the vertical leg and preferably a spigot and socket attachment is provided for releasably attaching the bracing leg to the vertical leg. The bracing leg may also include a pad and preferably the pad is releasably attachable to the bracing leg. A spigot and socket formation may be provided for releasably attaching the pad to the bracing leg. The upright leg may also include a pad.

The elongate lifting member may comprise a central region and first and second end regions extending generally transversely from the central region to provide the lifting member with a generally U-shaped configuration.
The second end region of the elongate lifting member may also be releasably attached to the second leg member. This feature in use enhances packaging and packing of the device which in turn enhances transporting thereof.

The device may also include a pivot member attached to the second leg member to pivot about a vertical axis of rotation; and the pivot member also being pivotally attached to the second end region of the lifting member allowing the lifting member to pivot about a horizontal axis.

The pivot member may include an elongate section longitudinally and rotatably received in an elongate hollow vertical leg defined by the second leg member. The pivot member may further include a cap secured thereto to extend over a rim defined by the vertical leg at the operatively upper end thereof.

The pivot member may include a bracket for pivotally attaching the second end region of the lifting member to the pivot member allowing the lifting member to pivot about a horizontal axis. The bracket may be attached to the cap.

The device may also include lever means for pivoting the lifting member about the vertical axis of rotation. The lever means may comprise a lever
releasably attachable to the device to pivot the lifting member about the vertical axis of rotation.

The device may also include controlling means for controlling pivoting of the lifting member about a vertical axis. The controlling means may comprise locking mechanism for locking the lifting member in certain positions as it pivots about the vertical axis.

The device may also comprise controlling means for controlling pivoting of the lifting member about a horizontal axis. The controlling means may comprise telescopic members which telescope into and out of each other as the lifting member pivots about the horizontal axis. The controlling means may include locking means for locking the lifting member in certain positions as it pivots about the horizontal axis. In one preferred embodiment of the invention the controlling means comprises means for lifting the lifting member to pivot about the horizontal axis and preferably the lifting means comprises a jack and preferably it comprises a hydraulic jack.

The lifting member is shaped and sized so as to preferably not exceed or extend beyond the overall shape of the vehicle cab as viewed from the vehicle front or back.
Additionally, cover members may be provided at each end region of the
lifting member to effectively hide or disguise from plain view the jack and
other components for operating the device as a crane. The cover members
may be made of materials such as wood, polyurethane or plastic and may be
attached to the lifting member at each end region thereof at least on one side
of the lifting member and preferably, facing the back of the vehicle to which
the device is in use mounted and placing the lifting member between the
cover members and the vehicle cab. In another preferred embodiment, at
least two cover members are provided at each end region of the lifting
member in a manner whereby the end regions are sandwiched therebetween.

A manually or electrically operable winch may be provided with the roll bar
and crane device and it may be attachable preferably either to the lifting
member or the connecting member connecting the leg members to each
other.

**BRIEF DESCRIPTION OF THE DRAWINGS**

Without thereby limiting the scope of the invention and by means of
example only embodiments thereof will now be further described with
reference to the accompanying drawings wherein:
Figure 1 is a rear view of a roll bar and crane device according to the present invention and shown as would typically be seen from a rear of a vehicle upon which the device is adapted to be mounted;

Figure 2 is an exploded perspective view of the roll bar and crane device of Figure 1 but including a winch and showing the device as would be dismantled;

Figure 3 is a side view of the roll bar and crane device of Figure 1 but with a modified leg structure and without any cover members thereon;

Figure 4 is an enlarged rear view of part of the roll bar and crane device of Figure 3;

Figure 5 is a partial cross-sectional view of the roll bar and crane device of Figure 1 taken along line 5-5;

Figure 6 is a partial cross-sectional view of the roll bar and crane device of Figure 4 taken along line 6-6;
Figure 7 is a top plan view of the pivot member of Figure 6 without the lifting member;

Figure 8a is a partial side view of the roll bar and crane device of Figure 4 and depicting the pivot member and cap along with the locking mechanism for selectively locking and preventing movement of the lifting member about the vertical axis;

Figure 8b is a cross-sectional view of the portion of the device of Figure 8a taken along line 8b-8b;

Figure 9 is a top plan view of the roll bar and crane device of Figure 3 showing possible motion of the lifting member about the vertical axis in single dash lines and a vehicle upon which the device may be mounted in double-single dash lines;

Figure 10 is a rear view of the device of Figure 9 showing the lifting member movable in various different positions in dash lines and a vehicle upon which the device may be mounted in double-single dash lines;

Figure 11 is a perspective view of the roll bar and crane device shown in
Figure 3 mounted on a vehicle and wherein a winch is provided on the connecting beam and shown being used for moving a log;

Figure 12 is a perspective view similar to Figure 11 but wherein the lifting member has been released from the first leg member and the winch rope operating via the lifting member;

Figure 13 is a rear view of a roll bar and crane device similar to that of Figure 1 but incorporating different cover members sandwiching the first and second end regions of the lifting member;

Figure 14 is a side view of the roll bar and crane device of Figure 13 and showing the front and rear cover members sandwiching and covering an end region of the lifting member;

Figure 15 is a top plan view of the roll bar and crane device of Figures 13 and 14; and

Figure 16 is a side view of yet another embodiment of a roll bar and crane device constructed in accordance with the principles of the present invention.
Corresponding reference numerals one used to denote corresponding parts.

The exemplifications set out herein illustrate preferred embodiments of the invention in one form thereof and such exemplifications are not to be construed as limiting the scope of the disclosure or the scope of the invention in any manner.

DETAIL DESCRIPTION OF SPECIFIC EMBODIMENTS

Referring initially to Figure 1, a roll bar and crane device is generally designated by the numeral 10 and is illustrated and shown fully assembled and in the roll bar position. The device 10 includes a first leg member 12 and a second leg member 14 connected to each other by means of a connecting member 16 extending therebetween to brace them in an upright configuration. Each of the first and second leg members 12 and 14 includes a vertical leg 18 with a pad 20 at the lower end thereof. Each of the first and second leg members 12 and 14 also includes a bracing leg 22 which extends downwardly at an angle from the upright leg 18 to support it in an upright configuration. The bracing legs 22 are at their upper ends, affixed to the upper ends of vertical legs 18 and at their lower ends include a pad 24.

Both vertical legs 18 and bracing legs 22 are made of steel tubular sections

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which are cut to length and bent as may be needed. The bracing legs 22 may be affixed to the legs 18 by welding [Figure 3] or may be releasably attached to the vertical legs 18 as shown in Figures 1 and 2. Pads 20 and 24 are preferably cut from plate steel material and are welded or otherwise affixed by suitable means to the respective lower ends of vertical legs 18 and bracing legs 24. Pads 20 and 24 are provided with holes (not shown) or other means by which they may be ridgedly affixed to a vehicle bed 26 and/or a vehicle wheel well 28 as, for example, shown in Figure 3. It is noted that in Figure 3 a typical vehicle such as a pickup truck is shown in double-single dash lines including a cab 30, wheels 32, pickup bed walls 34 along with the pickup bed 26 and wheel wells 28.

As best seen in Figures 1 and 2, first and second leg members 12 and 14 are each further provided with cylindrical socket formations 36. The cylindrical socket formations 36 are also made of steel tube material and are affixed as shown generally to the upper portion of each of the vertical legs 18 in a position which is generally perpendicular to or 90° from the bracing legs 22. Below socket formations 36, each of the first and second leg members 12 and 14 are provided with leg attachment plates 38 preferably made of plate steel. At each of the first and second legs 12 and 14, the leg attachment plates 38 are affixed by welding or other suitable means to the cylindrical socket formation 36. The cylindrical socket formations 36 and leg attachment plates
38 are also affixed to the vertical legs 22 by welding or other suitable means. It is noted that, as best seen in Figure 5, the leg attachment plates 38 are located slightly to the left or right of a plane extending centrally through both the cylindrical socket formation 36 and vertical legs 18. Holes 40 are provided and extend through cylindrical socket formations 36 and holes 42 are provided and extend through the leg attachment plates 38.

The connecting member 16 is an elongate beam made of steel tube material having a sufficient diameter and thickness and being cut to the proper length. The beam 16 defines first and second ends defining, reduced diameter portions 44 having an outer diameter slightly smaller than the inner diameter of cylindrical socket formations 36 and, further, having a longitudinal length which is adapted to be substantially totally received within the cylindrical socket formations 36. Holes 46 are also provided on the reduced diameter portions 44 and are fully received within the cylindrical socket formations, 36, holes 44 and holes 40 become aligned with respect one another.

At each end of beam 16, there are also provided beam attachment plates in the form of brace members 48 which are made of plate steel material and which are generally triangularly shaped. Each brace members 48 is affixed to the central beam 16 along a portion of one leg of the triangularly shape thereof as shown by welding or other suitable means. Along the other leg
of the brace member 48 triangularly shape, a plurality of holes 50 are provided and are located such that when the reduced diameter portions 44 are fully received within the cylindrical socket formations 36, the respective brace members 48 are located adjacent the leg attachment plates 38 as shown in Figure 5 and, further, the holes 50 of brace members 48 are aligned with the holes 42 of leg attachment plates 38.

As can now be appreciated, the beam 16 is selectively releasably attachable to the first and second leg members 12 and 14. Furthermore, for attachment of the beam 16 to the respective first and second leg members 12 and 14, the respective ends of the beam 16 are joined with the respective first and second leg members 12 and 14 by placing the reduced diameter portions 44 within the cylindrical socket formations 36 and the brace members 48 adjacent the leg attachment plates 38. In this position, the leg members 12 and 14 are secured to the beam 16 with locking members in the form of bolt and nut combinations 52 received through aligned holes 42 and 50 and locking members in the form of nut bolt combinations 54 received through aligned holes 40 and 46. As shown in Figure 5 and similar to leg attachment plates 38, the brace members 48 are located slightly to the left or right of a plane extending centrally along both the cylindrical socket formations 36 and vertical legs 18.
The bracing legs 22 may be welded to the vertical legs 18 as shown in Figure 3. In a preferred embodiment of the invention (as shown especially in Figure 2) the bracing legs 22 are selectively releasably attachable to the vertical legs 18. This enhances packing, packaging and transport of the device 10 and also allows different size and shape bracing legs 22 to be used for adapting the device 10 to be used with various different vehicles and truck beds. The interconnection between bracing legs 22 and vertical legs 18 can be similar to the interconnection between the beam 16 and vertical legs 18.

In a preferred embodiment as best shown in Figure 2 each bracing leg 22 is releasably attachable to the vertical leg 18 by means of a spigot and socket attachment. As shown in Figure 2 a spigot formation 22.1 with a reduced diameter portion 22.3 is provided on each vertical leg 18 and a socket formation 22.4 is provided in the bracing leg 22 for receiving the portion 22.3 therein.

Each pad 24 is also releasably attachable to the bracing leg 22 by means of a spigot and socket attachment 22.5 to 22.7 similar to the spigot and socket attachment 22.1 to 22.4. This feature also allows the pad 24 to be rotated prior to securing it, in order that it extends generally horizontally [as shown in the drawings] or generally vertically if it is so required [not shown]. The pad 24 can thus be secured to a generally horizontal surface or a generally
vertical surface.

Referring now more particularly to Figure 2, 4 and 6-8b, the roll bar and crane device 10 includes a pivot member 56 attached or attachable to the second leg member 14. Pivot member 56 includes inner tube section 58 also made of steel tubular material and cut to length. At its upper end, inner tube section 58 is closed with a disk portion 60. As best seen in Figures 6 and 8b, inner tube member 58 has an outer diameter which is slightly smaller than the inner diameter of a vertical leg 18 of the second leg member 14. Accordingly, inner tube member 58 is freely rotatably about a vertical axis 62 within the vertical leg 18. At the upper end of pivot member 56 there is also provided a cap 64 including a cylindrical portion 66. Cap 64 is provided with a hole 68 through which the inner tube section 58 extends. Cap 64 is also made of steel and inner tube member 58 and cap 64 are welded together as best seen in Figures 6 and 8b thereby forming a cylindrical channel 70 therebetween. The inner diameter of cylindrical portion 66 is slightly larger than the outer diameter of vertical leg 18 and the upper portion of vertical leg 18 is received within the channel 70. The upper annular surface or rim 72 abuts and slides on the annular surface 74 located on the cap 64 and between the inner tube section 58 and the cylindrical portion 66. As can be appreciated, annular surfaces 72 and 74 are vertically bearing so as to transfer vertical forces downwardly from the cap 64 to the vertical leg 18. Grease
and/or other lubricating oil can be placed within and between channel 70 for
decreasing the friction between the components as the cap 64 and inner tube
section 58 are rotated about the vertical axis 62 and over the vertical leg 18.
Grease nippels [not shown] may be provided for this purpose.

Alternatively and more preferably, the thrust or vertical downward forces
and pivotal motion about vertical axis 62 is more easily accomplished with
structure such as that shown at the bottom of vertical leg 18 in Figure 4.
Here, the inner tube section 58 is provided with a cap or an otherwise disc
surface 59 at its lower end thereof. Below cap 59 there is provided a thrust
bearing, washer or disc 61. Thrust bearing 61 can be made of Teflon or
other similar structurally ridged low friction materials. Thrust bearing 61,
in combination with the lower portion of inner tube section 58, thus allows
the pivot member 56 to more easily and freely rotate about the vertical axis
62. Grease and/or other lubricating oil can be placed at this position.
Grease nippels may again be provided for this purpose.

As more fully described hereinbelow, an elongate lifting member 76 which
also functions as the upper part of the roll bar is pivotally connected to the
pivot member 56 and with the pivot member it is rotatable about vertical
axis of rotation 62. In this regard, a controlling means in the form of a
locking mechanism generally designated by the numeral 78 is provided and
functions to selectively lock the pivot member 56 and elongate lifting member in a plurality of distinct positions as they pivot about vertical axis 62. Locking mechanism 78 includes a generally square channel 80 also made of steel and affixed to the vertical leg 18 by welding or other suitable means. Square channel 80 is open at its upper end and is closed at its lower end. Square channel 80 includes an elongate slot 82. A tongue member 84 is slidingly received within the square channel 80 and a compression spring 86 is located within and at the lower end of square channel 80 for biassing or pushing the tongue member 84 vertically upwardly. As best seen in Figure 8a, compression spring 86 pushes tongue member 84 vertically upwardly and within one of a plurality of slots 87 located in the cylindrical portion 66 of cap 64.

As can be appreciated, when tongue member 84 is in its upper position as shown in Figures 8a and 8b and is received within a channel 87, rotation of the pivot member 56 and lifting member 76 about vertical axis 62 is effectively prevented. For allowing such pivotal motion, a threaded rod 88 is provided and is affixed to the tongue member 84 and extends out of the square channel 80 through the elongate slot 82. A knob 90 having a threaded bore is threadingly received on threaded rod 88 and is selectively threadingly turned for frictionally engaging and sandwiching the outer wall of square channel 80 between tongue member 84 and knob 90. As should
now be evident, by first turning and loosening knob 90, the knob 90 and
tongue member 84 can be pushed and forced downwardly against the force
of compression spring 86 and out of the slots 87 of cylindrical portion 66.
By turning and tightening knob 90 while tongue 84 is in its lowermost
position, tongue 84 can be retained thereat and thereby allowing the pivot
member 56 and lifting member 76 to freely rotate about the vertical axis of
rotation 62. However, by turning and loosening knob 90 compression
spring 86 again forces tongue member 84 upwardly and into one of the
plurality of slots 87 thereby again stopping or limiting pivotal motion of the
pivot member 56 and lifting member 76 about the vertical axis of rotation
62.

As best seen in Figure 2, at the lower end of inner tube section 58, a
horizontal slot 92 is provided and is adapted to receive a bolt 94
therethrough after inner tube member 58 has been fully inserted within the
vertical leg 18. A threaded hole (not shown) is located through vertical leg
18 which is aligned with horizontal slot 92 when inner tube member 58 is
fully inserted into vertical leg 18. Bolt 94 is threadingly received through the
threaded hole of vertical leg 18 and extends through the horizontal slot 92
of inner tube section 58.

At the upper end of pivot member 56, a pair of gussets 96 forming a bracket
are provided to extend generally over cap 64. Gussets 96 are preferably made of plate steel material and are affixed to cap 64 by welding or other suitable means. For additional strength, gussets 96 are also affixed to the upper end of inner tube section 58 extending up and through the cap 64. In this regard, a pair of spacers 98 are located between each of the gussets 96 and the upper portion of inner tube member 58 and, preferably, gussets 96, spacers 98 and the upper end of inner tube member 58 are affixed to one another by welding or other suitable means. It is noted that spacers 98 are provided for locating gussets 96 apart from one another at a desired distance and different size spacers may be incorporated or the spacers themselves can be totally eliminated if desired. As best shown in Figure 4, apertures 96.1 are provided in each of the gussets 96 and in use a lever [not shown] can be inserted in the apertures 96.1 to rotate the pivot member 56 and lifting member 76 about the vertical axis 62. The apertures 96.1 and lever define a lever means.

The elongate lifting member 76 comprises a central region 101, a first end region 102, and a second end region 100, the end regions extending generally transversely from the central region 101 to provide the lifting member 76 with a generally U-shaped configuration. Lifting member 76 is also made of steel tubing material and is formed preferably by bending the steel tubing for forming the second and first end regions 100 and 102. The end of second

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end region 100 is partially located between gussets 96 and includes a hole which is aligned with holes at the upper end of gussets 96 and through which a bolt 104 extends. Bolt 104 is secured and is retained in place by a nut 106. As should now be evident, the lifting member 76 is pivotable about bolt 104 and about a horizontal axis of rotation 108a.

The device 10 also includes a controlling means for controlling pivoting of the lifting member 76 about the horizontal axis of rotation 108a and the controlling means comprises a hydraulic jack or cylinder 108 pivotally connected between the upper portion of pivot member 56 and the lifting member 76. Hydraulic jack 108 includes a fluid pumping mechanism 110 including a pump handle receiving cylinder 112, a pressure release valve control port, and a cylinder 116 which is selectively telescopically extendable and retractable. A pump handle (not shown) is received in a know and customary manner within pump handle receiving cylinder 112 and is selectively oscillated for pumping the hydraulic jack 108 and causing the cylinder 116 to be extended. A valve control handle 118 is received in and coupled with the valve control port 114 in a manner whereby the turning of handle 118 selectively releases the pressure within hydraulic jack 108 and causes the cylinder 116 to be retracted.

The base 120 of hydraulic jack 108 is located between a portion of the
gussets 96 and is provided with a hole which is aligned with holes in the
gussets 96 and which receive therethrough a nut and bolt combination 122.
Accordingly, hydraulic jack 108 may pivot about the nut and bolt
combination 122. At the other end of hydraulic jack 108, cylinder 116 is
pivotally connected to gussets 124 through the use of a nut and bolt
combination 126. Gussets 124 are generally triangularly shaped and
preferably made of plate steel and are affixed to the lifting member 76 by
welding or other suitable means. In this regard, the upper part of cylinder
116 is provided with a hole which is aligned with holes located on the
gussets 124 and the nut and bolt combination 126 is received therethrough
for securing and allowing pivotal motion between cylinder 116 and gussets
124.

In yet another alternative preferred embodiment, as shown in Figure 16, the
horizontal axis of rotation is located on the central region 101 of lifting
member 76. In this embodiment, the pivot member 56 is constructed with
the second end region 100 of the lifting member 76, directly affixed to the
gussets 96 thereby forming part of the pivot member 56. Second end region
100 is affixed to both gussets 96 and cap 64 by welding or other suitable
means. At its upper end the second end region 100 is cut away from the
central region 101 and pivot gussets 125 are provided on both sides of the
second end region 100 and central region 101. Pivot gussets 125 are affixed
to the central region 101 by welding or other suitable means. Pivot gussets 125 are also pivotally connected to the hydraulic cylinder 116 via nut and bolt combination 126 and are also pivotally connected to second end region 100 via a nut and bolt combination 123. As can be appreciated, in this embodiment the pivot member 56 is effectively lengthened and the horizontal axis of rotation of the lifting member 76 extends coaxially through the nut and bolt combination 123. Thus, by selectively extending or retracting the cylinder 116 of hydraulic jack 108, lifting member 76 is selectively pivoted about nut and bolt combination 123.

The device of Figure 16 also includes a controlling mechanism in the form of a locking mechanism 123 which is an alternative to the locking mechanism 78. In this case a flange formation 123.1 with apertures 123.2 therein is provided on the vertical leg 18. A sleeve 123.4 with a pin 123.5 is slidingly received through the sleeve 123.4 to engage and disengage the apertures 123.2. The pin 123.5 includes a transverse arm 123.6 which in use engages a hook formation 123.7 to retain the pin 123.5 in a upward position wherein it is disengaged from the apertures 123.2 thereby allowing the lifting member 76 to freely rotate about the vertical axis. To arrest rotation of the lifting member 76 about the vertical axis the pin 123.5 is inserted into a suitable aperture 123.2.
Referring again to the device 10 of Figures 1 and 2 the first end region 102 of the lifting member 76 is provided with an eyelet 128 which is received within the vertical leg 18 of the first leg member 12 whenever the lifting member 76 is attached to the first leg member 12 as shown in Figure 1. Alternatively [not shown] a hook formation may be provided in stead of the eyelet 128. Additionally, the first end region 102 of the lifting member 76 is releasably secured to the vertical leg 18 of first leg member 12 by a latch 103.

From the foregoing, it should now be evident that lifting member 76 can be placed in a roll bar position by attaching the first end region 102 to the first leg member 12 as shown in Figure 1. In the alternative, the first end region 102 can be released from the first leg member 12 allowing the lifting member 76 to be used for lifting objects as may be needed or desired. The lifting member 76 can be placed in various different positions as may be needed and the versatility and some of the various positions are depicted and shown in Figures 9 and 10 in dash lines.

Referring now to Figures 2, 11 and 12 a means such as a winch 30 for winding up or paying out an elongate flexible member is provided and is located and mounted either on the lifting member 76 or the beam 16. Winch 130 is preferably operated by an electric motor although is it also
contemplated that hand operated winches can also be used. The winch 130 is affixed to the beam 16 or lifting member 76 by welding, bolts, and/or with other suitable means. Winch 130 includes an elongate flexible member such as rope or steel cable 132 which is extendable and selectively retractable in a known and customary manner. As shown in Figure 11, the rope or steel cable 132 can be extended and used while the roll bar and crane device 10 is operating as a roll bar. In the alternative, when the roll bar and crane device 10 is used as a crane, the rope or steel cable 132 can be extended through eyelet 128 for pulling and lifting objects such as a log 134.

So as to provide a more aesthetically pleasing roll bar and crane device and provide for greater safety during operation of the device as a crane, as shown in Figures 1 and 2, there are provided first and second cover members 136 and 138. Cover members 136 and 138 are shaped generally as mirror images of one another and having curvilinear outer portion 140 having a shape quite similar that of lifting member 76 near its respective end regions 100 and 102. Cover members 136 and 138 also include an inner arm portion 142. An opening 144 is provided and is located between the curvilinear outer portions 140 and the inner arm portion 142. The cover members 136 and 138 may be made of wood, polyurethane, plastic or other suitable materials and are affixed to one side of the lifting member 76 as best shown in Figure 1. The cover members 136 and 138 are affixed by fasteners such as screws, adhesives
and/or other suitable means. The inner arm portion 142 of cover member 138 functions to generally cover or disguise the hydraulic jack 108 from plain view while the inner arm portion 142 of the cover member 136 functions only for aesthetics with respect to the overall appearance of the roll bar and crane device 10.

The inner arm portion 142 of the cover member 138 is also provided with a slot 146 therethrough the valve control handle 118 extends for interconnection within the valve control port. It is noted that the pump handle (not shown) is also inserted through the slot 146 when placing within the pump handle receiving cylinder 112 of the hydraulic jack 108. The slot 146 is located and is sized so that the pump handle and the valve control handle 118 extend through the slot 146 and move therein relative to the motion of cover member 138 as the cylinder 116 is extended retracted. In the alternative, hydraulic jack 108 can be provided with the fluid pumping mechanism 110 and the pump handle receiving cylinder 112 on the opposite side of the hydraulic jack 108 shown in Figure 2. In such an embodiment, only the valve control handle 118 extends through the slot 146 and the pump handle is inserted into the pump handle receiving cylinder 112 through the cover opening 144. This embodiment is best seen in Figure 1 where the pump handle receiving cylinder 112 is slightly visible through the cover opening 144.
An additional cover member 148, also made of the same materials as the cover members 136 and 138, is also provided but is generally kidney shaped. Cover member 148 is affixed to the upper portion of pivot member 56, namely to one of the gusset members 96 or cap 64 with fasteners such as screws, adhesives and/or other suitable means. Thus, cover member 148 remains stationary while cover member 138 and lifting member 76 may be pivoted.

In an alternative embodiment as shown in Figures 13, 14 and 15, a first forward cover member 150 is provided on the other side of the lifting member 76 and the first cover member 136. Similarly, a second forward cover member 152 is provided on the other side of lifting member 76 and the second cover member 138. First forward cover member 150 is essentially a mirror image of first cover member 136 and second forward cover member 152 is essentially a mirror image of a second cover member 138. In this embodiment, however, cover members 136, 138, 150 and 152 are most preferably made of plastic by injection molding or vacuum forming and/or forming a polyurethane. When assembled to the lifting member 76, cover members 136 and 150 sandwich and enclose at least a part of the first end region 102, and cover members 138 and 152 sandwich and enclose at least a portion of the second end region 100. Here, the covers are affixed to the lifting member 76 and/or the opposing cover members with fasteners such
as screws, adhesives and other suitable means.

Finally, it is noted that the overall shape of the lifting member 76 and the cover members 136, 138, 150 and 152 are shaped as generally shown, similar to, and at least somewhat smaller than the vehicle cab adjacent thereto.

In Figure 9 there are depicted pads 20 at the lower end of vertical legs 18 of a substantially larger size. These pads 20 provide a greater surface area and distribute the forces of the roll bar and crane device 10 over a larger surface area of the vehicle bed 26.

While the invention has been described as having specific embodiments, it will be understood that it is capable of further modifications. This application is therefore, intended to cover any variations, uses, or adaptions of the invention following the present disclosure as come within known or customary practice in the art to which the invention pertains and fall within the limits of the appended claims.
WHAT IS CLAIMED IS:

1. A roll bar and crane device comprising a first leg member and a second leg member both of which are attachable to a vehicle; brace means for in use bracing at least one of the leg members in an upright configuration, the brace means being at least partly releasably attached to the at least one leg member; an elongate lifting member defining a first and a second end region; the first end region being releasably attached to the first leg member; the second end region being attached to the second leg member to allow the lifting member to selectively pivot about both a vertical axis and a horizontal axis, thereby allowing the device to operate as a crane when the first end region is released from the first leg member and allowing the device to operate as a roll bar when the first end region is attached to the first leg member.

2. The device of claim 1 wherein the brace means in use braces each of the leg members in an upright configuration.

3. The device of claim 2 wherein the brace means form part of each leg member, each leg member defining a vertical leg; and a bracing leg operatively extending downwardly at an angle from
the vertical leg; and the bracing leg being releasably attachable to the vertical leg to form the brace means.

4. The device of claim 2 wherein the brace means comprises a connecting member for releasably connecting the first and second leg members to each other.

5. A roll bar and crane device comprising a first leg member and a second leg member both of which are attachable to a vehicle; a connecting member for releasably connecting the first and second leg members to each other; an elongate lifting member defining a first and a second end region; the first end region being releasably attached to the first leg member; the second end region being pivotally attached to the second leg member to allow the lifting member to selectively pivot about both a vertical axis and a horizontal axis, thereby allowing the device to operate as a crane when the first end region is released from the first leg member and allowing the device to operate as a roll bar when the first end region is attached to the first leg member.

6. The device of claim 5 wherein the connecting member comprises an elongate beam defining a first end and a second end, the first
end being releasably attachable to the first leg member and the second end being releasably attachable to the second leg member.

7. The device of claim 6 wherein the first end of the elongate beam is receivable in a socket formation provided on the first leg member and the second end is receivable in a socket formation provided on the second leg member.

8. The device of claim 7 which includes securing means for releasably securing the elongate beam to the first and second leg members.

9. The device of claim 8 wherein the securing means comprises a number of nut and bolt combinations; and holes provided in the socket formations and the first and second ends, which holes in the socket formations and first and second ends are in use aligned to receive the bolts therethrough to secure said socket formations to said ends.

10. The device of claim 8 wherein the securing means comprises beam attachment plates at either end of the elongate beam; leg attachment plates on the first and second leg members; and
locking members in use provided through aligned holes in the beam attachment plates and the leg attachment plates to lock the beam attachment plates to the leg attachment plates.

11. The device of claim 5 wherein each leg member comprises a vertical leg and a bracing leg operatively extending downwardly at an angle from the upright leg.

12. The device of claim 11 wherein the bracing leg is releasably attachable to the vertical leg.

13. The device of claim 12 wherein a spigot and socket attachment is provided for releasably attaching the bracing leg to the vertical leg.

14. The device of claim 11 wherein the bracing leg includes a pad which is releasably attachable to the bracing leg.

15. The device of claim 14 wherein a spigot and socket formation is provided for releasably attaching the pad to the bracing leg.

16. The device of claim 5 wherein the elongate lifting member...
comprises a central region and first and second end regions extending generally transversely from the central region to provide the lifting member with a generally U-shaped configuration.

17. The device of claim 5 wherein the second end region of the elongate lifting member is releasably attached to the second leg member.

18. The device of claim 5 which includes a pivot member attached to the second leg member to pivot about a vertical axis of rotation; and the pivot member also being pivotally attached to the second end region of the lifting member allowing the lifting member to pivot about a horizontal axis.

19. The device of claim 18 wherein the pivot member includes an elongate section longitudinally and rotatably received in an elongate hollow vertical leg defined by the second leg member and the pivot member further including a cap secured to the elongate section to extend over a rim defined by the vertical leg at the operatively upper end thereof.
20. The device of claim 5 which includes controlling means for controlling pivoting of the lifting member about a vertical axis.

21. The device of claim 20 wherein the controlling means comprises a locking mechanism for locking the lifting member in certain positions as it pivots about the vertical axis.

22. The device of any one of the preceding claims which includes controlling means for controlling pivoting of the lifting member about a horizontal axis.

23. The device of claim 22 wherein the controlling means comprises a hydraulic jack for lifting the lifting member to pivot about the horizontal axis.

24. The device of claim 23 which includes cover members at each end region of the lifting member to hide the jack from plain view.
FIGURE 9

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INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER
IPC(6) : B60P 3/42
US CL : 212/180
According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED
Minimum documentation searched (classification system followed by classification symbols)

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>US 2,557,466 A (RICHARDS et al) 19 June 1951, see entire document.</td>
<td>1-8, 11, 12, 17, 18, 20-23</td>
</tr>
<tr>
<td></td>
<td>US 1,817,392 A (OHLIGER) 4 August 1931, see entire document.</td>
<td>5-8, 17, 18, 20</td>
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</table>

Further documents are listed in the continuation of Box C. See patent family annex.

Date of the actual completion of the international search
31 AUGUST 1997

Date of mailing of the international search report
24 SEP 1997

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