

A REMOTE QUICK RELEASE TOWING MECHANISM AND METHOD FOR REMOTELY RELEASING A TRAILER FROM A TOWED VEHICLE

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FIELD OF INVENTION

The present invention relates to a quick release towing mechanism that provides a vehicle operator the capability to remotely disengage a towed vehicle or trailer from the towing vehicle, particularly during amphibious operations.

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BACKGROUND

Conventionally, a towing attachment for towing trailers on land consists of a lunette ring attached to a trailer for hooking onto a towing pintle of a towing vehicle to join the trailer to the towing vehicle. The coupling between the trailer and the towing vehicle must be strong so that it is not easy to separate the trailer from the towing vehicle. Many current systems include some type of safety device, such as a cotter pin, that prevents accidental separation of the trailer from the towing vehicle.

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One problem with this conventional towing arrangement is that, once the trailer is attached to the towing vehicle, an operator is required to exit the cab of the vehicle to physically disengage or separate the trailer from the towing vehicle. In the case of an amphibious vehicle towing a trailer through a lake, river, stream or the like, should the trailer sink, it may pull the amphibious vehicle underwater as well if the trailer and amphibious vehicle are not separated in time. Currently, the only way to release the trailer is to physically release the locking jaw of the towing pintle on the amphibious vehicle or the trailer, depending on where it is mounted. This may not be possible in water, as the towing pintle may be completely submerged and inaccessible. This is hazardous to the crew in the amphibious vehicle and may require the crew to abandon the amphibious vehicle.

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One solution to the problem is to use ropes instead, that is, the amphibious vehicle is tied to the trailer using quick release knots. If there is a need to jettison the trailer, the

rope is released via the quick release knots to separate the trailer from the amphibious vehicle.

However, using ropes also poses a danger, in that the trailer is not securely attached to the towing vehicle. When negotiating a downward grade to enter the water, the trailer may move independently of the towing vehicle. Additionally, the quick release capability of the rope is only effective when there is some slack in the rope. Slacking of the rope may not occur when the trailer is pulling on the rope as it sinks.

A need therefore arises for a towing mechanism that addresses at least one of the above problems.

SUMMARY

A first aspect of the present invention provides a quick release towing mechanism comprising: a jettison assembly comprising; a base link; a first link pivotally connected to the base link; a second link pivotally connected to the first link, and a third link pivotally connected to the base link and the second link; wherein the first link and base link form a jaw structure, and the second and third links cooperate to allow the jaw structure to move between an open position for receiving a tow shaft assembly and a closed position for securing the tow shaft assembly during a towing operation; and means for remotely operating the jettison assembly; wherein the tow shaft assembly cooperates with the jettison assembly to allow a vehicle to tow a trailer or towed vehicle, such that a person in the vehicle can activate the means for remotely operating the jettison assembly to disengage the tow shaft assembly from the jettison assembly, thereby separating the vehicle from the trailer or towed vehicle.

In some embodiments, the jettison assembly may be mounted on the vehicle and the tow shaft assembly may be mounted on the trailer or towed vehicle. Alternatively, the jettison assembly may be mounted on the trailer or towed vehicle and the tow shaft assembly may be mounted on the vehicle. The person may activate the jettison assembly from within a cab of the vehicle.

The second and third links may form a locking mechanism that maintains the jaw structure in the closed position when a force is applied to the jaw structure by the tow shaft assembly.

- 5 The tow shaft assembly may further include a T-bar that can be secured within the jaw structure of the jettison assembly. The T-bar may further include a left and right roller that can be secured within the jaw structure of the jettison assembly.

- 10 The means for remotely operating the jettison assembly may include a lever connected to the jettison assembly, and a strap having a first end connected to the lever and second end that is accessible to the person, such that the person can apply a force to the strap to open the jettison assembly and release the tow shaft assembly.

- 15 In alternate embodiments, the means for remotely operating the jettison assembly may include a lever connected to the jettison assembly, a strap having a first end connected to the lever and a second end operably coupled to a winch mounted on the vehicle, such that the person can electrically activate the winch to open the jettison assembly and release the tow shaft assembly.

- 20 The jettison assembly may include a lunette ring that can be secured in a towing pintle of the towing vehicle.

- 25 The person may operate the jettison assembly from within a cab of the vehicle. The jettison assembly may be operated during an amphibious towing operation to release the trailer while traversing through water.

- 30 Another aspect of the present invention provides a method for remotely releasing a towed vehicle or trailer from a towing vehicle, the method comprising the steps of: providing a jettison assembly mounted on one of the towing vehicle or the towed vehicle or trailer; the jettison assembly comprising; a base link; a first link pivotally connected to the base link; a second link pivotally connected to the first link, and a third link pivotally connected to the base link and the second link; wherein the first link and base link form a jaw structure, and the second and third links cooperate to allow the jaw structure to move

between an open position for receiving the towing assembly and a closed position for securing the towing assembly during a towing operation; providing means for remotely operating the jettison assembly; providing a tow shaft assembly mounted on the other of the towing vehicle or the towed vehicle or trailer, wherein the tow shaft assembly cooperates with the jettison assembly to allow the vehicle to tow the trailer or towed vehicle; and activating the means for remotely operating the jettison assembly by opening the jaw structure to disengage the tow shaft assembly from the jettison assembly, thereby separating the vehicle from the trailer or towed vehicle.

The means for remotely operating the jettison assembly may include a lever connected to the jettison assembly, and a strap having a first end connected to the lever and second end that is accessible to a person on the vehicle, and wherein the activating step comprises having the person apply a force to the strap.

Alternately, the means for remotely operating the jettison assembly may include a lever connected to the jettison assembly, a strap having a first end connected to the lever and a second end operably coupled to a winch mounted on the vehicle, wherein the activating step comprises electrically activating the winch to open the jettison assembly and release the tow shaft assembly.

A person may perform the activating step from within a cab of the vehicle. The activating step may be performed during an amphibious towing operation to release the trailer while traversing through water.

BRIEF DESCRIPTION OF THE DRAWINGS

Embodiments of the invention will be better understood and readily apparent to one of ordinary skill in the art from the following written description, by way of example only, and in conjunction with the drawings, in which:

Figure 1a is a side view of a quick release towing mechanism connecting a vehicle with a trailer according to one embodiment of the present invention;

Figure 1b is a top view of a portion of the vehicle of Figure 1a showing one embodiment of a mechanism for releasing the quick release towing mechanism;

- 5 Figure 2 is an exploded perspective view of a jettison assembly that forms part of the towing mechanism of Figure 1;

Figure 3 is a perspective view of the jettison assembly of Figure 2;

- 10 Figure 4 is a perspective view of a tow shaft assembly of the quick release towing mechanism of Figure 1;

Figure 5 is a perspective view of the tow shaft assembly of Figure 4 when it is mounted on a trailer;

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Figure 6 is a close up side view of the quick release towing mechanism of Figures 1-5;

- 20 Figure 7 is a close up side view of the quick release towing mechanism of Figure 6, showing the forces acting on the mechanism in a closed position;

Figure 8 is a close up side view of the quick release towing mechanism of Figures 6 and 7 in a partially open position;

- 25 Figure 9 is a close up side view of the quick release towing mechanism of Figures 6-8 in a fully open position; and

Figure 10 illustrates one embodiment of a method for remotely releasing a trailer from a towed vehicle.

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DETAILED DESCRIPTION

Figure 1a shows one embodiment of a quick release towing mechanism 10 connecting a towing vehicle 12 to a trailer 14. The towing mechanism 10 includes a jettison assembly

100 mounted on the vehicle 12 and a tow shaft assembly 200 mounted on the trailer 14. Embodiments of the present invention allow an operator or passenger of the towing vehicle 12 to remotely disengage the jettison assembly 100 from the tow shaft assembly 200, thereby releasing the trailer 14 from attachment to the towing vehicle 12. A lever
5 150 can be connected to the jettison assembly 100 to provide a means to open and close the jettison assembly 100

One end of a line or strap 50 can be attached to the lever 150. The other end of the line or strap 50 can be run to a cab of the vehicle 12 to allow an operator or passenger in the
10 vehicle 12 to remotely disengage the jettison assembly from the tow shaft assembly 200. In alternate embodiments, the line or strap 50 could be connected to, for example, a winching mechanism (not shown) attached to the vehicle 12 such that an operator of the vehicle could activate a switch in the cab of the vehicle to electrically activate the winch to disengage the jettison assembly 100 from the tow shaft assembly 200. Similarly, a
15 motorized attachment mounted directly on the jettison assembly could be used. It is understood that other methods of activating the quick release towing mechanism to release the trailer could also be used.

Figure 1b illustrates a close up view of a portion of the vehicle 12, showing one
20 mechanism 52 for releasing the strap 50. The mechanism 52 can include a handle 54. By applying a force to the handle 54, sufficient tension can be applied to the strap 50 to raise the handle 150 and release the trailer 14 from the vehicle 12. The specific operation of the quick release towing mechanism is described below.

While the embodiment of the quick release towing mechanism 10 shown in the figures illustrates the jettison assembly 100 mounted on the vehicle 12, and the tow shaft assembly 200 mounted on the trailer 14, it is understood that the opposite configuration could also be used. Therefore, it is also possible for the jettison assembly 100 to be mounted on the trailer 14, while the tow shaft assembly 200 is mounted on the vehicle
30 12. Both configurations fall within the scope of the present invention.

The towing vehicle 12 can be any type of vehicle capable of towing a trailer or other vehicle. By way of example and not limitation, the towing vehicle 12 can be a wheeled vehicle, a tracked vehicle, a train, a boat, etc. The trailer 14 can be any type of trailer

capable of being towed. Alternately, the quick release towing mechanism 10 can be used by one vehicle 12 to tow another vehicle. All such towing arrangements are considered to fall within the scope of the present embodiments.

5 Figure 2 shows an exploded view of the jettison assembly 100. Figure 3 shows a perspective view of the assembled jettison assembly 100. With reference to Figures 2 and 3, the jettison assembly 100 operates as a four bar link to open and close. The jettison assembly 100 includes a base link 102, a first link 120 pivotally attached to the base link 102, a second link 140 pivotally attached to the first link 120, and a
10 third link 160, pivotally attached to both the base link 102 and the second link 140. For purposes of the following discussion, it is understood that terms left, right, upper, lower, etc. refer to the orientation shown in the Figures, and should not be construed as limiting the scope of the embodiments in any way.

15 In this embodiment, the base link 102 includes a lunette ring 104 that can be mounted on a standard towing pintle (not shown) of a vehicle 14. In alternate embodiments, the jettison assembly 100, or tow shaft assembly 200, can be mounted directly onto the vehicle 12.

20 A portion of the base link 102 can also include a lower jaw portion 106 that forms part of a clamp jaw structure for securing the tow shaft assembly 200. The lower jaw portion 106 can be substantially flat, to allow easy disengagement of the tow shaft assembly 200. The base link 102 can also include a rounded portion 107 forward of the lower jaw portion for receiving a portion of the tow shaft assembly. This will be discussed in more
25 detail below.

The base link 110 can also include a first pivot hole 108 for receiving a first pivot pin 109 that pivotally secures the base link 102 to the first link 120. In the embodiment shown, the first pivot pin 109 can be secured using, for example, a washer 109a, a nut 109b,
30 and a safety pin 109c that prevents the nut 109b from unscrewing during towing operations. Alternate devices and methods for securing the various pivot pins discussed herein are also possible.

The base link 102 can also include a fourth pivot hole 110 for receiving a fourth pivot pin 111 that pivotally secures the base link 102 to the third link 160 (the second and third pivot holes/pins are discussed below). In the embodiment shown, the fourth pivot pin 111 can be secured using, for example, a c-clip 111a.

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The first link 120 can include left and right flanges 122a, 122b each having a corresponding pivot hole 123a, 123b for receiving the first pivot pin 109. The left and right flanges 122a, 122b can also each have a left and right pivot hole 124a, 124b for receiving a second pivot pin 126 that pivotally secures the first link 120 to the second link 140. In the embodiment shown, the second pivot pin 126 can be secured using, for example, a washer (not shown), a nut 126a, and a cotter pin 126b that can be secured in a corresponding cotter pin hole 126c on the second pivot pin 126 to prevent the nut 126a from unscrewing during towing operations.

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Each of the flanges 122a, 122b can include a curved portion 128 that is configured to secure the tow shaft assembly 200 during towing operations. Similarly, an upper jaw portion 130 can be configured to contact the lower jaw portion 106 to secure the tow shaft assembly 200 during towing operations. Together, the base link 102 and the first link 120 form a hook jaw for securing the tow shaft assembly 200 during towing operations. It is understood that many different designs for the upper jaw portion 130 and lower jaw 106 can be provided depending on the specific design of the tow shaft assembly 200. All such designs are deemed to fall within the scope of the embodiment of the present invention illustrated.

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The second link 140 can include a first pivot hole 142 for receiving the pivot pin 126 that pivotally secures the first link 120 to the second link 140. The second link 140 can also include a second pivot hole 144 for receiving a third pivot pin 145 that pivotally secures the second link 140 to the third link 160. In the embodiment shown, the third pivot pin 145 can be secured using, for example, a c-clip 145a.

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The second link 140 can also include a locking pin hole 146 for receiving a locking pin 147 that fixedly secures the second link 140 and third link 160 during normal towing operations. The locking pin 147 can be secured by, for example, a safety pin 147a that can be placed in a corresponding safety pin hole 147b in the locking pin 147. The

locking pin 147 prevents movement of the links when it is installed, thus locking the hook jaw closed during towing operations. It is also possible to temporarily secure the locking pin 147. In alternate embodiments, other structures, such as a pneumatically operated or spring loaded piston, may be used to secure the links.

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The third link 160 can include left and right flanges 162a, 162b connected by a center section 166. Each of the flanges 162a, 162b can include a first pivot hole 163a, 163b for receiving the third pivot pin 145 that pivotally secures the second link 140 to the third link 160, as previously discussed. Similarly, each of the flanges 162a, 162b can include a
10 second pivot hole 164a, 164b for receiving the fourth pivot pin 111 that pivotally secures the base link 102 to the third link 160, as previously discussed.

The center section 166 can include an opening 168 for receiving a lower portion 152 of the handle 150. The center section 166 can also include a hole 169 for receiving a
15 cotter pin 169a that can be used to secure the handle 150 to the center section 166 through a corresponding hole 153 in the lower portion 152. The handle 150 can also include a connector 154 for receiving the strap 50 used to disengage the jettison assembly 100 from the tow shaft assembly 200. It is understood that any type of connector that allows the strap 50 to be attached to the handle 150 can also be used.

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In the embodiment shown, the base link 102, first link 120, second link 140, and third link 160 can be made of a metal or metal alloy that has been cast, machined, or otherwise formed according to techniques known to those of skill in the art. Alternately, separate component parts could be welded or brazed together to form
25 one or more of the links. In a preferred embodiment, the links are made from a type of steel.

Figure 4 shows a perspective view of the tow shaft assembly 200 of the quick release towing mechanism 10. Figure 5 shows a perspective view of the tow shaft assembly 200 mounted on the trailer 14. With reference to Figures 4 and 5, the tow shaft assembly 200 can include a main shaft 202 that can further include a T-bar 210 on
30 the front end, a central section 230, and a rear section 206. In some embodiments, the rear section 206 may include threads (not shown) to secure the tow shaft assembly 200 to the trailer 14 using, for example, a locking nut 208. It is appreciated that various other

mechanisms known to those of skill in the art can be used to secure the tow shaft assembly 200 to the trailer 14.

In some embodiments, the main shaft 202, portions of the T-bar 210, the central section 230 and the rear section 206 can be formed from a unitary piece of steel that has been machined to the desired shape. Other materials may also be used. Alternately, the T-bar 210 and/or the central section 230 can be attached to the main shaft 202 using techniques known to those of skill in the art.

10 The T-bar 210 includes a shaft 212 having a substantially rectangular cross section. It is understood that many other cross-sectional shapes could also be used. The shaft 212 can include a rounded portion 214 on its front end. In this embodiment, the rounded portion 214 of the shaft 212 is shaped to engage the rounded portion 107 of the base link 102. The rounded portion 214 of the shaft 212 may also include a through hole (not shown).

The T-bar 210 can also include a left and right roller 216a, 216b that can be secured within the curved portion 128 of the left and right flanges 122a, 122b on the first link 120 during a towing operation. In this embodiment, the rollers 216a, 216b can be secured to the shaft 212 using, for example, one or more washers 218 secured by nuts 220 to a threaded section 222 that extends through the through hole (not shown) in the rounded portion 214 of the shaft 212. In some embodiments, the rollers 216a, 216b can be made from a rubber or high density plastic compound. It is understood that other types of rollers, including, but not limited to, roller bearings, could also be used, depending on the loads and environment. Similarly, other materials could be used for the rollers, including, but not limited to softer metals, brass, bronze, or higher density polymers.

The central section 230 can be larger in cross sectional area than the rear portion 206 of the shaft 202 to allow the central section 230 to seat against a face 18 of the trailer 14. In this embodiment, the central section 230 can include perpendicular sides 232a, 232b (232b not shown) that are immediately adjacent corresponding stops 20a, 20b on the face 18 of the trailer 14. The sides 232a, 232b and stops 20a, 20b cooperate to prevent the tow shaft assembly 200 from rotating when it is mounted on the trailer 14.

Figure 6 shows a close up side view of the quick release towing mechanism 10. It illustrates the operating principle of the four bar link used in the jettison assembly 200. With reference to Figure 2, for purposes of this operational discussion, the fixed link is illustrated as a line 40 that runs from a center of the first pivot pin 109, to the center of the fourth pivot pin 111. The first link is illustrated as a line 42 that runs from the center of the first pivot pin 109 to the center of the second pivot pin 126. The second link is illustrated as a line 44 that runs from the center of the second pivot pin 126 to the center of the third pivot pin 145. The third link is illustrated as a line 46 that runs from the center of the third pivot pin 145 to the center of the fourth pivot pin 111. The lines 40, 42, 44 and 46 represent the relative movement of the links 202, 220, 240, 260 with respect to each other.

Figure 7 is a close up side view of Figure 6, showing the forces acting on the quick release towing mechanism 10 in a closed position. By careful arrangement and shaping of the links 202, 220, 240, 260, the T-bar 210 and the hook jaw, a force, illustrated as arrow 50, exerted in any direction by the T-bar 210 on the jettison assembly 100, whether pushing or pulling, is converted into an anti-clockwise rotational motion, illustrated as arrow 52. This in turn compresses the locking action further as indicated by the two pairs of arrows 54, 56. Therefore, the first link 120 and second link 140 form a locking mechanism such that, once the hook jaw is closed, it tends to remain closed regardless of the forces exerted by the T-bar 210 on the lock jaw.

With reference to Figure 6, this principle is illustrated by a line that can be drawn between the second pivot pin 126 and the fourth pivot pin 111. As long as the center of the third pivot pin 145 is below this line (neutral position), any force exerted on the quick release mechanism 10 tends to increase the angle of lines 44 and 46 in a downward direction.

Advantageously, even if the lever 150 vibrates in operation, as long as the vibrations do not cause the locking pivot 145 to be lifted beyond the neutral point, the hook jaw remains in a grip configuration and the T-bar 210 cannot be separated from the hook jaw. As such, the towing mechanism 10 is advantageously immune to minor vibrations of the lever 150.

Figure 8 is a close up side view of the quick release towing mechanism 10 of Figures 6 and 7 in a partially open position. In operation, when an operator of the vehicle 12 pulls on the rope or strap 50, a rotational force, illustrated as arrow 60 in Figure 8, is exerted about pivot pin 111. This in turn exerts a lifting force on pivot pin 145. With
5 reference to Figure 6, once the pivot pin 145 rises above the line running between the second pivot pin 126 and the fourth pivot pin 111, any force exerted by the tow shaft assembly 200 on the jettison assembly 100 tends to open the hook jaw, as shown in Figure 9.

10 Before beginning an amphibious towing operation, the vehicle operator can remove the locking pin 147. Since the four bar linkage is designed as described above, even with the locking pin 147 removed, the tow shaft assembly 200 will not accidentally disengage from the jettison assembly 100. If the trailer begins to sink in an amphibious environment, the operator or a passenger of the vehicle 12 can apply
15 a force to the strap 50 to activate the jettison assembly 100. Once the hook jaw formed by the base link 102 and the first link 120 partially opens up past the neutral point, the force exerted by the T-bar 210 will cause the hook jaw to fully open, thus releasing the trailer.

20 Figure 10 illustrates one method, designated generally as reference numeral 300, for remotely releasing a towed vehicle or trailer 14 from a towing vehicle 12. The method 300 can include a first step of providing a jettison assembly 100 mounted on one of the towing vehicle 12 or the towed vehicle or trailer 14, as illustrated with reference numeral 302. The method 300 can also include a step for providing means for remotely
25 operating the jettison assembly 100, as illustrated with reference numeral 304. Next the method 300 can include a step of providing a tow shaft assembly 200 mounted on the other of the towing vehicle 12 or the towed vehicle or trailer 14, wherein the tow shaft assembly 200 cooperates with the jettison assembly 100 to allow the vehicle 12 to tow the trailer or towed vehicle 14, as illustrated with reference numeral 306. The method
30 300 may also include a final step of activating the means for remotely operating the jettison assembly 100 to disengage the tow shaft assembly 200 from the jettison assembly 100, thereby separating the vehicle 12 from the trailer or towed vehicle 14, as illustrated with reference numeral 308.

The quick release towing mechanism of the present invention provides several advantages over the prior art. First, when a vehicle is towing a trailer or other vehicle in an amphibious operation, and the towed vehicle or trailer begins to sink, the operator of the vehicle need not risk drowning or other injury to release the towed vehicle or trailer.

The robust design of the four bar linkage provides a mechanism that is relatively immune to vibration, even when traversing rough terrain. Even with the safety pin removed, the jettison assembly will not open when force is applied to the tow shaft assembly.

The quick release towing mechanism thus described therefore provides the capability to perform towing operations in any type of terrain, and further allows an operator or passenger in the towing vehicle to remotely release the trailer if necessary.

It will be appreciated by a person skilled in the art that numerous variations and/or modifications may be made to the present invention as shown in the specific embodiments without departing from the spirit or scope of the invention as broadly described. The present embodiments are, therefore, to be considered in all respects to be illustrative and not restrictive.

CLAIMS

1. A quick release towing mechanism comprising:
a jettison assembly comprising;
5 a base link;
a first link pivotally connected to the base link;
a second link pivotally connected to the first link, and
a third link pivotally connected to the base link and the second link;
wherein the first link and base link form a jaw structure, and the
10 second and third links cooperate to allow the jaw structure to move between
an open position for receiving a tow shaft assembly and a closed position for
securing the tow shaft assembly during a towing operation; and
means for remotely operating the jettison assembly;
wherein the tow shaft assembly cooperates with the jettison assembly to
15 allow a vehicle to tow a trailer or towed vehicle, such that a person in the vehicle can
activate the means for remotely operating the jettison assembly to disengage the tow
shaft assembly from the jettison assembly, thereby separating the vehicle from the
trailer or towed vehicle.
- 20 2. The towing mechanism of claim 1, wherein the jettison assembly is mounted
on the vehicle and the tow shaft assembly is mounted on the trailer or towed vehicle.
3. The towing mechanism of claim 1, wherein the jettison assembly is mounted
on the trailer or towed vehicle and the tow shaft assembly is mounted on the vehicle.
- 25 4. The towing mechanism of any one of claims 1-3, wherein the person can
activate the jettison assembly from within a cab of the vehicle.
- 30 5. The towing mechanism of claim 4, wherein the second and third links form
a locking mechanism that maintains the jaw structure in the closed position when
a force is applied to the jaw structure by the tow shaft assembly.
- 35 6. The towing mechanism of claims 4 or 5, wherein the tow shaft assembly
further comprises a T-bar that can be secured within the jaw structure of the jettison
assembly.

7. The towing mechanism of claim 6, wherein the T-bar further comprises a left and right roller that can be secured within the jaw structure of the jettison assembly.
- 5 8. The towing mechanism of any one of claims 1-7, wherein the means for remotely operating the jettison assembly comprises a lever connected to the jettison assembly, and a strap having a first end connected to the lever and second end that is accessible to the person, such that the person can apply a force to the strap to open the jettison assembly and release the tow shaft assembly.
- 10 9. The towing mechanism of any one of claims 1-7, wherein the means for remotely operating the jettison assembly comprises a lever connected to the jettison assembly, a strap having a first end connected to the lever and a second end operably coupled to a winch mounted on the vehicle, such that the person can
- 15 electrically activate the winch to open the jettison assembly and release the tow shaft assembly.
10. The towing mechanism as claimed in any one of the preceding claims, wherein the jettison assembly further comprises a lunette ring that can be secured
- 20 in a towing pintle of the towing vehicle.
11. The towing mechanism as claimed in any one of the preceding claims, wherein the person can operate the jettison assembly from within a cab of the vehicle.
- 25 12. The towing mechanism as claimed in any one of the preceding claims, wherein the jettison assembly can be operated during an amphibious towing operation to release the trailer while traversing through water.
- 30 13. A method for remotely releasing a towed vehicle or trailer from a towing vehicle, the method comprising the steps of:
- providing a jettison assembly mounted on one of the towing vehicle or the towed vehicle or trailer; the jettison assembly comprising;
- 35 a base link;
- a first link pivotally connected to the base link;
- a second link pivotally connected to the first link, and
- a third link pivotally connected to the base link and the second link;

wherein the first link and base link form a jaw structure, and the second and third links cooperate to allow the jaw structure to move between an open position for receiving the towing assembly and a closed position for securing the towing assembly during a towing operation;

5 providing means for remotely operating the jettison assembly;

providing a tow shaft assembly mounted on the other of the towing vehicle or the towed vehicle or trailer, wherein the tow shaft assembly cooperates with the jettison assembly to allow the vehicle to tow the trailer or towed vehicle; and

10 activating the means for remotely operating the jettison assembly by opening the jaw structure to disengage the tow shaft assembly from the jettison assembly, thereby separating the vehicle from the trailer or towed vehicle.

14. The method of claim 13, wherein the means for remotely operating the jettison assembly comprises a lever connected to the jettison assembly, and a strap having a first end connected to the lever and second end that is accessible to a person on the vehicle, and wherein the activating step comprises having the person apply a force to the strap.

20 15. The method of claim 13, wherein the means for remotely operating the jettison assembly comprises a lever connected to the jettison assembly, a strap having a first end connected to the lever and a second end operably coupled to a winch mounted on the vehicle, wherein the activating step comprises electrically activating the winch to open the jettison assembly and release the tow shaft assembly.

16. The method of any one of claims 14 or 15, wherein a person can perform said activating step from within a cab of the vehicle.

30 17. The method of any one of claims 13-16, wherein said activating step can be performed during an amphibious towing operation to release the trailer while traversing through water.

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REMOTELY RELEASING A TRAILER FROM A TOWED VEHICLE**

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ABSTRACT

Embodiments of the present invention provide a quick release towing mechanism that includes a jettison assembly; means for remotely operating the jettison assembly; and a tow shaft assembly that cooperates with the jettison assembly to allow a vehicle to tow a trailer or towed vehicle, such that a person in the vehicle can activate the means for remotely operating the jettison assembly to disengage the tow shaft assembly from the jettison assembly, thereby separating the vehicle from the trailer or towed vehicle. A method for remotely releasing a trailer from a towed vehicle is also disclosed.

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Figure 1a