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Esquilin-Mangual et al.

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(54) **FORKLIFT ADAPTIVE ACCESSORY**

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(72) Inventors: **Omar Esquilin-Mangual, Vicksburg,
MS (US); Devin K. Sham, Vicksburg,
MS (US)**

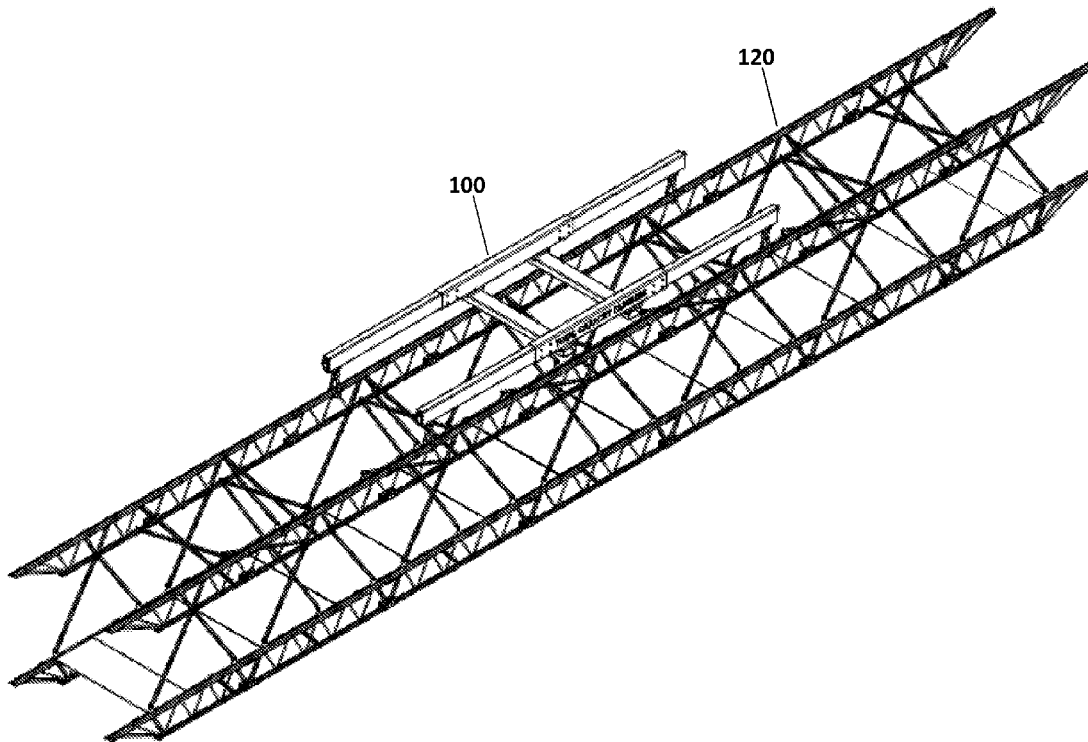
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(57) **ABSTRACT**

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This invention relates to the field of construction vehicles, and more particularly, to an accessory for extending the capacity of a forklift to accommodate long payloads previously requiring the use of a crane.



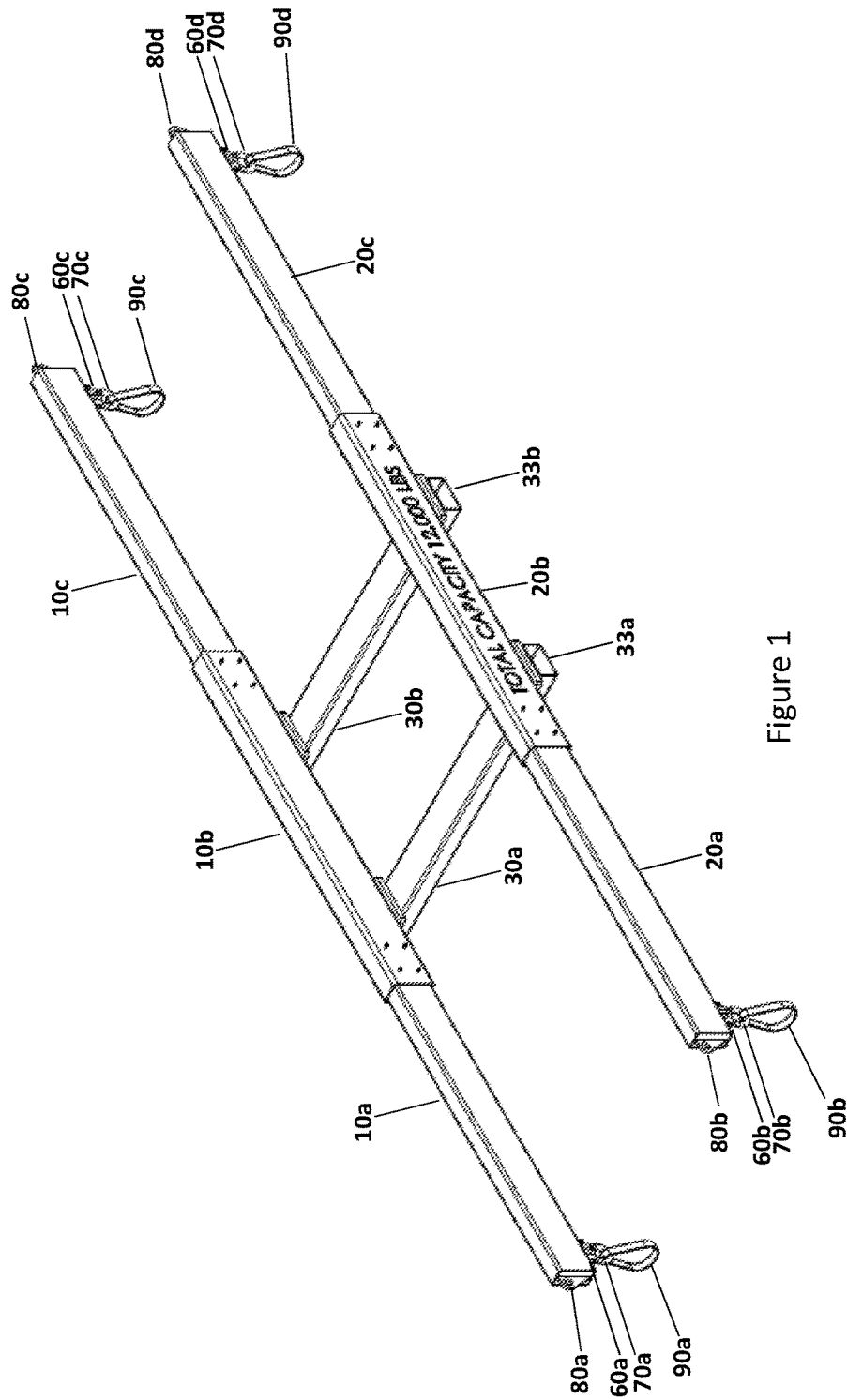


Figure 1

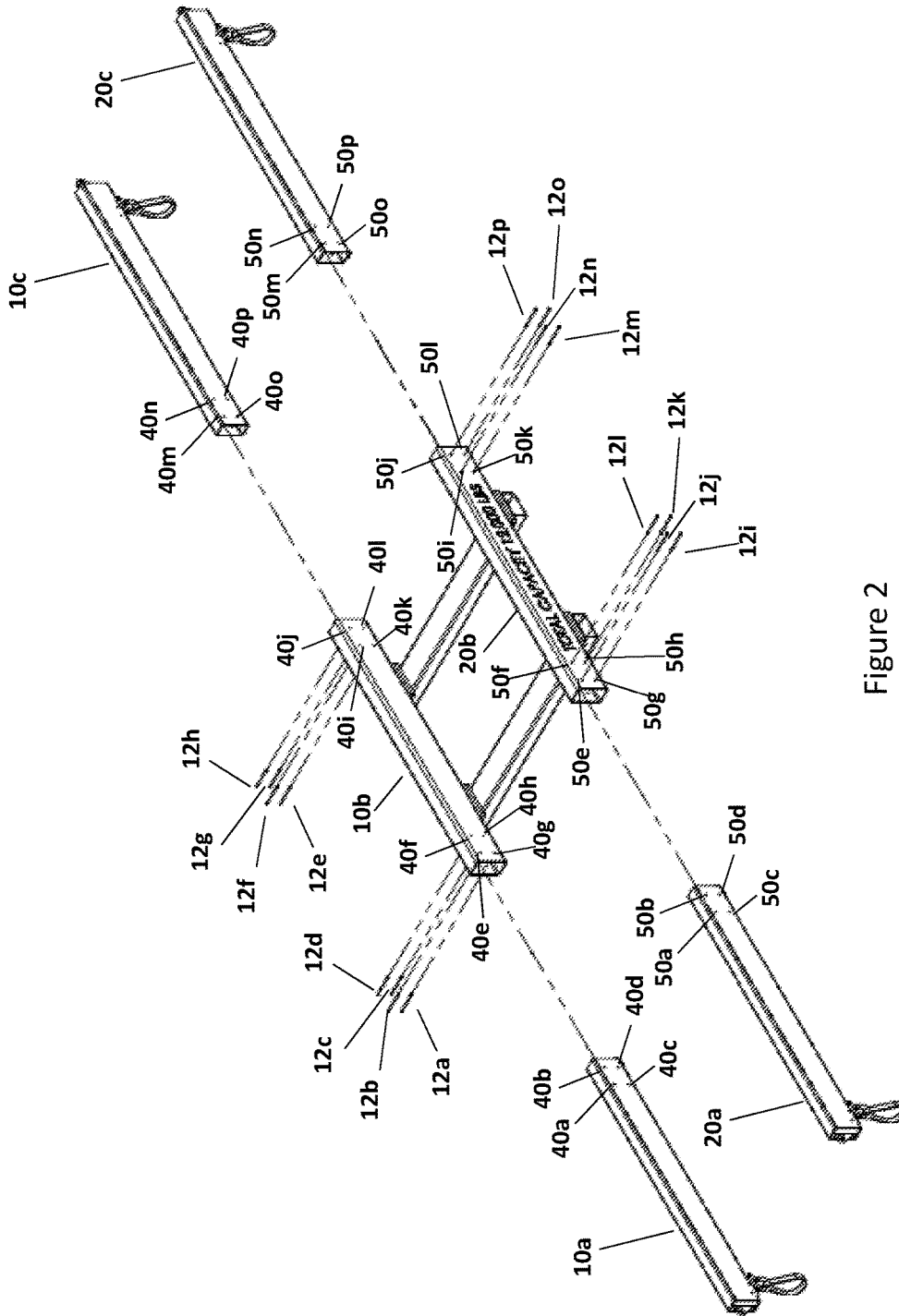


Figure 2

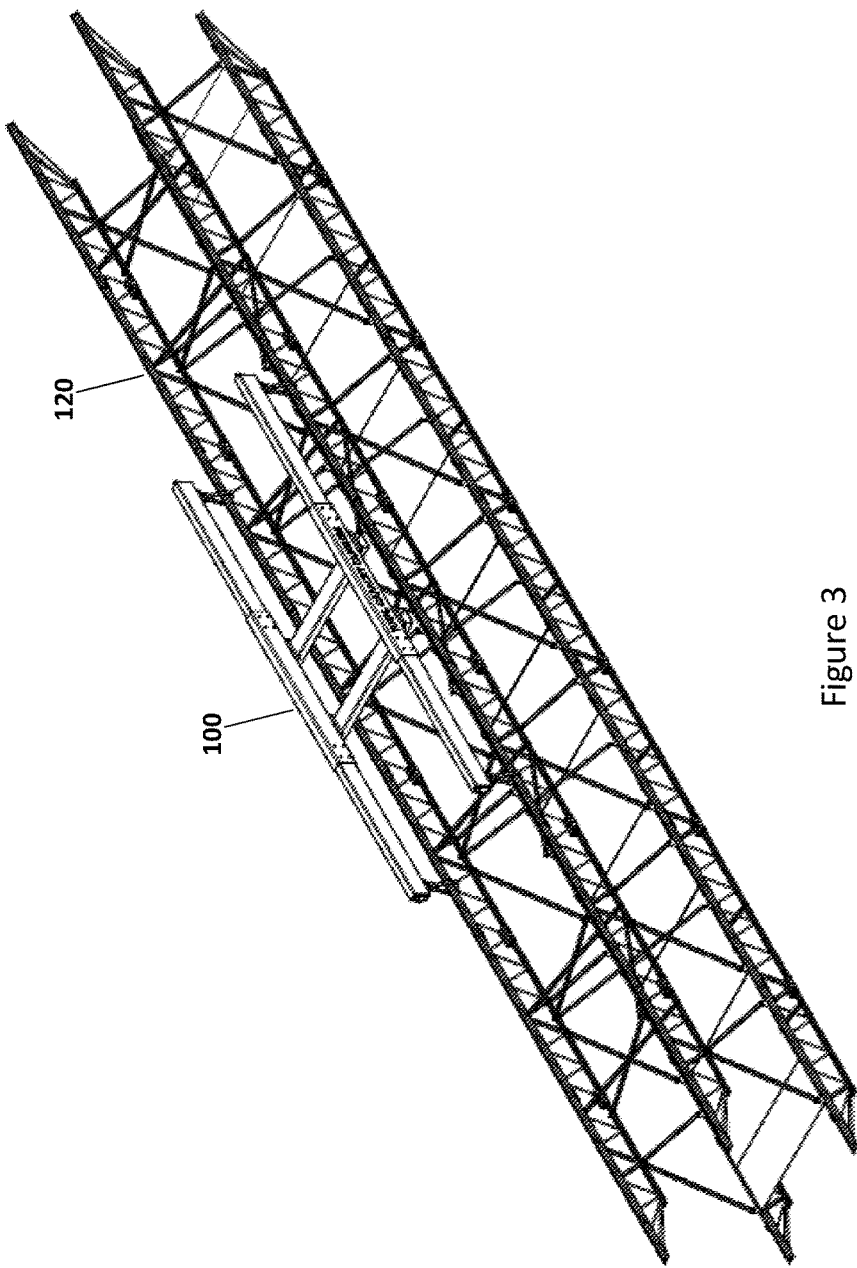


Figure 3

FORKLIFT ADAPTIVE ACCESSORY

STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT

[0001] The invention described herein was made by an employee of the United States Government and may be manufactured and used by the Government of the United States of America for governmental purposes without the payment of any royalties thereon or therefore.

FIELD OF INVENTION

[0002] This invention relates to the field of construction vehicles, and more particularly, to an accessory for extending the capacity of a forklifts and cranes.

BACKGROUND OF THE INVENTION

[0003] The Army Corps of Engineers (USACE) continuously develops tactical and civil engineering solutions to protect troops in hostile environments. These solutions include providing rapidly deployed, modular structures to protect assets from harmful projectiles or ballistics.

[0004] US Patent No. 2014/0130438 (the '348 patent) teaches a system developed by USACE for rapidly deploying antiballistic shelters that can be constructed from human portable components.

[0005] However, it is a problem known in the art that the construction of larger modular facilities requires joists in excess of 30 to 50 feet. Building with structural components of this size generally requires the use of cranes.

[0006] Typically, cranes must be rented at a cost of \$12,000 to \$20,000 per month and shipped to the site. Currently, the government faces a nation-wide shortage of cranes and direct economic competition with the private sector to rent this equipment.

[0007] The cost and availability of cranes is a significant problem known in the art for both civilian and military construction projects and results in frequent costs and delays.

[0008] There is an unmet need for tooling equipment that can accomplish lifting operations that previously required cranes to facilitate rapid and cost-effective deployment of military and civilian facilities.

SUMMARY OF THE INVENTION

[0009] The invention is a stabilizing tool for use with forklifts and cranes that enables rapid and accurate placement of long construction components partially assembled on the ground. The invention enables use of a forklift to lift long construction components having multiple attachment points which might be destabilized and deformed during lifting and placement.

[0010] The stabilizing tool minimizes the number of lifting operations required and provides controlled placement of objects. The invention may be used by a wide range of forklifts and comparable equipment without the need to modify or retrofit the equipment, greatly expanding the functionality and efficiency of forklifts known in the art.

BRIEF DESCRIPTION OF SEVERAL VIEWS OF THE DRAWING(S)

[0011] FIG. 1 illustrates an exemplary forklift adaptive accessory for accurately placing large building components.

[0012] FIG. 2 illustrates an exploded view of a forklift adaptive accessory.

[0013] FIG. 3 illustrates an exemplary forklift adaptive accessory in use with a forklift.

TERMS OF ART

[0014] As used herein, the term "fixedly attached" means non-removable except during construction.

Detailed Description of the Invention

[0015] FIG. 1 illustrates exemplary forklift adaptive accessory **100** for accurately placing large building components.

[0016] Visible in FIG. 1 are elongated members **10** and **20**, central supports **30a** and **30b**, and rigging components **90a**, **90b**, **90c**, and **90d**.

[0017] In the embodiment shown, elongated member **10** is comprised of segments **10a**, **10b** and **10c**. Elongated member **20** is comprised of segments **20a**, **20b** and **20c**. Central supports **30a** and **30b** have open hollow ends **33a** and **33b** for engaging the forks of a forklift. Central supports **30a** and **30b** are fixedly attached at a perpendicular orientation to segments **10b** and **20b**, and are spaced at a distance of 3.5 feet.

[0018] In various embodiments, segments **10a** and **10c** and **20a** and **20c** may be detached from segments **10b** and **20b** for storage.

[0019] In other embodiments, segments **10a** and **10c** and **20a** and **20c** may be telescoping.

[0020] Segments **10a**, **20a**, **10c**, and **20c** include rigging protuberances **60a**, **60b**, **60c** and **60d** with apertures for receiving shackles **70a**, **70b**, **70c**, and **70d**.

[0021] Shackles **70a**, **70b**, **70c**, and **70d** receive rigging components **90a**, **90b**, **90c**, and **90d**. In various embodiments, each one of shackles **70a**, **70b**, **70c**, and **70d** receive one of rigging components **90a**, **90b**, **90c**, or **90d** that engage the lifted object at four distinct attachment points.

[0022] In other embodiments, rigging components attach shackle **70a** to shackle **70b** to form one sling and rigging components attach shackle **70c** to shackle **70d** to form a second sling; the two slings can accommodate a long object without attachment points, such as a plank or panel.

[0023] In various embodiments, more or fewer rigging components may be present.

[0024] Rigging components may be cables, ropes, chains, or nylon, provided the total combined capacity of the rigging components is at least 12,000 lbs. In one exemplary embodiment, forklift adaptive accessory **100** includes 4 nylon web straps that are each 2 inches wide and 3 feet long. In this embodiment, the capacity of each of these 4 nylon web straps is 5100 lbs (using a choker hitch knot) or 12,800 lbs (using a basket hitch knot).

[0025] In various embodiments, crane protuberances **80a**, **80b**, **80c** and **80d** are fixedly attached to segments **10a**, **20a**, **10c**, and **20c** by welding. In alternate embodiments, crane protuberances **80a**, **80b**, **80c** and **80d** are integrally formed during the manufacturing of segments **10a**, **20a**, **10c**, and **20c**.

[0026] In various embodiments, crane rigging components must have a combined capacity of at least 12,000 lbs. If there are four crane rigging components and each engages a single crane protuberance **80**, then each crane rigging component needs a minimum capacity of 3,000 lbs.

[0027] In various embodiments, forklift adaptive accessory **100** operates as a stabilizing tool for use with a forklift that enables rapid and accurate placement of long construction components which generally require the use of a crane. Forklift adaptive accessory **100** provides multiple attachment points for long objects which may bend or deform if portions of more than six feet, up to twenty feet, are left unsupported.

[0028] In various embodiments, forklift adaptive accessory **100** provides added support for objects having weakened areas at seams or attachment points. In various embodiments, forklift adaptive accessory **100** may expedite construction of all types of structures by allowing more on-ground assembly and fewer lifting operations.

[0029] Forklift adaptive accessory **100** minimizes the number of lifting operations required and provides controlled placement of objects. Forklift adaptive accessory **100** may be used by a wide range of forklifts and comparable equipment without the need to modify or retrofit the equipment, greatly expanding the functionality and efficiency of forklifts known in the art.

[0030] In the exemplary embodiment shown, forklift adaptive accessory **100** has a lifting capacity of 12,000 pounds. In the exemplary embodiment shown, forklift adaptive accessory **100** is constructed from high strength steel tubing and weighs 1350 pounds.

[0031] FIG. 2 illustrates an exploded view of forklift adaptive accessory **100**. Elongated member **10** is comprised of segments **10a**, **10b** and **10c**.

[0032] Segment **10a** includes apertures **40a-d**, that align with apertures **40 e-h** in segment **10b**, into which securing pins **12a**, **12b**, **12c** and **12d** are inserted.

[0033] Segment **10c** includes apertures **40m-p**, that align with apertures **40 i-l** in segment **10b**, into which securing pins **12e-h** are inserted.

[0034] Segment **20a** includes apertures **50a-d**, that align with apertures **50 e-h** in segment **20b**, into which securing pins **12i-l** are inserted.

[0035] Segment **20c** includes apertures **50m-p**, that align with apertures **50 i-l** in segment **20b**, into which securing pins **12m-p** are inserted.

[0036] Other embodiments may include more or fewer securing pins or apertures.

[0037] In various embodiments, segments **10a** and **10c** and **20a** and **20c** may be detached from segments **10b** and **20b** for storage.

[0038] In other embodiments, segments **10a** and **10c** and **20a** and **20c** may be telescoping.

[0039] FIG. 3 illustrates exemplary forklift adaptive accessory **100** in use.

[0040] FIG. 3 shows forklift adaptive accessory **100** and object **120**.

[0041] In the exemplary embodiment shown, rigging components connect forklift adaptive accessory **100** to object **120** at four distinct attachment points.

[0042] In various embodiments, more or fewer rigging components may be present and the number of attachment points on object **120** may vary.

[0043] In various embodiments, object **120** may be as long as 75 feet and may weigh up to 12,000 pounds. In various embodiments, object **120** may be a plank or panel without easily accessible attachment points. Altering the configuration of the rigging components will allow forklift adaptive accessory **100** to lift an object that does not have easily accessible attachment points.

What is claimed is:

1. forklift accessory comprised of:
 - a plurality of elongated members comprised of a plurality of segments wherein said plurality of segments of said elongated members include apertures into which securing pins are inserted and wherein said apertures of said plurality of segments align and accept said securing pins to secure said plurality of segments; and
 - central supports wherein said central supports are fixedly attached to said elongated members at a perpendicular orientation and are hollow and have open ends for engaging the forks of a forklift.
2. (canceled)
3. (canceled)
4. The accessory of claim 1, wherein said segments of said elongated members may detach for storage.
5. (canceled)
6. (canceled)
7. The accessory of claim 1, wherein a number of d apertures is greater than a number of said securing pins.
8. The accessory of claim 7, wherein a position of said apertures allows said elongated members to be secured in alternative positions.
9. The accessory of claim 8, wherein said alternative positions produce said elongated members having adjustable length.
10. The accessory of claim 1, wherein said segments include rigging protuberances that have apertures for receiving shackles.
11. The accessory of claim 10, wherein said shackles receive rigging components that engage a lifted object.
12. (canceled)
13. The accessory of claim 11, wherein said lifted object has attachment points.
14. The accessory of claim 11, wherein said lifted object is approximately 25 to 75 feet long.
15. The accessory of claim 11, wherein said lifted object weighs approximately 500 to 12,000 pounds.
16. The accessory of claim 1, wherein said segments include crane protuberances that have apertures.
17. The accessory of claim 16, wherein said apertures receive rigging components that engage a crane.

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