Sept. 22, 1959 R. S. JAKUBOWSKI 2,905,501

LIFTING HITCH

Filed July 7, 1955

Fig. 1.

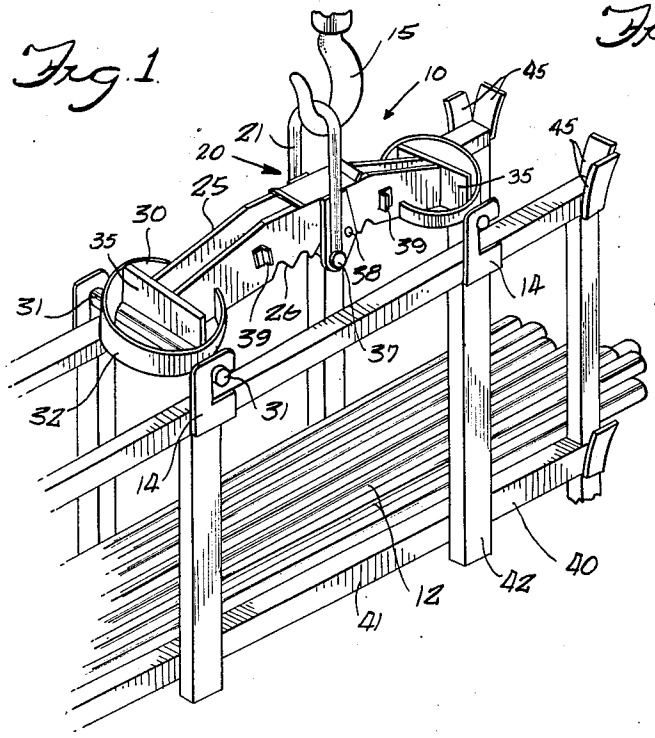


Fig. 2.

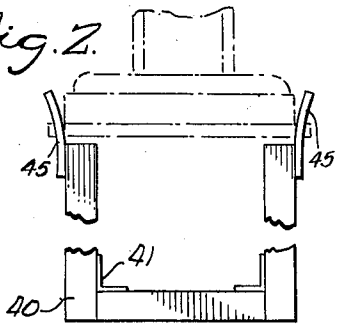


Fig. 3.

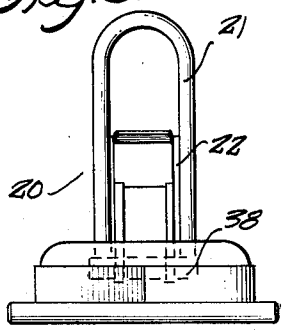


Fig. 4.

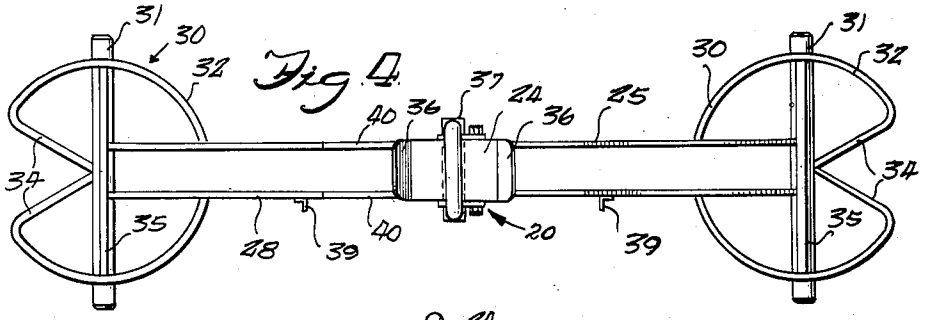
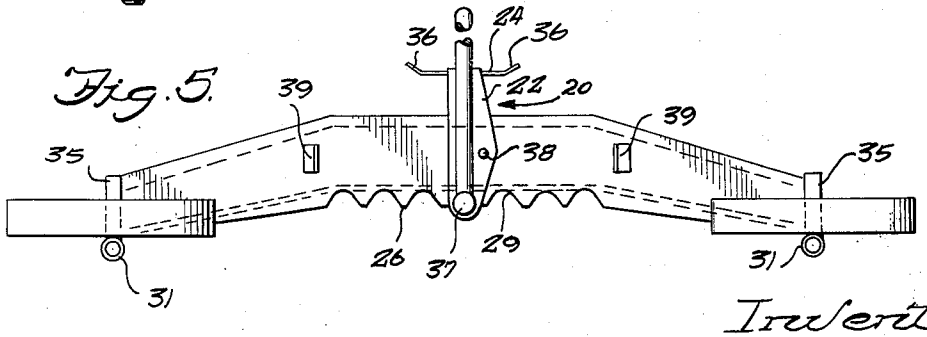


Fig. 5.



Inventor
Richard S. Jakubowski
by. Jack [illegible]
Attorney

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LIFTING HITCH

Richard S. Jakubowski, Chicago, Ill., assignor to Jarke Manufacturing Company

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1 Claim. (Cl. 294—81)

The present invention relates to the handling of materials, and in particular pertains to a hitch which may be used with an overhead crane and like lifting devices.

The handling of materials is becoming increasingly more mechanized. In addition, the storage of materials is becoming unitized, standardized, and packaged. Where heavy and lengthy goods are concerned such as bar stock, pipe, and the like they are often stored on racks, which are stacked one atop the other. Naturally, since such units are heavy, they need to be moved mechanically. It is with the engagement of such handling equipment that the present invention is concerned.

Conventionally slings and the like are employed to be warped beneath the unit intended for lifting. With such expedients care must be exercised with each unit lifted to insure a proper balance to prevent tipping as well as any shifting of the load.

Accordingly, the general object of the present invention is to provide a lifting hitch for the safe and expeditious moving of materials. A related object of the invention is to furnish a lifting hitch which may be readily handled by one man.

Another object of the invention is to provide a lifting hitch which makes possible rapid, and safe pickup and transport of the carried load.

A more specific object of the invention is realized when the lifting hitch is employed with a travelling crane where the engagement and adjustment may be handled by the crane operator.

Another more detailed object of the invention is to provide a lifting hitch which is readily adjustable to balance off-center loads.

Further objects and advantages of the present invention will become apparent as the following description of an illustrative embodiment proceeds, taken with the accompanying drawings, in which:

Figure 1 is a perspective view of a typical bar stock rack engaged by a lifting hitch illustrative of the present invention.

Fig. 2 is an end view, partially broken, showing the lifting grab in engagement with a bar stock rack such as shown in Fig. 1.

Fig. 3 is an end view in enlarged scale of the lifting hitch.

Fig. 4 is a top view of a lifting grab showing an alternative construction of the fender guide.

Fig. 5 is a front elevation of the lifting hitch shown in Fig. 4, the eye portion of the shackle being broken.

In broad outline the invention contemplates a lifting hitch with a shiftable shackle and self-centering load engagement assembly. The details of an illustrative embodiment of a lifting grab which will be described, along with its operation, will demonstrate the many advantages of the invention.

A typical use of an illustrative lifting hitch **10** is illustrated in Fig. 1. There it will be seen that a bar stock rack **40**, partially loaded with elongated bar stock **12**, is poised for moving by means of the engagement

of the lifting hitch **10** with the bar stock rack engaging hooks **14**. The lifting hitch **10**, in the present instance, is engaged by the hook **15** of a travelling crane. The shackle assembly **20** has an open eye **21** extending from its upper portion which engages the crane hook **15** or any similar hooking means which might be attached to a travelling crane, fork lift truck, or the like. The fender-guide assemblies **30** at the ends of the box frame **25** serve to self-center the engagement of the C-shaped hooks **14** on the bar stock rack **40**.

In operation the lifting hitch **10** is lowered into place over the rack intended for movement with the projecting rods **31** of the fender-guide assembly **30** facing the open portion of the C-shaped hooks **14**. The lifting hitch **10** is then shifted inwardly to bring the engaging rods **31** into location for engaging the C-shaped hooks **14**. Then the load is lifted by raising the engaging hook **15** of the associated travelling crane or other lifting device.

If the bar stock **12** in the bar stock rack **40** is off-center, this will show up as the lifting begins, or may be even anticipated by visual inspection of the load. To compensate, the shackle assembly **20** may be shifted to one side or the other of the box frame **25** and the entire load brought into balance. The shackle may be adjusted by the crane operator by merely lowering the crane hook **15** which lowers the shackle assembly **20** and permits it to be adjusted laterally for further raising and engagement with the box frame **25** at a different station along the shackle grab **26**. The circular locating fenders **32** of the fender-guide assembly **30** insure an alignment for engagement with the C-shaped hooks **14**. If the lifting hitch assembly should be out of line laterally the circular locating fenders **32** will guidingly shift the unit into position for engagement with the hooks simultaneously with the movement of the unit in that direction.

In reviewing the details of construction additional operating features will become apparent. Referring now to Figs. 1 and 4, it will be seen that an alternative construction of the locating fender **32** and lifting hitch have been shown. In one instance the fender is circular in nature, such as shown in Fig. 1. Where the size of the unit is increased substantially it may prove more desirable to use the construction shown in Fig. 4 where the circular lateral portions of the fender are more securely tied to the frame by bending the locating fender **32** inwardly in a V-shape defined by the fender legs **34**.

The engaging pin **31** has been shown in the form of a piece of bar stock extending out from underneath the edge of the circular portion of the fender **32**. The engaging pin **31** is secured along an edge to a fender supporting plate **35** which ties in the box frame **25**, fender **32** and engaging pin **31**, as well as the reinforcing legs **34** of the modified fender construction. The box frame **25** contemplates a pair of side plates **28** and a center shackle assembly comprising a plurality of grooves **29** at a central end raised portion of the box frame **25**.

Through the use of the unique shackle construction **20** in combination with the shackle grab **26** on the frame, imbalance in the load may be compensated for readily. The shackle assembly **20**, as will be seen in Figs. 1 and 3, contemplates an engaging eye **21** which is made in the form of a large U-shaped section secured to the side plates **22** of the shackle as by welding. A top plate **24** connects the side plates **22** of the shackle and is provided with up-turned outer edge portions **36**. A supporting bar **37** crosses the bottom portion of the shackle side plates and is proportioned to mate with the grooves **29** of the shackle grab **26** on the lower portion of the box frame **25**. A bolt **38** is provided to traverse the box frame **25** through a hole in the frame (not shown). The hole is so located that when the bolt **38** is secured the unit will balance on a crane hook.

To prevent the shackle from becoming wedged or jammed in any of its positions as it may be shifted along the box frame, the edges **36** of the shackle top plate **24** have been turned up so that the unit may be dragged along the upper flat edges **40** of the box frame sides **28**, the shifting travel being limited by the engagement of the shackle sides **22** with the shackle stops **39** on the box frame **25**. The shackle top plate also serves the function of holding the engaging eye **21** in an upright position. In this way the eye **21** may be engaged by a hook (such as shown in Fig. 1) without requiring a second man besides the crane operator to guide the hook into the eye. An even further function is accomplished by the top plate in that it is so located within the shackle assembly **20** that when the shackle assembly **20** rests on the frame **25** the transverse supporting bar **37** does not fall below the level of the engaging pins **31** This action prevents the shackle components from interfering with the shifting of the lifting hitch by becoming fouled with the associated racks and other shop equipment.

Although the lifting hitch may be employed with many types of containers and racks, the particular operation shown with a bar stock rack has proved highly satisfactory. Such a bar stock rack **40** contemplates longitudinal supporting stringers **41** and vertical supporting posts **42**. The end support posts and center support posts may be located in accordance with the desire of the manufacturer.

Stacking means are provided in the form of a pocket **44** at the corners made up of a pair of plates **45** which flare outwardly at their upper portion to receive the corresponding corner post bottom of an associated bar stock rack. It will be noted that the C-shaped hook **14** is similarly flared out at its upper portion, as is shown in the end view of Fig. 2 of the rack assembly. This configuration of the C-clamp serves further to render the engagement of the lifting hitch and the rack more self-centering in nature.

The lifting hitch **10** may, of course, be employed using a variety of engaging means on the load to be lifted as well as on the lifting hitch itself. It has been found that the hitch in the form of an engaging pin **31**, such as illustrated, is extremely durable and simple in operation. The equivalent of the C-shaped hooks **14** may be provided in the nature of slots in the side of open containers or otherwise rendered integral in the container structure.

Although a particular embodiment of the invention has been shown and described in ful here, there is no intention to thereby limit the invention to the details of such embodiment. On the contrary, the intention is to cover all modifications, alternative embodiments, usages and equivalents of the lifting hitch as fall within the spirit and scope of the invention, specification and appended claim.

I claim as my invention:

For use with materials handling equipment having a lifting hook, a lifting hitch comprising an elongated frame member with a lower central shackle engaging element characterized by a plurality of serrations, a single shiftable shackle having a transverse shackle engaging member, a hook eye on the shackle for engagement with the associated materials handling equipment hook, a top plate on the shiftable shackle having upwardly turned end portions, the top plate being positioned between the hook eye and the transverse shackle engaging member, a locating fender laterally encircling both of the ends of the frame member, load engaging means transverse of the locating fenders and frame member adjacent both ends of the frame member, and a pair of shackle stops, spaced longitudinally along the frame member cooperating with the shiftable shackle to limit the range through which the shackle may be shifted to engage the shackle serrations thereby permitting the operator to selectively alter the center of lifting effort on the lifting hitch to compensate for imbalance in a load and to simultaneously guide the load engaging means by means of the locating fenders into a lifting position.

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