July 11, 1967 C. C. PAVELKA 3,330,591

OIL DRUM GRAPPLING HOOK

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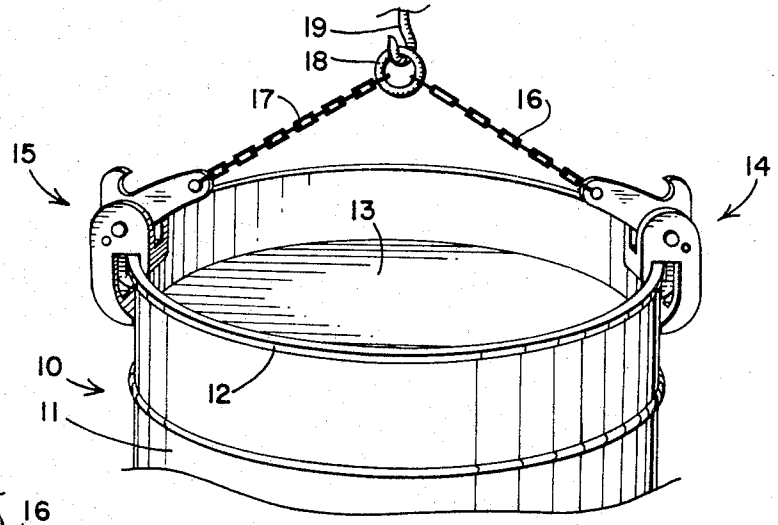


FIG. 1

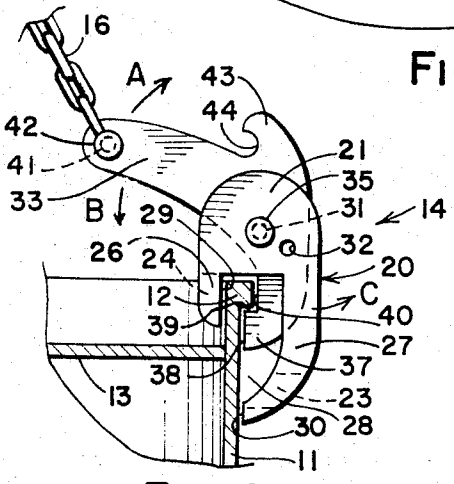


FIG. 2

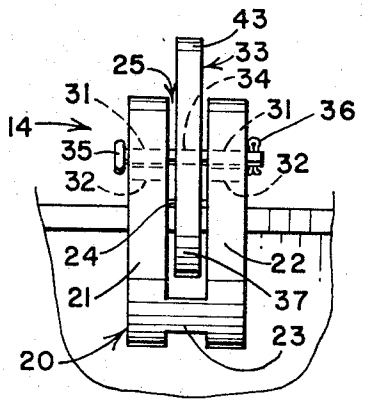


FIG. 3

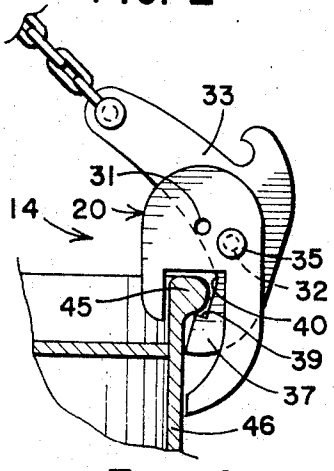


FIG. 4

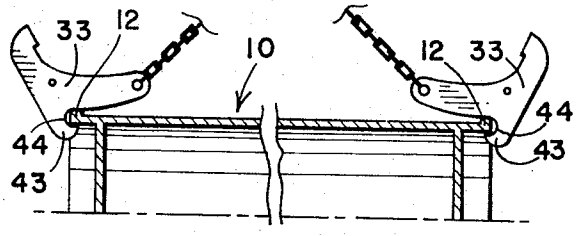


FIG. 5

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OIL DRUM GRAPPLING HOOK

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ABSTRACT OF THE DISCLOSURE

This disclosure relates to a drum rim grappling structure for facilitating the lifting of oil drums and the like. The structure includes a mounting means having first and second leg portions respectively engaging the inside surface of the rim, and an outer surface of the drum slightly below the rim but above the midpoint of the drum. A C-shaped pivot arm is coupled to the mounting means at a point above the engaging portions of its legs and includes at its lower end below the pivot point a jaw engaging the outside of the rim in opposing relationship to the first leg of the mounting means engaging the inside surface of the rim. The other end of the C-shaped pivot arm terminates above the pivot point of the arm to the mounting means and is arranged to receive a chain or cable such that an upward pulling force on this end of the C-shaped pivot arm urges the lower jaw end into tight engagement with the rim of the drum. The gripping force on the rim increases with increased weight of the drum so that the oil drum may be effectively transported by the grappling hook structure.

This invention relates generally to lifting devices and more particularly to a grappling hook adapted to engage and lift an oil drum.

Grappling hooks have been devised in a variety of arrangements for gripping and lifting drums, barrels, and the like from one location to another. Usually these hooks are arranged to engage the conventional lip or rim portion of the drum. However, the structural arrangement of the hook is usually characterized by its complexity. Such hooks often include cams, levers, springs, lock means, and the like arranged in cooperative relationship, particularly when the hook is designed to be easily removed after release of the lifting force. Such an assembly of parts is not only relatively expensive to manufacture, but, moreover, increases the probability of breakdown requiring expensive repairs.

In addition, many prior art hook structures for engaging the rim of a drum have been difficult to initially locate and be retained on the rim in proper gripping position unless some tension is applied on the lifting chain or line connected to the hook while the hook is being temporarily held by hand on the rim. Such a condition can result in injury to an operator. Further, unless properly designed, the hook itself can damage the drum rim and possibly puncture the drum, particularly when the gripping action increases with load.

With the foregoing in mind, it is a primary object of the present invention to provide a novel grappling hook for gripping and lifting a drum in which the foregoing problems are overcome.

More particularly, it is an object to provide a grappling hook in which the means gripping the drum is automatically releasable in response to release of lifting force on the hook to the end that the grappling hook may be quickly and easily removed from the drum.

Another object is to provide a novel grappling hook for accomplishing the foregoing object by means of a greatly simplified structural arrangement.

Another object is to provide a grappling hook which

may be readily located on the rim of a drum and be self-supporting in proper gripping position without any tension on the lifting line so that risk of injuries in placing the hooks is minimized.

Still another object is to provide a hook meeting the foregoing objects which is so designed as to minimize the risk of possible damage to the drum rim or puncturing the drum even though the drum may be heavy.

Another object is to provide a novel grappling hook which is readily adjusted to enable use with drums having rims of a variety of configurations.

Still another object is to provide a grappling hook means capable of gripping and lifting a drum in vertical and horizontal positions.

Briefly, these and many other objects and advantages of this invention are attained by providing a grappling hook adapted to be positioned over the top rim of a drum in engagement therewith, enabling the drum to be gripped and thus lifted thereby. The novel grappling hook preferably includes a mounting frame having spaced engaging portions adapted to be mounted over the rim in engagement with the inside of the rim and the outside of the sidewall of the drum, all in a manner to stabilize the hook and facilitate placing of the same on the drum. Pivotally coupled within the mounting frame is a pivot arm including a gripping jaw at one end and means for coupling a chain to its other end. The pivot arm is coupled to the mounting frame, enabling the jaw to be pivoted into and out of engagement with the rim at a point where the rim is backed by one of the engaging portions of the mounting frame in response to imposition and release, respectively, of lifting force on the chain.

The grappling hook is preferably provided with means for coupling the pivot arm to the mounting arm in at least two positions, thereby providing means for adjusting the hook to accommodate drums having rims of various configurations.

An additional feature is the provision of an auxiliary hook adapted to engage and lift a drum in a horizontal position or from a horizontal to a vertical position as desired.

A better understanding of the invention will now be had by referring to a preferred embodiment thereof as illustrated in the accompanying drawings, in which:

FIGURE 1 is a fragmentary perspective view of a pair of grappling hooks of this invention in engagment with diametrically opposite points of the top rim of an oil drum;

FIGURE 2 is a side elevational view partly in cross-section, of one of the grappling hooks of FIGURE 1;

FIGURE 3 is an end elevational view of the grappling hook as shown in FIGURE 2 in a first adjusted position;

FIGURE 4 is a side elevational view partly in cross-section of the grappling hook in a second adjusted position; and,

FIGURE 5 is a fragmentary side elevational view, partly in cross-section, of the grappling hooks arranged to engage an oil drum in a horizontal position.

Referring first to FIGURE 1, there is shown a conventional oil drum **10** including a cylindrical sidewall **11** terminating in a rim **12** extending above the end **13** of the drum. Shown secured to opposite sides of the drum over the top rim thereof are a pair of grappling hooks **14** and **15**, each designed in accordance with the invention. Secured to the grappling hooks **14** and **15** are chains **16** and **17**, respectively, which are in turn secured to a ring **18** mounted on a hoist hook **19**. Since the grappling hooks **14** and **15** are the same, detailed description of one will suffice for both.

Thus, referring to FIGURES 2 and 3, it will be seen that the grappling hook **14** includes a mounting frame **20**

including side portions 21 and 22 integrally connected in spaced parallel relationship by transverse members 23 and 24. As shown, the side portions 21 and 22 are spaced apart to define an open-ended vertical slot 25 therebetween. Each of the side portions 21 and 22 are similar. Thus, the side portion 21 includes first and second engaging portions in the form of legs 26 and 27 formed to define a rim receiving opening 28.

The first engaging portion in the form of the leg 26 includes a vertically extending bearing surface 29 in engagement with the inside of the rim 12. The second engaging portion in the form of the leg 27 is curved inwardly at its lower end and terminates in a vertically disposed bearing surface 30 in engagement with the outside of the sidewall 11 at a point below the rim as shown. The engaging portions on the side portion 22 similarly engage the inside of the rim and external wall of the drum and thus stabilize the mounting frame so that it will remain in a set position on the drum.

The mounting frame 20 also includes first and second openings 31 and 32 extending transversely therethrough across the vertical slot 25. A generally C-shaped pivot arm 33 is positioned within the vertical slot 25 and is provided with a transverse opening 34 positioned in registration with the opening 31 so as to receive a pin 35 therethrough. A cotter pin 36 is received within an end of the pin 35 as best shown in FIGURE 3 to thus mount the pivot arm 33 for pivotal movement with respect to the mounting frame 20.

The lower end of the pivot arm 33 terminates in a gripping jaw 37 including a first vertically disposed bearing surface 38, a horizontal transversely extending shoulder 39, and a second vertically extending bearing surface 40, as shown. The jaw 37 is adapted to engage the rim 12 on a side thereof opposite the side on which the legs 26 of the mounting frame side portions engage the inside of the rim 12.

The opposite end of the pivot arm 33 is provided with a transverse opening 41 adapted to receive in coupled relationship therewith a clevis 42 to which the chain 16 is coupled. The pivot arm 33 further includes an outturned hook 43 which is formed so as to provide a curved bearing surface 44 thereon as shown.

In the event that the drum is provided with an enlarged and rounded type rim as distinguished from the rim shown in FIGURE 3, pivot arm 33 may be coupled to the mounting frame 20 by means of the pin 35 received within the opening 32 rather than in the opening 31. Thus, as shown in FIGURE 4, when the hook is attached to an enlarged drum rim such as at 45 on a different type of drum 46, the pivot arm 33 is positioned outwardly and downwardly from the position as shown in FIGURE 2. The grappling hook 14 is thus adjustable to accommodate the enlarged and rounded rim 45.

Referring now to FIGURE 5, in the event the drum 10 is to be lifted from a horizontal position, the pivot arms 33 may be coupled to the rims 12 in the manner shown.

In operation and with reference first to FIGURE 1, the grappling hooks 14 and 15 are mounted over the rim 12 by simply positioning the mounting frame 20 over the rim as shown in FIGURE 2. The engagement of the bearing surface 29 against the inside of the rim 12 and the engagement of the bearing surface 30 against the outside of the sidewall insures stability and proper engagement of the jaw with the rim so that the operator need not hold the same in position until tension is applied to the chain. Should it be found that the rim is of a size and configuration which the jaw will not safely grip, the pin 35 is simply removed from the opening 31, the pivot arm moved outwardly and downwardly so that the opening 34 registers with the opening 32 and the pin is then inserted into the opening 32 as shown in FIGURE 4.

As lifting force is applied to the chain, the pivot arm

33 pivots in the direction of arrow A as shown in FIGURE 2, thereby moving the jaw 37 into engagement with the drum rim 12 in a direction toward the leg 26, thus providing a strong and stable connection with the rim. Because of the backing on the inside of the rim provided by the bearing surface 29, risk of damage to the rim and/or drum is minimal.

As the drum is lowered onto the desired location, the release of the lifting force on the chains permits the pivot arm to pivot in the direction of arrow B under the influence of gravity which thus causes the jaw 37 to move outwardly in the direction of arrow C. Thus, it is apparent that the release of the lifting force enables the jaw to swing away from the rim enabling the grappling hook to be quickly and easily removed from the drum.

As shown in FIGURE 5, should it be desired to lift a drum from a horizontal position, the pivot arm is simply removed from the mounting frame and the hook 43 is placed under the rim 12. It is apparent that only one grappling hook would be used to move the drum from a horizontal to a vertical position.

If it is desired to maintain the drum in a horizontal attitude while lifting the same, two such hooks would be used on opposite ends of the drum as shown.

From the foregoing description, it is apparent that this invention provides a novel and greatly simplified means for gripping and moving drums from place to place. The entire structure comprises only two movable parts with a single connecting pivot pin and yet attains the various objects heretofore only realized by a large number of components.

Various changes falling within the scope and spirit of this invention will occur to those skilled in the art. The grappling hook is therefore not to be thought of as limited to the specific embodiment set forth.

What is claimed is:

1. A grappling hook for gripping and lifting a drum having a rim, comprising: a mounting frame having parallel side portions spaced apart to define an open-ended vertical slot therebetween, each of said side portions including engaging portions in the form of first and second downwardly extending legs positioned to define a rim receiving opening, said first leg including a vertical bearing surface in engagement with the inside surface of said rim, said second leg including a curved portion terminating in a vertical bearing surface in engagement with the upper half of the outside of said drum at a position below said rim, said mounting frame including a first opening therethrough across said vertical slot above said first and second legs and rim receiving opening; a substantially C-shaped pivot arm disposed in said vertical slot and including an opening therethrough registering with said first opening in said mounting frame; a pin disposed in said first opening, coupling said pivot arm in a first position to said mounting frame, said pivot arm extending downwardly to said rim and including a gripping jaw on its end adapted to engage the outside of said rim opposite said bearing surface of said first leg; and means for coupling a chain to the other end of said pivot arm whereby said jaw is movable into and out of engagement with said rim in response to imposition and release, respectively, of lifting force exerted on said chain.

2. The subject matter of claim 1, including a second opening in said mounting frame across said vertical slot for coupling said C-shaped pivot arm to said mounting frame in a second position outwardly and downwardly with respect to said first position.

3. The subject matter of claim 1, including a hook means integrally formed in said C-shaped pivot arm whereby said hook means is engageable with said rim to raise said drum from a horizontal position.

4. The subject matter of claim 1, in which said gripping jaw includes a vertical bearing surface having a

horizontal shoulder adapted to engage complementary outside surfaces of said rim.

References Cited

UNITED STATES PATENTS

282,134	7/1883	Ward	294—16 X
1,221,042	4/1917	Frankell	294—104 X
2,689,663	9/1954	Shramek	214—653

2,764,447	9/1965	Schmidt	294—15 X
3,003,806	10/1961	Shramek	294—101
3,190,685	6/1965	Bopp	294—104 X

FOREIGN PATENTS

4,702	11/1913	Great Britain.

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