Oct. 17, 1950 L. J. ROTOLLO 2,526,085

LIFTING DEVICE

Filed Aug. 8, 1947

Fig. 1.

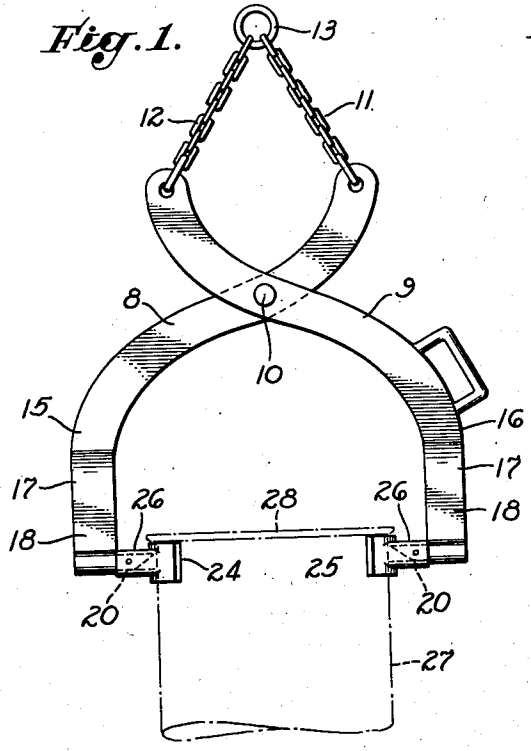


Fig. 2.

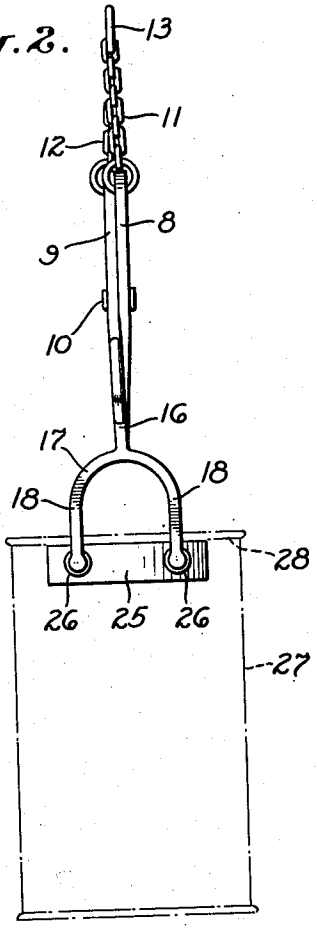
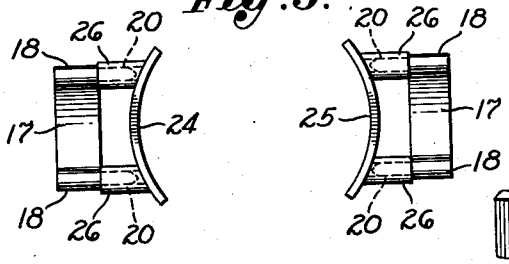


Fig. 3.



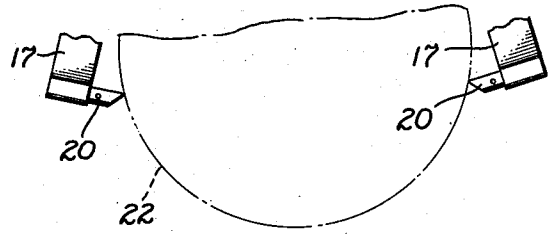


Fig. 5.

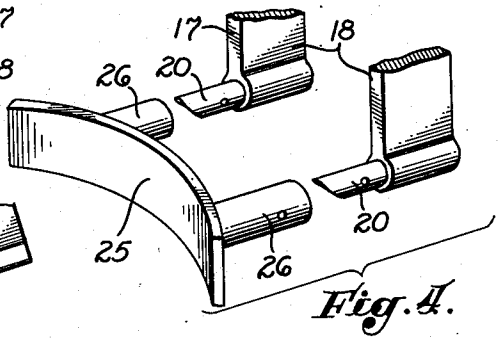


Fig. 4.

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Patented Oct. 17, 1950

2,526,085

UNITED STATES PATENT OFFICE

2,526,085

LIFTING DEVICE

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Application August 8, 1947, Serial No. 767,390

4 Claims. (Cl. 294—118)

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My invention relates to lifting devices employed for lifting various objects and particularly to a device of the tong type having pivoted jaws provided with points or prongs adapted to engage the opposite sides of an object to be lifted. Specifically, the invention pertains to a lifting device of this character having means adapted to engage under a peripheral flange on the object to be lifted so as to adequately support the object during the lifting thereof.

Lifting devices of the tong type are usually provided with prongs at the ends of their pivoted levers or jaws, these prongs being adapted to bite into the sides of a wooden or like object to be lifted or to at least engage with the same during the lifting operation. Such devices are commonly employed for lifting cylindrical objects such as wooden barrels and operate quite successfully when the barrel is lifted with its axis disposed horizontally and the prongs engage the periphery of the barrel below the center thereof. However, considerable difficulty is experienced when the prongs are engaged beneath a peripheral flange or hoop at the end of the barrel due to the fact that the prongs provide merely contact points and afford very little engagement surface and thus are apt to lose their hold on the object, particularly when the object swings or strikes other objects during the lifting and subsequent lowering operation.

It has also been determined that when such lifting devices are used to lift steel barrels or drums, the prongs often become blunt or otherwise damaged to render them ineffective. Moreover, when the prongs are relatively sharp they sometimes puncture the relatively thin sides of the steel drum, causing leakage of its contents. It is apparent, therefore, that while tong-type lifting devices having object-engaging prongs are quite suitable for lifting wooden boxes, crates, barrels and similar containers and objects they are quite unsatisfactory for use in lifting metal containers for the reasons stated above.

It is an object of my invention to provide a lifting device of the tong or jaw type having relatively wide object-engaging and supporting means so as to effect adequate engagement between the device and the object to be lifted. This object is best attained by providing arcuate supporting means at the ends of the tong levers or

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jaws, these means being adapted to embrace the periphery of a barrel and to engage beneath a peripheral flange disposed adjacent the end of the barrel so as to afford adequate bearing contact and more positive gripping of the barrel to prevent release thereof during the lifting and lowering operations. By this means, damaging of the barrel or drum is avoided and, because the supporting means have no sharp edges apt to become dull and ineffective, the supporting means will last indefinitely.

It is desirable that a lifting device be adapted for use in lifting both wooden and metal objects and to meet this prerequisite, my invention provides a device which employs prongs for use when lifting wooden objects and curved supporting plates when metal objects are to be lifted. It is an important object in this respect to provide curved supporting means which may be detachably mounted on the device and these means are preferably held in place by the prongs without screws, bolts or other fastening means so that they can be quickly and easily attached to and detached from the tongs or jaws.

Further objects of my invention will be apparent from the following specification and from the drawing, which is intended for illustration only, and in which:

Fig. 1 is a side elevational view of my improved lifting device, showing it applied to use in lifting a metal barrel or drum;

Fig. 2 is an end view of the same;

Fig. 3 is a bottom view of the device;

Fig. 4 is an enlarged perspective view of the lower portion of one side of the lifting device, showing the supporting plate as disconnected from the tong or jaw; and

Fig. 5 is a fragmentary side view of the lower portion of the device with the supporting plates removed and illustrating the manner in which an object is lifted by means of the prongs.

Referring to the drawing in detail, my improved lifting device includes a pair of curved tong-levers 8 and 9 which are pivoted together in crossing relation by means of a rivet 10 or other suitable means. The upper ends of the crossing levers 8 and 9 have holes through which the end links of a pair of chains 11 and 12 are looped, the chains being joined at their other ends by a large ring 13 through which the hook

of a lifting chain or cable of a hoisting apparatus (not shown) may be inserted. The pivotal arrangement of the levers 8 and 9 is such that when the device is suspended from the chains 11 and 12 the lower jaw portions 15 and 16 of the levers will be pivoted toward each other.

Formed integral with or secured to the lower extremities of the jaw portions 15 and 16 by welding or other means are inverted U-shaped extensions 17 providing spaced legs 18, the extensions being arranged at right-angles to the plane of the tong levers 8 and 9. Welded or otherwise secured to the lower ends of the legs 18 are cylindrical pins or prongs 20 which are beveled to provide relatively sharp points at their ends. The prongs 20 of the opposite extensions 17 are directed inwardly toward each other so as to adapt them to engage the opposite sides of an object to be lifted, such engagement being indicated in Fig. 5 where the prongs are shown as contacting the periphery of a wooden barrel 22 below the center thereof. As the lifting device is raised, the prongs 20 bite into the wooden barrel with considerable force and the barrel is lifted in a well known manner.

As thus far described, the lifting device is similar to conventional tong-type lifting devices now used for lifting various types of containers and other objects, particularly those of wooden construction. As previously mentioned, the present invention provides means for adapting the lifting device for use in lifting metal barrels, drums and the like which the prongs cannot effectively grip or which might be punctured by the penetration of the prongs. The invention is concerned primarily with means for adapting the lifting device to support and lift a sheet steel barrel or drum in the direction of its axis. In its preferred construction, this means consists of a pair of arcuate plates 24 and 25 of any desirable length and width. To the outer convex surface of each supporting plate 24 and 25 is welded a pair of mounting tubes 26 which are so spaced and of such size as to adapt them to be slid onto the cylindrical pins or prongs 20.

When the lifting device is to be used for lifting a steel barrel, such as indicated at 27 in the drawing, the supporting plates 24 and 25 are applied to the jaw portions 15 and 16 of the tong levers 8 and 9 by merely sliding their tubes 26 onto the prongs 20 as shown best in Fig. 3. If desired, aligned holes may be provided in the prongs and tubes through which a cotter pin or other means may be inserted to retain the supporting plates in place. To lift the barrel 27, which may be resting upon a floor with its axis vertically disposed, the jaw portions 15 and 16 are moved apart to permit the supporting plates 24 and 25 to embrace the periphery of the barrel. The plates 24 and 25 are positioned beneath a peripheral flange 28 adjacent the upper end of the barrel as shown in Fig. 1. As the lifting device is raised by the hoisting apparatus the supporting plates 24 and 25 will engage firmly with the periphery of the barrel and, since the upper edges of the plates form seats upon which the flange 28 rests, the barrel is effectively supported by the device and may be lifted without danger of sliding out of the lifting device.

It is seen from the foregoing that the present improved lifting device is adaptable for use in lifting many types of shipping containers and other objects. As a particular feature of improvement, the invention provides means whereby the device may be readily converted from a type suitable for lifting wooden objects to a type capable of lifting metal objects. The curved supporting and lifting plates may be formed integral with the jaws of the device but preferably they are made as separate elements adapted to be conveniently applied as an attachment to the lifting jaws.

While I have herein shown and described the improved lifting device as embodied in a preferred form of construction and applied to use in a particular manner, it will be apparent that various modifications might be made in the structure and that device might be applied to use in other ways, without departing from the spirit of the invention. Consequently I do not wish to be limited in this respect but desire to be afforded the full scope of the appended claims.

I claim as my invention:

1. A lifting device adapted to lift a circular object having a peripheral flange, comprising: a pair of levers pivotally connected in crossing relationship, each of said levers having at its lower end an inverted, U-shaped extension providing spaced depending legs disposed in a plane normal to the plane of said levers, said legs having circular lugs at their lower ends, the lugs of each extension being directed inwardly toward the lugs of the other extension; and a pair of arcuate supporting plates each detachably mounted on and extending between said lugs of said legs of each extension and adapted to embrace the periphery of and to engage beneath the annular flange of the circular object to lift the object upon inward pivotal movement of the lower ends of said levers and upward movement of the device.

2. A lifting device adapted to lift a circular object having a peripheral flange, comprising; a pair of levers pivotally connected in crossing relationship, each of said levers having at its lower end an inverted, U-shaped extension providing spaced depending legs disposed in a plane normal to the plane of said levers, said legs having circular lugs at their lower ends, the lugs of each extension being directed inwardly toward the lugs of the other extension; and a pair of arcuate supporting plates each provided with tubular mounting portions adapted to be slid over said lugs of each extension to detachably mount said supporting plates on said extensions, said plates being adapted to embrace the periphery of and to engage beneath the annular flange of the circular object to lift the object upon inward pivotal movement of the lower ends of said levers and upward movement of the device.

3. A lifting device adapted to lift either articles of different shapes or a circular object having an annular flange, comprising: a pair of levers pivotally connected in crossing relationship, each of said levers having at its lower end an inverted, U-shaped extension providing spaced depending legs disposed in a plane normal to the plane of said levers, said legs having circular lugs at their lower ends, the lugs of each extension being directed inwardly toward the lugs of the other extension and pointed at their inner ends to adapt them to engage the sides of the article to be lifted; and a pair of arcuate supporting plates each provided with tubular mounting portions adapted to be slid over said lugs of each of said extensions to detachably mount said supporting plates on said extensions, said plates being adapted to embrace the periphery of and to engage beneath the annular flange of the circular object to lift the object upon inward pivotal movement of the lower ends of said levers and upward movement of the device.

4. A lifting device adapted to lift a circular object having a peripheral flange, comprising: a pair of curved levers connected in crossing relationship, each of said levers having at its lower end an inverted, U-shaped extension providing depending legs disposed in a plane normal to the plane of said levers; arcuate supporting plates; and interengaging means on said plates and said legs for detachably mounting said plates on said legs, said plates extending between said legs and being adapted to embrace the periphery of and to engage beneath the annular flange of the circular object to lift the object upon inward pivotal movement of the lower ends of said levers and upward movement of the device.

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