July 27, 1943. H. C. ESBECK 2,325,235

WHEEL GRAPPLE

Filed April 27, 1942

FIG. 2

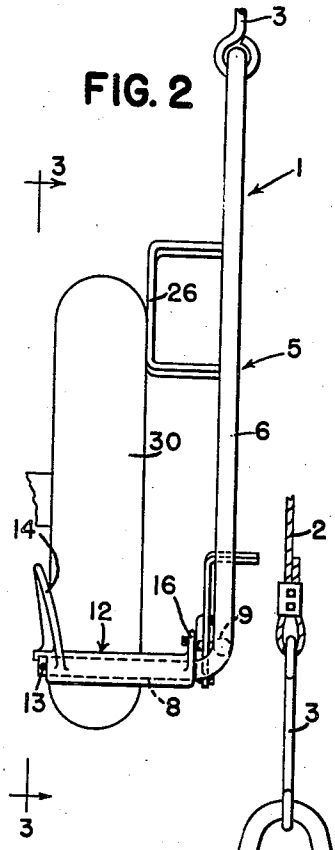


FIG. 3

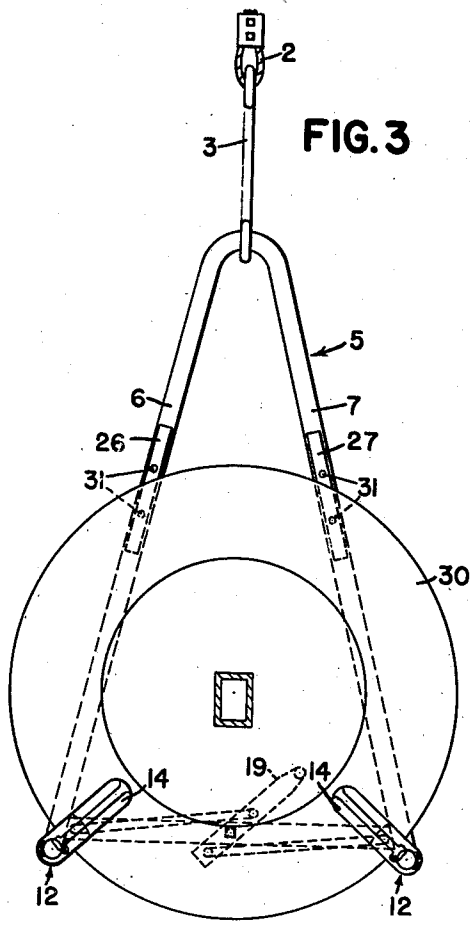
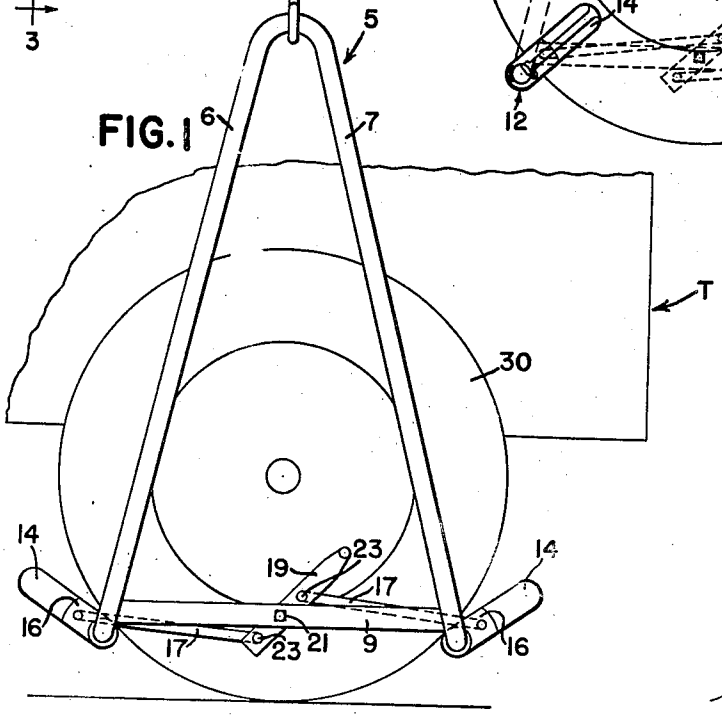


FIG. 1



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WHEEL GRAPPLE

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16 Claims. (Cl. 294—82)

The present invention relates generally to hoists and the like, and is more particularly concerned with a new and improved form of wheel-engaging grapple particularly adapted for use with wagon-or truck-dumps.

The object and general nature of this invention is the provision of a wheel grapple having manually controlled means engageable with the lower portion of the associated wheel of a grain wagon or truck for holding the grapple in engagement with the wheel of the wagon or truck, not only when the lifting cable is raising the wheel but also when the lifting cable is slack. Further, it is a feature of this invention to provide a grapple having tire-engaging parts shiftable to a position to facilitate moving the grapple into place and then holding the grapple in engaged position to prevent the grapple from falling away from the wheel when the lifting cable is slack and to hold the wheel on the grapple during the raising and dumping operations.

Another feature of the present invention is the provision of a grapple having wheel-engaging sections that may be swung from a position facilitating the placing of the grapple against the wheel into a position in which the grapple and wheel are held in engagement. It is also a feature of this invention to provide a grapple having tire-engaging parts which are movable and, while entirely adequate for holding the grapple engaged with the wheel, do not interfere with placing the grapple in position, even though the wheel is disposed in a rut or soft ground. More particularly, it is a feature of this invention to provide a wheel grapple having a pair of rockably mounted members at the lower end that are spaced close enough together to secure a firm engagement with the lower portion of the wheel but which are adapted to be swung into a position to clear the wheel when applying the grapple. Further, it is a feature of this invention to provide means for manually controlling the swingable parts that hold the grapple engaged with the wheel.

Another important feature of the present invention is the provision of a wheel grapple which does not require adjustment but is adapted to support different sizes of wheels. Further, it is a feature of this invention to provide a grapple having means to engage the upper portion of wheels of different sizes for the purpose of holding the upper part of the grapple laterally outwardly away from the wagon or truck body so as to prevent the lifting cable from damaging it. This is particularly important when hoisting trucks with fenders that overhang the wheels.

Another feature of this invention is the provision of a grapple having locking arms which are held in wheel-engaging relation by the pressure of the wheel thereagainst.

These and other objects and advantages of the present invention will be apparent to those skilled in the art after a consideration of the following detailed description, taken in conjunction with the accompanying drawing in which the preferred form of the invention has been illustrated.

In the drawing:

Figure 1 is a side view of a portion of a hoist in which the principles of the present invention have been incorporated, showing the locking mechanism in open position;

Figure 2 is an end view of the wheel grapple shown in Figure 1; and

Figure 3 is a view taken generally along the line 3—3 of Figure 2, but with the mechanism set in locking position.

Referring now to the drawing, the wheel grapple that forms the subject matter of the present invention is indicated in its entirety by the reference numeral 1 and is suspended by a cable 2 and a link 3 from a vehicle hoist of conventional construction. The details of the hoist itself are not shown in the drawing since they do not form any part of the present invention. It is to be understood that a conventional hoist for agricultural wagons and trucks commonly include lifting mechanism and a pair of wheel-engaging elements for engaging the front wheels of a truck or wagon so as to raise the front end thereof, whereby the material in the wagon or truck discharges therefrom by gravity. Mechanism of this kind is commonly used with portable or stationary elevators for elevating grain and other crops into bins or other places of storage.

The wheel grapple 1 comprises a support 5 in the form of an inverted V-shaped bar having legs 6 and 7 and laterally inwardly directed extensions 8 at the lower ends of the legs 6 and 7. The member 5 also includes a lower transverse bar 9, forming a generally triangular frame, the upper apex of which is suspended by the link 3 from the cable 2 and the lower apices carrying the lateral extensions 8.

Mounted on each of the lateral extensions 8 is a wheel-engaging sleeve member 12 rotatable on the associated extension 8 and held in place thereon by a cotter 13 or the like. Each member 12 includes at its inner end a generally radially inwardly extending tire-engaging member

or part 14. At its outer end each sleeve 12 has a radially upwardly extending arm section 16 to each of which the outer end of a link 17 is pivotally connected. A hand lever 19 is pivoted, as at 21, to the middle portion of the lower bar 9, and the two links 17 are pivotally connected to the lever 19, as indicated at 23. A pair of wheel-engaging brackets 26 and 27 are fixed, respectively, to the legs 6 and 7 of the frame 5. The tire of the vehicle to be hoisted is indicated in the drawing by the reference numeral 30 and, as shown, is represented as a pneumatic tire of a truck T.

The operation of my improved wheel grapple is substantially as follows.

The lateral spacing between the extensions 8 and the rockable wheel engaging members 12 is such that when they are in the open position shown in Figure 1, the grapple 1 may be lowered while the truck is standing with the wheel 30 supporting its normal load, and when the parts reach the positions shown in Figure 1, the grapple 1 may be moved laterally inwardly to carry the wheel supporting members 12 underneath the lower part of the wheel and at opposite sides of the ground contacting portion thereof, until the brackets 26 and 27 engage the upper and outer side of the wheel 30, thereby terminating further lateral inward movement. At this point the handle 19 may be swung from the position shown in Figure 1 to the locking position shown in Figure 3, which causes the lugs or extensions 14 on the members 12 to swing toward one another substantially into a radial position with respect to the tire 30, as is shown in Figure 3. Thus, there is little likelihood of the wheel 30 and grapple becoming disengaged, even before or after the lifting cables have been tightened. It is particularly important to swing the arms or extensions 14 over into the position shown in Figure 3 after first applying the grapple to the wheel. This serves to prevent the grapple from falling outwardly while the cable 2 is slack. Also, after both grapples have been engaged, and the hoisting mechanism operated, the arms 14 hold the wheels in place in the grapples. The brackets 26 are extended laterally (see Figure 2) a distance sufficient to insure that the upper part of the grapple support 5 and the cables and link will be held away from the fenders of the truck or other vehicle. Also, the brackets 26 and 27 are of sufficient vertical length to receive wheels of different sizes. The brackets 26 and 27 are provided with openings 31 whereby, if necessary, auxiliary members, such as straps or boards, may be bolted to the brackets so as to receive smaller or larger wheels than can be accommodated by the brackets 26 and 27 without such additions. After the load has been dumped and the hoist lowered, it is a simple matter to disengage the grapple, which is done merely by swinging the lever 19 over into the position shown in Figure 1, in which the grapple may be swung away from the truck T. The lever 19 may be operated by hand but preferably it is operated by the foot, which may be done easily and conveniently without stooping.

While I have shown and described above the preferred structure in which the principles of the present invention have been incorporated, it is to be understood that my invention is not to be limited to the particular details shown and described above, but that, in fact, widely different means may be employed in the practice of the broader aspects of my invention.

What I claim, therefore, and desire to secure by Letters Patent is:

1. In a hoist or the like, a grapple including a frame, a pair of laterally extending wheel engaging members movably mounted on said frame, wheel locking parts on said movable members, and means for shifting said parts from one position, in which said members may be passed under a wheel at opposite sides of the portion of the wheel engaging the ground whereupon an upward movement of said grapple serves to lift said wheel to another position in which said parts engage the inner side of the wheel and prevent the latter from being disengaged from the wheel engaging members.

2. A wheel-engaging grapple comprising a support, a pair of spaced apart wheel-engaging members carried at the lower portion of said support and adapted to engage a wheel at opposite sides of the ground contacting portion thereof, and means movably mounted on the ends of said members for holding the grapple in place with respect to said wheel.

3. A wheel-engaging grapple comprising a rigid support adapted to be disposed against the outer side of a wheel, a pair of spaced apart members at the lower end of said support and adapted to be disposed underneath the wheel at opposite sides of the ground contacting portion thereof, and means engaging the lower part of the wheel for holding the latter on said members.

4. A wheel-engaging grapple comprising a support having a pair of spaced apart laterally inwardly directed portions adapted to be engaged with the lower part of a wheel at opposite sides of the ground contacting portion thereof, and means on the laterally inner end of at least one of said portions and swingable relative thereto into a position behind the lower portion of the wheel for holding the latter in place.

5. A wheel-engaging grapple comprising a support having laterally inwardly extending spaced apart members adapted to be passed laterally inwardly under a wheel and at opposite sides of the ground contacting portion thereof, a pair of rotatable parts mounted, respectively, on said laterally inwardly directed members, and an extension on the inner end of each of said members and adapted when the latter are turned to be disposed behind the wheel for holding it in place.

6. A wheel-engaging grapple comprising a support having laterally inwardly extending spaced apart members adapted to be passed laterally inwardly under a wheel and at opposite sides of the ground contacting portion thereof, a pair of rotatable parts mounted, respectively, on said laterally inwardly directed members, an extension on the inner end of each of said members and adapted when the latter are turned to be disposed behind the wheel for holdiing it in place, and means for simultaneously swinging said extensions into a position behind the wheel.

7. A wheel-engaging grapple comprising a support having a pair of laterally inwardly directed portions spaced apart so as to pass underneath a wheel at opposite sides of the ground contacting portion thereof, and a pair of rockably mounted wheel-engaging members carried by said laterally inwardly directed portions.

8. A wheel-engaging grapple comprising a support having a pair of laterally inwardly directed portions spaced apart so as to pass underneath a wheel at opposite sides of the ground contacting portion thereof, a pair of rockably mounted

wheel-engaging members carried by said laterally inwardly directed portions, and means accessible at the outer side of said support for rocking said wheel engaging members.

9. A wheel-engaging grapple comprising a support having a pair of laterally inwardly directed wheel carrying extensions spaced apart so as to be passed underneath the wheel at opposite sides of the ground contacting portion thereof, and means swingably mounted on one of said extensions for holding the wheel in place on said extensions.

10. A wheel-engaging and lifting member for wagon and truck dumps and the like, comprising a pair of spaced apart elements adapted to be moved laterally into engagement with a wheel at opposite sides of the portion in contact with the ground, and a pair of rotatable members for holding said wheel against displacement from said elements.

11. A wheel grapple comprising a generally inverted V-shaped support, wheel engaging parts at the lower ends of said support, a pair of parts secured rigidly to said generally inverted V-shaped support for engaging the side of a wheel to hold the latter in position against displacement in one direction relative to the grapple, and means swingably mounted at the lower ends of said support for movement into a position behind the wheel for holding the latter against displacement in the other direction.

12. In a hoist or the like, a wheel-engaging grapple comprising a frame, arms movably mounted on the lower portion thereof and swingable from an upwardly diverging position, in which they clear a wheel, into an upwardly converging position in which they hold the grapple in engagement with the wheel.

13. In a hoist or the like, a wheel-engaging grapple comprising a support, spaced apart rotatable members thereon adapted to engage underneath the lower portion of a wheel having a pneumatic tire, and arms on said rotatable members swingable into a position behind the wheel for holding the grapple engaged therewith, said rotatable members being adapted to be shifted into and held in the engaged position by the pressure of the tire against said rotatable members when the wheel is hoisted.

14. A wheel-engaging grapple comprising a support having a pair of laterally inwardly directed wheel carrying extensions spaced apart so as to be passed underneath the wheel at opposite sides of the ground contacting portion thereof, a sleeve member rotatably mounted on one of said laterally inwardly directed extensions, and means on said sleeve member for holding the grapple engaged with the wheel.

15. A wheel engaging grapple comprising a rigid support having a portion adapted to be disposed outside a wheel and wheel supporting parts rigidly associated with said outside portion and adapted to be shifted under the lower side of said wheel at opposite sides of the ground contacting portion by moving said support toward the wheel, and locking means carried on said support and movable relative thereto into locking engagement with the lower portion of said wheel.

16. A wheel engaging grapple comprising a rigid support having a portion adapted to be disposed outside a wheel and wheel supporting parts rigidly associated with said outside portion and adapted to be shifted under the lower side of said wheel at opposite sides of the ground contacting portion by moving said support toward the wheel, locking means carried on said support and movable relative thereto into locking engagement with the lower portion of said wheel, and spacing means rigidly fixed to the upper portion of said support and engageable with the wheel to hold the support away from the top side of the wheel.

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