Jan. 3, 1950 F. W. KROGER 2,493,150

HOIST

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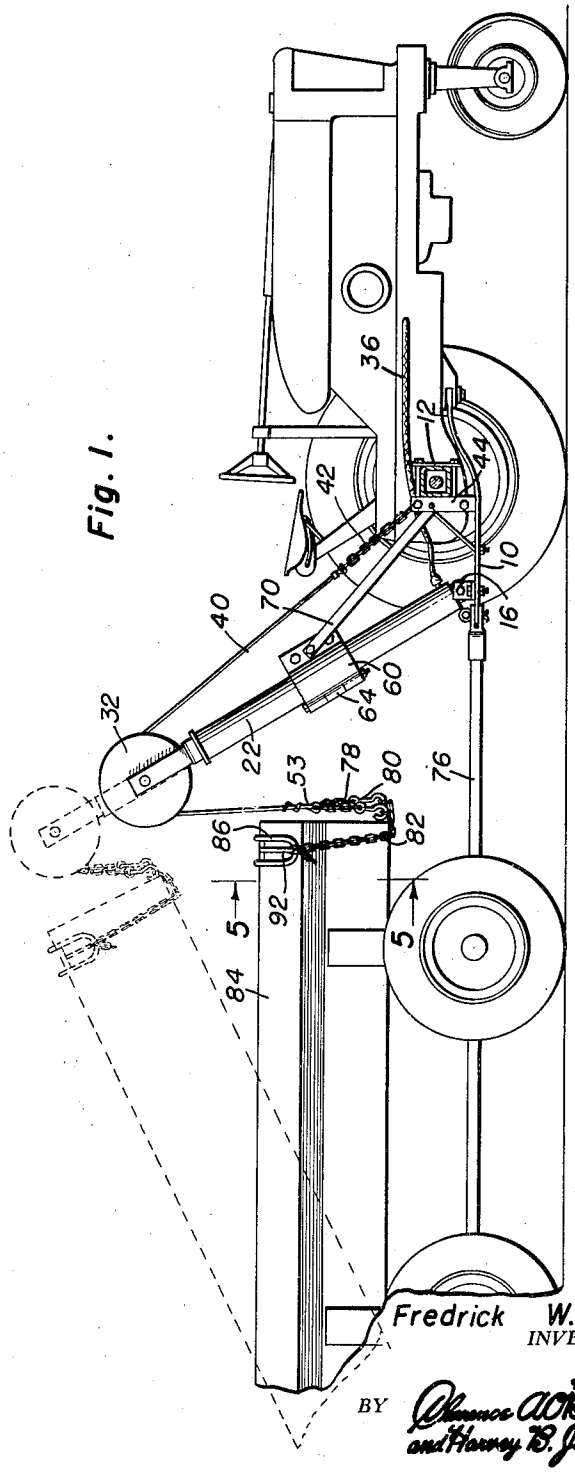


Fig. 1.

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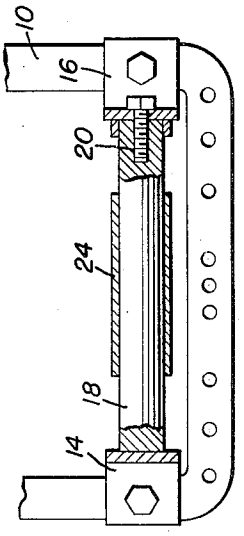


Fig. 6.

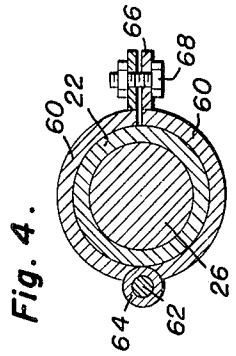


Fig. 4.

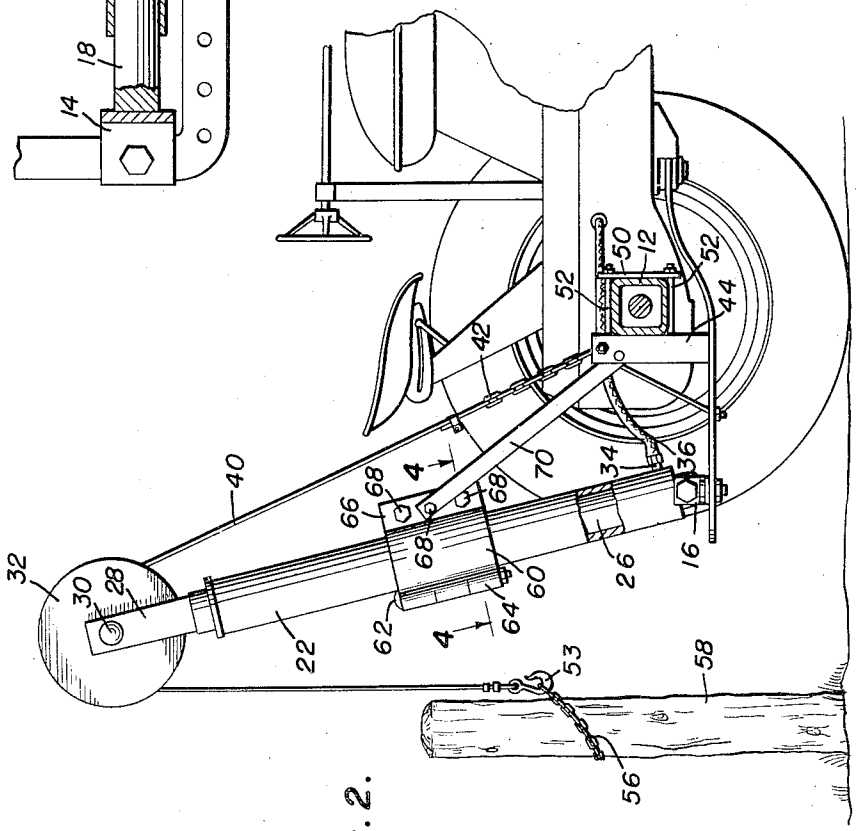


Fig. 2.

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Fig. 3.

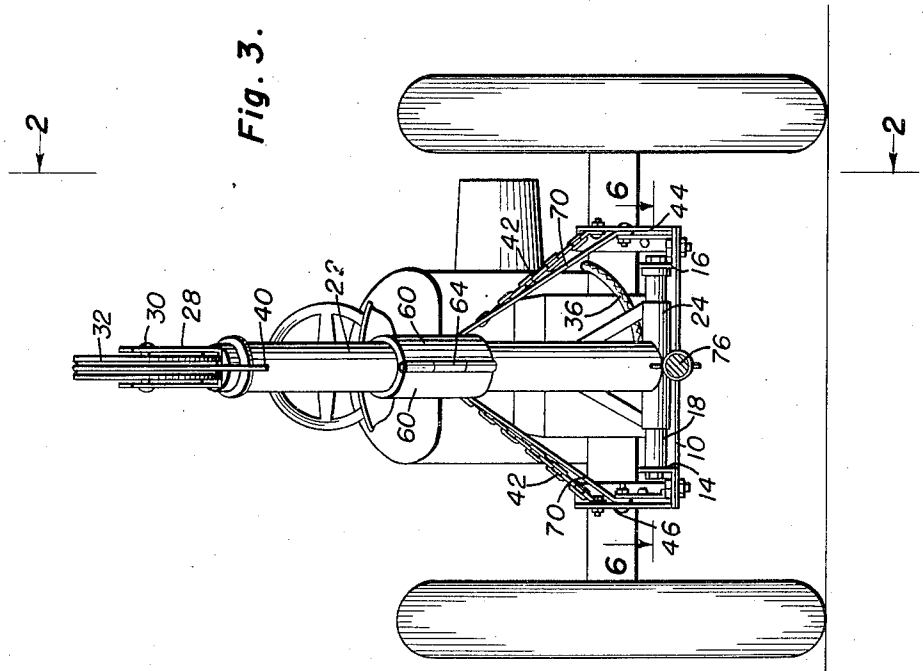


Fig. 5.

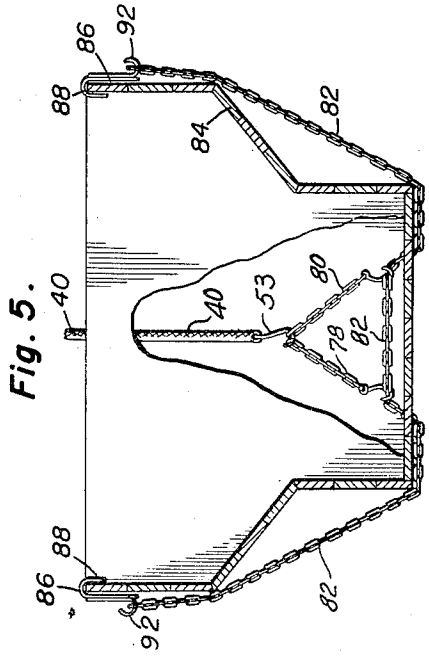
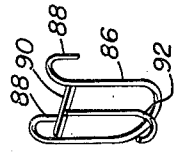


Fig. 7.



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Patented Jan. 3, 1950

2,493,150

UNITED STATES PATENT OFFICE

2,493,150

HOIST

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Application August 12, 1948, Serial No. 43,821

12 Claims. (Cl. 298—17)

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This invention relates to novel and useful improvements in lifting devices.

An object of this invention is to supply an improved hoist for use in association with a tractor or other prime mover which includes a pair of spaced brackets attached to the draw bar of the tractor or other vehicle utilized in connection with the hoist, a pivot pin secured to said bracket with a sleeve and means pivotally securing the sleeve to the pivot pin, a piston in the sleeve reciprocatively positioned, a conduit for conducting fluid such as liquid or air to the lower portion of the sleeve in order to urge the piston outwardly of the said sleeve, a guide in the form of a pulley attached to the free end of the said piston and to attach a flexible member to the tractor or other prime mover which is entrained over the guide and which may attach to a post, truck body or other suitable element to be lifted or towed.

Another object of this invention is to provide a sectional type clamp or guide, the sections of which are hingedly connected and which are positioned around the said sleeve, and bracing members attached to the sections and to the prime mover.

Another object of this invention is to so locate the brace or braces mentioned above that they may be moved in one of several positions with respect to the sections of the clamps thereby raising or lowering the sleeve in a pivotal fashion.

Another object of this invention is to provide an extremely simplified device of the character to be described which lends itself well to commercial manufacture and which serves its intended function effectively.

Ancillary objects and features of novelty will become apparent to those skilled in the art, in following the description of the preferred form of the invention, illustrated in the accompanying drawings, wherein:

Figure 1 is an elevational side view of the preferred form of the invention, showing its use in one environment;

Figure 2 is an elevational side view showing the preferred form of the invention put to a second use;

Figure 3 is a sectional view of the invention shown in Figure 1;

Figure 4 is a sectional view taken substantially on the line 4—4 of Figure 2 and in the direction of the arrows;

Figure 5 is a sectional view of Figure 1 and in the direction of the arrows a portion being broken away;

Figure 6 is a sectional view taken substantially

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on the line 6—6 of Figure 3 and in the direction of the arrows, and;

Figure 7 is a perspective view of a clip utilized in conjunction with the present invention.

The preferred form of the invention is illustrated in the accompanying drawings as being attached to a suitable tractor having among other appurtenances contiguous to tractors, a draw bar indicated at 10 and a rear axle housing indicated at 12. A pair of brackets 14 and 16 respectively are attached to the parallel portions of the draw bar and have upstanding flanges to which a pivot pin 18 is attached. This pivot pin may be rigidly joined to one of the brackets 14 and detachably attached to the other bracket by means of a conventional bolt 20 or the like.

A sleeve 22 has a bearing of the sleeve type 24 attached at one end and encircling the said pivot pin 18. This of course pivotally mounts the said sleeve 22 on the draw bar of the tractor.

Reciprocatively mounted in this sleeve 22 is a piston or plunger 26 which has bifurcations 28 at one end thereof. The said bifurcations have a pin or shaft 30 extending therethrough which journals a pulley 32 or other suitable guide members. The structure so far described constitutes an extensible crane or hoist boom pivoted at its lower end to the rearward portion of a tractor.

The said sleeve is of course open ended at one portion thereof and is closed at the other end thereof in order to form a fluid receiving chamber. This fluid receiving chamber is communicated with a suitable coupling generally indicated at 34 which has a conduit 36 connected thereto. This conduit conducts fluid from the tractor or the suitable prime mover to the fluid chamber in order to force the piston 26 outwardly of the sleeve. The same conduit may be used for the purpose of relieving fluid from this chamber (unnumbered) in allowing the piston to recede within the sleeve 22. Of course, in instances wherein a two hose system is desired, the additional hose may be similarly connected.

A flexible member such as the cable 40 is entrained around the pulley or other suitable guide 32 and has a pair of chains, each of which is indicated at 42 connected at one end thereof. The terminals of these chains are attached to the reinforcing brackets 44 and 46 respectively, which are in turn attached to the axle housing 12. Any suitable attaching means may be used such as the adjusting clamps which include back plates 50 connected to the brackets by means of stay bolts 52.

The opposite end of the said cable 40 has a

hook 48 attached thereto by the usual means, which hook may be employed for several purposes. Attention is directed to Figure 2 showing the hook 53 and the chain 56 attached thereto, which is in turn positioned around a post 58 which is to be lifted from the ground.

A guide member which is composed of a pair of identical sections 60 connected by means of a hinge pin 62 extending through hinge bights 64, is provided. Flanges 66 are provided opposite the said bights and a number of bolts 68 extend through the said flanges thereby maintaining the sections in assembled relation.

One of the bolts 68 has a pair of identical braces 70 secured thereto, the opposite ends of which are attached to the said bracing brackets 44 and 46 respectively. Thus, by positioning the braces 70 in conjunction with one of the number of bolts 68, the pivotal position of the sleeve 22 may be regulated. It will also be apparent that the braces 70 may remain attached to one of bolts 68 and the position of the guide member 60, 60, along the sleeve 22 may be adjusted by merely loosening bolts 68, sliding the guide member to a desired position and then tightening the bolts. This, of course, adjusts the inclination of the boom.

Noting Figure 1 it will be seen that a dump type trailer having a draft bar 76 attached to the draw bar 10 is supplied. Accordingly, the trailer may be towed by the tractor and the said hook 53 may be attached to a pair of chains 78 and 80 respectively. These chains are in turn attached to another chain 82 which passes from a position forwardly of the bottom of the truck 84, as shown in Figure 1, under portions of the bottom, and around the side portions to the upper edges thereof.

In order to attach the chain 82 in such a position that it will lend lateral support to the trailer truck 84, a pair of the clips shown in Figure 7 are utilized. These clips include a substantially U-shaped portion 86 having hooks 88 at the free ends thereof and having a cross member 90 connected to the leg of the said U-shaped member 86 adjacent the hooks 88. An additional hook 92 is attached to the cross member 90 and has its curved portion extending in the opposite direction from the said hooks 88. A suitable link in the chain 82 attaches to the said hooks 92 of each clip and the said hooks 88 overlie the upper portions of the side walls of the truck 84.

In operation fluid is applied to the fluid chamber to urge the piston exteriorly of the sleeve thereby carrying with it the guide or pulley 32. This of course tightens the cable 40 until all the slack is removed and then must lift the element to be hoisted.

It is within the purview of the invention to utilize the same as a towing implement in case of necessity, the elements to be towed simply being attached to the hook 53 or attached to intermediate structural elements which in turn may be attached to the device to be towed.

It is to be particularly observed that hoisting with the present invention is effected solely by movement of the piston and that one end of cable 40 is fixed to a part of the hoist, that is, brackets 44 and 46. This eliminates complicated winding drums and their drive means normally employed in hoists. The source of power, moreover, is taken from a fluid pump on the tractor which requires only a few simple pipe connections and a control valve, in contradistinction to complicated mechanical power transmissions to wind the cable on a drum or the like.

The fact that the boom may be disposed substantially vertical as shown in Figure 2 and close to the rear axle of the tractor also has certain advantages. It is apparent that when a load is lifted in a vertical direction with a boom substantially vertical, the forces required to resist tilting of the boom are small. Thus, when the boom is in the position shown in Figure 2, the forces in brace members are small in comparison to what they would be had the boom been at a large inclination. Further, the lifting is effected close to the rear wheels of the tractor and the weight of the tractor ahead of the wheels is utilized to counterbalance the lifting forces on the boom to prevent upward rotation of the front of the tractor about its rear axle. The close proximity of the boom to the rear wheels is therefore important since the lifting capacity of the hoist is a function of the distance of application of the lifting force rearwardly of the rear axle.

It is apparent that many modifications will become apparent within the purview of the invention. For example, while one type of attachment has been disclosed which effects securement of the hoist to the tractor, this is only exemplary and any other suitable attachment which may be secured to convenient parts of the tractor may be employed. The particular manner in which the inclination of the boom is varied is also subject to modifications. It is not intended, accordingly, to limit the invention to precise details, which have been given only by way of exemplification, except as defined by the scope of the appended claims.

Having described the invention, what is claimed as new is:

1. A hoist for use with a tractor having a draw bar comprising a pair of spaced brackets mounted on the draw bar and a pivot pin secured thereto, a sleeve, means pivotally securing said sleeve to said pivot pin, a piston in said sleeve, a flexible member, means securing one end of said flexible member to the tractor, the opposite end adapted to be attached to an element to be towed or lifted, a guide leaving said flexible member entrained therearound attached to said piston, and means secured to said sleeve for introducing and relieving fluid from said sleeve.

2. A hoist for use with a tractor having a draw bar comprising a pair of spaced brackets mounted on the draw bar and a pivot pin secured thereto, a sleeve, means pivotally securing said sleeve to said pivot pin, a piston in said sleeve, a flexible member, means securing one end of said flexible member to the tractor, the opposite end adapted to be attached to an element to be towed or lifted, a guide leaving said flexible member entrained therearound attached to said piston, means secured to said sleeve for introducing and relieving fluid from said sleeve, a support member positioned intermediate the ends of said sleeve, and a brace secured to said sleeve and to the tractor.

3. The combination of claim 2 and said support including a pair of hingedly connected sections each of which having a flange, and threaded elements extending through said flanges maintaining said sections assembled around said sleeve.

4. The combination of claim 3 and said brace attached to one of said threaded elements.

5. The combination of claim 4 and said guide comprising a rotatively mounted sheave.

6. The combination of claim 5 and a chain at-

tached to the end of said flexible member, clips at the ends of said chain adapted to be secured to a towed or lifted element.

7. A tractor hoist comprising, an attachment adapted to be secured to a tractor and extending rearwardly of its rear axle housing, a hoist boom having a cylinder pivotally secured at its lower end to the attachment for movement in a vertical plane, a piston rod slidable in the cylinder and extending outwardly thereof to render the boom extensible, means connecting the cylinder and tractor to vary the inclination of the boom in said plane relative to the ground, said means also bracing the boom against movement away from said vertical plane, a flexible member adapted to be fixedly secured at one end to a part of the hoist and at its other end to an article to be pulled, the intermediate portion being trained over the outer end of the piston rod, and means for conducting fluid to or from the cylinder, whereby the article to be lifted is moved in response to movement of the piston rod.

8. A portable hoist in accordance with claim 7 wherein said attachment includes a draft device for use with an article to be towed by the tractor and lifted by the hoist.

9. Apparatus for transporting and dumping material comprising; a trailer truck having a body pivoted on its chassis in such manner that elevating the front end thereof effects dumping of material contained therein at its rear end, a tractor, draft means secured to the tractor extending rearwardly thereof, means connecting the draft means and trailer truck for towing the latter, hoist means including a cylinder pivoted at its bottom on the draft means, a piston rod in the cylinder, a flexible member secured at one end to the tractor and trained over a sheave on the end of the piston rod, means for varying the inclination of the cylinder and piston rod and also bracing the cylinder against lateral movement, whereby the sheave may be disposed substantially above the front end of the trailer truck, means

for connecting the other end of the flexible member to the front end of the trailer truck, and means for conducting fluid from and to the cylinder, whereby the position of the piston therein determines the amount of elevation of the front end of the trailer truck.

10. Apparatus in accordance with claim 9 wherein said other end of the cable is connected to the dump truck at spaced points and in such manner that the hoist means and the means for bracing the same on the tractor supports the trailer truck body against lateral movements about its longitudinal axis.

11. Apparatus in accordance with claim 10 wherein said other end of the cable is connected at spaced points to a flexible member which passes under the body and around the sides, the ends thereof being fastened to the top edges of the sides.

12. Apparatus in accordance with claim 11 wherein the ends of the flexible member are connected to the top edges by U-shaped clips, the bight portion of which engage an upper edge of the body.

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REFERENCES CITED

The following references are of record in the file of this patent:

UNITED STATES PATENTS

Number	Name	Date
1,424,425	Spencer	Aug. 1, 1922
1,987,052	Choate et al.	Jan. 8, 1935
2,027,098	Helms	Jan. 7, 1936
2,220,450	Howell	Nov. 5, 1940
2,258,383	Haniquet	Oct. 7, 1941
2,421,472	Way	June 3, 1947

FOREIGN PATENTS

Number	Country	Date
273,099	Great Britain	1927