May 27, 1958 V. J. LUNDELL 2,836,460

HOIST

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Fig. 1

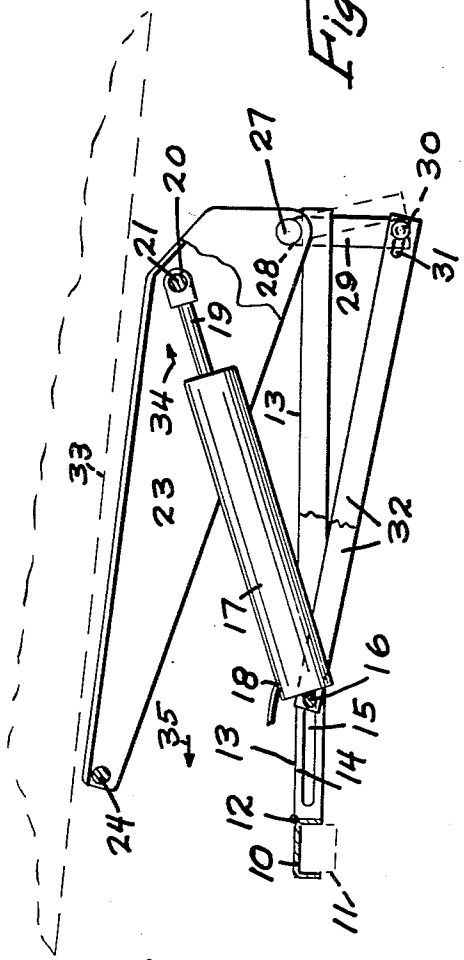


Fig. 2

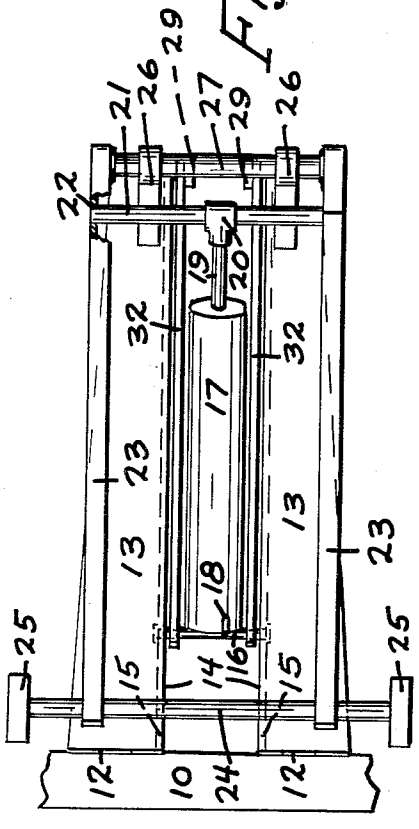
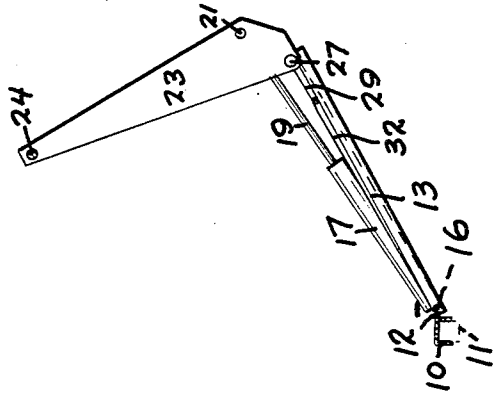


Fig. 3



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HOIST

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2 Claims. (Cl. 298—22)

My invention relates to a hoist.

An object of my invention is to provide a hoist for wagon boxes especially, it being understood, however, that the hoist can be used on any pivotal arrangement.

A further object of my invention is to provide a hoist in which a reciprocating piston is used in combination with a hydraulic cylinder, and which includes the very important feature that the thrust or effort of the hoist is doubled due to the fact that both the forward thrust of the piston rod as well as the rear thrust of the cylinder itself are utilized to provide the lifting action.

A further object of my invention is to provide a simple arrangement which can be readily installed.

With these and other objects in view, my invention consists in the construction, arrangement, and combination of the various parts of my device, whereby the objects contemplated are attained, as hereinafter more fully set forth, pointed out in my claims, and illustrated in the accompanying drawings, in which:

Figure 1 is a side elevation of the hoist, with portions thereof being taken in cross section,

Figure 2 is a plan view of Figure 1, and

Figure 3 is a side elevation of the hoist in its fully raised position.

My invention contemplates the provision of a simple hoist which can be readily attached to a wagon box lower structure for raising a pivoted wagon box, and by which the component forces of both ends of a hydraulic unit are employed to provide the lifting action, thereby providing a higher lifting efficiency to the arrangement.

I have used the character **10** to designate a U-shaped member which is placed over the transverse beam at the forward end of the wagon box, and which beam usually overlies the forward shaft, the character **11** indicating this beam.

Suitably hinged at **12** to the member **10** are a pair of rearwardly extending members **13** having the downwardly inclined flanges **14** in which flanges are provided the lengthened slots **15**, and received in these slots **15** is a transverse lengthened shaft or pin **16** which is rigidly attached to a hydraulic oil cylinder **17** which is fed at **18**.

Received within the cylinder **17** is a suitable piston which is secured to the piston rod **19** which is attached to the member **20**, which is secured to the transverse shaft **21**, which shaft **21** is suitably journalled at **22** to the spaced lifting arms **23**. The arms **23** include the transverse shaft **24** which is journalled in these arms, the shaft **24** being journalled within the brackets **25** which are attached to the wagon box itself.

Secured to the members **13** are the bearings **26** through which bearings passes a shaft **27**, this shaft **27** being securely welded to the arms **23**. Also securely welded at **28** to the same shaft **27** are a pair of levers **29**. The levers **29** include the short studs or pins **30** which are received in the short slots **31**, these slots being provided in the lengthened bars **32**, which bars are pivotally secured to the transverse pin **16**.

The dotted line character **33** indicates a wagon box

which is to be raised, the apparatus being shown in a partially raised position, the levers **29** being shown by dotted lines in the original or starting position. The device operates in the following manner.

When it is desired to raise the wagon box, the oil under pressure is fed into the cylinder **17** at **18**, which causes the rod **19** to be thrust in the direction of the arrow **34** to thereby start the raising action of the side members **23** which will pivot on the shaft **27**. During the reciprocating action of the piston within the cylinder **17**, since the transverse pin **16** is not secured, it will travel toward the left, or in the direction of the arrow **35** during this action, thereby pulling on the two rods **32** which in turn, due to the connection at **30**, will correspondingly tend to draw the levers **29** toward the left. This action will have the tendency of causing the pivotal point **16** to change during the raising action so as to provide a greater effort at the pivoting point **21** to increase the efficiency, especially in the initial action. This action would not be true if the pivoting point **16** were fixed.

It will also be noted that at a certain point in the raising action, the members **13** will also rise. The small slots **31** provide means whereby the raising action in the direction of the arrow **34** can be more rapid after the transverse pin **16** has reached its maximum limit to the left by virtue of the fact that the levers **29** can travel further in an arc after this limit has been reached, this action occurring when the wagon is practically lifted to its full extent thereby speeding up the action at this point where the maximum force is not required.

It should be specifically understood that slight changes or alterations could be made in the various members and still involve the same general principles.

It will now be seen that I have provided the advantages mentioned in the objects of my invention with various other advantages being readily apparent.

Some changes may be made in the construction and arrangement of the parts of my invention without departing from the real spirit and purpose of my invention, and it is my intention to cover by my claims any modified forms of structure or use of mechanical equivalents which may be reasonably included within their scope.

I claim as my invention:

1. A hoist comprising a pivotal member adapted to be pivotally attached to a framework portion of a wagon, a hydraulic cylinder, said pivoting member having slots, a transverse pin attached to the base of said hydraulic cylinder and received in said slots, bearings attached to said pivoting member, a shaft journalled in said bearings, lifting arms rigidly attached to said shaft, a piston in said hydraulic cylinder, a piston rod attached to said piston, the end of said piston being pivoted to said lifting arms, levers rigidly attached to said shaft, longitudinally extending bars pivotally attached to the ends of said levers and pivotally attached to said transverse pin, the forward ends of said lifting arms being pivotally secured to a forward portion of a wagon box, expanding movement of said piston rod causing said lifting arms to raise, and said transverse pin to move in said slots.

2. A hoist comprising mounting means pivotally attached to a framework portion of a wagon, a hydraulic cylinder, a transverse pin attached to the base of said hydraulic cylinder, bearings attached to said mounting means, a shaft journalled in said bearings, lifting arms rigidly attached to said shaft, a piston in said hydraulic cylinder, a piston rod attached to said piston, the end of said piston rod being pivoted to said lifting arms, levers rigidly attached to said shaft, longitudinally extending bars pivotally attached to the ends of said levers and pivotally attached to said transverse pin, the forward ends of said lifting arms being pivotally secured to a

forward portion of said wagon box, expanding movement of said piston rod causing said lifting arms to raise and said bars to move longitudinally, means on said mounting means operatively connected to said pin for guiding said pin a pre-determined distance during the forward movement caused by said levers.

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