Oct. 24, 1967 R. E. LARDNER 3,348,809

HYDRAULIC HOIST FOR TOW TRUCKS

Filed Feb. 7, 1966

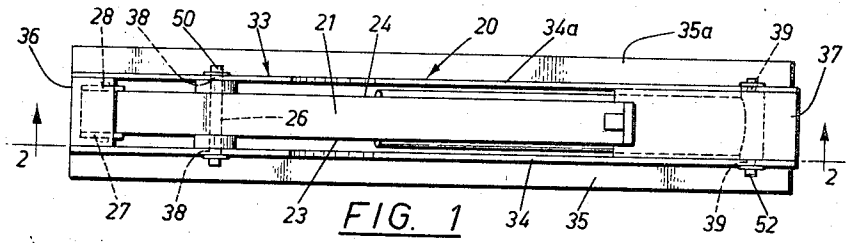


FIG. 1

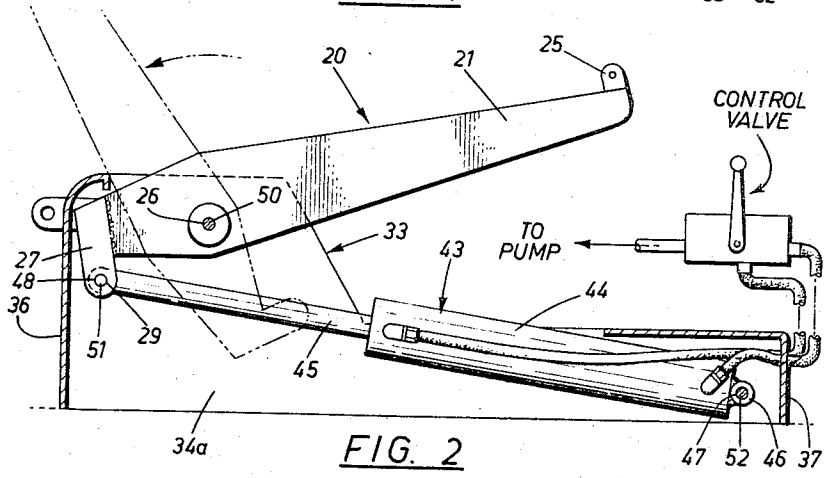


FIG. 2

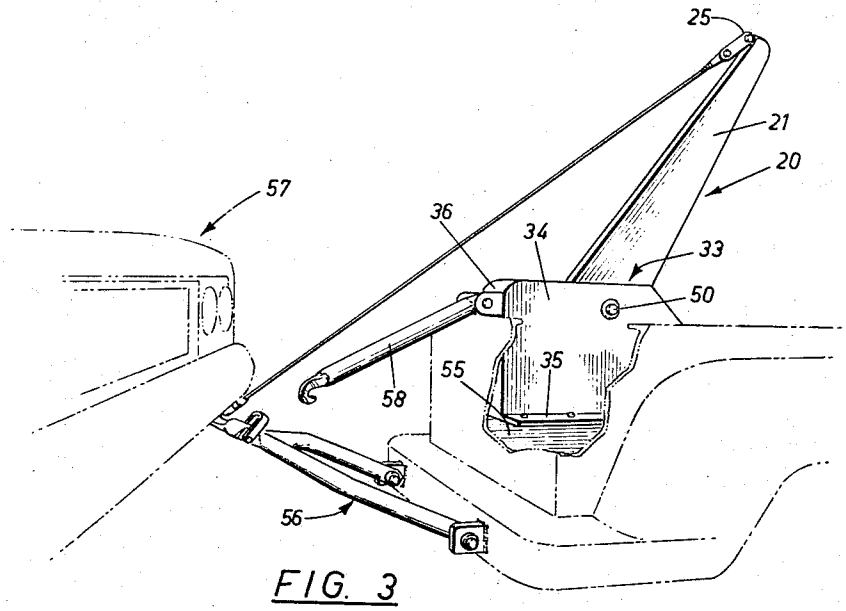


FIG. 3

INVENTOR.
ROBERT E. LARDNER

BY Frank 9. Pyle

Agent

United States Patent Office 3,348,809 Patented Oct. 24, 1967

3,348,809

HYDRAULIC HOIST FOR TOW TRUCKS

Robert E. Lardner, Edmonton, Alberta, Canada, assignor to Western Pneumatics Ltd., Edmonton, Alberta, Canada

Filed Feb. 7, 1966, Ser. No. 525,575
2 Claims. (Cl. 254—124)

This invention relates to a hydraulic hoist for lifting and handling heavy objects, and particularly to hoists for use with automotive towing vehicles.

The invention is particularly directed to a hydraulic hoist suited for mounting on the rear portion of a towing vehicle for co-operation with a towing bridle, whereby a second vehicle may be suitably raised into a towing position.

Hoists presently used on vehicles for such purposes as towing are generally of large size and complex structure. Owing to the necessity of securely fastening the hoist to the vehicle and the obstructive nature and form of the hoists presently used, the vehicle is generally not usable except in a lifting or towing role.

An object of the presene invention is to provide hoist for use in a towing vehicle adapted to occupy a minimum amount of space in the vehicle when not in use.

Another object of the present invention is to provide a simple and robust hoisting device readily actuated by hydraulic power means.

Still another object of the present invention is to provide a hoist for use in conjunction with a towing bridle to raise vehicles to be towed into a suitable towing position. A further object is to provide a securing device to hold the load independently of the hoist while in transit.

A further object of the present invention is to provide a hydraulically actuated hoist having a dual range of loading capacity.

These and other objects of the invention are achieved by means of a hydraulically operated hoist for use on a truck, comprising: pivotal arm means; load attachment means secured to the arm means adjacent one end thereof; an elongated support frame including a pair of side members; pivot means extending between the side members in supporting relation with the arm means; hydraulically operable piston and cylinder actuator means extending within the support frame and attached at one end thereto; means to selectively provide pressure fluid to the actuator means; and means attaching the other end of the actuator to the arm means to provide pivotal movement of the load attachment means in response to changes in the effective length of the actuator means, said attaching means enabling the arm means to be positioned in close coextensive relation with the support frame, whereby the space requirement of the hoist when not in use is reduced to a minimum.

An embodiment of the invention is described with reference to the following drawings wherein:

FIGURE 1 shows a plan view of a hoist according to the present invention;

FIGURE 2 shows a side elevation of the device taken on 2—2 of FIGURE 1; and

FIGURE 3 is a view of the device mounted on a truck as used for raising vehicles into a suitable position for towing.

Referring to FIGURES 1 and 2, the hoist **20** comprises a cantilevered arm **21** pivotally mounted in a frame **33** and actuated by a hydraulic actuator **43**.

The arm **21** is of inverted U-form having a top portion **22** and side portions **23, 24**. A load attachment bracket **25** is attached to one end of the arm.

A pair of transversely aligned apertures **26** in the side portions **23, 24** of the arm **21** are adapted to receive pivot

pin **50** for supporting arm **21**. Arm **21** has a pair of actuating bracket arms **27, 28** attached to and extending downwardly from the side portions **23, 24**, and having transversely aligned apertures **29** to receive a pivot pin **51** for connection to the actuator **43**.

The hoist support frame **33** includes a pair of side members **34, 34*a*** having attachment flanges **35, 35*a*** at the bottom edges thereof for attachment to a mount such as the bed **55** of a truck shown in FIGURE 3. The side members **34, 34*a*** of the frame are spaced from each other by a back plate **36** and a front plate **37** which provide a substantially rigid structure. The first pair of apertures **38** extend through the side wall members **34, 34*a*** in transverse alignment to receive pivot pin **50** for the arm **21**, while a second pair of apertures **39** also extending transversely through the frame side members **34, 34*a*** in transverse alignment are adapted to receive pivot pin **52** for the actuator **43**.

The actuator **43** comprises a cylinder **44** and an output member or piston rod **45**. The actuator cylinder **44** is secured to the frame **33** by means of a cylinder mounting bracket **46** having an aperture **47** therethrough to receive pivot pin **52**, while the piston rod **45** is similiary apertured as shown at **48** to receive pivot pin **51** for attachment to the actuating bracket arms **27, 28**. Pressurized hydraulic fluid is supplied to the actuator, which is double-acting, by way of flexible pressure supply lines **49**.

The three main components of the hoist are assembled in co-operating relation by means of pivot pins **50, 51** and **52**. The arm pivot pin **50** on which the loading arm **21** is mounted extends through apertures **38** in the support frame side members **34, 34*a*** and through apertures **26** in the loading arm side portions **23, 24**. The actuator cylinder pivot pin **52** is located in apertures **39** of the support frame side members **34, 34*a*** and passes through the aperture **47** in the cylinder mounting bracket **46**.

The loading arm drive pin **51** secures the output member **45** of the actuator **43** to the actuator bracket arms **27, 28** of the loading arm **21**.

In the case of the pin **50**, attached to the frame **33**, spacers **53** provide centering of the arm between the frame side members **34, 34*a***. The pins **50, 51** and **52** are secured in position relative to the other components by conventional means such as circlips, drive pins or split pins (not shown).

An inextensible hook member **58** is shown attached to the rear portion of the frame **33**, so that when the hoist is in use, the load on the actuator **43** and the arm **21** need not be continuously sustained by these parts. In addition to, or as an alternative to the link **58**, it is contemplated that a locking pin may be inserted through the arm **21** and engaged within holes in the side members **34, 34*a*** of the support frame **33**, in order to immobilize the arm **21** in a desired position or positions.

As shown in FIGURE 2, a control valve may be used in co-operation with a source of pressurized hydraulic fluid such as an accumulator connected to a suitable pump, providing pressurized fluid through the flexible lines **48** to the actuator cylinder **44**.

When mounted on a truck bed **55** (FIGURE 3) for use in conjunction with an A-frame stabilizer **56**, the hoist according to the present invention provides a ready means for lifting a portion of a vehicle **57**.

It will be seen that the control valve of the present arrangement can be mounted in an accessible position adjacent the tailgate of the towing vehicle.

When not in use, or when a vehicle has been raised into a desired towing position and secured by the hook member **58**, the loading arm **21** can then be returned to a substantially horizontal position in which the truck bed is substantially unobstructed, and is available for other requirements and uses.

In addition to possessing the capability of raising a vehicle into the towing position, it will be seen that by permitting a lifting cable to pass in contact with the rear end of the lifting arm **21** very large lifting forces may be exerted upon the cable. The provision of transverse cable stabilizing members to locate the cable on the arm **21** at the rear portion thereof adjacent the pivot point is contemplated.

What I claim as new and desire to protect by Letters Patent of the United States is:

1. A hydraulically operated hoist for use on a truck comprising: lift arm means, said arm means having a load attachment means secured thereto adjacent one end thereof and actuator attachment means secured thereto adjacent the other end thereof; an elongated support frame including a pair of spaced apart side members; pivot means extending transversely between said side members at the rearward end thereof in supporting relation with said arm at a point intermediate the ends thereof; a double acting hydraulically operable piston and cylinder actuator extending between said support frame side members and having one end pivotally attached at the forward end of said support frame; means to selectively provide fluid pressure to said actuator, said actuator and actuator attaching means enabling said arm means to be rotated to a position substantially perpendicular to said support frame when said actuator is in a retracted position and to a position in close coextensive relation with said support frame when said actuator is in an extended position, whereby the space requirement of the hoist when not in use is reduced to a minimum.

2. A hoist as claimed in claim **1** wherein said arm means includes an upper portion with a load attachment bracket secured to one end thereof, a pair of side walls extending from the upper portion having a pair of transversely aligned apertures extending therethrough located intermediate the ends of the arm means to receive a pivot pin extending between said side members, and a pair of bracket arms extending from said arm side walls at the ends remote from said load attachment bracket with a pair of transversely aligned apertures extending therethrough to receive a pivot pin attaching said other end of the actuator between said side arms.

References Cited

UNITED STATES PATENTS

2,373,469	4/1945	Grime	254—8
2,702,988	3/1955	Rhoads et al.	254—2
2,789,788	4/1957	Wilson	254—2
2,950,085	8/1960	Lizzadro	254—124

OTHELL M. SIMPSON, *Primary Examiner.*