

Oct. 18, 1960

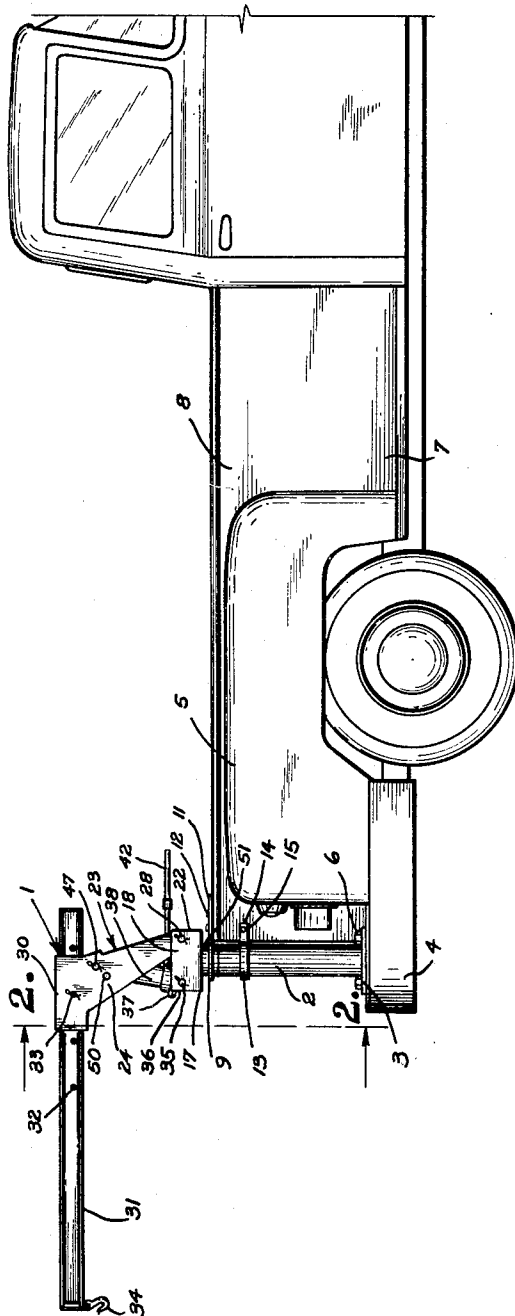
D. J. FANGMAN
HYDRAULIC CRANE

2,956,691

Filed June 8, 1959

2 Sheets-Sheet 1

Fig. 1.



INVENTOR.

Donald J. Fangman.

BY

Fishburn & Gold
ATTORNEYS.

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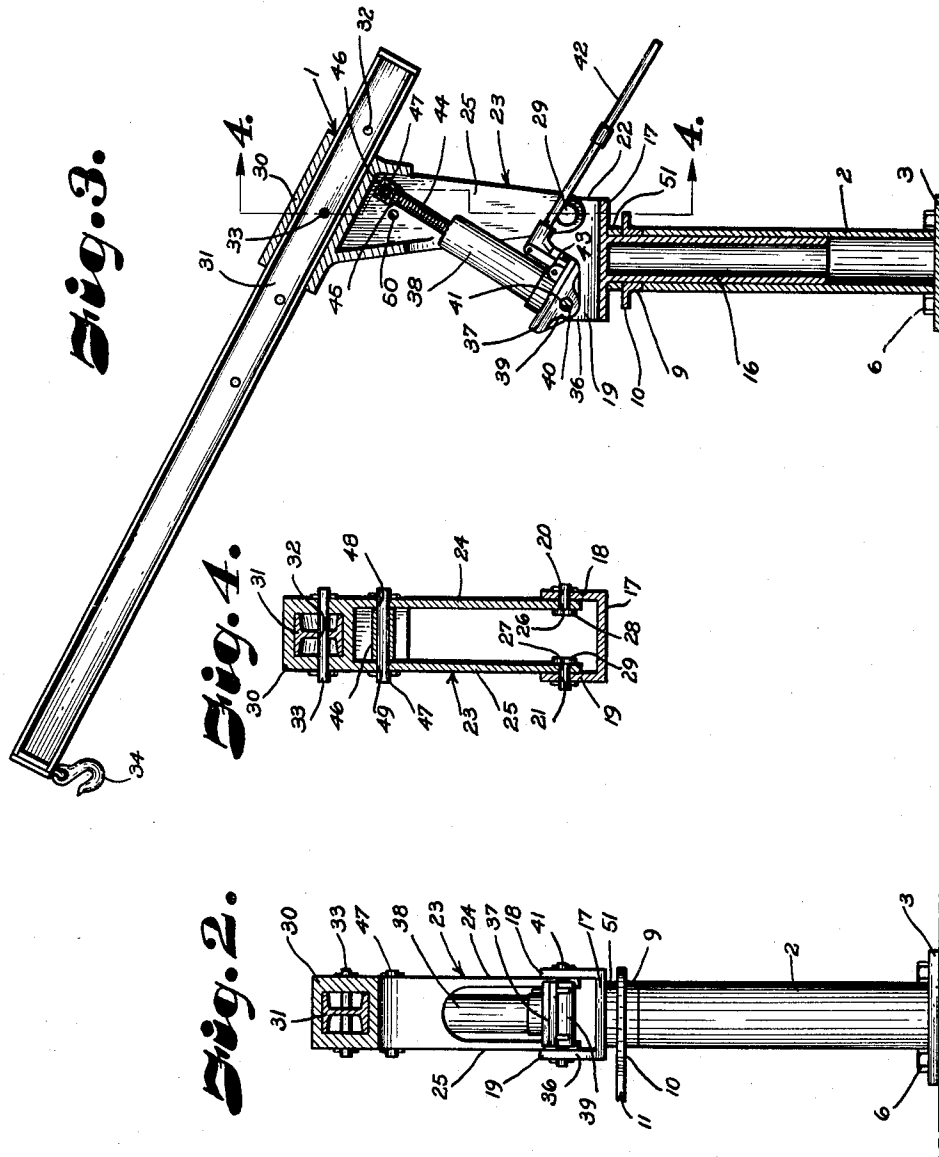
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INVENTOR.

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BY

BT
Fishburn & Gold
ATTORNEYS.

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2,956,691

HYDRAULIC CRANE

Donald J. Fangman, Amarillo, Tex., assignor, by mesne assignments, to William R. Curtis, Amarillo, Tex.

Filed June 8, 1959, Ser. No. 818,937

2 Claims. (Cl. 212—35)

This invention relates to a hydraulic crane, and more particularly to a lifting device of this type which may be mounted upon a truck or the like for lifting objects from the ground to the truck or from the truck and placing the objects on the ground.

Various attempts have been made in the past to devise a crane of this character which would be simple and adapted to be attached to the rear end of a truck or the like and wieldable for the purpose intended without interfering with loading or unloading of the truck. None of such apparatus have proven commercially satisfactory.

It is the principal object of the present invention to provide a jack of this character mountable upon the rear of a truck bed or the like and having a hydraulic jack mounted on the standard of the crane adjustable on the arm of the crane for maximum height or lift of the boom, and the boom also being adjustable with respect to the arm to increase the range of lift and deposit of the objects being moved.

More specifically, other objects of the invention are to provide a standard or post having a member mounted therein and rotatable thereon having a head to which the arm is pivotally mounted and the hydraulic jack is also pivotally mounted; to provide the upper end of the arm with a sleeve for receiving a boom slidable therein to adjust the length of the boom; to provide the arm with means for securing the hydraulic jack thereto in adjusted position to increase the lift or height of the crane; to provide one end of the boom with a hook or fastening device for attachment to the objects to be lifted; to provide the hydraulic jack valve means and with a handle for operating the same; and to provide a device of this character simple and economical to manufacture.

In accomplishing these and other objects of the invention I have provided improved details of structure, the preferred forms of which are shown in the accompanying drawings, wherein:

Fig. 1 is a side view of my improved hydraulic crane mounted on the rear of a truck or the like.

Fig. 2 is a cross-sectional view taken on a line 2—2, Fig. 1.

Fig. 3 is a longitudinal cross-sectional view through the standard and arm showing the rotatability of the device and the boom slidable in the sleeve on the arm of the crane.

Fig. 4 is a cross-sectional view taken on a line 4—4, Fig. 3, particularly illustrating the mounting of the arm, the jack secured thereto, and the pin for securing the boom in the sleeve.

Referring more in detail to the drawings:

1 designates a crane embodying the feature of my invention comprising a hollow post or standard 2 having a base 3 adapted to be secured to the rear end 4 of a truck bed or the like 5 by bolts 6. The truck as shown has a bed 7 with sides 8. Mounted on top of the post is a collar or sleeve 9 having a flange 10, and extending from one side thereof is a plate or arm 11 adapted to be secured

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to the top of the bed by bolts or the like 12 (Fig. 1). I also provide a bracket 13 around the post which has its ends 14 attached to the side of the bed, as indicated at 15.

Mounted for rotation within the tubular standard 2 is a tubular member or post 16 having a head or bracket 17 with spaced upwardly extending side arms 18 and 19 with aligned openings 20 and 21 near the end edge 22 thereof for mounting an arm or head 23. The head 23 has bracket arms 24 and 25 spaced apart to engage within the arms 18 and 19 of the bracket 17 and are provided with openings 26 and 27 for securing the head 23 to the arms 18 and 19 by pins of the like 28 and 29 (Fig. 4).

The upper end of the arm is provided with a sleeve or tubular member 30 for receiving a boom 31 of I-beam construction, as best illustrated in Fig. 4. The boom is mounted for sliding in the sleeve 30 and is provided with a plurality of spaced openings 32 and is held in an adjusted position in the sleeve by a pin 33. The outer end of the boom is provided with a hook 34 for use with a chain or the like (not shown) for fastening to the object to be lifted by the crane. The side arms 18 and 19 of the bracket 17 are provided with aligned openings 35 near the end edge 36 of the arms for mounting a base 37 of a hydraulic jack 38. The base has a sleeve member 39 provided with an opening 40 (Fig. 3) for receiving a pin 41 extending through the openings 35 in the arms 18 and 19 for pivotally mounting the hydraulic jack on the bracket 17.

The hydraulic jack is of the hand operated type by handle 42 and includes the usual reservoir, pump and fluid. It also includes the usual valve 43 for control of the fluid to allow the jack to be lowered. The jack is of conventional type and no invention is claimed in the specific form thereof.

The hydraulic jack includes a piston rod 44 having a flat head 45 at its outer end adapted to engage the flat portion of hollow square-shaped member 46 sleeved over a pin 47 extending through aligned openings 48 and 49 in the arms 24 and 25 near the sleeve. The arms 24 and 25 of the head 23 are also provided with aligned openings as indicated at 50 (Fig. 3) spaced from the aligned openings 48 and 49 and at a slightly lower elevation or towards the pivotal point of the head for adjustment of the jack and head to get a greater lift with the jack when the device is in operation.

In operation of the device constructed and assembled as described, the hydraulic jack 38 is lowered by manipulation of the handle 42 so that the piston 44 is extended into the cylinder and thus the arm or head 23 will be lowered and at the same time the jack and arm will pivot with respect to each other on the bracket between the arms 18 and 19. When the boom is lowered the chain (not shown) may be attached to the object to be lifted through the hook 34 on the end of the boom and then operation of the handle 42 of the jack will extend the piston to raise the arm and the boom with the load thereon. When it has reached the desired height it may be rotated to deposit the load in the truck. The reverse operation may be accomplished to unload the load from the truck.

By changing the pin 47 to the opening 50 a higher lift will be accomplished with the device. Also the adjustment of the boom 31 in the sleeve 30 of the arm 23 to its outermost position or to the left, as shown in the drawing, will give a greater lift and also a greater range for deposit of the load. A spacer 51 may be provided between the flange 10 of the sleeve 9 and the lower side of the head plate 17 for easier rotation of the head 23 and to adjust the heights of the head plate 17 with respect to the base 3 by using a different sized spacer 51 or sleeve 9 to accommodate beds of different shape and heights,

It will be obvious from the foregoing that I have provided an improved hydraulic crane which may be operated by a hydraulic jack having an adjustment of the jack with the head or arm for accomplishing greater lift and a boom slidable in the sleeve of the arm for greater range of work.

While I have here described a form of invention which has been proven satisfactory, other forms may be used without departing from the spirit of my invention.

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

1. A lifting device of the character described for mounting on a vehicle comprising, a standard mounted on said vehicle, a post rotatably mounted on said standard, an elongated substantially horizontally disposed head on said post, an arm extending upwardly from said head, means pivotally mounting said arm adjacent one end of said elongate head for swinging movement in a vertical plane extending longitudinally of said elongate head, a sleeve on the upper end of said arm and having an elongate open ended channel therethrough substantially in the plane of swinging movement of said arm, a boom slidably mounted in said sleeve channel for longitudinal movement relative thereto for adjusting the extension of the boom, means securing said boom to said sleeve to hold said boom in selected extended position, said boom having a load carrying portion extending from said sleeve at the end thereof toward the other end of said elongate head, the longitudinal axis of said load carrying end portion of the boom being in a line at an obtuse angle to the longitudinal axis of said arm, and an extensible member having one end pivotally mounted adjacent said other end of the elongate head in substantially horizontal spaced relation relative to the pivotal mounting of said arm, said extensible member being substantially in the plane of swinging movement of the arm and having its other end pivotally connected to said arm below and adjacent said sleeve for raising and lowering said boom in response to extension and contraction respectively of said extensible member, the longitudinal axis of said extensible member being substantially perpendicular to the longitudinal axis of said load carrying end portion of the boom and having a relative position whereby said extensible member is substantially upright when the boom is in lowered position and is inclined from said upright position in a direction toward said one end of the elongate head when said boom is in raised position.

2. A crane of the character described for mounting on the bed of a truck or the like comprising, a hollow

standard having a base for attachment to the bed of the truck, a post rotatably mounted in said hollow standard, an elongate substantially horizontally disposed head on said post having open ends and spaced side flanges provided with aligned openings near each end of the head, an arm having spaced side plates, said side plates having aligned openings in the lower end thereof, a pin engaged in the aligned openings in the lower ends of the plates and in one end of the side flanges of the elongate head for pivotally mounting said side plates to the arm thereto whereby said arm extends upwardly from said one end of said elongate head and is swingable in a vertical plane extending longitudinally of said elongate head, a sleeve on the upper end of said arm and having an open ended channel therein in the plane of swinging movement of said arm, said side plates of the arm having pairs of spaced aligned openings near said sleeve, a boom adjustably mounted in said sleeve channel for movement longitudinally thereof for selectively varying the extension of the boom therefrom and having a load carrying end portion extending from said sleeve, means securing said boom to said sleeve in selected extended position, the longitudinal axis of said load carrying end portion of the boom being in a line at an obtuse angle to the longitudinal axis of said arm, an hydraulic jack having a handle for operating same, means pivotally mounting one end of the jack in the aligned openings near the other end of the side flanges of said elongate head in substantially horizontal spaced relation and toward the load carrying end of the boom relative to the pin pivotally mounting the arm on the head, said jack having its other end extending between the arm side plates and pivotally connected in a pair of the spaced aligned openings in said side plates near the sleeve whereby operation of the handle will operate said jack to raise and lower said boom, the longitudinal axis of said hydraulic jack being substantially perpendicular to the longitudinal axis of said boom and having a relative position whereby said hydraulic jack is substantially upright when the boom is in lowered position and is inclined from said upright position in a direction toward said one end of the elongate head when said boom is in raised position.

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