May 8, 1951 H. B. HUTCHINGS 2,551,745

ALL-PURPOSE LIFT ATTACHMENT FOR VEHICLES

Filed July 2, 1947 2 Sheets-Sheet 1

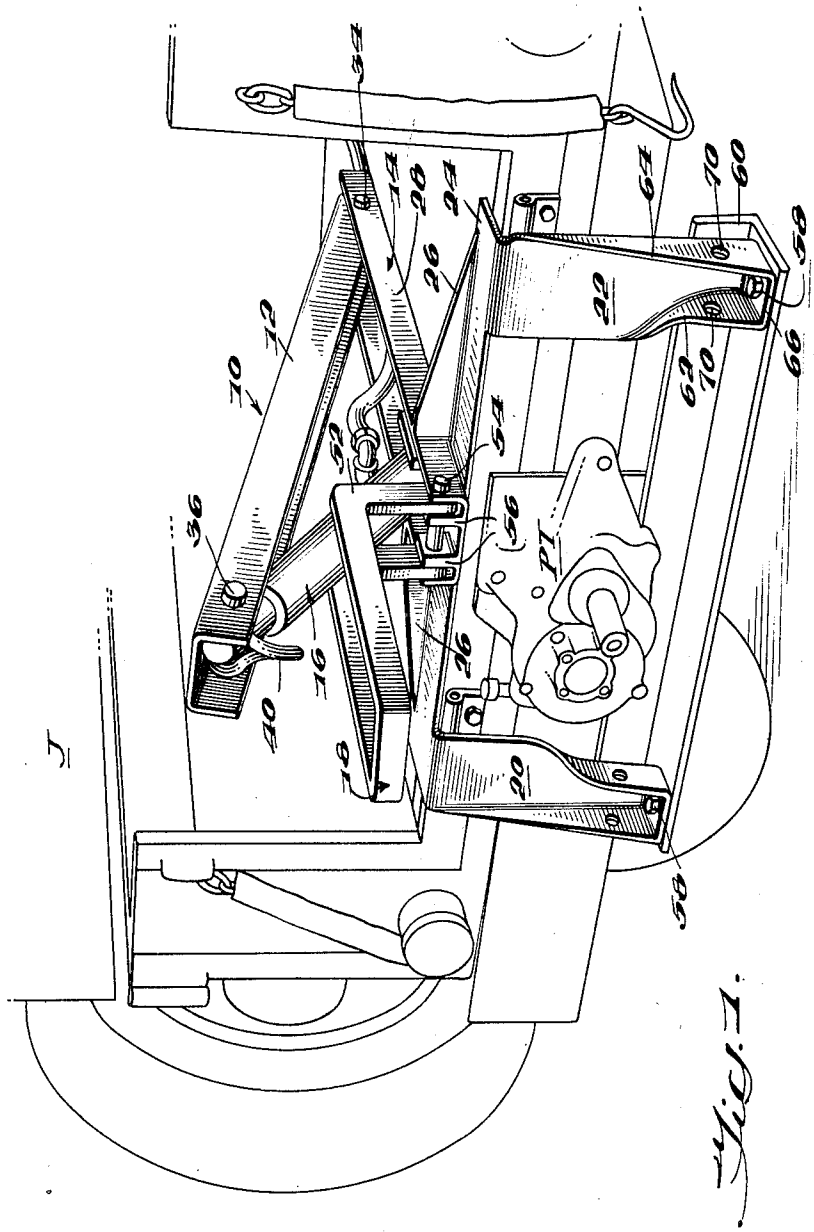


Fig. 1.

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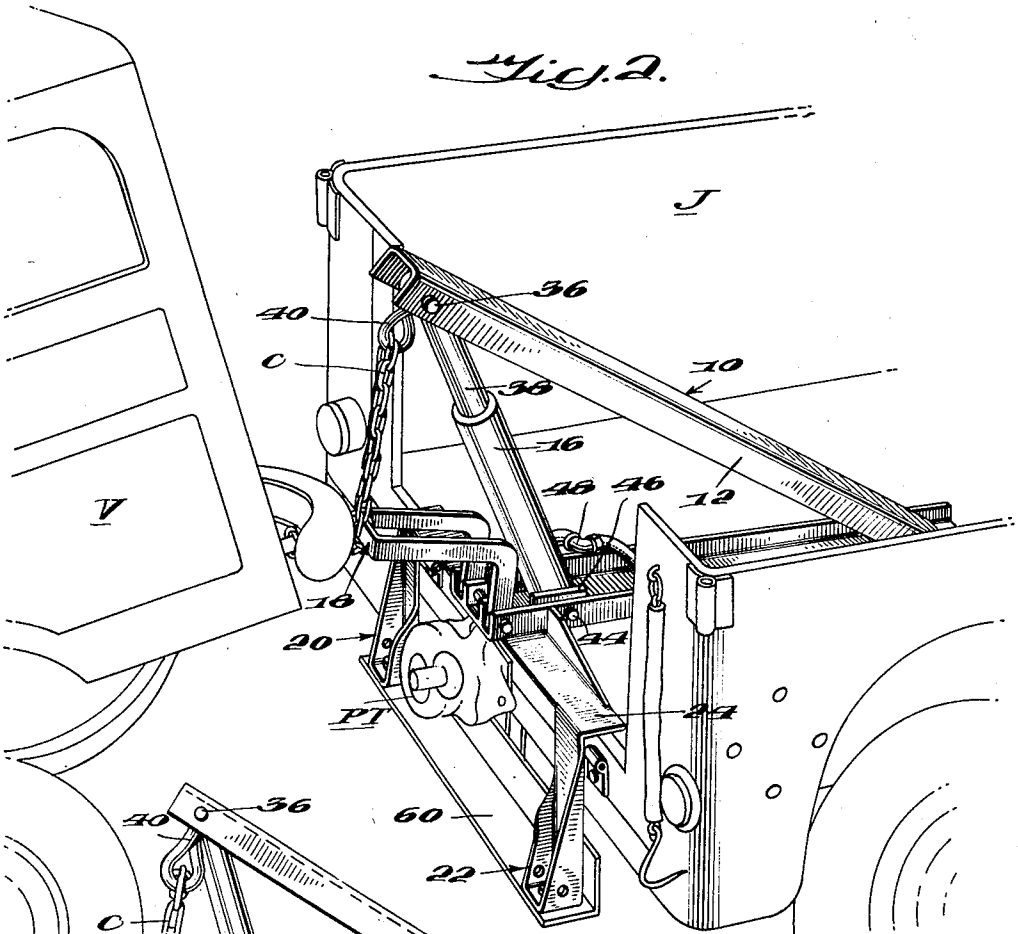
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Filed July 2, 1947 2 Sheets-Sheet 2

Fig. 2.



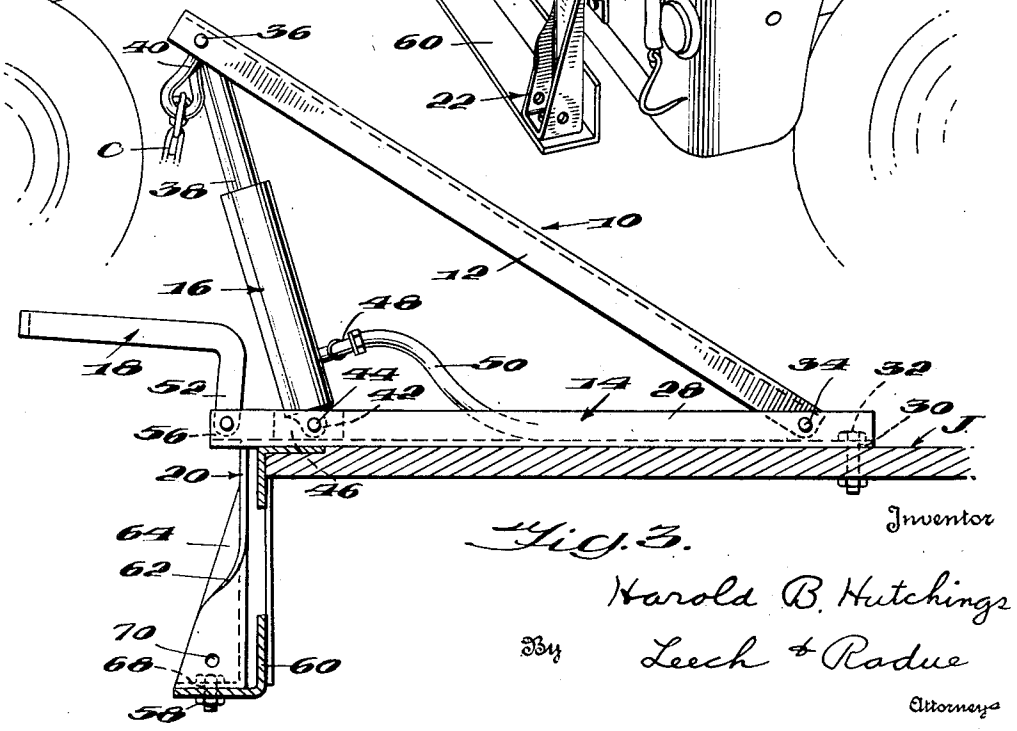


Fig. 3.

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ALL-PURPOSE LIFT ATTACHMENT FOR VEHICLES

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5 Claims. (Cl. 214—86)

1

This invention relates to an all-purpose lift attachment for vehicles and in particular to a power operated lift adapted for simple and efficient attachment to that form of small truck or vehicle known as a "Jeep."

The "Jeep" now available for general farm and garage purposes comprises a small truck having a readily detachable rear tail gate and a transverse drawbar disposed below the rear opening provided for the tail gate. The transverse drawbar of such a "Jeep" is formed with a plurality of spaced holes for convenient attachment of a variety of devices. As one of the principal purposes of this invention is to provide a lift attachment for "Jeeps" which can be readily mounted thereon with a minimum of trouble and expense, one of the connecting parts of the attachment is made with bolt holes spaced to correspond to the standard spacing on the drawbar, and another connecting part adapted to extend along the floor of the "Jeep" is provided with a bolt hole adapted to align with a center cross member of the body frame. Consequently, in order to make the required attachment, it is necessary only to drill an aligned bolt hole through the center frame member and to insert bolts in that hole and in the bolt holes of the attachment which match up with the drawbar.

Another important object of this invention is to provide a strong, low cost attachment having a hydraulically operated boom constructed and arranged to accomplish a large number of odd jobs on the farm, and in garages or service stations, where the "Jeep" has gone into extensive use. The attachment provided by this invention can be used for moving milk cans, oil drums, stumps and other heavy objects quickly and safely with practically no manual effort. It may also be employed for towing other vehicles, moving engines, lifting a chassis for repairs, and many other similar operations.

It is a specific object of this invention to provide a simple lift attachment constructed and arranged for efficient cooperation and maximum utility with a "Jeep" or similar vehicle.

More specifically stated, a further object of this invention resides in the provision of a lift attachment of the character indicated including a boom movable in a vertical plane with its lifting end extendible beyond the rear end of the vehicle, a base member to which the boom is pivotally anchored by one end, and a hydraulic ram or jack pivotally connected at opposite ends to the free end portion of the boom and the base member. A related object includes the provision of a strut or link member pivotally connected to the

2

base member of the attachment and constructed and arranged to swing in a plane coincident with or parallel to the operating plane of the boom for cooperative engagement with a load, or attachment to an end of another vehicle, being elevated by operation of the boom.

These and other features of novelty contributing to efficiency in operation, wide utility, dependability, and ruggedness of construction will be more apparent from the following detailed description of a preferred embodiment of the lift attachment taken in connection with the accompanying drawings, in which:

Fig. 1 is a rear perspective view of the lift attachment indicating the manner of connection with a "Jeep" or like vehicle;

Fig. 2 is a side perspective view of the attachment and vehicle of Fig. 1 in operative position for lifting and towing another vehicle; and

Fig. 3 is a side elevational view showing further the manner in which the lift attachment is mounted on and connected to a "Jeep," the essential cooperating elements of which are shown fragmentarily in longitudinal section.

With reference to Figs. 1 and 2, the reference numeral 10 indicates the entire attachment which is shown in its operative relation to the rear end of a small truck or "Jeep" J, the tail gate having been removed for this purpose.

The lift attachment 10 comprises a boom arm 12 pivotally connected to the inner end of a base member 14, and a hydraulic ram 16 pivotally connected at its opposite ends between the outer end of the boom arm 12 and the base member 14. The greater effective length of the boom arm 12 permits its unconnected lifting end to extend beyond the outer end of the base member 14. Preferably, the base member 14 will also be provided with a pivoted arm or strut member 18 illustrated as U-shaped.

The portion of the base member 14 which is supported by the rear part of the floor of the "Jeep" is generally T-shaped in plan and includes a pair of vertical leg extensions 20 and 22 extending downwardly adjacent the ends of the head 24. As shown in Fig. 1, these extensions lie on opposite sides of the lifting arm 12 and are spaced to provide ample clearance for a centrally mounted power take-off PT, with which vehicles of this character are usually equipped.

It will also be noted that two vertical reinforcing webs 26, 26 connect the inner edge of the transverse portion or head 24 to the upturned, channel-shaped leg 28 of the T defined by the base member 14.

The inwardly disposed end of the leg or lon-

gitudinal portion 28 is provided with a hole or perforation 30 through its web portion for receiving a central securing bolt 32 passing through a center member of the "Jeep" body, as shown best in Fig. 3. The opening for receiving the bolt 32 is the only one required which it is necessary to make in securing the attachment of this invention to a standard or conventional form of "Jeep."

A pivot pin 34 which may be secured in place by cotter pins or other conventional means, not shown, extends horizontally across the inward end of the leg 28 and is pivotally connected to the corresponding end of the boom arm 12 to accommodate movement of that arm in a plane perpendicular to that of the base member 14 and the floor of the "Jeep." The outer end of the boom or arm 12, which is of such a length as to extend appreciably beyond the base member 14 and the rear opening of the vehicle, carries a horizontal pivot pin 36 suitably secured in position for cooperation with piston 38 of the ram 16 and a lifting loop or eye 40. As shown best in Fig. 1, the loop 40 is twisted into a plane corresponding approximately with that through which the boom 12 moves, and has its ends secured around the pin 36 on opposite sides of the pivotally connected end of piston 38, and between the channel sides of said arm. The arrangement and size of the pivoted lifting loop 40 are such that a lifting chain C may readily be passed therethrough in the manner indicated in Figs. 2 and 3.

With further reference to Fig. 3, the extremity of the cylinder end of the hydraulic ram 16 is formed to provide a lug or ear 42 arranged for cooperation with a pivot pin 44 mounted horizontally in the channel-shaped leg 28 in parallelism with the boom pivot pin 34. A pair of parallel vertical plates 46, 46 integrally secured to the bottom of the channel-shaped leg 28 are also formed with openings to receive the pivot pin 44, and are arranged to maintain the hydraulic ram 16 centered as it swings in a vertical plane in operating the boom arm 12. These plates 46, as shown also in Fig. 2, provide additional bearing for the pivot pin 44 which receives a large portion of the load from the end of the boom.

The conventional hydraulic ram or jack 16, which is single-acting in the preferred embodiment, is provided adjacent the lower end of its cylinder with a fluid pressure connection 48 joined to a hose or line 50 connected to a fluid pressure supply and a fluid pressure control which may be fitted between the front seats of the "Jeep," neither the conventional fluid pressure supply nor control being shown.

With more specific reference to the arm or link member 18, which has been described as U-shaped in the illustrative embodiment, it will be further observed that this member is formed to provide a spaced pair of downturned inner ends 52, 52 which will clear the hydraulic ram 16 in all relative positions as the member 18 swings in a vertical plane about a pivot pin 54 passing through the channel sides of the leg 28 outwardly of the jack pivot pin 44. Additional bearing for the strut pivot pin 54 is provided by a pair of parallel plates 56, 56 (Fig. 1) integrally secured to and extending vertically from the bottom of the longitudinal leg portion 28. The spaced plates 56, 56 serve also to maintain the ends 52, 52 loosely in centered relation and provide centering means for other forms of link members which may be pivotally connected (between the plates) by the pin 54. The pivot pin 54, which is readily detachable for removal of the member 18 when that member is not required, or for substitution of link members of different size and shape, may be secured in position by cotter pins or other conventional means (not shown).

As shown best in Figs. 1 and 3, the spaced depending legs 20 and 22 of the base member 14 are secured to the "Jeep" J by means of individual bolts 58, 58 passing through preformed holes in an L-shaped, transverse drawbar 60 with which the standard "Jeep" is provided. Each leg is formed with strengthening side webs 62 and 64 connected by a lower end web 66 provided with a bolt opening 68, through which one of the bolts 58 extends. It will also be noted that the webs 62 and 64 are formed with horizontally aligned openings 70, 70 spaced appreciably above the web 66 to receive pin connections with links for agricultural and other devices with which the lift 10 may be advantageously used.

In addition to providing most convenient bolt spacing for attachment and clearance for auxiliary "Jeep" equipment, the transverse head 24 and leg extensions 20, 22 give the lift attachment 10 a large amount of lateral stability against forces acting at an angle to the plane of boom operation.

The operation of the lift 10 will be better appreciated from a consideration of Fig. 2 showing its use in lifting one end of and towing a vehicle V by means of its rear bumper. Before the vehicle V is elevated to the position shown, the chain C, passing through the loop 40 at the extending end of the boom 12, was wrapped around the free end of the U-shaped member 18 and then secured about the mounting bracket of the bumper. Operation of the hydraulic jack 16 to extend the piston 38 elevated the member 18 with the bumper of the vehicle V, the member 18 acting as a strut to prevent swaying and to maintain the vehicle in the desired spaced relation to the rear end of the "Jeep" while being towed. The member 18 in this association also functions as a drawbar in towing.

The integral base member 14 and leg extensions 20 and 22 will be formed from metal of suitable strength and properties, as will also the boom arm 12, the pivoted link 18, the pivot pins, and the principal parts of the hydraulic jack 16. The base member 14 and boom arm 20 may be of channel shape with the channel openings opposing each other as shown best in Fig. 1. Important savings in weight and cost without sacrifice of strength have been effected by efficient use of reinforcing webs and channel sections.

Although numerous examples have been given of operations or jobs to which the lift attachment of this invention is particularly adapted, many more will occur as one becomes familiar with its use.

While a preferred embodiment of the invention has been described in detail, it is to be understood that numerous changes can be made in the details of construction and arrangement of parts without departing from the spirit of the invention and the scope of the appended claims.

Having thus described my invention, what I claim as new and desire to secure by Letters Patent of the United States is:

1. An all-purpose lift attachment for a "Jeep" or similar vehicle having a rear body opening and comprising, in combination, a base member formed to provide a longitudinally extending portion adapted to be secured to the floor struc-

ture of the vehicle inwardly of the rear opening, a transverse portion adapted to extend across said floor structure adjacent the opening, and spaced leg members depending from the transverse portion; a boom arm pivotally connected to the longitudinally extending portion of the base member adjacent its inner end; a hydraulic jack pivotally connected by its piston and its cylinder respectively to the respective outer end portions of the boom arm and the base member; and an outwardly extending U-shaped member having downturned ends, said ends being pivotally connected to the base member on opposite sides of the jack in line with and outwardly of the connection of the jack thereto, to receive the jack during its pivotal movement and elevate the free end of said U-shaped member in the direction of the lifting end of the boom arm.

2. A lift attachment for vehicles comprising a base member having longitudinal and transverse portions lying in the same general plane, and spaced leg extensions projecting from the transverse portion and lying in a plane perpendicular to the plane of said longitudinal and transverse portions; a boom arm pivotally connected by one end to the longitudinal portion at a point remote from the transverse portion for movement toward and away from the transverse portion, said boom arm being of a length for its lifting end part to extend beyond said transverse portion and being disposed on the side of the longitudinal and transverse portions opposite said leg extensions; a hydraulic jack having a cylinder and an extending piston; pivot means connecting the cylinder of the jack to the base member for swinging movement in the same plane as the boom arm; a pin pivotally connecting the outer end of the piston of the jack to the lifting end portion of the boom arm; and a link member pivotally connected by one end to the base member for independent movement in the same plane as the boom arm and constructed and arranged to extend beyond the lifting end part of the boom arm.

3. A lift attachment for "Jeeps" comprising a base member having longitudinal and transverse portions lying in the same general plane and spaced attaching leg extensions projecting at right angles from the transverse portion; a boom arm pivotally connected by one end to the longitudinal portion at a point remote from the transverse portion for movement toward and away from the transverse portion midway of the leg extensions, said boom arm being of a length to extend beyond said transverse portion; a hydraulic jack having a cylinder and an extending piston; pivot means connecting the cylinder of the jack to the base member for swinging movement in the same plane as the boom arm; a pin pivotally connecting the outer end of the piston of the jack to the end portion of the boom arm; a lifting loop secured to said pin on opposite sides

of the piston; and a link member pivotally connected by one end to the base member for independent movement in the same plane as the boom arm and constructed and arranged to extend beyond the lifting end of the boom arm.

4. A lift attachment for vehicles comprising a base member formed to provide a central longitudinal portion and a transverse portion extending on opposite sides of one end thereof, said portions being generally co-planar, and spaced leg extensions depending from the transverse portion in a plane perpendicular to that of the longitudinal and transverse portions; a boom arm pivotally connected to the end of the central portion that is remote from the transverse portion for movement in a plane perpendicular to and above the base member, said boom arm being of a length for its lifting end part to extend beyond said transverse portion; and a hydraulic jack pivotally connected by one end to the base member adjacent the transverse portion and by its other end to the lifting end part of the boom arm that is extendible beyond said transverse portion.

5. A lift attachment for "Jeeps" comprising a base member having longitudinal and transverse portions lying in the same general plane and spaced attaching leg extensions projecting at right angles from the transverse portion; a boom arm pivotally connected by one end to the longitudinal portion at a point remote from the transverse portion for movement toward and away from the transverse portion midway of the leg extensions, said boom arm being of a length to extend beyond said transverse portion and said longitudinal portion and boom arm being of channel shape; a hydraulic jack having a cylinder and an extending piston; pivot means connecting the cylinder of the jack to the base member for swinging movement in the same plane as the boom arm; a pin pivotally connecting the outer end of the piston of the jack to the end portion of the boom arm; and a link member pivotally connected by one end to the base member for independent movement in the same plane as the boom arm and constructed and arranged to extend beyond the lifting end of the boom arm.

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