Aug. 29, 1950 P. G. PIERCE 2,520,431

ATTACHMENT FOR CRANES

Filed Oct. 2, 1946

FIG. 1

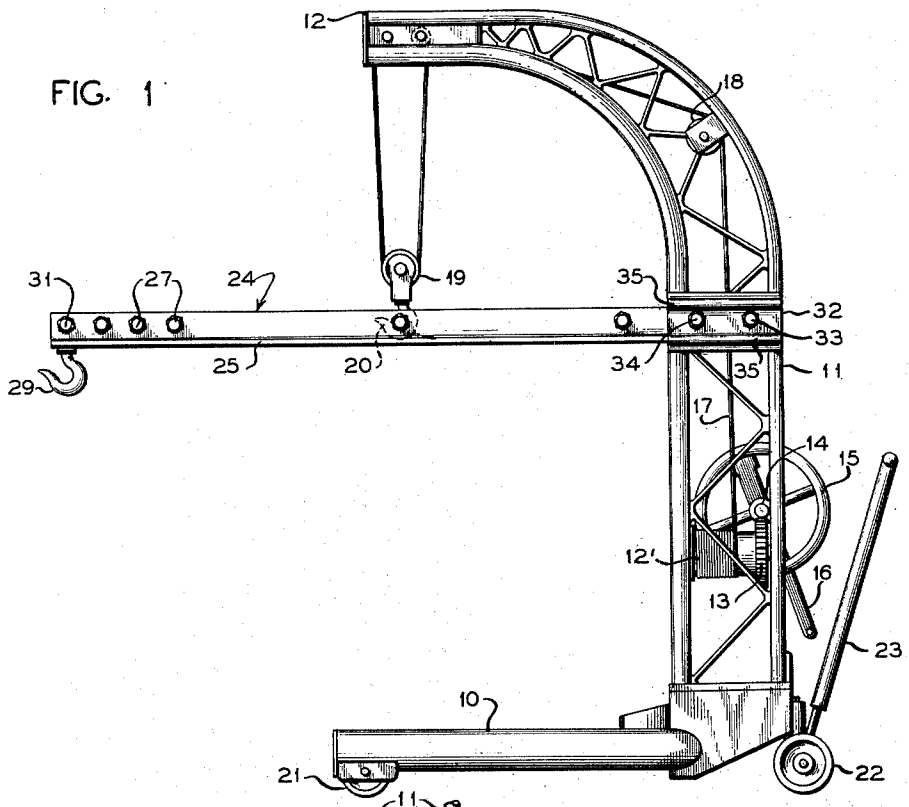
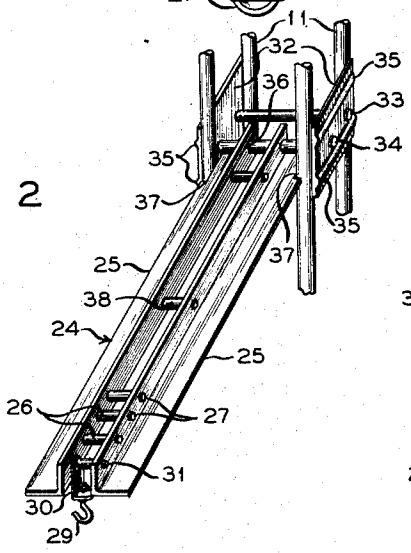


FIG. 4

FIG. 2



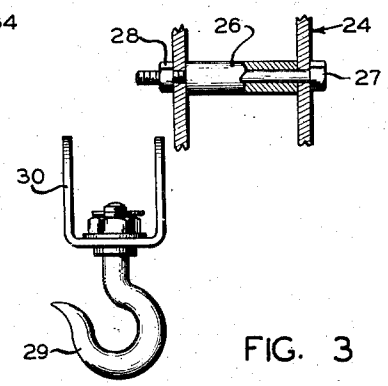


FIG. 3

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ATTACHMENT FOR CRANES

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2 Claims. (Cl. 212—9)

1

This invention relates to article handling and more particularly to an attachment for a conventional portable floor crane to facilitate lifting objects, such as vehicle engines and the like to which access from above by a hanging crane or other lifting device cannot readily be had.

Heretofore the removal and replacement of engines in vehicles, such as automobiles, certain types of trucks, and busses has been a difficult and time consummming task due to the fact that, particularly in trucks and busses, the engines are very frequently located beneath permanent parts of the body structure, in which case vertical removal of the engine is impossible. It has, therefore, been necessary in some cases first to lift the engine vertically a slight amount and then move the same laterally on planks or other supporting members to a position such that the engine may be raised vertically, the supports and obstructions therebeneath removed and the engine lowered to the floor for removal from beneath the vehicle. In the case of automobiles having a modern alligator type hood, it is necessary to remove the entire hood structure before the engine can conveniently be lifted out of the vehicle.

It is therefore an object of the present invention to provide an attachment for a conventional portable floor crane or the like, which facilitates the application of an upward lifting force to an object located beneath more or less permanent obstructions and the subsequent removal of the object from under the obstructions by movement of the entire crane structure.

It is another object of this invention to provide a lifting bar attachment for a crane which may be easily constructed from parts and materials commonly found in a garage.

It is a more specific object of this invention to provide an attachment for a conventional portable crane which comprises an extending boom or lifting bar adapted to be inserted within confined spaces over an object to be lifted and to lift and remove the same therefrom by upward and lateral movement of said boom.

Further objects and advantages of the invention will be apparent from the following description taken in conjunction with the accompanying drawings, wherein:

Fig. 1 is a side elevation of the boom or lifting bar of this invention applied to a conventional portable crane;

Fig. 2, a view in perspective showing the detailed construction of the boom or lifting bar and the manner of attachment to the crane;

Fig. 3, a detail of one form of a work engaging hook which may be applied to the boom or lifting bar; and

2

Fig. 4, a fragmentary detail of the bar or boom illustrating its construction and the manner of spacing the elements thereof.

Referring to the drawings, there is shown in Fig. 1 a conventional portable floor crane comprising a U-shaped base 10, an upstanding skeleton frame work 11, secured at its lower end to the base and terminating at its upper end in a portion 12 overhanging the base.

Mounted for rotation on the upstanding frame work 11 is a winding drum 12' provided with a worm wheel 13. Meshing with the worm wheel 13 is a worm 14 mounted on a shaft journalled in bearings on the frame work 11, the shaft being provided with a hand wheel 15 and crank 16, whereby upon rotation of said hand wheel and crank the winding drum 12' will be rotated and when at rest will be held against rotation by the engagement of said worm and worm wheel. Wrapped around the winding drum 12' is a cable 17 which extends upwardly within the frame work 11 and over guide pulleys such as 18 to the overhanging end 12 of the frame 11. Within the overhanging end 12 there is provided a pulley, not shown, over which the cable 17 is trained, the cable then passing around another pulley 19 and upwardly where it is fixed to the overhanging end 12 of the frame 11. The pulley 18 is provided with a swivel hook 20 which may engage objects to be lifted or the boom of the present invention.

The base 10 of the portable crane may be provided with wheels 21 rotatably mounted thereon and a single steerable wheel 22 may be pivotally mounted on the bottom of the frame 11, a tongue or tow bar 23 secured to the wheel 22 being provided for facilitating steering and movement of the crane.

The structure above described represents a conventional portable floor crane now in use in garages, shops and the like and it can readily be seen that such a crane, while very efficient for lifting objects to which access may be had from above, provides no means whereby objects located beneath obstructions may be conveniently lifted and removed from beneath said obstructions.

The above description has been given with a view to facilitating a better understanding of the construction and operation of the device forming this invention, and which is particularly designed to be applied to a crane of this type.

In order to utilize a crane of the type described above in lifting and removing objects such as vehicle engines and the like from beneath obstructions, there is provided a bar or boom, indicated generally at 24, which is adjustably mounted on the upstanding frame 11 of the

crane and extends outwardly therefrom a sufficient distance to be inserted beneath an obstruction and engage a vehicle engine or the like to be removed therefrom. The lifting bar or boom is fabricated from two angle bars 25 of sufficient strength to withstand the intended loads, the bars being positioned with two flanges thereof in the same horizontal plane and with the upstanding flanges facing each other and spaced apart by hollow spacers 26, a sufficient number of which are provided to give the structure the required strength and rigidity. Passing through apertures in the upstanding flanges and the hollow spacers 26 are bolts 27 secured in place by nuts 28 threadedly received thereon which serve to clamp the angle bars 25 rigidly together.

In order to properly engage the object to be lifted, there is provided a hook 29 swivelled in a U-shaped bracket 30, there being apertures provided in the arms of the bracket 30 through which bolt 31 passes to pivotally mount the hook 29 and bracket 30 at the outer end of the bar or boom 24.

Since various objects to be lifted thereby may be located at different heights above the floor, means is provided for adjustably mounting the bar or boom 24 on the upright frame 11 and this means may conveniently take the form of two plates 32, one on each side of the frame 11 and bolts 33 and 34 extending through the plates to clamp them securely in place on the frame 11. The plates 32 may be provided with strengthening ribs 35. The bar or boom 24 is pivotally mounted on the plates 32 by passing the forward bolt 34 through apertures 36 in the upstanding flanges of the bar. If necessary, cutaway portions 37 may be provided in the horizontal flanges of the bar 24 to provide necessary clearance for upward and downward pivotal movement thereof.

In order to attach the lifting hook 20 of the crane to the boom or bar 24, there is provided midway thereof a through bolt and spacer 38 which may be identical with the bolt and spacer 26 and 27, the hook 20 being merely engaged around the spacer 38 to support the bar 24 from the cable 17.

In operation, it is only necessary to clamp the plates 32 on the upright portion 11 of the crane at the desired height, after which the crane, together with the bar 24, may be moved adjacent the object to be lifted with the bar 24 extending beneath any overhead obstruction and the hook 29 engaging the object to be lifted or a sling applied thereto. The crank 16 is then actuated to wind up the cable 17 and raise the hook 29, thus lifting bar 24 and the object attached to hook 29. When the object has been raised a sufficient distance, the crane with the object suspended therefrom may be moved a sufficient distance for the object to clear any obstruction and thereafter to any desired location in the shop.

It will be seen from the above description that there is provided by this invention a relatively simple structure which may be easily manufactured from parts and materials readily available around the ordinary garage or shop and which may be applied to or removed from a conventional crane at will and which will readily facilitate the use of a crane in the removal or installation of vehicle engines or other objects which must be handled beneath overhead obstructions.

It will be obvious to those skilled in the art that various changes may be made in the invention without departing from the spirit and scope thereof and therefore the invention is not limited by that which is shown in the drawings and described in the specification but only as indicated in the appended claims.

What is claimed is:

1. An attachment for a portable crane comprising an elongated boom pivotally mounted on said crane for movement in a vertical plane, said boom comprising two parallel angle bars having their horizontal flanges in substantially the same plane and their vertical flanges spaced from each other, a plurality of spacing sleeves located at spaced points along the length of said vertical flanges, bolts passing through said vertical flanges and said sleeves, nuts on said bolts securing said angle bars together to form a rigid fabricated structure, a work engaging swivelled hook having a U-shaped bracket, apertures in each leg of said bracket, one of said clamping bolts passing through said apertures to pivotally mount said bracket and hence said hook on said boom adjacent one end thereof, apertures in said vertical flanges adjacent the opposite end of said boom, clamping plates having longitudinal strengthening ribs thereon constructed and arranged to engage the sides of the crane structure, clamping bolts passing through apertures in said plates whereby said plates may be clamped in any desired vertical position on said crane structure, one of said clamping bolts passing through the apertures in said vertical flanges whereby said boom is pivotally mounted on said crane structure, and means comprising one of said spacers and angle bar securing bolts engaging the lifting hook of said crane whereby upward and downward pivotal movement of said boom may be obtained by actuation of the lifting mechanism of said crane.

2. An attachment for a portable crane comprising an elongated boom pivotally mounted on said crane for movement in a vertical plane, said boom comprising two parallel bars spaced from each other, a plurality of spacing sleeves located at spaced points along the length of said bars, bolts passing through said bars and said sleeves to form a rigid fabricated structure, a work engaging swivelled hook having a U-shaped bracket, apertures in each leg of said bracket one of said clamping bolts passing through said apertures to pivotally mount said hook on said boom against one end thereof, adjustable means pivotally mounting said boom on the crane structure and arranged to be secured at any desired vertical position, and means on said boom engaging the lifting hook of said crane whereby upward and downward pivotal movement of said boom may be obtained by actuation of the lifting mechanism of said crane.

PRESTON G. PIERCE.

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