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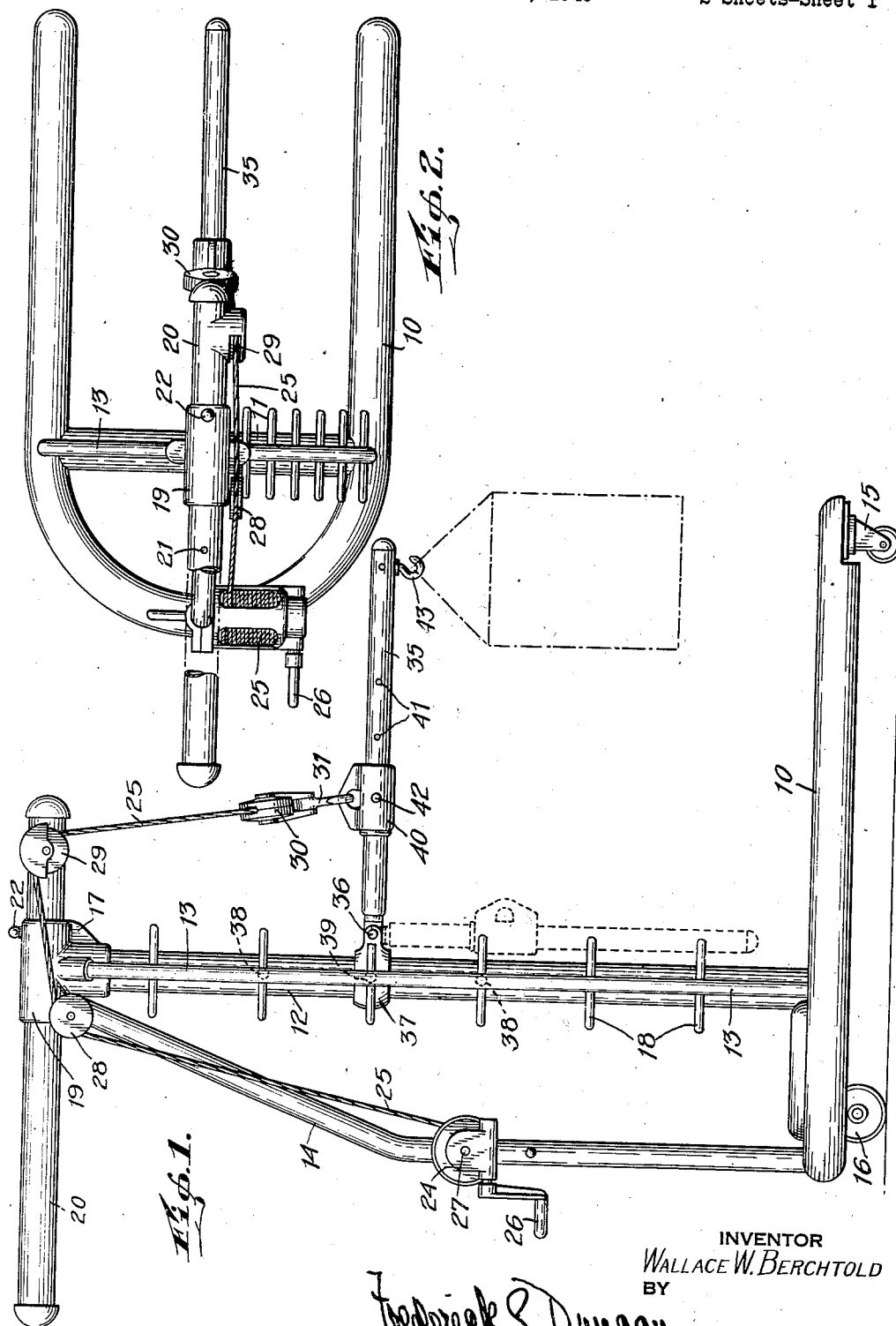
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2,419,813

CRANE

Filed Feb. 6, 1945

2 Sheets-Sheet 1



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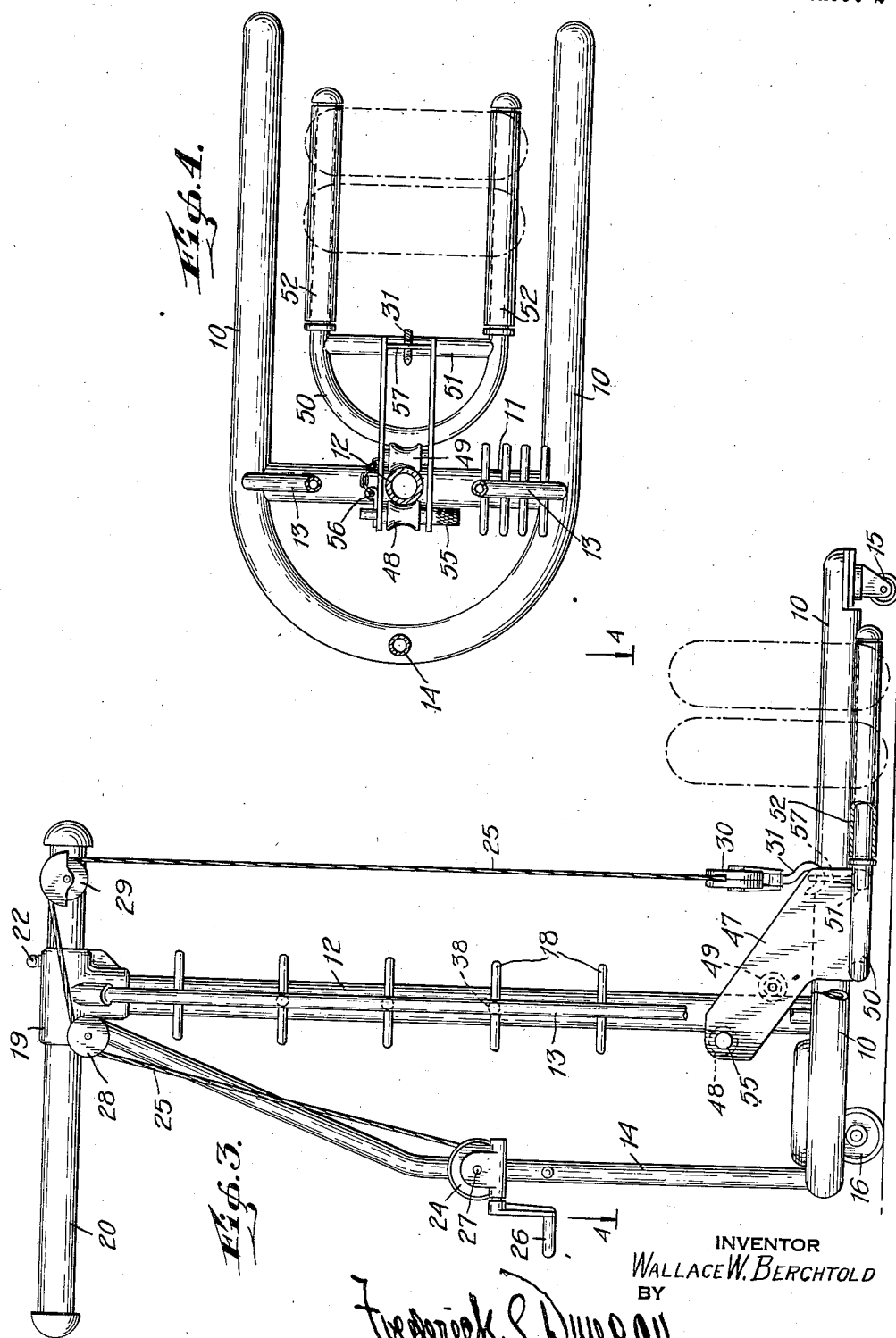
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UNITED STATES PATENT OFFICE

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CRANE

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5 Claims. (Cl. 212-57)

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The invention relates to a crane having general application but constructed particularly for garage use, such as for the removal of the engine or motor of cars and especially for the removal of the motor from the rear end of a bus. The crane also provides mechanism for the removal and remounting of tires or wheels such as the dual rear wheels for buses which are heavy and cumbersome. These wheels are removed periodically for inspection of the brake drums and mechanism.

It is an object of the invention to construct a crane having general utility and also particularly suited for removing the rear end mounted motor of a bus.

Another object is to construct a crane having general utility and having mechanism for easy removal and remounting of wheels of vehicles and particularly the dual wheels of buses.

Another object of the invention is to construct a new and novel portable crane having a plurality of crane arms.

Another object is to construct a crane having a general utility arm and an additional arm or boom particularly suited for removal of the rear end mounted motor of a bus.

A still further object is to construct a crane having a plurality of arms one of which may be used alone as a general utility arm and another arm which cooperates with the utility arm particularly designed for the removal of dual wheels and tires of buses and remounting the same upon the bus.

Other objects of the invention will be more apparent from the following description taken in connection with the accompanying drawings illustrating the preferred embodiment thereof in which:

Figure 1 is a side elevation of the crane using two arms for the removal of a bus motor shown diagrammatically in dot-dash lines.

Figure 2 is a top view of the crane.

Figure 3 is a side elevation of the crane showing the arm or frame used in the removal and mounting of the dual wheels of a vehicle such as a bus.

Figure 4 is a plan view of the tire removal and mounting arm with dual wheels supported thereon.

Because of the limitations of space in the location of the motor at the rear end of a bus, it is difficult to remove the same therefrom. Such motors are heavy and require the use of a crane for their removal. The crane herein is provided with a plurality of arms, one of which may be

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used for general lifting purposes and the pair of arms are used particularly for the removal of the motor of the bus in the confined space in which said motors are mounted. The crane also utilizes a plurality of arms for facilitating the removal of the dual wheels of a bus and for remounting the same on the axle of the bus. Also because of the size and weight of the dual wheels of a bus it is very difficult to align the bolt holes upon the wheel and the crane is designed to make this operation relatively easy.

The crane provides a frame of any suitable form, that illustrated including a U or horse-shoe shaped lower frame 10 provided with a cross bar 11. A vertical standard 12 is carried by the cross bar. The vertical standard is braced by means of bars 13 extending from the top of the standard on each side thereof and to the U-shaped frame. A brace 14 also extends rearwardly from the standard to the rear of the U-shaped frame. One of the braces 13 may carry rods 18 at spaced intervals to form a ladder. The frame may have swivel wheels 15 on the ends of the U-shaped lower frame and a wheel 16 at the bend in the U. This construction of U-shaped frame permits the load to be straddled by the arms of the U for ease in attaching the hoist hook and in lifting a load whereupon the crane and load may be moved away.

A bracket 17 at the top of the vertical standard carries a slide 19 which receives an arm 20 slidable therein so that the arm may be extended or retracted as desired. Any suitable means may be used to lock the arm in its adjusted position, the means particularly illustrated including a series of holes 21 which receive a lock pin 22 carried by the slide.

The hoisting means may take any desired form, that illustrated being a manual hoist carried by the frame and slidable arm. The hoisting means includes a drum, which may be in a housing 24, carrying a cable 25 which drum is rotated by a handle 26 preferably connected by a self-locking worm to the drum shaft 27. The drum and its mechanism is mounted upon the brace 14. The cable extends over a pulley 28 mounted upon the bracket 17 and then over a pulley 29 carried upon the end of the adjustable arm 20, the cable connecting with a snatch block 30. The snatch block carries a hook 31 for supporting a load directly from the arm 20 or for attachment to a secondary arm, two of which are shown.

The crane is provided with a plurality of arms, which includes the adjustable arm 20 and a boom

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or secondary arm 35 which is swingable vertically on a pivot 36 carried by a bracket 37. This bracket is mounted upon the standard 12 and preferably is slidable thereupon for adjusting its vertical position. The adjustment mechanism includes a plurality of holes 38 in the standard which receive a lock pin 39 carried by the bracket 37 to support the boom in adjusted position or elevation. The boom carries an attaching bracket 40 to receive the hook 31 of the snatch block 30 which bracket may be adjustable along the length of the boom. Three adjustment positions are shown represented by the holes 41 located along the length of the boom which holes receive a locking pin 42 carried by the attaching bracket. The boom may carry a hook 43 shown at the outer end thereof to carry the load supported by the boom. The pivot 36 not only permits the boom to swing vertically but enables it to extend downwardly out of the way when not in use either in front of the standard as shown in dotted lines in Figure 1 or it may be rotated and hang out of the way on the other side of the standard.

The boom 35 may be adjusted in its elevation or vertical position so that it can project into the limited space above the motor in the motor hood at the rear end of the bus whereupon the motor is secured to the hook 43 such as by cables or other means and lifted off of its supporting structure by the hoisting means. The crane may then be moved to withdraw the engine from the bus. The adjustment of the boom enables it to be fixed at the proper elevation for whatever job it is intended to perform in some confined space. The adjustable position for the attaching bracket 40 permits variation of the leverage applied to the boom and also permits the boom to extend into the bus hood without interference with the snatch block. When the boom is in use the upper arm 20 may be slid to any one of its retracted positions, Figure 3 showing the arm retracted substantially its full length.

The crane is also constructed to facilitate the removal and mounting of heavy wheels such as the dual rear wheels of a bus. The mechanism for this purpose utilizes an auxiliary arm or frame which slides or rolls vertically on the lower end of the standard 12, as shown in Figures 3 and 4. This arm includes a roller bracket 47 which carries a pair of vertically spaced rollers 48 and 49 which engage opposite sides of the lower end of the standard 12. This roller bracket carries a U shaped frame 50 having a cross brace 51. The frame 50 and its cross brace are secured to the roller bracket in any suitable fashion such as by welding. The bracket may carry an eye 57 to receive the hook 31 of the snatch block 30. Each side of the auxiliary frame may carry a long roller 52 upon which the wheels are carried. The rollers permit the wheels to be rotated for aligning the bolt holes in the wheel with those carried by the axle or brake drum.

The roller 48 may be mounted upon a removable roller pin 55 which when withdrawn permits the roller to be removed whereupon the auxiliary arm or frame 50 may be removed from the post or standard 12. The roller pin 55 may be held in place or against inadvertent removal by a suitable lock pin 56.

The crane illustrated in Figures 3 and 4 does not show the boom carried by the standard. The boom may be provided if desired and usually will be carried by the crane so that it may be used for both engine removal and wheel mounting and removal. In any event the crane carries

a pair of arms which includes the slidable arm 20 and a secondary arm which may be the boom 35 or the tire removal arm.

This invention is presented to fill a need for improvements in a crane. It is understood that various modifications in structure, as well as changes in mode of operation, assembly, and manner of use, may and often do occur to those skilled in the art, especially after benefiting from the teachings of an invention. Hence, it will be understood that this disclosure is illustrative of preferred means of embodying the invention in useful form by explaining the construction, operation and advantages thereof.

What is claimed is:

1. A crane comprising a frame including a vertical standard, a slide carried by the upper end of the frame, an arm carried by the slide and adjustable horizontally with respect thereto, hoisting means carried by the frame and arm, a bracket carried by the standard at the lower end thereof and movable thereupon, a wheel frame carried by the bracket to support a wheel thereon, means carried by the wheel frame for connection with the hoisting means.

2. A crane comprising a frame including a vertical standard, a slide carried by the upper end of the frame, an arm carried by the slide and adjustable horizontally with respect thereto, hoisting means carried by the frame and arm, a bracket carried by the standard at the lower end thereof and movable vertically thereupon, a wheel arm carried by the bracket including parallel arms to support a wheel thereon, means carried by the wheel arm for connection with the hoisting means, and a roller upon each parallel arm for rolling the wheel thereon.

3. A crane comprising a frame including a vertical standard, an arm carried by the upper end of the frame, hoisting means carried by the frame and arm, a wheel arm including a bracket having spaced rollers engaging the standard at the lower end thereof to permit vertical movement thereupon, a wheel frame carried by the bracket located substantially below the spaced rollers and positioned horizontally to support a wheel thereon, one of the rollers being removable to permit removal of the bracket and wheel frame from the standard, and means carried by the wheel arm for connection with the hoisting means.

4. A crane comprising a frame including a vertical standard, a slide carried by the upper end of the frame, an arm carried by the slide and adjustable horizontally with respect thereto, hoisting means carried by the frame and arm, a wheel arm including a bracket having spaced rollers engaging the standard at the lower end thereof to permit vertical movement thereupon, a wheel frame carried by the bracket including parallel arms located substantially below the spaced rollers and positioned horizontally to support a wheel thereon, means carried by the wheel arm for connection with the hoisting means, and a roller upon each parallel arm for rolling a wheel thereon.

5. A crane comprising a frame including a vertical standard, a slide carried by the upper end of the frame, an arm carried by the slide and adjustable horizontally with respect thereto, hoisting means carried by the frame and arm, a wheel arm including a bracket having spaced rollers engaging the standard at the lower end thereof to permit vertical movement thereupon, a wheel frame carried by the bracket including parallel

arms located substantially below the spaced rollers and positioned horizontally to support a wheel thereon, one of the aforesaid rollers being removable to enable removal of the wheel arm from the standard, means carried by the wheel arm for connection with the hoisting means, and a roller upon each parallel arm for rolling a wheel thereon.

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