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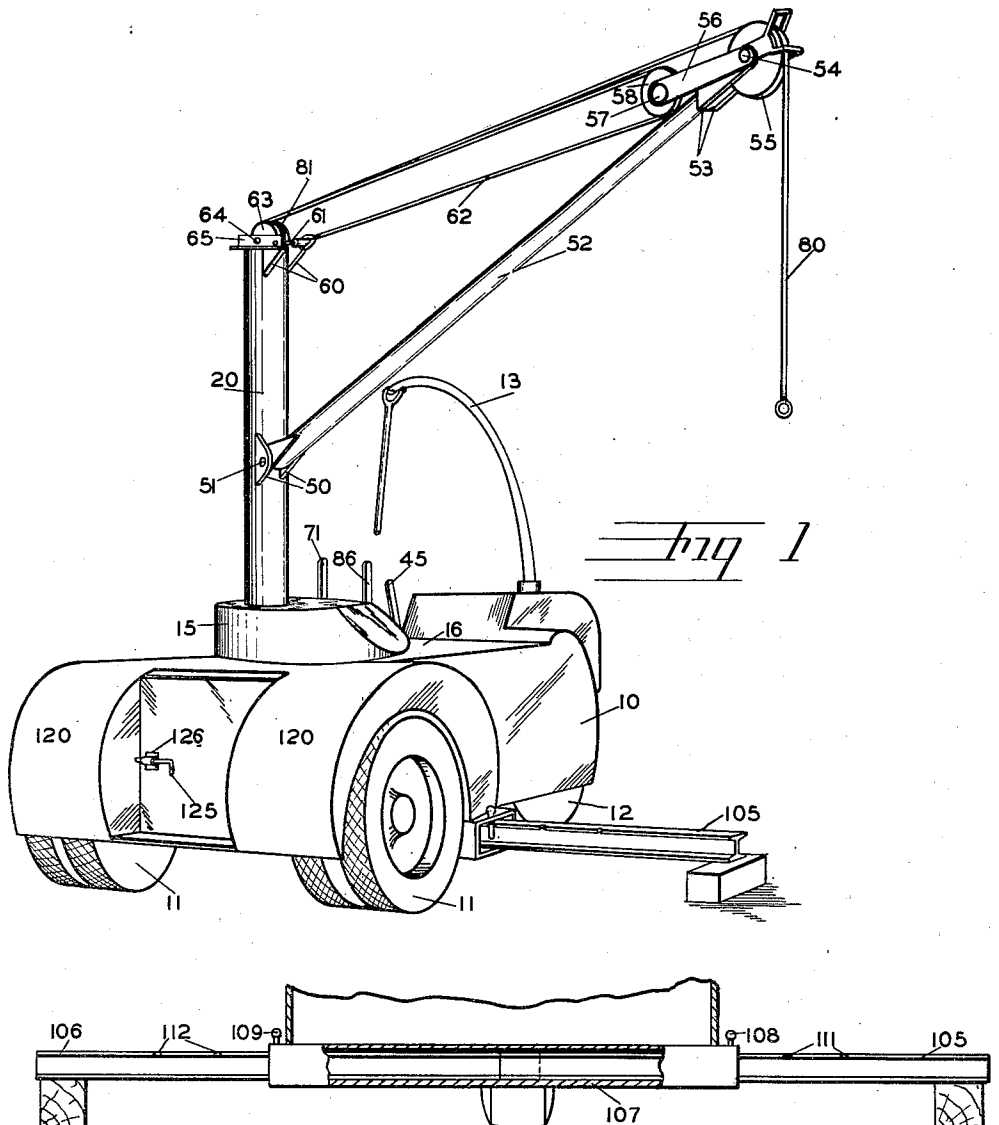
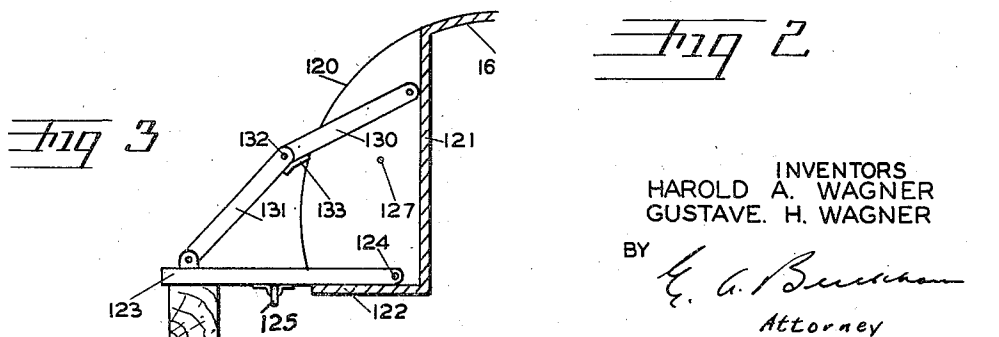
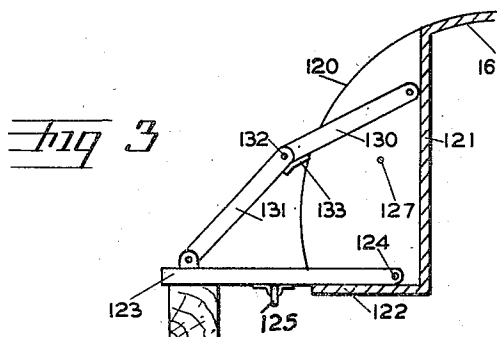
H. A. WAGNER ET AL

2,557,484

TRUCK CRANE

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2 Sheets-Sheet 1



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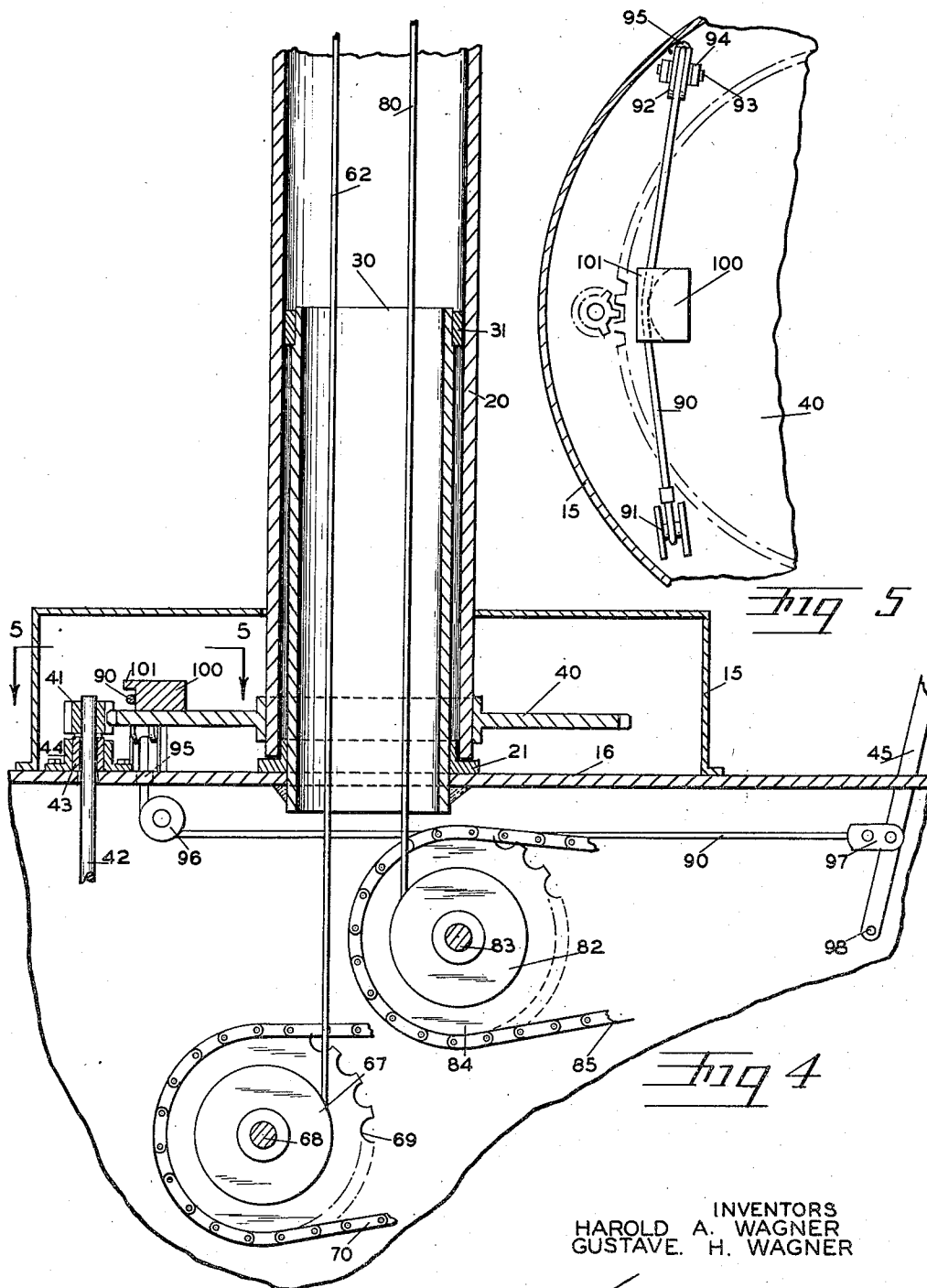
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TRUCK CRANE

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UNITED STATES PATENT OFFICE

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TRUCK CRANE

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2 Claims. (Cl. 212-67)

1

Our present invention relates to a mobile hoisting unit comprising a self-propelled vehicle having a boom crane mounted thereon.

An object of the present invention is to provide a hoisting device which may be moved from place to place and may be utilized to transport a heavy object from place to place.

A further object of the present invention is to provide a mobile crane which may be utilized in a stationary position to move objects about and which may be braced against tipping by outriggers carried by the vehicle.

A further object of the present invention is to provide a mobile hoisting crane in which a crane post is mounted at one end of the vehicle and the greater mass of the vehicle, including the engine for propelling it, is adjacent the opposite end so that the mass of the vehicle acts as a counterbalance for the crane.

A further object of the present invention is to provide a mobile crane with a platform upon which objects lifted by the crane may be rested while the vehicle is moving about, the platform being close to the ground and close to the mast or post of the crane so that the vehicle will not tend to tip, and in which the platform is counterbalanced by the greater mass of the vehicle.

A further object of the present invention is to provide a new and improved mast construction for a boom crane, the mast comprising a hollow tube adapted to be rotated to swing the boom and through which pass the boom controlling cable and the lifting cable.

A further object of the present invention is to provide a boom crane having mast rotating means thereon with means to limit the rotation of the crane to substantially 360 degrees so that the crane will not rotate greater than one complete revolution.

The foregoing and other objects and advantages of the present invention will be more readily apparent from an inspection of the accompanying drawings taken in connection with the following specification wherein like numerals refer to like parts throughout.

In the drawings

Fig. 1 is a view in perspective of a vehicle embodying the present invention;

Fig. 2 is a partial vertical section with parts broken away through a portion of the vehicle to illustrate lateral extensible outriggers;

Fig. 3 is a partial vertical section to illustrate the front outrigger or platform;

Fig. 4 is a partial vertical section on an enlarged scale taken through the center of the post; and

Fig. 5 is a partial horizontal section taken substantially along line 5-5 of Fig. 4 and looking in the direction of the arrows.

The automotive vehicle herein illustrated com-

2

prises a body 10 having two sets of forward wheels 11 which are mounted upon an axle and adapted to be driven by means of an engine mounted within the body 10. A single rear wheel 12 is provided so as to form a tricycle vehicle, the rear wheel 12 being so mounted as to be shiftable by a tiller bar 13 so that the vehicle may be driven from place to place. Details of the engine mounting and the method of connecting the engine to the driving wheels are unnecessary for an understanding of the present invention as such details may assume many well known forms. It is preferred, however, that the greater mass of the vehicle and engine be located as closely adjacent the steering wheel 12 as possible.

At the forward end of the vehicle and close to the axle connecting the wheels 11 there is provided a housing 15 extending above the deck 16 of the vehicle. At or near the longitudinal center line of the vehicle and close to a point above the axle connecting the wheels 11, and within the wheelbase of the vehicle, there is mounted an upright crane post 20 comprising a section of heavy steel pipe or the like, the lower end of which is machined and rests upon a collar 21 mounted upon the deck 16 within the housing 15. The collar 21 extends upward within the lower end of the mast 20 to provide a bearing to prevent shifting of the butt of the mast and has a lateral flange forming a thrust bearing seat for the lower end of the mast. A shorter section 30 of heavy steel tubing of lesser external diameter than the internal diameter of the post 20 extends through a hole in the deck 16 and is welded to the lower surface thereof beneath the collar 21. The tube 30 extends upward within the tube 20 and is provided with a bearing collar 31 at its upper edge to prevent sideward tipping of the mast 20. A large gear 40 is affixed to the lower end of the mast 20 and extends in a horizontal plane therefrom within the housing 15. The gear 40 meshes with a gear 41 mounted upon the upper end of a vertical shaft 42 which is journaled in a bearing sleeve 43 mounted in a bracket 44 affixed to the upper surface of the deck 16 within the housing 15. The shaft 42 is suitably connected to the engine of the vehicle by any convenient means including a clutch (not shown), the details thereof not being herein illustrated as they may vary and assume many well known forms. The clutch is adapted to be engaged or disengaged by a lever 45 extending through the deck 16 so that the gear 40 and the mast 20 attached thereto may be rotated at will when the clutch lever 45 causes the clutch to be engaged.

Substantially midway of the vertical height of the mast 20 there is provided a pair of plates 50 supporting a transverse pivot member 51 which passes through the lower end of a crane boom 52. At the outer end of the boom 52 there is

mounted a pair of spaced plates 53 supporting a pivot pin 54 upon which is mounted a pulley 55. A pair of spaced arms 56 extend rearwardly from the pin 54 and support a pivot member 57 which carries a pulley 58. The upper end of the mast 20 supports a spaced pair of bracket plates 60 which extend forward above the plates 50 and mount a transverse pin 61 about which is fastened the end of a boom raising cable 62. The cable 62 passes about the pulley 58 and then about a pulley 63 mounted upon a pin 64 journaled in spaced brackets 65 at the top of the mast 20. The cable 62 then passes vertically downward through the mast 20 and the tube 30 to a drum 67 mounted upon a transverse shaft 68 within the body of the vehicle. The shaft 68 is rotated by means of a sprocket gear 69 and sprocket chain 70 passing thereabout and extending to suitable means for driving the sprocket chain. Such means for driving the sprocket chain are not illustrated as the same may assume many different forms. A lever 71 extends through the deck plate 16 adjacent the lever 45 and is preferably adapted to assume two positions, in one position engaging a clutch for driving the chain 70 and in another position engaging a brake to prevent the chain from moving. Such a mechanism may be of the type illustrated and claimed in our co-pending application Serial No. 613,142, filed August 28, 1945, and issued March 2, 1950, as Patent No. 2,501,198, or any reasonable equivalent thereof.

A hoisting cable 80 passes about the pulley 55 and a pulley 81 mounted alongside of pulley 63 on the pin 64, and then descends through the hollow mast and the hollow tube 30. The lower end of the cable 80 is fastened about a drum device 82 mounted upon a transverse shaft 83 adjacent the shaft 68. The shaft 83 is rotated by a sprocket gear 84 affixed thereto and driven by a sprocket chain 85.

A third clutch lever 86 extends through the deck plate 16 adjacent the clutch lever 71 and is suitably connected to the means for driving the chain 85. Preferably such means comprises a clutch and a brake and the lever is adapted to engage the clutch to lift a weight by means of the cable 80 and to disengage the clutch and engage a brake to hold the weight at its elevated position, such means being preferably of the type disclosed and claimed in our co-pending application Serial No. 613,142, filed August 28, 1945, and issued March 2, 1950, as Patent No. 2,501,198, as mentioned above.

We thus have provided means whereby the engine for propelling the automotive vehicle may be connected at will to means for raising or lowering the boom, or to means for raising or lowering a weight swung from the boom, or to means for rotating the mast and thus swinging the boom.

It is important that the mast 20 be restrained from rotating through more than approximately 360 degrees, otherwise the cables 62 and 80 would be wrapped about each other and prevented from moving. To achieve this object we provide a trip device comprising a cable 90 which is fastened at one end to a bracket 91 extending upward from the deck plate 16 between the periphery of the gear 40 and the vertical wall of the housing 15. The cable 90 extends horizontally above the upper surface of the gear 40 and passes about a pulley 92 mounted on a pin 93 journaled in a bracket 94 extending upward from the deck plate 16 at a transverse point between the periphery of the

gear 40 and the vertical wall of the housing 15. The cable then passes downward through an opening 95 in the deck 16 and about a guide pulley 96 suitably mounted beneath the deck plate 16 so that the cable 90 may extend rearwardly longitudinally of the machine. The rear end of the cable 90 is fastened to a bracket 97 connected to an intermediate point of the lever 45 which is pivoted at point 98. The lever 45 is so arranged that upon rearward movement thereof by the operator the clutch controlled thereby will be engaged to rotate the shaft 42 and hence rotate the mast 20. Suitable reversing means are preferably provided so that the operator may at will rotate the mast 20 in either direction. In order to prevent the mast from rotating beyond a complete circle means are provided to disengage the clutch as the gear 40 approaches the end of a complete revolution, such means comprising a cam 100 affixed to the upper surface of the gear 40 and having an overhanging flange 101 adapted to prevent the cable 90 from slipping off of the cam. The tension of cable 90 is so adjusted that upon the cam 100 approaching a plane passing through the center line of the gear 41 and of the mast 20 from either direction the cable 90 will be drawn taut to pull forward on the clutch lever 45 and disengage the means driving the shaft 42.

When the vehicle is in use as a stationary crane device it might be desired to lift a weight and swing the weight from one side to another, such weight being greater than could be handled by the crane when the boom is substantially horizontal without overturning the vehicle. In order to guard against this we provide outrigger bars in the form of a pair of H-bars 105 and 106 mounted side by side in a hollow housing 107 affixed to the bottom of the vehicle, the bars being easily slidable transversely of the vehicle and retained therein by pins 108 and 109, one at each side of the vehicle, adapted to engage notches 111 and 112 respectively in the flanges of the H-bars to hold the outrigger members in desired position. When they are extended the ends thereof may be rested upon blocks, stones or the like to prevent sideward tipping of the vehicle.

At the forward end of the vehicle and between the fender portions 120 extending about the forward edges of the wheels 11 there is provided a niche formed by the inner surface of the fenders, a vertical plate 121 extending downward from the deck 16 and a horizontal ledge 122 extending between the inner walls of the fenders 120 at their lower edges. A platform 123 is hinged at 124 close to the inner edge of the ledge 122 and is adapted to be retained in a substantially vertical position by a latch member 125 slidable in a bracket 126 mounted on a platform into a retaining hole 127 on the inner surface of one of the fenders. When the platform is in this vertical position, as seen in Fig. 1, a ledge is thus provided upon which a person may stand while the vehicle is being moved about. It may be desired to augment the counterbalance effect of the mass of the vehicle when lifting a heavy object and the boom is retained in a position extending forwardly of the vehicle, in which case the platform 123 may be swung forward to a lower horizontal position, as illustrated in Fig. 3, being braced in that position by a pair of toggle arms 130 and 131 pivoted to the fender and to the platform respectively and to each other at point 132. The arm 130 carries a limiting bracket 133 adapted to engage the arm 131 as soon as the pivot mem-

5

ber 132 has passed beyond a center position so as to prevent upward movement of the platform. The outer end of the platform may be blocked up as shown in Fig. 3 to prevent the vehicle from tipping forward.

The platform 123 may be left in its horizontal position as the vehicle moves about to provide a larger space for a person to ride upon or to provide a platform upon which a heavy object may be rested, the weight thereof being partially supported by the platform and partially by the cable 80 and the crane. The fenders 120 will aid to retain the object in its position which is closely adjacent the ground and closely adjacent the crane mast so that a very large weight may be thus transported.

Having illustrated and described a preferred form of our invention it should be apparent to those skilled in the art that the invention permits of modification in arrangement and detail. We claim as our invention all such modifications as come within the true spirit and scope of the appending claims.

We claim:

1. A mobile hoisting unit comprising a self-propelled wheeled vehicle, a crane including a post mounted on the vehicle, a gear affixed to the butt end of said post, gear means for rotating said gear and post, and means including a trip cable and a cam mounted on said gear in position to contact and tension said trip cable for preventing rotation of said gear and post beyond a limit in either direction of rotation.

6

2. In a crane unit including operating cables, a hollow post through which said cables pass, gears for rotating said post, means including a clutch lever for connecting said gears to a source of power, and a trip device for preventing rotation of said post beyond a certain limit in either direction of rotation comprising a cable attached to said clutch lever and cable tensioning means for tensioning said cable as said post approaches a desired limit of rotation whereby said clutch lever is shifted to clutch disengaging position.

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