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SELF-LOADING AND UNLOADING VEHICLE FOR PALLETIZED LOADS

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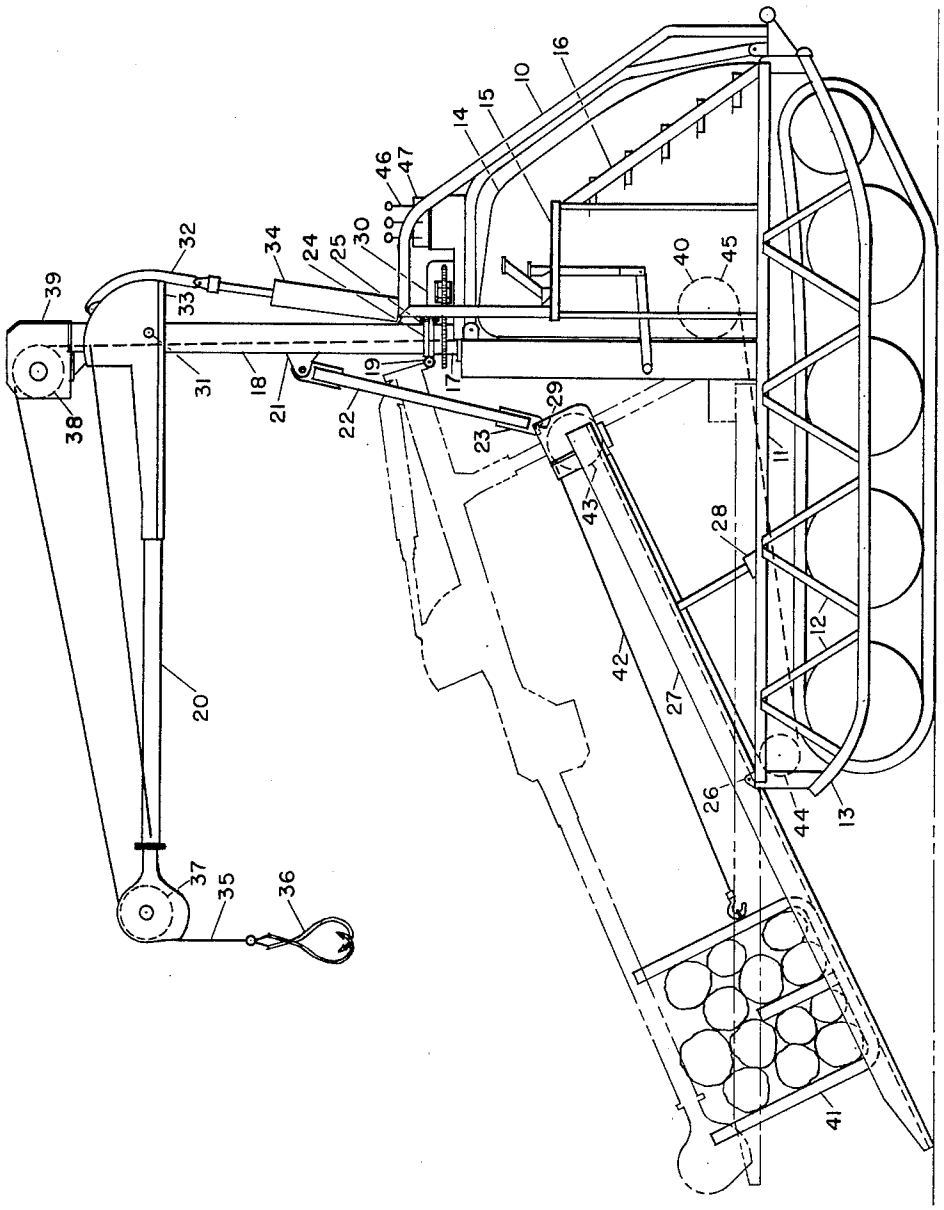


FIG. 1

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SELF-LOADING AND UNLOADING VEHICLE FOR PALLETIZED LOADS

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This invention relates to material-handling devices and more particularly to a self-loading vehicle for gathering and transporting loaded pallets.

In the gathering of resinous wood for extraction of rosin therefrom, it is often necessary to work in hilly terrain with boggy lowlands. The wood is usually loaded on a truck and moved to a central depot for transportation to the mill. The movement of the wood to a central depot over the rugged terrain has in the past been accomplished by using separate loading devices and the combination of a tractor and a trailer. There has been a need for more compact equipment with greater maneuverability in the woods.

It is, therefore, an object of the present invention to combine in one self-loading transportation vehicle a load-lifting device, a load-carrying device and a traction device.

It is a further object to provide a means for lowering the mast of the load-lifting device during its movement to new locations.

It is a still further object to provide a tilting load-carrying device to aid in unloading filled pallets.

It is a still further object to apply the movement of the tilting deck to the elevation and lowering of the mast.

Other objects will be apparent from the following description taken in connection with the following drawings wherein:

FIG. 1 is a side elevation of the apparatus in which is illustrated a power-driven transport vehicle 10 of the tractor type on which is mounted a horizontal framework 11 having bracing 12 and supporting members 13. A control center 14 comprising an elevated platform 15 is mounted on the framework 11 over the front end of the vehicle and steps 16 are provided for ascending to the platform 15. Directly behind the control center 14 is a hoist mechanism comprising a lower mast section 17 vertically mounted on the frame 11 and an upper mast section 18. At the top of the lower mast section 17 is a hinged coupling 19 to which the upper mast section 18 is attached. The upper mast section 18 is adapted to carry a boom 20 at its top and, at a point intermediate the top and bottom, a bracket 21 which pivotally supports a rigid pole 22 with a fork 23 at its opposite end for swinging the upper mast section 18 into raised and lowered positions. The hinged coupling 19 joining the upper and lower mast sections is provided with flanges 24 through which bolts 25 are passed for maintaining the mast rigid during use of the hoist.

Hingedly attached by means of pivoting hinge 26 to the rearmost part of the frame 11 is a horizontal load-supporting deck 27 adapted to pivot at a position intermediate the forward and rearward ends such that when the deck 27 is pivoted to an inclined position, the rear end of the deck 27 extends to the ground. The deck is provided with a hydraulic cylinder 28 for moving the deck to and from the inclined position.

For purposes of movement to new locations on a trailer where the elevated mast would be objectionably high for transportation on public roads, the upper mast section 18 with boom 20 attached is swung down to rest on the deck as shown by the broken lines. This is accomplished by hooking the fork 23 of the hingedly attached pole 22 over a rod 29 on the deck while the deck is in tilted position, removing the locking bolts 25 at the hinged coupling 19 and actuating the pressure at the hydraulic cylinder 28 so as to lower the front end of the deck 27 and thereby cause the upper mast section 18 to swing down to the deck 27. The hinged pole 22 is normally unhooked from the deck rod 29 while the deck is being loaded and unloaded by means of the hoist.

While loading and unloading and thus using the hoist, the upper mast section 18 is rigidly bolted at the flanges 24 of the hinge coupling 19 maintaining a vertical mast. The upper section 18 is raised into this vertical position by hooking the pole 22 hingedly attached thereto over rod 29 on the deck while the deck is substantially in a horizontal position and exerting pressure by means of the hydraulic cylinder 28 to tilt the deck to an inclined position thereby urging the upper section into a vertical position. While in this position the mast hinge 19 is locked rigidly by means of bolts 25 passing through the flange of the hinge coupling 19.

The mast is rotatable through a 180° arc when the mast-lifting pole 22 is unhooked from the rod 29 of the deck. This is accomplished by rotating means 30 which rotates the mast as a unit.

The hoist has a boom of sufficient length to permit operation in a radial range from about ⅓ to about ⅔ of the length of the deck through a 180° arc from one side around the rear to the other side of the vehicle. The boom 20 is raised and lowered to attain the desired extension by swinging the boom 20 in a vertical arc about the pivot 31 by means of a roller chain 32 connected to said boom by means of an extension bracket 33 having an arcuate track such that a constant radius of pull is maintained in all positions of the boom. Power is applied to the roller chain 32 by means of hydraulic cylinder 34 mounted on the upper mast section 18.

The hoist line 35 holding a hook 36 or tongs passes over a sheave 37 at the extended end of the boom 20, over a sheave 38 in the mast head 39 and through the center of the mast to a winch drum 40 at the base of the lower mast section.

The hoist is used for loading pallets of wood on the deck while the deck is in the horizontal position.

While loading, a pallet is positioned on the deck, and stumps and other pieces of wood are picked up by the hoist and dropped into the pallet. By properly maneuvering, it is possible to pick up and load scattered wood in rough boggy terrain and transport a filled pallet to a depot where the pallet is transferred to a truck for rapid transportation over improved roads.

To unload the pallet, the deck is tilted so as to allow the pallet to slide and a line 42 attached to the pallet is used to control the rate of sliding and to maintain balance. The line 42 is threaded over a sheave 43 on the forward end of the deck and over a sheave 44 at the rear end of frame 11 under the deck and forward to a winch drum 45 at the base of the lower mast section whereby the line is pulled by operating the winch. Winch drum 40 and winch drum 45 are separate drums on a single shaft with separate clutches using motive power from the same source.

The operating platform 15 is mounted high over the driver's cab to permit good visibility in the loading and unloading operation.

Power is drawn from an engine in the vehicle for operating the winch drums 40 and 45 and for producing pressure for operating the hydraulic cylinders 28 and 34. Control valves 46 for operating the winches and hydraulic cylinders are assembled on a panel 47 within reach of an operator on the control center platform 15.

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

1. A materials-handling device comprising a self-

powered vehicle having a horizontal frame, a control center mounted on the forward end of said frame, hoist means comprising a boom-supporting two-section mast having a lower section vertically mounted on said frame at the rear of said control center and an upper section adapted to carry a boom and hingedly mounted at the top of said lower section said upper section adapted for swinging motion through an arc in a vertical plane to a vertical position and provided with means for locking in the vertical position, a horizontal deck extending from the base of the mast rearwardly beyond the extremity of said frame and hingedly mounted on the rear of said frame at a point intermediate between the forward and rearward ends of said deck and adapted for motion from a horizontal position to an inclined position whereby the rear end of said deck extends to the ground, a rigid pole member hingedly attached to said upper section of said mast and detachably resting on the deck and adapted for raising said upper mast section to the vertical position on tilting of said deck, means for swinging said deck to and from an inclined position, and means for operating said hoist means for hoisting materials onto and off said deck.

2. In a tractor-type mobile materials-handling device having a frame with a tilting deck and a folding hoist mast mounted on said frame, said deck being normally capable of motion independent of said mast, the combination therewith of a disengageable rigid pole means for coupling the deck and mast for transmitting the motion of the deck, in moving to a tilted position, to motion in the folding hoist mast to raise said mast to a vertical operating position, means for locking said mast in the vertical position and disengaging means for said pole whereby said deck is rendered capable of independent motion.

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